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(54) **SKATE BOOT CONSTRUCTION WITH INTEGRAL PLASTIC INSERT**

SCHLITTSCHUH MIT EINGEBAUTER KUNSTSTOFFEINLAGE

CHAUSSURE DE PATINAGE A PIECE RAPPORTEE MONOBLOC EN MATIERE PLASTIQUE

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EP-A- 0 117 372 **EP-A- 0 389 215**
WO-A-89/09552 **DE-A- 1 785 151**
GB-A- 1 106 958 **US-A- 4 385 456**

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Description

[0001] This invention relates to a boot construction, especially for ice skates or in-line roller skates, but not necessarily limited to same.

[0002] In skate boots, there are somewhat conflicting requirements for rigidity and comfort which, particularly in recent years, have led to increasingly sophisticated boot constructions in the perhaps never-ending quest for the "perfect" skate. In high-end skates such as those worn by professional hockey players, the twin requirements of rigidity and comfort are magnified. Performance must be optimized, and frequent wearing demands comfort, not just for the sake of comfort itself, but also to prevent blistering or other forms of injury to the foot (short term or long term).

[0003] One means which has been used in skates to increase rigidity is to employ plastic ankle inserts and heel counter inserts, sewn in between the layers of various materials which make up the boot. When skates are relatively new, this is fairly effective both in terms of rigidity and comfort. After considerable use of the skate, however, the leather and other materials naturally soften and become less rigid from repeated flexing, with the result that the upper ankle portion of the boot tends to slump down onto or over the heel counter, typically creating a ridge on the inside of the skate. This ridge bears against the Achilles' tendon, and thus creates a pressure point which results in decreased comfort and potential for blistering or other injury.

[0004] One also knows a skate boot comprising, all permanently secured together:

- a non rigid outer configured to form a boot shape including a heel area and an ankle area above said heel area, said heel and ankle areas having rear, lateral and medial areas;
- cushioning means positioned inwardly from said outer;
- an inner lining positioned inwardly from said outer and said cushioning means;
- a plastic insert positioned between said outer and said inner lining for adding rigidity to said skate boot, said plastic insert including an ankle portion extending upwardly from said rear area of said heel area and including forwardly projecting lateral and medial wing portions which cup around said ankle area, along said lateral area and said medial area respectively.

[0005] Document US-A-4,385,456 (upon which the preamble of claim 1 is formed) discloses such a skate boot, in which a preformed lining component reinforces the rigidity of the skate boot at the expense of flexibility and comfort.

[0006] Besides, a ski boot is disclosed in document WO-A-89/09552 which features a reinforcement component having cut-outs on either sides to permit bending

of the boot. However, this reinforcement part provides no added comfort to the wearer.

[0007] The present invention is aimed specifically at avoiding the above problems, and generally at providing an improved skate boot.

[0008] To this end, according to the invention, a skate boot of the kind in question is characterized in that said plastic insert is an integral plastic insert made in one piece;

in that said integral plastic insert is positioned between said outer and said cushioning means, in that said integral plastic insert includes a generally U-shaped heel counter portion which cups within said heel area, running from along said lateral area, across said rear area and along said medial area, said heel counter portion having separate lateral and medial side segments extending partially along each side of said outer and partially underneath an insole of said skate boot, said side segments being joined together at the rear end of said skate boot, thereby forming a structure which is open at the bottom;

in that said lateral and medial winged portions of the ankle portion include dished areas shaped to overlie the skater's malleoli; and

in that said wing portions of the ankle portion and said lateral and medial side segments of said heel counter portion are separated by a pair of slots, whereby said integral plastic insert does not substantially restrict flexing of a person's ankle while wearing the skate boot.

[0009] Other features of the invention are mentioned in the depending claims.

[0010] The concept of the invention, i.e. the use of a one-piece plastic insert where separate pieces have been used before, is quite simple. However, in practice this has been difficult to achieve, and does not appear to have been previously considered, since conventional boot manufacturing assembly sequences have had to be changed to accommodate insertion of the one-piece insert. It has therefore not been natural to try this approach, due to the process changes involved, and has required a change in approach and thinking.

[0011] Further features of the invention will be described or will become apparent in the course of the following detailed description.

[0012] In order that the invention may be more clearly understood, the preferred embodiment thereof will now be described in detail by way of example, with reference to the accompanying drawings, in which:

- Figure 1 is an exploded perspective view of the preferred embodiment of the skate boot;
- Figure 2 is a perspective view of the skate boot, cut open to show details of the construction;
- Figure 3 is a right side elevation of the skate, in

cross-section, after positioning of the insert, but prior to positioning of the cushioning means and lining;

- Figure 4 is a right side elevation view of the skate, in cross-section, after positioning of the insert and the cushioning pack of flowable material, but prior to positioning of the neoprene rubber pad and of the lining, showing the lateral side of the insert and cushioning pack;
- Figure 5 is a left side elevation view of the skate, in cross-section, corresponding to figure 4, and showing the medial side of the insert and cushioning pack;
- Figure 6 is a right side elevation view of the skate, in cross-section, after positioning of the insert, the cushioning pack of flowable material and the neoprene rubber pad, but prior to positioning of the lining;
- Figure 7 is an elevation view of the cushioning pack laid flat;
- Figure 8 is a plan view of the cushioning pack; and
- Figure 9 is a cross-sectional view of a portion of the cushioning pack, at 9-9 of figure 8.

[0013] All of the drawings are of a left skate. Referring to the drawings, the invention will now be described in greater detail. Figure 1 shows the various components of the skate boot in exploded fashion. From the outside to the inside, the skate boot is made up of:

- a typical skate boot outer 2, conventionally having various layers of leather, plastic, ballistic nylon and/or other materials portions sewn together;
- the plastic insert 4 of the present invention;
- cushioning means such as, preferably, a cushioning pack 6 of flowable gel-like material which will conform to the particular individual's ankle shape, and neoprene rubber pads 8; and
- a soft material lining 10, preferably having a thin foam layer 12 bonded to the outside thereof.

