US 20090094862A1

(19) United States

(12) Patent Application Publication

(10) Pub. No.: US 2009/0094862 A1

(43) Pub. Date: Apr. 16, 2009

Krauss

(54) **HEEL STABILIZER**

(76) Inventor: **Betsy M. Krauss**, Stamford, CT (US)

Correspondence Address:
MILES & STOCKBRIDGE PC
1751 PINNACLE DRIVE, SUITE 500
MCLEAN, VA 22102-3833 (US)

(21) Appl. No.: **12/314,686**

(22) Filed: **Dec. 15, 2008**

Related U.S. Application Data

(63) Continuation-in-part of application No. 12/136,806, filed on Jun. 11, 2008.

(60) Provisional application No. 60/943,170, filed on Jun. 11, 2007, provisional application No. 61/136,231, filed on Aug. 20, 2008.

Publication Classification

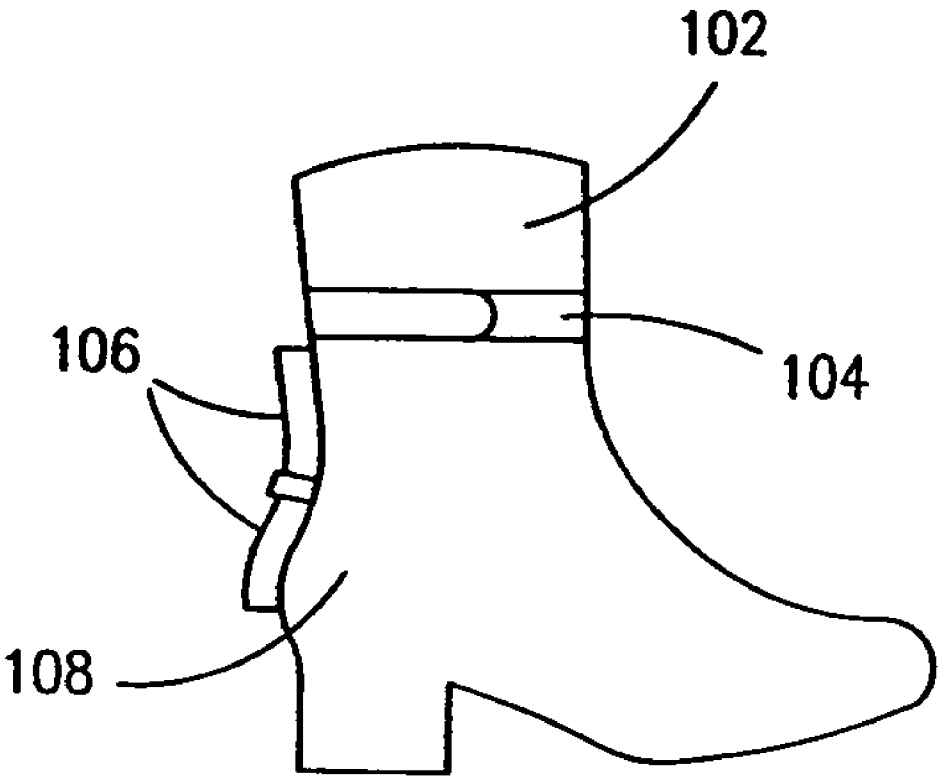
(51) **Int. Cl.**

A43B 7/16	(2006.01)
A43B 3/16	(2006.01)
A43B 23/08	(2006.01)
A43C 15/00	(2006.01)

(52) **U.S. Cl.** ..... **36/92**; 36/7.1 R; 36/69; 36/59 C

(57) **ABSTRACT**

The present invention relates to heel stabilizing technology that can be used on many kinds of footwear. This heel stabilizing technology can be incorporated during manufacture of the footwear. This heel stabilizing technology can also be manufactured as a separate component, and then added to many kinds of footwear. The heel stabilizer of the present invention increases the stability of the wearer when walking by minimizing the side-to-side teetering a person experiences when wearing flat heels to any height heel shoe, sneakers, boot, overshoe, galoshes or any combination thereof. Implementation of the heel stabilizing technology results in the heel of the footwear being set to a raised position and then flexed downward at heel strike. The resulting vertical stretch at the heel helps lessen side-to-side teetering of the wearer and thereby increases stability. The disclosed heel stabilizer includes at least one anchoring means, at least one heel lift means, a stretch segment, and a sole. An alternative embodiment includes an upper that conceals the structural features of the overshoe; a sole; a stay to center and stabilize the foot atop the shoe; and a well in the sole's heel to receive the high heel and the bottom of the stay component or, in an alternative embodiment, a hole in the sole so that the high heel and the bottom of the stay component penetrates the hole to form a watertight joint, the protruding heel cup then forms the visible sole of the overshoe.



