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(54) **HEAT MOLDABLE BOOT LINER**

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(56) References cited:
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Description

[0001] The present invention relates to a heat moldable boot liner for use, for example, with a ski boot.

Background Art

[0002] Conventionally, moldable ski boot liners are made of a heat moldable material comprising a heat moldable foam interfaced between outer layers of felt fabric, and such heat moldable materials are readily commercially available.

[0003] In United States Patent No. 5,673,448, issued October 7, 1997, to Herbert Lang et al., there is disclosed a liner for a sports boot shell and a method of making a custom fitted liner for a sports boot shell which employ a single piece of thermoplastic foam material for the liner. More particularly, a blank made of the thermoplastic foam material is welded or stitched to connect together different portions of the edge of the blank so as to form an unfitted liner having a seam extending from its heel along its underside, and up and over the top of a foot portion of the liner to a gap which extends from a point situated centrally on the wearer's forefoot behind the wearer's toes and between the forward portion of the wearer's arch and the region above the ball of the wearer's foot. From this point, the gap extends upwardly between a pair of flaps or wings to a cuff at the top of the liner.

[0004] In use, the unfitted liner is heated in an oven and placed on the wearer's foot, the toes of which are padded to prevent the liner from subsequently holding the wearer's toes immobile. The wings are then wrapped around the wearer's lower leg, with one wing overlapped by the other, and a short nylon stocking is rolled over the liner, after which the wearer's foot with the liner on it is placed in a boot.

[0005] However, it has been found in practice that such a liner does not operate satisfactorily because the portions of the liner adjacent the gap, including the wings, tend to become adversely distorted as the wings are wrapped around the wearer's lower leg and as the foot and liner are inserted into the boot. Because the seam extends along the underside of the liner and because the underside of the liner is formed of deformable foam material, the shape of the liner is unstable as the liner is forced into its boot shell. Also, the foam molds itself into the soft parts of the underside of the wearer's foot during the molding operation, which causes pain and discomfort during subsequent use of the molded liner. It was also found that the heel portion of this prior liner tended to become dislocated during the molding operation, thus not only causing distortion of the lower portion of the liner but also causing dislocation of the cuff or top of the liner at the back of the wearer's leg, where the liner is required to be correctly positioned to protect the leg against the cuff or top of the boot shell. in addition, because this prior liner has only two wings, it is difficult to insert the wearer's foot with the liner after the molding of the liner has been completed and the liner material has hardened.

Disclosure of the Invention

[0006] It is accordingly an object of the present invention to provide a novel and improved boot liner which facilitates improved molding of the liner to the user's foot.

[0007] According to the present invention, there is provided a heat moldable boot liner which comprises a foot portion, an upper portion extending upwardly from the foot portion and including first and second flaps which can be wrapped over the wearer's foot and a tongue extending upwardly from the second flap. The upper portion has third and fourth flaps which can be wrapped over the tongue and the front of a lower portion of the wearer's leg.

[0008] When the present boot liner is in use, it is firstly heated to render the liner pliable and is then fitted in an unmolded state to the user's foot. The flaps are then adjusted into their overlapping relationships, with the tongue between the wearer's lower leg portion and the third and fourth flaps. The first and second flaps are preferably secured together, for example by means of a hook-and-loop fastener, so that the foot portion of the boot is snugly adapted to fit the user's foot. The liner and the wearer's foot in the liner are then inserted into a boot shell so as to mold the liner to the user's foot in a one-stage operation.

Brief description of the drawings

[0009] The invention will be more readily understood from the following description of a preferred embodiment thereof given, by way of example, with reference to the accompanying drawings, in which:-

Figure 1 shows a view in perspective of a boot liner according to the present invention in an opened condition;

Figure 2 shows a heel portion of the liner of Figure 1 during the manufacture of the liner;

Figure 3 shows a view of the heel portion of Figure 2 in a finished condition;

Figure 4 shows a view in perspective of the liner of Figure 1 during fitting of the liner onto a wearer's foot (not shown);

Figure 5 shows a view in perspective of the liner of Figures 1 and 4 in a partially closed condition;

Figure 6 shows a blank employed in the making of the boot liner of Figures 1 through 5;

Figures 7 and 8 show blanks of a tongue and a sole, respectively, forming parts of the liner of Figures 1 through 6; and

Figure 9 shows a view in perspective of the sole of Figure 8 being attached to the remainder of the liner.

Description of the Best Mode

[0010] The boot liner illustrated in the accompanying drawings and indicated generally by reference numeral 10 is made of commercially available heat moldable boot liner material, such as that described above, and comprises a foot portion indicated generally by reference numeral 12, and an upper portion indicated generally by reference numeral 14.