[0014] The essence of the present invention resides in the one-piece plastic ankle/heel counter insert 4. It is made of a suitable plastic such as thermoplastic polyurethane, and is relatively thin (about 2.5 mm at its thickest central portions, thinning near the edges down to zero) so as to not add too much weight to the skate. Because it is fairly thin, it is somewhat flexible, but nevertheless does add a fair amount of rigidity to the overall structure of the boot.

[0015] The insert includes lateral and medial side portions 14 and 16 which extend forward from the heel area 18; a rear ankle portion 20 extending upwardly from the heel area; lateral and medial wing portions 22 and 24 arranged to overlie the malleoli of the skater's ankle; and lateral and medial cuff portions 26 and 28 to wrap partially around the skater's upper ankle.

[0016] Preferably, in order to be as nearly anatomically correct as possible, the lateral and medial wing por-

tions include dished areas 30 and 32 to accommodate the malleoli. The boot outer 2 preferably includes recesses 33 to accommodate these dished areas.

[0017] To permit flexing of the ankle with minimal restriction, slots 35 preferably are provided between the wing portions and the side portions 14 and 16.

[0018] The additional cushioning means preferably includes a cushioning pack 6 of flowable gel-like material which will conform to the particular skater's ankle shape. (One such material is that supplied by ALDEN LABORATORIES, Inc. of Boulder, Colorado under its FLO trademark.) The preferred cushioning pack is shown in greater detail in figures 7-9, and includes lateral and medial gel pouches 34 and 36 defined between thin layers of plastic, preferably but not necessarily connected by an integral neck portion 38. The cushioning pack may include lateral and medial closed areas 40 and 42, which approximate the path followed by the lateral and medial malleoli when the ankle is flexed, for even greater anatomical correctness and hence comfort and performance. The cushioning pack preferably is overlaid by thin pads 8, of 1/8 inch (3,2 mm) neoprene rubber for example. This is followed by the soft material lining 10, such as a synthetic leather, the lining preferably having a thin foam layer 12 bonded to the outside thereof.

[0019] With the integral or one-piece construction of the insert 4, the ankle portion 20 cannot slump down onto the heel portion 18 with time, which is the problem in the prior art which this invention avoids. The blister-causing pressure point which often results once skates have been used for a length of time, is thus avoided.

[0020] It will be appreciated that the above description relates to the preferred embodiment by way of example only. Certain variations on the invention will be obvious to those knowledgeable in the field, and such obvious variations are within the scope of the invention as claimed, whether or not expressly described herein.

[0021] For example, it should be clearly appreciated that the invention is not restricted to the specific configuration of insert as illustrated herein. Many variations in shape could be contemplated which would still employ the principle of this invention.

[0022] For example, as one example only, the slots 35 could be omitted, i.e. the wing portions could be directly connected to the heel portion. This would restrict flexing of the ankle somewhat, and would therefore not be optimal, but would still be within the scope and spirit of the invention.

[0023] The invention provides an improved skate boot, with better comfort and a longer effective life.

Claims

1. A skate boot comprising, all permanently secured together:

- a non rigid outer (2) configured to form a boot shape including a heel area (18) and an ankle area above said heel area, said heel and ankle areas having rear, lateral and medial areas;
- cushioning means (6, 8, 12) positioned inwardly from said outer;
- an inner lining (10) positioned inwardly from said outer (2) and said cushioning means (6, 8, 12);
- a plastic insert (4) positioned between said outer (2) and said inner lining (10) for adding rigidity to said skate boot, said plastic insert including an ankle portion (20, 22, 24) extending upwardly from said rear area of said heel area and including forwardly projecting lateral and medial wing portions (22, 24) which cup around said ankle area, along said lateral area and said medial area respectively,

characterized in that said plastic insert (4) is an integral plastic insert made in one piece;

in that said integral plastic insert (4) is positioned between said outer (2) and said cushioning means (6, 8, 12),

in that said integral plastic insert (4) includes a generally U-shaped heel counter portion (18, 14, 16) which cups within said heel area, running from along said lateral area, across said rear area and along said medial area, said heel counter portion (18, 14, 16) having separate lateral and medial side segments (14, 16) extending partially along each side of said outer (2) and partially underneath an insole (50) of said skate boot, said side segments (14, 16) being joined together at the rear end of said skate boot, thereby forming a structure which is open at the bottom;

in that said lateral and medial wing portions (22,24) of the ankle portion include dished areas (30,32) shaped to overlie the skater's malleoli; and

in that said wing portions (22, 24) of the ankle portion and said lateral and medial side segments (14, 16) of said heel counter portion are separated by a pair of slots (35), whereby said integral plastic insert does not substantially restrict flexing of a person's ankle while wearing the skate boot.

2. A skate boot as defined in claim 1, wherein the ankle portion (20, 22, 24) of said integral plastic insert (4) comprises a rear ankle portion (20) extending upwardly from said winged portions (22,24) of said ankle portion, said rear ankle portion being connected to lateral and medial cuff portions (26,28) which also belong to the integral plastic insert (4) and which are designed to wrap partially around the back of

the skater's upper ankle.

3. A skate boot as defined in claim 1 or claim 2, wherein said cushioning means comprise at least a cushioning pack (6) which includes lateral and medial gel pouches (34,36) adapted to conform to the particular shape of the skater's ankle.
4. A skate boot as defined in claim 3 wherein said lateral and medial gel pouches (34,36) are connected by an integral neck portion (38).
5. A skate boot as defined in any one of the preceding claims, wherein said medial side segment (16) is longer than said lateral side segment (14).
6. A skate boot as defined in any one of the preceding claims, wherein the outer (2) includes recesses (33) in an area of the ankle to accommodate said dished areas (30,32) of said wing portions (22, 24).