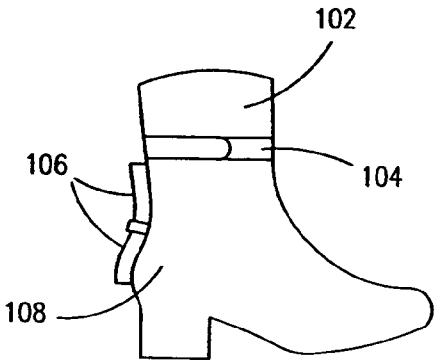


FIG. 1

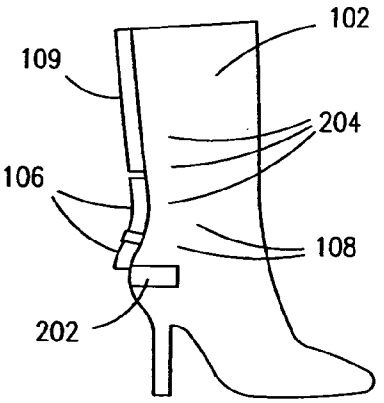


FIG. 2

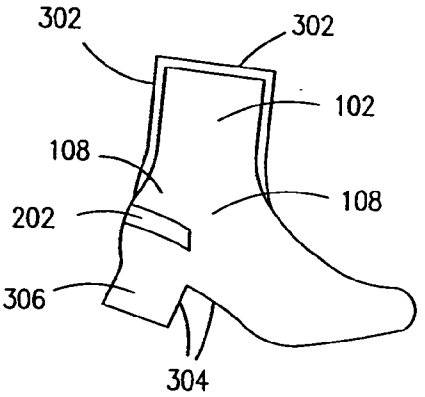


FIG. 3

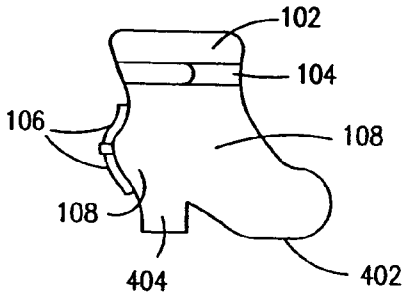


FIG. 4

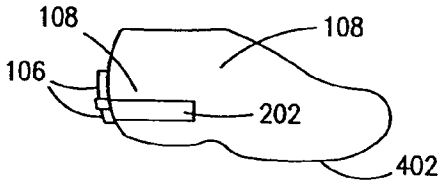


FIG. 5

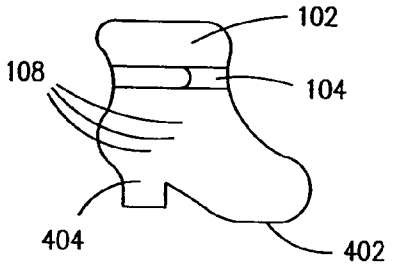


FIG. 6

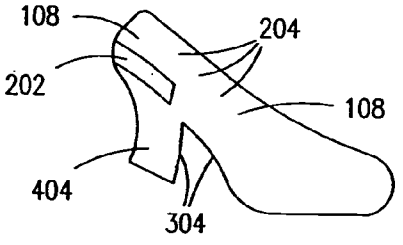


FIG. 7

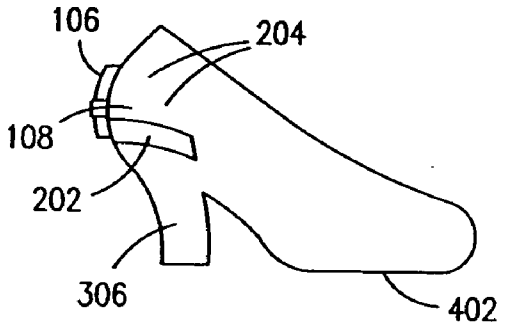


FIG. 8

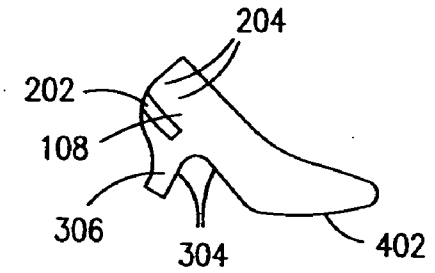


FIG. 9

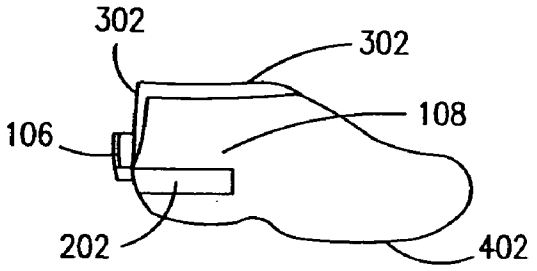


FIG. 10

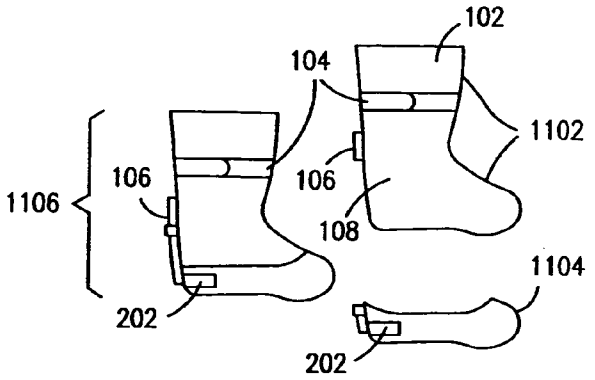


FIG. 11

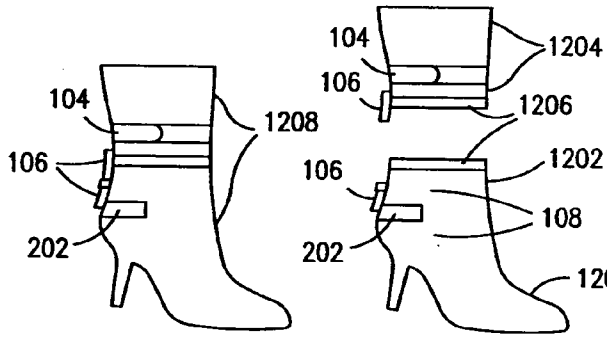


FIG. 12

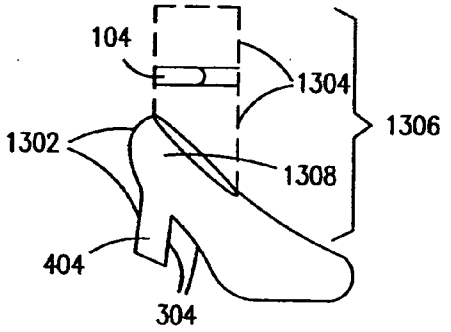


FIG. 13

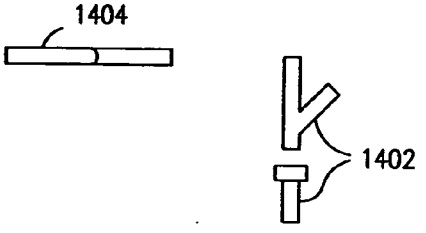


