Notably, the Severance Agreement, while containing a non-disparagement clause, does not provide an equitable remedy for a breach of the agreement. Thus, it differs from the Non-Competition and Non-Solicitation Agreement and Invention and Nondisclosure Agreement, both of which do provide equitable remedies. Consequently, it is the permanent injunction itself, signed by Mr. Howell and his attorney on March 30, 2009, that affords the basis for a sanction.[13] The injunction does not reference any time limitation and is thus inferred to have expired at the final hearing.

The Court does not find that the injunction raises constitutional concerns to warrant an exception to the collateral bar rule.[14] The March 30, 2009 order expressly references the March 16, 2009 TRO. The TRO, in turn, references the Non-Competition and Non-Solicitation Agreement, Severance Agreement, and Invention and Non-Disclosure Agreement to which Mr. Howell was a party. The Court further explains in the TRO that pursuant to these agreements, Mr. Howell agreed to maintain the confidentiality of proprietary information and to refrain from competing with KneeBinding, Inc. or making false, disparaging or defamatory statements to certain identified individuals. He also agreed to injunctive relief in the event that he violated

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[13] Mr. Howell asserts that he had signed the stipulation for entry of a permanent injunction under duress. In November 2009, he filed for relief from the injunction, raising the issue of the "extreme economic duress" under which he was compelled to agree to the stipulation. The motion was denied in a written decision entered on June 28, 2011, with leave "to argue against any final injunction at the trial." Mr. Howell did not raise the issue of duress at trial. As such, the Court does not reach this issue.

[14] Courts may decline to apply the collateral bar rule where compliance could cause "irreparable injury which may not be repaired by appellate vindication." *Duckman,* 2006 VT 23 at ¶ 11. Case law reflects that "irreparable injury" in this context tends to connote "an irretrievable surrender of constitutional guarantees" that could arise through compliance with the court order. Mr. Howell has not demonstrated such injury here. Instead, he cites *Campbell Inns, Inc. v. Banholzer, Turnure & Co., Inc.*, 148 Vt. 1 (1987), in which the defendant contended that the plaintiffs failed to show the requisite substantial likelihood of irreparable injury for a preliminary injunction. The Court finds *Campbell* inapplicable to the instant proceedings—*Campbell* involves a request for a preliminary injunction and the harm that could arise if the injunction is not issued. By contrast, Mr. Howell is using the case to argue that he should be permitted to *violate* an injunction already issued against him.

certain of those agreements. The TRO prohibits Mr. Howell from publishing or causing to be published "any communication, oral or written, that relates to Kneebinding and its products to any current or potential customer, client, investor or vendor." The context makes clear that this particular clause is meant to bar disparaging communication. That the language of the permanent injunction tracks the language of the TRO signals to the reader that the stipulation was intended to prohibit Mr. Howell from publishing disparaging communication.

Moreover, Mr. Howell signed the Severance Agreement and was present in court when the TRO issued and when the permanent injunction was being negotiated. He had been served with the plaintiff's Complaint, which contained allegations that he had breached his agreement with KneeBinding, Inc. by disparaging the Company and made defamatory statements. Under these circumstances, the Court concludes that Mr. Howell understood that the injunction prohibited disparaging communications about the Company to the individuals specified, even assuming the injunction is overbroad as written. Thus, Mr. Howell is not entitled to an exception to the collateral bar rule on the ground that a reasonable person in his position would not understand what conduct was prohibited by the order. See *Com. v. Marrero*, 85 Mass. App. Ct. 911, 912, 10 N.E.3d 1136, 1138, n. 4 (2014), *review denied sub nom. Com. v. Marrera*, 469 Mass. 1105, 15 N.E.3d 762 (2014).

Between September 15, 2009 and November 2015, there were numerous negative communications generated by Mr. Howell pertaining to KneeBinding, Inc. or its principals. For instance, on a public website, Mr. Howell referred to the KneeBinding, Inc. bindings as "100% defective" and having failed international safety standards. He also alluded to Mr. Springer-Miller as a "spoiled brat" that had "wrongfully modified" Mr. Howell's design, "knowingly creat[ed] fraudulent inducement" concerning the KneeBinding, Inc. product, and committed a

"fraud on the court." Each of these communications was disparaging and the readers of the EpicSki Forum postings were likely comprised of potential KneeBinding, Inc. customers. In addition, in June 2009, Mr. Howell referred to John Springer-Miller and his wife as "evil" when speaking to an acquaintance named David Sullivan at a UPS store in Stowe, Vermont. Both Springer-Millers are current investors in KneeBinding, Inc. Therefore, the Court concludes that on numerous occasions Mr. Howell violated paragraph 1 of the injunction to which he agreed on March 30, 2009.

On the other hand, the Court finds no further support for any violations of paragraph 1 from March 30, 2009 through September 15, 2009. Mr. Howell argues that his communications to the CPSC during that time period did not violate the terms of the injunction for two reasons: (1) the CPSC does not fall within any of the groups with which he was prohibited from communicating; and (2) any such finding would infringe on his First Amendment right to petition the government for a redress of grievances. Mr. Howell is correct that the injunction does not bar communication with a government agency, which is not a "current or potential customer, client, investor or vendor."

Additionally, to the extent that Plaintiff's request for an injunction stemmed from Mr. Howell's exercise, in connection with a public issue (i.e., the purported defects of the KneeBinding), of the right to freedom of speech or to petition the government for redress of grievances under the United States or Vermont Constitution, the Legislature has created a safety mechanism in the form of the Anti-SLAPP (Strategic Lawsuit Against Public Participation) statute. See 12 V.S.A. § 1041. That statute permits a defendant in such an action to file a special motion to strike. See 12 V.S.A. § 1041(a). Mr. Howell did not do so. Nevertheless, the statute provides guidance, indicating that if a plaintiff shows that the defendant's exercise of his or right

to freedom of speech and to petition was devoid of any reasonable factual support and any arguable basis in law *and* the defendant's acts caused actual injury to the plaintiff, immunity by the First Amendment will not attach. Cf. 12 V.S.A. § 1041(e)(1) (emphasis added); see also *Eastern R.R. Presidents Conference v. Noerr Motor Freight, Inc.*, 365 U.S. 127, 144 (1961). In this case, there is insufficient evidence that KneeBinding, Inc. sustained any injury in terms of reputation or financial loss, other than that cost and expense incidental to responding to CPSC inquiries. Ultimately, the CPSC determined that Mr. Howell's petition amounted to a "personal disagreement between company stockholders." Plaintiff's Exhibit 46. In the absence of any communication to a prohibited third party or actual harm to the plaintiff, the Court does not find a violation of the March 30, 2009 injunction in this instance.

Likewise, the Court concludes that no violation of paragraph 2 of the permanent injunction has occurred. Paragraph 2 prohibits Mr. Howell from publishing or causing to be published "any communication, oral or written, that has a reasonable likelihood to create confusion as to whether he speaks or acts on behalf of KneeBinding, its products, or John or Tina Springer-Miller or any of its other principals." None of Mr. Howell's postings or communications following the issuance of the March 30, 2009 order and through May 2015 would tend to have "a reasonable likelihood to create confusion as to whether Mr. Howell speaks or acts on behalf of KneeBinding, its products, or John or Tina Springer-Miller or any of its other principals." To the contrary, it is quite clear from all of Mr. Howell's statements that he is emphatically speaking against them. He is not purporting to represent or speak for the Company or any of its principals in any way. Neither were Mr. Howell's submission with the CPSC, and any follow up communications, in any way likely to "create confusion" as proscribed by the order in paragraph 2.

Similarly, there is insufficient credible evidence for the Court to find that Mr. Howell is or has been in violation of paragraph 3 of the injunction. That paragraph stipulates:

> Richard J. Howell shall forthwith remove, delete or destroy, and to the extent not within his possession, custody or control, make his best efforts to remove, delete or destroy and communications within his possession, custody or control that fall within paragraphs 1 and 2 of this Order, including without limitation postings at EpicSki.com dated February 11, 2009, March 12, 2009, and March 16, 2009 and material at youtube.com beginning identifier http://www.youtube.com/watch?v=1sG7T68v6bE. Among other efforts, within 2 days of this Order, Mr. Howell shall send a letter or email to the appropriate administrators of the websites in question and any other websites to which he has posted, requesting that the material be taken down, with a copy to KneeBinding, Inc. via its counsel. However, he may retain a copy for his records.

On April 2, 2009, Mr. Howell's counsel wrote KneeBinding, Inc.'s lawyer regarding Mr. Howell's efforts to remove the communications in compliance with these terms. See Defendant's Exhibit 272. It advised that Mr. Howell "has taken all reasonable steps to comply with the stipulation and court order of Monday, March 30th. I am enclosing copies of his emails and any related responses." The letter further stated, "Please advise no later than 12:00 on Friday, April 3rd, if you disagree."

Although there was testimony that some communications by Mr. Howell were still available on certain websites, there is no evidence of a reply regarding dissatisfaction with Mr. Howell's efforts. The Court is therefore unable to find that Mr. Howell is or has been in violation of paragraph 3 of the injunction. Notwithstanding the determination that Mr. Howell has not violated paragraphs 2 and 3 of the permanent injunction, the Court has found him in contempt for violations of paragraph 1 of the March 30, 2009 order. The Court concludes that the plaintiff should be permitted to present argument as to an appropriate sanction for past violations and for appropriate equitable remedies to discourage similar behavior in the future.

Tortious Interference with Contract

To establish liability for this tort, Plaintiff must show that Defendant intentionally and improperly induced Plaintiff's vendor not to perform its contract. *Gifford v. Sun Data, Inc.*, 165 Vt. 611, 612 (1996). "Intent to interfere with a contractual relationship exists if the actor acts for the primary purpose of interfering with the performance of the contract," or if the actor "knows that interference will be substantially certain to occur as a result of his or her action." *Id.* at 612 (citing *Williams v. Chittenden Trust Co.*, 145 Vt. 76, 80-81 (1984)) (internal quotations omitted). The court may find inducement if Defendant's acts caused the nonperformance of the contract. *Id.* In determining whether the acts were "improper," the court must consider "the motives and actions of [Defendant], the relations of the parties, and their respective interests." *Id.*

It is clear on the facts that Mr. Howell acted to interfere with Progressive Plastics' performance of its contract with KneeBinding by his demands in his May 6, 2015 communication to halt the shipment of the "wrongly modified" KneeBinding. Given that Mr. Springer-Miller is Mr. Howell's adversary and by May 2015, the defects he had complained of in the first year's production had been remedied, Mr. Howell's motive in attempting to interrupt the business of KneeBinding Inc. in May 2015 was improper. Notwithstanding Mr. Howell's intentional conduct, and despite the two-day delay, there is no evidence that Progressive Plastics substantially failed to perform or that either party lost any particular amount of money. Any loss would have been to Progressive for a couple of days of interrupted work. Thus, while Mr. Howell's conduct amounted to attempted interference, this claim must fail because it has not been shown by persuasive evidence that KneeBinding, Inc. was harmed to any material extent by the communication.

Defamation

In reviewing this claim, the Court relies on the law concerning defamation set forth under Third-Party Plaintiff's claim for defamation beginning at page 52. In addition, "a qualified privilege exists where such account is fair, impartial and substantially accurate even though it may contain matters otherwise libellous[.]" *Lancour v. Herald & Globe Ass'n*, 111 Vt. 37, 3831 (1941). A communication may also be privileged when it is "fairly made in the discharge of some public duty, moral or social" and in this way "affords a qualified defence, depending on the absence of actual malice." *Shurtleff v. Stevens*, 51 Vt. 501 (1879).

Mr. Howell has made numerous statements to the CPSC that are potentially false or defamatory, including that KneeBinding, Inc. knowingly shipped out defective bindings to be sold to consumers and that such bindings could cause serious bodily injury or death. See Plaintiff's Exhibits 132 and 146. Even assuming that these statements were defamatory, however, the Court agrees with Mr. Howell that the communications to the CPSC were privileged to the extent that he sought redress to halt the shipment of defective bindings out of public concern, even though Mr. Howell's motive in filing with the CPSC was not limited to the concern over public safety. See *Shurtleff*, 51 Vt. 501.

On the other hand, the Court concludes that a number of Mr. Howell's numerous posts on the EpicSki Forum were false and defamatory. For example, Mr. Howell stated that the bindings were "100% defective" and that "the parties on the other side intended to steal [his] technology and company from [him]," and had "knowingly creat[ed] fraudulent inducement around a safety-product." See Plaintiff's Exhibits 75.13 (Attachment K), 75.15 (Attachment M), 75.18 (Attachment N). As discussed above, the evidence shows that Mr. Springer-Miller made clear

the conditions of his investment in KneeBinding, Inc. Consequently, Mr. Howell's claims of fraudulent inducement or theft of the Company have not been substantiated.

Additionally, while there were several problems with the KneeBinding in the initial production run, Mr. Howell's claim that the bindings were 100% defective, or were knowingly shipped out to the public with serious defects likely to cause serious injury or death has little support in the evidence. Because Mr. Howell wrote the statements to "blacken the reputation of the plaintiff," the Court finds them to be both false and defamatory. See *American Legion,* 2014 VT 134, ¶ 22, 198 Vt. at 213.

Further, in each of these instances, the statements were published to at least one third person. The Court concludes that these statements were made intentionally, and, except for those statements made to the CPSC, were without privilege. Because KneeBinding, Inc.'s claim involves libel, or the written word, "special damages need not be proven." *Lent*, 143 Vt. at 547.[15] Still, a plaintiff cannot recover general damages unless able to demonstrate "actual harm." *Id.* at 549. Malice may be inferred upon a showing that the defendant knew the statement was false or acted with reckless disregard of its truth. *Id.* "Actual malice includes spiteful or wanton conduct." *Id.*

If Mr. Howell were truly concerned about the anti-friction devices and the fading numbers, he could have identified the problems in his postings and warned skiers to keep a watch out for them until they were resolved by the Company. That might have been a reasonable approach if one were primarily concerned for the skiers. Instead, the focus of Mr. Howell's postings was on all the bad things he perceived the Springer-Millers had done to him. Moreover, the Court finds that Mr. Howell, in retaliation, used the postings to falsely proclaim that the

[15] "Special damages are those of a pecuniary nature, and historically they have included loss of customers or business, loss of contracts, or loss of employment." *Lent*, 143 Vt. at 546 (internal citation omitted).

bindings were 100% defective, were below industry safety standards, and were knowingly shipped with defects likely to cause serious bodily injury or death.

Whether or not to impose liability in these circumstances is a close question. The defects in the bindings were real, although not of the kind particularly dangerous, at least in the short term. To that extent, there was some truth in Mr. Howell's claims. But, Mr. Howell's use of the defects against the Company, its product, and the management, was clearly based on spite and retaliation. There were so many other ways of calling attention to a problem with the product that were more appropriate if public safety were the central concern. Nevertheless, there must have been some damage to the Company's reputation, and maybe even to sales, as a result of Mr. Howell's libelous statements. The Court therefore concludes that the plaintiff should be permitted to present whatever evidence may be available regarding damages for defamation.

Misappropriation of Trade Secrets

The Vermont Trade Secrets Act prevents the misuse of business information and allows injunctive relief and damages for misappropriation of trade secrets. See *Dicks v. Jensen*, 172 Vt. 43, 46 (2001); see also 9 V.S.A. §§ 4602, 4603. Title 9 defines "trade secret" as:

> information, including a formula, pattern, compilation, program, device, method, technique, or process, that:
>
> (A) derives independent economic value, actual or potential, from not being generally known to, and not being readily ascertainable by proper means by, other persons who can obtain economic value from its disclosure or use; and
>
> (B) is the subject of efforts that are reasonable under the circumstances to maintain its secrecy.

9 V.S.A. § 4601(3).

"In general, liability for trade secret misappropriation in the employment context requires proof of both the existence of a trade secret as well as unauthorized disclosure or use of the

secret in breach of a duty of confidence." *Omega Optical, Inc. v. Chroma Technology Corp.*, 174 Vt. 10, 13 (2002) (internal citations omitted). The test to determine whether information deserves trade secret protection is a two-pronged inquiry: (1) "whether the information has independent economic value that is not readily ascertainable to others"; and (2) "whether reasonable efforts were made to maintain the information's secrecy." *Id.* at 47 (citing *American Credit Indem. Co. v. Sacks*, 213 Cal.App.3d 622, 262 Cal.Rptr. 92, 97 (1989)). Both current and former employees have a duty not to use or disclose confidential information given to them by the employer. *Id.* at 13 (citing Restatement (Second) of Agency § 396(b), Restatement (Third) of Unfair Competition § 42 cmt. b). This duty of confidence attaches to any information the employee knows or has reason to know is confidential. *Id.* (internal citations omitted). "Whether an employee knows or should know certain information obtained from the employer is confidential can be implied from the totality of the circumstances; no explicit notice to the employee is necessarily required. It is a fact-specific inquiry." *Id.* at 13-14 (internal citations omitted). "[T]he party claiming a trade secret must demonstrate that it has taken steps to ensure the information's secrecy to prevail on a claim for trade secret misappropriation." *Id.* (citing *McClary v. Hubbard*, 97 Vt. 222, 232-33 (1923)).

The Court is unable to find that Mr. Howell has disclosed trade secrets. Plaintiff asserts that as a principal of KneeBinding, Inc., "Howell had access to trade secrets and confidential information" and that "the proprietary science and trade secret ownership interests of KneeBinding, Inc. related to development of the Kneebinding product and the proprietary science behind it is broad." While it is undisputed that Mr. Howell is a former employee of KneeBinding, Inc., "[m]ore than mere employer-employee relationship is required to establish a duty of confidentiality." *Omega Optical*, 174 Vt. at 14 (internal citations omitted).

The fact that Mr. Howell made presentations at various conferences, posted statements on EpicSki.com relating to lateral heel release or ski binding release kinematics, and placed an advertisement referring to a conference he had attended, does not persuade the Court that Mr. Howell misappropriated any trade secrets. First, to the extent that the plaintiff argues that its patents are trade secrets, the Court disagrees. Without evidence that particular aspects of the plaintiff's patents had not been previously revealed, the court finds that those aspects of the plaintiff's product were already in the public domain. See *Speedry Chemical Products, Inc. v. Carter's Ink Co.*, 306 F.2d 328, 332 (2d Cir. 1962) (holding that evidence for alleged wrongful use of trade secrets revealed in confidence supported findings to effect that trade secrets had not been revealed, that aspects of similarity in defendant's competitive product were in public domain, and that defendant had not used business information obtained from plaintiff).

Second, the plaintiff has failed to specify any other "information" at issue. Simply referring to "proprietary information" deprives the court of the ability to conduct a fact-specific inquiry. The plaintiff has defined "proprietary information" as "all information and know-how, whether or not in writing, of a private, secret or confidential nature concerning the Company's business or financial affairs." Plaintiff's Exhibit 1.11. The Court is unable to determine from such generalization whether the information has independent economic value that is not readily ascertainable to others, whether reasonable efforts were made to maintain the information's secrecy, or whether the information had already been disclosed or was otherwise available in the public domain. Accordingly, this claim must fail.

Breach of Contract

KneeBinding, Inc. asserts that Mr. Howell's conduct has violated his contractual agreements. In particular, KneeBinding, Inc. alleges that Mr. Howell breached the Severance

Agreement, Invention and Non-Disclosure Agreement, and Non-Competition and Non-Solicitation Agreement, by disparaging the Company and its products.[16] The Severance Agreement contains a non-disparagement clause which reads as follows:

> You understand and agree that, as a condition for payment to you of the consideration and other promises herein described (including the Company entering into the Consulting Agreement at Attachment A), you shall not make any false, disparaging or derogatory statements to any media outlet, industry group, financial institution or current, former, or potential employee, consultant, investor, client or vendor of the Company regarding the Company or any of its current or former directors, officers, employees, investors, stockholders, agents or representatives or about the Company's business affairs and financial condition.

Plaintiff's Exhibit 113.

Paragraph 2(a) is the operative section of the Invention and Non-Disclosure Agreement, stating:

> The Employee agrees that all information and know-how, whether or not in writing, of a private, secret or confidential nature concerning the Company's business or financial affairs (collectively, "Proprietary Information"), is and shall be the exclusive property of the Company . . . The Employee will not disclose any Proprietary Information to any person or entity other than employees of the Company or use the same for any purposes (other than in the performance of his/her duties as an employee of the Company) without written approval by an officer of the Company, either during or after his/her employment with the Company, unless and until such Proprietary Information has become public knowledge without fault by the Employee.

Plaintiff's Exhibit 1.11.

The Non-Competition and Non-Solicitation Agreement, for its part, provides in paragraph 1 that:

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[16] The plaintiff also asserts that Mr. Howell's internet postings have confused readers as to whether he spoke for or on behalf of KneeBinding, Inc. The Court addressed the plaintiff's argument in the Motion for Contempt section, *supra*, and found it to be unavailing.

> for a period of one year after the termination or cessation of [ ] employment or engagement for any reason, provided that the Company is not in default of its obligations to the Principal pursuant to any employment, consulting or other agreement, the Principal will not directly or indirectly: . . . Either alone or in association with others, solicit, divert or take away, or attempt to divert or take away, the business or patronage of any of the clients, customers, or business partners of the Company which were contacted, solicited, or served by the Company during the 12-month period prior to the termination or cessation of the Principal's employment with or engagement by the Company[.]

Plaintiff's Exhibit 1.8.[17]

In light of the above provisions, and having found in the section concerning the plaintiff's motion for contempt that Mr. Howell has published disparaging communications about KneeBinding, Inc. and its principals, the Court concludes that he has breached the terms of the Severance Agreement.

By contrast, for reasons similar to those set forth in the Misappropriation of Trade Secrets section, the plaintiff has failed to prove that Mr. Howell breached the Invention and Non-Disclosure Agreement. The Court has not found that Mr. Howell disclosed any "proprietary information." The only information specified by the parties that conceivably could be "proprietary," was that the Company knowingly shipped "100% defective" bindings, if, in fact, the Company did ship such bindings. But, given that the Company has disputed that the bindings were so defective, the Court cannot conclude that such information was "proprietary." To the extent that Mr. Howell disclosed the KneeBinding flaws (i.e., anti-friction device problems, faded number settings, faulty ski brakes), that information has not been shown to be "proprietary." All of the three problems described above were readily observable to any skier

[17] The Court assumes that the author of the Non-Competition and Non-Solicitation Agreement intended to reference the 12-month period prior to the termination or "after the cessation" of the Principal's employment with or engagement by the Company.

who encountered them. And, the Company itself indicated that some of its bindings could contain defects in that all skiers were instructed in writing at the time of purchase not to ski on a binding with observable defects and to have the binding adjusted or replaced. As such, the basis for this claim is unavailing.

The Court likewise does not find that Mr. Howell breached the Non-Competition and Non-Solicitation Agreement. To the extent that KneeBinding, Inc. contends that Mr. Howell's disparaging statements or other acts violated the provisions of paragraph 1, either by diverting or attempting to divert the business or patronage of potential clients, customers or business partners, the prohibition against such conduct was limited to one year following Mr. Howell's exit from the Company on September 15, 2008. As discussed with respect to the plaintiff's motion for contempt, KneeBinding, Inc. has set forth no conduct on the part of Mr. Howell that has so damaged the Company between September 15, 2008 and September 15, 2009. Thus, this portion of KneeBinding, Inc.'s claim fails.

Trademark Infringement and Unfair Competition

KneeBinding, Inc. also asserts that Mr. Howell has breached the Series A Stock Purchase Agreement and the Invention and Non-Disclosure Agreement by using KneeBinding's trademarks without permission. The Lanham Trademark Act of 1946 prohibits the use of a federally registered trademark without the consent of the registrant. 15 U.S.C. § 1114(1)(a). Similarly, the Act prohibits a person from using in commerce words, terms, names, and devices that are likely to cause confusion or mistake, or deceive as to the affiliation, connection, or association of a competitor, or as to the origin, sponsorship, or approval of the person's goods, services, or commercial activities. 15 U.S.C. § 1125(a)(1)(A).

"To prevail on a trademark infringement and unfair competition claim under 15 U.S.C. § 1114(a), § 1125(a), in addition to demonstrating that the plaintiff's mark is protected, the plaintiff must prove that the defendant's use of the allegedly infringing mark would likely cause confusion as to the origin or sponsorship of the defendant's goods with plaintiff's goods." *Starbucks Corp. v. Wolfe's Borough Coffee, Inc.*, 588 F.3d 97, 114 (2d Cir. 2009) (citing *Savin Corp. v. Savin Group,* 391 F.3d 439, 456 (2d Cir. 2004) ("The crucial issue in an action for trademark infringement . . . is whether there is any likelihood that an appreciable number of ordinarily prudent purchasers are likely to be misled, or indeed simply confused, as to the source of the goods in question.") (internal quotation marks omitted)); *Star Indus., Inc. v. Bacadari & Co. Ltd.*, 412 F.3d 373, 384 (2d Cir. 2005) ("In order to be confused, a consumer need not believe that the owner of the mark actually produced the item and placed it on the market. The public's belief that the mark's owner sponsored or otherwise approved the use of the trademark satisfies the confusion requirement.") (quoting *Dallas Cowboys Cheerleaders, Inc. v. Pussycat Cinema, Ltd.*, 604 F.2d 200, 204–05 (2d Cir. 1979) (internal quotation marks omitted)).

The following eight factors, set forth in *Polaroid Corp. v. Polarad Elecs. Corp.*, 287 F.2d 492 (2d Cir. 1961), may be applied to determine whether there is a likelihood of confusion. Those factors are:

> (1) strength of the trademark; (2) similarity of the marks; (3) proximity of the products and their competitiveness with one another; (4) evidence that the senior user may "bridge the gap" by developing a product for sale in the market of the alleged infringer's product; (5) evidence of actual consumer confusion; (6) evidence that the imitative mark was adopted in bad faith; (7) respective quality of the products; and (8) sophistication of consumers in the relevant market.

Id. at 115 (citing *Star Indus.*, 412 F.3d at 384). Rather than "mechanical" application of the *Polaroid* test, the inquiry "focuses on the ultimate question of whether, looking at the products in

their totality, consumers are likely to be confused." *Id.* Importantly, a plaintiff must prove "'a probability of confusion, not a mere possibility,' affecting 'numerous ordinary prudent purchasers in order to establish a likelihood of confusion.'" *Star Indus*, 412 F.3d at 383 (internal citations omitted).

It has long been acknowledged that "common law unfair competition is a flexible and evolving concept, not confined to any particular form of unethical behavior." See *Maguire v. Gorruso*, 174 Vt. 1, 7 (2002) (internal citations omitted). Common law unfair competition includes "passing off," which is the common law name for trademark infringement, trade-secret violations, and misappropriation. *Maguire v. Gorruso*, 174 Vt. 1, 7 (2002) (citing Prosser & Keeton, The Law of Torts ¶ 130, 1015-20 (5th ed. 1984)). "The gravamen of unfair competition through misappropriation [ ] is the unfair competitive use to which defendants put the property, and the measure of damages is generally the resulting loss to the plaintiff or gain to the defendant." *Id.* at 8 (citing Restatement (Third) of Unfair Competition 45(1), 512)). "Trademark infringement, in turn, includes a variety of deceptive acts, such as false or misleading advertising, tradename infringement (appropriating a competitor's descriptive terms or names), and trade dress infringement (appropriating the design elements of a competitor's packaging or product)." Restatement (Third) Unfair Competition § 9 cmt. f, at 82, & § 16 at 156 (1995).

The Court is unable to find a trademark infringement in this case. At best, there has been so far only an attempt at unfair competition. The evidence disclosed no incidence of actual consumer confusion. To date, no Howell bindings have shown up in ski shops or otherwise have been released for sale to the public. This trademark infringement claim is premature.

