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54 **Lever device for sports footgear, particularly for ski boots.**

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**CH-A- 504 850**  
**DE-A- 2 712 737**  
**FR-A- 2 363 294**  
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## Description

The present invention relates to sports footgear, and in particular ski boots, comprising a lever device according to the preamble of claim 1.

A footgear of this type is disclosed in document CH-A-504 850.

Several types of lever used in ski boots are currently known; for this purpose this same Assignee has filed, on July 17, 1975, an Italian patent, no. 1039897, disclosing a lever constituted by an arm which is pivoted, at one end, by means of an adapted pivot, to a pair of shoulders which are rigidly associated with a flap of the boot, said arm having a toothed region for interacting with the end of a hook which is associable, at its other end, with the other flap of the boot to be closed.

Said known lever requires a surface finish of good aesthetic quality, since it is in view on the boot; this therefore requires the use of materials, such as aluminum or plastics, which have an appreciable aesthetic appearance for the skier but do not, at the same time, have the high strength characteristics required to withstand the stresses and impacts to which they are subjected during sports practice.

In any case, the protrusion of the levers with respect to the lateral surface of the boot does not give said boot a neat aesthetic appearance, and said levers are subject, in case of impact with the snow, to accidental openings or breakages.

As a partial solution to this disadvantage, this same Applicant has filed, on January 21, 1976, an Italian patent, granted as No. 1054289, disclosing a closure assembly for ski boots which, despite using a simplified structure, has been found to be difficult to close, due to the small action surface for the hand, on which the effort must then be exerted.

An Italian patent for utility model, no. 185645 filed on January 20, 1981, also discloses a lever closure system, in particular for motorcycle boots, wherein the arm of the lever, which is still pivoted at one end at an adapted support which is rigidly associated with a flap, is inserted within adapted slots defined on another flap to be closed.

Even this solution, despite having a small number of components, has some disadvantages, such as the direct interaction of the lever arm with the flap to be closed, which entails breakages or deformations due to the different strength of the materials which are in contact with one another.

A French patent, published as No. 2432280 and filed on August 3, 1978, discloses a closure device which is again composed of a U-shaped lever arm and having wings pivoted, at their ends, at an adapted support which is rigidly associated with a flap, a pivot being interposed between said wings and interacting with an adapted rack defined

in, and protruding from, the other flap to be joined.

This solution has disadvantages, since the engagement between the lever arm and the rack is not always reliable, because the rack must necessarily be made of plastic material together with the flap of the boot and is thus made of a material which does not withstand the high stresses imparted while skiing.

Among the various described situations, the same Applicant of said French patent in fact provides the use of a single lever arm which has a toothed region which interacts with an adapted pivot which is transversely associated with the wings of a U-shaped bar which is pivoted in a cantilever manner to the other flap to be joined.

Even this solution, therefore, has the above described disadvantages; in addition there is a difficult closure operation for the skier, who must in practice rotate the lever arm through 180°.

As a partial solution to this disadvantage, this same Applicant filed, on September 8, 1980, an Italian patent application, No. 22716 B/80, related to a closure device, particularly for ski boots, wherein there is a lever arm which is pivoted, at one end, at one of the flaps to be secured; the end of a traction element is articulated to a median portion of said lever element; said traction element is provided, at its opposite end, with a hook-like element which can be engaged in an engagement seat defined at the other flap to be secured; said traction element has means for adjusting its useful length and at least one substantially flexible portion.

Even this solution, however, constructively comprises a large number of components and protrudes outside the contour of the boot; the closure device furthermore extends considerably longitudinally and affects a very large area of the boot.

The aim of the present invention is to eliminate the disadvantages described above in known types by providing a lever device which allows to achieve the optimum securing of two flaps to be joined although at the same time it does not protrude outside the external contour of the boot.

Within the scope of the above aim, an important object is to provide a structurally simple lever device which can be manufactured with a small number of components.