Patentansprüche

1. Schlittschuh bzw. Rollschuh mit folgenden Komponenten, die alle dauerhaft aneinander befestigt sind:

- einem nachgiebigen Außenschuh (2), der so konfiguriert ist, daß er eine Stiefelform mit einem Absatzbereich (18) und einem Knöchelbereich oberhalb des Absatzbereichs bildet, wobei der Absatz- und Knöchelbereich einen hinteren, lateralen und medialen Bereich haben;
- einer Polstereinrichtung (6, 8, 12), die vom Außenschuh nach innen positioniert ist;
- einem Innenfutter (10), das vom Außenschuh (2) und von der Polstereinrichtung (6, 8, 12) nach innen positioniert ist;
- einer Kunststoffeinkle (4), die zwischen dem Außenschuh (2) und dem Innenfutter (10) positioniert ist, um dem Schlittschuh bzw. Rollschuh zusätzliche Steifigkeit zu verleihen, wobei die Kunststoffeinkle einen Knöchelabschnitt (20, 22, 24) aufweist, der sich vom hinteren Bereich des Absatzbereichs nach oben erstreckt und einen nach vorn vorstehenden lateralen und medialen Flügelbereich (22, 24) aufweist, die den Knöchelbereich entlang dem lateralen Bereich bzw. dem medialen Bereich umfassen,

dadurch gekennzeichnet, daß die Kunststoffeinkle (4) eine einteilige Kunststoffeinkle ist, die in einem Stück hergestellt ist;

daß die einteilige Kunststoffeinkle (4) zwischen dem Außenschuh (2) und der Polsterein-

richtung (6, 8, 12) positioniert ist;
 daß die einteilige Kunststoffeinklebe (4) einen
 allgemein U-förmigen Absatzsteifenabschnitt
 (18, 14, 16) aufweist, der sich in den Absatzbe-
 reich einpaßt und dabei entlang dem lateralen
 Bereich, über den hinteren Bereich und entlang
 dem medialen Bereich verläuft, wobei der Ab-
 satzsteifenabschnitt (18, 14, 16) ein gesonder-
 tes laterales und mediales Seitensegment (14,
 16) hat, die sich teilweise entlang jeder Seite
 des Außenschuhs (2) und teilweise unterhalb
 einer Brandsohle (50) des Schlittschuhs bzw.
 Rollschuhs erstrecken, wobei die Seitenseg-
 mente (14, 16) am hinteren Ende des Schlitt-
 schuhs bzw. Rollschuhs miteinander verbun-
 den sind, um so eine Struktur zu bilden, die am
 Boden offen ist;
 daß der laterale und mediale Flügelabschnitt
 (22, 24) des Knöchelabschnitts gewölbte Berei-
 che (30, 32) aufweisen, die so geformt sind,
 daß sie über den Knöcheln des Läufers liegen;
 und
 daß die Flügelabschnitte (22, 24) des Knöchel-
 abschnitts sowie das laterale und mediale Sei-
 tensegment (14, 16) des Absatzsteifenab-
 schnitts durch ein Paar Schlitze (35) getrennt
 sind, wodurch die einteilige Kunststoffeinklebe
 die Knöchelbeugung einer Person beim Tragen
 des Schlittschuhs bzw. Rollschuhs nicht wes-
 sentlich einschränkt.

2. Schlittschuh bzw. Rollschuh nach Anspruch 1, wo-
 bei der Knöchelabschnitt (20, 22, 24) der einteiligen
 Kunststoffeinklebe (4) einen hinteren Knöchelab-
 schnitt (20) aufweist, der sich von den Flügelab-
 schnitten (22, 24) des Knöchelabschnitts nach
 oben erstreckt, wobei der hintere Knöchelabschnitt
 mit einem lateralen und medialen Manschettenab-
 schnitt (26, 28) verbunden ist, die ebenfalls zur ein-
 teiligen Kunststoffeinklebe (4) gehören und die so
 gestaltet sind, daß sie die Rückseite des Oberknö-
 chels des Läufers teilweise umhüllen.
3. Schlittschuh bzw. Rollschuh nach Anspruch 1 oder
 Anspruch 2, wobei die Polstereinrichtung minde-
 stens eine Polsterpackung (6) aufweist, die über ei-
 nen lateralen und medialen Gelbeutel (34, 36) ver-
 fügt, die geeignet sind, sich der speziellen Knöchel-
 form des Läufers anzupassen.
4. Schlittschuh bzw. Rollschuh nach Anspruch 3, wo-
 bei der laterale und mediale Gelbeutel (34, 36)
 durch einen einteiligen Kragenabschnitt (38) ver-
 bunden sind.
5. Schlittschuh bzw. Rollschuh nach einem der vorste-
 henden Ansprüche, wobei das mediale Seitenseg-
 ment (16) länger als das laterale Seitensegment

(14) ist.

6. Schlittschuh bzw. Rollschuh nach einem der vorste-
 henden Ansprüche, wobei der Außenschuh (2)
 Aussparungen (33) in einem Bereich des Knöchels
 aufweist, um die gewölbten Bereiche (30, 32) der
 Flügelabschnitte (22, 24) unterzubringen.