FIG. 14

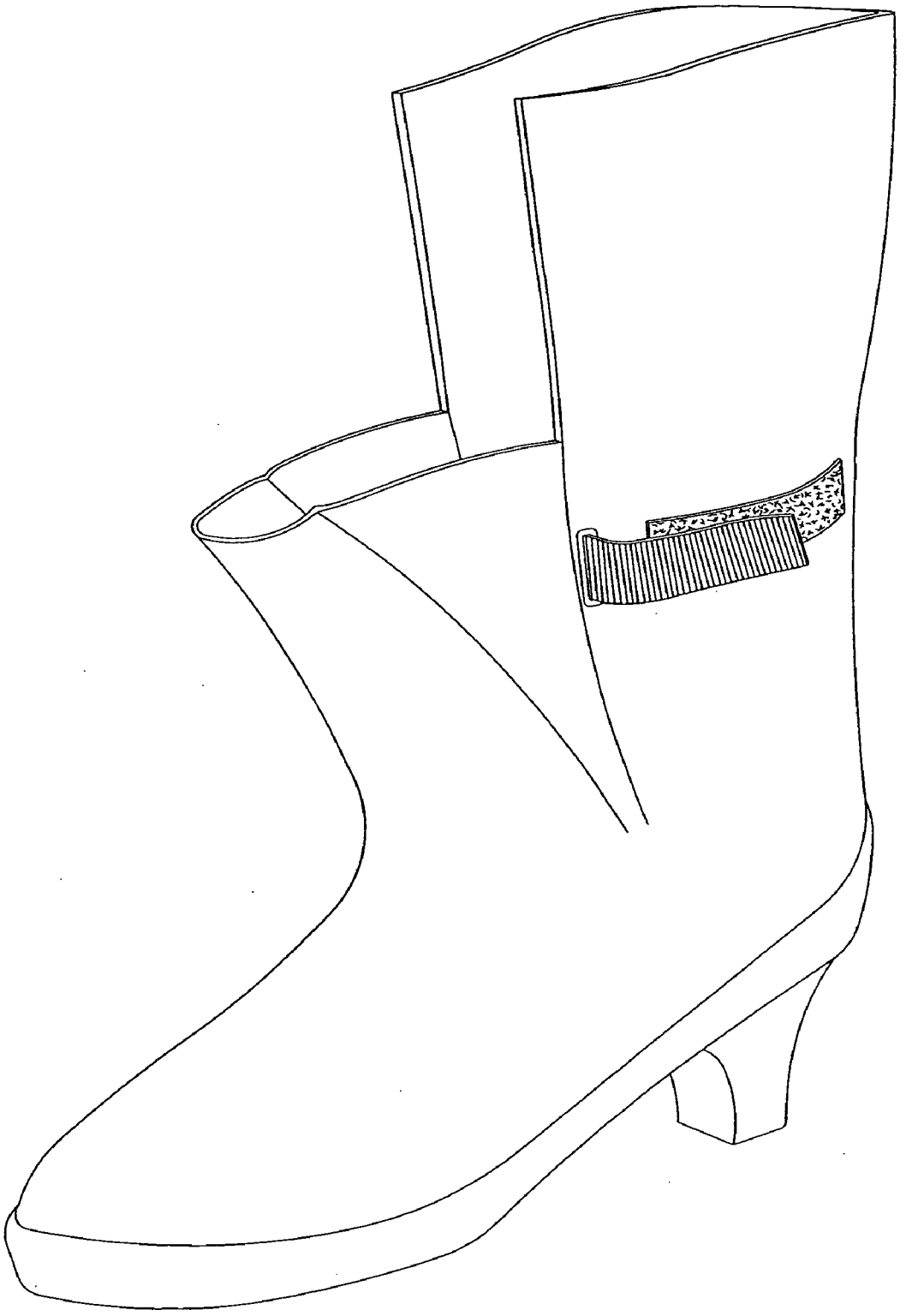


FIG. 15

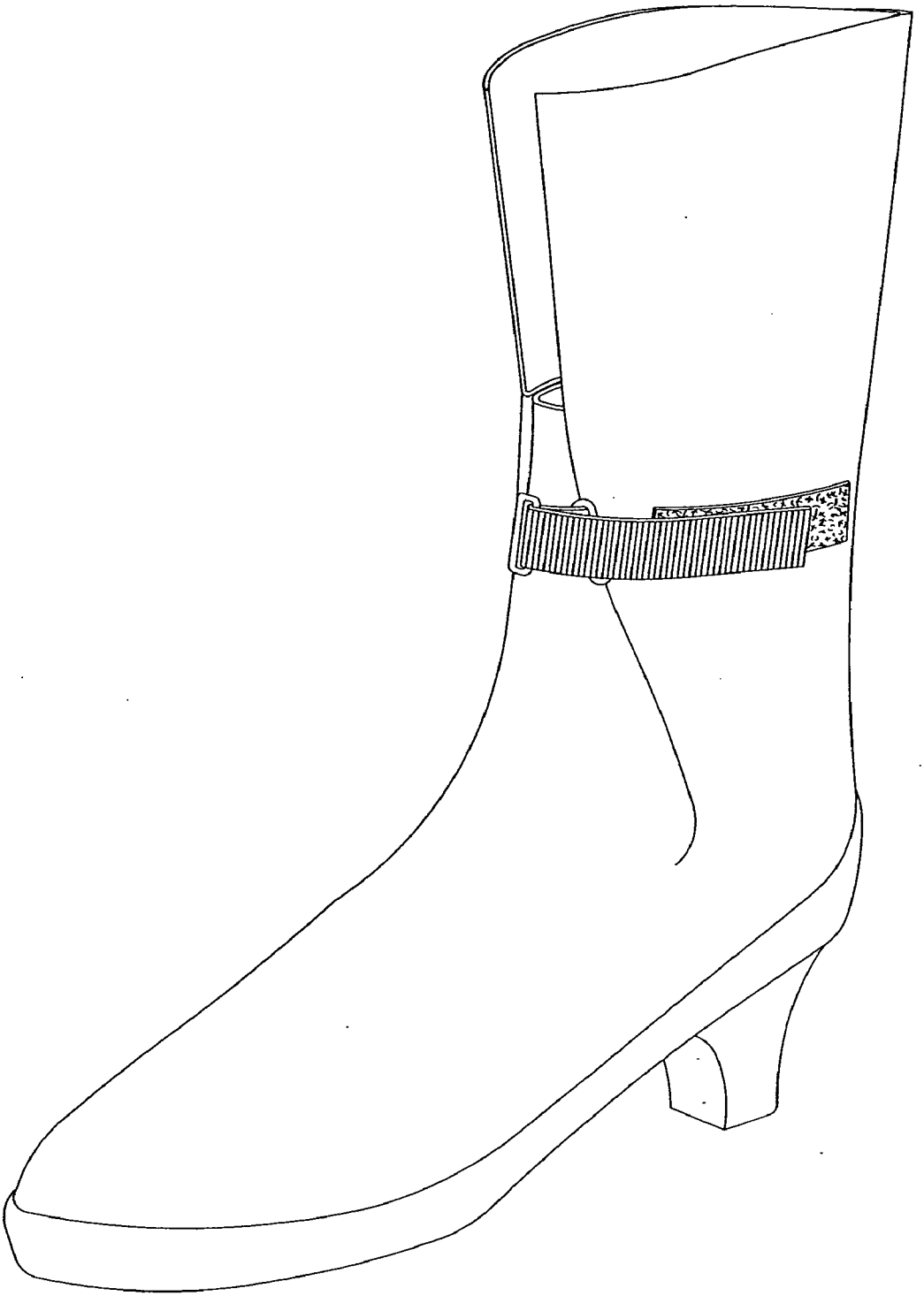


FIG. 16

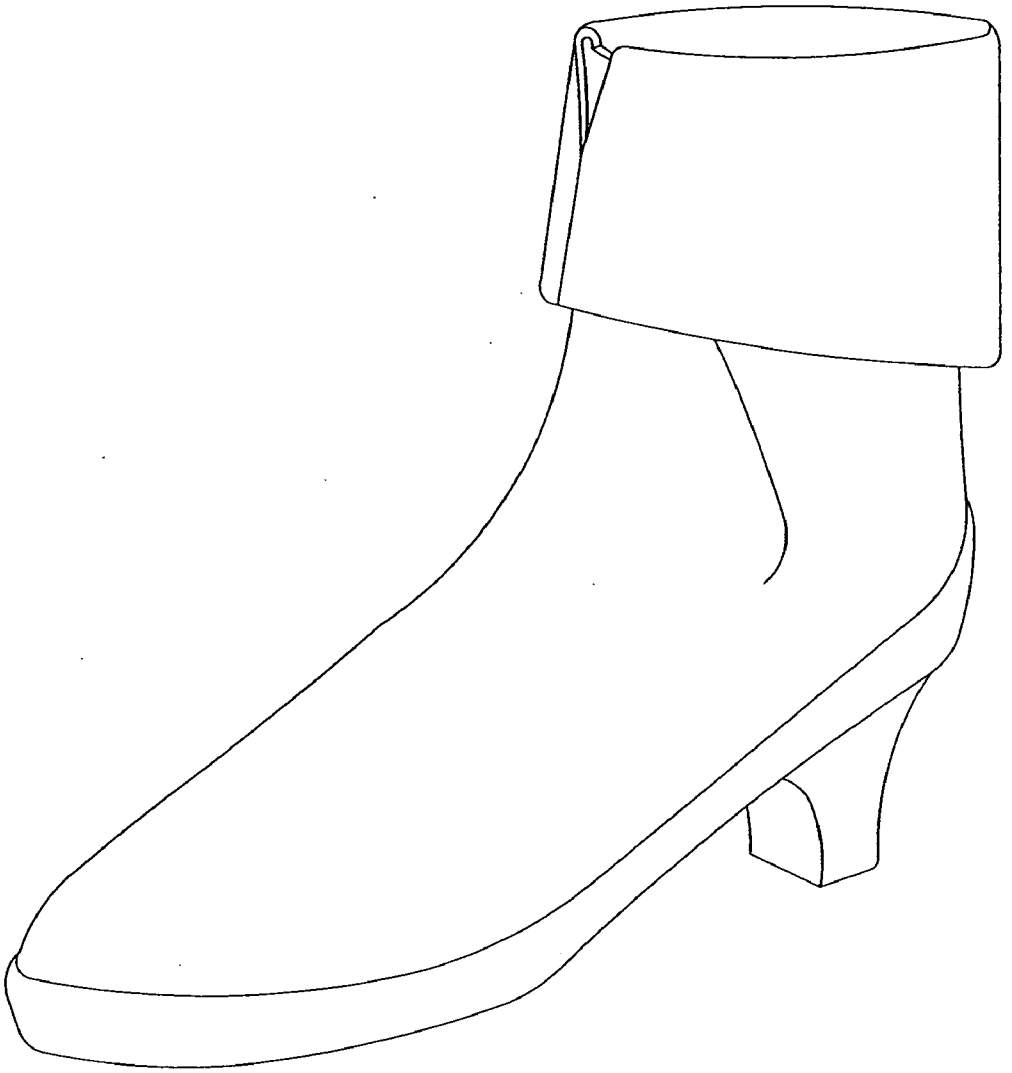


FIG. 17

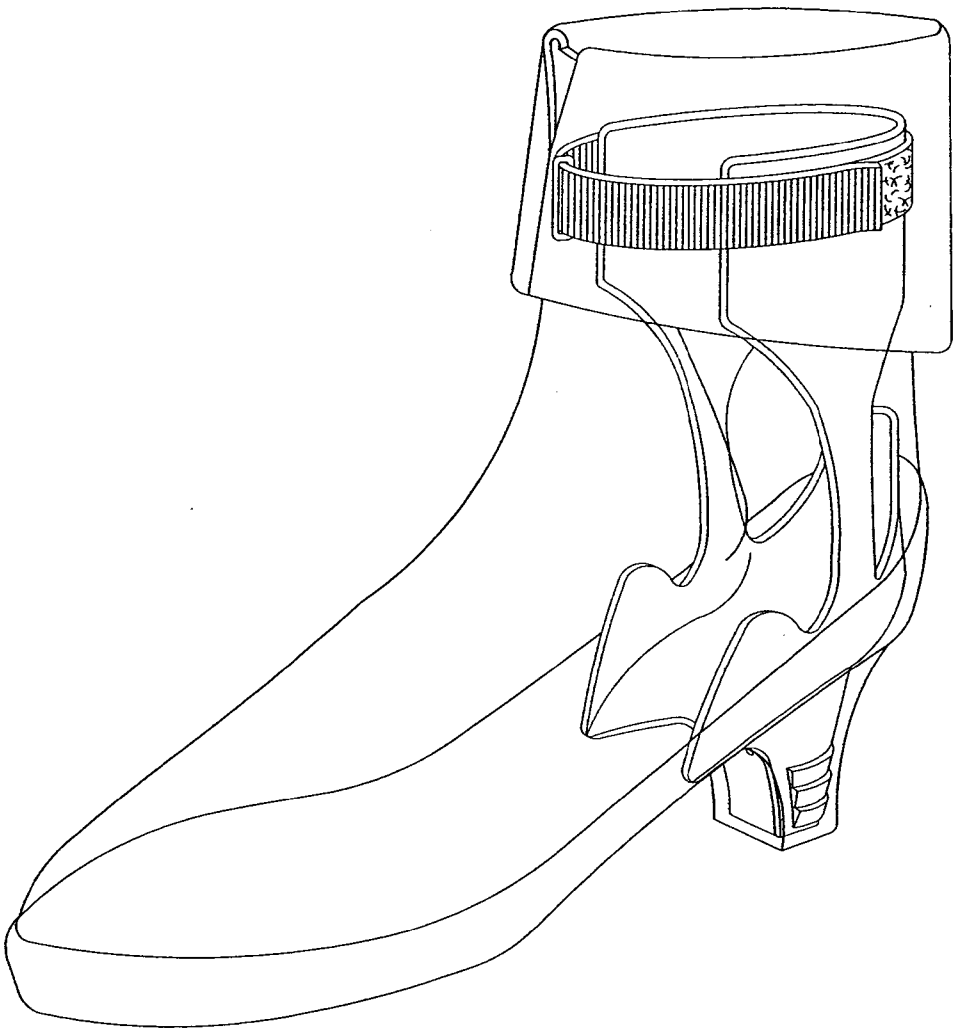


FIG. 18

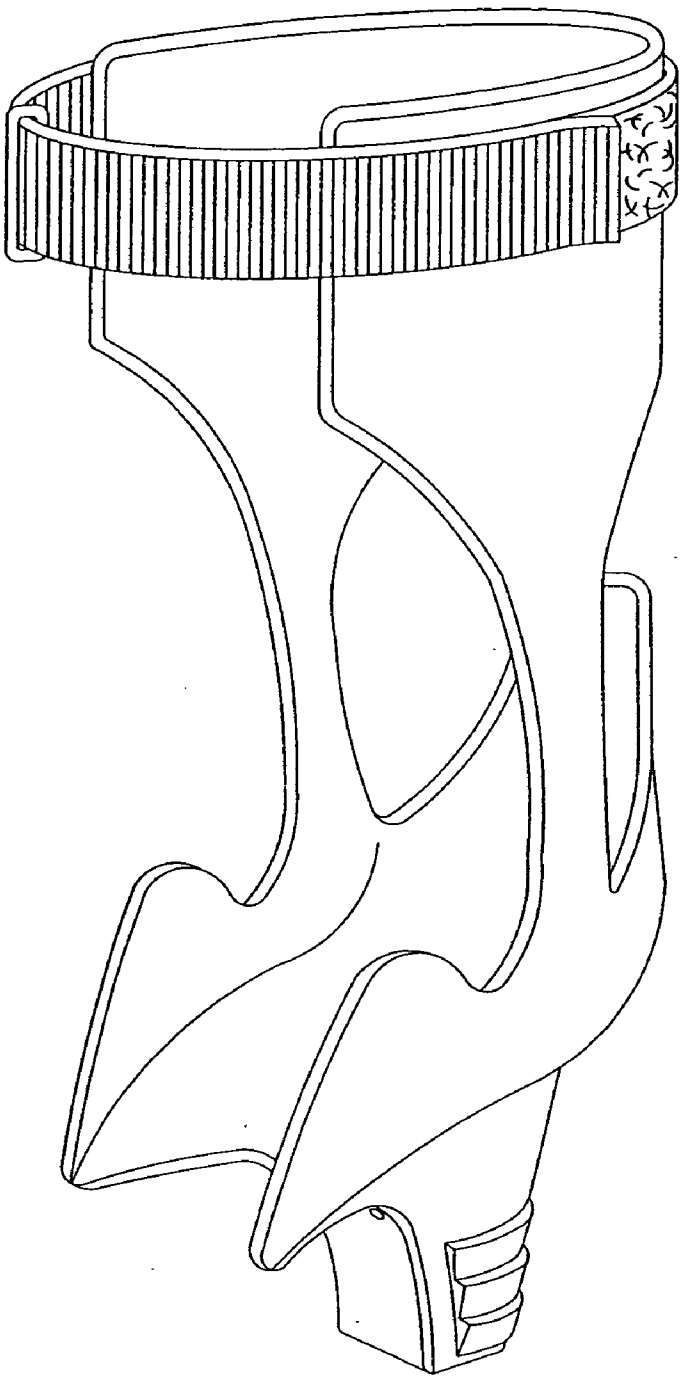


FIG. 19

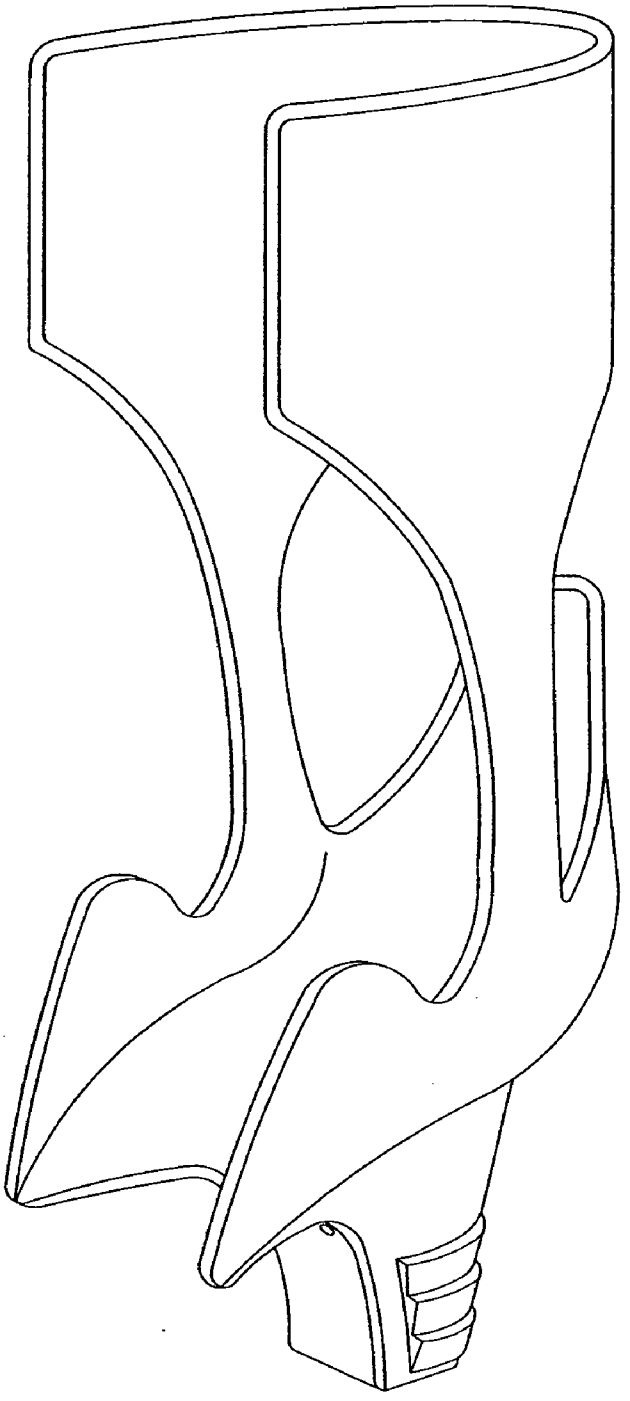


FIG. 20

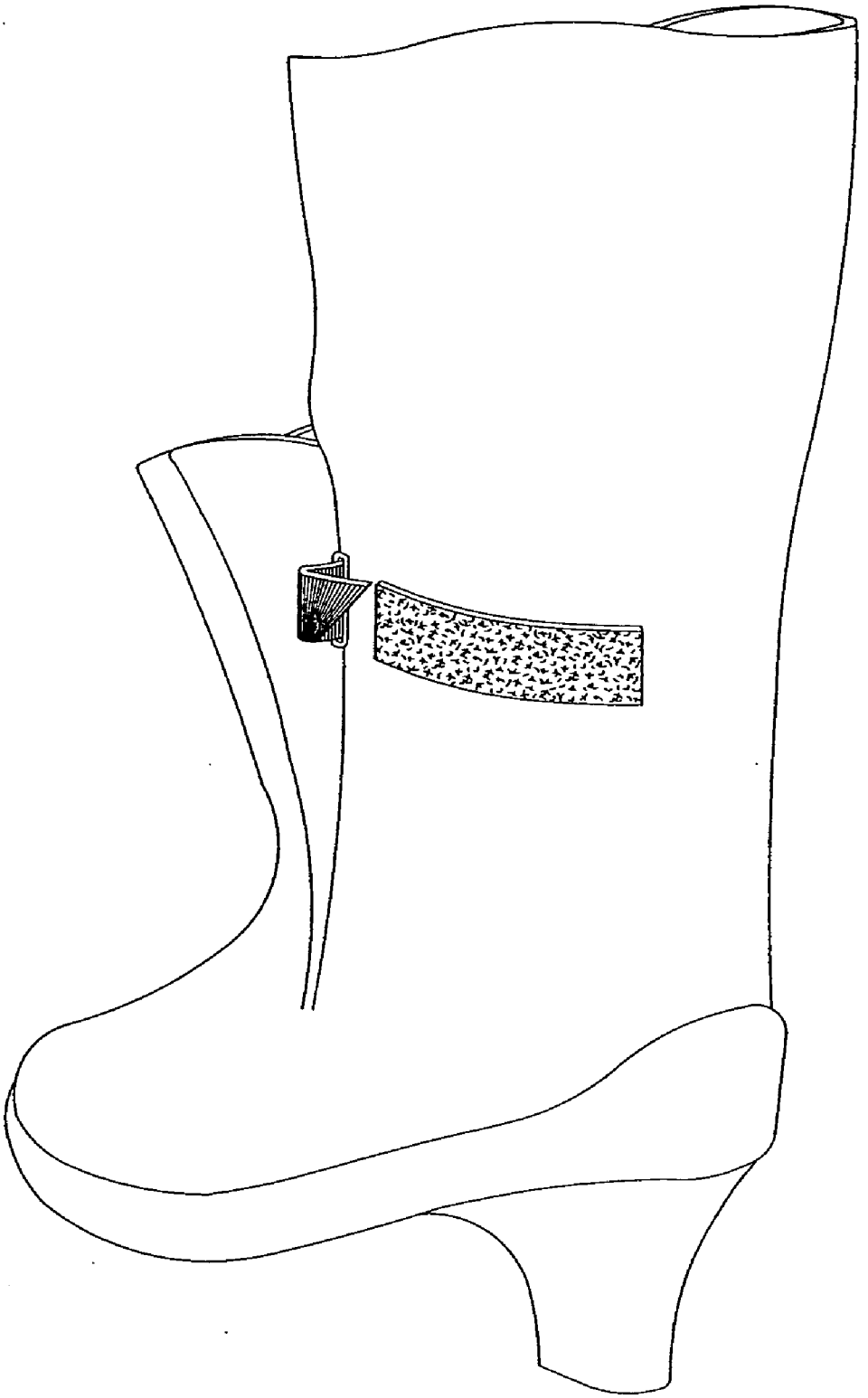


FIG. 21

FIG. 22

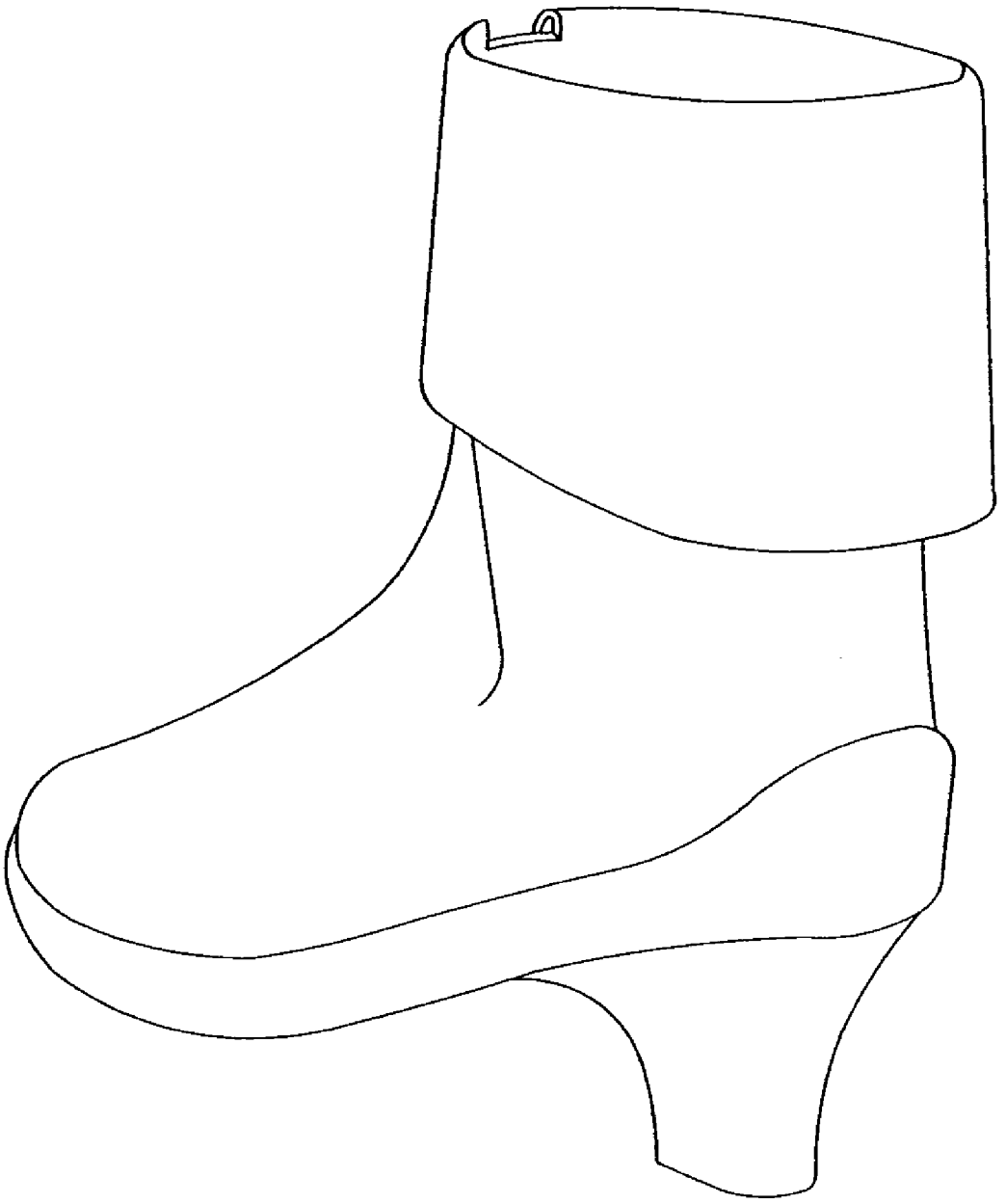


FIG. 23

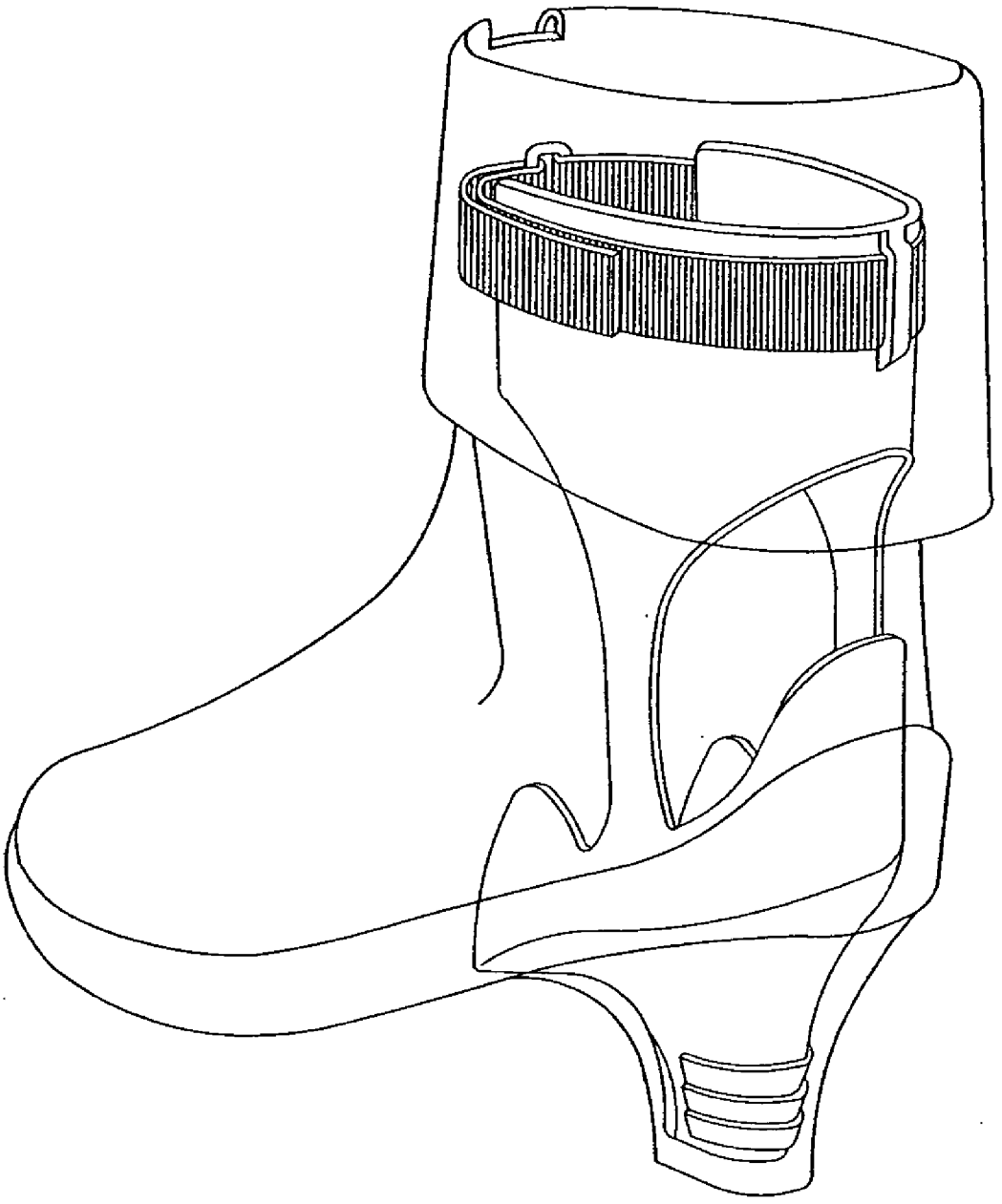


FIG. 24

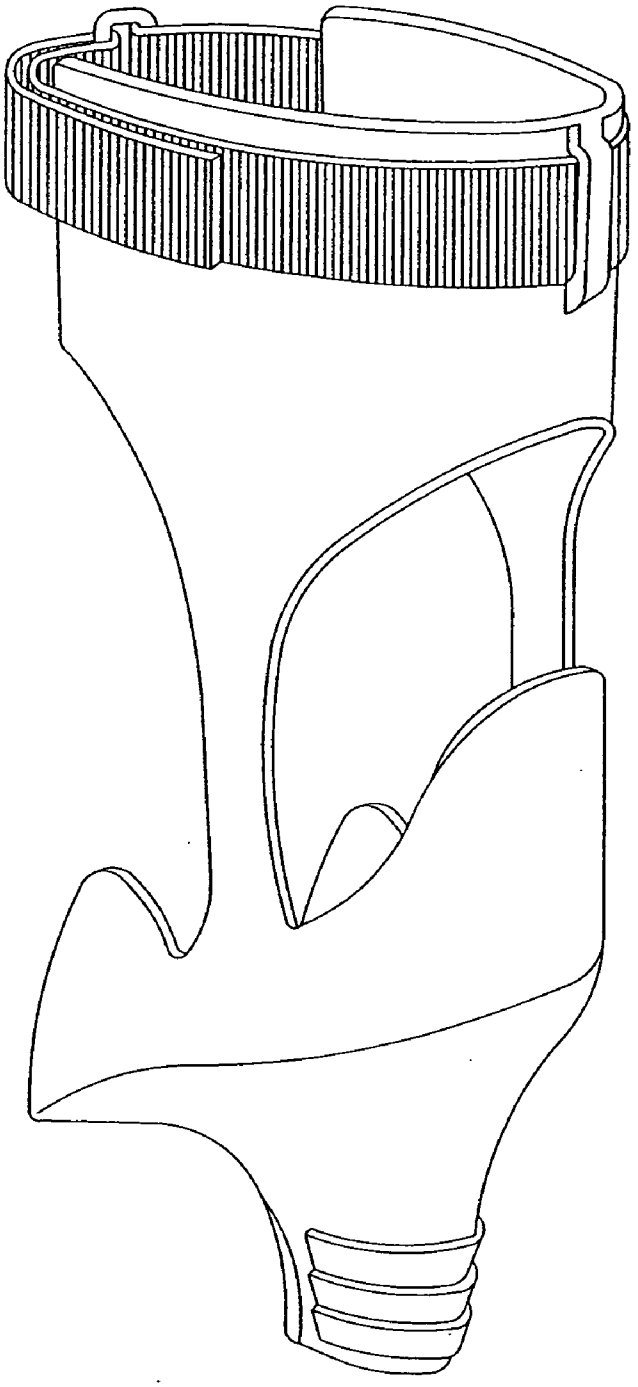


FIG. 25

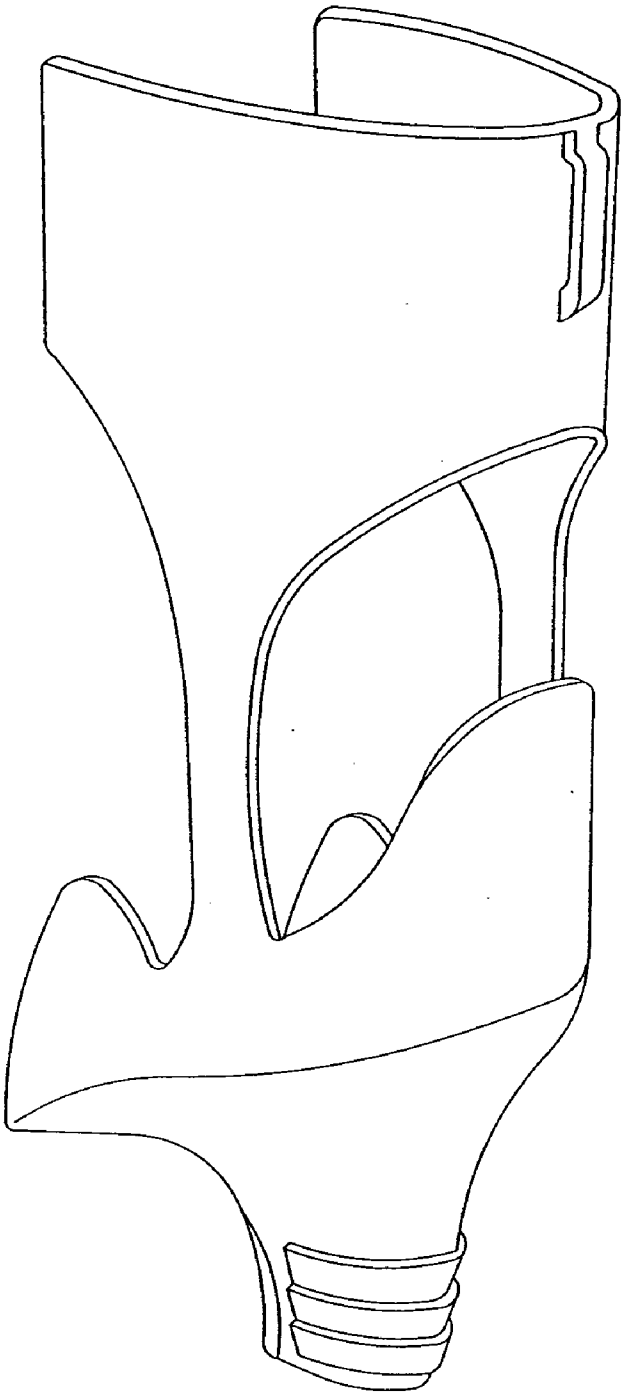


FIG. 26

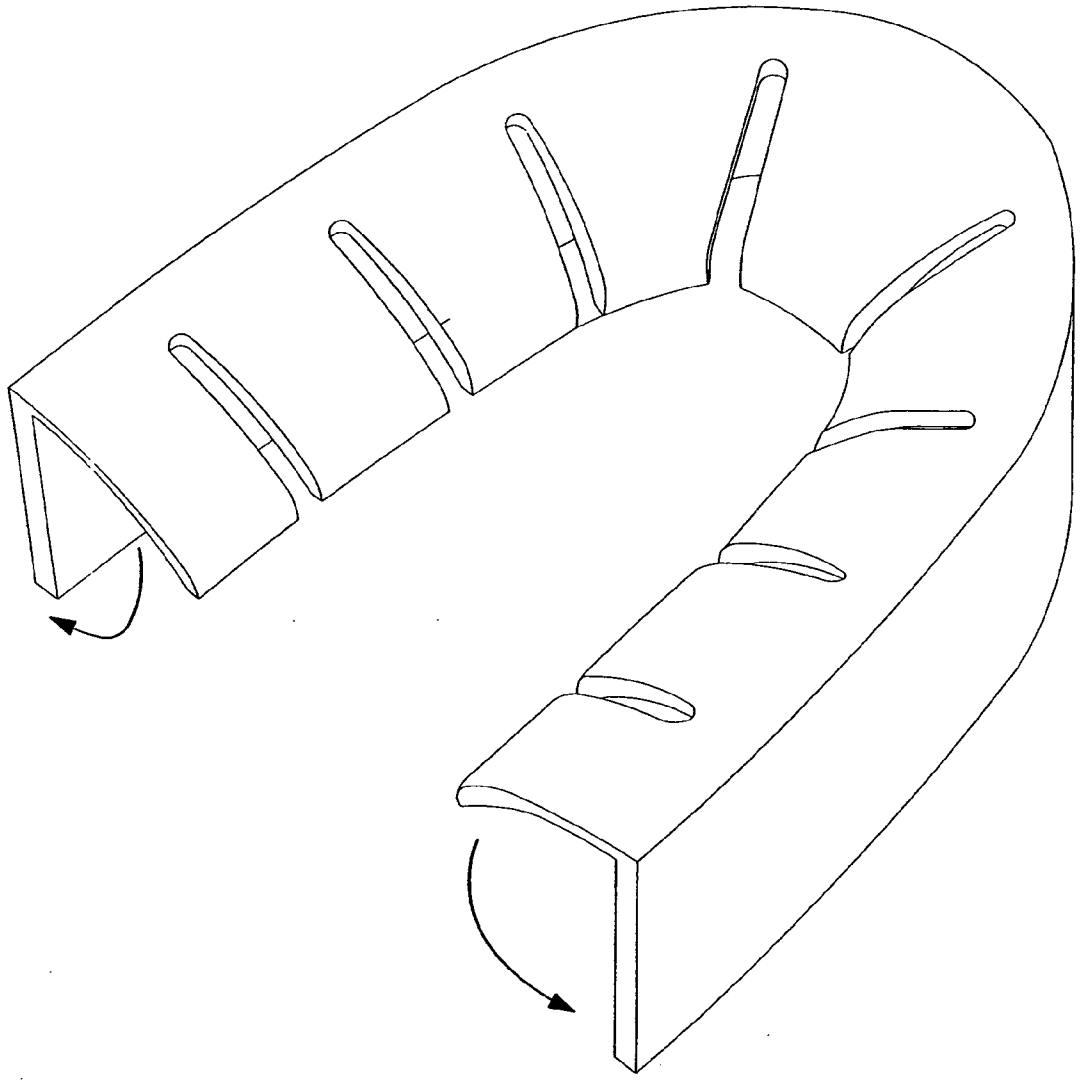


FIG. 27

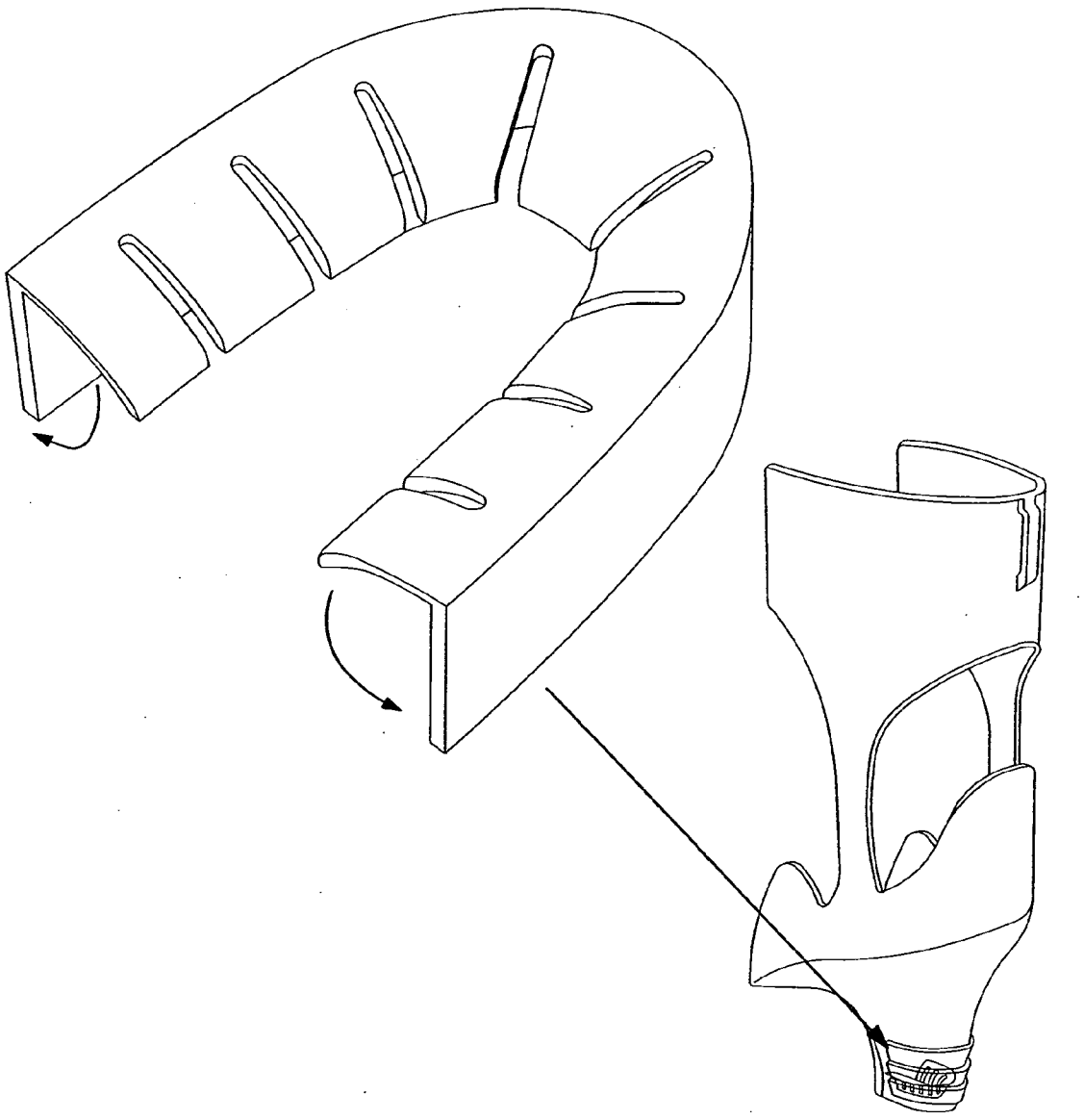


FIG. 28