March 30, 2009 Stipulation Regarding Contempt

The Stipulation Regarding Contempt of March 30, 2009, a handwritten document, separately dealt with the contempt motion filed by the plaintiff following issuance of the TRO on March 16, 2009. See Plaintiff's Exhibit 70. (Attachment I). It will be recalled that in response to the TRO, Mr. Howell posted to a blog and picketed outside the courthouse in Hyde Park with a sign saying that the KneeBinding was 100% defective. Mr. Howell admitted that his actions were "knowing and deliberate" and that they supported the Court's finding of contempt. The agreed upon sanction was a fine of $7,000, to be waived if "he [did] not further violate the Temporary Restraining order or the permanent injunction prior to September 15, 2009."

The plaintiff argues that Mr. Howell violated this order between the time it was issued and September 15, 2009, thus triggering imposition of the $7,000 fine. The claim is that Mr. Howell deliberately delayed withdrawing the paper he had submitted for the upcoming ISSS conference that the judge permitted him to attend, with limitations.

As best the Court can understand the plaintiff's argument, it is based on Mr. Howell having signed a letter of agreement dated April 10, 2009. Plaintiff's Exhibit 75.4 (Attachment O). The letter provided that Mr. Howell would "Contact ISSS and request that they withdraw, not publish or disseminate his abstract[.]" He was also to contact "other standards organizations" and request that they not publish the paper he had submitted via email on March 11, 2009. See Attachment O at Paragraph 1b and accompanying exhibits. And, Mr. Howell was to provide evidence that he had taken such steps no later than April 17, 2009. Finally, he was to "Cease and desist from making any statements of any kind about KneeBinding, to anyone, including anyone in the scientific, business, or lay community." Attachment O at Paragraph 1c. The Agreement Letter also provided in paragraph 3 that "Failure by Mr. Howell to comply with

the terms of paragraph 1 of this agreement will be a violation of the Court's Order of March 31, 2009."

The Court finds several violations of the April 10, 2009 agreement. First, the evidence reflects that Mr. Howell wrote an email to Jasper Shealy and others requesting that his presentation be withdrawn on April 21, 2009. In that email he stated that "today is the deadline for me to formally make these withdrawals." We have no evidence that Mr. Howell took steps to stop the publications before April 21, 2009. Obviously, Mr. Howell was incorrect that April 21 was the last day to withdraw his presentation. The last day expired on April 17. Thus, the withdrawal of his paper was untimely.

Additionally, in the April 21, 2009 email, Mr. Howell expressed his thoughts about "[t]he investor who squeezed [him] out of the company that [he] formed, KneeBinding, Inc.," and that Mr. Howell would "continue to fight this unsafe court order." His communication was sent to persons the Court finds from the evidence at the hearing were persons "in the scientific, business, or lay community." In this way, he violated paragraph 1c of the April 10, 2009 agreement letter.

Because Mr. Howell has violated Paragraph 1 of the April 10, 2009 agreement, he has also violated the March 31, 2009 Stipulation Agreement and order (Plaintiff's Exhibit 71, Attachment J), in light of paragraph 3 in the April 10, 2009 agreement letter.

These violations revive the potential that the $7,000 fine in the Stipulation Regarding Contempt, Exhibit 70, may be imposed. The parties may brief the question for hearing and argument. The Court finds no other violations of the March 31, 2009 Stipulated Agreement and Order before September 15, 2009.

Attorneys' Fees

Various agreements referred to in this opinion have a provision for attorneys' fees and the expenses of litigation. This question was left to be decided at a later date.

ORDER

The Court finds in favor of the plaintiff, and the defendant is found in contempt of the March 31, 2009 Stipulated Agreement and Order. The Court will schedule a hearing in the latter part of September 2016 on the extent of sanctions to be imposed, including what equitable remedies may be available to discourage future violations. The Court would appreciate all briefing on this and other questions to be filed during the week prior to the hearing.

The Court finds in favor of the plaintiff on the question of violations of the April 10, 2009 Letter of Agreement. The Court is uncertain as to whether the violations should carry with them sanctions for contempt. A finding of contempt is therefore withheld at this time. The Court will consider the question, as well as the potential $7,000 fine, after briefing and argument at the September hearing.

The Court finds in favor of the plaintiff on its defamation claim. The court will hear evidence and argument on damages at the September hearing. Briefing would be appreciated.

The Court finds in favor of all third-party defendants on the third-party claims. The third-party claims are hereby dismissed.

The Court finds in favor of the plaintiff on the counterclaims earlier filed. They are hereby dismissed. Defendant's direct claims earlier plead but not briefed at the final hearing are dismissed.

At the hearing scheduled for the later part of September, the Court will hear argument on the question of attorneys' fees and expenses. The Court would appreciate careful and in-depth briefing. Although only the plaintiff has prevailed as to liability in this case, it has not by any means prevailed on all the theories or all the arguments presented. The defendant has won a substantial share of them. The Court does not presently see this issue as merely the question of who was the prevailing party overall. In a complex case such as this one, should a party not be awarded attorneys' fees for a theory or factual assertion successfully defended?

Dated at Hyde Park this 17th day of August, 2016.

Alden T. Bryan
Presiding Judge, Specially Assigned

ENDNOTE

[i] This case involved extraordinary delays as a result of changes in courts, judges, and Mr. Howell's attorneys. The judge who signed the stipulated documents in late March 2009 moved to another court. The Judge who moved in recused himself during the fall of 2009, and the case was assigned to another judge then presiding in the Washington Superior Court. During this time, Mr. Howell filed motions to dismiss the injunction and for contempt. There were delays over issues regarding production of a potential insurance policy.

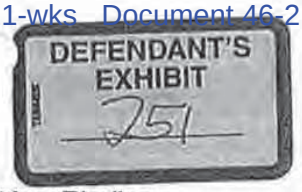
In February 2010, a new attorney appeared on behalf of Mr. Howell. In March, KneeBinding, Inc. filed a second motion for contempt. Additional motions were filed over the next several months, including a motion to dismiss the amended counterclaim. Even though represented by counsel, the docket entries appear to show that Mr. Howell was filing motions on his own behalf. In November, Attorney Peter Anderson entered an appearance for KneeBinding, to replace the Company's original attorneys, which prompted Mr. Howell to file a motion requesting the court not to allow Mr. Anderson's appearance.

By December 28, 2010, all motions were heard by Judge Crawford. Attorneys Cheney for Mr. Howell and Hemley for KneeBinding were permitted to withdraw. The motion to disqualify Mr. Anderson was denied. Mr. Howell was to obtain new counsel "as soon as possible." A one-week court trial was to be scheduled "immediately after 5/15/10 to include initial claims, counterclaims, and motion for contempt of Kneebinding." See Docket Sheet entry dated 12/28/10.

There were no hearings and no trial through nearly the end of August, 2011. Numerous motions of many kinds were filed, none heard. Attorney John H. Bloomer entered an appearance for Mr. Howell on August 25. With the start of the new term in September, the file moved from Washington Superior Court to the Chittenden Superior Court with Judge Crawford. During the remainder of 2011, entries involved discovery and motions for sanctions.

By early 2012, the case was reassigned to retired judge Alden Bryan, and questions of discovery resumed. By the middle of March Attorney Bloomer had withdrawn as Mr. Howell's counsel. Mr. Howell was then *pro se* for until Attorney Stephen D. Ellis began filing a limited appearance for each proceeding on behalf of Mr. Howell. The Court allowed him to do this in order to make progress on the case because he would not represent Mr. Howell on any other basis.

ATTACHMENTS



JSM Ex. 00
6-7-12

A

Subject: RE: Investment in KneeBinding
From: "John Springer-Miller" <jspringerm@aol.com>
Date: Sun, 14 Oct 2007 20:21:30 -0400
To: "'Rick Howell'" <rick.howell@kneebinding.com>

JSM 10/14

Perhaps you should send it to me.
It may be better to look at it by myself first.

John

From: Rick Howell [mailto:rick.howell@kneebinding.com]
Sent: Sunday, October 14, 2007 5:29 PM
To: John Springer-Miller
Subject: Re: Investment in KneeBinding

Hello John,

Thank you for your kind note. This is heartening. I have trimmed the financials back to reflect the combination of the necessary updates that the business must now have, plus your max investment requirements. I'm open to getting together, soonest. Pls feel free to let me what time works best for you.

Rick

John Springer-Miller wrote:
JSM 10/13/07

Rick,

Thanks for sending this. It helps to have you explain what happened.
I am very attached to this project, and I hope there is still some way to make it work.

I think you completely misunderstood me. I neither have the time nor the interest in running the business. In fact, one of my biggest concerns with Kneebinding is that it would take more time than I have to offer. My goal in our negotiations has been to lock you into a business plan that will really work – that will allow you to focus all your time on building the business – and to protect my investment if you do not succeed.

I have never wanted to take over the business plan. At the same time, I admit that I have always had concerns about your ability to achieve the plan. I am confident that you can get the product off the ground, market it, create sales for it – and so on. Building and running the business is something I think you can do. But creating something that "flips" for a significant amount of money five years from now isn't the same thing as building the business.

I have been very consistent about my requirements as an investor, but you have not met them. My wrangling over the terms and/or the financial plan have all been about meeting those requirements. The single significant concern with this – all along – has been to make sure the company had the ability to succeed. This means a financial plan that fits in with the amount of available funding. That's all it has ever been about.

Let's clear the air – sit down again over the financial plan, and see if there is still something we can do.

John

A 2

From: Rick Howell [mailto:rick.howell@kneebinding.com]
Sent: Saturday, October 13, 2007 8:14 AM
To: John Springer-Miller
Cc: bill.contente@gesmer.com; Rebecca.Briber@gesmer.com
Subject: Re: Investment in KneeBinding

John,

You identified the problem in your reply. I am a professional business manager with considerable successful business management experience.

1) I profitably sealed-driveways on my own at a very young age.
2) I grew up in a profitable family-owned construction business.
3) I have a college degree in business management.
4) Beginning immediately after college, I received bonuses EVERY quarter for 8-years at Geze.
5) While I was Director of Marketing at Geze for 4 years, I took the brand from a 2% market share to a 20% share, profitably.
6) I was the leader of the team that bundled-together Geze for sale to Rossignol. This was a profitable sale.
7) I founded CycleBinding, Inc. with 20 employees and 3 years of profits. I managed the organized dissolution of CycleBinding due the bankruptcy of the company's key footwear manufacturing supplier. I minimized the creditors' losses to the extent that I took on the remaining debt, personally. Therefore, there was no bankruptcy of CycleBinding, Inc.
8) I set-up and managed the complete development and market launch of Tubbs high-tech snowshoes, including the complete market launch involving the trade show, trade advertising campaign, sales rep training, iterative market research and secured the initial orders from the key customers (L.L. Bean, REI, EMS). My company that performed this parallel-skunk-works operation was profitable during the complete course of the contract-defined project (exactly 3 years). My company and I performed all of my contractual duties as defined at the commencement of the project. Tubbs paid my company properly per the contract for 4 years after the successful completion of the 3-year turn-key project. Everything want smooth as silk for Tubbs - and for my company - until Tubbs decided four years AFTER I completed all of my duties and well into the royalty-stream that the royalty payments were too big: they stopped paying me (the royalties were to be for 17 years). I personally lost everything in this matter while pursuing the proper litigation - due to dirty lawyers.
9) None of the above means that I'm not a successful professional business manager. I lost everything twice, personally, while the businesses surrounding my work flourished and these businesses have continued to flourish for 20 years.
10) Very little of the above success is from "inventions" - the sales and profitability successes are from my professional business management.

The "invention" as you call it is not what I bring to the table. The market invented the product -- I just listened, as a good business manager, to what the market wants -- and came up with a solution, which solution is 90% a business proposition and 10% an invention.

The deal was for you to be the investor and for me to run the company. As you decided with each meeting to reverse this proposition by having me invest my business proposition while you would increasingly run the company, matters became strained.

If you can somehow see that my business decision to avert a bankruptcy from a failed supplier (#7, above) and my business decision to pursue contract-enforcement in the Tubbs matter (#8) - wiped me out, personally - but makes me no less of a successful business manager to successfully run another sports product company, again, then I will be able to sit down with you under these terms to finalize the investment into KneeBinding, Inc. Where we were headed was to wipe me out, again, personally. I will not let that happen. I need to be respected as a strong, already-proven-successful business manager in order to make this work. If you are willing to respect me for what my proven talents are, and therefore what I can do for KneeBinding, Inc. as a business manager, then I will be willing to come back to the negotiating table, then run this business, successfully (while watching that I'm not wiped-out, personally).

Rick

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John Springer-Miller wrote:
JSM 10/9/07

I am really sorry this isn't working out.
I'm sure that with your invention and my business savvy, you (and I) could have made a whole lot of money.

As you know, I believe whole-heartedly in what you have created.
I sincerely hope you succeed in bringing the product forward.
I can't wait to buy my first pair!

John

From: Rick Howell [mailto:rick.howell@kneebinding.com]
Sent: Tuesday, October 09, 2007 7:16 PM
To: John Springer-Miller
Cc: Stein, Jeff; Dave Arnold
Subject: Investment in KneeBinding

John:

It has become clear to me from our discussions that there are fundamental and irreconcilable disagreements between KneeBinding, Inc. and you relating to a prospective investment in the company. Accordingly, I think it is in our respective best interests to cease all further negotiations at this time . Thank you for your consideration of an investment in KneeBinding.

Rick

Richard J. Howell
President & CEO
KneeBinding, Inc.
782 South Main Street
Stowe, VT 05672 USA
<Rick.Howell@KneeBinding.com>
1-802-253-2116
Cell 1-802-793-4849
[www.KneeBinding.com]

B

KNEEBINDING, INC.

VOTING AGREEMENT

Dated as of November 1, 2007

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VOTING AGREEMENT

THIS VOTING AGREEMENT (the "Agreement") is made and entered into as of this 1st day of November, 2007, by and among KneeBinding, Inc., a Delaware corporation (the "Company"), each holder of the Company's Series A Convertible Preferred Stock, $.01 par value per share ("Series A Preferred Stock") listed on Schedule A (together with any subsequent investors, or transferees, who become parties hereto as "Investors" pursuant to Section 6.2 below, the "Investors") and those certain stockholders of the Company and holders of options to acquire shares of the capital stock of the Company listed on Schedule B (together with any subsequent stockholders or option holders, or any transferees, who become parties hereto as "Stockholders" or "Key Holders" pursuant to Sections 6.1 and 6.2 below, the "Key Holders," and together collectively with the Investors, the "Stockholders").

RECITALS

A. Concurrently with the execution of this Agreement, the Company and the Investors are entering into a Series A Preferred Stock Purchase Agreement (the "Purchase Agreement") providing for the sale of shares of the Company's Series A Preferred Stock, and in connection with that agreement the parties desire to provide the Investors with the right, among other rights, to elect certain members of the board of directors of the Company (the "Board") in accordance with the terms of this Agreement.

B. The Amended and Restated Certificate of Incorporation of the Company (the "Restated Certificate") provides that the holders of record of the shares of the Company's Series A Preferred Stock, exclusively and as a separate class, shall be entitled to elect three (3) directors of the Company (the "Series A Directors") and the holders of record of the shares of Common Stock and the Series A Preferred Stock, voting together, shall be entitled to elect two (2) directors of the Company (the "Company Directors").

C. The parties have agreed that one (1) Company Director shall be the designee of the "Founders" (as defined in the Purchase Agreement), and one Company Director shall be an Independent Director (as hereinafter defined).

D. The parties also desire to enter into this Agreement to set forth their agreements and understandings with respect to how shares of the Company's capital stock held by them will be voted on, or tendered, in connection with (i) an acquisition of the Company and (ii) an increase in the number of shares of Common Stock required to provide for the conversion of the Company's Series A Preferred Stock.

NOW, THEREFORE, the parties agree as follows:

1. Voting Provisions Regarding Board of Directors.

1.1 Size of the Board.

Except as set forth in Article Fourth, Section C., 3.2 and Article Fourth, Section C., 6.1 of the Restated Certificate, as from time to time amended, each Stockholder agrees to vote, or cause to be voted, all Shares (as defined below) owned by such Stockholder, or over which such

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Stockholder has voting control, from time to time and at all times, in whatever manner as shall be necessary to ensure that the size of the Board shall be set and remain at five (5) directors. For purposes of this Agreement, the term "Shares" shall mean and include any securities of the Company the holders of which are entitled to vote for members of the Board, including without limitation, all shares of Common Stock and Series A Preferred Stock, by whatever name called, now owned or subsequently acquired by a Stockholder, however acquired, whether through stock splits, stock dividends, reclassifications, recapitalizations, similar events or otherwise.

1.2 Board Composition.

Each Stockholder agrees to vote, or cause to be voted, all Shares owned by such Stockholder, or over which such Stockholder has voting control, from time to time and at all times, in whatever manner as shall be necessary to ensure that at each annual or special meeting of stockholders at which an election of directors is held or pursuant to any written consent of the stockholders, the following persons shall be elected to the Board:

(a) At each election of directors in which the holders of the Series A Preferred Stock, voting as a separate class, are entitled to elect three (3) directors of the Company, three individuals designated by holders of a majority of the then-outstanding shares of Series A Preferred Stock, voting together as a single class, which individuals shall initially be John Springer-Miller and Tina Springer-Miller, with the third individual yet to be designated; and

(b) For so long as the Founder(s) hold at least 500,000 shares of Common Stock (as adjusted for any stock splits, stock dividends, recapitalizations or the like), one (1) individual designated by the Founder(s), which individual shall initially be Rick Howell; and

(c) One individual approved by holders of a majority of the then-outstanding Series A Preferred Stock, voting as a separate class, and by holders of a majority of the then-outstanding Common Stock, voting as a separate class, which individual has substantial business experience relevant to the Company's business and is independent of the Company, each Investor and each Founder (the "Independent Director"); and

(d) To the extent that any of clauses (a) or (b) above shall not be applicable, any member of the Board who would otherwise have been designated in accordance with the terms thereof shall instead be voted upon by all the stockholders of the Company entitled to vote thereon in accordance with, and pursuant to, the Company's Restated Certificate.

For purposes of this Agreement, an individual, firm, corporation, partnership, association, limited liability company, trust or any other entity (collectively, a "**Person**") shall be deemed an "**Affiliate**" of another Person who, directly or indirectly, controls, is controlled by or is under common control with such Person, including, without limitation, any general partner, officer, director, or manager of such Person and any venture capital fund now or hereafter existing that is

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controlled by one or more general partners (or members thereof) of or shares the same management company or member thereof with such Person.

1.3 Failure to Designate a Board Member.

In the absence of any designation from the persons or groups with the right to designate a director as specified above, the director previously designated by them and then serving shall be reelected if still eligible to serve as provided herein.

1.4 Removal of Board Members.

Each Stockholder also agrees to vote, or cause to be voted, all Shares owned by such Stockholder, or over which such Stockholder has voting control, from time to time and at all times, in whatever manner as shall be necessary to ensure that:

(a) no director elected pursuant to Sections 1.2 or 1.3 of this Agreement may be removed from office unless (i) such removal is directed or approved by the affirmative vote of the Person, or of the holders of a majority of the shares of the applicable class or series of stock, entitled under Section 1.2 to designate that director or (ii) the Person(s) originally entitled to designate or approve such director pursuant to Section 1.2 is no longer so entitled to designate or approve such director;

(b) each director elected pursuant to Sections 1.2 or 1.3 of this Agreement shall be removed from office if such removal is directed or approved by the affirmative vote of the Person, or of the holders of a majority of the shares of the applicable class or series of stock, entitled under Section 1.2 to designate that director; and

(c) any vacancies created by the resignation, removal or death of a director elected pursuant to Sections 1.2 or 1.3 shall be filled pursuant to the provisions of such sections.

All Stockholders agree to execute any written consents required to perform the obligations of this Agreement, and the Company agrees at the request of any party entitled to designate directors to call a special meeting of stockholders for the purpose of electing directors.

1.5 No Liability for Election of Recommended Directors.

No party, nor any Affiliate of any such party, shall have any liability as a result of designating a person for election as a director for any act or omission by such designated person in his or her capacity as a director of the Company, nor shall any party have any liability as a result of voting for any such designee in accordance with the provisions of this Agreement.

2. Vote to Increase Authorized Common Stock.

Each Stockholder agrees to vote or cause to be voted all Shares owned by such Stockholder, or over which such Stockholder has voting control, from time to time and at all times, in whatever manner as shall be necessary to increase the number of authorized shares of

C

From: Stein, Jeff <Jeff Stein@wilmerhale.com>
To: "Rick Howell" <rick.howell@kneebinding.com>
Subject: RE: New CFO
Date: 2007-12-11 02:13:47

Rick,

As we had discussed at the time of the financing, the appointment of officers is a BOD matter. I really think you need to talk these issues out with John, rather than communicating through emails, as through his board rights he controls the company and all of its personnel decisions, including your own position. It is going to have to be a personal approach throughout.

Jeff

From: Rick Howell [mailto:rick.howell@kneebinding.com]
Sent: Monday, December 10, 2007 6:07 PM
To: Stein, Jeff
Subject: New CFO

Hello Jeff,
It is not advantageous to KneeBinding, Inc.'s stated goals, per the financials of the closing docs, to continue w John Springer-Miller (JSM) as CFO.

Specifically, it is Dec 10 and I have no financial statements to date -- and JSM has acted to undermine our sales and management hierarchy...which are not conducive toward the achievement of our goals. JSM has also attempted to significantly change the pricing and product-volume forecasts....and has made no attempt that I am aware of to contact the banks with whom I initiated discussions re the necessary debt financing programs that KneeBinding,Inc. needs to undertake in May, while knowing that in order for us to shape our pricing programs at this time, we need to determine whether we will need to ask our large customers for LC's as part of our order program or not....based on the requirements of the banks in order to obtain the necessary debt financing that is essential for KneeBinding, Inc to meet its targets.

Additionally, John heatedly accused me of inappropriately turning on a dime in front of Roland last Thursday on a critical matter that fell well within our plans. Roland reports to me. This was inappropriate in front of Roland. JSM also 'took-over' the sales mtg that Roland was conducting w the Japanese distributor this past Friday....w a negative result. Roland, on the other hand, has been hugely successful in all of his high level sales meetings re KneeBinding, to date.

JSM has also inappropriately taken over legal matters (as president, this is my responsibility) - but many critical legal matters have been delayed or have not been done.

JSM is an investor and controls the BOD; but operationally, I will not permit the company to fail. I do know of another person, Jed Kalkstein, who might be right for the position for CFO of KneeBinding, Inc. He is fully-qualified, is a skier and lives nearby.

Steve Welkerman, will remain COO, and will continue to report to me.

As JSM controls the BOD, and as you are the company's lawyer regarding these post-closing matters, pls advise how to appropriately replace him w another CFO who will help KneeBinding achieve its financial-operational goals.

Thank you and best regards,
Rick

Richard J. Howell
President & CEO
KneeBinding, Inc.
782 Mountain Road
Stowe, VT 05672 USA
<Rick.Howell@KneeBinding.com>
1-802-253-2116
Cell 1-802-793-4849
[www.KneeBinding.com]

D

From: Rick Howell <rick.howell@kneebinding.com>
To: Roland Böhme <roland.boehme@gmx.de>
Subject: Re: AW: SIA Membership Internet link- KneeBinding
Date: 2007-12-21 02:07:31

Hello Roland,
Pls do not answer him. You do not report to him. He is the CFO (Chief Financial Officer). He reports to me; and you report to me. Thank you for your kind reply.
Rick

Roland Böhme wrote:

OK Sorry I will NOT Bc him again
Did you look at the web now. Did he look at it?

Now it is set up much more professional In design we can still work on it The info is pointed out very well and search engines such as Google will find it now and rank it higher for a better performance. Shall I answer him? In one month we see good results as arguments. Don't fight now.

Sorry again.

Best regards
Roland

Von: Rick Howell [mailto:rick.howell@kneebinding.com]
Gesendet: Donnerstag, 20. Dezember 2007 23:58
An: 'Roland Böhme'
Betreff: Re: SIA Membership Internet link- KneeBinding

Roland,
Pls do NOT ever blind-copy JSM on any emails again.

Additionally, this email should never have been copied to him (blind or not). You knew that he would try to stop this. Now I have to fight JSM on one more point. This is a major fight that I do not want to have with him.

Please think these steps through before acting.

Thank you, Roland – you are the best – but we are dealing w very complex human-issues (JSM) at this time, which means that you must think-through the next 4 Chess-moves BEFORE you make each move.

All best,
Rick

John Springer-Miller wrote:
JSM 12/20/07

It would be a negative to send people to our website at this time.
We are going to completely overhaul it for January – but I really think we should let it lay low for now.

John

From: Roland Böhme [mailto:roland.boehme@gmx.de]
Sent: Thursday, December 20, 2007 12:09 PM
To: eway@snowsports.org; esemon@snowsports.org
Cc: 'Rick Howell'
Subject: WG: SIA Membership Internet link- KneeBinding

Hi Mr. Ed Wray and Mr. Chris Semon,

We know that with our membership SIA will provide us with a link to our website www.kneebinding.com We do not know if you are the people to contact at SIA to provide us with this link. This link does not exist jet and if you "search" in your website looking for "KneeBinding" nothing is found and this is not good at all. We have paid our membership fee and we where supported by you with research information but we do not exist jet in your web as an official member under "suppliers & services". http://www.snowsports.org/content/search?SearchText=KneeBinding+Inc.&SearchButton=Search

Please make this happen ASAP.

Thank you for your help. Please let me know when we perform.

Best regards
Roland Böhme

International Sales
KneeBinding Inc.
Mobil: 001 49 172 9953637

roland.boehme@gmx.de

Obere Burghalde 44
D-71229 Leonberg

D-71229 Leonberg
Germany

www.KneeBinding.com

D2

Von: Rick Howell [mailto:rick.howell@kneebinding.com]
Gesendet: Samstag, 1. Dezember 2007 04:00
An: Ed Wray
Betreff: Re: SIA Membership and Research - KneeBinding

Ed,
Thank you. This is what we need.
All best,
Rick

Ed Wray wrote:
Rick,

Here are the binding and ski system reports for last season. I can either have an invoice sent out Net 30 terms or you can give me a CC# for payment. Let me know which way to go.

Have a great weekend.

Best Regards,

Ed Wray | Eastern Sales & Marketing Manager
SnowSports Industries America (SIA)
8377-B Greensboro Drive
McLean, VA 22102

direct ph: 401-846-7488
cell ph: 401-743-8039
fax: 703.821.8276

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Please consider the environment before printing this email.

www.snowsports.org
www.winterfeelsgood.com
www.snowlink.com

E

Kneebinding, Inc
Board of Directors Meeting
March 13, 2008

Board Members Present: Rick Howell, John Springer-Miller, Tina Springer-Miller
Guest Present: Steve Walkerman

The meeting was called pursuant to notice duly given to the directors. The meeting was held at the offices of the Company and commenced at 5:35 p.m. Director Tina Springer-Miller kept the minutes of the meeting.

After discussion about the need to reopen lines of communication in the company, Tina Springer-Miller made a motion to establish a weekly meeting of all shareholders. Directors are also invited to attend. Steve Walkerman will be responsible for coordinating these meetings. Motion was seconded by Rick Howell and passed by a unanimous vote by the board.

John Springer-Miller made a motion that all email correspondence related to company business be copied to the four employees of the company. Motion was seconded by Tina Springer-Miller. Rick raised concerns about impact of this on his time. John reiterated the need for this at this time to help with communications. After discussion the motion was passed unanimously.

Tina Springer-Miller motioned that Steve Walkerman be appointed Secretary of Kneebinding with the Secretary of State of Vermont. Motion was seconded by John Springer-Miller. Motion passed unanimously.