Revendications

1. Chaussure de patinage comprenant les éléments
 suivants tous fixés de façon permanente les uns
 aux autres :

- une partie extérieure non rigide (2) configurée
 de manière à former une forme de bottine com-
 prenant une zone (18) au niveau du talon et une
 zone au niveau de la cheville située au-dessus
 de ladite zone au niveau du talon, ladite zone
 au niveau du talon et ladite zone au niveau de
 la cheville possédant des parties arrière, laté-
 rales et médiane;
- des moyens de rembourrage (6,8,12) position-
 nés à l'intérieur de ladite partie extérieure;
- un revêtement intérieur (10) disposé à l'inté-
 rieur de ladite partie extérieure (2) et desdits
 moyens de rembourrage (6,8,12);
- un insert en matière plastique (4) disposé entre
 ladite partie extérieure (2) et ledit revêtement
 intérieur (10) pour accroître la rigidité de ladite
 chaussure de patinage, ledit insert en matière
 plastique comprenant une partie (20,22,24) au
 niveau de la cheville s'étendant vers le haut à
 partir de ladite partie arrière de ladite zone au
 niveau du talon et comprenant des parties en
 forme d'ailes latérale et médiane (22,24), qui
 font saillie vers l'avant et s'étendent respective-
 ment autour de ladite zone au niveau de la che-
 ville, le long de ladite zone latérale et le long de
 ladite zone médiane,

caractérisée en ce que ledit insert en matière plas-
 tique (4) est un insert intégral en matière plastique
 formé d'un seul tenant;

en ce que ledit insert intégral en matière plas-
 tique (4) est positionné entre ladite partie exté-
 rieure (2) et lesdits moyens de rembourrage (6,
 8, 12).

en ce que ledit insert intégral en matière plas-
 tique (4) comprend une partie de renfort de ta-
 lon en forme générale de U (18,14,16), qui s'in-
 curve à l'intérieur de ladite zone au niveau du
 talon, en s'étendant depuis ladite zone latérale,
 en travers de ladite zone arrière et le long de
 ladite zone médiane, ladite partie de renfort de
 talon (18,14,16) possédant des segments

(14,16) situés sur les côtés latéraux et sur le côté médian et s'étendant en partie le long de chaque côté de ladite partie extérieure (2) et en partie au-dessous d'une semelle intérieure (50) de ladite chaussure de patinage, lesdits segments de côté (14,16) étant réunis entre eux au niveau de l'extrémité arrière de ladite chaussure de patinage, en formant de ce fait une structure qui est ouverte au niveau de sa partie inférieure;

en ce que lesdites parties en forme d'ailes latérale et médiane (22,24) de ladite partie au niveau de la cheville incluent des zones bombées (30,32) conformées de manière à recouvrir les malléoles du patineur; et

en ce que lesdites parties formant ailes (22,24) de la partie au niveau de la cheville et desdits segments (14,16) des côtés latéraux et du côté médian de ladite partie de renfort de talon sont séparées par une paire de fentes (35), de sorte que ledit insert intégral en matière plastique ne limite pas sensiblement la flexion de la cheville d'une personne lorsqu'elle porte la chaussure de patinage.

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2. Chaussure de patinage selon la revendication 1, dans laquelle la partie (20, 22, 24) au niveau de la cheville dudit insert intégral en matière plastique (4) comprend une partie arrière (20) au niveau de la cheville s'étendant vers le haut à partir desdites parties en forme d'ailes (22,24) de ladite partie au niveau de la cheville, ladite partie arrière au niveau de la cheville étant raccordée à des parties formant pattes latérale et médiane (26,28), qui font également partie de l'insert intégral en matière plastique (4) et qui sont agencées de manière à s'enrouler partiellement autour de la partie arrière du haut de la cheville du patineur.
3. Chaussure de patinage selon la revendication 1 ou la revendication 2, dans laquelle lesdits moyens de rembourrage comprennent au moins un bloc de rembourrage (6) qui inclut des sacs latéral et médian (34,35) contenant un gel et adaptés pour se conformer à la forme particulière de la cheville du patineur.
4. Chaussure de patinage selon la revendication 3, dans laquelle lesdits sacs latéral et médian (34,36) contenant le gel sont raccordés par une partie intégrée formant collet (38).
5. Chaussure de patinage selon l'une quelconque des revendications précédentes, dans laquelle ledit segment du côté médian (16) est plus long que ledit segment du côté latéral (14).
6. Chaussure de patinage selon l'une quelconque des

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revendications précédentes, dans laquelle la partie extérieure (2) comprend des renforcements (33) dans une zone de la cheville de manière à loger lesdites zones bombées (30,32) desdites parties formant ailes (22,24).