[0011] The foot portion 12 is formed, at its top, with first and second flaps 16 and 17 which define therebetween a gap, indicated generally by reference numeral 18, which extends along the top of the foot portion 12 to the upper portion 14 of the liner and, more particularly, to a gap, indicated generally by reference numeral 20, which extends upwardly from the foot portion 12 to a top edge 22 of the upper portion 14 between third and fourth flaps 21 and 23 forming parts of the upper portion 14.

[0012] A tongue 24 is joined, at a lower end of the tongue 24, to the second flap 17 and is dimensioned so that, when the boot liner 10 is closed as shown in Figures 4 and 5, the tongue 24 extends along the front of the lower portion of the wearer's leg, with the tongue 24 extending the entire height of the upper portion 14 of the liner 10, substantially to the top edge 22 of the upper portion 14.

[0013] During the manufacture of the boot liner 10 shown in Figure 1, a heel portion, indicated generally by reference numeral 26, of the foot portion 12 is formed so as to be vertically curved, with the heel portion 26 having an externally convex shape, as shown in Figures 4 and 5, and, consequently, a correspondingly concave inner surface, in order to snugly fit the heel of the user. This curved shape of the heel portion 26 is produced by firstly forming a V-shaped cut-out, as indicated generally by reference numeral 28 in Figures 2 and 6, in the heel portion 26 and by the closing together of opposite edges 30 of the cut-out 28 and stitching these edges 30 together as illustrated in Figure 3.

[0014] When the boot liner 10 is fitted to the user's foot, the boot liner is firstly heated to render the material of the liner.pliable, in known manner, and the foot is then inserted into the liner. The flap 16 is then adjusted so that it is disposed in overlapping relationship relative to the flap 17, as shown in Figure 4, over the wearer's foot. This enables the foot portion 12 to be snugly fitted to the user's foot. As can also be seen from Figure 4, the tongue 24 is located within the upper portion 14 of the liner 10 during this operation.

[0015] In order to maintain the foot portion 12 in its snugly fitting relationship with the user's foot, a fastener is provided in the form of patches 32 and 33 of hook-and-loop fastener material secured to opposed faces 34 and 35 of the flaps 16 and 17, the faces 34 and 35 being brought into face-to-face relationship with one another so as to interengage the patches 32 and 33 with one another, as shown in Figure 4.

[0016] After the flaps 16 and 17 have been thus snugly fitted in mutually overlapping relationship, as shown in Figure 5, over the wearer's foot, with the tongue 24 extending up the front of the lower portion of the leg of the wearer, the flaps 21 and 23 are wrapped around the lower leg portion into overlapping relationship with one another and with the tongue 24.

[0017] The wearer's foot and the liner are then inserted into a boot shell to cause the still-pliable liner to be molded between the foot and the boot shell. The insertion of the foot and the liner into the boot shell may, if desired, be facilitated by covering the liner with a plastic sheet material or other low-friction material to facilitate sliding of the liner into the boot shell by reducing friction between the liner and the boot shell.

[0018] Also, if desired, the upper flaps 21 and 23 may be retained in snugly fitting overlapping relationship around the lower leg by means of a strap (not shown) extending around the upper portion 14 of the liner 10.

[0019] When the liner 10 is intended for a snowboard boot shell, as distinct from a ski boot shell, hook-and-loop fastener material patches shown in broken lines in Figure 1 and indicated by reference numeral 25 may be used to secure the flaps 21 and 23 together and to the tongue 24.

[0020] Since the foot portion 12 can be snugly fitted to the foot of the user, as described above, and retained by the fastener patches 32 and 33, the foot portion 12 remains in position on the user's foot during insertion into the boot shell and resists being moved around the foot, and since the snugness of this fitting and the insertion into the boot shell without dislocation of the liner on the foot are facilitated by the above-described vertical curvature of the heel portion 26, it is found that the liner 10 can be heat molded in a one-stage molding operation, which substantially facilitates and abbreviates the fitting of the liner 10 to the foot of its user.

[0021] Figure 6 shows a blank, indicated generally by reference numeral 40, of heat moldable material used to make the liner 10.

[0022] The blank 40 is formed with a gap 42 which extends between the first and third flaps 16 and 21 and another gap 44, in the form of a slit, which extends between the second and fourth flaps 17 and 23. The gaps 42 and 44, as viewed in Figure 6, are inclined downwardly and convergently towards a heel portion 46 in which the cut-out 28 is formed. These gaps 42 and 44 enable the flaps 16, 17, 21 and 23 to be wrapped snugly around the wearer's foot and leg in such a manner as to counter-act subsequent distortion of the liner during the molding of the liner.