In a motion made by Rick Howell, seconded by John Springer-Miller and unanimously passed, the Board approved the exclusion of the corporate officers from workmen's compensation insurance.

Tina Springer-Miller motioned that any entity working on the Kneebinding product(s) will have a contractor, or other agreement that has sufficient language to vest ownership of intellectual property in the Company, and to address other relevant issues, as approved by the CFO or board, prior to any work being done. Rick modified this motion to include a broader scope of vendor including those working on marketing information. The motion was seconded by John Springer-Miller and passed unanimously.

Discussion was had and decision was made that Rick Howell and Steve Walkerman would be responsible for obtaining and making sure these agreements were in place.

Rick Howell made a motion that all agreements with all entities that the Company is doing business with need to be approved by the CFO or the board. This motion was amended by Tina Springer-Miller to further state that these agreements must be in place with all entities prior to work bein done or product being bought or sold, and the

EZ

Company will not enter into verbal agreements. John Springer-Miller seconded the motion, and the motion as amended passed unanimously.

Discussion was had and all agreed that the purchases already made by Kneebinding under Kneebinding issued purchase orders, in the form approved by the CFO, were okay

Other business:

The board asked Steve Walkerman to prepare a policy for logging all contracts and maintaining electronic copies of all contracts for archival and off site backup purposes. Such policy to be reviewed at the next board meeting.

Steve has also been asked to pursue board of directors and officers insurance.

Meeting adjourned at 7:10 p.m.

Attest: A True Record

_____

Tina Springer-Miller, Secretary Pro Tem

PAUL FRANK + COLLINS P.C.

Tristram J. Coffin
tcoffin@PFClaw.com

February 14, 2008

John Springer-Miller
P.O. Box 1262
Stowe, Vermont 05672

Re: Meeting to Discuss KneeBinding Business Issues

Dear Mr. Springer-Miller:

This office has been retained by Richard J. Howell to represent his interests in certain matters relating to the production, marketing and general operations of KneeBinding, Inc.

It has come to our attention that since the closing on November 1, 2007, the relationship between you and Mr. Howell has deteriorated significantly. In Mr. Howell's view, you are responsible for certain actions that have created serious difficulties in meeting the planned marketing and production schedule and otherwise achieving the goals of KneeBinding, namely, reaching a sustained positive cash flow, operating a profitable business and generating expansive revenue in order to transfer the business in time at a normal industry exit multiplier. This conduct has threatened the success of the enterprise and aspects of it have been in violation of the agreements entered into on November 1 (the "November 1 Agreements"). More recently, you have requested without justification that Mr. Howell step down from his position as president and chief executive officer. This request is uncalled for and undermines the company's ability to meet its production and marketing deadlines. It is also violative of the essence of the November 1 Agreements. It appears to be an attempt to freeze Mr. Howell out of his position in the company, depriving him of the fair benefit that he rightfully should have expected from his innovation and this venture. As you are well-aware, this comes at a time that is particularly disruptive for the company, since meeting certain deadlines in the upcoming days and weeks is essential to launch KneeBinding in time for the 2008-2009 ski season.

We would like to detail for you some of the conduct that may have contributed to difficulties meeting production and business goals, aspects of which may violate the November 1 Agreements:

1. Failure to Hold Board Meetings

You have not held any board of directors meetings since the closing on November 1. Section 5.6 of the KneeBinding Inc. Investors' Rights Agreement requires meetings of the board of directors on at least a monthly basis unless otherwise determined by a vote of the directors then in office.

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2. Failure to Provide Financial Information

You have not fulfilled your responsibility to provide information on the company. Section 3.1 of the Investors' Rights Agreement requires the company to deliver to each major investor substantial financial information. See e.g. Section 3.1(c)-(f). In your position as majority shareholder, director and chief financial officer, you have not provided such information as required under the investor agreement.

3. Threat to Remove Mr. Howell as President

Contrary to every expressed intention prior to closing, and to the business plan incorporated in the closing as Exhibit C to the Investors' Rights Agreement, you have told Mr. Howell you will remove him as president and chief executive officer of the company. This undermines the success of the entire business and production cycle, is grossly unjust to Mr. Howell, and deprives him of the essence of your agreement with him. Not only that, it violates Section 5.5(b) of the Investors' Rights Agreements which requires the company to conduct business in a way that is in substantial conformity with the company's business plan. Your apparent direction to Mr. Walkerman to obtain Mr. Howell's company credit card is similarly oppressive conduct.

4. Interference and Improper Conduct with Potential Customers

You have also adversely affected the company's ability to produce and market its products by interfering with potential customers. Examples of this type of conduct are:

-- your resistance and delay in permitting the company to offer to produce the binding in the white color requested by substantial buyers;

-- your resistance, in contradistinction to industry practice, in requiring potential buyers to produce letters of credit for orders;

-- your making negative statements about the company's president, Mr. Howell, before potential buyers at the recent ski industry show (at which the product he developed won an award for Innovation of the Year), and even defaming Mr. Howell within the ski industry by stating to at least one important ski industry marketer that Mr. Howell had suffered a nervous breakdown.

5. Failure to Prepare Necessary Financing Materials

In your capacity as chief financial officer, you have not prepared materials necessary for the corporation to obtain financing for key parts of its production cycle. Such failure threatens to cause KneeBinding to miss the 2008-2009 ski season.

6. Failure to Engage Essential Engineering Support

You have failed to close a contract with Quinn Campbell for essential engineering support for KneeBinding. As you know, this engineering work is critical for having a substantiated basis for the settings for the lateral release mechanism. Mr. Howell had

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directed you to arrange for this work to be done, yet inexplicably the contract for these highly particularized services has not been closed.

7. Reconstruction of KneeBinding Website

You also undermined the ability of the company to achieve its production and business goals by acting to shut down the website of the company and replacing it with one that does not segment information for different types of interested parties. This was contrary to the wishes of the company president and has negatively affected the company's ability to manufacture and sell KneeBinding. This also prevented effective use of market analysis features in Google Analytics which would be very useful for the company in marketing KneeBinding.

In summary, these, as well as other breaches of your responsibilities as a director and employee of KneeBinding, may have placed the company on the verge of missing key technical, manufacturing and promotional deadlines. Some of this conduct also constitutes a serious breach of the KneeBinding agreements and your fiduciary obligations to Mr. Howell.

Moreover, based on the conduct described above, it appears that you may have intentions for the company that are substantially inconsistent with the business plan approved by you barely more than two months ago. If that is the case, then you have a fiduciary duty to provide full information about such intentions to Mr. Howell.

To this end, we propose that Mr. Howell and his representatives meet with you and any representative(s) you care to bring so these issues can be discussed and aired in full. We invite you to such a meeting at the offices of Paul Frank + Collins P.C., 1 Church Street, Burlington, Vermont, on Thursday, February 21, 2008 at 10:00 a.m. If the time and place proposed is inconvenient, please feel free to suggest an alternative time and place for such a meeting.

Thank you for your attention to and consideration of these matters. We await your prompt response and look forward to a productive meeting to attempt to resolve these differences.

Sincerely,

PAUL FRANK + COLLINS P.C.

Robert S. DiPalma
Tristram J. Coffin

Counsel for Richard J. Howell

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PAUL FRANK + COLLINS P.C.

Tristram J. Coffin
tcoffin@PFClaw.com

DEFENDANT'S EXHIBIT 227

FILE COPY

VIA FACSIMILE AND OVERNIGHT MAIL

February 26, 2008

William Contente, Esq.
Gesmer Updegrove LLP
40 Broad Street
Boston, MA 02109

Re: Critical Matters Facing KneeBinding, Inc.

Dear Attorney Contente:

I am writing to you in your capacity as the attorney who represented John Springer-Miller in the November 1 KneeBinding, Inc. transaction. We represent Richard J. Howell in connection with certain matters related to the production and marketing of KneeBinding, and the general operations of KneeBinding, Inc. For some time, we have been attempting to arrange a meeting with Mr. Springer-Miller to discuss issues of immediate and critical importance to the KneeBinding venture. Copies of correspondence that we have sent Mr. Springer-Miller detailing serious problems with acts and omissions for which he is responsible that threaten to undermine the viability of the KneeBinding venture are enclosed. This correspondence has gone unanswered and unacknowledged.

In addition, please be advised that the following acts and omissions of Mr. Springer-Miller have further threatened the viability of KneeBinding:

1. Mr. Spinger-Miller has diverted electronic mail inquiries and communications that come into the KneeBinding website to himself and has cut off distribution of such communications to Mr. Howell. Blocking communications to Mr. Howell during this critical period of product development and promotion in itself threatens to undermine the challenging development, production and promotion schedule which the company faces.

2. Mr. Springer-Miller has still not arranged financing critical to manufacturing KneeBinding for the 2008-2009 ski season. Without such financing, the company may not be able to manufacture the bindings needed to meet anticipated orders for the product.

3. Mr. Springer-Miller has not cooperated in providing terms of sale for KneeBinding to ski equipment buyers. Finalizing such terms is also absolutely critical to selling KneeBindings for the 2008-2009 ski season.

Despite the acts and omissions noted above and in the enclosed correspondence, Mr. Howell is proceeding as best he can with the implementation of the business plan and

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has been remarkably successful. For example, last week he was able to obtain an order for 3,000 bindings valued at approximately $875,000 from REI. Nonetheless, it is extremely important that Mr. Howell and Mr. Springer-Miller meet as soon as possible to attempt to resolve these problems to best ensure the company's success. Time is of the essence. Options to resolve this matter amicably and outside of litigation are dwindling extremely quickly.

Please contact Mr. Springer-Miller as soon as possible to discuss how such a meeting can be expeditiously arranged and how these problems can be addressed and rectified and get back to me. If I do not hear from you, Mr. Springer-Miller or his representative within the next few days, I will understand that discussion of these problems outside of a litigation context is not possible.

Sincerely,

Tristram J. Coffin
Robert J. DiPalma

Counsel for Richard J. Howell

cc: John Springer-Miller via certified and electronic mail

H

From: Rick Howell <rick.howell@kneebinding.com>
To: Hank Buermann <hank@progressiveplasticsinc.net>
Cc: tsmblow@aol.com; progressivebob@yahoo.com; steve.walkerman@kneebinding.com
Sent: Saturday, June 28, 2008 3:47 PM
Subject: Re: Completed molds

Hello Hank,
We're in a tough spot -- and we need your help.
We're going forward w the extended payment terms that you provided (thank you, seriously, thank you) -- and I realize that because of this extension of good faith, it is now difficult for us to ask for on-time delivery, too.... but we are now in very serious trouble regarding proper parts in time for testing at TÜV in the last week in July in Munich, Germany....with no real answers as to timing. We missed this coming season regarding real orders because we did not have real bindings in time for the on-snow trade shows because the CAD process took too long. Ultimately, I will probably lose the company and my involvement because of that. Now, however, here we are today.....about to lose our shipping-window for this coming season w the few orders that we do have because we MUST gain certification at this time – and if we miss this window, I will for sure lose my life's work.

I need your help w real answers re timing for ALL of the parts (not just molds, not just some of the molds). We cannot have 99% of the parts in order to make a full-binding for testing-certification at TÜV : we must have ALL of the parts to make full bindings (except for the fairing). I realize that the final materials are held-up for a few days because I did not approve the first batch of color tests; but I did provide a rapid response to your compounder regarding the colors....and we can make the first parts out of the molds with ANY material that has approximately the same shrink-allowance so that we can determine if we are in the ball park w part-dimensions / gates / ej-pins / parting-lines / knit-lines / fill / sinking / date-stamps, etc., irrespectively of whether we utilize the exact final material for TÜV certification or not -- while at the same time the final-final materials are en-route to China. By the time the initial tweaks are made utilizing a near-substitute material, the final-final material should arrive in China to then allow us to run our first batch of parts for testing-certification. I'm confident that we will have the final-final material in China in time for the production of the first batch of real bindings. However, it will be moot to have the final-final material in China if the molds are not done (including tweaks). Therefore the availability of the final-final material in China IS NOT the issue driving the critical path at this time: the issue driving the critical path is the full completion of the molds -- including the tweaks to the molds as noted, above.

On my side, we must schedule the certification-tests at TÜV, now; we have to book plane flights, now; we have to secure other people to go w me to TÜV, now. Before we go to TÜV, I need a few days to do our own tests (most companies need a few months to do test before they go to TÜV ..... but I'm willing to deal w a few days). All of this requires exacting / reliable planning at this time, please.

Pls advise re my open question to Todd, below, earliest.

Thank you and best regards,
Rick Howell
President & CEO
KneeBinding, Inc.
Stowe, Vt

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Rick Howell wrote:
Good morning, Todd -
Thank you for your note .... but I still look forward to an answer to my earlier question (of a few moments ago).
Thank you and best regards,
Rick Howell
KneeBinding, Inc.

tsmblow@aol.com wrote:

Good morning Rick,
Here is the list of completed the completed molds as of 6-26
Indicator cap
Heel cap round
Follower
Treadle snap
Heel cap square
Brake ends
Heel pad afd
Heel pad brake
Heel pad base
lens caps
Brake treadle
Upper Heel

I will work with Bob on samples for all of the above ASAP.

Thanks,

Todd Blow
Progressive Plastics
802-433-1563

STATE OF VERMONT
LAMOILLE COUNTY, SS.

LAMOILLE SUPERIOR COURT
DOCKET NO. 74-3-09 Lecv

FILED
MAR 30 2009
Lamoille County Superior Court
Hyde Park Vermont

KNEEBINDING, INC.,
Plaintiff
v.
RICHARD J. HOWELL,
Defendant

STIPULATION REGARDING CONTEMPT

The parties agree, through their attorneys:

(1) Following the issuance of the Temporary Restraining Order on March 16, 2009, Mr. Howell
a) posted to a blog and
b) picketed at the Lamoille Superior Court in violation of the Temporary Restraining Order.

(2) The violation was knowing and deliberate and supports the Court's finding that Mr. Howell is in contempt of the Temporary Restraining Order.

(3) An appropriate sanction for the contempt is that Mr. Howell be fined $7,000.00, BUT, shall be relieved of the obligation to pay the fine if ~~from~~ he does not further violate the Temporary Restraining Order or the permanent injunction prior to September 15, 2009.

(4) Nothing herein shall preclude further petitions to hold Mr. Howell in contempt if he commits other violations

of the Temporary Restraining Order or the permanent injunction in this matter.

MARCH 30, 2009
HYDE PARK, VT

KneeBinding, Inc.

Attorney for Plaintiff

Richard J. Howell

Attorney for Defendants

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STATE OF VERMONT
LAMOILLE COUNTY, SS.

LAMOILLE SUPERIOR COURT
DOCKET NO. 74-3-09 Lecv

KNEEBINDING, INC.,
Plaintiff
v.
RICHARD J. HOWELL,
Defendant

FILED
MAR 30 2009
Lamoille County Superior Court
Hyde Park Vermont

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(1) Following the issuance of the Temporary Restraining Order on March 18, 2009, Mr. Howell
(a) posted to a blog and
(b) picketed at the Lamoille Superior Court
in violation of the Temporary Restraining Order.

(2) The violation was knowing and deliberate and supports the Court's finding that Mr. Howell is in contempt of the Temporary Restraining Order.

(3) An appropriate sanction for the contempt is that Mr. Howell be fined $7,000.00, BUT, shall be relieved of the obligation to pay the fine if he does not further violate the Temporary Restraining Order or the permanent injunction prior to September 15, 2009.

(4) Nothing herein shall preclude further pleadings to hold Mr. Howell in contempt if he commits other violations

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of the Temporary Restraining Order or the permanent injunction in this matter.

MARCH 30, 2009
HYDE PARK, VT

[signature]
KneeBinding, Inc.

[signature]
Attorney for Plaintiff

[signature]
Richard J. Howell

[signature]
Attorney for Defendant

So Ordered this 30th of March 2009

[signature]
Judge

PLAINTIFF'S EXHIBIT 71

STATE OF VERMONT LAMOILLE SUPERIOR COURT

LAMOILLE COUNTY, SS. DOCKET NO. 74-3-09 Lecv

KNEEBINDING, INC., Plaintiff

v.

RICHARD J. HOWELL, Defendant

FILED MAR 31 2009 Lamoille County Superior Court Hyde Park Vermont

FILED MAR 30 2009 Lamoille County Superior Court Hyde Park Vermont

STIPULATED AGREEMENT AND ORDER

WHEREAS, this Court entered a Temporary Restraining Order in this matter on March 16, 2009; and

WHEREAS, Richard J. Howell received actual notice of the Temporary Restraining Order by e-mail on March 16, 2009 and by service by the Lamoille County Sheriff on March 18, 2009; and

WHEREAS, this Court has set a hearing for March 30 and March 31, 2009, upon KneeBinding, Inc.'s ("KneeBinding") motion for a preliminary injunction and petition to hold Richard J. Howell in contempt of the Temporary Restraining Order; and

WHEREAS, Richard J. Howell agrees to the entry of a permanent injunction, and to a finding that he was in contempt of the Temporary Restraining Order,

NOW THEREFORE, the Court orders as follows:

1. Richard J. Howell shall not publish or cause to be published any communication, oral or written, that relates to KneeBinding, its products, or John or Tina Springer-Miller or any of its other principals to any current or potential customer, client, investor or vendor.

2. Richard J. Howell shall not publish or cause to be published any communication, oral or written, that has a reasonable likelihood to create confusion as to whether he speaks or

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acts on behalf of KneeBinding, its products, or John or Tina Springer-Miller or any of its other principals.

3. Richard J. Howell shall forthwith remove, delete or destroy, and to the extent not within his possession, custody or control, make his best efforts to remove, delete or destroy any communications within his possession, custody, or control that fall within paragraphs 1 and 2 of this Order, including without limitation postings at EpicSki.com dated February 11, 2009, March 12, 2009, and March 16, 2009 and material at youtube.com bearing identifier http://www.youtube.com/watch?v=1sH7Y68v6bE. Among other efforts, within 2 days of this Order, Mr. Howell shall send a letter or email to the appropriate administrators of the websites in question and any other websites to which he has posted, requesting that the material be taken down, with a copy to KneeBinding, Inc. via its counsel. However, he may retain a copy of the same for his records.

4. Richard J. Howell is in contempt of the Temporary Restraining Order, and shall be fined in an amount, and upon conditions to be determined by the Court.

5. Execution of this Stipulated Order for Permanent Injunction by Richard J. Howell constitutes acceptance of service by him for all purposes in lieu of all other forms of service.

6. The restrictions set forth in Section 1 of the Non-Competition and Non-Solicitation agreement dated October 26, 2007, shall be in force until March 1, 2010.

7. Mr. Howell's severance under the Severance Agreement will be restarted upon completion of the tasks outlined in paragraph 3, and shall continue according to its terms absent any violation of this agreement and order.

8. The video of Richard J. Howell explaining the function of KneeBinding's product will be removed from the KneeBinding web site.

Dated: Hyde Park, Vermont
March 31, 2009

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KNEEBINDING, INC.

By _____
John Springer-Miller

Dated: Hyde Park, Vermont
March 27, 2009

_____
Richard J. Howell

APPROVED AS TO FORM:

Dated: Hyde Park, Vermont
March 30, 2009

_____
Robert B. Hemley, Esq.
Gravel and Shea
76 St. Paul Street, 7th Floor
P. O. Box 369
Burlington, VT 05402-0369
(802) 658-0220
For Plaintiff

Dated: Hyde Park, Vermont
March 27, 2009

_____
Scott R. Williams, Esq.
Williams & Gray
14 Merchant Street
Barre, VT 05641
(802) 476-5300
For Defendant

SO ORDERED, this 31 day of March, 2009

_____
Superior Court Judge

STATE OF VERMONT
LAMOILLE COUNTY, SS.

LAMOILLE SUPERIOR COURT
DOCKET NO. 74-3-09 Lecv

KNEEBINDING, INC.,
Plaintiff

v.

RICHARD J. HOWELL,
Defendant

FILED
MAR 3 0 2009
Lamoille County Superior Court
Hyde Park Vermont

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JS

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3. Richard J. Howell shall forthwith remove, delete or destroy, and to the extent not within his possession, custody or control, make his best efforts to remove, delete or destroy any communications within his possession, custody, or control that fall within paragraphs 1 and 2 of this Order, including without limitation postings at EpicSki.com dated February 11, 2009, March 12, 2009, and March 16, 2009 and material at youtube.com bearing identifier http://www.youtube.com/watch?v=1sH7Y68v6bE. Among other efforts, within 2 days of this Order, Mr. Howell shall send a letter or email to the appropriate administrators of the websites in question and any other websites to which he has posted, requesting that the material be taken down, with a copy to KneeBinding, Inc. via its counsel. However, he may retain a copy of the same for his records.

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Dated: Hyde Park, Vermont
March 20, 2009

KNEEBINDING, INC.

By _____
John Springer-Miller

Dated: Hyde Park, Vermont
March 30, 2009

_____
Richard J. Howell

APPROVED AS TO FORM:

Dated: Hyde Park, Vermont
March 30, 2009

_____
Robert B. Hemley, Esq.
Gravel and Shea
76 St. Paul Street, 7th Floor
P. O. Box 369
Burlington, VT 05402-0369
(802) 658-0220
For Plaintiff

Dated: Hyde Park, Vermont
March 30, 2009

_____
Scott R. Williams, Esq.
Williams & Gray
14 Merchant Street
Barre, VT 05641
(802) 476-5300
For Defendant

SO ORDERED, this _____ day of March, 2009

_____
Superior Court Judge

Kneebinding: off-topic from "I'm the person with the first ACL tear on a Knee Binding"

3/24/13 at 2:42pm THREAD STARTER

post #23 of 265

Richard Howell

PAGSHOLDER

offline

276 Posts, Joined 8/2011

Location: Stowe, Vermont USA

Dear PetwJE, If you truly are 'more holy than thou', then pls show us your cards: Stop hiding behind a pseudonym and tell us who you are and what you do for work. I think that if you are claiming insights beyond our mere level of thinking, then you need to be fully-transparent with us.

I have been fully-transparent with everyone since day-1 — especially when I announced to all that the bindings were 100% design defective and did not pass the minimum international alpine ski binding safety standards ISO 9462, 9465 and 11087, which announcement precipitated the lawsuit by KneeBinding (my company) against me. I even then picketed in front of the courthouse against a TRO to not do that BECAUSE ALL OF YOU ARE MY CUSTOMERS AND I FORMED THE COMPANY, INVENTED THE PRODUCT, DEVELOPED THE PRODUCT, ORGANIZED THE INITIAL ENTERPRISE, AND SOURCED "AN INVESTOR" TO IMPROVE SKIING SAFETY ... WHICH THEN CAUSED EXACTLY THE OPPOSITE TO HAPPEN —— BINDINGS THAT DID NOT MEET THE MINIMUM STANDARDS WERE KNOWINGLY AND WILLINGLY SHIPPED BY "THE INVESTOR" WHO WRONGLY SQUEEZED ME OUT OF THE COMPANY, WHO KNEW THAT THE BINDINGS FAILED BECAUSE HE WAS PHYSICALLY PRESENT WHEN THEY FAILED THE MINIMUM INTERNATIONAL SAFETY STANDARDS ISO 9462, 9465 AND 11087 AT TUV IN MUNICH, GERMANY ... AND THE POSTS BY OUR OTHER FELLOW EPIC BLOGGERS ARE STILL LIVE TODAY WHERE THEY ABSOLUTELY WROTE, OPENLY, ABOUT AFD'S FALLING OFF, BRAKES NOT OPENING UPON STEPPING-OUT, ETC. I WAS TOLD THAT MARTIN LUTHER KING WENT TO JAIL BECAUSE HE PROTESTED A STANDING TRO: I DID THAT WITH FULL-TRANSPARENCY TO PROTECT MY CUSTOMERS — ALL OF YOU. THE JUDGE CAME OUTSIDE OF THE COURTHOUSE IN HER FROCK AND WALKED TO THE BOTTOM OF THE STEPS TO THE GROUND LEVEL AND STARED AT ME FOR WHAT SEEMED LIKE FOREVER (IT WAS PROBABLY 30-SECONDS) TO READ MY PICKET-SIGN THAT SAID: " "KNEEBINDING SKI BINDINGS ARE 100% DEFECTIVE" — RICK HOWELL". I DID THAT IN ORDER TO BE FULLY-TRANSPARENT WITH THE PRODUCT AND COMPANY THAT I CREATED IN ORDER TO PROTECT ALL OF YOU, AT THE EXPENSE OF MY STOCK OWNERSHIP IN KNEEBINDING AND AT THE POSSIBLE EXPENSE OF GOING TO JAIL.

That's how serious this is.

AFD's that fall off can cause pre-release. Pre-release can be far worse than no-release.

If you think you know it all about the binding, then tell us who you are. Be transparent. Show us the Certificates from TÜV (the only independent testing lab in the world that tests according to the minimum alpine ski binding safety standards). Aside from the minimum international safety standards and the aside from the only independent testing lab in the world that tests according to those minimum standards — show us real test data that measures actual valgus torque as compared to the valgus torque that this binding is supposed to produce according to the designer — *utilizing measuring instruments*. Show us the facts. Yes, this is an ironic statement at this time in the religious calendar — but this is where we are at with fact-based consumer products, not spiritual theory.

Show us data from actual physical measurements.

Rick Howell

PO Box 1004 / 79A Mansfield View Drive
Stowe, Vermont 05672

K2

802.793.4849
<rick.howell@pshift.com>

AND

Rick Howell

President
Howell Product Development Holding, Inc. d/b/a Howell Ski Bindings
PO Box 1274 / 79A Mansfield View Drive
Stowe, VT 05672
802.793.4849
<rick.howell@howellskibindings.com>
[www.howellskibindings.com]

AND

either ~34% owner of KneeBinding, Inc; or ~91% owner of KneeBinding, Inc. depending on the outcome of the in-process litigation (in 2 or 3 years).

Edited by Richard Howell - 3/24/13 at 3:57pm

Reply

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Subject: No Estopple.
From: Rick Howell <rick.howell@pshift.com>
Date: Wed, 06 May 2015 04:40:01 -0400
To: "Peter G. Anderson, Esq." <pga@pgalaw.net>, "Stein, Jeff" <Jeff.Stein@wilmerhale.com>, "Steinberg, Don" <Don.Steinberg@wilmerhale.com>, buermann@sover.net
CC: Bob Carpenter <progressivebob@yahoo.com>

NOTICE.

PLAINTIFF'S EXHIBIT tabbies 75.32

PLAINTIFF'S EXHIBIT tabbies 32

To: Peter G. Anderson, Peter Anderson and Associates, Stowe, Vermont

Jeffrey A. Stein, WilmerHale, Boston, Mass.
Donald Steinberg, WilmerHale, Boston, Mass.
Hank Buermann, Progressive Plastics, Wilmington, Vermont

From: Richard J. Howell

Date: May 6, 2015

RE: Cease and Desist; No Estoppel. Howell-inventor patent(s).

In view of my pending derivative counterclaims as KneeBinding, Inc. and my pending Third Party Plaintiff claims in the litigation matter that is before the Superior Court of the State of Vermont, Civil Division, Docket No. 74-3-09 Lecv — the parties, KneeBinding, Inc., John Springer-Miller, Tina Springer-Miller and ACL Investments, LLC, (as well as the provider who is presently not a subject of the above noted litigation, Progressive Plastics) are hereby given notice by this email that I, Richard J. Howell, 100% owner of KneeBinding, Inc. (or, in the alternative, as owner of KneeBinding, Inc. in an amount to be determined by the court in the outcome of the pending litigation matter) have sole ownership of U.S. Patent 8955867 B2 that was published on February 17, 2015 with a priority date of February 18, 2003; also published as US7318598, US8955867, US20040173994, US20080179862, US20110193324, WO2004074087A2, WO2004074087A3, WO2004074087A9

... and therefore, all other parties, people, and/or entities that are making, using, selling and/or inducing others to sell all products involving at least one claim of this above captioned granted-patent and the other related-patents and patent-applications that are noted above are infringing my ownership rights and consequently all parties noted above must immediately cease and desist from making, using, selling and/or inducing others to sell all such products because the damages and consequential-damages to me are massive in magnitude and duration and in addition all such damages from all prior-use have also accumulated and continue to accumulate each and every day the above parties make, use, sell and/or induce others to sell all products that contain at least one claim within the above noted granted-patents and patent-applications.