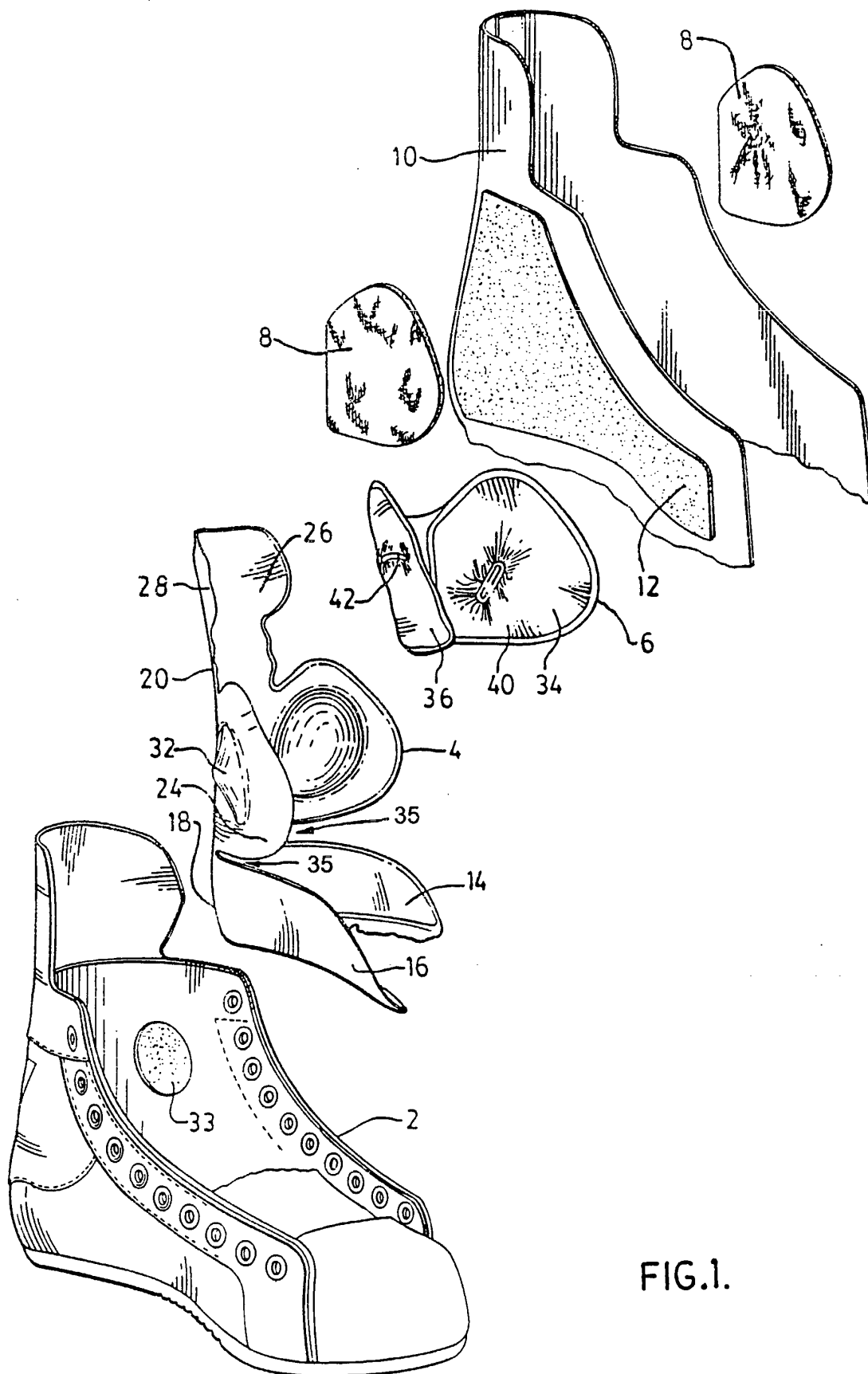


FIG.1.

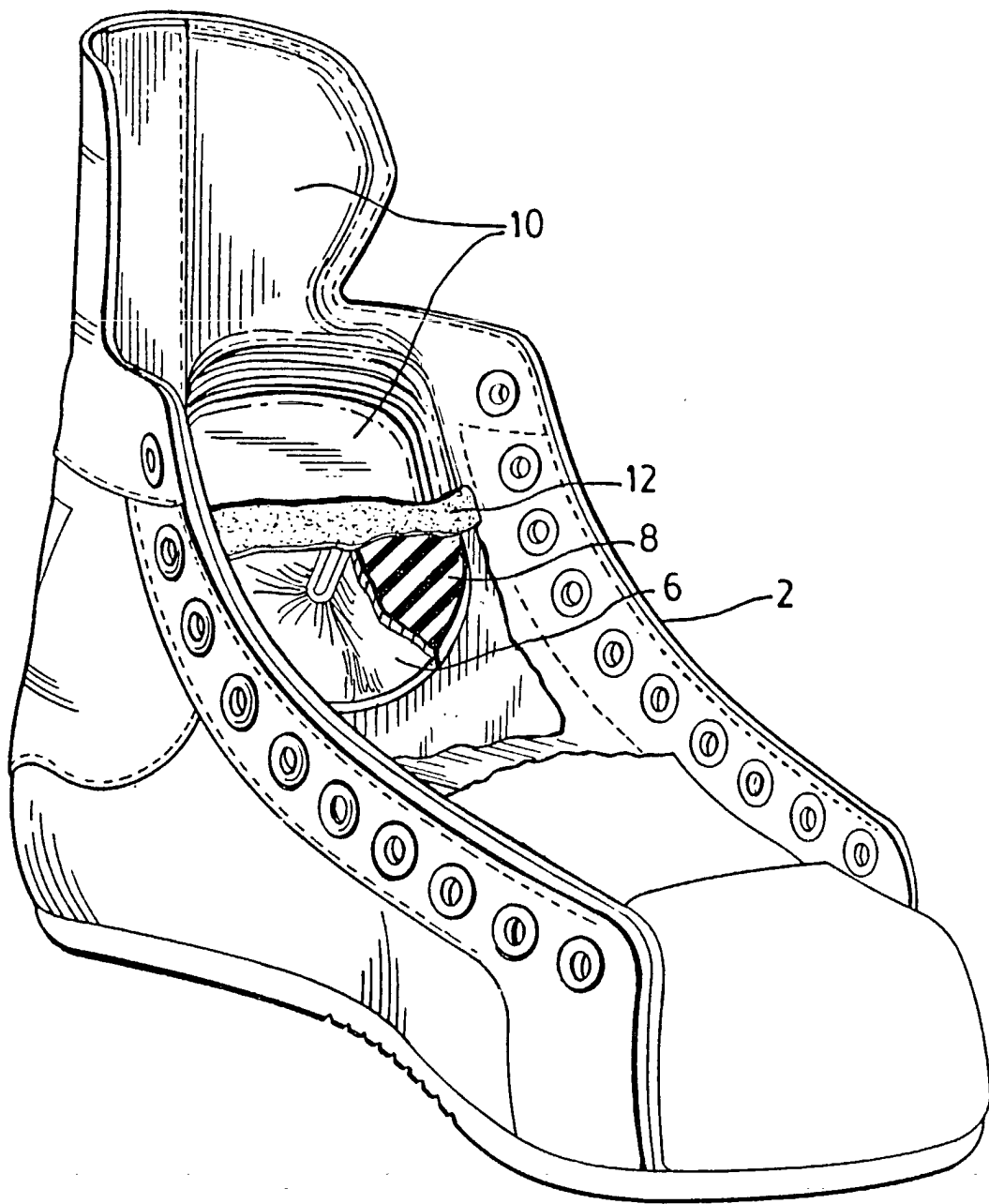


FIG.2.