[0023] More particularly, the gaps 42 and 44 arc suf-

ficiently long to ensure that stresses in the flaps 16 and 17 are not transmitted to the flaps 21 and 23, and vice versa, during the fitting and molding of the liner 10.

[0024] The flap 17 is formed with a straight edge 48 and the tongue 24 is formed from a blank indicated generally by reference numeral 50 in Figure 6, which has a corresponding straight edge 52. The tongue 24 is formed by joining the blank 50 along its edge 52 by stitching or welding to the edge 48 of the flap 17.

[0025] The boot liner 10 also includes a sole 54, shown in Figure 8, which is firstly formed separate from the blank 40 and then secured, by a joint 55 (Figure 3) along a peripheral edge 56 (Figure 6) of the sole 54, to a bottom edge 58 of the blank 40, also by stitching or welding.

[0026] The sole 54 is made of a material which is such that the sole 54 is not molded to the wearer's foot during the fitting and molding of the liner 10. This avoids a "mashy" feel between the foot and the sole, which is undesirable when skiing. The sole 54 also provides stability during the fitting and molding and therefore counteracts dislocation of the sole and the rest of the liner during the fitting and molding of the liner.

[0027] The sole 54 may, for example, be made of natural gum rubber or a synthetic elastomer, and may be premolded, as a foot bed, to the underside of the wearer's foot.

Claims

1. A heat moldable boot liner, comprising an upper portion (14) extending upwardly from a foot portion (12) which includes first and second flaps (16, 17) which can be wrapped over a wearer's foot with the first flap (16) in overlapping relation to the second flap (17) **characterized by** a tongue (24) extending upwardly from the second flap (17), the upper portion (14) including third and fourth flaps (21, 23) which can be wrapped over the front of a lower leg portion of the wearer with the third and fourth flaps (21, 23) overlapping one another and overlapping the tongue (24).

2. A heat moldable boot liner as claimed in claim 1, **characterized by** a pair of gaps (42, 44) extending between the first and third flaps (16, 21) and the second and fourth flaps (17, 23), respectively.

3. A heat moldable boot liner as claimed in claim 1, **characterized by** a sole (54), formed separately from the foot portion (12), and a joint between the sole (54) and the foot portion (12) extending peripherally around the sole (54).

4. A heat moldable boot liner as claimed in claim 1, **characterized in that** the tongue (24) extends upwardly at least substantially to the top of the upper portion (14).

5. A heat moldable boot liner as claimed in claim 1, **characterized by** a fastener for securing the first flap (16) in the overlapping relation to the second flap (17).

6. A heat moldable boot liner as claimed in claim 5, **characterized in that** the fastener comprises patches (32, 33) of hook-and-loop fastener material secured to the first and second flaps (16, 17).

7. A heat moldable boot liner as claimed in claim 1, **characterized in that** the foot portion (12) includes a vertically externally convexedly curved heel portion (26).

8. A heat moldable boot liner as claimed in claim 7, **characterized in that** the heel portion (26) is formed by a V-shaped cut-out (28) in the foot portion (12), the V-shaped cut-out (28) having opposite edges joined together.

9. A method of fitting a heat moldable boot liner to a wearer's foot, comprising heating the boot liner (10) to render the liner (10) moldable, inserting the wearer's foot into the liner (10), and wrapping first and second flaps (16,17) on the liner (10) into mutually overlapping relationship over the wearer's foot, **characterized by** locating a tongue (24) extending from the second flap (17) against the front of a lower leg portion of the wearer, wrapping third and fourth flaps (21,23) on the liner (10) around the front of the lower leg portion of the wearer into overlapping relationship with one another and with the tongue (24), and inserting the liner (10), with the wearer's foot within, into a boot shell to mold the liner (10) between the wearer and the boot shell.

10. A method as claimed in claim 9, **characterized by** fastening the first and second flaps (16,17) to one another in their mutually overlapping relationship.

11. A method as claimed in claim 9, **characterized by** providing the boot liner (10) with a seamless sole (54) joined peripherally of the sole (54) to the liner (10).

12. A method as claimed in claim 9, **characterized by** providing the boot liner (10) with a vertically externally convex heel portion (26) so as to snugly fit the wearer's heel.