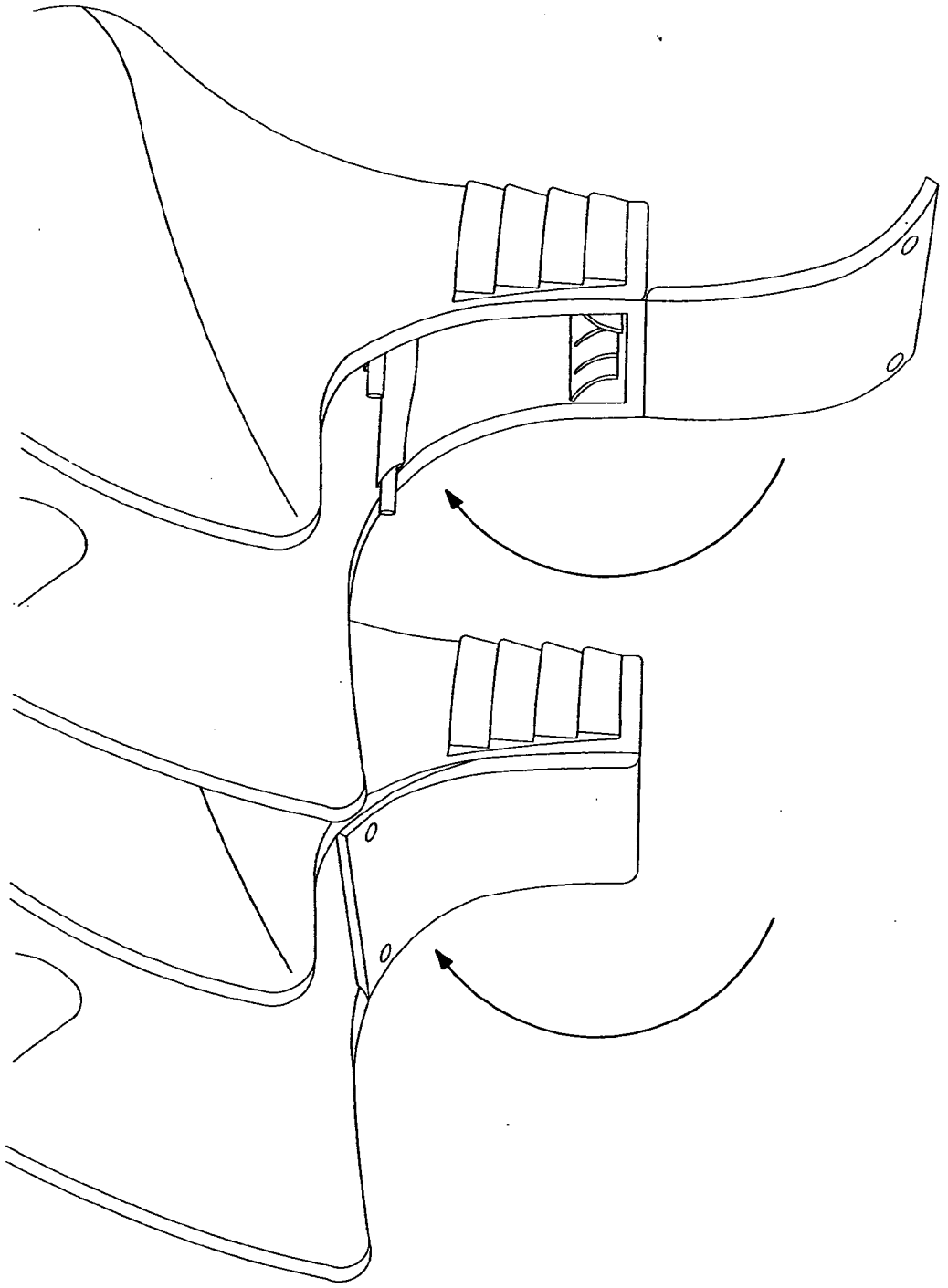


FIG. 29

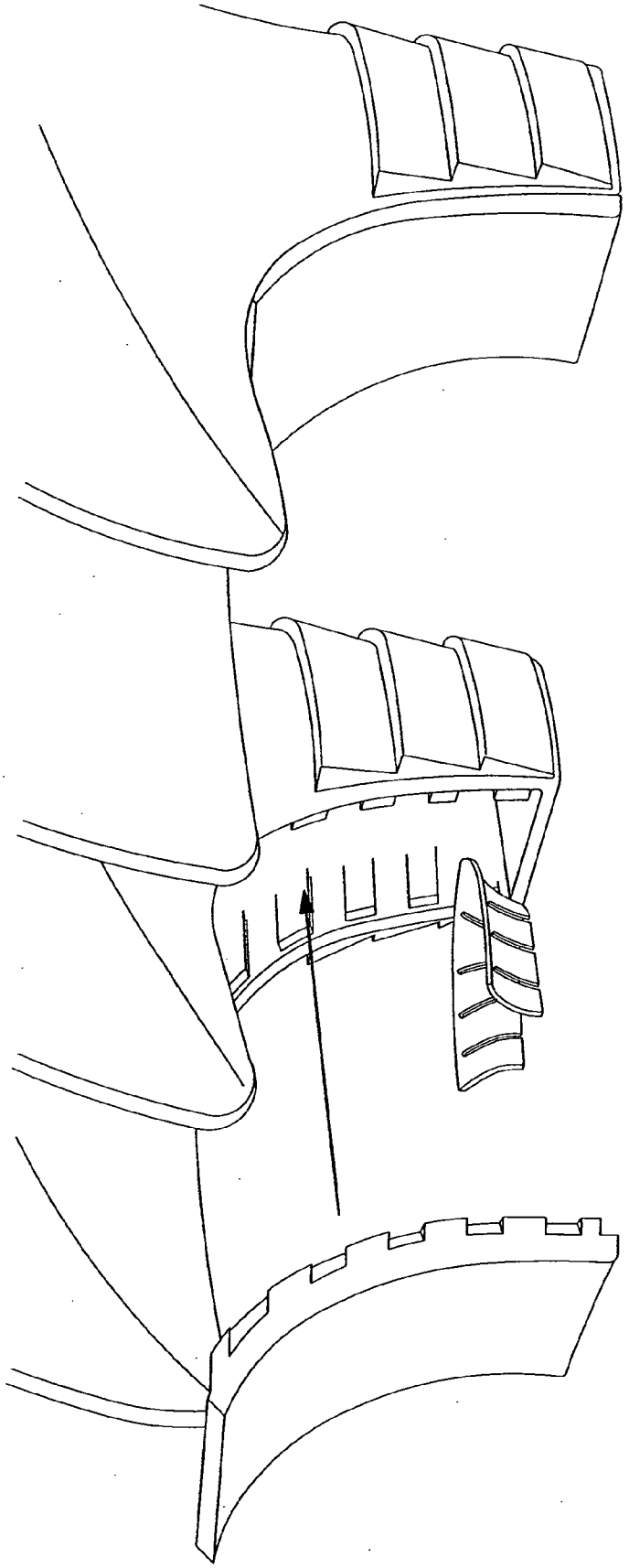


FIG. 30

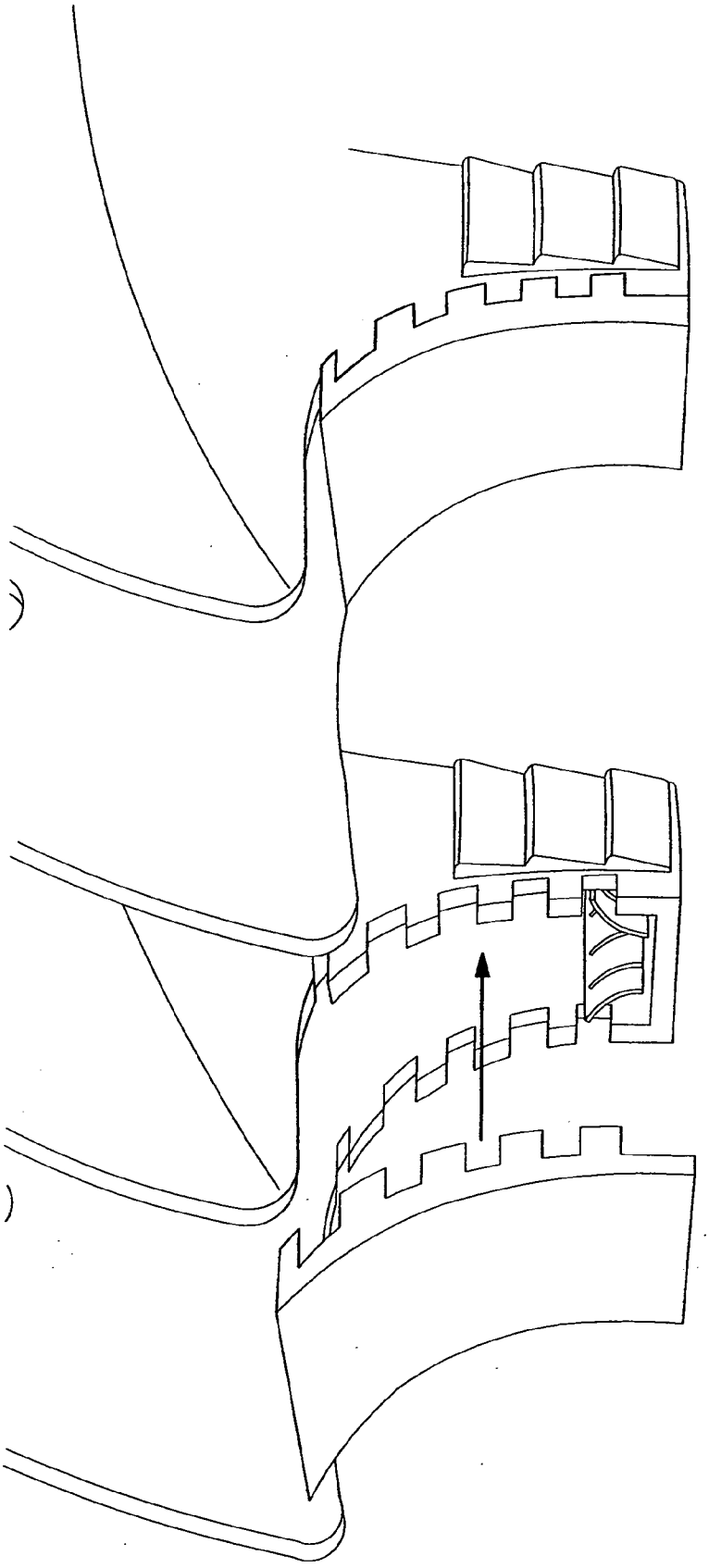


FIG. 31

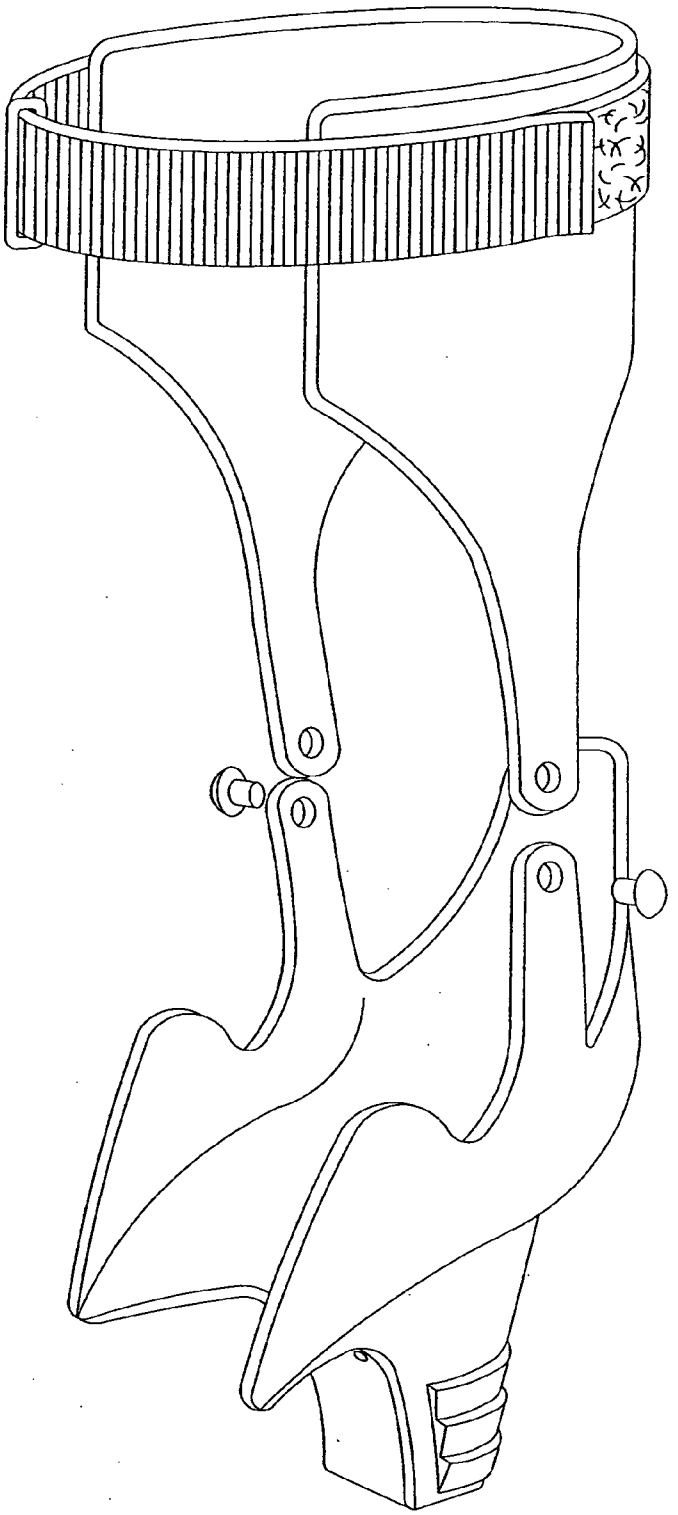


FIG. 32

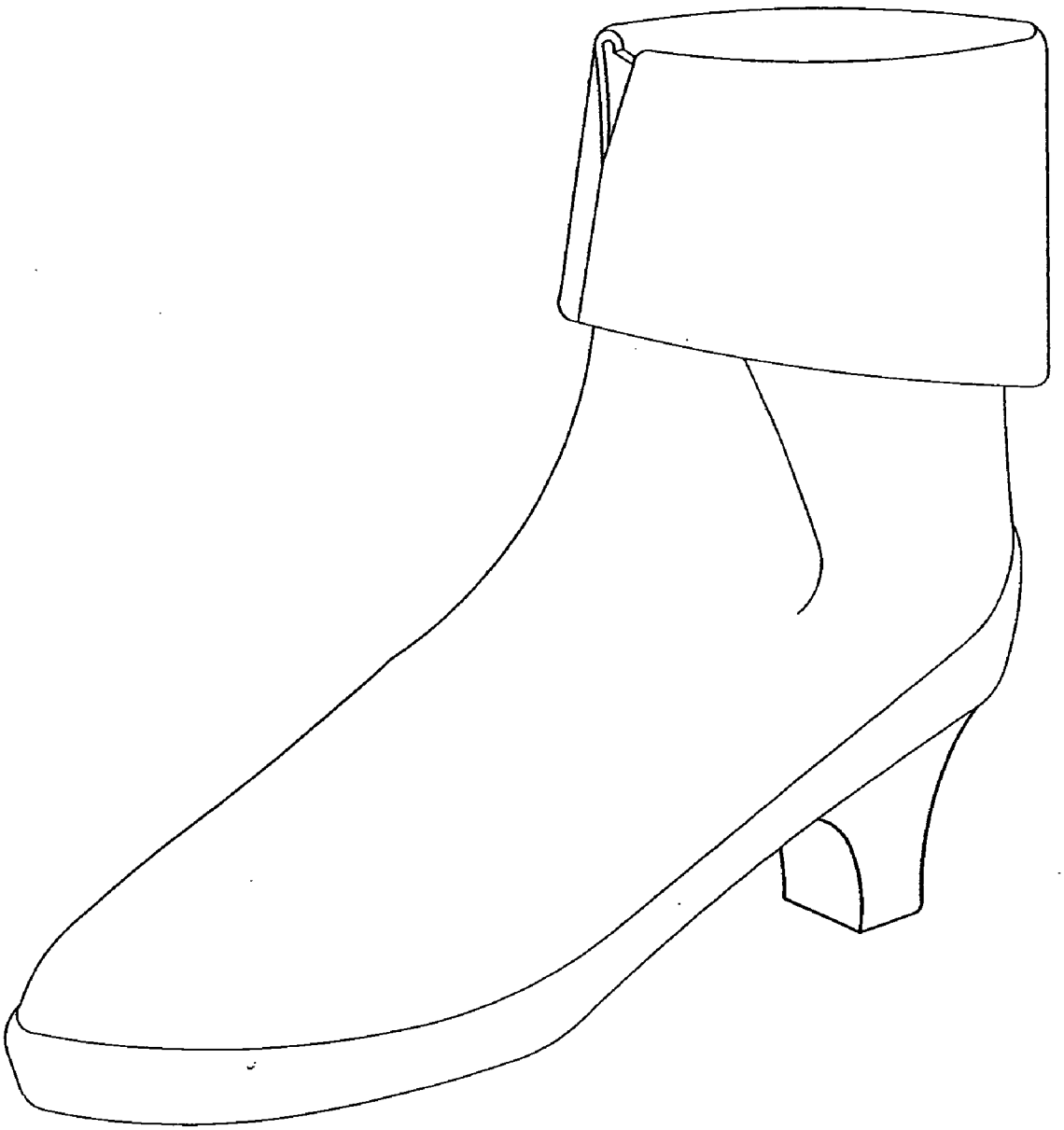


FIG. 33

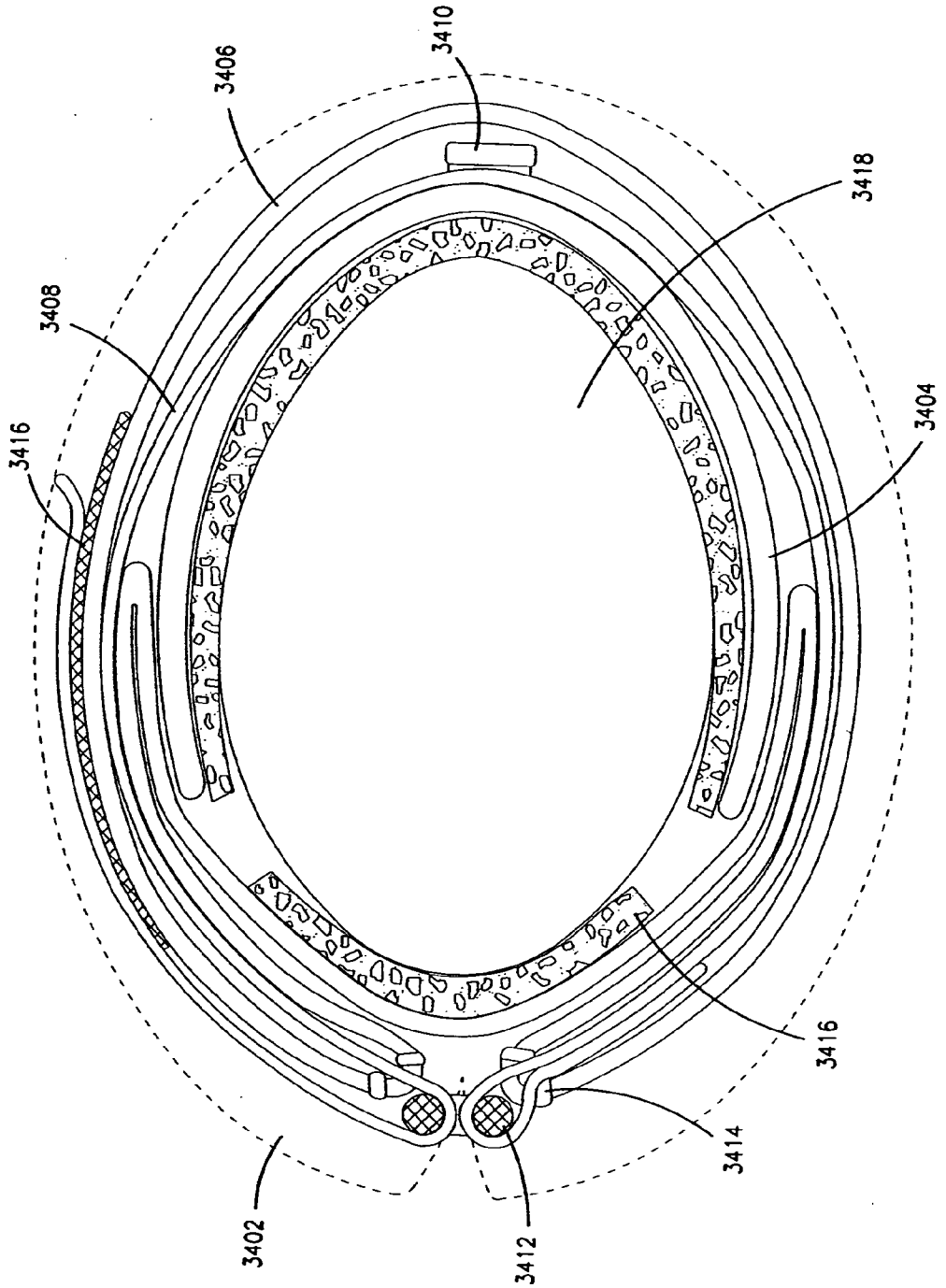


FIG. 34

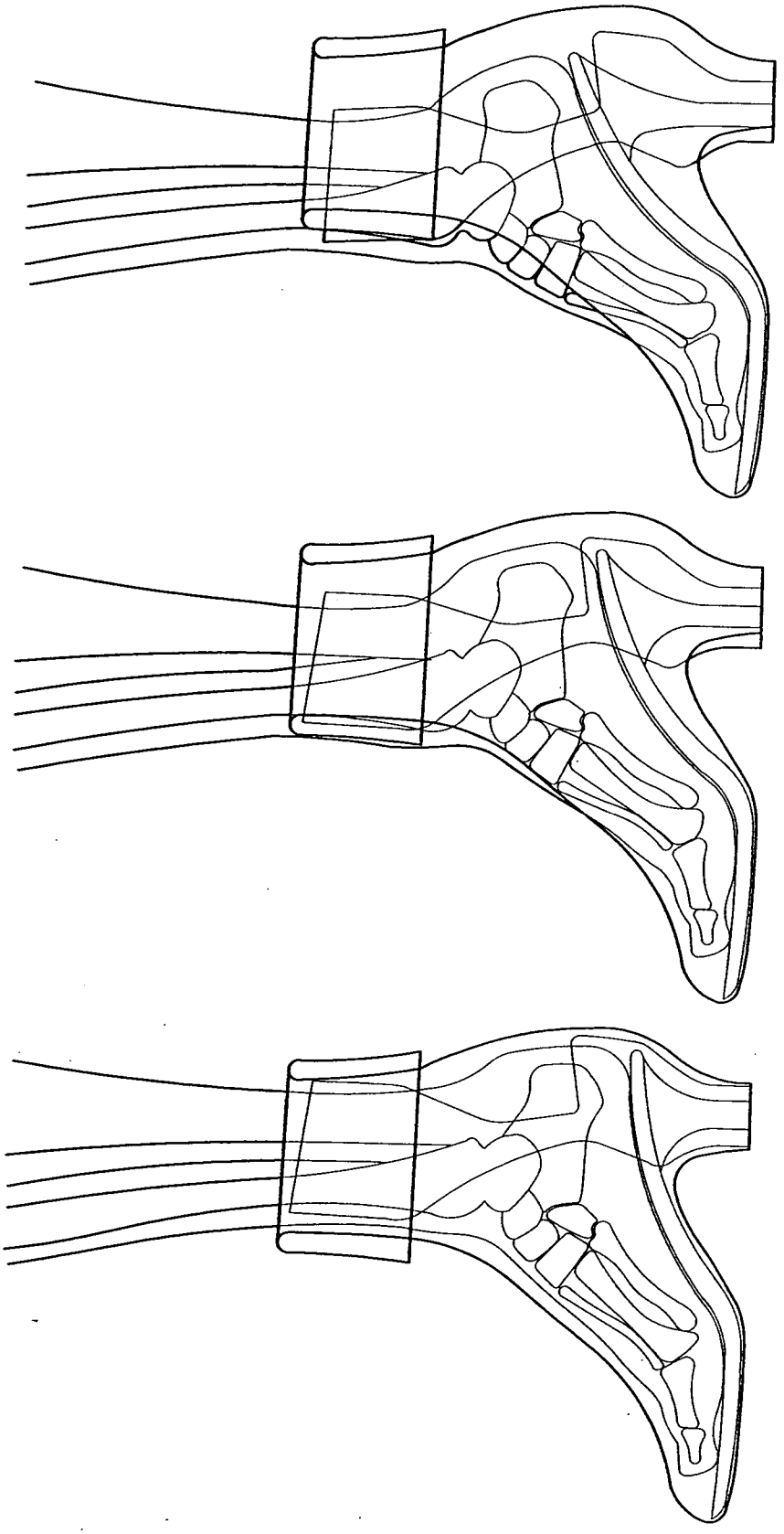


FIG. 35

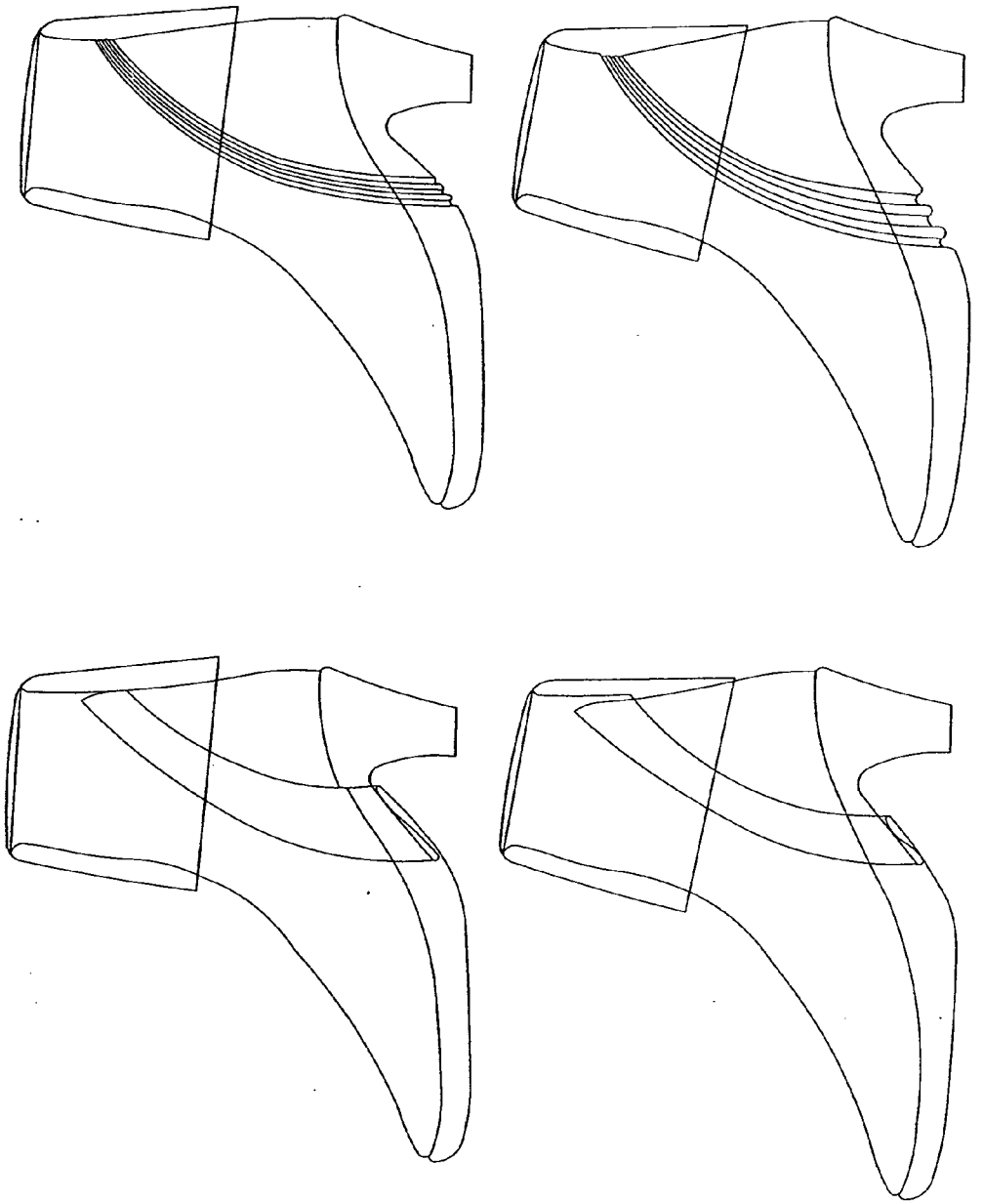


FIG. 36

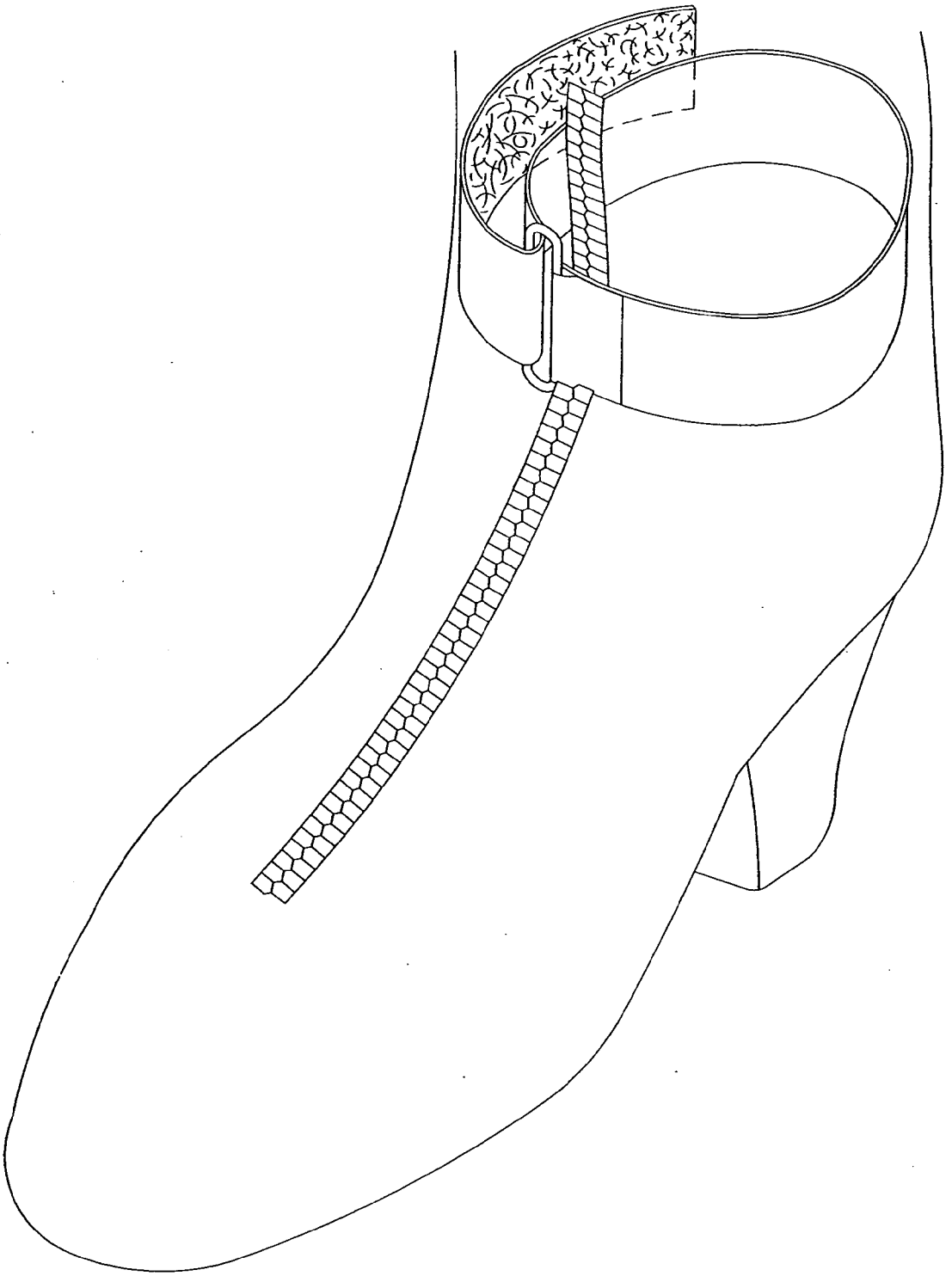


FIG. 37

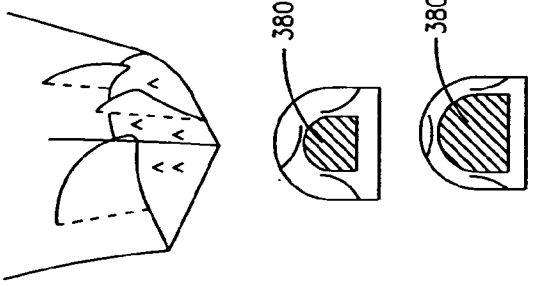


FIG. 38A

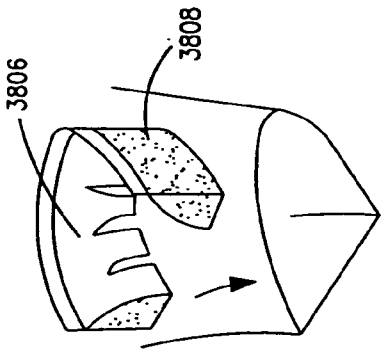


FIG. 38B

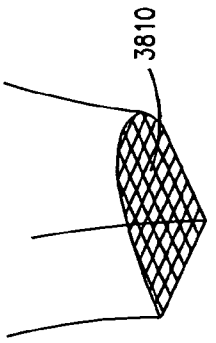


FIG. 38C

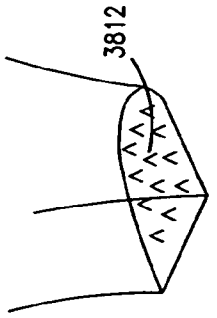


FIG. 38D