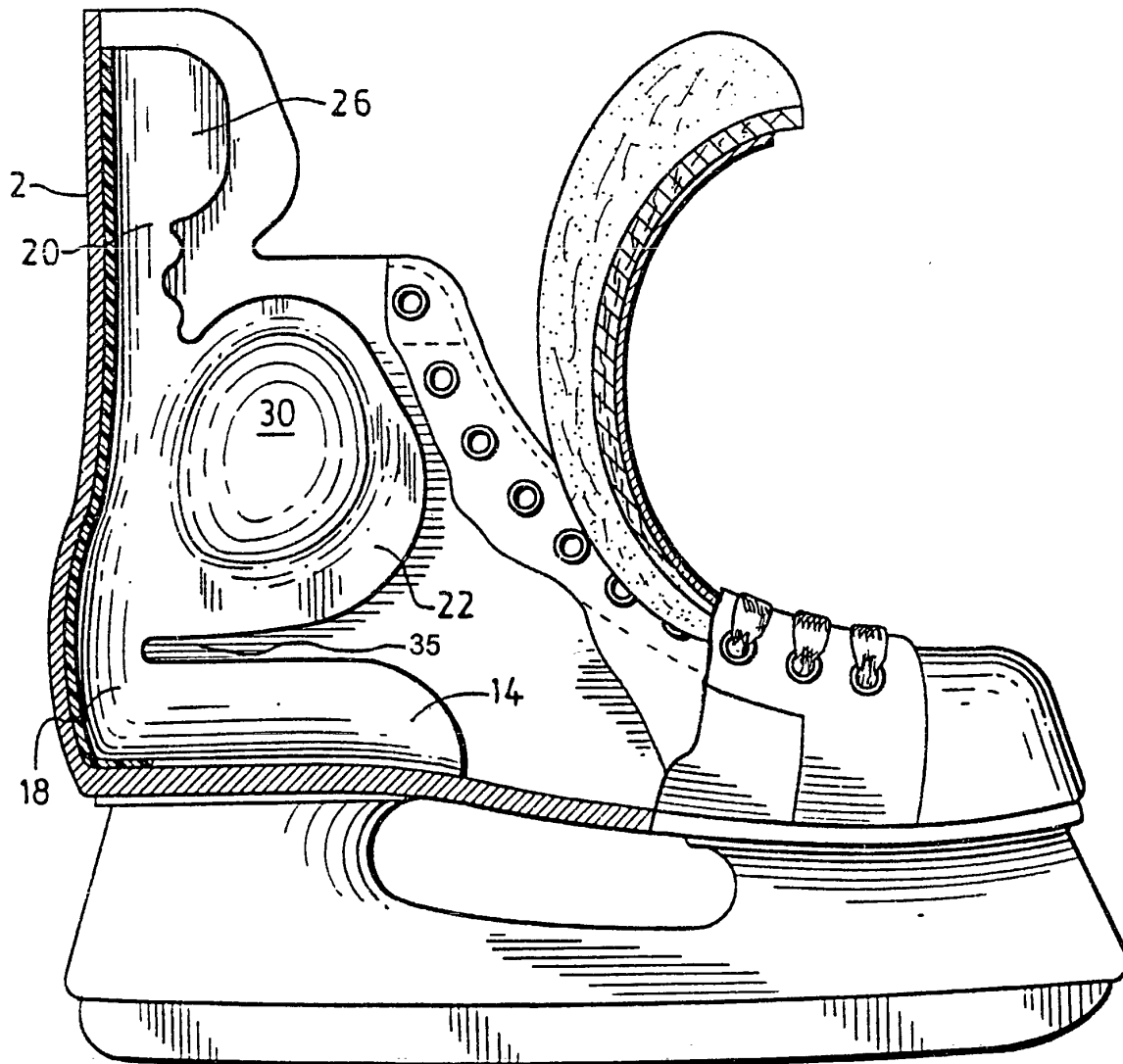


FIG. 3.