Patentansprüche

1. Heißformbarer Innenschuh mit einem oberen Abschnitt (14), der sich nach oben ausgehend von ei-

nem Fußabschnitt (12) erstreckt, welcher eine erste und eine zweite Klappe (16,17) aufweist, die über den Fuß des Schuhträgers geschlagen werden können, wobei die erste Klappe (16) zur zweiten Klappe (17) eine überlappende Anordnung aufweist, **gekennzeichnet durch** eine Zunge (24), die sich nach oben von der zweiten Klappe (17) ausgehend erstreckt, wobei der obere Abschnitt (14) eine dritte und eine vierte Klappe (21,23) aufweist, welche um die Vorderseite des unteren Beinabschnitts des Schuhträgers geschlagen werden können, wobei die dritte und die vierte Klappe (21,23) einander und die Zunge (24) überlappen.

2. Heißformbarer Innenschuh nach Anspruch 1, **gekennzeichnet durch** ein Paar Spalte (42,44), welche sich zwischen der ersten und der dritten Klappe (16,21) bzw. zwischen der zweiten und der vierten Klappe (17,23) erstrecken.

3. Heißformbarer Innenschuh nach Anspruch 1, **gekennzeichnet durch** eine Sohle (54), die separat von dem Fußabschnitt (12) gebildet ist, und eine Verbindung zwischen der Sohle (54) und dem Fußabschnitt (12), die sich peripherisch um die Sohle (54) erstreckt.

4. Heißformbarer Innenschuh nach Anspruch 1, **dadurch gekennzeichnet, daß** sich die Zunge (24) nach oben zumindest im wesentlichen bis zur Oberseite des oberen Abschnittes (14) erstreckt.

5. Heißformbarer Innenschuh nach Anspruch 1, **gekennzeichnet durch** ein Befestigungsmittel zum Befestigen der ersten Klappe (16) in der überlappenden Anordnung an der zweiten Klappe (17).

6. Heißformbarer Innenschuh nach Anspruch 5, **dadurch gekennzeichnet, daß** das Befestigungsmittel Flächenabschnitte (32,33) eines Klettverschluß-Materials umfaßt, die an der ersten und zweiten Klappe (16,17) befestigt sind.

7. Heißformbarer Innenschuh nach Anspruch 1, **dadurch gekennzeichnet, daß** der Fußabschnitt (12) einen vertikal außen konvex gekrümmten Fersenabschnitt (26) aufweist.

8. Heißformbarer Innenschuh nach Anspruch 7, **dadurch gekennzeichnet, daß** der Fersenabschnitt (26) durch einen V-förmigen Ausschnitt (28) in dem Fußabschnitt (12) gebildet ist, wobei der V-förmige Ausschnitt (28) einander gegenüberliegende und miteinander verbundene Ränder aufweist.

9. Verfahren zum Anpassen eines heißformbaren Innenschuhs an den Fuß eines Schuhträgers mit folgenden Schritten: Erhitzen des Innenschuhs (10), um den Innenschuh (10) formbar zu machen, Einbringen des Fußes des Schuhträgers in den Innenschuh (10) und Umschlagen von ersten und zweiten Klappen (16,17) an dem Innenschuh (10) in eine einander über dem Fuß des Schuhträgers überlappende Anordnung, **gekennzeichnet durch** das Anlegen einer Zunge (24), die sich von der zweiten Klappe (17) aus erstreckt, gegen die Vorderseite eines unteren Beinabschnittes des Schuhträgers, Umschlagen von dritten und vierten Klappen (21,23) an dem Innenschuh (10) um die Vorderseite des unteren Beinabschnittes des Schuhträgers in eine einander und die Zunge (24) überlappende Anordnung und Einbringen des Innenschuhs (10) mit dem darin befindlichen Fuß des Schuhträgers in eine Stiefelschale, um den Innenschuh (10) zwischen dem Schuhträger und der Stiefelschale zu formen.

10. Verfahren nach Anspruch 9, **gekennzeichnet durch** das Befestigen der ersten und zweiten Klappe (16,17) aneinander in ihrer einander überlappenden Anordnung.

11. Verfahren nach Anspruch 9, **gekennzeichnet durch** Ausstatten des Innenschuhs (10) mit einer nahtlosen Sohle (54), die in bezug auf die Sohle (54) peripherisch mit dem Innenschuh (10) verbunden ist.

12. Verfahren nach Anspruch 9, **gekennzeichnet durch** das Ausstatten des Innenschuhs (10) mit einem vertikal außen konvex gekrümmten Fersenabschnitt (26), der die Ferse des Schuhträgers passend umfaßt.

Revendications

1. Chausson thermomoulable comportant une partie supérieure (14) s'étendant vers le haut à partir d'une partie pied (12) qui inclut les premier et deuxième rabats (16, 17) qui peuvent être enroulés sur un pied du porteur avec le premier rabat (16) grâce à une relation de chevauchement avec le second rabat (17), **caractérisé en ce qu'**un battant (24) s'étend vers le haut à partir du second rabat (17), la partie supérieure (14) inclut les troisième et quatrième rabats (21, 23) qui peuvent être enroulés sur le devant de la partie inférieure de la jambe du porteur avec les troisième et quatrième rabats (21, 23) se chevauchant l'un l'autre et chevauchant le battant (24).