Another important object is to provide a lever device which associates with the preceding characteristics that of allowing the use of less expensive materials without this affecting the overall aesthetic appearance of the boot.

Another object is to provide a compact lever device which thus occupies a reduced area of the boot.

Not least object is to provide a reliable, and safe in use, lever device.

This aim, these objects and others which will become apparent hereinafter are achieved by sports footgear as defined in the appended claim 1.

Preferred embodiments are defined in the dependent claims.

Further characteristics and advantages of the invention will become apparent from the detailed description of some particular but not exclusive embodiments, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

figure 1 is a side view of a ski boot having a lever device according to the invention;

figure 2 is a partially sectional perspective view of the lever device in the open condition;

figure 3 is a top view of the lever device in the closed position;

figure 4 is a view, taken along the sectional plane III-III of figure 3, wherein, for the sake of clarity, the lever arm has been placed in the open condition;

figure 5 is a view of the use of a lever device which comprises two engagement elements integrated in a single lever arm;

figure 6 is a view, similar to that of figure 2, of a second embodiment;

figure 7 is a view, similar to that of figure 5, of the use of two engagement elements integrated in a single lever arm with reference to the solution illustrated in figure 6.

With reference to the above figures, the reference numeral 1 indicates a lever device usable for sports footgear and in particular for securing a first flap 2 with a second flap 3 of a ski boot 4.

The lever device comprises at least one lever arm 5 which, in the particular embodiment illustrated in figure 2, is substantially U-shaped and comprises a base 6 for connecting a pair of wings 7a and 7b, between the free ends of which an engagement means, constituted by a pivot 8, is transversely interposed.

Said at least one lever arm 5 is associated, or temporarily associable with the boot, at an adapted seat 9 defined on the first flap 2 of the boot.

Said first flap 2 can advantageously be constituted by a strap which is rigidly associated with said first flap and/or protrudes therefrom.

Said first and second flaps can thus be constituted for example by a strap which protrudes from a quarter or from the shell and is connected, at its other end, to the quarter and/or to the shell.

In the particular embodiment, the lever arm 5 is partially inserted within the seat 9; the base 6 is concealed within said seat 9 and the pair of wings 7a and 7b is also partially concealed therein, whereas the ends of said wings, including the pivot 8, protrude from said seat at the inner surface 10 of the first flap 2 which faces the second flap 3.

A longitudinal opening 12 is furthermore defined at the seat 9, at the surface 11 which is opposite to the surface 10 of the first flap 2.

From the point of view of the component material, the first flap 2, and therefore, optionally, the strap which constitutes it, can be made of a soft material and thus suitable for allowing the flexing of said strap for the engagement of the pivot 8 at adapted grip elements associated with the second element 3. Said grip elements can advantageously be constituted by a rack 13 rigidly associated with the second flap 3 by means of adapted first rivets 14a and 14b.

Said material for manufacturing the first flap or the strap is thus advantageously soft plastics or a natural material such as, for example, leather or, alternatively, soft synthetic material.

The seat 9 can furthermore advantageously be obtained by mutually connecting two distinct pieces of material, for example by glueing, sewing or welding, or can be obtained directly at a single part.

Alternatively, the seat 9 can be manufactured by folding on itself the end of a single part and by then defining the seat by sewing, glueing or welding.

The connection between the pair of wings 7a and 7b and the first flap 2 can advantageously be increased by using second rivets 15a and 15b.

Figure 5 illustrates the use of a lever device 1 which comprises two engagement means, indicated by the numerals 8a and 8b, which are part of a single body which is composed of two lever arms 5a and 5b which are mutually connected, at the respective bases 6a and 6b, by means of a crosspiece 16.

Two racks, indicated by the numerals 13a and 13b, are conveniently provided at the second flap 3.

It has thus been observed that the invention has achieved the intended aim and objects, a lever device having been provided which is perfectly integrated in the boot, which has a considerably appreciable aesthetic appearance, since the lever arm is totally or partially concealed in the seat defined on one of the flaps or on a band.