Independently and in addition, all parties are hereby ordered by me to verify immediately by return email that no further making, using, selling and/or inducement of others to sell the above noted granted-patents, and patent-applications is transpiring and that any such making, using, selling and/or

inducement of others to sell has not and does not form an estoppel and/or ... implied-estoppel.

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Sincerely,

Richard J. Howell
79A Mansfield View Road
P.O. Box 1004
Stowe, Vermont 05672
email: <rick.howell@pshift.com>

Kneebinding: off-topic from "I'm the person with the first ACL tear on a Knee Binding" - Page 3

3/26/13 at 5:18am THREAD STARTER

Richard Howell

PASSHOLDER

offline

post #74 of 265

276 Posts. Joined 8/2011

Location: Stowe, Vermont USA

Dear Epic Skiers,

Throughout my entire life, I have never compromised one second to invent, develop, design, test, make and/or sell only super high quality products. That history can never be changed, no matter how hard one person tries. We have solid witnesses and comprehensive emails that document the full truth. This situation is why there is litigation. We came to learn that the parties on the other side intended to steal my technology and company from me, pre-transaction ... and here, as all of you can witness, real-time, are their efforts to complete the theft. Along the way, they ruined my fantastic product, but kept shipping the ruined-product anyway (the problems are well documented here within Epic). Unlike what Chairman told all of you, KneeBinding brand ski bindings failed at TÜV — and there is no certificate from TÜV because they failed the full-series of tests. They have done everything imaginable to try to stop the whistleblower (me) to not lose their multi-million dollar investment: their actions have nothing to do with shipping ski bindings that are correct — because KneeBinidng ski bindings do not meet the minimum international safety standards, ISO 9462, 9465 and 11087 ... and they don't know how to make them so that they will meet these minimum standards (as tested by the only independent testing lab in the world that tests alpine ski bindings according to these minimum standards). It is folly to state that the international safety standards do not matter here in North America. We, here in the U.S. are party to the international ISO standards via represention by delegates with ASTM (as mandated by ANSI) — but unlike here in the U.S., Switzerland, through the BfÜ, ENFORCES compliance with these ISO standards as tested by TÜV (TÜV is in Germany). Here in the U.S., it is up to us to do our own homework to see which bindings meet the ISO standards according to the list of certificates on-file at TÜV. ALL of the other major alpine ski bindings meet ISO 9462, 9456 and 11087 as tested and approved by TÜV.

Justice must be served and I will fight this heinous situation as long as it takes.

Meanwhile, my latest product development efforts are strong. Over the past several months, I have conducted a massive new body of ski-binding development testing. CADD-files are being finalized at this moment that document the highly-positive results of these latest tests. I have sourced a fantastic industrial designer in Montréal who will style my new bindings. Last Thursday, March 21, 2013, I filed my latest provisional patent application at the U.S. Patent & Trademark Office regarding my new ski binding technology. Just 2 days ago, this past Sunday, March 24, 2013, I received electronic notice from the peer-reviewers at the International Society for Skiing Safety (ISSS) that my presentation for the upcoming ISSS conference, in August of 2013, in San Carlos de Bareloche, Argentina — is approved. Yesterday, I approved the final draft of the brief prepared by my lawyers that we will be submitting this week to the Vermont Supreme Court in the litigation regarding KneeBinding, Inc. and myself. But the best news is that I will go skiing today here in sunny, warm, no-wind, Stowe, Vermont ... with perfect snow cover — and smiles.

I am sincere when I tell all of you that I have generated, throughout my entire life, some of the finest products that can be made — including CycleBinding® clipless bicycle pedals and shoes (creating the category of hands-off clipless pedals), Tubbs® (1) snowshoes (their 1st full line of high tech snowshoes); Reader's Window® book holders; and several of the finest alpine ski bindings, ever.

The only way I will lose the litigation is if I run out of funding for my lawyers and for the work required to bring my newest binding to market. So far, I have applied $625,000 toward my lawyers (I have no open payables, no off-balance sheet obligations, and no contingency arrangements with my lawyers). I have expended all of my liquidity after having liquidated all of my physical assets to stay ahead of this situation. I need another $250,000 to complete the mission in the litigation. Upon winning the litigation, I will then combine the good assets of KneeBinding, Inc. together with the new intangible assets that I am currently-developing to

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become the new 'asset-basis' of my new ski binding company, Howell™ — to then drive-forward a beautiful new offering that will provide all of you with what you seek in a ski binding: Confidence. All donations for this effort, no matter how small, will be warmly welcomed.

Respectfully,

Rick Howell
Stowe, Vermont

(1) Tubbs® is a registered trademark of K2, Inc.

Edited by Richard Howell - 3/26/13 at 6:24am

Reply

2

Kneebinding Update - Page 6

Start a New Thread

12/24/13 at 5:30am

post #179 of 179

Richard Howell

PASSHOLDER

offline

276 Posts. Joined 8/2011
Location: Stowe, Vermont USA

The reality, Chris, is that when one develops a product that must at least meet minimum safety standards — but yet others who wrongfully should not have management control of the company that controls the product (and who should not have management control of the valuation of the company that was to be built-up around the product) cause the product to be shipped into the consumer market even though it does not meet minimum safety standards (and the parties with wrongful control know that it does not meet minimum safety standards) — then one must stand-up and fight to keep the customers from being harmed by the non-compliant product; must stand up to and fight those who wrongfully have control of the product and the company that controls the product; must work hard and smart to provide the customers with the original goal; and must gain recourse for the train wreck that was ***caused by the parties with wrongful control who willingly and knowingly shipped the non-compliant safety-product into the consumer market***. This is what one does when one is a stand-up citizen. 'And I refuse to smile until proper equity is restored. I worked too hard; skiing is too beautiful; and my trusting customers deserve proper transparency. Knowingly creating fraudulent inducement around a safety-product is totally unacceptable: 5-years is too long to wait during a 'spoiled brat / multi-millionaire's game' that's purely about financial attrition to pound me into the ground to make me go away. I will not go away. 'And market factors will prevail.

This is my experience with the product that is the subject of this thread.

Based on this experience, together with my positive career experiences — *I have developed version 6.0 — Howell Ski Bindings.* From all of this, the best compliment that can be provided is a pre-order [www.howellskibindings.com].

Rick Howell

President,
Howell Ski Bindings
Stowe, Vermont USA
[www.howellskibindings.com]

Edited by Richard Howell - 12/25/13 at 5:53am

GRAVEL AND SHEA
Attorneys at Law

76 St. Paul Street
Post Office Box 369
Burlington, Vermont 05402-0369

Telephone 802.658.0220
Facsimile 802.658.1456
www.gravelshea.com

Writer's E-Mail:
chenley@gravelshea.com

April 10, 2009

E-MAIL AND MAIL

Scott R. Williams, Esq.
Williams & Gray, LLC
14 Merchant Street
Barre, VT 05641

Re: Kneebinding, Inc. v. Richard J. Howell
Docket No. 74-3-09 Lecv

Dear Scott:

I am sending you a revised proposal following our telephone conversation this afternoon. Based on our conversations and e-mail exchange of Thursday, April 9, 2009, we have reached the following agreement:

1. In addition to steps already taken, in compliance with the Court's Order of March 31, 2009, Mr. Howell will:

   a. Contact ISSS and request that they withdraw, not publish or disseminate his abstract, a copy of which is attached hereto as Exhibit A..

   b. Contact DIN, ASTM, PIN, ASBN, and other standards organizations and request that they withdraw, not publish or disseminate the contact such as the "Lateral Heel Release Settings as a function of Z-scale" sent by email on March 11, 2009, attached as Exhibit B.

   c. Cease and desist from making any statements of any kind about KneeBinding, to anyone, including anyone in the scientific, business, or lay community.

2. Mr. Howell will provide evidence that these steps have been taken no later than April 17, 2009.

PLAINTIFF'S EXHIBIT 754

PLAINTIFF'S EXHIBIT 4

02

GRAVEL AND SHEA

Scott R. Williams, Esq.

April 10, 2009
Page 2

2. Upon acknowledgment of this agreement, evidenced by Mr. Howell signing a copy of this letter, KneeBinding will provide Mr. Howell with a check for severance due to date, by delivering a check to your law office made payable to Mr. Howell.

3. Failure by Mr. Howell to comply with the terms of paragraph 1 of this agreement will be a violation of the Court's Order of March 31, 2009, and among other things, will justify KneeBinding withholding additional severance payments.

As expressed, it is KneeBinding's strong view that the March 31, 2009, Court Order prohibits Mr. Howell from saying or publishing anything that relates to KneeBinding, its products, or its principals to any current or potential customer, client, investor, or vendor. The order further restricts Mr. Howell permanently from saying or publishing anything that has a reasonable likelihood to create confusion as to whether he speaks or acts on its behalf. Whether as a function of the Order, prior written agreements, or both, Mr. Howell is also prohibited from disclosing any confidential or proprietary information. He has negotiated away any right to express himself on these subjects that he might otherwise have had. Publishing statements, press releases, or other materials relating in any way to KneeBinding, its products, or its principals or even conversations on the street are violations, and must stop. Mr. Howell needs to understand that KneeBinding will not hesitate to proceed to seek a finding of contempt if there are any future violations.

If I have misstated any aspect of our understanding, or failed to include anything you believe is necessary to fully express our understanding, please contact me immediately.

Very truly yours,

GRAVEL AND SHEA

Robert B. Hemley

RBH:lbb

ACCEPTED AND AGREED

APRIL 10, 2009

03

Exhibit A

LATERAL HEEL RELEASE SETTINGS FOR ALPINE SKI BINDINGS

Richard J. Howell

President & CEO, Howell Product Development, Stowe, Vermont USA

KEY WORDS: ski bindings, lateral heel release

INTRODUCTION: Standardization of release settings for ordinary alpine ski bindings for forward bending and torsion about the tibia are established (1) and the prevalence of tibia fractures now comprise 2% of all skiing injuries (2). However, ACL-injuries have a prevalence of 18-to-25% of all skiing injuries (2). New binding technology exists that provides lateral heel release in an attempt to mitigate ACL injuries. Therefore, recommended release settings must be provided for bindings that have lateral heel release. A method is presented that generates release settings for bindings with lateral heel release.

METHOD: In the mid-1970's, Claude Gantet developed an on-slope "Skiability Method" that generates reproducible release settings based upon a minimum skiable "retention" level for a given ski binding design (3). Several binding companies have applied this method for 25-years to determine the relative retention properties of a given binding design. Utilization of the Skiability Method generates a "Skiability Value" for a binding with an alternating-pivot toe-cup and a step-in heel. Applying this known Skiability Value to a similar binding that also has lateral heel release, a lateral heel release Skiability Value is derived. These Skiability Values then generate a "cross-over-point" — a point at which, when a lateral force is applied to the medial edge of the ski aft of it, the toe releases laterally; while a lateral force that is applied to the medial edge of the ski forward of the cross-over point, causes the heel to release laterally. The cross-over point then provides a relative-basis for developing a range of recommended lateral heel release force values for any given lateral toe release setting. A comparison is made between the recommended lateral heel release force corresponding to a 50th-percentile male and the peak force that causes an in compute 50th-percentile male ACL to reach its elastic limit when the force is applied to the medial edge of the ski 15 cm behind the projected axis of the tibia (4).

RESULTS: Based upon the Skiability Value of 4 daNm of torsional torque about the tibia for the known type of binding, a minimum lateral-heel-release Skiability Value is generated, which produces a cross-over point of 50+/-5 cm. Applying the cross-over point to each torsional release value defined by the ISO release recommendation standard, a corresponding lateral heel release force is generated, ranging from 1.7 times the lateral toe release force (when torsional release torque is 3.0 daNm), to 1.4 times the lateral toe release force (when torsional release torque is 12 daNm). The recommended lateral heel release values are approximately 67% below the above-defined force required to approach the elastic limit of the 50th-percentile male ACL.

DISCUSSION: The combination of the Skiability and the cross-over point methods provide established techniques to derive lateral heel release setting values based on minimum retention limits. Utilizing these combined methods, inadvertent pre-release is mitigated in the lateral heel release direction, while release may be below the elastic limit of the reference ACL—though known deficiencies exist in the in compute knee model.

CONCLUSION: These lateral heel release values can be considered for integration into the ISO release recommendation standard to be utilized, optionally, for bindings with lateral heel release in order to mitigate inadvertent pre-release—but it remains unknown whether these values provide release below the elastic limit of the ACL.

REFERENCES

(1) ISO 8061; (2) Epidemiology of Snowboarding and Skiing Injuries, N. Endres, R. Johnson, S. Kim, C. Ettinger, J. Shealy, ASTM STP, 2000; (3) "Skiability Method", C. Gantet, ASTM F-504.1 Skiing Safety Test Methods & Equipment meeting, 1977; (4) "Effect of Ski Binding Parameters on Knee Biomechanics"; N. St. Onge, Y. Chevalier, N. Hagemeister, M. van de Putte, J. Dagulse, Medicine and Science in Sports and Exercise, p1218-1225, June, 2004.

04

Exhibit B

Lateral Heel Release Settings as a function of "Z-scale"
Version 4 March 11, 2009

Z #	Boot Sole Length L S mm	Tibia Torque M Z daNm	Lateral Force at Toe F SH daN	Forward Bending Moment M Y daNm	Vertical Force at Heel F AV daN	Lower-Lim Lateral Force at Heel F LH daN	Expected Lateral Force at Heel F LH daN	Upper-Lim Lateral Force at Heel F LH daN	Ratio Lat Force at Heel to Lat Force at Toe -	Median Lat Force at Heel above Lat Force at Toe %
0.5	20.0	0.5	2.9	1.8	10.7					
1.0	22.5	1.0	5.1	3.7	18.8					
1.5	24.3	1.5	7.0	5.5	26.0					
2.0	25.8	2.0	8.8	7.5	32.8					
2.5	270	2.5	10.4	9.4	39.2					
3.0	280	3.0	12.0	11.4	45.5	15.0	20.0	25.0	1.7	40
3.5	290	3.5	13.5	13.4	51.6	17.0	22.0	27.0	1.6	39
4.0	298	4.0	14.9	15.4	57.6	18.5	23.5	28.5	1.6	37
4.5	306	4.5	16.3	17.5	63.4	20.0	25.0	30.0	1.5	35
5.0	314	5.0	17.6	19.6	69.2	21.5	26.5	31.5	1.5	34
5.5	320	5.5	18.9	21.8	75.0	23.0	28.0	33.0	1.5	33
6.0	327	6.0	20.2	23.9	80.6	24.5	29.5	34.5	1.5	32
6.5	333	6.5	21.5	26.1	86.3	26.5	31.5	36.5	1.5	32
7.0	339	7.0	22.7	28.4	91.9	28.0	33.0	38.0	1.5	31
7.5	344	7.5	23.9	30.7	97.5	29.5	34.5	39.5	1.4	31
8.0	350	8.0	25.0	33.0	103.1	31.0	36.0	41.0	1.4	31
8.5	355	8.5	26.2	35.3	108.7	32.5	37.5	42.5	1.4	30
9.0	360	9.0	27.3	37.7	114.3	34.0	39.0	44.0	1.4	30
9.5	364	9.5	28.4	40.1	119.9	35.5	40.5	45.5	1.4	30
10.0	369	10.0	29.5	42.5	125.5	37.0	42.0	47.0	1.4	30
11.0	369	11.0	32.4	47.4	140.0	40.5	45.5	50.5	1.4	29
12.0	369	12.0	35.4	52.5	155.0	43.5	48.5	53.5	1.4	27
13.0	369	13.0	38.3	57.7	171.0					
14.0	369	14.0	41.3	63.0	186.0					
15.0	369	15.0	44.2	68.5	202.0					
16.0	369	16.0	47.2	74.0	219.0					
17.0	369	17.0	50.0	80.0	236.0					
18.0	369	18.0	53.1	86.0	253.0					
19.0	369	19.0	56.0	92.0	271.0					
20.0	369	20.0	59.0	98.0	289.0					

Note 1: "L S" provides 30mm reduction in sole length to generate proper effective lever arm.

EXHIBIT C

US007318598B2

(12) **United States Patent**
Howell

(10) **Patent No.: US 7,318,598 B2**
(45) **Date of Patent: Jan. 15, 2008**

(54) **ALPINE SKI BINDING HEEL UNIT**

(75) Inventor: **Richard J. Howell**, Stowe, VT (US)

(73) Assignee: **KneeBinding Inc.**, Stowe, VT (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 341 days.

(21) Appl. No.: **10/780,455**

(22) Filed: **Feb. 17, 2004**

(65) **Prior Publication Data**

US 2004/0173994 A1 Sep. 9, 2004

Related U.S. Application Data

(60) Provisional application No. 60/448,645, filed on Feb. 18, 2003.

(51) **Int. Cl.**
A63C 9/084 (2006.01)

(52) **U.S. Cl.** **280/626**; 280/629

(58) **Field of Classification Search** 280/625, 280/628, 631, 618, 626, 627, 623, 632, 634
See application file for complete search history.

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Primary Examiner—Christopher P. Ellis
Assistant Examiner—Bridget Avery
(74) *Attorney, Agent, or Firm*—Wilmer Cutler Pickering Hale and Dorr LLP

(57) **ABSTRACT**

Ski binding heel unit includes lateral release cams and a vector decoupler mechanism that provide lateral shear release of the heel of a ski boot from a ski. The ski binding heel unit includes an independent vertical heel release mechanism, independent lateral release mechanism and a forward pressure compensator. The lateral release cams have laterally outwardly flaring contact points. The vector decoupler mechanism restricts heel unit lateral rotation and translation to a control path. The shape of the lateral release cams dictates the control path. The vector decoupler mechanism redirects the non-lateral forces without effecting the vertical heel release, lateral heel release or forward pressure compensator. The lateral release cams and vector decoupler mechanism avert non-lateral, benign loads from the lateral heel release, and avert non-vertical, benign loads from the vertical heel release thereby reducing the incidence of inadvertent pre-release of a boot from a ski.

2 Claims, 4 Drawing Sheets

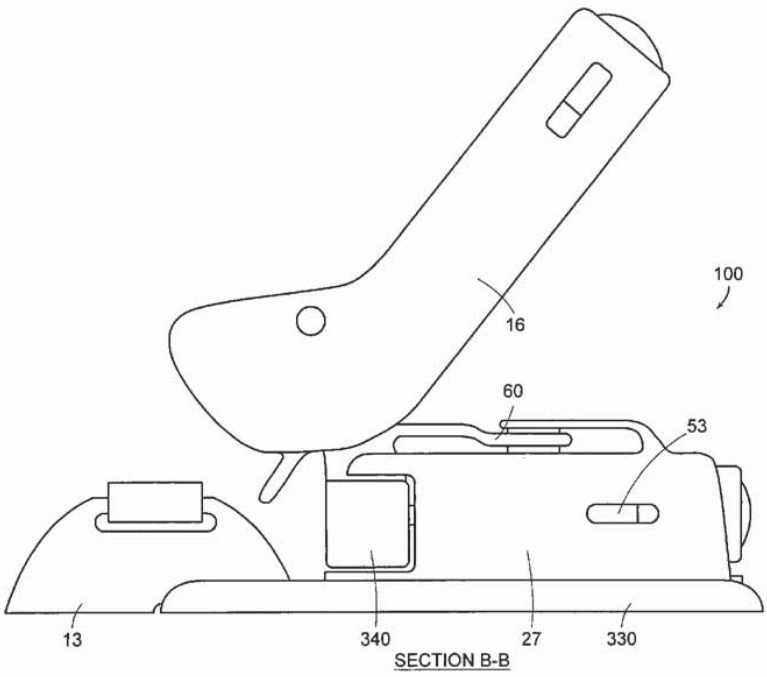
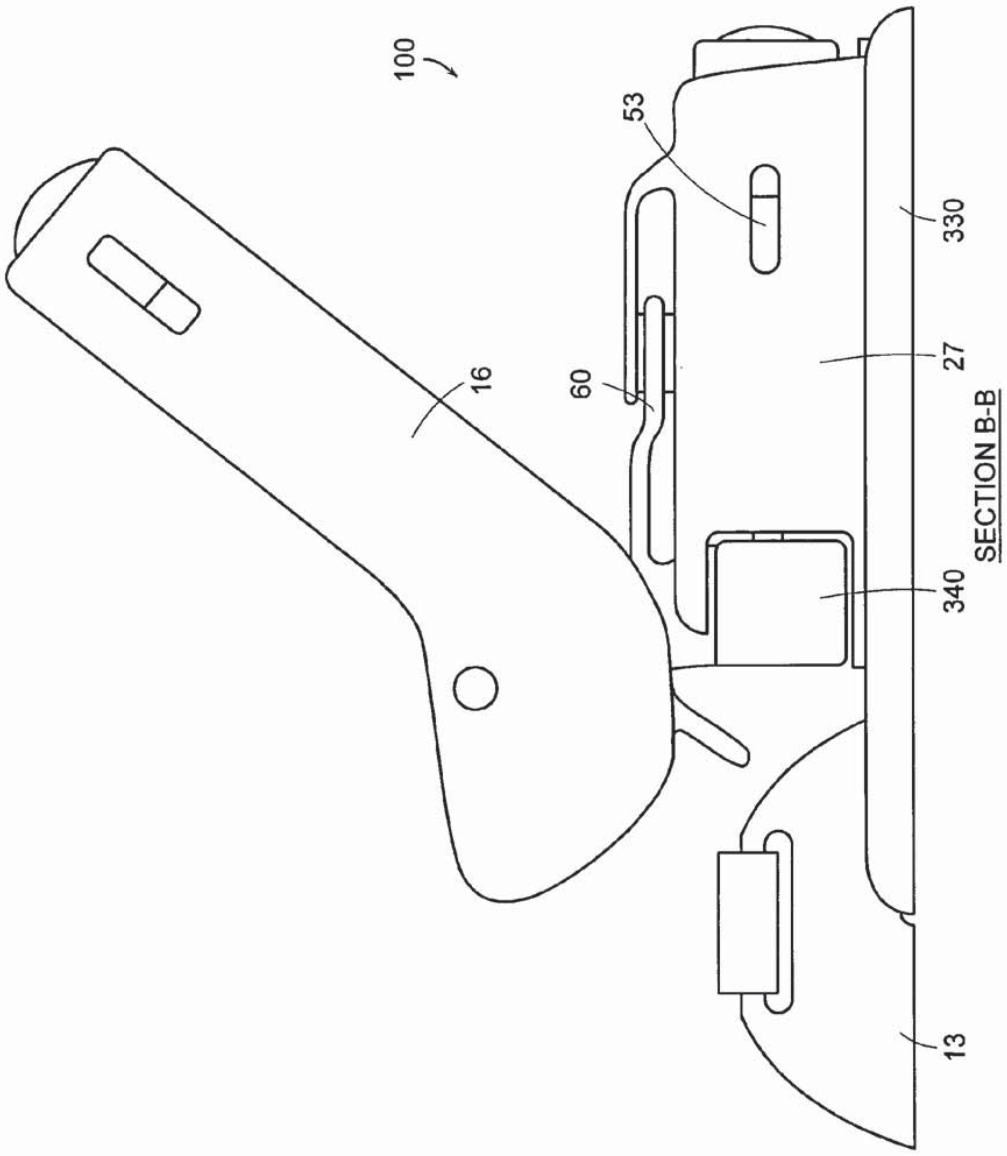