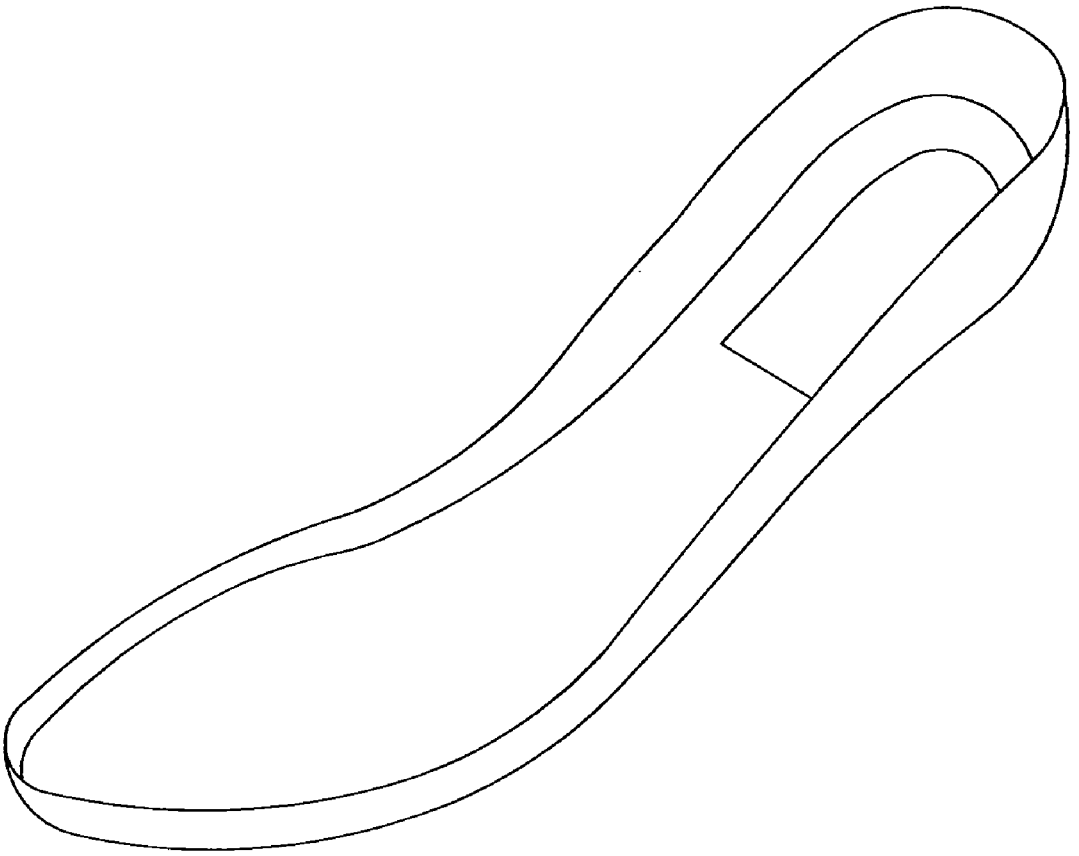


FIG. 39

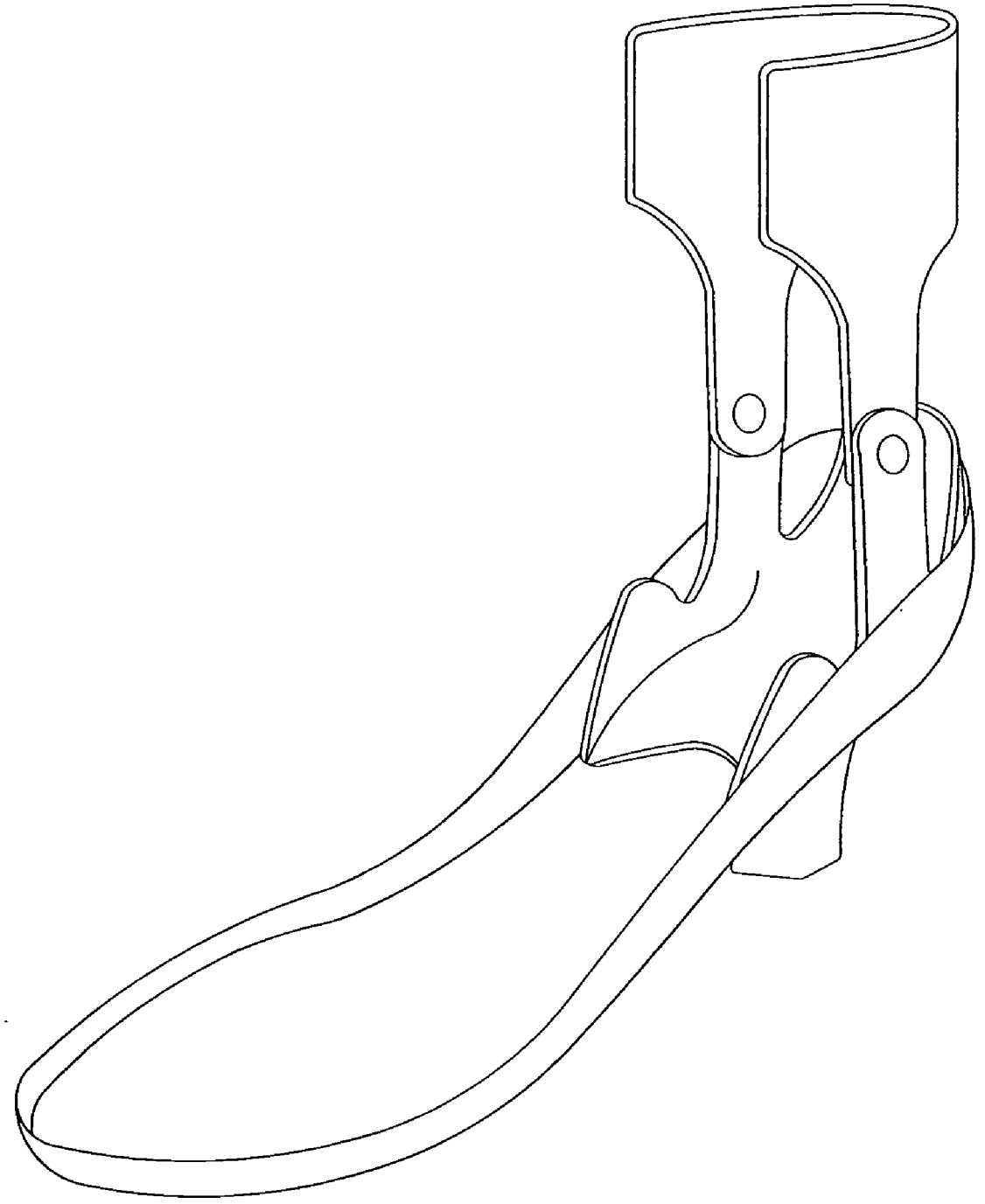


FIG. 40

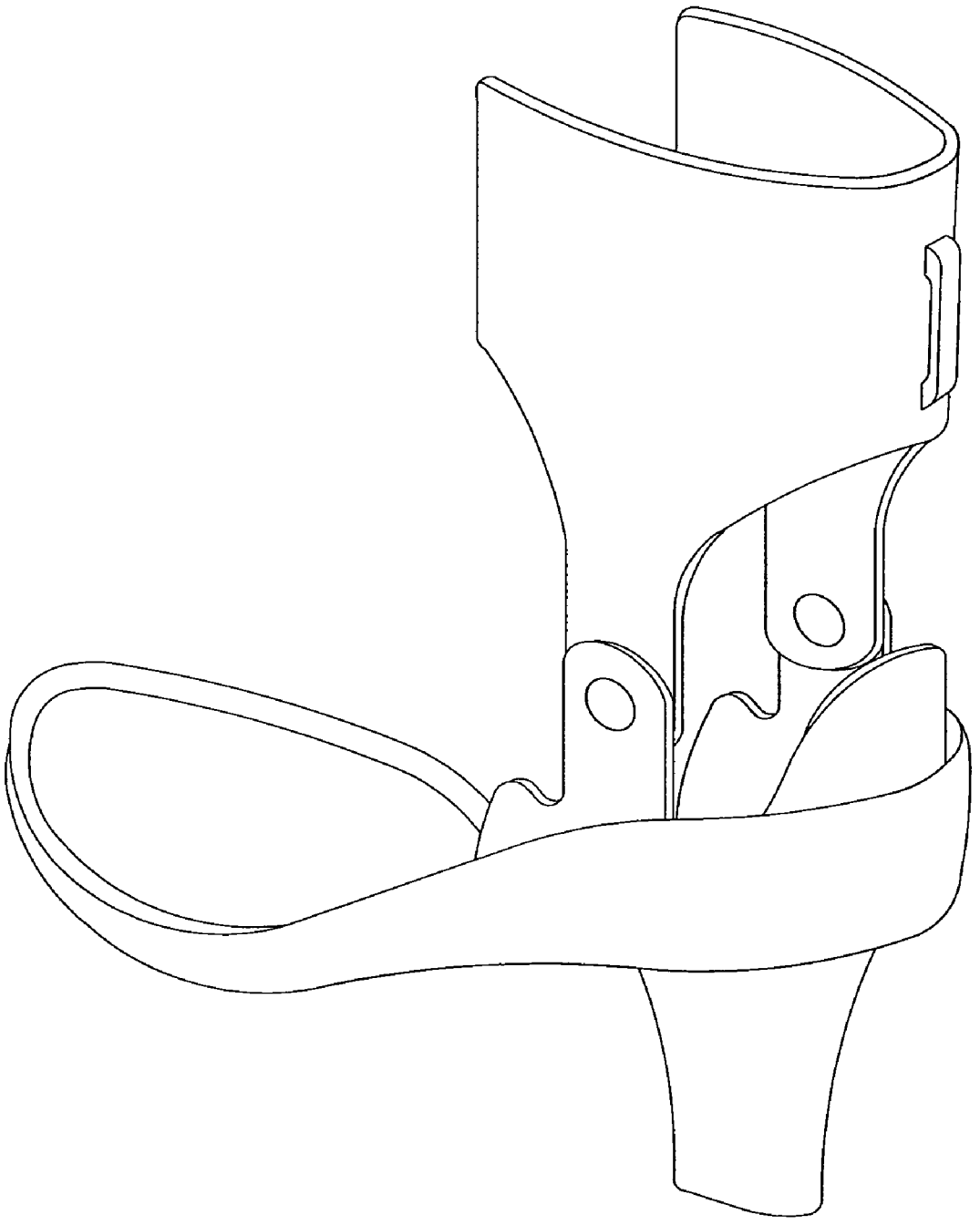


FIG. 41

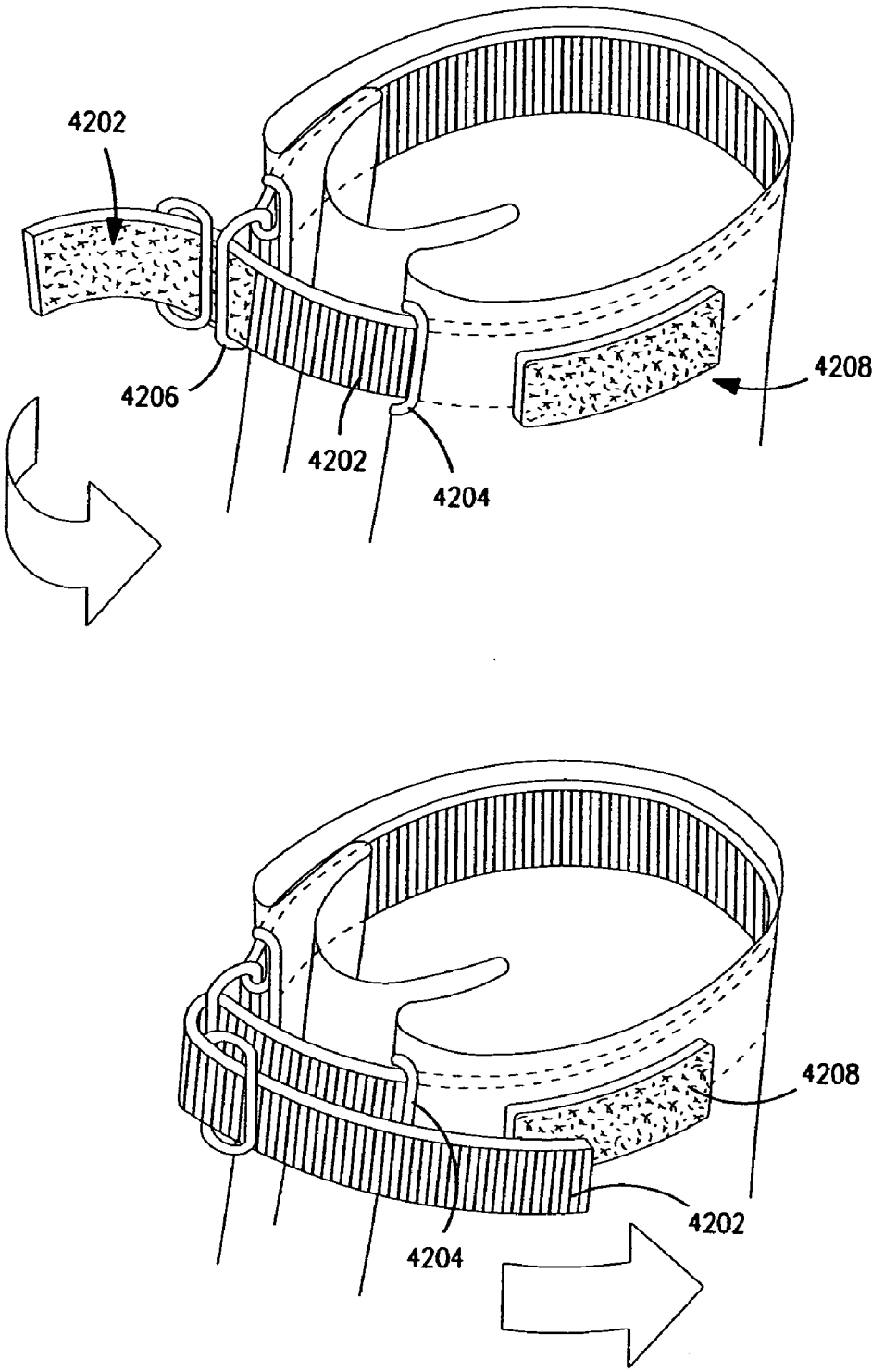


FIG. 42

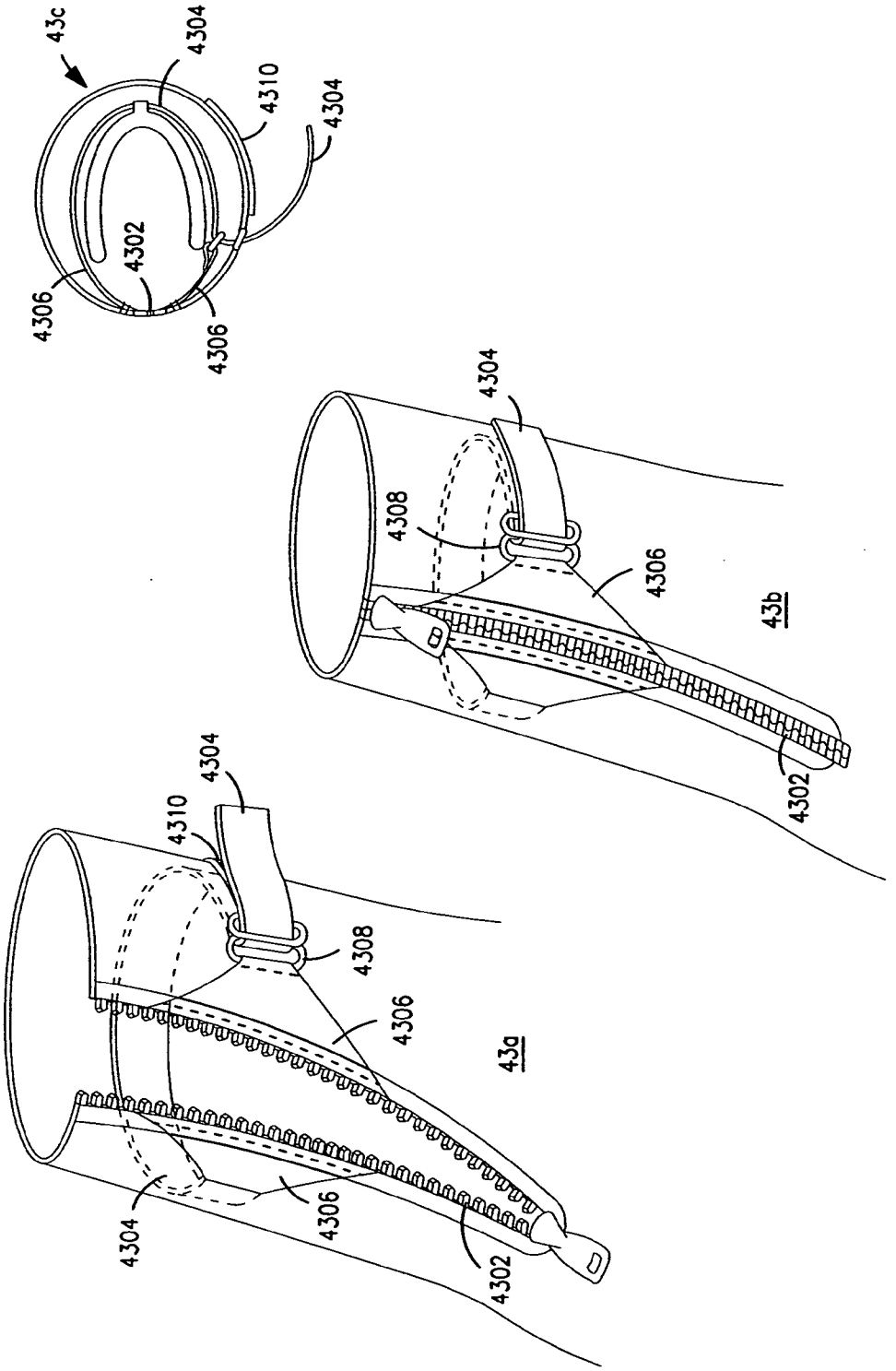

43c
4304
4310
4304
4302
4306
4306
4304
4308
4306
43b
4302
4304
4310
4308
4306
43a
4304
4306
4302

FIG. 43

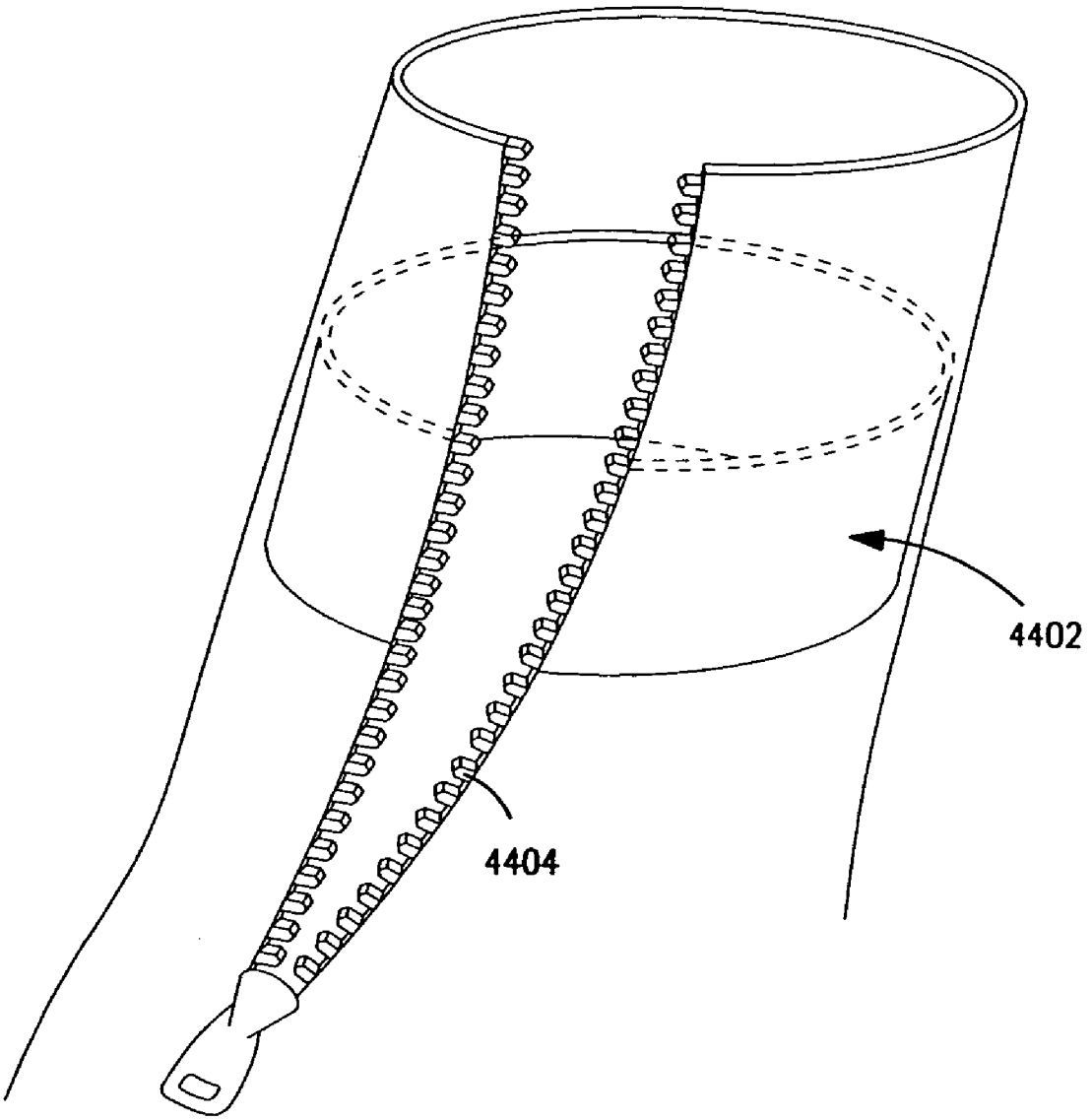


FIG. 44

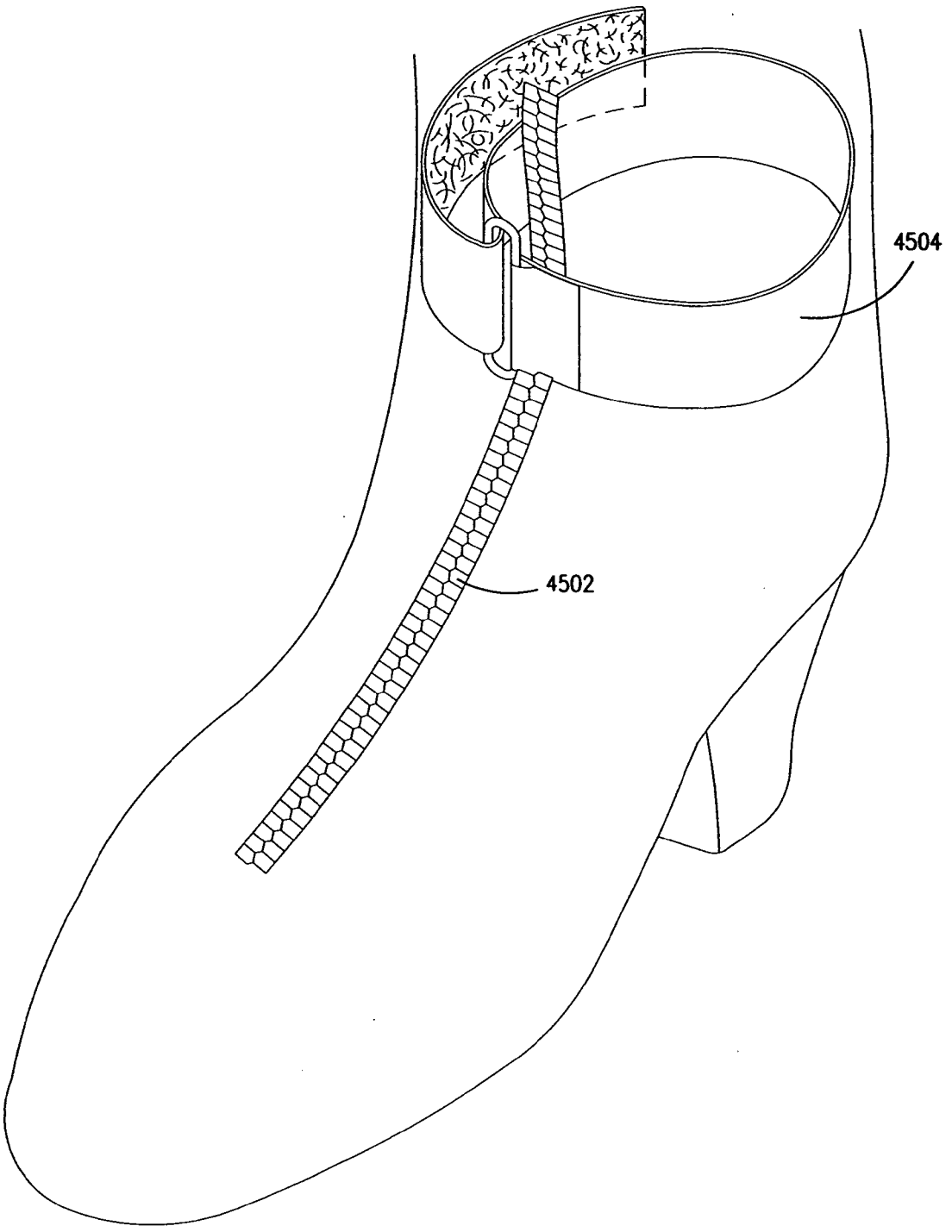


FIG. 45

HEEL STABILIZER

[0001] This application claims the benefit of 61/136,231 filed Aug. 20, 2008, 12/136,806 filed Jun. 11, 2008, 60/943,170 filed Jun. 11, 2007, and 10/982,923 filed Nov. 8, 2004, each hereby incorporated by reference in its respective entirety.