This also allows to use, for the lever arm, materials such as a blanked metal sheet or steel rod, having good strength but an unpleasant visual appearance.

The lever device thus obtained furthermore allows to reduce the number of components, since bases, brackets and traction elements are in fact eliminated, thus allowing to decrease the dimensions and the weight, on one hand, and the manufacturing costs on the other hand.

The lever device according to the invention is susceptible to numerous modifications and vari-

ations, all of which are within the scope of the same inventive concept on the basis of the appended claims.

Thus, for example, figures 6 and 7 illustrate a second embodiment for a lever device 101 which comprises at least one lever arm 105 which has a base 106, having an arc-shaped end, from which a pair of parallel and identical wings 107a and 107b extends; an engagement means, constituted by a pivot 108, is arranged transversely at the free ends of said wings.

Said lever arm 105 thus has a T-shaped configuration, and the end of a first flap or of a strap 102 is connected to the base 106.

Said strap partially affects, and covers, part of the wings 107a and 107b proximate to their connection to the base 106, and this defines an opening 112 on said first flap or strap 102 at the interspace between said pair of wings 107a and 107b.

The lever arm 105 is connected to the first flap or strap 102 by means of adapted pivots, indicated by the numerals 117a and 117b.

The lever arm 105 is thus pivoted at the first flap or strap 102.

This solution is advantageous if the material which constitutes the first flap or the strap is of the semirigid type and thus does not allow the flexing thereof for the use of the pivot 108 with the grip elements constituted by the rack 113.

Figure 7 illustrates a lever device 101 in which a pair of engagement means 108a and 108b is used; said means are integrated in a single body which is composed of two identical lever arms, indicated by the numerals 105a and 105b, connected by a crosspiece 116 at the bases 106a and 106b.

In this case, the interconnection between the lever arms 105a, 105b and the first flap or strap 102 occurs by means of the use of pivots 117a, 117b and 117c, said pivot 117c connecting the facing wings of the two lever arms.

In this case also, a pair of racks 113a and 113b for interaction with the pivots 108a and 108b is provided at the second flap 103.

The materials which constitute the individual components of the lever device may naturally be the most pertinent according to the specific requirements.

Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the scope of each element identified by way of example by such reference signs.

## Claims

1. Sports footgear comprising a lever device, particularly for securing a first flap (2;102) and a second flap (3;103) of a ski boot (4), comprising a lever arm (5;5a,5b;105;105a,105b) which is provided at a lower end thereof with engagement means (8;8a,8b;108;108a,108b) for pivotal engagement in at least one grip means (13;13a,13b;113;113a,113b) connected to said second flap thereby to pivotally connect the lower end of said lever arm to said second flap, said lever arm having an upper portion thereof which is connected to said first flap (2;102) and said first flap being made of a soft material to allow pivoting thereof together with said lever arm, the lever device being characterized in that said first flap comprises at least one seat (9) which is obtained by folding over a portion of said first flap or by connecting a distinct piece of material to said first flap and in which said upper portion of the lever arm is inserted thereby to connect said first flap to said upper portion of the lever arm, said lower end of the lever arm together with the engagement means provided thereat protruding from said seat at the inner surface (10) of the first flap which faces the second flap.
2. Footgear according to claim 1, characterized in that said lever arm is substantially U-shaped and comprises at said upper portion a base (6) for connecting a pair of wings (7a,7b), between the free ends of which said engagement means, constituted by a pivot (8), is transversely interposed.
3. Footgear according to the preceding claims, characterized in that said upper portion of the lever arm is removably inserted in said seat.
4. Footgear according to the preceding claims, characterized in that a longitudinal opening (12) is defined at said at least one seat (9).
5. Footgear according to the preceding claims, characterized in that said at least one grip element is constituted by a rack (13).
6. Footgear according to the preceding claims, characterized in that it comprises two engagement means (8a,8b) which are integrated in a single body composed of two lever arms (5a,5b) which are mutually connected at their respective bases by means of a crosspiece (16).