FIG. 1



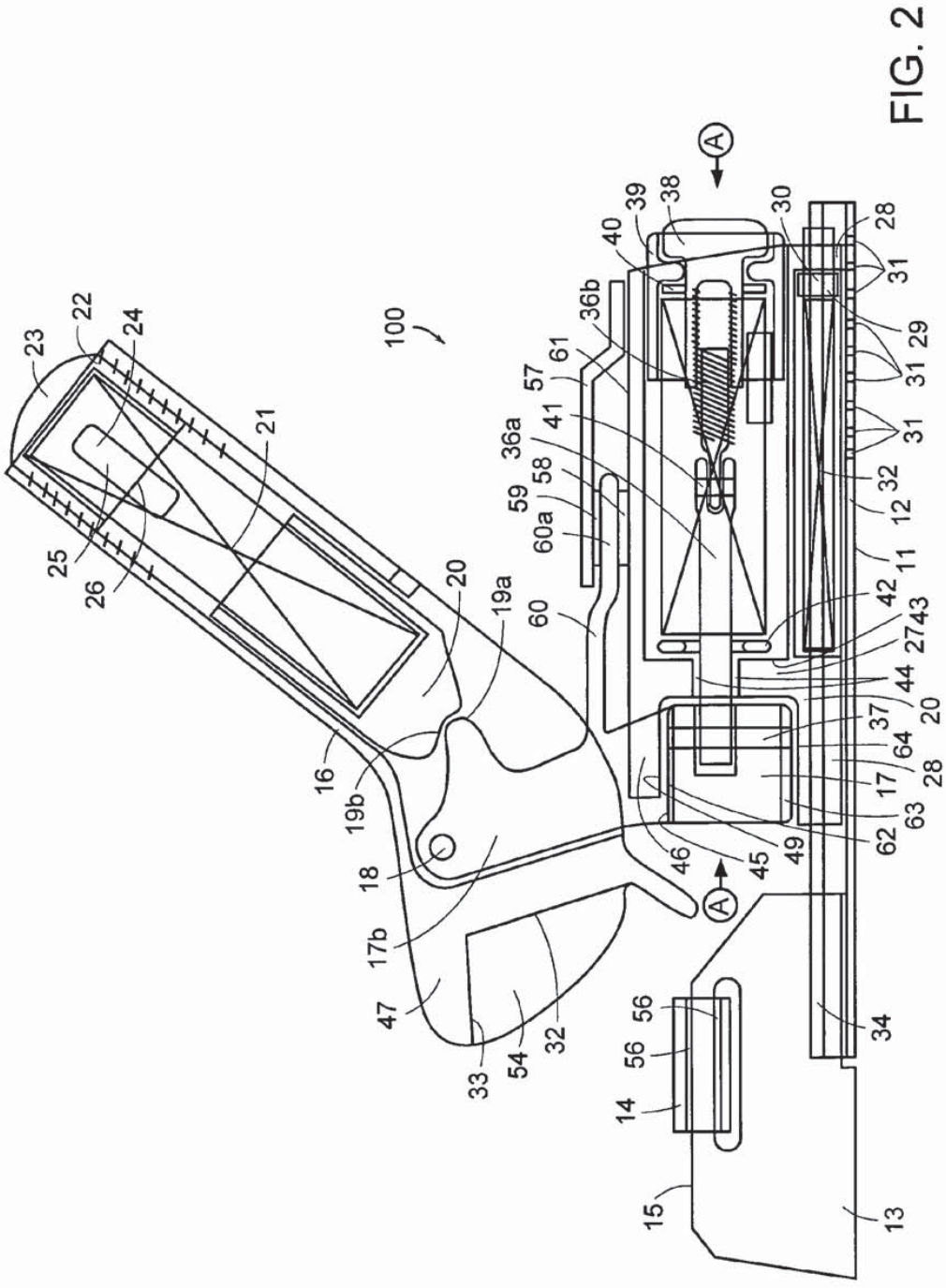

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FIG. 2

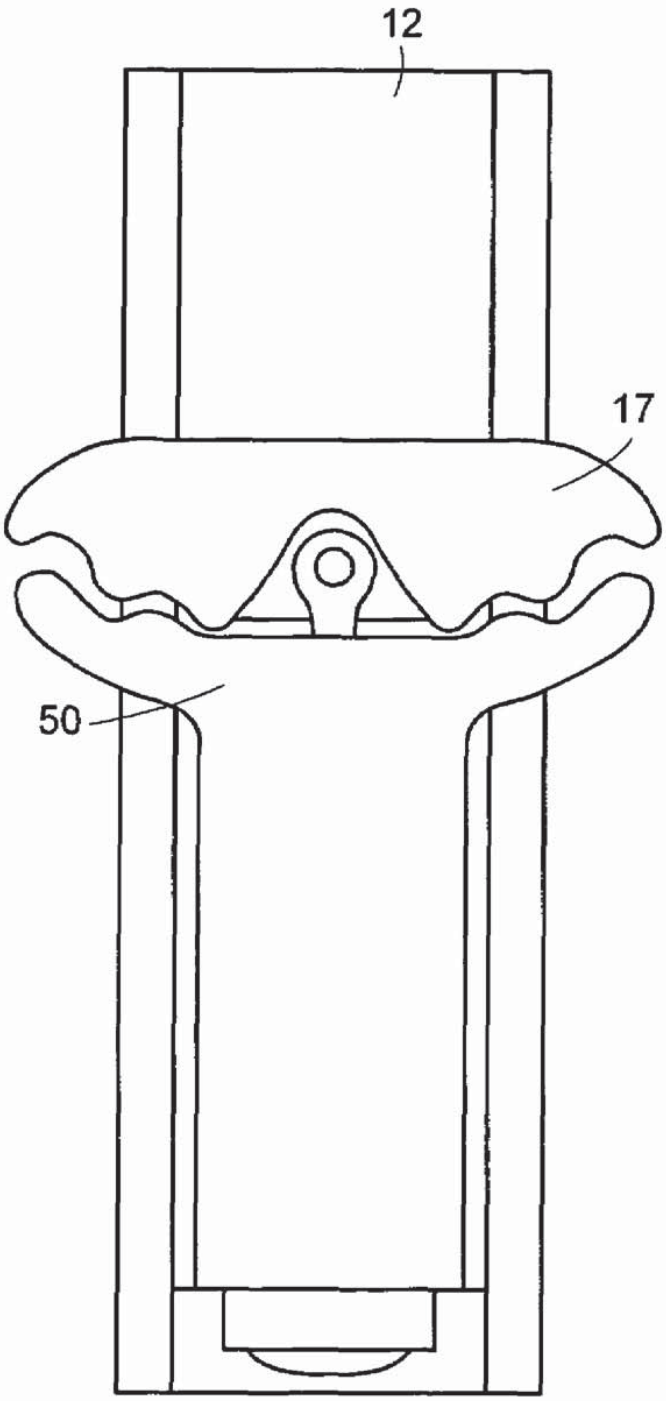

FIG. 3

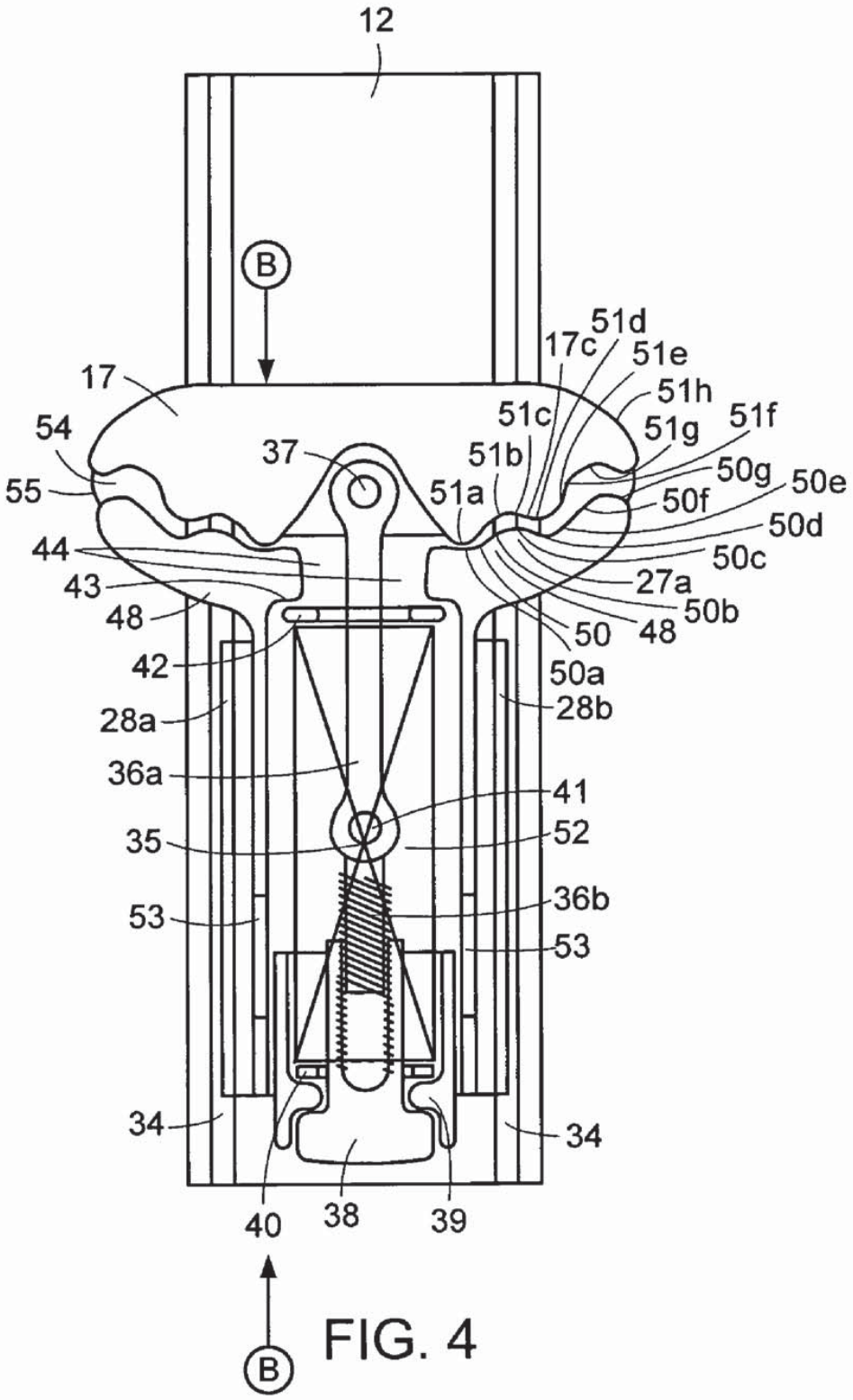
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FIG. 4

ALPINE SKI BINDING HEEL UNIT

CROSS-REFERENCE TO RELATED APPLICATIONS

This application claims priority to U.S. Provisional Appl. Ser. No. 60/448,645, filed on Feb. 18, 2003, entitled ALPINE SKI BINDING HEEL UNIT, under 35 U.S.C. §119(e) which is expressly incorporated herein by reference in its entirety.

BACKGROUND

This invention relates in general to alpine ski bindings and, in particular, to multi-directional release alpine ski binding heel units that release in the vertical and lateral directions.

Ski binding heel units have a jaw that is adapted to hold a boot and move between a boot retention position and a release position. The jaw vertical pivots around an axis transverse to the longitudinal axis of the ski and/or binding against the action of an elastic system. The elastic system comprises a mobile member biased by a spring against a release incline on a support attached to the ski. Vertical heel release bindings have serious disadvantages because vertical release bindings only release the ski when there is downward stress imparted by the skier on the ski where the area of applied stress is located in front of the boot's fulcrum point, which fulcrum is typically located under the ball of the foot; or release the ski when there is an upward stress applied to the ski by the skier when the skier is turned backwards in a fall with the top/aft section of the ski being dragged in the snow. Ski binding heel units that only release vertically rely on the mating ski binding toe units (which toe units release in response to lateral stresses or in the case of multi-directional toes units, release in response to lateral and special vertical stresses), which in the case of multi-directional release toes that provide vertical release in response to vertical stresses applied to the ski by the skier to the top after-body section of the ski during pure backward falls and release vertically at the toe in response to vertical stresses being applied by the snow surface when the skier is backwards and the tip of the ski is being dragged in the snow. Heels that release only in the vertical direction rely on the mating ski binding toe units to provide lateral release in response to lateral stresses that enter the fore-body of the ski during forward twisting falls and in response to pure straight-downward twisting loads where an almost pure-torque is applied to the ski. Accordingly, with heels that only provide vertical release, lateral release of the ski from the boot is not possible when lateral forces are applied to the ski immediately under or near the heel that only releases vertically.

In an equal-and opposite vernacular, the boot can release from the ski, or the ski can release from the boot.

All alpine ski bindings provide lateral toe release to release the ski from the boot when a transverse-longitudinal (side of the ski) force is applied to the ski at all points along the ski, except where a lateral force is applied to the ski immediately under or near a non lateral releasing heel. A heel that releases in the vertical direction only which relies on a lateral releasing toe can be dangerous to the knee in the event of lateral forces being applied to the ski immediately under a heel that only provides vertical release, because a lateral force applied to a non-releasing ski, under a non-lateral releasing heel, can act over the entire length of the lower leg to generate a moment about the femur when the knee is bent at nearly 70-degrees to 110-degrees, which femur is semi-rigidly attached to the hip, thereby producing very high strain across the anterior cruciate ligament of the knee, often causing rupture of the ACL

Heel unit bindings that release both vertically and laterally have been proposed. Multi-directional heel unit bindings can have a jaw that laterally pivots around a vertical axis located on the longitudinal plane of symmetry of the ski or a jaw mounted on a universal joint and biased to a centered retention position by an elastic locking system. These heel unit bindings, however, have serious disadvantages. These disadvantages include unsatisfactory lateral and vertical retention of the ski to the boot.

Multi-directional release bindings that exhibit unsatisfactory lateral and vertical ski retention fail to retain skis to boots during normal controlled skiing which gives rise to a condition called pre-release. Pre-release occurs when a ski binding releases a ski during normal controlled skiing. Pre-release can be caused by an undesired relationship between the vertical forces, the lateral forces, the fore-and-aft forces, the forward and backward bending moments, the torsional moments (pure torques) and the roll moments (edging loads) that enter the binding

To overcome pre-release, some skiers manually increase the release level biasings of the ski binding which increases the retention of the ski to the boot in the binding. The increase in release level offsets inadvertent pre-release. However, the increase in retention also increases the release level, negating the original benefits that multi-directional bindings are intended to resolve.

Many of the multi-directional heel release bindings have offered the promise of improved release but have failed to provide adequate retention in practice. Consequently, previous multi-directional heel bindings do not meet fundamental design requirements of an alpine ski binding including providing proper retention of a ski to a boot during controlled skiing maneuvers

There is also one multi-directional heel unit which provides false-positive retention, because it provides retention during controlled skiing, but fails to allow proper lateral heel release when roll moments (from edging) are induced into the binding, and is being taken to market, regardless, because there is no international standard that tests for the effects of induced roll moments on proper lateral heel release. Therefore, in this special case, the important promise of multi-directional release is not present during edging, which is almost always occurring during controlled and uncontrolled skiing (potentially injurious falls).

Despite improvements in multi-directional toe release bindings, the incidence of knee injuries continues to increase. Frequently the anterior cruciate ligament (ACL) of knee is strained or ruptured. ACL strain intensifies when lateral forces are applied to the ski immediately under or near the projected tibial axis (coaxial with the tibia), generally known as phantom-foot fall kinematics. In phantom-foot falls a lateral heel release binding will avert ACL strain. For example, when the knee is in a flexion angle of approximately 70 to 110-degrees, lateral forces applied to the bottom of the project tibia axis generate a torque about the femoral axis when the hip is semi-fixed. Due to the long length of the lever-arm from the base of the ski, including the thickness of the ski, the thickness of the binding (often also including "under-binding devices"/plates), the thickness of the heel section of the boot sole and the long length of the tibia), this high leverage generates a large torque about the femur where the instant unit stress through the knee is applied as strain to the ACL. In this frequent circumstance,

a lateral heel release binding could release. However, a multi-directional heel release binding that accommodates the release of the ski in the above described situation, which provides proper lateral release during edge-induced roll moments and also prevents pre-release during normal skiing conditions has yet to be reduced to practice.

Pre-release in a multi-directional release heel (that provides release in the lateral and vertical directions) is primarily caused by an improper cross-linking of the design of the lateral and vertical release mechanisms; or by the cross-linked design of the mechanisms that control lateral, vertical, longitudinal, roll (induced edging), and forward and backward bending moments, causing the pure lateral release mode or the pure vertical release mode (the injurious modes) to become overloaded by the linked addition of the other non-lateral and non-vertical stresses (non-injurious/innocuous modes), by excessive friction between the release interfaces (low friction interfaces not only improve combined-loading release, but also enhance the rapid re-centering of the ski to the boot during innocuous stresses), and by insuring that the fitting adjustments that properly connect the binding to the individual sizing of the boot are correct.

In related art with a multi-directional heel release, a center release mechanism is used. However, center release mechanisms show evidence of internal friction, especially during induced roll moments from edging. Furthermore, snow can be forced into the front end of the binding where the moving twist release interface resides between the bottom side of the binding and the ski. The snow builds up, and when compressed by the cyclical action of ski flex and counter-flex, forms an expanding layer of ice that greatly increases the resultant twist release. The presence of snow and ice melts deposits large amounts of dirt and grit in the release interfaces. The deposition greatly increases the resultant twist release and subsequent resultant torsional loading induced into the tibia during combined forward twisting falls, by as much as 300%, easily causing a fractured tibia.

A multi-directional release binding that takes into consideration the aforementioned intricacies and prevents pre-release has not been reduced to practice.

SUMMARY OF THE INVENTION

An alpine ski binding heel unit is disclosed that includes a primary vertical release, lateral heel release and longitudinal pressure compensator. The primary vertical release, lateral heel release and longitudinal pressure compensator are de-linked from each other. That is, they are functionally independent mechanisms. The forward release, the lateral heel release, and longitudinal pressure compensator include independent adjustment.

In one embodiment, the lateral heel release includes a lateral release cam. The lateral release cam features a decisively controlled level of release effort as the heel of the boot displaces from the longitudinal center of the ski. The lateral release cam and similarly matched cam interface include two pairs of individual cam members. Each pair includes a left individual cam member and right individual cam member for lateral heel release in the left and right direction, respectively. The individual cam member comprise rounded faces such that during dynamic motion of the lateral release only one or two cam members are in contact with the matched cam interface. The lateral release cam restricts the movement of the lateral heel release to a predetermined path of both rotation and translation. The shape of the individual cam members and the matched cam interface define this predetermined path.

In one embodiment, the left and right side individual cam members are shaped symmetrically providing similar lateral release in either the inward or outward directions. In another embodiment, the two sides are shaped asymmetrically to provide unequal release in the inward and outward directions. The asymmetry is shaped so that the gross features of the individual cam members are either curved toward the fore body of the ski or curved aft toward the after-body of the ski. Curving forward increases the net lateral release, while curving aft decreases the net lateral release.

During dynamic actuation, the shape of the individual cam members shifts the instant center of contact between the lateral release cam and the matched cam interface. The contact center during its initial phase of lateral movement is at the inner pair of individual cam members. Specifically, one of the individual cam members (left or right) will contact the matched cam interface during the initial phase of lateral release. Then, during the latter phase of lateral movement, the contact center shifts from the inner pair to the outer pair of individual cam members (either left or right).

Analytically, the lateral heel release includes an incremental lever arm that resists lateral motion. The incremental lever arm is defined by the distance between the point of contact between the tension shaft and the point of contact on the lateral release cam. The incremental lateral release cam tilts during initial and latter phases of release. The lateral release cam tilt allows the instant lateral center of effort (from the longitudinal pressure) of the boot to shift laterally to a point that is farther away from the concentrated point of contact. The rolling nature of the contact interface, defined by the lateral release cam and the matched cam interface, minimizes changes in the coefficient of friction within the cam interface of the lateral heel release mechanism.

Lateral release of the ski from the boot occurs after the instant lateral center of the boot's longitudinal pressure is displaced past the outer most individual cam member (either left or right). The incremental lever arm offsets an opposing lever arm of the lateral release spring-bias. When the boot's lateral instant center of longitudinal pressure is disposed near the outer pair of individual cam members, the ski, relative to the boot, can either continue to move laterally until release if the induced load increased, or the ski, relative to the boot, can be pulled back to center if the loading innocuously dissipates. The net effect of multiple lever arms as described above pulls the ski, relative to the boot, back to center.

In one or more embodiments, a vector decoupler mechanism separates and isolates undesired release conditions from intended release conditions. The vector decoupler mechanism filters events including induced roll loads (due to edging on snow or ice), forward bending moments, vertical forces and backward bending moments from the primary lateral and vertical heel release mechanisms. The vector decoupler prevents influence on objects including the lateral heel release, the vertical heel release and the longitudinal pressure compensator.

The vector decoupler mechanism includes a tongue that extends from the upper stem of the lateral release cam. The tongue moves between two plates disposed above and below the tongue. The two plates are stationary relative to lateral heel release and are a part of a lower heel unit housing The lower heel unit housing connects to the non-moving side of the lateral release cams.

The heel unit as described also provides the function of entry and exit into and out of the ski by virtue of the movement of the vertical release feature. Stepping upon a treadle latches the heel unit to the boot. The other protruding

end of the heel unit can be stepped upon by the opposite ski, boot, pole or hand to effect stepping-out of (i.e., disengaging the boot from) the heel unit.

The vector decoupler mechanism filters out unwanted non-lateral loads away from the lateral release cam. The unwanted loads include those that occur when stepping-into the binding (as during latching the vertical release mechanism),those that occur during vertical only release, and those that occur during edging on snow or ice (roll moments).

The longitudinal pressure compensator includes a spring. The spring bias produces linear force between the boot and the jaw (heel interface of the binding) of the binding. Ski flex causes the spring to become compressed. In one embodiment, the longitudinal pressure compensator mechanism is semi-linked to the primary vertical heel release and lateral heel release mechanisms. Consequently, the longitudinal pressure on the lateral heel release mechanism and vertical release mechanism increases proportionally and predictably in the event of ski flex as a function of the spring rate of the forward pressure spring.

The design largely blocks the introduction of foreign matter into the lateral heel release cam mechanism, thereby not significantly affecting performance. The open space between the lateral release cam and the matching cam interface may be partially filled with a compressible rubber-like polymer to prevent the introduction of mud, road-salt and ice contaminates.

Another embodiment describes a heel pad, to which the heel area of the sole of the boot rests, which is coated with a low-friction element to minimize the lateral friction produced by normal forces (downward forces). An alternative describes a different coefficient of friction coating surface, such as, polytetrafluoroethylene (PTFE) or polypropylene. This low-friction interface maintains an expected level of lateral-twist release during the introduction of combined vertical-downward and roll loads, as primarily controlled by the spring-biased lateral heel release.

BRIEF DESCRIPTION OF THE DRAWING

FIG. **1** illustrates a side view of the alpine ski binding heel unit;

FIG. **2** is a more detailed side view of the heel unit of FIG. **1**;

FIG. **3** illustrates a cross-sectional top view of a lateral release mechanism including the spring biasing; and,

FIG. **4** is a more detailed cross-sectional top view of the lateral release mechanism of FIG. **3**.

DETAILED DESCRIPTION

FIG. **1** shows a sectional side view of a ski binding heel unit **100**. The ski binding heel unit includes an upper heel housing **16**, lower heel housing **27**, heel pad **13**, lateral release **340**, interface support **330**, and vector decoupler mechanism **60**. Heel pad **13** connects to interface support. The heel housing is disposed on the lateral release **340**, which is connected to the vector decoupler mechanism **60**.

FIG. **2** details a side view of the alpine ski binding heel unit shown in FIG. **1**. Upper Heel housing **16** includes a pivot rod **18**, cam surfaces **19***a* and **19***b* stem section **17***b*, lateral release cam assembly **17**, vertical release cam follower **20**, vertical release spring **21**, threaded cap **22**, window **24**, polymer piece **25**, surface **26**, region **33**, and heel cup assembly **47**.

As used herein, the longitudinal and horizontal plane of the ski is that plane which is parallel to the bottom surface of the ski. The longitudinal and vertical plane of the ski is that plane which is perpendicular to the longitudinal and horizontal plane of the ski and parallel to the longitudinal centerline of the ski.

Upper heel housing **16** connects to lateral release cam **17** by way of a pivot rod **18**. Vertical release is a function of opposing vertical release cam surfaces **19***a* and **19***b* on the aft-most end of the upper one-third stem section **17***b* of lateral release cam **17**, and the vertical release cam follower **20**. The vertical release spring **21** (shown by an "X") in the large internal pocket of the upper heel housing **16** pushes cam follower **20**. Forward release threaded cap **22** compresses the opposing end of spring.

A window **24** on surface **26** registers the release adjustment value. In one embodiment, a transparent polymer piece **25** covers the window **24**. In a forward skiing fall, which generates a forward bending moment on the lower leg of the skier, the ski boot applies an upward vertical force to region **33** of the underside of heel cup **47** which heel cup is integral with upper heel housing **16**.

The upper heel housing **16** holds and compresses a ski boot heel downward to oppose the upward forces generated by the ski boot during skiing. Forces include those from forward bending moments and roll moments generated during edging because region **33** and pivot rod **18** have a lateral width to resist such induced roll moments from edging. The skier removes the ski boot from the alpine ski binding heel unit by applying downward pressure to the top end of upper heel housing **16** with the opposite ski, opposite boot, by ski pole, or by an open hand.

Cam follower **20** moves along the length of the pocket of the long axis of upper heel housing **16** in response to upward vertical forces being applied to region **33** or in response to downward exiting forces applied to the upper end of upper heel housing **16**. The shape of cam surfaces **19***a* and **19***b* control the relationship of the forces and corresponding displacement of cam follower **20**, as biased by spring **21**, which allows for the rotational displacement about a horizontal axis **18** of upper heel housing **16** and the vertical displacement of the ski boot in concert with region **33**.

The vertical release cam follower **20** is made of plastic, while the moving lateral release cam **17**/**17***b* is made of coated die cast metal or injection molded plastic, although other suitable materials known in the art may also be used. The vertical release cam interface between cam surfaces **19***a* and **19***b* can be heavily greased with moderately high viscosity low-friction grease such as molybdenum disulfide or the like. The wicking action of cam surfaces **19***a* and **19***b*, as in the way an eye-lid functions, preclude mud, road-salt and ice from interfering with smooth vertical release cam action.

Interface support **330** includes bottom surface, stop-lock/nut **29**, teeth **30**, longitudinal spring **32**, and lower carriage **12**.

Lower carriage **11**, connects to the top surface of a ski (not shown), to a riser plate (not shown), a lifter (not shown) or to an integral rail-system (not shown). Stop-lock/nut **29** has one or more teeth **30** to allow selective movement of lower heel housing **27** along the length of lower carriage **12** in conjunction with slots **31** that are formed in lower carriage **12**. Turning stop-lock/nut **29** facilitates movement of lower heel housing **27** relative to lower carriage **12** to properly fit various lengths of ski boots between the lower heel housing **27** and an alpine binding toe piece (not shown).

In series with the stop-lock/nut **29** and lower heel housing **27** is longitudinal spring **32**, which provides a spring bias between lower heel housing **27** and lower carriage **12**.

Longitudinal spring **32** also provides longitudinal pressure between the lower heel housing **27** and alpine binding toe piece to ensure proper hold of a boot during the ski's counter-flex. Counter-flex increases the strain on the top surface of the ski, thereby increasing the distance between the toe piece and heel unit **100**. The longitudinal pressure maintains the contact of the binding's toe piece and heel unit **100** throughout the ski counter-flex. The lower heel housing **27** applies longitudinal pressure to the ski boot via the upper heel housing **16** at surface **32** of heel cup **47**. An internal shoulder on stop-lock/nut **29** prevents the nut **29** from falling out of its opening at the end of the lower heel housing **27**. Longitudinal pressure increases substantially during ski flex. Such pressure is addressed by the longitudinal pressure spring biasing means that is comprised of elements **32**, **29**, **30**, **31** within lower heel housing **27**.

The lower heel housing **27** fits to and integrates with lower carriage **12** by flanges **28**. Specifically, flanges **28***a*, **28***b*, on each side of the lower heel housing **27**, mate with lower carriage **12**.

Heel pad **13** includes low-friction element **14**, low-friction surface **15**, and bearing grease **56**. Low-friction element **14** is disposed on the heel pad **13** and is lubricated with bearing grease **56**. In an alternate embodiment low-friction surface **15** and bearing grease **56** is replaced with a low-friction surface **15** to which a boot can contact. Low-friction means **14** and **15** provide smooth lateral heel release during combined downward-vertical and lateral stresses, which mitigate torque about the femur and correspondingly strained ACL. Low-friction means **14** and **15** contribute to rapid re-centering of the heel of a boot during innocuous lateral heel loads.

The vector decoupler assembly **60** includes cantilevered plate **57**, vector decoupler tongue **60***a*, top surface **61**, and low-friction elements **58** and **59**.

The cantilevered plate **57** joins to the moving lateral release cam element **17**. The low friction elements **58** and **59** are made of a low-friction polymer, such as polytetrafluoroethylene (PTFE), or are made of other low-friction materials or surfaces that are already well known in the art. One side of the low-friction element **58** bonds to a mating surface (not shown). For example, the top-side of low-friction element **58** can be bonded to the bottom side of vector decoupler assembly **60**, allowing the low friction element **58** to slide while rotating and translating laterally. The translation occurs with the vector decoupler tongue **60***a* when a force is applied to the vector decoupler tongue **60***a* such that the vector decoupler tongue **60***a* is applied against top surface **61** of lower heel housing **27**. Optionally, the bottom side of low-friction element **58** can be bonded to the top surface **61** of lower heel housing **27**. Accordingly, the vector decoupler tongue **60** can rotationally and translationally slide laterally against low friction element **58**. if the vector decoupler tongue is made of an aluminum die casting, a low friction coating (such as Teflon impregnated epoxy paint) is applied to the contact surfaces of the vector decoupler tongue **60***a* and the top surface **61** of the lower heel housing **27**. Low friction coatings provide a low friction interface between the vector decoupler tongue **60** and the lower heel housing. If the vector decoupler tongue is made of injection molded plastic, the plastic material itself can be of a low coefficient of friction material without any coating, such as DuPont Delrin blended with PTFE, low-coefficient of friction grades of Nylon 12 or Nylon 66 or other low-coefficeint of friction/high impact at low-temperature grades of plastics that are already well known in the art.

In a similar way, the top-side of low-friction element **59** bonds to the bottom side of cantilevered plate **57** so that the vector decoupler tongue **60***a* can slide smoothly while rotating and translating in the general lateral direction. Or, optionally, the bottom side of low-friction element **59** can be bonded to the top surface of the vector decoupler tongue **60***a* while the top surface of the low-friction element **59** slides by rotating and translating against the bottom side of the cantilevered plate **57**. If the vector decoupler tongue is made of die castable aluminum, low friction coatings, such as Teflon impregnated epoxy paint, are applied to the contact surfaces of the vector decoupler tongue **60***a* and the bottom surface of the cantilevered plate **57**. The application provides a low-friction interface between the vector decoupler tongue **60***a* and the cantilevered plate **57**.