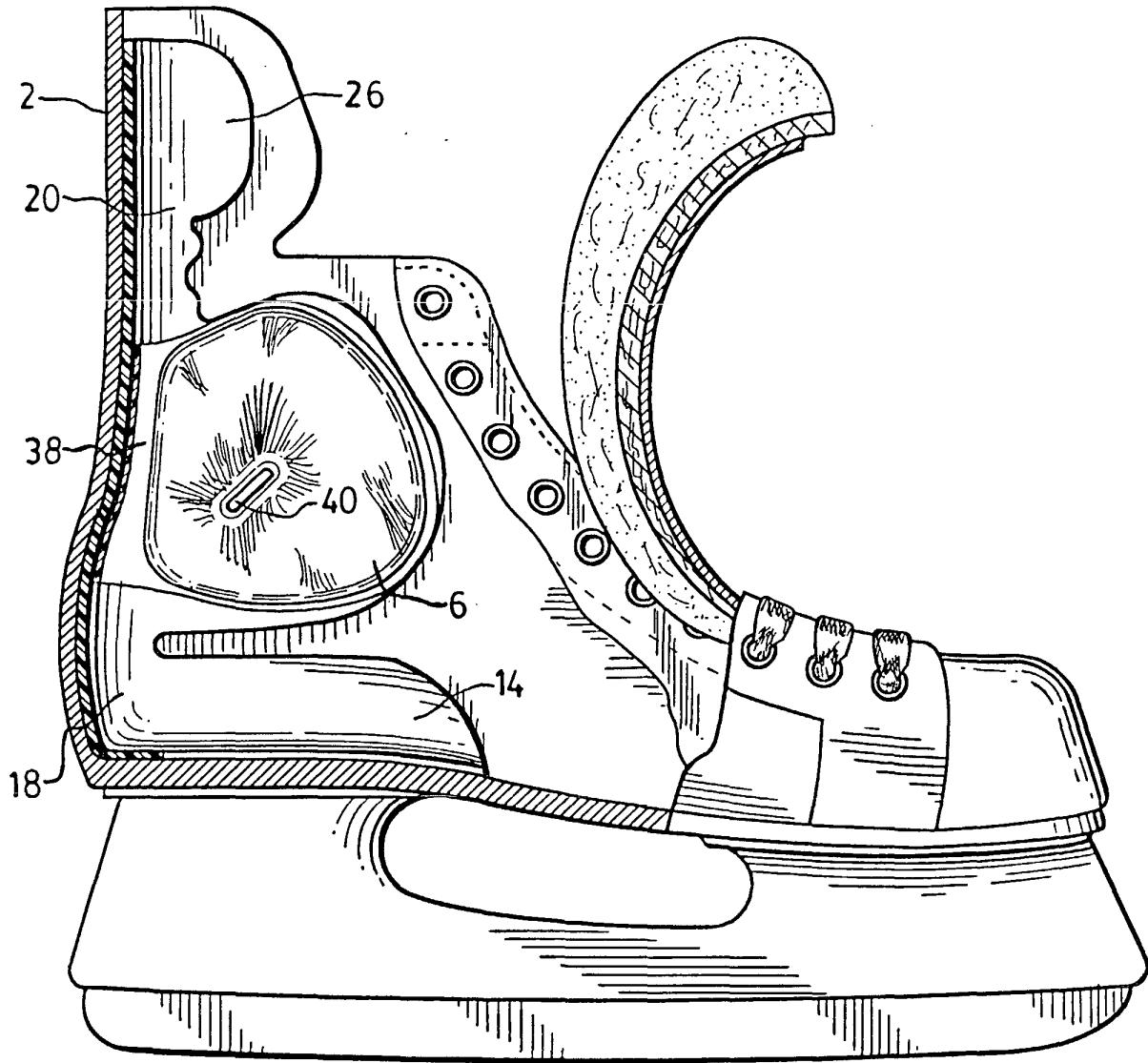


FIG.4.

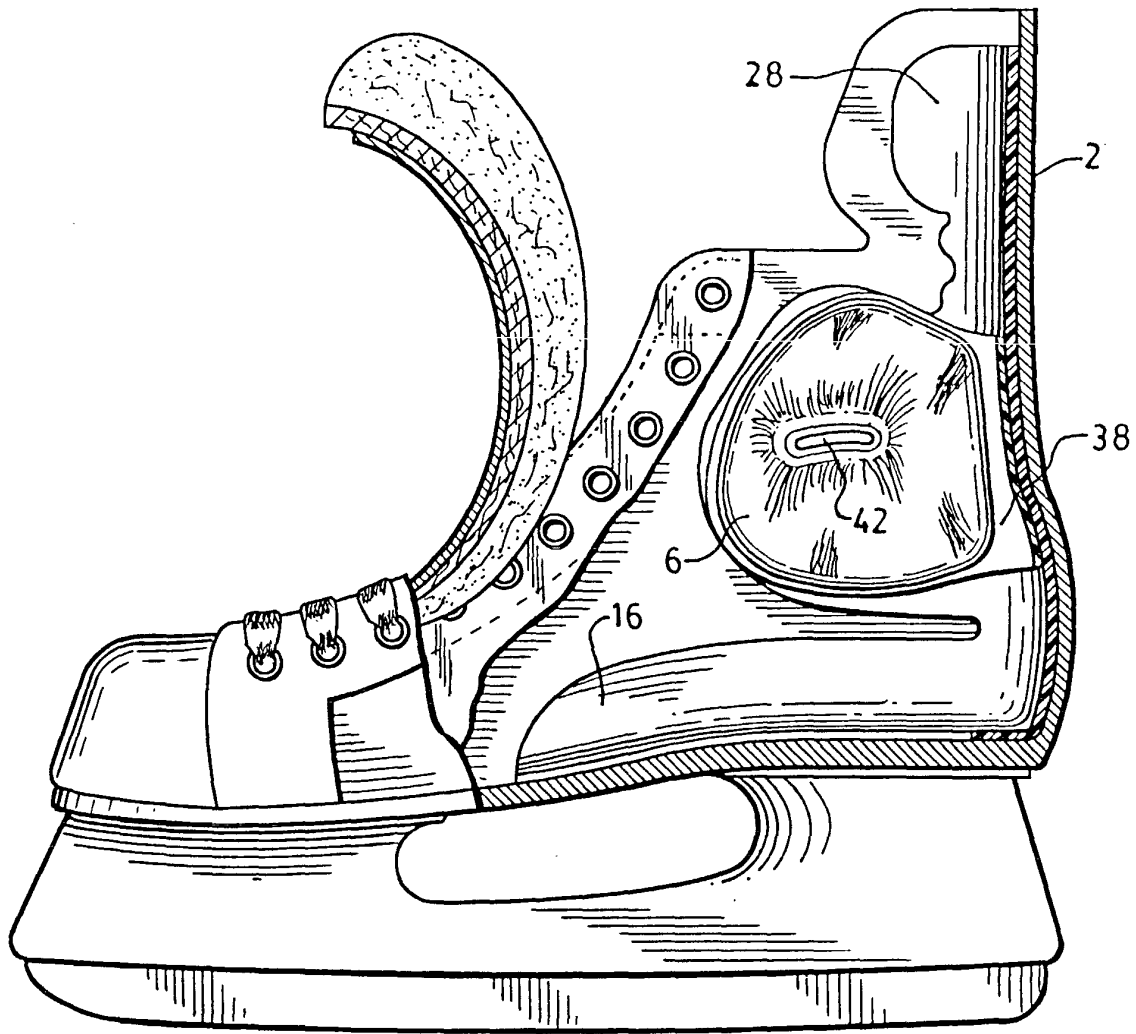


FIG.5.