## Patentansprüche

1. Sportschuh umfassend eine Hebelvorrichtung, insbesondere zum Befestigen einer ersten Lasche (2;102) und einer zweiten Lasche (3;103) eines Skistiefels (4), mit einem Hebelarm (5;5a,5b;105,105a,105b), der an seinem unteren Ende mit einer Eingriffseinrichtung (8;8a,8b;108;108a,108b) zum schwenkbaren Eingriff mit wenigstens einer Greifeinrichtung (13;13a,13b;113;113a,113b), die mit der zweiten Lasche verbunden ist, um auf diese Weise das untere Ende des Hebelarmes mit der zweiten Lasche schwenkbar zu verbinden, wobei der Hebelarm einen oberen Abschnitt aufweist, der mit der ersten Lasche (2;102) verbunden ist, und wobei die erste Lasche aus einem weichen Material besteht, damit diese zusammen mit dem Hebelarm schwenkbar ist, wobei die Hebelvorrichtung **dadurch gekennzeichnet ist, daß** die erste Lasche mindestens einen Sitz (9) aufweist, der durch Umfalten eines Abschnitts der ersten Lasche oder durch Verbinden eines einzelnen Materialstückes mit der ersten Lasche erhalten wird und in dem der obere Abschnitt des Hebelarmes eingeführt wird, um auf diese Weise die erste Lasche mit dem oberen Abschnitt des Hebelarmes zu verbinden, wobei das untere Ende des Hebelarmes zusammen mit der daran vorgesehenen Eingriffseinrichtung von dem Sitz an der Innenseite (10) der ersten Lasche hervorsteht, die der zweiten Lasche gegenüberliegt. 5  
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2. Schuhwerk nach Anspruch 1, **dadurch gekennzeichnet, daß** der Hebelarm im wesentlichen U-förmig ist und am oberen Abschnitt einen Basisteil (6) zum Verbinden von einem Paar Flügel (7a,7b) umfaßt, zwischen deren freien Enden die durch einen Drehzapfen (8) gebildete Eingriffseinrichtung in Querrichtung eingesetzt ist. 35  
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3. Schuhwerk nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, daß** der obere Abschnitt des Hebelarmes lösbar in den Sitz eingesetzt ist. 45
4. Schuhwerk nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, daß** eine längliche Öffnung (12) in dem mindestens einen Sitz (9) ausgebildet ist. 50
5. Schuhwerk nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, daß** das mindestens eine Greifelement durch eine Zahnstange (13) gebildet ist. 55

6. Schuhwerk nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, daß** es zwei Eingriffseinrichtungen (8a,8b) umfaßt, die in einen einzigen, aus zwei Hebelarmen (5a,5b) bestehenden Körper integriert sind, wobei die Hebelarme an ihrer jeweiligen Basis mittels ein Querstück (16) miteinander verbunden sind.