FIELD OF THE INVENTION

[0002] The present invention relates to heel stabilizing technology that can be used alone, or incorporated within footwear including, but not limited to shoes, sneakers, boots, overshoes, galoshes or any combination thereof with flat to any heel height.

BACKGROUND OF THE INVENTION

[0003] Women's rain gear has come into its own. Gone are the days when a raincoat, umbrella and rain boots are nothing more than a utilitarian way to keep dry. The contemporary equivalent of the British-inspired Wellington boot hit the U.S. market in Fall 2000. These "pattern wellies" or printed novelty rain boots were sellouts with their floral print designs. Now, other designers and boot manufacturers have followed suit by creating tall and short rain boots, as well as ankle height Chelsea style rain boots and rubber clogs featuring stripes, polka dots, plaids and more.

[0004] These fashion-forward rain boots have created a new niche in the women's rain gear category. Previously, the only choices for women's protective footwear for rainy weather have been black or green knee high Wellingtons; black rubber galoshes; low casual rubber boots (i.e. Muck or duck boots); gardening boots or clogs; jogging overshoes; and the clear plastic/rubber hybrid overshoes for high heel shoes with heels no higher than 1½".

[0005] However, when women dress in business attire or evening wear, accessorized with high heel shoes averaging well in excess of 1½", the need for protective footwear for rain which provides both aesthetic satisfaction and physical functionality has yet to be adequately addressed.

[0006] What is currently needed by women who have a closet full of shoes with heels of all different heights, is a fashionable protective overshoe that will not only look good, but will offer the unique benefit of helping reduce the teetering from side-to-side inherent when they wear high heel shoes, particularly when wearing the shoes inside an overshoe in inclement weather conditions.

[0007] In the past, overshoes have been regarded as a clumsy, low cost contrivance with little or no structure. This afforded prior overshoes with an easy design target having a low level of sophistication. What is needed is an overshoe that actually augments the wearer's safety.

[0008] In designing a stabilized high-heel overshoe, several competing factors have to be addressed. The overshoe has to be stylish, comfortable, adaptable to a selected range of heel heights, and easy to put on and take off. By simultaneously protecting expensive high-heeled shoes from inclement weather, mud and snow while at the same time stabilizing the user's foot, a new category of overshoe is created.

[0009] Further, falls among the elderly result in enormous economic and personal losses. Often a fall for an older adult can result in a hip fracture or other serious injury, even death. According to the Center for Disease Control: 1/more than one-third of adults ages 65 years and older fall each year; 2/among older adults, falls are the leading cause of injury deaths and the most common cause of nonfatal injuries and hospital admissions for trauma; and 3/in 2003 more than 1.8 million seniors age 65 and older were treated in emergency departments for fall-related injuries and more than 421,000 were hospitalized.

[0010] The CDC also lists the following fall related outcomes: 1/in 2002, nearly 13,000 people ages 65 and older died from fall-related injuries; 2/of those who fall, 20% to 30% suffer moderate to severe injuries such as hip fractures or head traumas that reduce mobility and independence, and increase the risk of premature death; 3/among people ages 75 years and older, those who fall are four to five times more likely to be admitted to a long-term care facility for a year or longer; 4/falls are a leading cause of traumatic brain injuries; and 5/among older adults, the majority of fractures are caused by falls.

[0011] In addition, there are many whose mobility is threatened due either to advanced age, neurodegenerative disorder, or other disorder that effects coordination and/or balance. Some may refuse to use walking aids such as a cane or a walker because the aid is seen as unsightly. A walking aid that is inconspicuous and/or attractive would be a distinct benefit. Such an aid would also assist those whose ambulatory difficulties were due to accident or birth defect, whether temporary or permanent.

[0012] What is currently needed by anyone that has difficulty balancing while walking is a walking aid that can be worn with a degree of privacy so that other people are not aware that it is in use.

[0013] U.S. Pat. No. 1,075,930 (the '930 patent) shows an overshoe that can accommodate shoes with heels of unspecified height, having a slip-resistant sole. However, the overshoe of the '930 patent has a multitude of cumbersome fasteners, does not have a means for fastening the overshoe to the wearer's ankle or calf, and does not prevent or minimize teetering in high heel shoes.

[0014] U.S. Pat. No. 2,068,238 (the '238 patent) shows an overshoe that is waterproof, but that does not have the capability of protecting a shoe with a high heel.

[0015] U.S. Pat. No. 3,283,422 (the '422 patent) shows a disposable overshoe that can accommodate shoes with heels of unspecified height. However, the overshoe of the '422 patent does not have a slip-resistant sole, is devoid of any type of fastener, and does not minimize teetering in high heel shoes. In addition, the disclosure of the '422 patent does not contemplate the flexibility/rigidity needs of the sole to provide shoe stability.

[0016] U.S. Pat. No. 4,335,527 (the '527 patent) shows an overshoe that is disposable, can accommodate shoes with heels of unspecified height, and has a slip-resistant sole. However, the overshoe of the '527 patent has a fastener only at the ankle of the boot which would not secure a high heel shoe inside the boot, and the overshoe does not have a means of minimizing teetering in high heel shoes.

[0017] U.S. Pat. No. 4,516,336 (the '336 patent) shows a protective overshoe that is waterproof or water-resistant and collapsible for ease of carrying in a purse. A plurality of elastic bands are positioned along different portions of the overshoe to properly position the overshoe on the wearer's leg and over the wearer's shoe or boot. The heel member (**28**) and the sole member (**30**) constitute reinforcing members to provide a durable walking surface. However, it would be very

difficult to insert a high heel shoe into the opening of the overshoe of the '336 patent and down the body of the boot. Although the overshoe cover of the '336 patent can accommodate shoes with heels of unspecified height, has a slip-resistant sole and ankle fastener, it does not have a means of minimizing teetering in high heel shoes. Further, the boot of the '336 patent is not disposable, the elastic band that gathers the boot material onto the arch of the boot could be hazardous if bulky gatherings get caught on an uneven slippery surface. Additionally, the separate heel and sole portions do not provide the same amount of security as would a heel and sole constructed in the same piece. Lastly, a tall, narrow heel such as a spike heel would not be strong enough to hold down the heel portion of the boot and can cause a tripping hazard.

[0018] U.S. Pat. No. 4,598,485 (the '485 patent) shows a slip resistant, disposable overshoe cover with a body formed of a flexible, foldable, sheet material, the overshoe comprising a bottom rib formed of a strip of flexible, stretchable, resilient and slip-resistant material.

[0019] U.S. Pat. No. 4,693,018 (the '018 patent) and German Patent No. DE 3,606,837 (the '837 patent) show an overshoe that has the advantage of being extendible in bootleg coverage, but it is not disposable or compact for carrying in a purse.

[0020] U.S. Pat. No. 4,785,556 (the '556 patent) and published U.S. Pat. No. 0,088,997 (the '997 patent) show overshoes that can accommodate heeled shoes of varying height, but these overshoes are not disposable in nature and do not cover the ankle of the wearer. Furthermore, the soles of these overshoes, although they have tread patterns, do not provide for increased ground contact effectively making the wearer walk on snow and ice in high heels with treads. The overshoes of the '556 patent and the '997 patent have extendible heels, are devoid of any type of fastener, and do not minimize teetering in high heel shoes.

[0021] U.S. Pat. No. 5,056,240 (the '240 patent) shows an overshoe for receiving a shoe or boot that has mud or dirt thereon so as to permit a person entering a house or other clean environment to enter without depositing mud therein. The overshoe of the '240 patent is for indoor use, does not have a slip-resistant sole, does not accommodate high heel shoes, and does not have a means of creating tension at the heel to provide the wearer of high heel shoes with greater stability. The '240 patent has gripping action on the interior surface of the sole of the overshoe, however, it does not provide for securing the overshoe around a front section of the shoe and on the leg so that the wearer's shoe is not positively engaged by any portion of the overshoe.

[0022] U.S. Pat. No. 5,226,245 (the '245 patent) shows a protective boot structure having an innersole including a plate (**37**) of relatively rigid material such as cardboard.

[0023] U.S. Pat. No. 5,996,258 (the '258 patent) shows a flexible overshoe that shields shoes from scratches and abrasions. The overshoe of the '258 patent has an upper member that extends over a front top portion of a shoe, a lower member extending below a front sole portion of the shoe and extending toward the heel of the shoe, and an intermediate flexible portion connected between the upper member and the lower member. Although the overshoe of the '258 patent can accommodate high heel shoes and has a slip-resistant sole, the overshoe does not have a fastener at the opening of the leg shaft and does not have a means of providing tension at the heel.

[0024] There is a need for a device that would decrease the side-to-side teetering inherent when wearing high heel shoes, thereby increasing the balance and therefore stabilization of the wearer's high heel shoe, foot and ankle thereby lessening the possibility of tripping. This same concept can be applied to shoes, sneakers, boots, overshoes, galoshes or any combination thereof. Furthermore, this heel stabilization concept can benefit several additional populations of people, including, but not limited to the elderly, the permanently or temporarily injured, and those people who prefer footwear with flat or low heels.

SUMMARY OF THE INVENTION

[0025] The present invention meets these needs; by utilizing heel stabilizing technology. Several varying embodiments are disclosed herein. In one exemplary embodiment, relatively stiff, flexing elements are used to both support the ankle and align it atop the heel of the shoe. These stays resist lateral ankle flex and heel toppling by translating any out-of-column lateral movement into tension and compression forces acting on the two stays. The stays are designed to resist this tension and compression loading, resulting in significantly greater stability and wearer confidence. In essence, the heel of the shoe becomes an axial (straight line) extension of the wearer's lower leg.

[0026] The present invention relates to a stabilizing mechanism for laterally aligning a wearer's lower leg and ankle with the heel portion and extended heel element of shoes of any heel height, this mechanism being integral with, or removably attached to an overshoe. The stabilizing mechanism includes, for example: a cuff, pivoting or flexing side members having specific control over permissible and impermissible movement types, heel receptacle, and an optional heel tip centering device within the heel receptacle.

[0027] In varying embodiments the cuff hugs the lower leg above the ankle bone by on at least two sides being: molded into a shape and/or held closed by a tension mechanism such as but not limited to a strap and/or held closed by closure of the overshoe itself. In varying embodiments the cuff is attached to rigid side members so that the cuff can pivot only fore and aft in tandem with the ankle's natural fore and aft movement, while restricting sideward bending, or is attached to flexible side members so that the cuff can only move fore and aft in tandem with the ankle's natural fore and aft movement, while restricting sideward bending. Further in varying embodiments, the cuff covers the back of the ankle and/or above ankle area in whole or in part. Also, in varying embodiments, the cuff can cover the front of the ankle and/or above ankle area in part or, if in whole, an opening would be required.

[0028] In varying embodiments the side members: can be attached to, or conjoin the lower portion of the cuff at least at two sides; can be rigid, can be flexible; can be attached to the sides of the heel cup, or an upward projection thereof; and/or can be attached to the insole and/or inside sides of the overshoe.

[0029] In varying embodiments the heel cup can be attached to or conjoined with the lower end of the side members; can be attached to the insole and/or inside sides of the overshoe; can have treading or other gripping protrusions on the inner bottom and/or inner sides; can be internal and/or external to the overshoe; and/or can have features on it to receive and guide a shoe's heel into said cup during insertion of the wearer's foot and shoe into the stabilizing overshoe.

[0030] In varying embodiments the optional heel tip centering device inside heel cup can be inserted during manufacture or molded in situ; and/or can have appendages and/or flexible surfaces that would serve to guide the heel to the center as the wearer puts on the overshoe.

[0031] The heel stabilizer of the present invention helps increase the stability of the wearer when walking. This heel stabilizer minimizes the side-to-side teetering a person experiences when wearing flat heels to any height heel shoe, sneakers, boot, overshoe, galoshes or any combination thereof.

[0032] The heel stabilizer would benefit people of both genders and all ages. Women who wear high-heeled footwear would benefit from increased stability. A major cause of hospitalization of the elderly is having an event of loosing balance while walking and subsequently falling and breaking bones. Heel stabilization would benefit the elderly even when they wear flat-soled shoes, by increasing their balance. Yet another population that could benefit from the heel stabilizer is those in need of orthopedic assistance, be it from recent injury or a lifelong physical disability.

[0033] It is an object of the present invention to provide an overshoe having a flexible, waterproof upper that reaches above the user's ankle bone, and conceals the structural features of the overshoe; a flexible, waterproof sole, optionally having a high heel appearance and including a well in the sole's heel to receive the high heel of the user's shoe; a stay that centers and stabilizes the foot atop the shoe, by having a portion that straps to the user's upper ankle and is flexibly attached to the lower portion, the lower portion having features to laterally center the heel of the foot and to prevent lateral tilt of the ankle relative to the shoe sole by extending down to encircle and engage with the tip of the shoe's heel, the bottom of the stay component is received by the aforementioned well in the sole's heel.

[0034] It is a further object of the present invention to provide an overshoe, that when worn, the user's foot is firmly centered above the heel of the high-heeled shoe, and lateral misalignment of the shoe's heel relative to the ankle is strongly curtailed. In this way, the high-heel column essentially becomes an extension of the foot, greatly augmenting the users' stability. The stay allows the upper to have less of structural support role, allowing it to be extremely flexible to accommodate decorative shoe elements and to make it easier to put on and take off.

[0035] There has thus been outlined, rather broadly, the more important features of the invention in order that the detailed description thereof that follows may be better understood, and in order that the present contribution to the art may be better appreciated. There are, of course, additional features of the invention that will be described further hereinafter.

[0036] In this respect, before explaining at least one embodiment of the invention in detail, it is to be understood that the invention is not limited in its application to the details of construction and to the arrangements of the components set forth in the following description or illustrated in the drawings. The invention is capable of other embodiments and of being practiced or carried out in various ways. Also, it is to be understood that the phraseology and terminology employed herein are for the purpose of description and should not be regarded as limiting.

[0037] As such, those skilled in the art will appreciate that the conception upon which this disclosure is based may readily be utilized as a basis for the designing of other structures, methods and systems for carrying out the several purposes of the present invention. It is important, therefore, that equivalent constructions insofar as they do not depart from the spirit and scope of the present invention, are included in the present invention.

[0038] For a better understanding of the invention, its operating advantages and the specific objects attained by its uses, reference should be had to the accompanying drawings and descriptive matter, which illustrate preferred embodiments of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS AND FIGURES

[0039] FIG. **1** illustrates a side view of an illustrative boot embodiment.

[0040] FIG. **2** illustrates a side view of a second illustrative boot embodiment.

[0041] FIG. **3** illustrates a side view of a third illustrative boot embodiment.

[0042] FIG. **4** illustrates a side view of a first illustrative overshoe embodiment.

[0043] FIG. **5** illustrates a side view of a second illustrative overshoe embodiment.

[0044] FIG. **6** illustrates a side view of a third illustrative overshoe embodiment.

[0045] FIG. **7** illustrates a side view of a fourth illustrative overshoe embodiment.

[0046] FIG. **8** illustrates a side view of an illustrative pump style shoe embodiment.

[0047] FIG. **9** illustrates a side view of a second illustrative pump style shoe embodiment.

[0048] FIG. **10** illustrates a side view of an illustrative sneaker/tennis shoe embodiment.

[0049] FIG. **11** illustrates a side view of an illustrative Valenkis multi-part footwear embodiment.

[0050] FIG. **12** illustrates a side view of an illustrative multi-part footwear embodiment.

[0051] FIG. **13** illustrates a side view of a second illustrative multi-part footwear embodiment.

[0052] FIG. **14** illustrates a side view of an attachable heel stabilizer.

[0053] FIG. **15** illustrates an alternative overshoe embodiment with boot open.

[0054] FIG. **16** illustrates an alternative overshoe embodiment with boot closed and cuff up.

[0055] FIG. **17** illustrates an alternative overshoe embodiment with boot closed and cuff folded, an "in use" view.

[0056] FIG. **18** illustrates an alternative overshoe embodiment with the internal stay visible.

[0057] FIG. **19** illustrates an internal stay with strap.

[0058] FIG. **20** illustrates an internal stay.

[0059] FIG. **21** illustrates a side/rear view of alternative overshoe embodiment with boot open.

[0060] FIG. **22** illustrates a side/rear view of alternative overshoe embodiment with boot closed and cuff up.

[0061] FIG. **23** illustrates a side/rear view of an alternative overshoe embodiment with boot closed and cuff folded, an "in use" view.

[0062] FIG. **24** illustrates a side/rear view of an alternative overshoe embodiment with the internal stay visible.

[0063] FIG. **25** illustrates a side/rear view of an internal stay with strap.

[0064] FIG. **26** illustrates a side/rear view of an internal stay.

[0065] FIG. **27** illustrates a heel centering insert.

[0066] FIG. **28** illustrates placement of heel centering insert.

[0067] FIG. **29** illustrates a two part heel cup.

[0068] FIG. **30** illustrates an alternative two part heel cup.

[0069] FIG. **31** illustrates another alternative two part heel cup.

[0070] FIG. **32** illustrates internal stay with strap.

[0071] FIG. **33** illustrates an alternative overshoe embodiment with boot closed and cuff down.

[0072] FIG. **34** provides a cross-section view.

[0073] FIG. **35** illustrates the effect of variations in heel height.

[0074] FIG. **36** further illustrates the effect of variations in heel height.

[0075] FIG. **37** illustrates an overshoe embodiment encompassing hook and loop and zipper.

[0076] FIG. **38** (A-D) illustrates alternative heel centering approaches

[0077] FIG. **39** illustrates a sole having an opening.

[0078] FIG. **40** illustrates a protruding heel cup/receptacle.

[0079] FIG. **41** illustrates a protruding heel cup/receptacle and back loop.

[0080] FIG. **42** illustrates a strap attachment closing means.

[0081] FIG. **43** illustrates a combination zipper, strap and grommets closing means.

[0082] FIG. **44** illustrates a strapless closure.

[0083] FIG. **45** illustrates zipper used in conjunction with strap attachment as a closing means.

DETAILED DESCRIPTION OF THE INVENTION

[0084] The heel stabilizer of the present invention provides increased stability to wearers of many kinds of footwear, including but not limited to shoes having heels of all heights, sneakers, boots, overshoes, galoshes, or any combination thereof. Further, when incorporated within or attached to a boot, overshoe, or galosh, the present invention provides increased stability to wearers in inclement weather conditions. In one embodiment, the heel stabilizer comprises an anchoring means, where the anchoring means comprises at least one of an anchoring fastener, anchoring material, or anchoring frame; a heel lift means, where the heel lift means comprises at least one of a heel tension fastener, shortened heel, or flex-angle sole; a stretch segment; and a sole. In another embodiment, a stabilizing mechanism is provided for laterally aligning a wearer's lower leg and ankle with the heel portion and extended heel element of shoes of any heel height, this mechanism being integral with, or removably attached to an overshoe. The stabilizing mechanism includes, for example: a cuff, pivoting or flexing side members having specific control over permissible and impermissible movement types, heel receptacle, and an optional heel tip centering device within the heel receptacle

[0085] Throughout this application the term "footwear" shall be held to encompass all footwear including but not limited to pumps, sandals, shoes, walking shoes, athletic sneakers, boots, overshoes, galoshes, and the like.

[0086] Throughout this application the term "fastener" shall be held to encompass all zipper(s), buckle(s), ring(s), tab(s), snap(s), button(s), clip(s), toggle closure(s), tie(s), hook-and-eye, hook-and-loop and loop/self grip, elastic drawstring, loops, rings, webbing, and the like, in any combination.

[0087] Throughout this application the term "anchoring fastener" shall be held to encompass all "fasteners" as outlined in the definition of "fastener" in this application regardless of whether the fastener is on the outside of the footwear such as for example when it encircles the ankle, or when it attaches to the footwear and/or foot from the inside.

[0088] The term, "anchoring material" shall mean at least one material that alone or in combination will not stretch downward when a heel lift mechanism is used, and the term "anchoring frame" shall mean a frame, that will not shift downward when a heel lift mechanism is used.

[0089] Throughout this application the term "heel tension fastener" shall be held to encompass all "fasteners" as outlined in the definition of "fastener" in this application, the fastener(s) are positioned at the back and/or side(s) of the footwear and at the heel tension attachment point cinches up a portion of the stretch segment while leaving approximately one inch of the stretch segment beneath the heel tension attachment point free to stretch downward. A "shortened heel" shall mean a heel with at least one area of elasticity that does not reach the ground. A "flex-angle sole" shall mean a flexible sole that is formed with its heel portion in a raised position.

[0090] Throughout this application the term "stretch segment" shall be held to encompass the elasticized portion of the footwear consisting of fabrications that have some degree of stretch to it such as neoprene, rubber, nylon, microfiber, and the like. In alternative embodiments, the stretch segment can comprise, in part, a non-stretch material such as polypropylene webbing. Such non-stretch material serves to limit the amount of stretch and/or prevent the stretch segment from being torn at the heel tension attachment point. The exact size of the stretch area depends upon materials used within the footwear.

[0091] Throughout this application the term "flexible sole" shall be held to encompass all footwear sole materials that can be willfully pulled up when the heel tension fastener is engaged, or pulled downward when the shortened heel is stretched downward or when the flex-angle sole is flexed downward and can be made of leather, rubber, poly vinyl chloride, ethylene vinyl acetate, and the like as well as being made slip resistant by using treads or the like, and/or by the material of the footwear sole itself providing some degree of slip resistance. It is also contemplated that the sole can comprise for example a first coated or non-coated cardboard or other material insert, a metal piece, and a second coated or non-coated cardboard or other material insert, wherein the metal piece is between the first insert and the second insert and/or the metal piece could be secured onto the bottom and/or top of the insert. Alternatively, the insert can be partially or entirely made of some rigid material.

[0092] Throughout this application the term "upper" shall be held to encompass everything including and above the insole. Therefore the heel and the out sole are not included in the upper. In the case of an overshoe or galosh, the sides of the heel can be considered part of the upper.

[0093] Throughout this application the term "Valenki(s)" shall be held to encompass the traditional Valenki wool boot with separate rubber galosh.

[0094] Throughout this application the term "stay" shall be held to encompass a means of providing ankle support.

[0095] Throughout this application the term "cup" shall be held to encompass a heel tip centering device.

[0096] Throughout this application the term "attached to" shall mean that the parts are separate and distinct, but it is possible to mold them as one part, either as a single type of plastic or as two types of plastic molded as one in a single mold. Throughout this application the term "Conjoin with" shall suggest a single part option.