The vector decoupler assembly **60** has sufficient width between 1 cm and 3 cm in the lateral direction. The augmented width resists a roll moment induced by a skier. The width also resists the stresses induced in the roll direction when skiing on snow or icy surfaces when a boot is forced to overturn laterally (roll), so that an upward unit force is applied to one side of the lateral region **33** of the underside of heel cup **47** thereby decoupling the effects of induced roll moments from the vertical release mechanism—minimizing inadvertent pre-release. The resistance supplied by the vector decoupler substantially decouples the roll moment from the moving lateral release cam surfaces **17***c* and interfacing lateral release cam surfaces **27***a*, thereby decoupling the effects of induced roll moments from the lateral heel release.

The vector decoupler assembly **60** allows free lateral translational and rotational movement of the moving lateral release cam **17** relative to the lower heel housing **27**. The vector decoupler assembly **60** also allows free coupling of moving lateral release cam **17** against the mating cam surfaces **27***a* in the presence of lateral heel release loads. This occurs even when induced roll moments and upward force vectors are applied through the vector decoupler assembly **60**. Free coupling is partially limited by friction generated between the sliding surfaces of low-friction elements **58** and **59** and the respective mating surfaces of components **60***a* and **61**. Component **61** can be affixed to the lower heel housing **27** by band **18** that wraps around the lower heel housing **27**.

In an alternate embodiment, cantilevered plate **61** is formed integrally with lower heel housing **27** as an aluminum die-casting or as an injection molded plastic part. The long length of vector decoupler tongue **60***a* reduces the unit compressive stresses at the far end of the tongue, between its interfacing components, low-friction element **59** and cantilevered plate **61** during induced forward bending moments. The long length of vector decoupler tongue **60** also serves to reduce the compressive stresses between interfacing components, low friction element **58**, and the lower heel housing **27** during the latching action of stepping into the lower heel housing **27**.

Vector decoupler mechanism **60** above is de-coupled from longitudinal pressure loads generated between moving lateral release cam **17** and lower heel housing **27**, due to the longitudinally-open linkage between tongue **60***a* and cantilevered plate **57**. In another embodiment, the side-to-side movement of the tongue **60***a* may be limited either on one side or both sides and substantially restricted on one side to block lateral heel release in one lateral direction to cut the probability of lateral heel pre-release in half while at the same time allowing release in the other lateral direction to provide for the lateral stresses that cause the inward twisting

abduction loads present in ACL ruptures, described in part by the phantom-foot injury mechanism/fall mechanics described above.

FIG. **3** illustrates a sectional top view of a lateral heel release mechanism. FIG. **4** shows the view of FIG. **3** in greater detail. Lateral release cam **17** is disposed next to matched cam interface **50**. Both lateral release cam **17** and matched cam interface is disposed on top of lower carriage **12**. Lateral release **340** includes lateral release cam **17**, matched cam interface **50**, spring biasing means **52**, lateral heel release spring **35**, tension shaft parts **36***a* and **36***b*, connector rod **41**, shaft-rod **37**, lateral release indicator washer **39**, internal washer **40**, integral opening **44**, rectangular opening washer **42**, and interface curved surfaces **51***a*, **51***b*, **51***c*, **51***d*, **51** *f*, **51***g*.

Referring to FIGS. **2** and **4**, the lateral heel release mechanism comprises lateral release cam surfaces **17***c* and lower heel housing lateral cam surfaces **27***a*, which are biased (i.e., forced together) by lateral heel spring-biasing component **52**. Lateral spring biasing component **52** includes lateral heel release spring **35** that is placed in compression by the opposing force of the tension shaft parts, **36***a* and **36***b* (or by optional unitary tension shaft **36**), and connector rod **41**. These are supported at each tensioned two ends of the rod(s). At one end, shaft-rod **37**, lateral release cam **17**, and rectangular opening washer **42** support the equal and opposite compression against internal wall **43** of lower heel housing **27**. At the other end, lateral release threaded cap **38**, lateral release indicator washer **39**, internal washer **40** support the equal and opposite compression of the tension rod(s). Internal opening **44** and the internal opening of rectangular opening washer **42** are both rectangular in shape to permit tension shaft **36***a* (or **36**) to rotate and translate laterally upon the lateral movement of moving lateral release cam **17**. While the vertical gaps of internal opening **44** and the vertical gaps of rectangular opening washer **42** are each smaller than their respective lateral gaps, such vertical gaps restrict the vertical movement of tension shaft **36***a* (or **36**), so that upper heel housing **16** provides vertical movement of the ski binding heel unit about its pivot axis **18**, rather than by the forced vertical movement of other elements.

Lateral heel release cam surfaces allow the lateral release cam **17** to both rotate and translate relative to the lower heel housing **27**, so that the heel area of the ski boot can displace laterally relative to the long axis of the ski. Boot displacement occurs when lateral loads are induced. Such lateral movement of the boot occurs across low-friction element **14** and heel pad top surface **15**, as well as laterally against heel cup **47** boot-interface surfaces **32** and **33**.

The lateral release cam surfaces **17***c* and **27***a* of the lateral release cam **17** and the mating cam surfaces **27***a* of the lower heel housing **27** displace relative to each other in a path described by their curved surfaces—specifically, curved surfaces **50***a*, **50***b*, **50***c*, **50***d*, **50***f*, **50***g* and their respective incremental interface curved surfaces **51***a*, **51***b*, **51***c*, **51***d*, **51***f*, **51***g*.

A partial lateral boot heel displacement occurs when the projected longitudinal-pressure center-of-effort between the boot and the heel cup **47** shifts laterally and the moving lateral release cam **17** tilts by rotating and translating a small amount, biased by lateral heel release spring **35**. During such a partial lateral boot heel displacement, the opposing curved cam surfaces **50***a*, **50***b*, **50***c*, **50***d*, **50***f*, **50***g* move by translating and rotating (tilting) from their at-rest position to the next point of cam contact **50***c* and **51***c*, biased by lateral heel release spring **35**. Accordingly, cam surfaces **50***b* and **51***b* space apart the "a-a" (as in **50***a* and **51***a*) surfaces from the "c-c" surfaces to provide an incremental lever arm. The incremental lever arm permits lateral translational and rotational movement of **17** relative to **27***a*. The at-rest position is defined to be when the surfaces on the symmetrically opposite side of the lower heel housing **27** are touching each other. For example, the at-rest position occurs when surfaces **50***a* and **51***a* are contacting each other.

As the heel of the boot continues to move laterally and lateral release cam **17** rotates and translates more to the point where cam surfaces "c-c" touch, a reverse-polarity lever-arm is generated that vector-adds to the spring bias effect of **52**. The resultant incrementally abates the rotational and translational movement of lateral release cam **17**. The abatement acts to re-center lateral release cam **17** toward its at-rest position, thereby providing incremental retention in the advent of large amounts of longitudinal pressure between the boot and lateral release cam **17**, which would otherwise cause inadvertent pre-release. If the lateral load at the heel persists in magnitude and/or and duration, the boot's instant center of effort of longitudinal pressure then shifts outside of cam contact surfaces "c-c" to release the ski from the boot quickly and efficiently as is the case with ACL injury producing loads.

A similar benefit results if a load continues to persist in magnitude and duration while lateral release cam **17** continues to translate and rotate past the boot's projected longitudinal pressure shifts "outside" of cam contact surface "e-e." This reverses the polarity of the lever arm that acts perpendicular to the boot's projected center of effort of longitudinal pressure, thereby vector-subtracting from spring biasing means **52** to precipitate efficient release. Cam surfaces "f-f" begin to separate as cam surfaces "g-g" contact one another.

Finally, when cam surfaces "g-g" contact and the boot's projected instant center of longitudinal pressure shifts "outside" of cam surface contact point "g-g", the perpendicular lever arm finally reverses polarity again to vector-subtract from the spring bias **52**, causing the moving lateral release cam **17** to rotate and translate toward lateral heel release.

The novel incremental vector additions and subtractions along the progressive cam surfaces that progress from cam surfaces "a-a" to cam surfaces "g-g" as described above, are also progressively effected by the increasing overall lateral lever arm generated between those cam contact surfaces and the reaction force of spring bias **52** applied at the instant-center-of-effort of shaft-rod **37**. This arrangement makes lateral pre-release incrementally more difficult, the maximum point of release being a function of the exact spring constant of lateral heel spring **35**, the amount of compression of spring **35** as controlled by lateral release threaded cap **38** (as indicated in lateral release level windows **53** on each side of lower heel housing **27**). The maximum point of release is off-set by the incrementally decreasing longitudinal distance of the lever arm, between the lateral instant-center-of-contact of the side of the boot's heel and the lateral heel cup surface **54**, to the instant-point of surface-contact on the progressive cam surfaces **17***c* and **27***a*.

If the moving progressive cam **17** were to rotate only about a central pivot located over the center of the ski, the alpine binding heel unit **10** would be too biased toward release and skiers would suffer from pre-release. On the other hand, if the moving progressive can were to rotate only about opposing cam surfaces "g-g" (as in **50***g* and **51***g*) the alpine binding heel unit would be too biased toward retention and skiers would suffer from ruptured ACL injuries. The progressive cams thus strike a decisive balance over release

and retention by incrementally reversing polarity between release and retention during the course of lateral heel movement when moving cam **17** rotates and translates accordingly.

The kinematics of the incremental lateral release path of the boot relative to the ski can be controlled by the geometry of the mating cam surfaces as noted above. Adjustments to control the point of maximum lateral release can be adjusted by the compressive movement of lateral release threaded cap **38**.

In one embodiment, a compressible elastomeric material **54** such as Dupont Crayton is placed between lateral release cam surfaces **27***a* and **17***c* to minimize the contamination effects of ice, mud and road-salt. Alternatively, a very highly elastic membrane **55** can be placed at the open end of the surfaces as a barrier to such contaminants. In yet another embodiment, the gap between the surfaces can remain open and exposed so that visual inspection of the gap can be easily performed by skiers or service technicians and because of the curved end surface of **51***h*. The curved end serves as a snow, ice and road-salt deflector to mitigate the practical effects of such environmental exposure. The entire lateral release mechanism including components **38**, **39**, **40**, can be easily removed from parts **35**, **36***a*, **36***b*, **41**, **42**, **37** and **17** to allow for periodic cleaning of the lateral release cam surfaces **17***c* and **27***a*. Snow pack does not build-up and compress into ice in the gap between **17***c* and **27***a* because the lateral orientation of the gap is at right angles to the direction of travel through the snow, mitigating the practical and important concerns about snow-pack and ice formation and its interference with lateral heel release.

Low-friction journals, or integral surfaces **62** and **63** of moving lateral release cam **17** further serve to decouple induced roll and vertical loads when acting against surfaces **49** and **64**. They are, however, limited in their structural capacity due to the high unit stresses imposed on these surfaces. Such stresses exist because of the necessary restricted longitudinal lengths of elements **62**, **63**, **49** and **64**, due to the need for the lower heel housing **27** to be compact in overall size, thereby causing the vector decoupler mechanism **60** to act in concert together with elements **62**, **63**, **49** and **64** to provide counter resistive fulcrum points as well as sliding bearing interface surfaces.

Other aspects, modifications, and embodiments are within the scope of the following claims.

What is claimed is:

1. A vector decoupling assembly for separating and isolating two or more force vectors applied to a safety binding securing a heel portion of a ski boot to a ski, wherein the safety binding includes a lower heel assembly attached to the ski and an upper heel assembly coupled to the lower heel assembly and having a lateral release assembly for applying lateral securing pressure to the ski boot, comprising:

a tongue component having a first end and a second end, the first end being fixedly attached to the lateral release assembly and the second end being disposed between a first surface fixedly attached to the lower heel assembly and a second surface fixedly attached to the lower heel assembly, such that the tongue component, the first surface and the second surface cooperate to allow motion of the lateral release assembly to occur only in the longitudinal and horizontal plane of the ski.

2. A safety binding assembly according to claim **1**, wherein the tongue component, the first surface and the second surface cooperate to limit motion of the lateral release assembly to within a predetermined region within the longitudinal and horizontal plane of the ski.

* * * * *

EXHIBIT D

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(12) **United States Patent**
Howell

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(54) **ALPINE SKI BINDING HEEL UNIT**

(75) Inventor: **Richard J. Howell**, Stowe, VT (US)

(73) Assignee: **KneeBinding, Inc.**, Stowe, VT (US)

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A63C 9/084 (2006.01)

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(58) **Field of Classification Search** 280/618, 280/624–627, 629, 632, 634
See application file for complete search history.

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Primary Examiner—J. Allen Shriver, II
Assistant Examiner—Bridget Avery
(74) *Attorney, Agent, or Firm*—Wilmer Cutler Pickering Hale and Dorr LLP

(57) **ABSTRACT**

Ski binding heel unit includes lateral release cams and a vector decoupler mechanism that provide lateral shear release of the heel of a ski boot from a ski. The ski binding heel unit includes an independent vertical heel release mechanism, independent lateral release mechanism and a forward pressure compensator. The lateral release cams have laterally outwardly flaring contact points. The vector decoupler mechanism restricts heel unit lateral rotation and translation to a control path. The shape of the lateral release cams dictates the control path. The vector decoupler mechanism redirects the non-lateral forces without effecting the vertical heel release, lateral heel release or forward pressure compensator. The lateral release cams and vector decoupler mechanism avert non-lateral, benign loads from the lateral heel release, and avert non-vertical, benign loads from the vertical heel release thereby reducing the incidence of inadvertent pre-release of a boot from a ski.

18 Claims, 4 Drawing Sheets

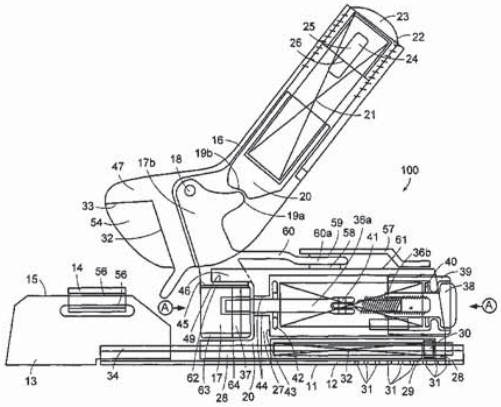

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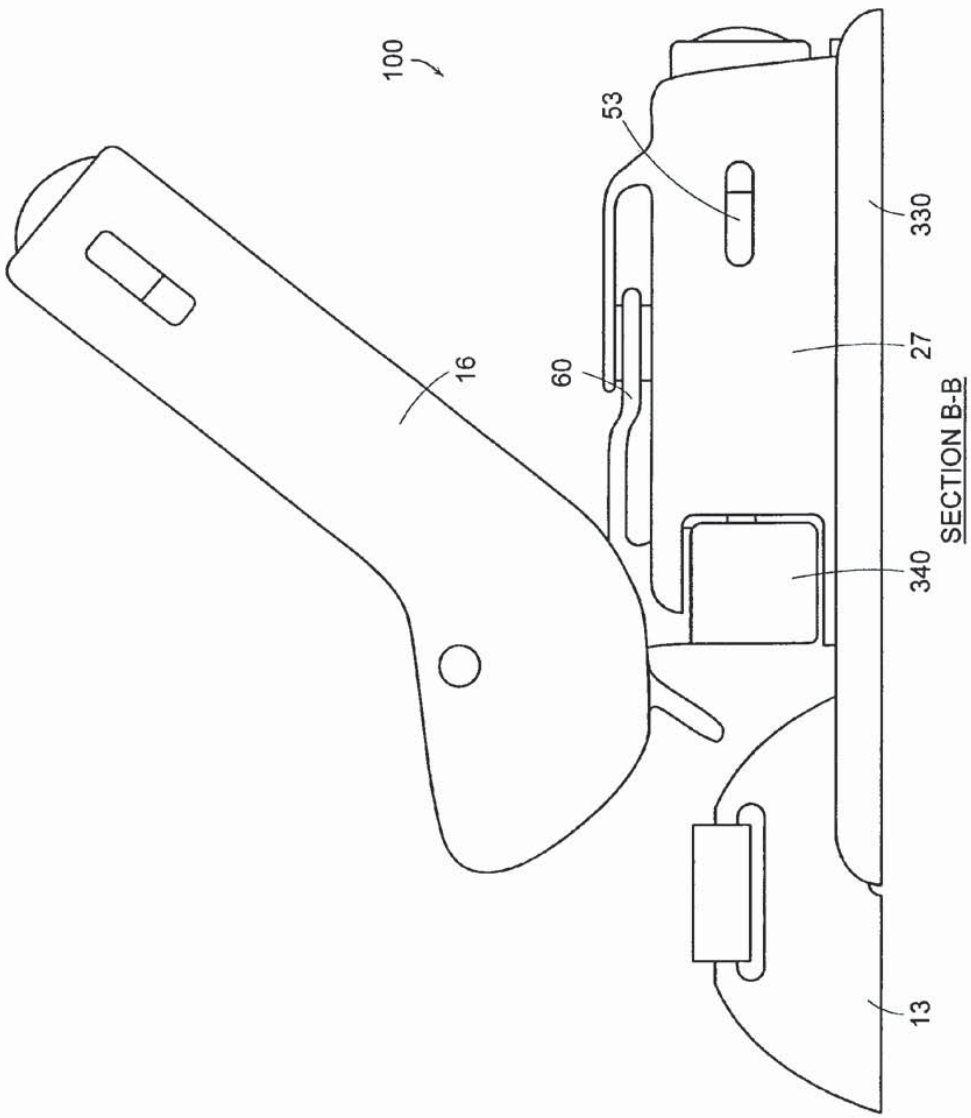
FIG. 1



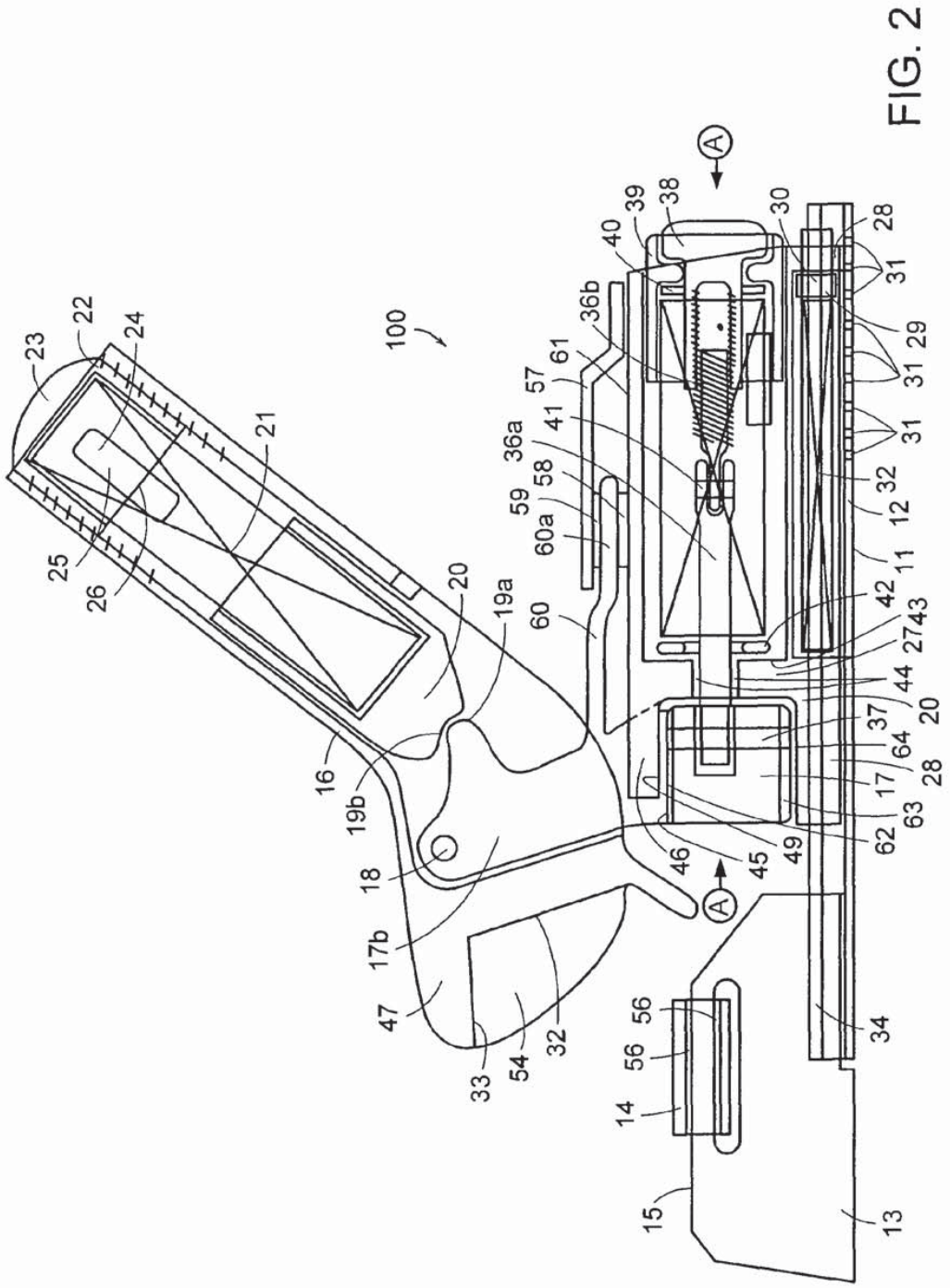

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FIG. 2

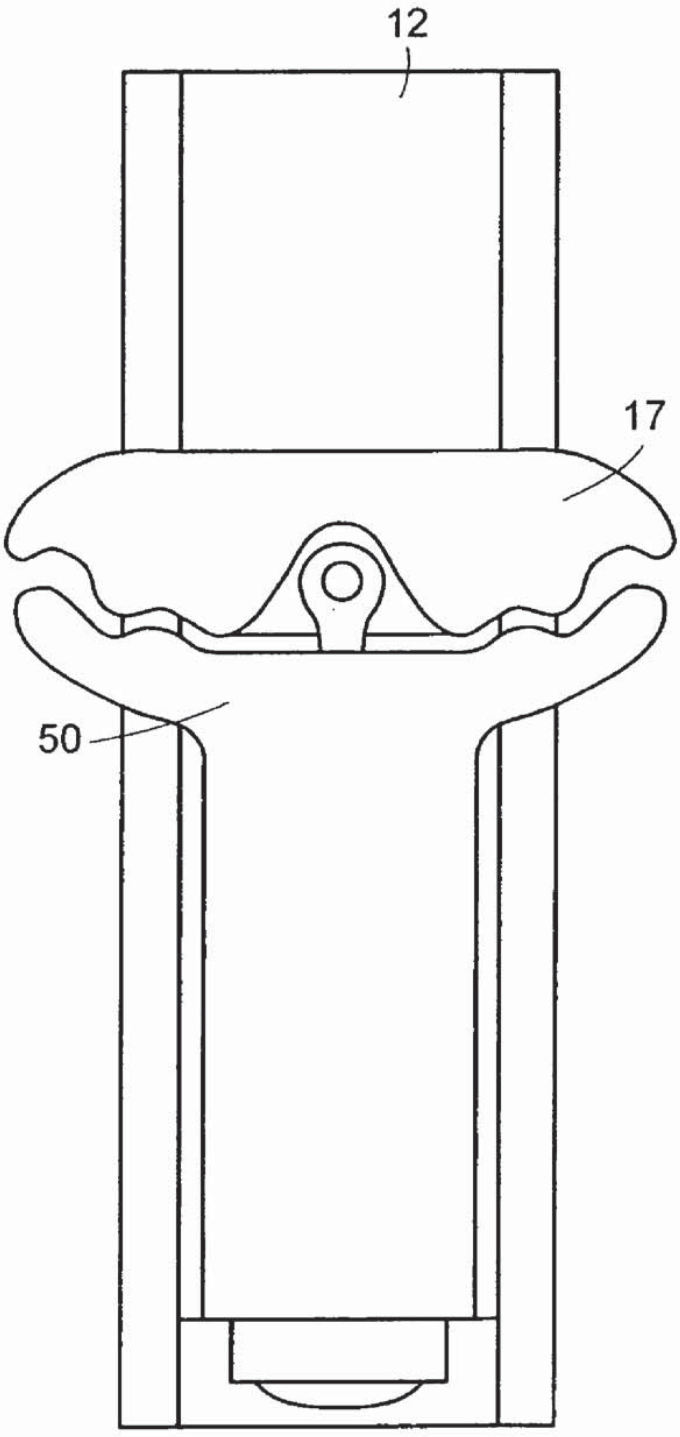

FIG. 3

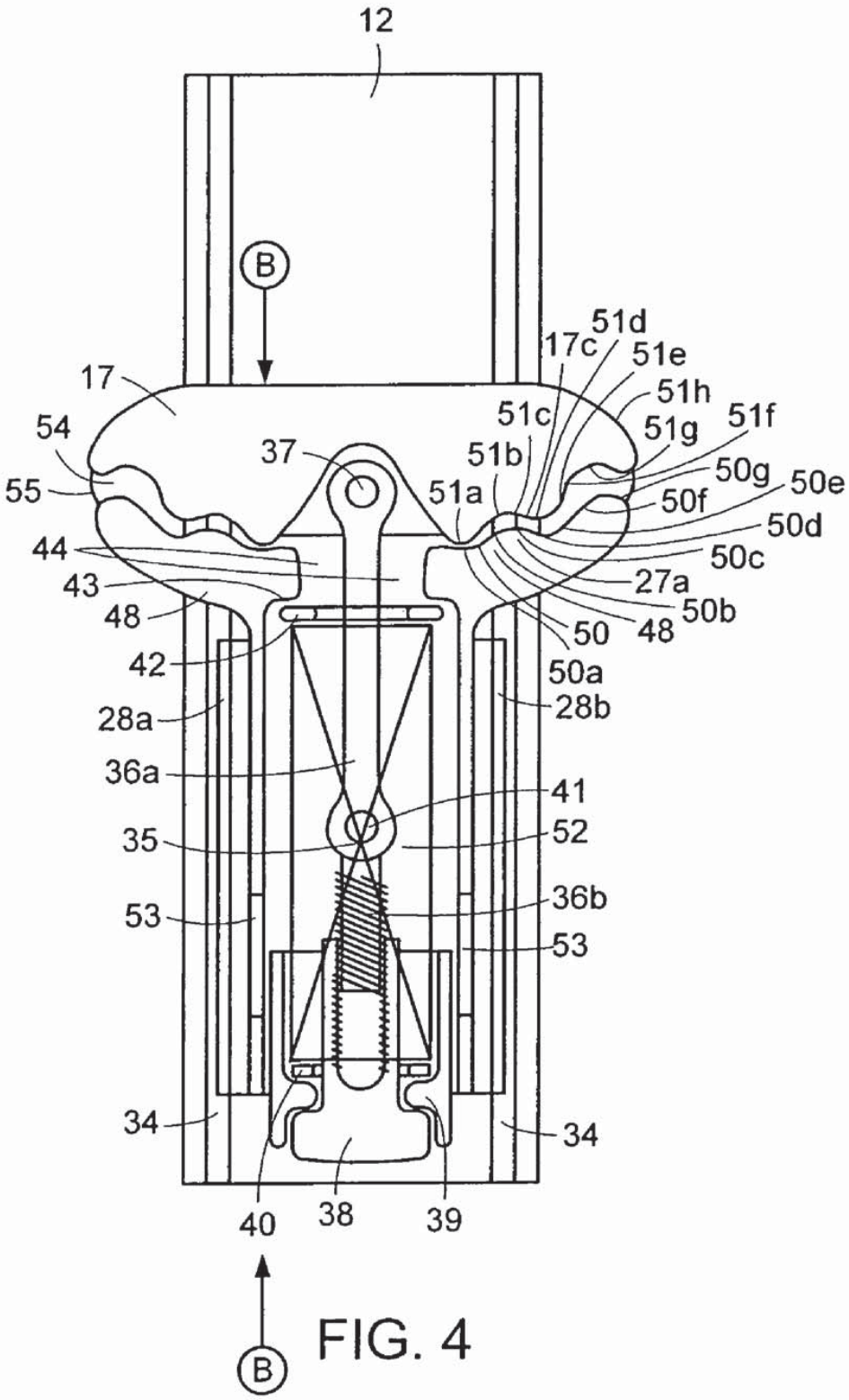
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FIG. 4

ALPINE SKI BINDING HEEL UNIT

CROSS-REFERENCE TO RELATED APPLICATIONS

This application claims priority to U.S. Provisional Application Ser. No. 60/448,645, filed on Feb. 18, 2003, and is a Divisional patent application of U.S. patent application Ser. No. 10/780,455, filed on Feb. 17, 2004, entitled ALPINE SKI BINDING HEEL UNIT, under 35 U.S.C. §119(e) which is expressly incorporated herein by reference in its entirety.