2. Chausson thermomoulable selon la revendication 1, **caractérisé en ce qu'**une paire de brèches (42, 44) s'étendent respectivement entre les premier et troisième battants (16, 21) et entre les deuxième et quatrième battants (17, 23).

3. Chausson thermomoulable selon la revendication 1, **caractérisé par** une semelle (54) formée séparément de la partie pied (12), et par un raccord entre la semelle (54) et la partie pied (12) s'étendant de façon périphérique autour de la semelle (54).

4. Chausson thermomoulable selon la revendication 1, **caractérisé en ce que** le battant (24) s'étend vers le haut, au moins en grande partie jusqu'en haut de la partie supérieure (14).

5. Chausson thermomoulable selon la revendication 1, **caractérisé par** une fermeture pour fixer le premier battant (16) dans la relation de chevauchement au second battant (17).

6. Chausson thermomoulable selon la revendication 5, **caractérisé en ce que** la fermeture comporte des plaques (32, 33) de matériau de fermeture « crochets et boucles » fixées aux premier et deuxième battants (16, 17).

7. Chausson thermomoulable selon la revendication 1, **caractérisé en ce que** la partie pied (12) inclut une partie talon (26) verticale extérieurement et convexement arrondie.

8. Chausson thermomoulable selon la revendication 7, **caractérisé en ce que** la partie talon (26) est formée d'une découpe (28) en forme de V dans la partie pied (12), la découpe (28) en forme de V ayant ses bords opposés se raccordant ensemble.

9. Méthode d'ajustement d'un chausson thermomoulable sur un pied du porteur, comprenant le chauffage du chausson (10) pour pouvoir mouler le chausson (10), en insérant le pied du porteur dans le chausson (10) et en enroulant les premier et deuxième rabats (16, 17) sur le chausson (10) grâce à une relation de chevauchement mutuel sur le pied du porteur, **caractérisée par** la présence d'un battant (24) s'étendant à partir du deuxième rabat (17) contre le devant de la partie basse de la jambe du porteur, par l'enroulement des troisième et quatrième rabats (21, 23) sur la chausson (10) autour du devant de la partie basse de la jambe du porteur grâce à une relation de chevauchement l'un sur l'autre et sur le battant (24), et par l'insertion du chausson, avec le pied du porteur à l'intérieur, dans un corps de chaussure pour mouler le chausson (10) entre le porteur et le corps de chaussure.

10. Méthode selon la revendication 9, **caractérisée par** la fermeture des premier et deuxième rabats (16, 17) l'un avec l'autre grâce à une relation mutuelle de chevauchement.

11. Méthode selon la revendication 9, **caractérisée par** la présence sur le chausson (10) d'une semelle sans couture (54) raccordée, de façon périphérique à la semelle (54), sur le chausson (10).

12. Méthode selon la revendication 9, **caractérisée par** la présence sur le chausson (10) d'une partie talon (26) verticale extérieurement et inversement arrondie de façon à ajuster douillettement le talon du porteur.