## Revendications

1. Article chaussant de sport comprenant un dispositif à levier, en particulier pour fixer un premier volet (2; 102) et un second volet (3; 103) d'une chaussure de ski (4), comprenant un bras de levier (5; 5a, 5b; 105; 105a, 105b) qui est muni à une extrémité inférieure d'un moyen d'engagement (8; 8a, 8b; 108; 108a, 108b) en vue d'un engagement à pivotement dans au moins un moyen de retenue (13; 13a, 13b; 113; 113a, 113b) relié audit second volet, reliant ainsi de façon pivotante l'extrémité inférieure dudit bras de levier audit second volet, ledit bras de levier comportant une portion supérieure qui est reliée au premier volet (2; 102) et ledit premier volet étant réalisé en un matériau mou pour permettre son pivotement avec ledit bras de levier, le dispositif à levier étant caractérisé en ce que ledit premier volet comprend au moins un siège (9) qui est obtenu en repliant une portion dudit premier volet ou en reliant une pièce de matière distincte audit premier volet et dans lequel ladite portion supérieure du bras de levier est insérée de façon à relier ledit premier volet à ladite portion supérieure du bras de levier, ladite extrémité inférieure du bras de levier faisant saillie avec le moyen d'engagement prévu sur lui dudit siège sur la surface interne (10) du premier volet qui est face au second volet. 1  
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2. Article chaussant selon la revendication 1, caractérisé en ce que ledit bras de levier est sensiblement en forme de U et comprend, dans ladite portion supérieure, une base (6) pour relier une paire d'ailes (7a, 7b) entre les extrémités libres desquelles ledit moyen d'engagement, constitué par un pivot (8), est interposé transversalement. 1  
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3. Article chaussant selon les revendications précédentes, caractérisé en ce que ladite portion supérieure du bras de levier est insérée de façon amovible dans ledit siège. 1  
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4. Article chaussant selon les revendications précédentes, caractérisé en ce qu'une ouverture longitudinale (12) est définie dans ledit siège. 1  
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5. Article chaussant selon les revendications précédentes, caractérisé en ce que ledit au moins un élément de retenue est constitué par une crémaillère (13). 5
6. Article chaussant selon les revendications précédentes, caractérisé en ce qu'il comprend deux moyens d'engagement (8a, 8b) qui sont intégrés sous forme d'un corps unique composé de deux bras de levier (5a, 5b) qui sont mutuellement reliés à leurs bases respectives au moyen d'une traverse (16). 10