BACKGROUND

This invention relates in general to alpine ski bindings and, in particular, to multi-directional release alpine ski binding heel units that release in the vertical and lateral directions.

Ski binding heel units have a jaw that is adapted to hold a boot and move between a boot retention position and a release position. The jaw vertical pivots around an axis transverse to the longitudinal axis of the ski and/or binding against the action of an elastic system. The elastic system comprises a mobile member biased by a spring against a release incline on a support attached to the ski. Vertical heel release bindings have serious disadvantages because vertical release bindings only release the ski when there is downward stress imparted by the skier on the ski where the area of applied stress is located in front of the boot's fulcrum point, which fulcrum is typically located under the ball of the foot; or release the ski when there is an upward stress applied to the ski by the skier when the skier is turned backwards in a fall with the top/aft section of the ski being dragged in the snow. Ski binding heel units that only release vertically rely on the mating ski binding toe units (which toe units release in response to lateral stresses or in the case of multi-directional toes units, release in response to lateral and special vertical stresses), which in the case of multi-directional release toes that provide vertical release in response to vertical stresses applied to the ski by the skier to the top after-body section of the ski during pure backward falls and release vertically at the toe in response to vertical stresses being applied by the snow surface when the skier is backwards and the tip of the ski is being dragged in the snow. Heels that release only in the vertical direction rely on the mating ski binding toe units to provide lateral release in response to lateral stresses that enter the fore-body of the ski during forward twisting falls and in response to pure straight-downward twisting loads where an almost pure-torque is applied to the ski. Accordingly, with heels that only provide vertical release, lateral release of the ski from the boot is not possible when lateral forces are applied to the ski immediately under or near the heel that only releases vertically.

In an equal- and opposite vernacular, the boot can release from the ski, or the ski can release from the boot.

All alpine ski bindings provide lateral toe release to release the ski from the boot when a transverse-longitudinal (side of the ski) force is applied to the ski at all points along the ski, except where a lateral force is applied to the ski immediately under or near a non lateral releasing heel. A heel that releases in the vertical direction only which relies on a lateral releasing toe can be dangerous to the knee in the event of lateral forces being applied to the ski immediately under a heel that only provides vertical release, because a lateral force applied to a non-releasing ski, under a non-lateral releasing heel, can act over the entire length of the lower leg to generate a moment about the femur when the knee is bent at nearly 70-degrees to 110-degrees, which femur is semi-rigidly attached to the hip,

thereby producing very high strain across the anterior cruciate ligament of the knee, often causing rupture of the ACL

Heel unit bindings that release both vertically and laterally have been proposed. Multi-directional heel unit bindings can have a jaw that laterally pivots around a vertical axis located on the longitudinal plane of symmetry of the ski or a jaw mounted on a universal joint and biased to a centered retention position by an elastic locking system. These heel unit bindings, however, have serious disadvantages. These disadvantages include unsatisfactory lateral and vertical retention of the ski to the boot.

Multi-directional release bindings that exhibit unsatisfactory lateral and vertical ski retention fail to retain skis to boots during normal controlled skiing which gives rise to a condition called pre-release. Pre-release occurs when a ski binding releases a ski during normal controlled skiing. Pre-release can be caused by an undesired relationship between the vertical forces, the lateral forces, the fore-and-aft forces, the forward and backward bending moments, the torsional moments (pure torques) and the roll moments (edging loads) that enter the binding

To overcome pre-release, some skiers manually increase the release level biasings of the ski binding which increases the retention of the ski to the boot in the binding. The increase in release level offsets inadvertent pre-release. However, the increase in retention also increases the release level, negating the original benefits that multi-directional bindings are intended to resolve.

Many of the multi-directional heel release bindings have offered the promise of improved release but have failed to provide adequate retention in practice. Consequently, previous multi-directional heel bindings do not meet fundamental design requirements of an alpine ski binding including providing proper retention of a ski to a boot during controlled skiing maneuvers

There is also one multi-directional heel unit which provides false-positive retention, because it provides retention during controlled skiing, but fails to allow proper lateral heel release when roll moments (from edging) are induced into the binding, and is being taken to market, regardless, because there is no international standard that tests for the effects of induced roll moments on proper lateral heel release. Therefore, in this special case, the important promise of multi-directional release is not present during edging, which is almost always occurring during controlled and uncontrolled skiing (potentially injurious falls).

Despite improvements in multi-directional toe release bindings, the incidence of knee injuries continues to increase. Frequently the anterior cruciate ligament (ACL) of knee is strained or ruptured. ACL strain intensifies when lateral forces are applied to the ski immediately under or near the projected tibial axis (coaxial with the tibia), generally known as phantom-foot fall kinematics. In phantom-foot falls a lateral heel release binding will avert ACL strain. For example, when the knee is in a flexion angle of approximately 70 to 110-degrees, lateral forces applied to the bottom of the project tibia axis generate a torque about the femoral axis when the hip is semi-fixed. Due to the long length of the lever-arm from the base of the ski, including the thickness of the ski, the thickness of the binding (often also including "under-binding devices"/plates), the thickness of the heel section of the boot sole and the long length of the tibia), this high leverage generates a large torque about the femur where the instant unit stress through the knee is applied as strain to the ACL. In this frequent circumstance, a lateral heel release binding could release. However, a multi-directional heel release binding that accommodates the release of the ski in the

above described situation, which provides proper lateral release during edge-induced roll moments and also prevents pre-release during normal skiing conditions has yet to be reduced to practice.

Pre-release in a multi-directional release heel (that provides release in the lateral and vertical directions) is primarily caused by an improper cross-linking of the design of the lateral and vertical release mechanisms; or by the cross-linked design of the mechanisms that control lateral, vertical, longitudinal, roll (induced edging), and forward and backward bending moments, causing the pure lateral release mode or the pure vertical release mode (the injurious modes) to become overloaded by the linked addition of the other non-lateral and non-vertical stresses (non-injurious/innocuous modes), by excessive friction between the release interfaces (low friction interfaces not only improve combined-loading release, but also enhance the rapid re-centering of the ski to the boot during innocuous stresses), and by insuring that the fitting adjustments that properly connect the binding to the individual sizing of the boot are correct.

In related art with a multi-directional heel release, a center release mechanism is used. However, center release mechanisms show evidence of internal friction, especially during induced roll moments from edging. Furthermore, snow can be forced into the front end of the binding where the moving twist release interface resides between the bottom side of the binding and the ski. The snow builds up, and when compressed by the cyclical action of ski flex and counter-flex, forms an expanding layer of ice that greatly increases the resultant twist release. The presence of snow and ice melts deposits large amounts of dirt and grit in the release interfaces. The deposition greatly increases the resultant twist release and subsequent resultant torsional loading induced into the tibia during combined forward twisting falls, by as much as 300%, easily causing a fractured tibia.

A multi-directional release binding that takes into consideration the aforementioned intricacies and prevents pre-release has not been reduced to practice.

SUMMARY OF THE INVENTION

An alpine ski binding heel unit is disclosed that includes a primary vertical release, lateral heel release and longitudinal pressure compensator. The primary vertical release, lateral heel release and longitudinal pressure compensator are de-linked from each other. That is, they are functionally independent mechanisms. The forward release, the lateral heel release, and longitudinal pressure compensator include independent adjustment.

In one embodiment, the lateral heel release includes a lateral release cam. The lateral release cam features a decisively controlled level of release effort as the heel of the boot displaces from the longitudinal center of the ski. The lateral release cam and similarly matched cam interface include two pairs of individual cam members. Each pair includes a left individual cam member and right individual cam member for lateral heel release in the left and right direction, respectively. The individual cam member comprise rounded faces such that during dynamic motion of the lateral release only one or two cam members are in contact with the matched cam interface. The lateral release cam restricts the movement of the lateral heel release to a predetermined path of both rotation and translation. The shape of the individual cam members and the matched cam interface define this predetermined path.

In one embodiment, the left and right side individual cam members are shaped symmetrically providing similar lateral release in either the inward or outward directions. In another embodiment, the two sides are shaped asymmetrically to provide unequal release in the inward and outward directions. The asymmetry is shaped so that the gross features of the individual cam members are either curved toward the fore body of the ski or curved aft toward the after-body of the ski. Curving forward increases the net lateral release, while curving aft decreases the net lateral release.

During dynamic actuation, the shape of the individual cam members shifts the instant center of contact between the lateral release cam and the matched cam interface. The contact center during its initial phase of lateral movement is at the inner pair of individual cam members. Specifically, one of the individual cam members (left or right) will contact the matched cam interface during the initial phase of lateral release. Then, during the latter phase of lateral movement, the contact center shifts from the inner pair to the outer pair of individual cam members (either left or right).

Analytically, the lateral heel release includes an incremental lever arm that resists lateral motion. The incremental lever arm is defined by the distance between the point of contact between the tension shaft and the point of contact on the lateral release cam. The incremental lateral release cam tilts during initial and latter phases of release. The lateral release cam tilt allows the instant lateral center of effort (from the longitudinal pressure) of the boot to shift laterally to a point that is farther away from the concentrated point of contact. The rolling nature of the contact interface, defined by the lateral release cam and the matched cam interface, minimizes changes in the coefficient of friction within the cam interface of the lateral heel release mechanism.

Lateral release of the ski from the boot occurs after the instant lateral center of the boot's longitudinal pressure is displaced past the outer most individual cam member (either left or right). The incremental lever arm offsets an opposing lever arm of the lateral release spring-bias. When the boot's lateral instant center of longitudinal pressure is disposed near the outer pair of individual cam members, the ski, relative to the boot, can either continue to move laterally until release if the induced load increased, or the ski, relative to the boot, can be pulled back to center if the loading innocuously dissipates. The net effect of multiple lever arms as described above pulls the ski, relative to the boot, back to center.

In one or more embodiments, a vector decoupler mechanism separates and isolates undesired release conditions from intended release conditions. The vector decoupler mechanism filters events including induced roll loads (due to edging on snow or ice), forward bending moments, vertical forces and backward bending moments from the primary lateral and vertical heel release mechanisms. The vector decoupler prevents influence on objects including the lateral heel release, the vertical heel release and the longitudinal pressure compensator.

The vector decoupler mechanism includes a tongue that extends from the upper stem of the lateral release cam. The tongue moves between two plates disposed above and below the tongue. The two plates are stationary relative to lateral heel release and are a part of a lower heel unit housing The lower heel unit housing connects to the non-moving side of the lateral release cams.

The heel unit as described also provides the function of entry and exit into and out of the ski by virtue of the movement of the vertical release feature. Stepping upon a treadle latches the heel unit to the boot. The other protruding end of the heel unit can be stepped upon by the opposite ski, boot, pole or hand to effect stepping-out of (i.e., disengaging the boot from) the heel unit.

The vector decoupler mechanism filters out unwanted non-lateral loads away from the lateral release cam. The unwanted loads include those that occur when stepping-into the binding (as during latching the vertical release mechanism), those that occur during vertical only release, and those that occur during edging on snow or ice (roll moments).

The longitudinal pressure compensator includes a spring. The spring bias produces linear force between the boot and the jaw (heel interface of the binding) of the binding. Ski flex causes the spring to become compressed. In one embodiment, the longitudinal pressure compensator mechanism is semi-linked to the primary vertical heel release and lateral heel release mechanisms. Consequently, the longitudinal pressure on the lateral heel release mechanism and vertical release mechanism increases proportionally and predictably in the event of ski flex as a function of the spring rate of the forward pressure spring.

The design largely blocks the introduction of foreign matter into the lateral heel release cam mechanism, thereby not significantly affecting performance. The open space between the lateral release cam and the matching cam interface may be partially filled with a compressible rubber-like polymer to prevent the introduction of mud, road-salt and ice contaminates.

Another embodiment describes a heel pad, to which the heel area of the sole of the boot rests, which is coated with a low-friction element to minimize the lateral friction produced by normal forces (downward forces). An alternative describes a different coefficient of friction coating surface, such as, polytetrafluoroethylene (PTFE) or polypropylene. This low-friction interface maintains an expected level of lateral-twist release during the introduction of combined vertical-downward and roll loads, as primarily controlled by the spring-biased lateral heel release.

BRIEF DESCRIPTION OF THE DRAWING

FIG. **1** illustrates a side view of the alpine ski binding heel unit;

FIG. **2** is a more detailed side view of the heel unit of FIG. **1**;

FIG. **3** illustrates a cross-sectional top view of a lateral release mechanism including the spring biasing; and,

FIG. **4** is a more detailed cross-sectional top view of the lateral release mechanism of FIG. **3**.

DETAILED DESCRIPTION

FIG. **1** shows a sectional side view of a ski binding heel unit **100**. The ski binding heel unit includes an upper heel housing **16**, lower heel housing **27**, heel pad **13**, lateral release **340**, interface support **330**, and vector decoupler mechanism **60**. Heel pad **13** connects to interface support. The heel housing is disposed on the lateral release **340**, which is connected to the vector decoupler mechanism **60**.

FIG. **2** details a side view of the alpine ski binding heel unit shown in FIG. **1**. Upper Heel housing **16** includes a pivot rod **18**, cam surfaces **19***a* and **19***b* stem section **17***b*, lateral release cam assembly **17**, vertical release cam follower **20**, vertical release spring **21**, threaded cap **22**, window **24**, polymer piece **25**, surface **26**, region **33**, and heel cup assembly **47**.

As used herein, the longitudinal and horizontal plane of the ski is that plane which is parallel to the bottom surface of the ski. The longitudinal and vertical plane of the ski is that plane which is perpendicular to the longitudinal and horizontal plane of the ski and parallel to the longitudinal centerline of the ski.

Upper heel housing **16** connects to lateral release cam **17** by way of a pivot rod **18**. Vertical release is a function of opposing vertical release cam surfaces **19***a* and **19***b* on the aft-most end of the upper one-third stem section **17***b* of lateral release cam **17**, and the vertical release cam follower **20**. The vertical release spring **21** (shown by an "X") in the large internal pocket of the upper heel housing **16** pushes cam follower **20**. Forward release threaded cap **22** compresses the opposing end of spring.

A window **24** on surface **26** registers the release adjustment value. In one embodiment, a transparent polymer piece **25** covers the window **24**. In a forward skiing fall, which generates a forward bending moment on the lower leg of the skier, the ski boot applies an upward vertical force to region **33** of the underside of heel cup **47** which heel cup is integral with upper heel housing **16**.

The upper heel housing **16** holds and compresses a ski boot heel downward to oppose the upward forces generated by the ski boot during skiing. Forces include those from forward bending moments and roll moments generated during edging because region **33** and pivot rod **18** have a lateral width to resist such induced roll moments from edging. The skier removes the ski boot from the alpine ski binding heel unit by applying downward pressure to the top end of upper heel housing **16** with the opposite ski, opposite boot, by ski pole, or by an open hand.

Cam follower **20** moves along the length of the pocket of the long axis of upper heel housing **16** in response to upward vertical forces being applied to region **33** or in response to downward exiting forces applied to the upper end of upper heel housing **16**. The shape of cam surfaces **19***a* and **19***b* control the relationship of the forces and corresponding displacement of cam follower **20**, as biased by spring **21**, which allows for the rotational displacement about a horizontal axis **18** of upper heel housing **16** and the vertical displacement of the ski boot in concert with region **33**.

The vertical release cam follower **20** is made of plastic, while the moving lateral release cam **17**/**17***b* is made of coated die cast metal or injection molded plastic, although other suitable materials known in the art may also be used. The vertical release cam interface between cam surfaces **19***a* and **19***b* can be heavily greased with moderately high viscosity low-friction grease such as molybdenum disulfide or the like. The wicking action of cam surfaces **19***a* and **19***b*, as in the way an eye-lid functions, preclude mud, road-salt and ice from interfering with smooth vertical release cam action.

Interface support **330** includes bottom surface, stop-lock/nut **29**, teeth **30**, longitudinal spring **32**, and lower carriage **12**.

Lower carriage **11**, connects to the top surface of a ski (not shown), to a riser plate (not shown), a lifter (not shown) or to an integral rail-system (not shown). Stop-lock/nut **29** has one or more teeth **30** to allow selective movement of lower heel housing **27** along the length of lower carriage **12** in conjunction with slots **31** that are formed in lower carriage **12**. Turning stop-lock/nut **29** facilitates movement of lower heel housing **27** relative to lower carriage **12** to properly fit various lengths of ski boots between the lower heel housing **27** and an alpine binding toe piece (not shown).

In series with the stop-lock/nut **29** and lower heel housing **27** is longitudinal spring **32**, which provides a spring bias between lower heel housing **27** and lower carriage **12**. Longitudinal spring **32** also provides longitudinal pressure between the lower heel housing **27** and alpine binding toe piece to ensure proper hold of a boot during the ski's counter-flex. Counter-flex increases the strain on the top surface of the ski, thereby increasing the distance between the toe piece and heel unit **100**. The longitudinal pressure maintains the contact

of the binding's toe piece and heel unit **100** throughout the ski counter-flex. The lower heel housing **27** applies longitudinal pressure to the ski boot via the upper heel housing **16** at surface **32** of heel cup **47**. An internal shoulder on stop-lock/nut **29** prevents the nut **29** from falling out of its opening at the end of the lower heel housing **27**. Longitudinal pressure increases substantially during ski flex. Such pressure is addressed by the longitudinal pressure spring biasing means that is comprised of elements **32**, **29**, **30**, **31** within lower heel housing **27**.

The lower heel housing **27** fits to and integrates with lower carriage **12** by flanges **28**. Specifically, flanges **28***a*, **28***b*, on each side of the lower heel housing **27**, mate with lower carriage **12**.

Heel pad **13** includes low-friction element **14**, low-friction surface **15**, and bearing grease **56**. Low-friction element **14** is disposed on the heel pad **13** and is lubricated with bearing grease **56**. In an alternate embodiment low-friction surface **15** and bearing grease **56** is replaced with a low-friction surface **15** to which a boot can contact. Low-friction means **14** and **15** provide smooth lateral heel release during combined downward-vertical and lateral stresses, which mitigate torque about the femur and correspondingly strained ACL. Low-friction means **14** and **15** contribute to rapid re-centering of the heel of a boot during innocuous lateral heel loads.

The vector decoupler assembly **60** includes cantilevered plate **57**, vector decoupler tongue **60***a*, top surface **61**, and low-friction elements **58** and **59**.

The cantilevered plate **57** joins to the moving lateral release cam element **17**. The low friction elements **58** and **59** are made of a low-friction polymer, such as polytetrafluoroethylene (PTFE), or are made of other low-friction materials or surfaces that are already well known in the art. One side of the low-friction element **58** bonds to a mating surface (not shown). For example, the top-side of low-friction element **58** can be bonded to the bottom side of vector decoupler assembly **60**, allowing the low friction element **58** to slide while rotating and translating laterally. The translation occurs with the vector decoupler tongue **60***a* when a force is applied to the vector decoupler tongue **60***a* such that the vector decoupler tongue **60***a* is applied against top surface **61** of lower heel housing **27**. Optionally, the bottom side of low-friction element **58** can be bonded to the top surface **61** of lower heel housing **27**. Accordingly, the vector decoupler tongue **60** can rotationally and translationally slide laterally against low friction element **58**. if the vector decoupler tongue is made of an aluminum die casting, a low friction coating (such as Teflon impregnated epoxy paint) is applied to the contact surfaces of the vector decoupler tongue **60***a* and the top surface **61** of the lower heel housing **27**. Low friction coatings provide a low friction interface between the vector decoupler tongue **60** and the lower heel housing. If the vector decoupler tongue is made of injection molded plastic, the plastic material itself can be of a low coefficient of friction material without any coating, such as DuPont Delrin blended with PTFE, low-coefficient of friction grades of Nylon 12 or Nylon 66 or other low-coefficient of friction/high impact at low-temperature grades of plastics that are already well known in the art.

In a similar way, the top-side of low-friction element **59** bonds to the bottom side of cantilevered plate **57** so that the vector decoupler tongue **60***a* can slide smoothly while rotating and translating in the general lateral direction. Or, optionally, the bottom side of low-friction element **59** can be bonded to the top surface of the vector decoupler tongue **60***a* while the top surface of the low-friction element **59** slides by rotating and translating against the bottom side of the cantilevered plate **57**. If the vector decoupler tongue is made of die castable aluminum, low friction coatings, such as Teflon impregnated epoxy paint, are applied to the contact surfaces of the vector decoupler tongue **60***a* and the bottom surface of the cantilevered plate **57**. The application provides a low-friction interface between the vector decoupler tongue **60***a* and the cantilevered plate **57**.

The vector decoupler assembly **60** has sufficient width between 1 cm and 3 cm in the lateral direction. The augmented width resists a roll moment induced by a skier. The width also resists the stresses induced in the roll direction when skiing on snow or icy surfaces when a boot is forced to overturn laterally (roll), so that an upward unit force is applied to one side of the lateral region **33** of the underside of heel cup **47** thereby decoupling the effects of induced roll moments from the vertical release mechanism—minimizing inadvertent pre-release. The resistance supplied by the vector decoupler substantially decouples the roll moment from the moving lateral release cam surfaces **17***c* and interfacing lateral release cam surfaces **27***a*, thereby decoupling the effects of induced roll moments from the lateral heel release.

The vector decoupler assembly **60** allows free lateral translational and rotational movement of the moving lateral release cam **17** relative to the lower heel housing **27**. The vector decoupler assembly **60** also allows free coupling of moving lateral release cam **17** against the mating cam surfaces **27***a* in the presence of lateral heel release loads. This occurs even when induced roll moments and upward force vectors are applied through the vector decoupler assembly **60**. Free coupling is partially limited by friction generated between the sliding surfaces of low-friction elements **58** and **59** and the respective mating surfaces of components **60***a* and **61**. Component **61** can be affixed to the lower heel housing **27** by band **18** that wraps around the lower heel housing **27**.

In an alternate embodiment, cantilevered plate **61** is formed integrally with lower heel housing **27** as an aluminum die-casting or as an injection molded plastic part. The long length of vector decoupler tongue **60***a* reduces the unit compressive stresses at the far end of the tongue, between its interfacing components, low-friction element **59** and cantilevered plate **61** during induced forward bending moments. The long length of vector decoupler tongue **60** also serves to reduce the compressive stresses between interfacing components, low friction element **58**, and the lower heel housing **27** during the latching action of stepping into the lower heel housing **27**.

Vector decoupler mechanism **60** above is de-coupled from longitudinal pressure loads generated between moving lateral release cam **17** and lower heel housing **27**, due to the longitudinally-open linkage between tongue **60***a* and cantilevered plate **57**. In another embodiment, the side-to-side movement of the tongue **60***a* may be limited either on one side or both sides and substantially restricted on one side to block lateral heel release in one lateral direction to cut the probability of lateral heel pre-release in half while at the same time allowing release in the other lateral direction to provide for the lateral stresses that cause the inward twisting abduction loads present in ACL ruptures, described in part by the phantom-foot injury mechanism/fall mechanics described above.

FIG. **3** illustrates a sectional top view of a lateral heel release mechanism. FIG. **4** shows the view of FIG. **3** in greater detail. Lateral release cam **17** is disposed next to matched cam interface **50**. Both lateral release cam **17** and matched cam interface is disposed on top of lower carriage **12**. Lateral release **340** includes lateral release cam **17**, matched cam interface **50**, spring biasing means **52**, lateral heel release spring **35**, tension shaft parts **36***a* and **36***b*, connector rod **41**,

shaft-rod **37**, lateral release indicator washer **39**, internal washer **40**, integral opening **44**, rectangular opening washer **42**, and interface curved surfaces **51***a*, **51***b*, **51***c*, **51***d*, **51***f*, **51***g*.

Referring to FIGS. **2** and **4**, the lateral heel release mechanism comprises lateral release cam surfaces **17***c* and lower heel housing lateral cam surfaces **27***a*, which are biased (i.e., forced together) by lateral heel spring-biasing component **52**. Lateral spring biasing component **52** includes lateral heel release spring **35** that is placed in compression by the opposing force of the tension shaft parts, **36***a* and **36***b* (or by optional unitary tension shaft **36**), and connector rod **41**. These are supported at each tensioned two ends of the rod(s). At one end, shaft-rod **37**, lateral release cam **17**, and rectangular opening washer **42** support the equal and opposite compression against internal wall **43** of lower heel housing **27**. At the other end, lateral release threaded cap **38**, lateral release indicator washer **39**, internal washer **40** support the equal and opposite compression of the tension rod(s). Internal opening **44** and the internal opening of rectangular opening washer **42** are both rectangular in shape to permit tension shaft **36***a* (or **36**) to rotate and translate laterally upon the lateral movement of moving lateral release cam **17**. While the vertical gaps of internal opening **44** and the vertical gaps of rectangular opening washer **42** are each smaller than their respective lateral gaps, such vertical gaps restrict the vertical movement of tension shaft **36***a* (or **36**), so that upper heel housing **16** provides vertical movement of the ski binding heel unit about its pivot axis **18**, rather than by the forced vertical movement of other elements.

Lateral heel release cam surfaces allow the lateral release cam **17** to both rotate and translate relative to the lower heel housing **27**, so that the heel area of the ski boot can displace laterally relative to the long axis of the ski. Boot displacement occurs when lateral loads are induced. Such lateral movement of the boot occurs across low-friction element **14** and heel pad top surface **15**, as well as laterally against heel cup **47** boot-interface surfaces **32** and **33**.

The lateral release cam surfaces **17***c* and **27***a* of the lateral release cam **17** and the mating cam surfaces **27***a* of the lower heel housing **27** displace relative to each other in a path described by their curved surfaces—specifically, curved surfaces **50***a*, **50***b*, **50***c*, **50***d*, **50***f*, **50***g* and their respective incremental interface curved surfaces **51***a*, **51***b*, **51***c*, **51***d*, **51***f*, **51***g*.

A partial lateral boot heel displacement occurs when the projected longitudinal-pressure center-of-effort between the boot and the heel cup **47** shifts laterally and the moving lateral release cam **17** tilts by rotating and translating a small amount, biased by lateral heel release spring **35**. During such a partial lateral boot heel displacement, the opposing curved cam surfaces **50***a*, **50***b*, **50***c*, **50***d*, **50***f*, **50***g* move by translating and rotating (tilting) from their at-rest position to the next point of cam contact **50***c* and **51***c*, biased by lateral heel release spring **35**. Accordingly, cam surfaces **50***b* and **51***b* space apart the "a-a" (as in **50***a* and **51***a*) surfaces from the "c-c" surfaces to provide an incremental lever arm. The incremental lever arm permits lateral translational and rotational movement of **17** relative to **27***a*. The at-rest position is defined to be when the surfaces on the symmetrically opposite side of the lower heel housing **27** are touching each other. For example, the at-rest position occurs when surfaces **50***a* and **51***a* are contacting each other.