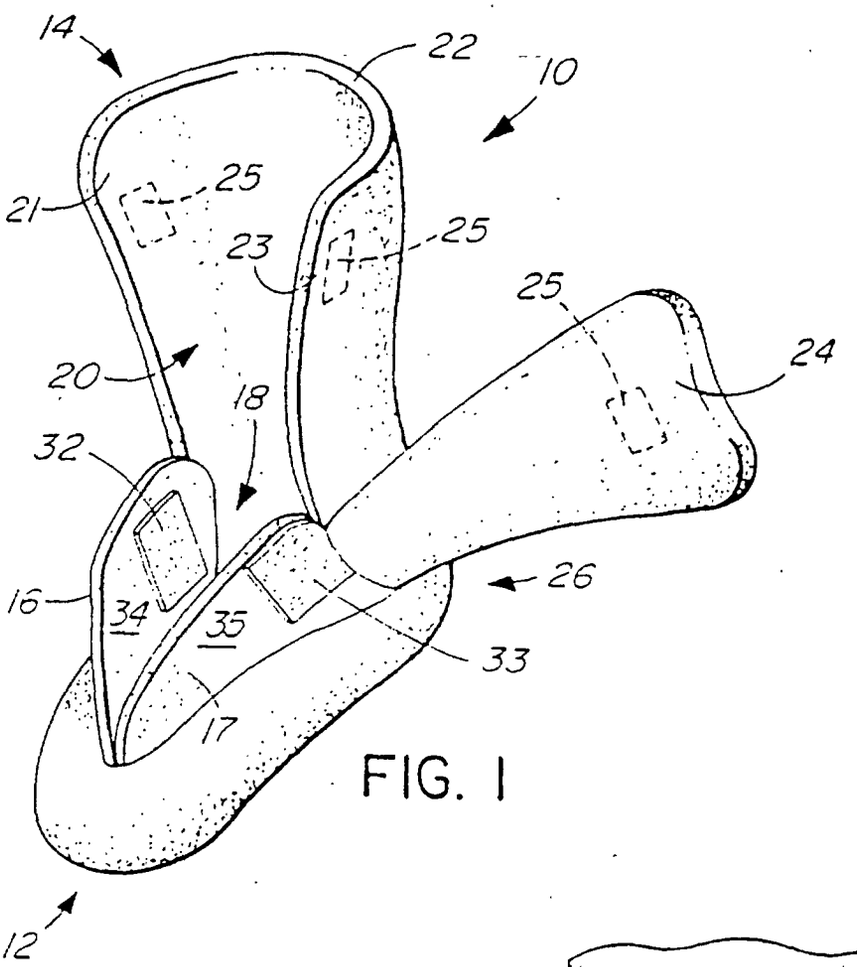

FIG. 1

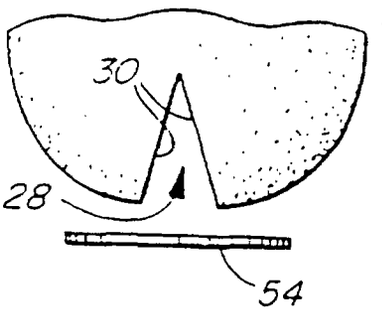

FIG. 2

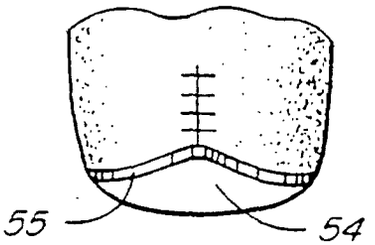

FIG. 3

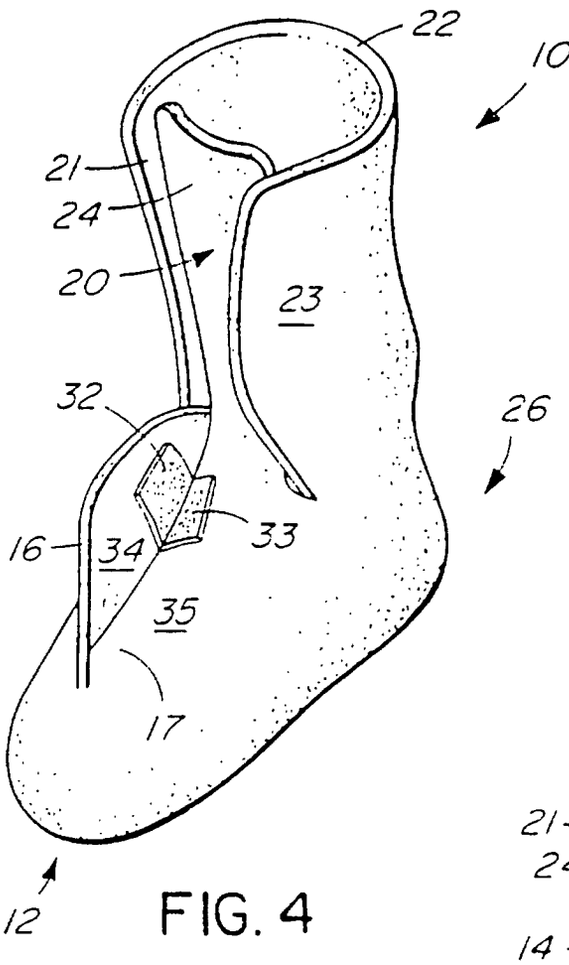
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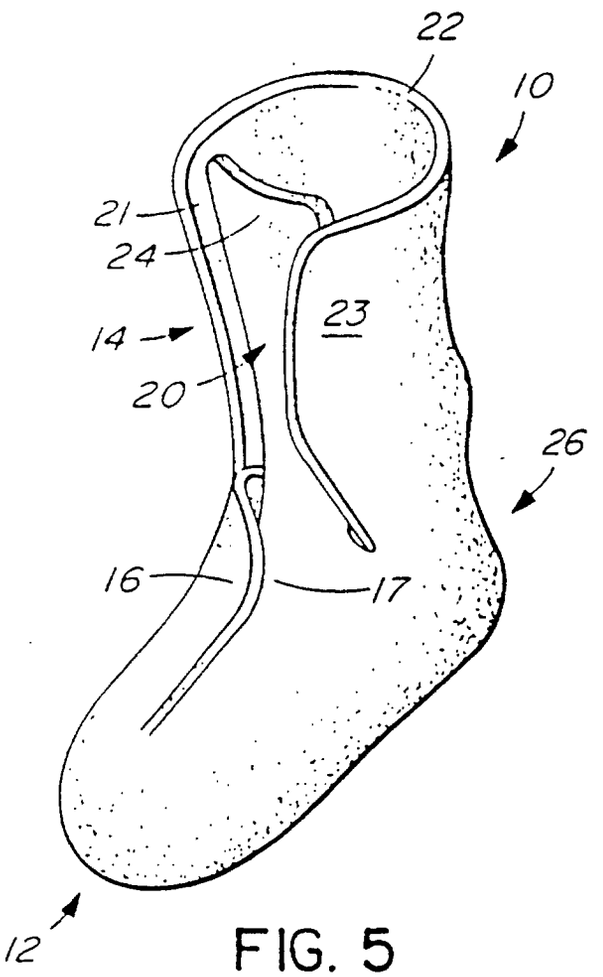
FIG. 4