Boot Embodiments

[0097] FIG. **1** shows a first illustrative boot embodiment. As shown, the boot has leg shaft **102** (top of leg shaft **102** ending at the ankle or any point above on the leg) that is encircled with anchoring fastener **104**, such as a hook-and-loop fastener that, when secured closed, will hold leg shaft **102** snugly to the wearer's leg. In a preferred embodiment, the anchoring fastener will be positioned just above the height of the wearer's anklebone. In one embodiment, upper **108** is neoprene. There can be a side opening means such as a zipper to make it easy to put the wearer's foot inside the boot (not shown). The lower portion of heel tension fastener **106** is attached at the heel tension attachment point which is to the back and/or sides of the heel of upper **108**. Where upper **108** is a material having stretch qualities, such as neoprene, a separate stretch segment is not required. In one embodiment heel tension fastener **106** can comprise a ring and hook-and-loop and non-stretch webbing. In varying embodiments such ring can be, for example, metal and/or plastic or the like. The upper portion of heel tension fastener **106** is attached at the upper tension attachment point which is a point on the back of the boot that is above the heel tension attachment point and is beneath and/or at the anchoring mechanism. The sole of the boot can be rubber with treads. There can be a stacked rubber heel on the boot. At heel strike, the wearer will experience increased stability when the neoprene at the heel of upper **108** that is cinched up by heel tension fastener **106** is partially stretched downward between the anchoring fastener **104** and the bottom of the stacked heel as it reaches the ground.

[0098] FIG. **2** shows an alternative boot embodiment. In this embodiment, upper **108** can be, in part, a leather or other material with minimal flexibility such that it serves as anchoring mechanism **204** in that it will not be pulled down when heel tension fastener **106** is engaged. A portion of upper **108** at stretch segment **202** is neoprene or other material having stretch properties. There can be a side opening means such as a zipper on the body of the boot so that the top of leg shaft **102** fits snugly against the wearer's leg (not shown). In one embodiment the lower portion of heel tension fastener **106** is attached at the heel tension attachment point which is to the back and/or sides of stretch segment **202** while leaving approximately one inch of the stretch segment beneath the heel tension attachment point free to stretch. In one embodiment heel tension fastener **106** can comprise a ring and hook-and-loop and non-stretch webbing. The upper portion of heel tension fastener **106** is attached at the upper tension attachment point which is a point on the back of upper **108** that is above the heel tension attachment point and at a point of upper **108** wherein upper **108** is a material having minimal flexibility such as leather. Preferably the sole of the boot has enough flexibility such that the heel area is able to be pulled slightly upward when the heel tension fastener is engaged and the sole will not crack with repeated heel strikes. The illustrated embodiment shows a wooden stiletto heel. At heel strike, the wearer will experience increased stability when a portion of stretch segment **202** of upper **108** is cinched up by heel tension fastener **106** at the heel tension attachment point while leaving approximately one inch of the stretch segment beneath the heel tension attachment point free to stretch downward between the anchoring material and the bottom of the stiletto heel as it reaches the ground. As mentioned the stretch segment area will depend upon materials used in the footwear. In alternative embodiments, the stretch area can be greater than one inch and or smaller than inch beneath the heel tension attachment point. In one embodiment where the heel of the footwear is heavy and/or the sole of the footwear has less that optimal flexibility, it may be necessary to increase the gripping surface area of the hook-and-loop heel tension fastener closure tab to increase the holding power of the closure. This is needed for example, if the shear strength of the hook-and-loop is insufficient. This can be done for example, by adding a fastening augmenter **109** such as a strip of hook and/or loop on the back of leg shaft **102**.

[0099] FIG. **3** shows an alternative boot embodiment. In this embodiment, the boot is partially made of leather or other material of minimum flexibility that is attached to a frame of leather stays that will function as anchoring frame **302**. A portion of upper **108** at stretch segment **202** is neoprene. Flex-angle sole **304** is formed so that heel **306** is in a raised position. At heel **306** strike, the wearer experiences increased stability when the stretch segment stretches downward resulting in the flex-angle sole flexing downward so that heel **306** reaches the ground thereby creating a vertical tension between anchoring frame **302** and the bottom of heel **306**.

[0100] There are many alternative boot embodiments contemplated. Each embodiment includes a stretch segment, which is preferably at least one elasticized area of the boot upper. Each embodiment preferably includes a flexible sole. Heel heights can be flat to any height. Boot embodiments include, but are not limited to: anchoring fastener in conjunction with at least one of a heel tension fastener or a flex-angle sole; anchoring material in conjunction with at least one of a heel tension fastener or a flex-angle sole; or anchoring frame in conjunction with at least one of a heel tension fastener or a flex-angle sole. The anchoring fastener, anchoring material, and anchoring frame can each be used alone or in any combination. Similarly, heel tension fastener and flex-angle sole can be used alone or together.

Overshoe Embodiments

[0101] FIG. **4** shows a first illustrative overshoe embodiment. As shown, upper **108** can be all neoprene. The overshoe has leg shaft **102** (top of leg shaft **102** ending at the ankle or at any point above on the leg) that is encircled with anchoring fastener **104** such as a hook-and-loop fastener. When secured closed, anchoring fastener **104** holds leg shaft **102** snugly to the wearer's leg. There can be a side opening means such as a zipper to make it easy to put the wearer's shoe inside the overshoe (not shown). The lower portion of heel tension fastener **106** is attached at the heel tension attachment point which is to the back and/or sides of the heel of upper **108**. Preferably the heel of upper **108** is neoprene. In one embodiment heel tension fastener **106** can comprise a plastic ring and hook-and-loop and non-stretch webbing. Alternatively, heel tension attachment point can be attached to heel cup **404**. The upper portion of heel tension fastener **106** is attached at the upper tension attachment point which is a point on the back of the overshoe that is above the heel tension attachment point and is beneath and/or at the anchoring mechanism. Sole **402** of the overshoe is preferably rubber. The wearer's shoe heel is positioned in heel cup **404**. Preferably heel cup **404** has neo-

prene on the back and the sides while the inner side and sole of heel cup **404** is manufactured as one piece with the sole of the overshoe. At heel strike, the wearer will experience increased stability when a portion of the neoprene is cinched up by heel tension fastener **106** while leaving approximately one inch of the neoprene beneath the heel tension attachment point free to stretch downward between the anchoring fastener **104** and the bottom of heel cup **404** as it reaches the ground.

[0102] Regarding heel stabilization with heel tension fasteners, tension in and around the back of the overshoe (in the foot heel and shoe high heel areas) can be achieved by use of elastic material (such as neoprene) from the inside of the overshoe when also using an ankle strap for anchoring. This can be done in numerous ways such as but not limited to: heel tension fasteners that can be adjusted by the wearer; heel tension fasteners that can be pre-set by the manufacturer; a stitch or some other tacking method by the manufacturer to cinch up the material; a pulley or drawstring type system to pull the material up and or down which may or may not also be connected to the ankle strap. Also, stretch creating tension can be provided underneath the instep of the overshoe when using an anchoring ankle strap which will aide in anchoring the foot to the wearer's high heel shoe. This can be used alone to provide heel stabilization and can also be used in addition to the other embodiments cited herein for creating tension in the fabric in and around the back of the overshoe.

[0103] FIG. **5** shows a second illustrative overshoe embodiment, where upper **108** does not have a leg shaft, and covers only the wearer's shoe. Upper **108** is, in part, a dense rubber with limited elasticity that would hold onto the heel of the body of the shoe, such that it serves as the anchoring mechanism in that it will not be pulled down when heel tension fastener **106** is engaged. A sponge like material (not shown) or other material can be added during manufacture or can be inserted by the wearer that would assist in holding the anchoring material to the inner shoe. The lower portion of heel tension fastener **106** is attached at the heel tension attachment point on stretch segment **202** which is to the back and/or sides of the heel of upper **108** and cinches up a portion of the stretch segment while leaving approximately one inch of the stretch segment beneath the heel tension attachment point free to stretch. In one embodiment heel tension fastener **106** can comprise a plastic ring and hook-and-loop and non-stretch webbing. The upper portion of heel tension fastener **106** is attached at the upper tension attachment point which is a point on the back of the overshoe that is above the heel tension attachment point and is at a point where the upper comprises a material having limited elasticity such as dense rubber, and thereby serves as an anchoring mechanism. There can be a side opening means such as a zipper on the overshoe (not shown). Sole **402** of the overshoe can be rubber with treads. Preferably the sole of heel **402** is manufactured as one piece with the sole of the overshoe. At heel strike, the wearer will experience increased stability when a portion of stretch segment **202** is cinched up by heel tension fastener **106** while leaving approximately one inch of the stretch segment beneath the heel tension attachment point free to stretch downward between the anchoring material and the bottom of the heel area as it reaches the ground.

[0104] FIG. **6** shows a third illustrative overshoe embodiment, wherein upper **108** can be all neoprene, or other material having elasticity. The overshoe has leg shaft **102** (top of leg shaft **102** ending at the ankle or at any point above on the leg) that is encircled with anchoring fastener **104**, such as a hook-and-loop fastener that, when secured closed, will hold leg shaft **102** snugly to the wearer's leg. There can be a side opening means such as a zipper to make it easy to put the wearer's shoe inside the overshoe (not shown). Instead of a heel tension fastener, heel cup **404** can be shortened. The shortened heel cup area has neoprene or other material having elasticity on the back and the sides, while the inner side and sole of heel cup **404** is manufactured as one piece with sole **402** of the overshoe. In one embodiment, sole **402** of the overshoe is rubber with treads. At heel strike, the wearer experiences increased stability when the heel of the inner shoe stretches the neoprene area of the shortened heel cup **404** downward between the anchoring fastener **104** and the bottom of the shortened heel cup.

[0105] FIG. **7** shows a fourth illustrative overshoe embodiment, wherein upper **108** does not have a leg shaft and only covers the wearer's shoe. Upper **108** can be, in part, a dense rubber with limited elasticity that would hold onto the heel of the body of the shoe, such that it serves as anchoring mechanism **204**. Stretch segment **202** is located at the back and/or sides of heel area of upper **108**. Heel cup **404** is manufactured as one with the overshoe sole such that all sides of heel cup **404** are of the sole material. Flex-angle sole **304** is formed with heel cup **404** in a raised position. At heel strike, the wearer experiences increased stability when the heel of the inner shoe stretches the neoprene downward at the back and sides of the heel upper **108** resulting in flex-angle sole **304** flexing downward so that the bottom of heel cup **404** reaches the ground thereby creating a vertical tension between anchoring material **204** and the bottom of heel cup **404**.

[0106] There are many alternative overshoe embodiments contemplated. Each embodiment includes a stretch segment, which is preferably at least one elasticized area of the overshoe upper. Each embodiment preferably includes a flexible sole. Each embodiment also includes either a heel cup or heel area to accommodate shoes that are flat to any height. Overshoe embodiments include, but are not limited to: leg shaft in conjunction with heel tension fastener and at least one of an anchoring fastener, anchoring material, or anchoring frame; no leg shaft in conjunction with heel tension fastener and at least one of an anchoring fastener, anchoring material, or anchoring frame; leg shaft in conjunction with shortened heel and at least one of an anchoring fastener, anchoring material, or anchoring frame; no leg shaft in conjunction with shortened heel and at least one of an anchoring fastener, anchoring material, or anchoring frame; leg shaft in conjunction with flex-angle sole and at least one of an anchoring fastener, anchoring material, or anchoring frame; no leg shaft in conjunction with flex-angle sole and at least one of an anchoring fastener, anchoring material, or anchoring frame. The anchoring fastener, anchoring material, and anchoring frame can each be used alone or in any combination. Similarly, heel tension fastener, shortened heel and flex-angle sole can be used alone or together.

SHOE/SNEAKER EMBODIMENTS

[0107] FIG. **8** shows an illustrative embodiment where the shoe is a pump. In this embodiment upper **108** is at least in part leather or other material with minimal flexibility such that it serves as anchoring mechanism **204**. A portion of upper **108** at stretch segment **202** is a material that has some elasticity to it such as neoprene. Preferably stretch segment **202** is located at the back and/or sides of the heel area of upper **108**.

In one embodiment, the lower portion of heel tension fastener **106** is attached at the heel tension attachment point of stretch segment **202** such that it cinches up a portion of the stretch segment while leaving approximately one inch of the stretch segment beneath the heel tension attachment point free to stretch. The stretch segment **202** is to the back and/or sides of the heel of upper **108**. The upper portion of heel tension fastener **106** is attached at the upper tension attachment point which is a point on the back of the shoe that is above the heel tension attachment point and is on anchoring mechanism **204**. Sole **402** of the pump is preferably leather. Heel **306** can be a stacked wooden high heel attached to sole **402**. At heel strike, the wearer experiences increased stability when a portion of the stretch segment **202** is cinched up by heel tension fastener **106** while leaving approximately one inch of the stretch segment beneath the heel tension attachment point free to stretch downward between anchoring mechanism **204** and the bottom of heel **306** it reaches the ground.

[0108] FIG. **9** shows an alternative illustrative embodiment where the shoe is a pump that comprises an upper that is at least in part leather or other material with minimal flexibility such that it serves as anchoring mechanism **204**. A portion of upper **108** at stretch segment **202** has some elasticity to it such as neoprene. Preferably stretch segment **202** is located at the back and/or sides of heel of upper **108**. Flex-angle sole **304** is formed so that the heel portion is in a raised position. As illustrated, sole is leather and heel **306** is a kitten heel. At heel strike, the wearer experiences increased stability when stretch segment **202** stretches downward resulting in the flex-angle sole flexing downward so that the bottom of the kitten heel reaches the ground thereby creating a vertical tension between anchoring material **204** and the bottom of heel **306**

[0109] FIG. **10** shows an illustrative sneaker or tennis shoe embodiment, upper **108** comprising a formed frame of leather stays or other material of minimum flexibility; wherein the formed framed functions as anchoring frame **302**. In a preferred embodiment upper **108** also comprises mesh. A portion of upper **108** at stretch segment **202** is neoprene or other material having stretch properties. The lower portion of heel tension fastener **106** is attached at the heel tension attachment point which is to the back and/or sides of stretch segment **202** while leaving approximately one inch of the stretch segment beneath the heel tension attachment point free to stretch. The upper portion of heel tension fastener **106** is attached at the upper tension attachment point which is a point on anchoring frame **302** at the back of the shoe upper that is above the heel tension attachment point. Sole **402** of the shoe can be rubber with some treads. In this contemplated embodiment there is little to no heel on sole **402**. At heel strike, the wearer experiences increased stability when a portion of the stretch segment **202** is cinched up by heel tension fastener **106** while leaving approximately one inch of the stretch segment beneath the heel tension attachment point free to stretch downward between anchoring frame **302** and the bottom of the heel area.

[0110] There are many alternative shoe/sneaker embodiments contemplated. Each embodiment includes a stretch segment, which is preferably at least one elasticized area of the shoe upper. Each embodiment preferably includes a flexible sole. Heel heights can be flat to any height. Shoe/sneaker embodiments include, but are not limited to: anchoring fastener in conjunction with at least one of a heel tension fastener or a flex-angle sole; anchoring material in conjunction with at least one of a heel tension fastener or a flex-angle sole; or anchoring frame in conjunction with at least one of a heel tension fastener or a flex-angle sole. The anchoring fastener, anchoring material, and anchoring frame can each be used alone or in any combination. Similarly, heel tension fastener and flex-angle sole can be used alone or together.

Valenkis Multi-Part Footwear

[0111] FIG. **11** shows an illustrative Valenkis multi-part footwear embodiment. As shown, there are two footwear components, one being wool boot **1102**, the other being galosh **1104**. Galosh **1104** can be worn over wool boot **1102** when conditions are too slushy to wear wool boot **1102** alone forming combined footwear **1106**. Preferably galosh **1104** is rubber. Wool boot **1102** has leg shaft **102** (top of leg shaft **102** ending at the ankle or any point above on the leg) that is encircled with anchoring fastener **104**, such as a hook-and-loop fastener that, when secured closed, will hold leg shaft **102** snugly to the wearer's leg. The upper portion of heel tension fastener **106** is attached at the upper tension point which is at the back of wool boot **1102**. Galosh **1104** has stretch segment **202** at the back and/or side(s) of heel area. In one contemplated embodiment, stretch segment **202** is neoprene. The lower portion of heel tension fastener **106** is attached to stretch segment **202** at the heel tension attachment point such that it cinches up a portion of the stretch segment while leaving approximately one inch of the stretch segment beneath the heel tension attachment point free to stretch. The sole of galosh **1104** preferably has little or no heel. At heel strike, the wearer will experience increased stability when a portion of the stretch segment **202** at the heel area of galosh **1104** is cinched up by heel tension fastener **106** while leaving approximately one inch of the stretch segment beneath the heel tension attachment point free to stretch downward between anchoring fastener **104** on wool boot **1102** and the bottom of the heel area of galosh **1104** as it reaches the ground.

[0112] There are many alternative Valenkis multi-part footwear embodiments contemplated. Each embodiment includes a boot preferably made of wool and a separate galosh with a stretch segment and a flexible sole and heels that are flat to any height. Valenkis multi-part footwear embodiments include, but are not limited to: anchoring fastener on boot leg shaft in conjunction with top part of heel tension fastener on leg shaft, and lower part of heel tension fastener on galosh; anchoring material is boot leg shaft in conjunction with top part of heel tension fastener on leg shaft, and lower part of heel tension fastener on galosh; and anchoring frame on boot leg shaft in conjunction with top part of heel tension fastener on leg shaft, and lower part of heel tension fastener on galosh. The anchoring fastener, anchoring material, and anchoring frame can each be used alone or in any combination.

Other Multi-Part Footwear

[0113] FIG. **12** shows an illustrative multi-part footwear embodiment. As shown, there are two footwear components, one being ankle boot **1202**, the other being attachable leg shaft **1204**. Attachable leg shaft **1204** can be attached to ankle boot **1202** by attachment means **1206** to form second combined footwear **1208**. Attachment means **1206** can be any fastener. In one embodiment, attachable leg shaft **1204** is leather. Attachable leg shaft **1204** is encircled with anchoring fastener **104**, such as a hook-and-loop fastener that, when secured closed, will hold attachable leg shaft **1204** snugly to

the wearer's leg. The upper portion of heel tension fastener **106** is attached at the upper tension point which is at the back of attachable leg shaft **1204**. In one embodiment, attachment means **1206** is a zipper. In this embodiment a first zipper portion is attached at the opening of the bottom of attachable leg shaft **1204**, with the corresponding second zipper portion attached at the opening of the top of ankle boot **1202**. In one embodiment, ankle boot **1202** is leather and has stretch segment **202** at the heel area of the body boot. Preferably stretch segment **202** is neoprene. The lower portion of heel tension fastener **106** is attached to ankle boot **1202** at stretch segment **202** while leaving approximately one inch of the stretch segment beneath the heel tension attachment point free to stretch. The exact size of the stretch area depends upon materials used within the footwear. It is contemplated that the sole can be leather, so long as the leather has flexibility requisite to withstand repeated flexing. There can be a stiletto heel. At heel strike, the wearer experiences increased stability when a portion of the stretch segment **202** at the heel of upper **108** is cinched up by heel tension fastener **106** while leaving approximately one inch of the stretch segment beneath the heel tension attachment point free to stretch downward between anchoring fastener **104** on attachable leg shaft **1204** and the bottom of the stiletto heel of ankle boot **1202** as it reaches the ground.

[0114] FIG. **13** shows a second illustrative multi-part footwear embodiment. As shown, there are two footwear components, one being overshoe without leg shaft **1302**, the other being second attachable leg shaft **1304**. In one embodiment, second attachable leg shaft **1304** is rubber. Second attachable leg shaft **1304** (beginning at the top of the overshoe) is encircled with anchoring fastener **104**, such as a hook-and-loop fastener, that, when secured closed, will hold second attachable leg shaft **1304** snugly to the wearer's leg. Second attachable leg shaft **1304** can be attached to overshoe without leg shaft **1302** by attachment means **1206** (not shown) to form third combined footwear **1306**. Attachment means can be any fastener. In one embodiment overshoe without leg shaft upper **1308** is at least in part neoprene, thereby providing a stretch segment of neoprene. Flex-angle sole **304** is preferably rubber and is formed so that heel cup **404** is in a raised position. Heel cup **404** has rubber on all sides and is made as one with the sole. At heel strike, the wearer experiences increased stability when the neoprene of the overshoe without leg shaft upper **1308** stretches downward resulting in flex-angle sole **304** flexing downward so that the bottom of heel cup **404** reaches the ground thereby creating a vertical tension between anchoring fastener **104** on second attachable leg shaft **1304** and the bottom of heel cup **404** on the overshoe.

[0115] There are many alternative multi-part footwear embodiments contemplated. Each embodiment includes at least two separate components to the footwear such as an ankle boot with a separate attachable leg shaft; an overshoe (with or without a leg shaft) with a separate attachable leg shaft; a separate boot that could be inserted into a galosh; and the like. Each embodiment includes a stretch segment, a flexible sole and heels that are flat to any height or a heel cup/heel area for heels that are flat to any height. Multi-part footwear embodiments include, but are not limited to: anchoring fastener on attachable boot leg shaft in conjunction with top part of heel tension fastener on attachable boot leg shaft, and lower part of heel tension fastener on ankle boot at the stretch segment; anchoring material is attachable boot leg shaft in conjunction with top part of heel tension fastener on attachable boot leg shaft, and lower part of heel tension fastener on ankle boot at the stretch segment; anchoring frame on attachable boot leg shaft in conjunction with top part of heel tension fastener on anchoring frame and lower part of heel tension fastener on ankle boot at the stretch segment; anchoring fastener on attachable boot leg shaft in conjunction with flex-angle sole on ankle boot; anchoring material is attachable to boot leg shaft in conjunction with flex-angle sole on ankle boot; anchoring frame on attachable boot leg shaft in conjunction with flex-angle sole on ankle boot; anchoring fastener on attachable overshoe leg shaft in conjunction with top part of heel tension fastener on attachable overshoe leg shaft and lower part of heel tension fastener on overshoe at stretch segment; anchoring material is attachable overshoe leg shaft in conjunction with top part of heel tension fastener on attachable overshoe leg shaft and lower part of heel tension fastener on overshoe at stretch segment; anchoring frame on attachable overshoe leg shaft in conjunction with top part of heel tension fastener on anchoring frame and lower part of heel tension fastener on overshoe at stretch segment; anchoring fastener on attachable overshoe leg shaft in conjunction with shortened heel cup/heel area on overshoe; anchoring material is attachable overshoe leg shaft in conjunction with shortened heel cup/heel area on overshoe; anchoring frame on attachable overshoe leg shaft in conjunction with shortened heel cup/heel area on overshoe; anchoring fastener on attachable overshoe leg shaft in conjunction with flex-angle sole on overshoe; anchoring material is attachable overshoe leg shaft in conjunction with flex-angle sole on overshoe; anchoring frame on attachable overshoe leg shaft in conjunction with flex-angle sole on overshoe; anchoring fastener on separate insertable boot in conjunction with top part of heel tension fastener on leg shaft and lower part of heel tension fastener on separate galosh; anchoring material is boot leg shaft of separate insertable boot in conjunction with top part of heel tension fastener on leg shaft and lower part of heel tension fastener on separate galosh; anchoring frame on separate insertable boot in conjunction with top part of heel tension fastener on anchoring frame and lower part of heel tension fastener on separate galosh; separate insertable boot in conjunction with anchoring fastener on separate galosh; and flex-angle sole on separate galosh; separate insertable boot in conjunction with anchoring material on separate galosh and flex-angle sole on separate galosh; and separate insertable boot in conjunction with anchoring frame on separate galosh and flex-angle sole on separate galosh.