As the heel of the boot continues to move laterally and lateral release cam **17** rotates and translates more to the point where cam surfaces "c-c" touch, a reverse-polarity lever-arm is generated that vector-adds to the spring bias effect of **52**. The resultant incrementally abates the rotational and translational movement of lateral release cam **17**. The abatement acts to re-center lateral release cam **17** toward its at-rest position, thereby providing incremental retention in the advent of large amounts of longitudinal pressure between the boot and lateral release cam **17**, which would otherwise cause inadvertent pre-release. If the lateral load at the heel persists in magnitude and/or and duration, the boot's instant center of effort of longitudinal pressure then shifts outside of cam contact surfaces "c-c" to release the ski from the boot quickly and efficiently as is the case with ACL injury producing loads.

A similar benefit results if a load continues to persist in magnitude and duration while lateral release cam **17** continues to translate and rotate past the boot's projected longitudinal pressure shifts "outside" of cam contact surface "e-e." This reverses the polarity of the lever arm that acts perpendicular to the boot's projected center of effort of longitudinal pressure, thereby vector-subtracting from spring biasing means **52** to precipitate efficient release. Cam surfaces "f-f" begin to separate as cam surfaces "g-g" contact one another.

Finally, when cam surfaces "g-g" contact and the boot's projected instant center of longitudinal pressure shifts "outside" of cam surface contact point "g-g", the perpendicular lever arm finally reverses polarity again to vector-subtract from the spring bias **52**, causing the moving lateral release cam **17** to rotate and translate toward lateral heel release.

The novel incremental vector additions and subtractions along the progressive cam surfaces that progress from cam surfaces "a-a" to cam surfaces "g-g" as described above, are also progressively effected by the increasing overall lateral lever arm generated between those cam contact surfaces and the reaction force of spring bias **52** applied at the instant-center-of-effort of shaft-rod **37**. This arrangement makes lateral pre-release incrementally more difficult, the maximum point of release being a function of the exact spring constant of lateral heel spring **35**, the amount of compression of spring **35** as controlled by lateral release threaded cap **38** (as indicated in lateral release level windows **53** on each side of lower heel housing **27**). The maximum point of release is off-set by the incrementally decreasing longitudinal distance of the lever arm, between the lateral instant-center-of-contact of the side of the boot's heel and the lateral heel cup surface **54**, to the instant-point of surface-contact on the progressive cam surfaces **17***c* and **27***a*.

If the moving progressive cam **17** were to rotate only about a central pivot located over the center of the ski, the alpine binding heel unit **10** would be too biased toward release and skiers would suffer from pre-release. On the other hand, if the moving progressive can were to rotate only about opposing cam surfaces "g-g" (as in **50***g* and **51***g*) the alpine binding heel unit would be too biased toward retention and skiers would suffer from ruptured ACL injuries. The progressive cams thus strike a decisive balance over release and retention by incrementally reversing polarity between release and retention during the course of lateral heel movement when moving cam **17** rotates and translates accordingly.

The kinematics of the incremental lateral release path of the boot relative to the ski can be controlled by the geometry of the mating cam surfaces as noted above. Adjustments to control the point of maximum lateral release can be adjusted by the compressive movement of lateral release threaded cap **38**.

In one embodiment, a compressible elastomeric material **54** such as Dupont Crayton is placed between lateral release cam surfaces **27***a* and **17***c* to minimize the contamination effects of ice, mud and road-salt. Alternatively, a very highly elastic membrane **55** can be placed at the open end of the surfaces as a barrier to such contaminants. In yet another embodiment, the gap between the surfaces can remain open

and exposed so that visual inspection of the gap can be easily performed by skiers or service technicians and because of the curved end surface of **51***h*. The curved end serves as a snow, ice and road-salt deflector to mitigate the practical effects of such environmental exposure. The entire lateral release mechanism including components **38**, **39**, **40**, can be easily removed from parts **35**, **36***a*, **36***b*, **41**, **42**, **37** and **17** to allow for periodic cleaning of the lateral release cam surfaces **17***c* and **27***a*. Snow pack does not build-up and compress into ice in the gap between **17***c* and **27***a* because the lateral orientation of the gap is at right angles to the direction of travel through the snow, mitigating the practical and important concerns about snow-pack and ice formation and its interference with lateral heel release.

Low-friction journals, or integral surfaces **62** and **63** of moving lateral release cam **17** further serve to decouple induced roll and vertical loads when acting against surfaces **49** and **64**. They are, however, limited in their structural capacity due to the high unit stresses imposed on these surfaces. Such stresses exist because of the necessary restricted longitudinal lengths of elements **62**, **63**, **49** and **64**, due to the need for the lower heel housing **27** to be compact in overall size, thereby causing the vector decoupler mechanism **60** to act in concert together with elements **62**, **63**, **49** and **64** to provide counter resistive fulcrum points as well as sliding bearing interface surfaces.

Other aspects, modifications, and embodiments are within the scope of the following claims.

What is claimed is:

1. A safety binding assembly for securing a heel portion of a ski boot to a ski, comprising:

a lower heel assembly attached to the ski, the lower assembly including a surface having a first plurality of cams disposed on either side of a longitudinal and vertical plane of the ski; and

an upper heel assembly coupled to the lower heel assembly, including

(i) a heel cup assembly for applying longitudinal securing pressure to the ski boot;

(ii) a lateral release assembly for applying lateral securing pressure to the ski boot, the lateral release assembly including a surface having a second plurality of cams, corresponding to and facing the first plurality of cams, disposed on either side of a longitudinal and vertical plane of the ski;

(iii) a vector decoupling assembly for separating and isolating two or more force vectors applied to the safety binding assembly; and,

(iv) a lateral heel biasing component for biasing the surface having the second plurality of cams against the surface having the first plurality of cams

wherein the lateral release assembly is constructed and arranged to pivot in a lateral and horizontal plane of the ski, against a force applied by the lateral heel biasing component, about any one of a plurality of cam axes each defined by a contact point of one of the first plurality of cams and one of the second plurality of cams, such that a lateral force applied to the heel portion of the ski boot in a direction perpendicular to the longitudinal and vertical plane of the ski causes the lateral release assembly to progressively pivot about consecutive cams, producing an incrementally increasing force opposing the lateral force applied to the heel portion of the ski boot, until the lateral release assembly rotates beyond a predetermined cam axis and releases the ski boot.

2. A safety binding assembly according to claim **1**, wherein the first plurality of cams and the second plurality of cams are disposed symmetrically on either side of the longitudinal and vertical plane of the ski.

3. A safety binding assembly according to claim **1**, wherein the first plurality of cams and the second plurality of cams are disposed asymmetrically on either side of the longitudinal and vertical plane of the ski.

4. A safety binding assembly according to claim **1**, wherein the lower assembly includes a surface having four cams, two disposed on each side of the longitudinal and vertical plane of the ski.

5. A safety binding assembly according to claim **1**, wherein the lower assembly includes a surface having six cams, three disposed on each side of the longitudinal and vertical plane of the ski.

6. A safety binding assembly according to claim **1**, wherein the lateral heel biasing component includes

(i) a first tension shaft having a first end and a second end, and a second tension shaft having a first end and a second end, pivotally attached to one another at the first end of each tension shaft via a connector rod; and,

(ii) a spring coupled to the first tension shaft and the second tension shaft for resisting longitudinal movement of the first tension shaft and second tension shaft;

wherein the second end of the first tension shaft is pivotally attached to the lateral release assembly, and the second end of the second tension shaft is adjustably attached to the lower heel assembly.

7. A safety binding assembly according to claim **1**, wherein the lateral heel biasing component includes

(i) a tension shaft having a first end and a second end, the first end of the tension shaft being pivotally attached to the lateral release assembly, and the second end of the tension shaft being adjustably attached to the lower heel assembly; and,

(ii) a spring coupled to the tension shaft for resisting longitudinal movement of the first tension shaft and second tension shaft.

8. A safety binding assembly according to claim **1**, wherein the vector decoupling assembly includes a tongue component having a first end and a second end, the first end being fixedly attached to the lateral release assembly and the second end being disposed between a first surface fixedly attached to the lower heel assembly and a second surface fixedly attached to the lower heel assembly, such that the tongue component, the first surface and the second surface cooperate to allow motion of the lateral release assembly to occur only in the longitudinal and horizontal plane of the ski.

9. A safety binding assembly according to claim **1**, wherein the lateral release assembly progressively pivots about consecutive cams so as to produce a consecutive series of vector additions and subtractions with respect to the biasing of the lateral heel biasing component.

10. A safety binding assembly according to claim **1**, further including a contaminant blocking material disposed between the surface having the first plurality of cams and the surface having the second plurality of cams.

11. A safety binding assembly according to claim **1**, further including a heel pad for reducing friction between a bottom surface of the heel portion of the ski boot and the safety binding assembly.

12. A safety binding assembly according to claim **8**, wherein the tongue component, the first surface and the second surface cooperate to limit motion of the lateral release assembly to within a predetermined region within the longitudinal and horizontal plane of the ski.

13. A safety binding assembly for securing a heel portion of a ski boot to a ski, comprising:

a lower heel assembly attached to the ski, the lower assembly including a surface having a first plurality of cams disposed on either side of a longitudinal and vertical plane of the ski; and

an upper heel assembly including

(i) a lateral release assembly for applying lateral securing pressure to the ski boot, the lateral release assembly including a surface having a second plurality of cams, corresponding to and facing the first plurality of cams, disposed on either side of a longitudinal and vertical plane of the ski; and,

(ii) a lateral heel biasing component for biasing the surface having the second plurality of cams against the surface having the first plurality of cams;

wherein the lateral release assembly is constructed and arranged to pivot in a lateral and horizontal plane of the ski, against a force applied by the lateral heel biasing component, about any one of a plurality of cam axes each defined by a contact point of one of the first plurality of cams and one of the second plurality of cams, such that a lateral force applied to the heel portion of the ski boot in a direction perpendicular to the longitudinal and vertical plane of the ski causes the lateral release assembly to progressively pivot about consecutive cams, producing an incrementally increasing force opposing the lateral force applied to the heel portion of the ski boot, until the lateral release assembly rotates beyond a predetermined cam axis and releases the ski boot.

14. A safety binding assembly according to claim 13, wherein the first plurality of cams and the second plurality of cams are disposed symmetrically on either side of the longitudinal and vertical plane of the ski.

15. A safety binding assembly according to claim 13, wherein the first plurality of cams and the second plurality of cams are disposed asymmetrically on either side of the longitudinal and vertical plane of the ski.

16. A safety binding assembly according to claim 13, wherein the lower assembly includes a surface having four cams, two disposed on each side of the longitudinal and vertical plane of the ski.

17. A safety binding assembly according to claim 13, wherein the lateral heel biasing component includes

(i) a first tension shaft having a first end and a second end, and a second tension shaft having a first end and a second end, pivotally attached to one another at the first end of each tension shaft via a connector rod; and,

(ii) a spring coupled to the first tension shaft and the second tension shaft for resisting longitudinal movement of the first tension shaft and second tension shaft;

wherein the second end of the first tension shaft is pivotally attached to the lateral release assembly, and the second end of the second tension shaft is adjustably attached to the lower heel assembly.

18. A safety binding assembly according to claim 13, wherein the lateral release assembly progressively pivots about consecutive cams so as to produce a consecutive series of vector additions and subtractions with respect to the biasing of the lateral heel biasing component.

* * * * *

EXHIBIT E

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Only KneeBindings have proven ACL protection. Ordinary bindings have lateral toe and forward heel releases. These "safety" bindings were designed 6 decades ago, when broken legs were the #1 injury in skiing, and they did an excellent job of solving that problem.

Today, ACL tears are the #1 injury in the sport. Each year, 70,000 skiers tear an ACL, making it the most frequent, serious injury in skiing history. About 75% of these injuries occur in a specific, rear-weighted manner. ***But no one has ever reported this type of injury while using KneeBindings.***

KneeBindings combine traditional release mechanisms with a third dimension - the multi-patented, ***PureLateral™*** heel release. KneeBinding is the only binding in the world that can detect the forces which cause most knee injuries on skis, and can release before an injury occurs.

Your knees
are better
with our Knees™

KneeBinding

Professional performance
- AND -
The world's only proven knee protection

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Allows the ski to flex more naturally for cleaner, more aggressive turns, and improves retention regardless of sudden changes in terrain.

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	Knee Binding	All Others
™ Protection	✔	✘
t™ Mounting	✔	✘
dge™ Stability	✔	✘
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onfigurability	✔	✘
Canting Kits	✔	✘
d Brake Sizes	✔	✘
-Fiber Model	✔	✘

DIN 3-12 or 5-14
ake Sizes: 75, 90, 110, 130 and 150mm
e/aft balance (0, 1.5, 3.0, 4.5, or 6.0mm)
kits (.5 to 3 degrees, inward or outward)

inding has proven ACL protection.
re precision toe-height adjustment,
widest mounting system,
most stable boot platform,
antilevered brakes, and
g mount system for flat-mount skis.

ëë binding
's Ski Binding

Phone: 802-760-3026
Fax: 802-760-3031
www.KneeBinding.com

Kudos to KneeBinding!

"[KneeBinding] is legit! There is no slop in the system, and it feels like a true performance binding underfoot. It makes sense to try to protect yourself against the heartbreak of knee surgery, and the boot-to-ski connection feels as good as any alpine binding made."
– Hans Ludwig (Powder Magazine)

"I just love 'em! I'll tell you what, they are very, very solid. When you click into them, you know you're there!"
– JH, Idaho

"I have an entirely new feeling of security."
– AA, Colorado

"I decided to try the KneeBinding for the obvious reason: I can't afford a serious knee injury at my age, and I'd like to keep skiing until I'm 80! I definitely felt a difference in the way your binding performed, resulting in a definable step up in my skiing."
– GF, New York

"I find I have an almost missionary zeal to let people know about your bindings!"
– DW, Wyoming

"Wow! Wonderful! Superlative! I'm 23, and have never been injured, but I watched my friend blow out his knee, and after that, I went right to […] and bought them. But I didn't expect to like them this much! As soon as you get out on the snow, you can feel the difference. Where is that extra power coming from?"
– LS, California

"These bindings are fabulous, everyone should be on them!"
– CF, Vermont

"The bindings were extremely easy to enter and exit. I didn't experience any premature releases, and I felt very confident during the day knowing that my chances of tearing an ACL had been greatly reduced."
– BV, Virginia

"The bindings really are a work of art. They have great retention."
– AB, New York

"Eleven years ago, I lost it crossing a cat track. In a split second, I tore both ACLs and I had to give up skiing, but last year, my doctor said I could ski again as long as I ski on KneeBindings. I'm baaaaack!"
– BWS, Washington

"Its really true, the extra protection gave me the confidence to reach a new level in the sport. [...] I've progressed faster in one season than I did in the previous 3 years. Thank you so much."
– SJ, Utah

Carbon
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KneeBinding c
more aggressiv
reliable switch

HardCo
Same great co
but with a DIN

EXHIBIT F

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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/984,293	02/17/2015	8955867	2003127.00122US3	2029

23483 7590 01/27/2015

WILMERHALE/BOSTON
60 STATE STREET
BOSTON, MA 02109

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

Richard J. Howell, Stowe, VT;

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

23483 7590 10/03/2014
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60 STATE STREET
BOSTON, MA 02109

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/984,293	01/04/2011	Richard J. Howell	2003127.00122US3	2029

TITLE OF INVENTION: ALPINE SKI BINDING HEEL UNIT

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$480	$0	$0	$480	01/05/2015

EXAMINER	ART UNIT	CLASS-SUBCLASS
AVERY, BRIDGET D	3618	280-628000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Wilmer Cutler Pickering
2 Hale and Dorr LLP
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: Kneebinding, Inc.

(B) RESIDENCE: (CITY and STATE OR COUNTRY): Stowe, Vermont

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:
☒ Issue Fee
☐ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
☐ A check is enclosed.
☒ Payment by credit card. Form PTO-2038 is attached.
☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number 08-0219 (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
☐ Applicant certifying micro entity status. See 37 CFR 1.29
NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
☐ Applicant asserting small entity status. See 37 CFR 1.27
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
☐ Applicant changing to regular undiscounted fee status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /Donald R Steinberg/ Date December 31, 2014
Typed or printed name Donald R. Steinberg Registration No. 37,241

PTOL-85 Part B (10-13) Approved for use through 10/31/2013. OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Docket No.: 2003127.00122US3
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Richard J. HOWELL	Confirmation No.:	2029
Application No.:	12/984,293	Art Unit:	3618
Filed:	January 4, 2011	Examiner:	B. D. Avery
Title:	ALPINE SKI BINDING HEEL		

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

SECOND REQUEST FOR REFUND

Applicant respectfully requests acknowledgement of the Request for Refund filed on November 26, 2013.

To reiterate, in accordance with 37 C.F.R. 1.26 and 1.28, Applicants request a refund of $850.00 for the RCE fee for the following:

On April 8, 2013, an Office Action issued in the above-referenced application. The cover page designated the Office Action as non-final, while paragraph 3 of the Office stated that it was Final. In an abundance of caution, the Applicant filed an RCE along with the Response filed on October 8, 2013.

On November 8, 2013, Applicant received a Notice of Improper Request for Continued Examination. Since the Examiner has determined that the Office Action was intended to be non-final, Applicant hereby requests a refund for the RCE charge incurred on October 9, 2013 in the amount of $850.00 in the above-referenced application to Deposit Account No. 08-0219.

Respectfully submitted,

Dated: January 2, 2015

/Donald R Steinberg/
Donald R. Steinberg
Registration No.: 37,241
Attorney for Applicant(s)

Wilmer Cutler Pickering Hale and Dorr LLP
60 State Street
Boston, MA 02109
(617) 526-6000 (telephone)
(617) 526-5000 (facsimile)

ActiveUS 139234569v.1

Electronic Patent Application Fee Transmittal

Application Number:	12984293
Filing Date:	04-Jan-2011
Title of Invention:	ALPINE SKI BINDING HEEL UNIT
First Named Inventor/Applicant Name:	Richard J. Howell
Filer:	Donald R. Steinberg/Becky Douglas
Attorney Docket Number:	2003127.00122US3

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Utility Appl Issue Fee	2501	1	480	480

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**480**

Electronic Acknowledgement Receipt

EFS ID:	21106720
Application Number:	12984293
International Application Number:	
Confirmation Number:	2029
Title of Invention:	ALPINE SKI BINDING HEEL UNIT
First Named Inventor/Applicant Name:	Richard J. Howell
Customer Number:	23483
Filer:	Donald R. Steinberg
Filer Authorized By:	
Attorney Docket Number:	2003127.00122US3
Receipt Date:	02-JAN-2015
Filing Date:	04-JAN-2011
Time Stamp:	16:28:32
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$480
RAM confirmation Number	1480
Deposit Account	080219
Authorized User	STEINBERG, DONALD R.

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	2015_01_02_122US3_IssueFee Transmittal_USSN_12_984293.PDF	108819 cc2ad0559f03d5ef78696df656e4432bb5fcef5c	no	1
Warnings:					
Information:					
2	Refund Request	2015_01_02_122US3_Request Refund_USSN_12_984293.PDF	84546 219f3f38ef99327bb81adf11fd4dacd520b46992	no	1
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30613 2b1ade62b850366f788f31d07223ebe71776a43d	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	223978		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

23483 7590 10/03/2014

WILMERHALE/BOSTON
60 STATE STREET
BOSTON, MA 02109

EXAMINER	
AVERY, BRIDGET D	
ART UNIT	PAPER NUMBER
3618	

DATE MAILED: 10/03/2014

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/984,293	01/04/2011	Richard J. Howell	2003127.00122US3	2029

TITLE OF INVENTION: ALPINE SKI BINDING HEEL UNIT

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$480	$0	$0	$480	01/05/2015

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

23483 7590 10/03/2014
WILMERHALE/BOSTON
60 STATE STREET
BOSTON, MA 02109

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/984,293	01/04/2011	Richard J. Howell	2003127.00122US3	2029

TITLE OF INVENTION: ALPINE SKI BINDING HEEL UNIT

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$480	$0	$0	$480	01/05/2015

EXAMINER	ART UNIT	CLASS-SUBCLASS
AVERY, BRIDGET D	3618	280-628000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
- ❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:
- ❑ Issue Fee
- ❑ Publication Fee (No small entity discount permitted)
- ❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
- ❑ A check is enclosed.
- ❑ Payment by credit card. Form PTO-2038 is attached.
- ❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ❑ Applicant certifying micro entity status. See 37 CFR 1.29
  NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
- ❑ Applicant asserting small entity status. See 37 CFR 1.27
  NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
- ❑ Applicant changing to regular undiscounted fee status.
  NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

PTOL-85 Part B (10-13) Approved for use through 10/31/2013. OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/984,293	01/04/2011	Richard J. Howell	2003127.00122US3	2029

23483 7590 10/03/2014

WILMERHALE/BOSTON
60 STATE STREET
BOSTON, MA 02109

EXAMINER	
AVERY, BRIDGET D	
ART UNIT	PAPER NUMBER
3618	

DATE MAILED: 10/03/2014

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 12/984,293	Applicant(s) HOWELL, RICHARD J.	
	Examiner BRIDGET AVERY	Art Unit 3618	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *6/24/14*.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on_____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *1-9*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov .
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
5. ☒ Examiner's Amendment/Comment
6. ☐ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/J. ALLEN SHRIVER II/
Supervisory Patent Examiner, Art Unit 3618

1. The present application is being examined under the pre-AIA first to invent provisions.

EXAMINER'S AMENDMENT

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

The application has been amended as follows:

3. Claims 10-14 have been canceled.

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BRIDGET AVERY whose telephone number is (571)272-6691. The examiner can normally be reached on 7:00AM-5:30PM Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, J. Allen Shriver can be reached on 571-272-6698. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. ALLEN SHRIVER II/
Supervisory Patent Examiner, Art Unit 3618

/BRIDGET AVERY/
Examiner, Art Unit 3618

Notice of References Cited	Application/Control No. 12/984,293	Applicant(s)/Patent Under Reexamination HOWELL, RICHARD J.	
	Examiner BRIDGET AVERY	Art Unit 3618	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2,745,672	05-1956	MEIER JR ROBERT C	280/627
	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	796	"280"/$.ccls. and (ski and (heel$ same release))	USPAT	OR	OFF	2006/10/12 16:51
S2	687	S1 and (lateral$ or horizontal$ or vertor$)	USPAT	OR	OFF	2006/10/12 16:50
S3	1223	((280/632) or (280/634) or (280/618) or (280/624) or (280/625) or (280/626) or (280/627)).CCLS.	USPAT	OR	OFF	2006/10/12 16:51
S4	455	S3 and (ski and (heel$ same release))	USPAT	OR	OFF	2006/10/16 10:56
S5	1223	((280/632) or (280/634) or (280/618) or (280/624) or (280/625) or (280/626) or (280/627)).CCLS.	USPAT	OR	OFF	2006/10/16 10:56
S6	455	S5 and (ski and (heel$ same release))	USPAT	OR	OFF	2006/10/16 10:56
S7	395	S6 and (lateral or horizontal)	USPAT	OR	OFF	2006/10/16 10:57
S8	334	S6 and lateral	USPAT	OR	OFF	2006/10/16 10:57
S9	177	S6 and (lateral with release)	USPAT	OR	OFF	2006/10/16 10:58
S10	129	S6 and (lateral near4 release)	USPAT	OR	OFF	2006/10/16 10:58
S11	1	("4070034").PN.	USPAT	OR	OFF	2006/12/19 04:08
S12	2	(("4070034") or ("3734522")).PN.	USPAT	OR	OFF	2006/12/19 04:09
S13	0	("skiandheelandlateral").PN.	USPAT	OR	OFF	2007/03/26 17:50
S14	2059	ski and heel and lateral	USPAT	OR	OFF	2007/03/26 17:50
S15	1242	"280"/$.ccls. and (ski and heel and lateral)	USPAT	OR	OFF	2007/03/26 17:51
S16	1282	"280"/$.ccls. and (ski and heel and (lateral adj "2" release))	USPAT	OR	OFF	2007/03/26 17:51
S17	166	(280/629).CCLS.	USPAT	OR	OFF	2007/07/09 14:21
S18	115	S17 and release	USPAT	OR	OFF	2007/07/09 14:22
S19	15	S17 and release with horizontal	USPAT	OR	OFF	2007/07/09 14:22
S20	15	S17 and (release with horizontal)	USPAT	OR	OFF	2007/07/09 14:25
S21	6	S20 and heel	USPAT	OR	OFF	2007/07/09 14:25
S22	1293	((280/632) or (280/634) or (280/618) or	USPAT	OR	OFF	2010/09/26

		(280/624) or (280/625) or (280/626) or (280/627)).CCLS.				21:50
S23	476	S22 and (ski and (heel$ same release))	USPAT	OR	OFF	2010/09/26 21:50
S24	9	("20020101063" | "2676813" | "3734522" | "3773344" | "3825273" | "3992032" | "4052086" | "4070034").PN. OR ("7318598").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2010/09/27 16:16
S25	31	US-2676813-$.DID. OR US-3606370-$.DID. OR US-3610650-$.DID. OR US-3727932-$.DID. OR US-3865388-$.DID. OR US-3897076-$.DID. OR US-3902728-$.DID. OR US-3905613-$.DID. OR US-3909029-$.DID. OR US-3936062-$.DID. OR US-4065151-$.DID. OR US-4264088-$.DID. OR US-4268064-$.DID. OR US-4286801-$.DID. OR US-4288094-$.DID. OR US-4288095-$.DID. OR US-4294461-$.DID. OR US-4307898-$.DID. OR US-4429896-$.DID. OR US-7225104-$.DID. OR US-4553772-$.DID. OR US-4753452-$.DID. OR US-20020101063-$.DID. OR US-4070034-$.DID. OR US-4052086-$.DID. OR US-3992032-$.DID. OR US-3825273-$.DID. OR US-3773344-$.DID. OR US-3734522-$.DID.	US-PGPUB; USPAT; USOCR	OR	OFF	2010/09/27 17:11
S26	158	(280/628).CCLS.	USPAT; USOCR	OR	OFF	2010/09/27 17:29
S27	0	("6nots23").PN.	USPAT; USOCR	OR	OFF	2010/09/27 17:30
S28	1293	((280/632) or (280/634) or (280/618) or (280/624) or (280/625) or (280/626) or (280/627)).CCLS.	USPAT	OR	OFF	2010/09/27 17:30
S29	476	S28 and (ski and (heel$ same release))	USPAT	OR	OFF	2010/09/27 17:30
S30	104	S26 not S29	USPAT	OR	OFF	2010/09/27 17:30
S31	158	(280/628).CCLS.	USPAT; USOCR	OR	OFF	2010/09/27 17:34
S35	49	US-2676813-$.DID. OR US-20020101063-$.DID. OR US-3578350-$.DID. OR US-3606370-$.DID. OR US-3610650-$.DID. OR US-3620545-$.DID. OR US-3695625-$.DID. OR US-3727932-$.DID. OR US-3734520-$.DID. OR US-3734522-$.DID. OR US-3773344-$.DID. OR US-3825273-$.DID. OR US-3865388-$.DID. OR US-3897076-$.DID. OR US-3902728-$.DID. OR US-3905613-$.DID. OR US-3909029-$.DID. OR US-3936062-$.DID. OR US-3992032-$.DID. OR US-7915705-$.DID. OR US-4052086-$.DID. OR US-4065151-$.DID. OR US-4070034-$.DID. OR US-4111453-$.DID. OR US-4183549-$.DID. OR US-4264088-$.DID. OR US-4266806-$.DID. OR US-4268064-$.DID. OR US-4286801-$.DID. OR US-4288094-$.DID. OR US-4288095-$.DID. OR US-4294461-$.DID. OR US-4307898-$.DID. OR US-4429896-$.DID. OR US-4444413-$.DID.	US-PGPUB; USPAT; USOCR	OR	ON	2011/06/19 13:37