22
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17
12

FIG. 5

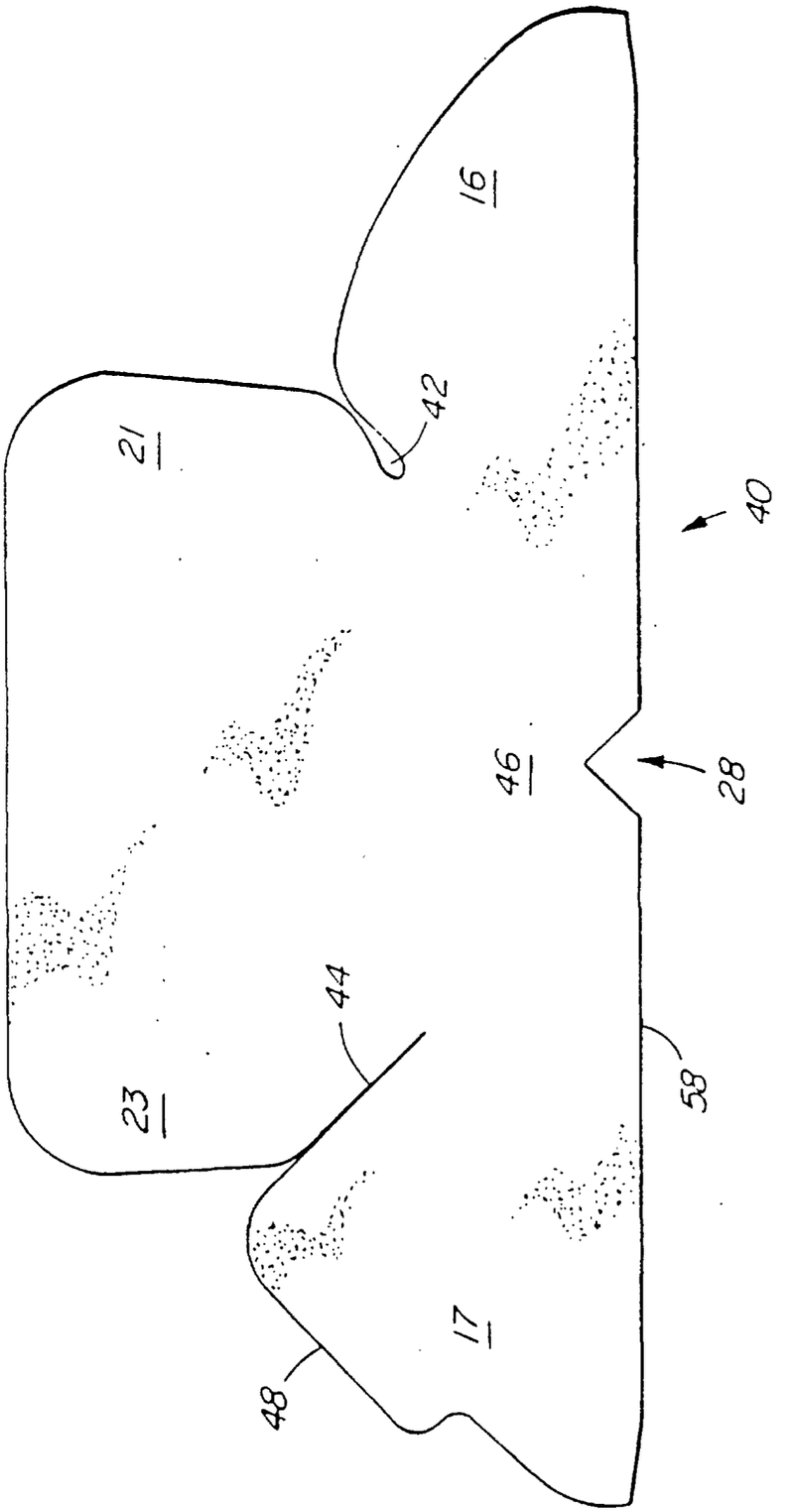

FIG. 6