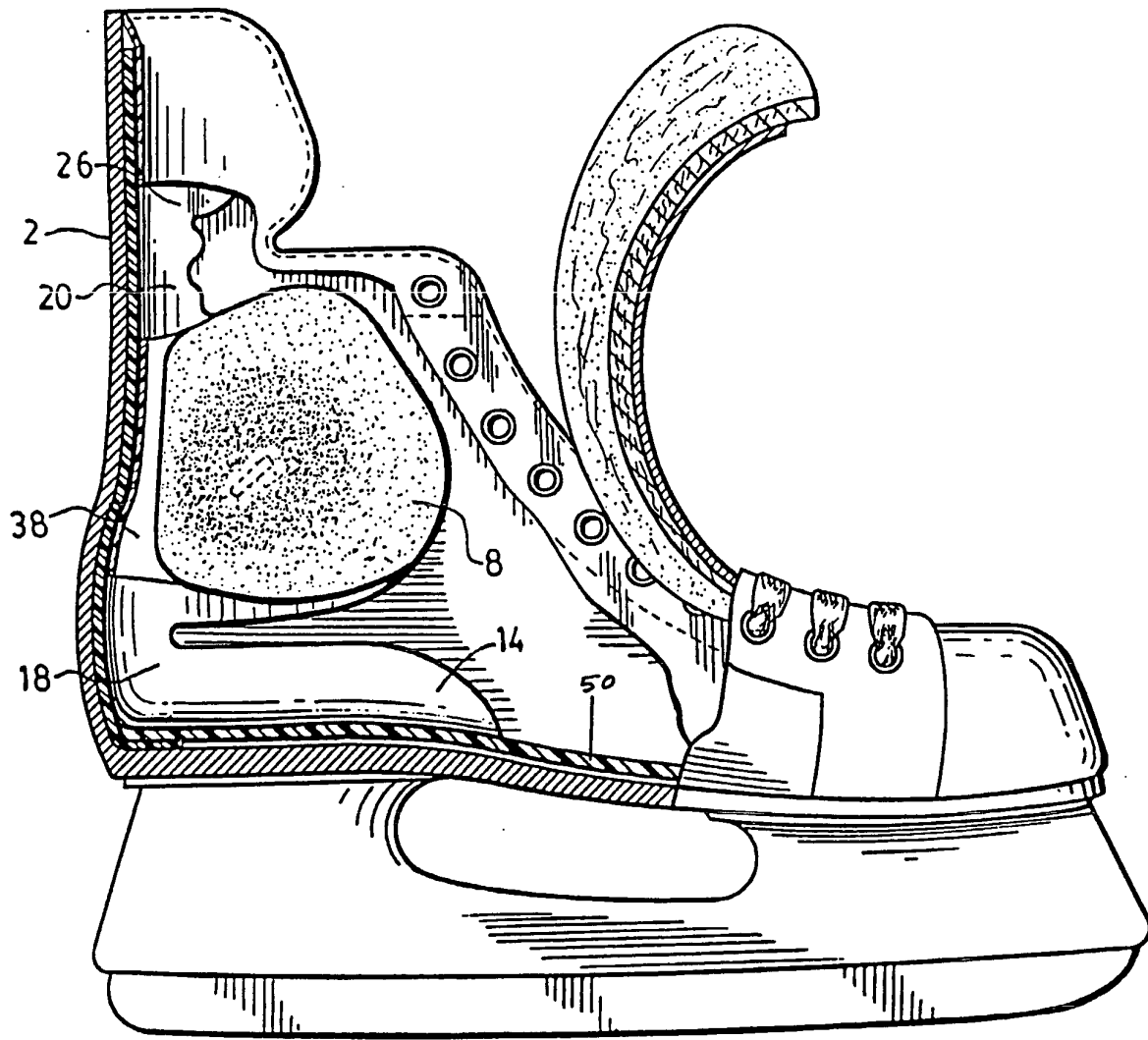


FIG.6.

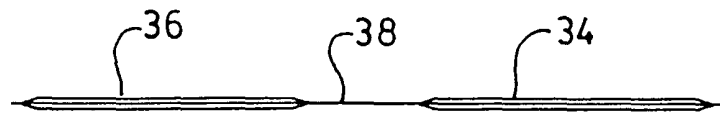


FIG. 7.

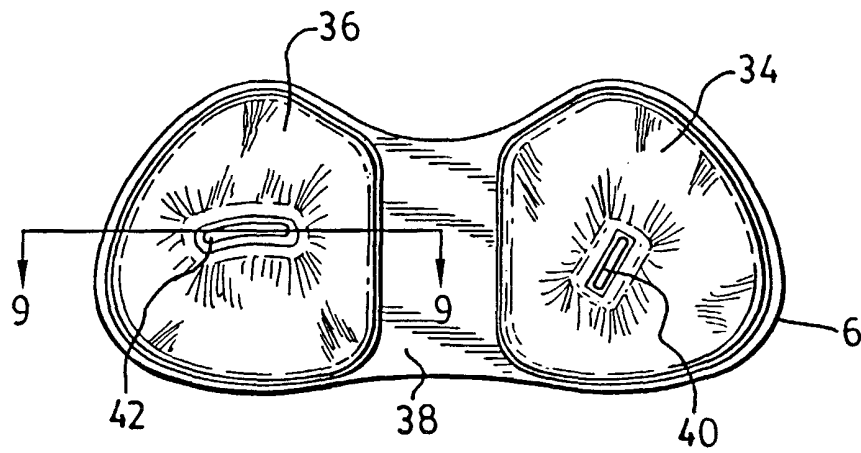


FIG. 8.

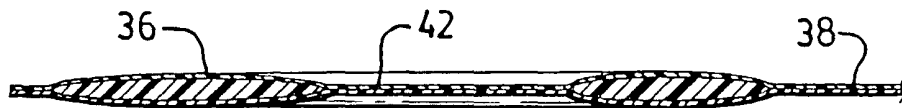


FIG. 9.