Attachable Heel Stabilizer

[0116] If the footwear has an upper with some kind of anchoring mechanism (fastener, material, and/or frame) and an upper with a heel area that can function as a stretch segment and a flexible sole, then a separate attachable anchoring fastener and heel tension fastener could be added to the footwear to increase balance while walking. The anchoring fastener and heel tension fastener can be attached to the footwear with industrial strength hook-and-loop stick-on type; by a shoemaker's sewing machine; or by some other means, be it permanent or semi-permanent, as long as it cannot easily be removed.

[0117] FIG. **14** shows an illustrative attachable heel stabilizer. As shown, in one embodiment there is attachable anchoring fastener **1404**, such as a hook-and-loop fastener that when attached for example, to a footwear leg shaft, when secured closed will hold the leg shaft snugly to the wearer's

leg. There is attachable heel tension fastener **1402**, which in one embodiment is hook-and-loop and a ring that is attached to a strip of webbing. The lower portion of attachable heel tension fastener **1402** is attached to a portion of the stretch segment of neoprene while leaving approximately one inch of the stretch segment beneath the heel tension attachment point free to stretch. The upper portion of attachable heel tension fastener **1402** is attached above the heel tension attachment point and is beneath and/or at attachable anchoring fastener **1404** or below and/or at the anchoring material or anchoring frame. At heel strike, the wearer experiences increased stability when a portion of the stretch segment on the footwear upper that is being cinched up by attachable heel tension fastener **1402** while leaving approximately one inch of the stretch segment beneath the heel tension attachment point free to stretch downward between attachable anchoring fastener **1404** on the leg shaft and the bottom of the heel or heel area of the footwear as it reaches the ground.

In Use

[0118] In use the wearer puts footwear on feet. The wearer then closes zipper or other top or side closing means if there is one on the footwear. While sitting, the wearer then raises heel while keeping ball of sole of footwear on floor. If an anchoring fastener is provided on the footwear, the wearer then closes the anchoring fastener snugly around the ankle. If a tension fastener is provided on the footwear, the wearer then adjusts the heel tension fastener on the footwear. This can be done for example, by pulling heel tension fastener hook-and-loop tab down from the upper tension attachment point, through a ring, then pulling upward on the tab which cinches up a portion of the neoprene stretch segment while leaving approximately one inch of the stretch segment beneath the heel tension attachment point free to stretch which results in the wearer feeling an upward tug at the heel. Then the wearer closes the heel tension fastener tab onto itself.

[0119] After following the above steps, the heel stabilizer is engaged, and the wearer feels a vertical tension at heel strike between the anchoring mechanism and the sole of the heel of the footwear.

[0120] Alternatively, it is contemplated that the footwear manufacturer could set the heel tension fastener to a position that would be suitable for any wearer having that footwear size. In this embodiment, the user would not need to adjust the heel tension fastener.

[0121] Similarly, in the overshoe case, the manufacturer could set the heel tension fastener (or cinch/tack up some of the fabric by stitching, stapling or some other means) to a fixed position (outside or inside the overshoe) desirable for a pre-determined inner shoe heel height range. In such a case, for example, a user would select one overshoe for high heels up to 2" high, and another overshoe for high heels above 2". The user would not need to adjust the heel tension fastener.

Alternative Overshoe Embodiments

[0122] Alternatively the overshoe can encompass the following elements: a flexible, waterproof upper, reaching above the ankle bone and concealing the structural features of the overshoe; a flexible waterproof sole, in alternative embodiments; a component that centers and stabilizes the foot atop the shoe providing a means to resist lateral ankle flex and heel toppling; and a well in the sole's heel to receive the high heel and the bottom of the stay component. FIGS. **18** and **24** illustrate these elements; e.g. upper, sole, and stay.

[0123] As contemplated, the shoe upper comprises features such as a slippery stretch lining for ease of entry into the boot. In a preferred embodiment such lining is satin. Preferably the shoe upper further comprises an outer surface that will shed water, and be soil resistant. In one embodiment, the material is neoprene with bonded stretch fabric faces. Preferably, the upper is waterproof or water resistant and elastic to conform to the contours of the shoe contained therein, and to permit ease of entry. The upper portion of the upper is manufactured with an open top that is very wide to permit ease of entry into the boot. The excess width is then collapsed into the front area around the ankle with the sides of the boot folding forward around this collapsed area. Preferably the upper is bonded into an elastomeric sole. The upper portion of the upper has a cuff that extends around the non-collapsing portion of the boot opening, essentially from a position even with the front edge of the ankle when seen from the side, thence rearward around back of the boot and forward to a symmetrical stopping point on the other side. The cuff conceals the ankle strap, thus at the front of the boot, when the boot is in use, the cuff will cross over itself.

[0124] Design parameters of the upper include: the creation of a liner surface that will not inordinately chafe the appearance surface of the shoe within; the use of a material for the upper that will flex enough to accommodate decorative elements on the shoe, yet not have so much flexibility that support is lost; ease of putting on and taking off through the use of a properly shaped boot opening and flexible materials; creation of a shape with as few seams as possible; and shaping the upper to accommodate ankle flex as comfortably as possible. FIGS. **42-45** illustrate samples of closing means. As illustrated in FIG. **42**, strap **4202** emerges through elongated grommet **4204**, is looped through metal ring **4206**, and secured with a securing means such as VELCRO **4208**. As illustrated in FIG. **43**, a combination of zipper **4302**, strap **4304** and grommets **4306** can also provide a means of closing and securing. Strap **4304** is looped through ring **4308** and secured via securing means such as VELCRO **4310**. FIG. **43***a* provides an open view, FIG. **43***b* provides a closed view, and FIG. **43***c* provides a top view. FIG. **44** provides an illustration of a strapless closure. As shown, band **4402** serves to compress cuff upon zipper **4404** closure. Preferably band **4402** is of a moderately stretchy fabric. FIG. **45** provides a further representation of a closing means, illustrating zipper **4502** used in conjunction with strap attachment **4504**.

[0125] As contemplated, the shoe sole of the overshoe shall be constructed of an elastomeric material that provides non-skid features through both material properties and tread design. The sole material must also have enough structural integrity to withstand the extremely high loads, inherent in the heel strike of a high-heeled shoe. This force has been measured at over 1000 pounds per square inch. It may be required to incorporate fibrous materials or other reinforcing means into this elastomeric compound, especially in the bottom of the heel area. To achieve the level of integrity required, the inside of the heel well will be shaped to receive the ankle-stabilizing stay, to be discussed later. Because the most popular high heeled shoes have a minimum height of 2¼", the design guidelines accommodate a range from 2⅛" to 3½". An additional feature of this stay assembly is a set of ridges or indentations, which are designed to interlock with matching indentations or ridges on the inside surface of the sole's heel

cup. In one embodiment, the sole includes an opening, allowing for protrusion by the heel cup. In this embodiment, the heel cup penetrates the sole and is fixed in place in the sole to form a watertight joint. The protruding heel cup then forms the visible portion of the overshoe. In an alternate embodiment, the heel cup nests within the sole. See for example FIGS. **39** and **40**. FIG. **41** further illustrates the stay, sole and back loop. The back loop (or strap retainer) can be used for example when using an ankle strap as a closure means or to attach the stay loosely to the fabric of the overshoe.

[0126] Design parameters of the sole's design include: allowance for variation in heel height, and the resulting effect on the distance between the heel and toe relative to the ground plane. Due to this variation, a certain amount of front to rear compliance, must be designed into the overshoe. This can be done either by allowing the receptacle for the shoe heel to have a front to rear dimension that allows a heel tip to migrate fore and aft as needed or in a less desirable design, allowing the forward and rearward portion of the shoe to collapse one into the other with a bellows arrangement, such as with an internal sliding track connector. Further design parameters include: an attractively styled sole that minimizes any apparent visual bulk in the heel area; and providing a means to address material integrity under the heel. Material integrity under the heel can be addressed for example through selection of durable material for the sole; by allowing the heel cup of the stay to protrude through the sole material to become a hard point that is fixed in place in the sole to form a watertight joint, the protruding heel cup then forms the visible heel of the overshoe. This example could be facilitated for example, by creating a stretch-fit hole in the sole that would engage with the heel to provide a stylish waterproof joint. In another embodiment the stay is designed to have the entire lower portion extend through the sole, so that the overshoe's sole goes no lower than the top of the heel spike (in other words there is a "tongue" that is essentially an extension of the stay component at the front of the heel cup such that the "tongue" would form the outsole of the overshoe in whole or in part thus requiring that the overshoe upper be attached to it or, the "tongue" could lay directly or indirectly on top of the inside portion of the outsole of the overshoe loosely or by attachment. FIG. **36** illustrates variation in heel height, and the resulting effect on the distance between the heel and toe relative to the ground plane.

[0127] As contemplated the stay shall provide ankle support. It has a number of features that work together to provide a combination of lateral support, lateral centering, easy ankle flexure (front to rear), and comfort for the user. The goal of the stay is to provide resistance to lateral movement, especially lateral tilting of the ankle relative to the shoe sole. It does this through the use of two vertical members located on each side of the ankle. When the ankle tips to one side, one of these vertical members goes into tension, while the other goes into compression. FIGS. **20** and **26** illustrate the internal stay. It is noted that the stay can also be formed as a two part design. In this design the upper and lower portions of the stay are connected by means of a joint such as a pivot or flexing joint. In this embodiment, the upper portion of the stay comprises an ankle collar having two downwardly extending strips on each side. The lower portion comprises a heel cup having upwardly extending projections. These upwardly extending projections and downwardly extending strips are joined.

[0128] These tension/compression loads are transmitted to the bottom of the stay, where the integral heel cup area is constrained from movement by the heel of the high-heeled shoe itself. At the top of the stay, these loads are transmitted to a padded, ergonomically formed collar that is strapped around the ankle. This strap simultaneously acts as closure for the opening of the boot itself.

[0129] This strap is held in place by a molded loop at the rear upper edge of the stay collar. At the front, both ends of the strap fit through slender elongated eyelets in the expanding portion of the upper. One end of the strap is stitched to a turning ring, while the other has a fastener such as a hook and loop fastening fabric sewn to it and to the upper's exterior. As the strap is pulled taut, and the hook and loop fabric is fastened, it simultaneously snugs-up the collar and closes the boot opening. Then the cuff on the upper is folded down to hide the strap. In this embodiment, the stay essentially takes all loading, while the upper simply conforms to the foot attractively. FIGS. **19** and **26** illustrate the internal stay with strap. FIG. **34** provides a cross-section, illustrating elements such as cuff **3402**, stay **3404** and upper **3406**. Components of an exemplary fastening means are also illustrated including strap **3408**, strap retainer **3410**, ring **3412**, ferrule **3414**, and hook and loop fastener **3416**. Leg **3418** is also shown.

[0130] The stay would preferably be made of polycarbonate, or high density polyethylene or other durable flexible polymer. The stay would be preferably lined with a thin layer of polyethylene, ethylene vinyl acetate (EVA) or similar foam for comfort. For the stay to add stability, it is important that it be fit snugly around the ankle. Therefore proper shaping of the stay collar and the foam liner are essential in encouraging the user to apply adequate cinching of the strap. Foam would also be affixed to the front portion of the upper in the same area.

[0131] While lateral movement of the ankle is to be limited, fore and aft movement of the ankle is vital to walking. This design has as its primary configuration a narrowed section of the above-mentioned vertical members in the region of the wearer's ankle that is designed to flex fore and aft with the ankle as a result of its narrower, and thus more flexible cross section. Alternate embodiments of this flexing area could include a physical pivot axis (for example a pin or rivet,) or an elastomeric or other flexible material used as a localized joint on each side of the wearer's ankle joint. The lower portion of the stay has upwardly facing protruding fences to contain the shoe sole and the users' foot.

[0132] At the very bottom of the stay is the heel cup. The heel cup would have several features to receive and anchor the heel in a predictable way. First, it is important to prevent the heel from sliding around inside the heel cup when under load. Therefore, a texture or small points should be used facing upwards on the floor of the heel cup to prevent slippage, especially when under load. In order to accommodate different sized heel cross-sections, a centering device would be inserted into the heel cup during manufacture, or molded in situ. It would have appendages or flexible surfaces that would serve to guide the heel to the center as the user puts on the overshoe. FIG. **27** illustrates a heel centering insert. FIG. **28** illustrates placement of said insert. FIG. **38** (A-D) illustrates alternative heel centering approaches. Preferably the rear heel guide ends at the proximal end of the calcareous bone so that it will not rub on the back of the heel of the wearer's foot. FIG. **38**(A) illustrates flexing fins to provide for heels of differing shapes and sizes. Alternatively this heel centering device could be an insert. Small heel **3802** and large heel **3804** are shown. FIG. **38**(B) illustrates a foam type heel centering

device. Alternatively this device can be an insert. The foam type devices includes hard, flexible face **3806** and foam under **3808**. Polyethylene, EVA and similar type "foam" is envisioned. FIGS. **38**(C) and **38**(D) each illustrate examples of heel centering devices comprising friction surfaces. As shown, the inside bottom of the heel cup has treading **3810** or other gripping protrusions **3812**. Such treading, gripping protrusions or other means of providing friction can also be provided on the heel cup inner sides.

[0133] As a high-heeled shoe's heel gets taller, the user's heel is rotated up and forward, shortening the distance between the toe contact area and the heel tip contact area on the floor. Thus for a certain individual who uses this overshoe with different height heels, the heel tip will contact the bottom of the heel cup at different points front to rear. This centering device should permit for a range of fore and aft positions to accommodate different height high heels and their relative positions. FIG. **35** illustrates the relative positioning of the heel tip in response to varying heel heights.

[0134] In order to mold the heel cup, a number of approaches are possible. The simplest of these, from a molding standpoint, is to separate the front surface of the heel cup from the rest of the stay component to permit the core of the mold to insert itself into the rear of the heel cup. This creates a front door for the heel cup, which can either be formed as a separate piece or attached via a living hinge, later to be pivoted into place. This front surface of the heel cup provides essential structural integrity to the stay in its stabilization role. From a structural standpoint, this door acts as a spreader between the two sides of the heel cup and resists the flexure that the lateral straps attempt to induce as they stabilize the foot. Therefore, whatever method is used to affix this to the front of the heel cup must be structurally sound.

[0135] A two part heel cup can be created by several means. One example is to use mating crenellations which interlock prior to being ultrasonically welded together. A second example is to use a living hinge at the bottom and two pins that locate through holes in the door and are ultrasonically staked and melted to affix the door into position. Other more complex solutions could include snap fit designs, but it must be kept in mind that constant movement of a user's foot should not be able to dislodge this component.

[0136] FIGS. **29-31** illustrate alternative two part heel cups. In FIG. **29** an integrally molded cover can flip up via a hinge. As illustrated pins protrude through holes and are sealed. In FIG. **30** a notched front face mates with internal ridges. The joint is then sealed. In FIG. **31** the crenellated front face mates with the matching edge. The joint is then sealed. Also illustrated in FIGS. **29-31**, the stepped ridges around the outer surface of the heel cup which mate with matching ridges on the inside of the sole. These ridges could also be molded on the outer surface of the heel cup's front door for an even more firm joint between the heel cup and the sole.

[0137] A one piece stay design having a fully enclosed heel cup is contemplated. Alternatively, the stay can be molded in two parts. This can be done by separating the upper and lower portions of the stay and connect them using a pivot or separate flexing joint, (as mentioned earlier). The upper part would consist of the ankle collar with two downwardly extending strips on each side. The lower portion would have a closed heel cup, the upwardly extending fences and the upwardly extending strips that would join the upper portion via a joint. This would permit a structurally sound heel cup yet still keep the mold fairly simple.

[0138] To use this alternative overshoe embodiment, the wearer would insert the foot and high-heeled shoe into the boot. Then the hook and loop strap is inserted through the ring and is pulled comfortably tight. Finally, the cuff is rolled down to cover the strap. FIGS. **15** and **21** illustrate an alternative overshoe embodiment with boot open and cuff up. FIGS. **16** and **22** illustrate an alternative overshoe embodiment with boot closed and cuff up. FIGS. **17**, **23**, and **33** illustrate an alternative overshoe embodiment with boot closed and cuff folded, an "in use" view. It is noted that a variety of means to close the boot would be readily apparent to one of ordinary skill in the art.

[0139] Additional embodiments are contemplated. For example, the heel cup could be oversized with centering features or could be specific to individual heel tip dimensions; the heel cup could have a wide lateral dimension that would afford stability to the shoe only and would give a more stable base upon which the wearer's foot could sit. Also, the shoe could be stabilized around the toe by a docking mechanism with a rear opening heel cup. In such an embodiment, the high heel shoe wearer essentially walks on her toes while the heel and the sturdy arch stabilize the toe.

[0140] The stay embodiment as well as the compression embodiment (with the heel tension fastener) tie the high heel shoe to the foot like an extension of the leg which minimizes side-to-side teetering, while the toe docking embodiment may not affect that lateral movement but does increase stability in a more limited way.

[0141] The means to stabilize the ankle relative to a high-heeled shoe heel is a central design feature. In a preferred embodiment the heel cup and its pivoting/or flexing upwardly extending stabilizing arms is coupled with the ankle surrounding collar and thereby comprises a complete stabilizing/coupling mechanism for the foot/high heel's heel.

[0142] There have been many devices to stabilize the ankle after injury, some of these are stand-alone items and some of these are integrated into shoes. However the present application provides a solution to the need for supporting an ankle above a high heel shoe's heel. This requires both a lateral support method and a downward anchoring method to in essence make the high-heeled shoe's heel an extension of the user's calf and ankle. When this stabilizing element is then incorporated into an aesthetic shoe covering device there is provided one embodiment of the product. This stabilizing function will however also work in fact in the absence of a shoe, as it requires only the heel.

[0143] Thus disclosed herein are varying stabilizing mechanisms for laterally aligning a wearer's lower leg and ankle with the heel portion and extended heel element of shoes of any heel height, this mechanism being integral with, or removably attached to an overshoe.

[0144] A further example of an exemplary embodiment comprise a cuff, pivoting or flexing side members having specific control over permissible and impermissible movement types, a heel receptacle, and an optional heel tip centering device within the cup. The cuff snugly circles the lower leg above the ankle bone on at least two sides. The cuff can be molded into a shape, it can be held closed by a tension mechanism such as but not limited to a strap and/or it can be held closed by closure of the overshoe itself. The cuff is attached to rigid side members so that the cuff can pivot only fore and aft in tandem with the ankle's natural fore and aft movement, while restricting sideward bending, or it is attached to flexible side members so that the cuff can only move fore and aft in

tandem with the ankle's natural fore and aft movement, while restricting sideward bending The cuff can further cover the back of the ankle and/or above ankle area in whole or in part, it may also cover the front of the ankle and/or above ankle area in part or, if in whole, an opening is required.

[0145] In varying embodiments, the side members: are attached to, or conjoin with the lower portion of the cuff at least at two sides; are rigid; are flexible; are attached to the sides of the heel cup, or an upward projection thereof; and/or are attached to the insole and/or inside sides of the overshoe

[0146] In varying embodiments the heel cup: is attached to or conjoined with the lower end of the side members; is attached to the insole and/or inside sides of the overshoe; has treading or other gripping protrusions on the inner bottom and/or inner sides; is internal and/or external to the overshoe; and/or has features on it to receive and guide a shoe's heel into said cup during insertion of the wearer's foot and shoe into the stabilizing overshoe.

[0147] In varying embodiments the optional heel tip centering device inside heel cup: is inserted during manufacture or molded in situ; and may have appendages and/or flexible surfaces that would serve to guide the heel to the center as the wearer puts on the overshoe

Ornamental Features

[0148] The invention disclosed herein provides both aesthetic satisfaction and physical functionality. It is therefore contemplated that the functional features as disclosed can be incorporated into design elements, and/or sandwiched between material layers of the footwear. Thus, components such as the heel tension fastening means, cinching up means and/or ankle strap means could also provide ornamentation or could be partially or completely hidden inside the footwear.

[0149] Having now described embodiments of the invention, it should be apparent to those skilled in the art that the foregoing is merely illustrative and not limiting, having been presented by way of example only. Numerous modifications and other embodiments are within the scope of one of ordinary skill in the art and are contemplated as falling within the scope of the invention and any equivalent thereto. It can be appreciated that variations to the present invention would be readily apparent to those skilled in the art, and the present invention is intended to include those alternatives. Further, since numerous modifications will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation illustrated and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the invention.

What is claimed is:

1. A stabilizing overshoe comprising:

a cuff, wherein said cuff circles a lower leg of a user above the user's ankle bone on at least two sides;

side member(s), wherein said cuff is attached to said side member(s), and wherein said side member(s) allow for fore and aft movement of said overshoe while restricting sideward bending; and

a heel receptacle; wherein said side member(s) are attached to or conjoin with said heel receptacle, or an upward projection thereof.

2. The stabilizing overshoe of claim **1** further comprising:

a heel tip centering device, wherein said device is within said heel receptacle or is insertable into said heel receptacle.

3. The stabilizing overshoe of claim **1**, wherein said cuff is of a moldable material.

4. The stabilizing overshoe of claim **1** further comprising:

a tension mechanism, wherein said cuff is closable by said tension mechanism

5. The stabilizing overshoe of claim **1** further comprising:

a closing means, wherein said cuff is closable by said closing means.

6. The stabilizing overshoe of claim **1**, said heel receptacle comprising an inner surface and an outer surface, said inner surface comprising a bottom and sides; said heel receptacle further comprising treading or gripping protrusions on at least one of the inner bottom or the inner sides.

7. The stabilizing overshoe of claim **2** said heel tip centering device having a center, and said heel tip centering device further comprising at least one of appendages or flexible surfaces to guide a heel of a shoe to said center.

8. The stabilizing overshoe of claim **1**, wherein said side member(s) are rigid.

9. The stabilizing overshoe of claim **1**, further comprising a sole, said sole comprising an opening, wherein said opening allows for protrusion by said heel receptacle.

10. The stabilizing overshoe of claim **9**, wherein said heel receptacle protrudes through said sole opening and is fixed to said sole to form a watertight joint.

11. The stabilizing overshoe of claim **10**, wherein said heel receptacle forms an outwardly visible portion of said overshoe.

12. The stabilizing overshoe of claim **5**, wherein said closing means is a fastener.

13. The stabilizing overshoe of claim **1**, further comprising an upper, wherein said upper conceals said side member(s).

14. The stabilizing overshoe of claim **1**, further comprising a sole, said sole comprising a material having structural integrity to withstand at least 1000 pounds per square inch heel strike force.

15. The stabilizing overshoe of claim **1**, said side member (s) further comprising a set of side member ridges or indentations, and said heel receptacle further comprising a set of heel receptacle ridges or indentations, wherein said side member(s) ridges or indentations interlock with said heel receptacle ridges or indentations.

16. The stabilizing overshoe of claim **1**, wherein said side member(s) and said heel receptacle are connected by means of a pivot or flex joint.

17. The stabilizing overshoe of claim **16**, said heel receptacle further comprising upwardly extending projections, and wherein said upwardly extending projections are connected to said side member(s) by means of a pivot or flex joint.

* * * * *