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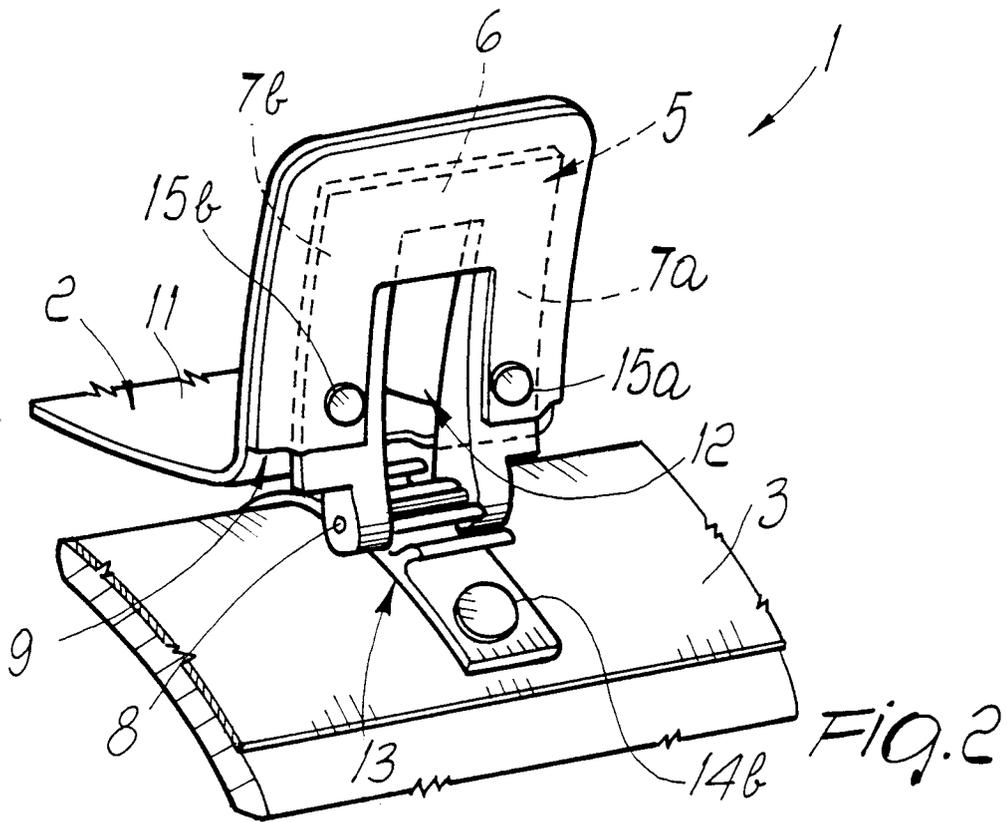
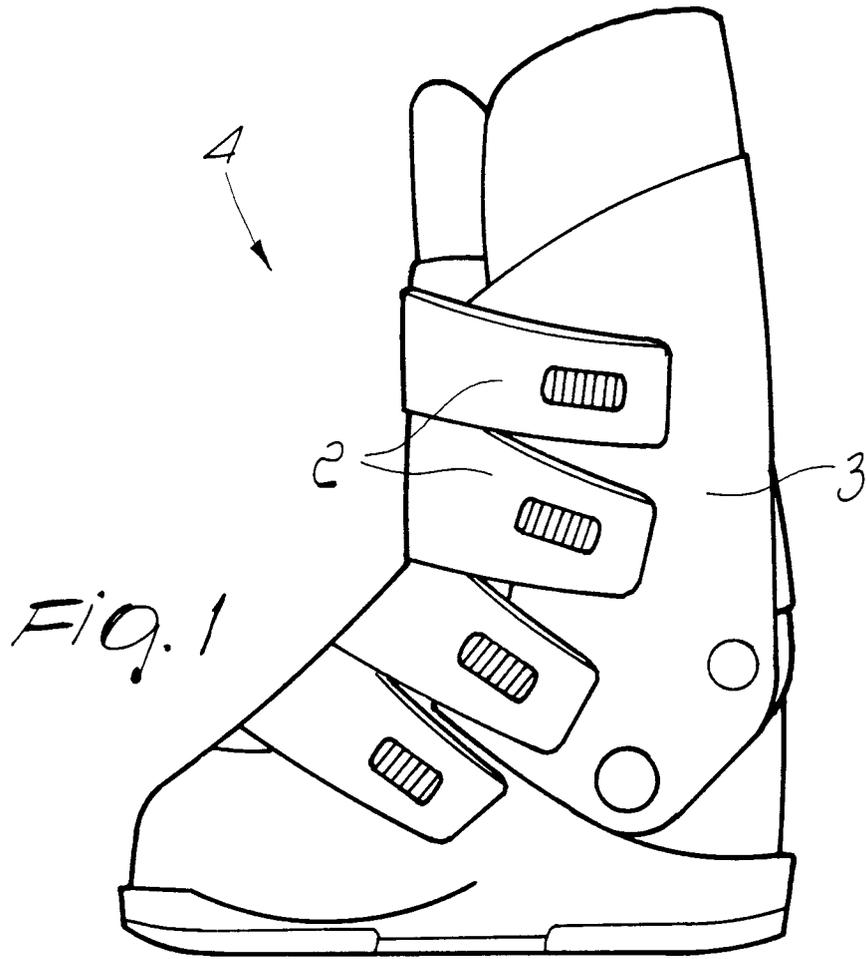
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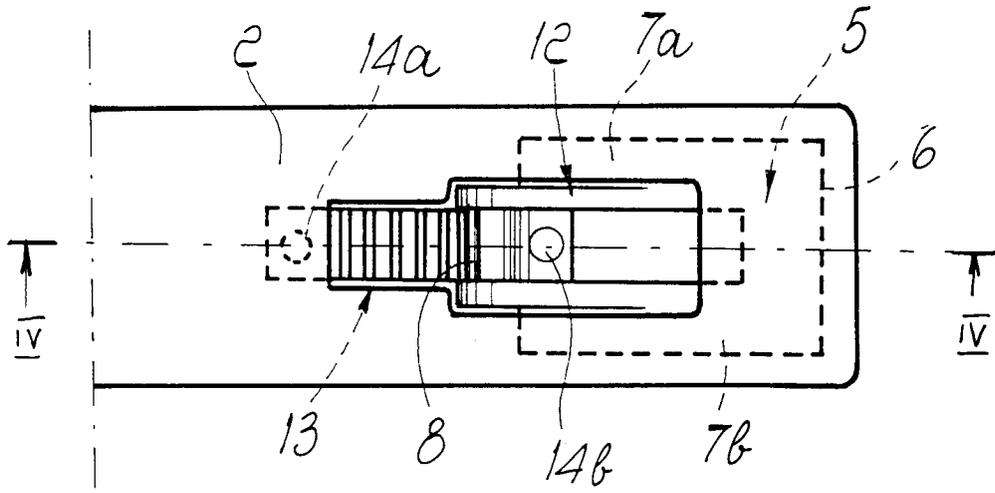