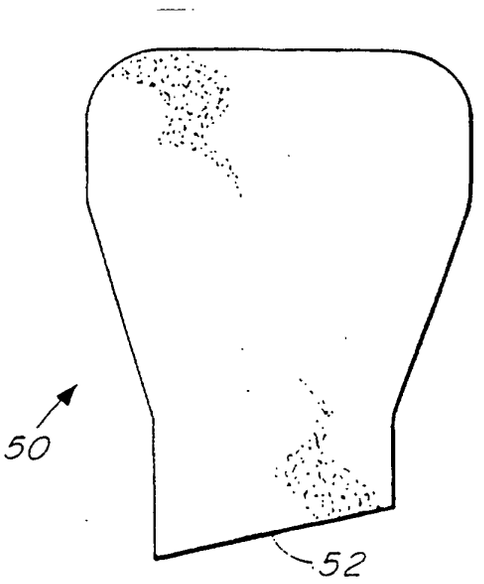

FIG. 7

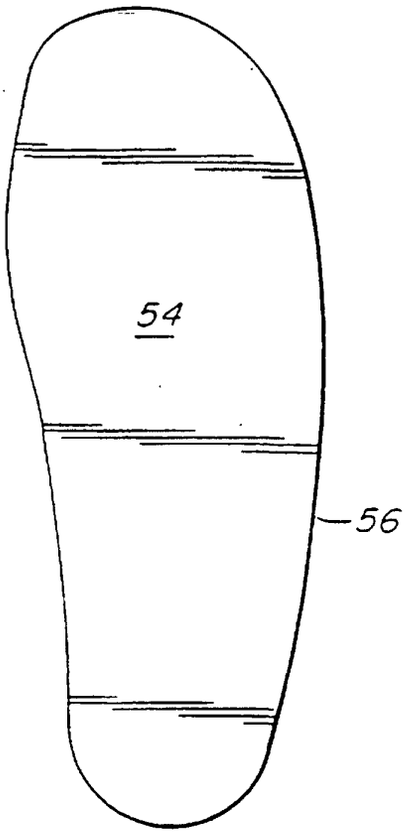

FIG. 8

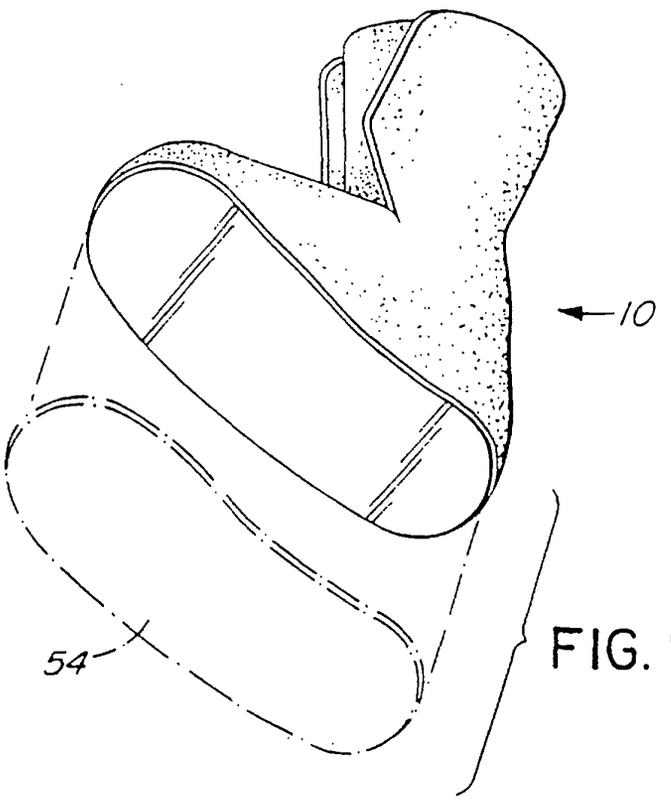

FIG. 9