FIG. 3

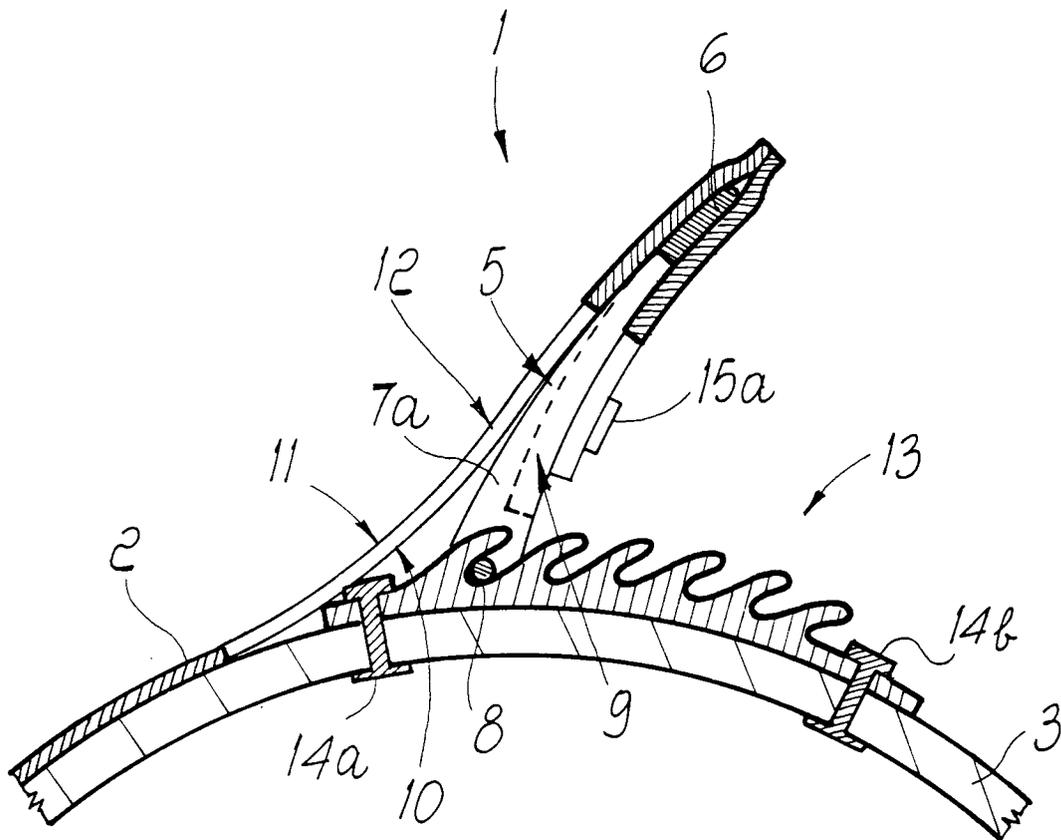


FIG. 4

