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(54) **Fastening device for sports shoes**

Schliessvorrichtung für Sportschuhe

Dispositif de fermeture pour chaussures de sport

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(56) References cited:
EP-A- 0 401 202 **DE-U- 29 612 858**
US-A- 4 395 801 **US-A- 5 575 045**

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Description

[0001] The present invention relates to a fastening device for sports shoes.

[0002] US-A-4 395 801 discloses a sports boot fastener having a combination of features as defined in the pre-characterizing portion of the appended claim 1.

[0003] In order to close the flaps of sports shoes, particularly in ski boots and in roller skates or ice skates, lever-type fastening devices are conventionally used which allow the user to achieve the mutual approach and subsequent fastening of the flaps.

[0004] Italian utility model No. 182,322 and corresponding document DE-A-3 132 042 of this same Applicant, provides an example of a fastening device of the above-mentioned type, which comprises a lever element pivoted, at one end, at one of the flaps to be fastened. The end of a traction element is articulated to a median portion of the lever element, said traction element being provided, at the other end, with a hook-shaped element which can be coupled in engagement seats formed at the other flap to be fastened.

[0005] Means are also provided to keep the traction element in close contact with the flaps even in the released position. The means is constituted by a spring acting between the lever element (hereinafter referenced as "lever arm" for the sake of clarity) and the traction element; the turns of the spring are arranged coaxially to the pivot for the articulation of the traction element with respect to the lever arm and are contained between the side walls of said lever arm and the traction element.

[0006] One of the drawbacks observed in these conventional devices is that, because of its accommodation inside the lever arm, the spring must have two turns wound in opposite directions in order to perform its function, i.e., to provide an elastic force, directed towards the underlying flaps, for contrasting the articulation of the traction element with respect to the lever arm. The spring double winding entails high production costs for the spring, due both to the complexity of the operating steps and to the particular machines required, thus affecting the overall cost of the device.

[0007] Moreover, the need to accommodate the turns of the spring between the walls of the arm and the traction element requires an empty space between these two components; accordingly, the pivot for articulation between the arm and the traction element, whereon the turns are arranged coaxially, has two cantilevered portions at said empty space which are subjected to bending stresses when the traction element is pulled. Since the bending stress is applied in a cyclic fashion, thus becoming a fatigue stress, the pivot must be given an adapted size to avoid breaking, which is likely in the presence of fatigue bending.

[0008] The aim of the present invention is to solve the above problems by providing a fastening device for sports shoes the structure whereof is such as to reduce

overall production costs whilst improving the strength characteristics of said device.

[0009] Within the scope of this aim, an important object is to provide a device which allows to simplify the production of the spring acting between the lever arm and the traction element, thus reducing the cost of said component.

[0010] A further important object is to provide a device wherein it is possible to reduce the dimensions, or use materials with lower technical characteristics that are therefore cheaper, for the pivot that provides the articulation between the lever arm and the traction element, preserving nonetheless the strength characteristics with respect to conventional devices. As an alternative, an object may be to maintain the dimensions or the materials of the pivot unchanged however considerably improving the strength characteristics.

[0011] A further object is to provide a device which is reliable and safe in use.

[0012] In accordance with the invention, there is provided a fastening device for sports shoes as defined in the appended claims.

[0013] The characteristics and advantages of the invention will become apparent from the following detailed description of a particular but not exclusive embodiment thereof, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

figure 1 is a partially sectional side view of the fastening device according to the invention;
figure 2 is a bottom plan view of the device, with the base plate shown in cross-section;
figure 3 is an enlarged-scale sectional view of a detail of the device, taken along the plane III-III.

[0014] With reference to the above figures, the fastening device according to the invention, generally designated by the reference numeral 1, comprises a lever arm 2, which is substantially U-shaped, its straight portions being constituted by a first pair of substantially vertical walls 3. Lever arm 2 is pivoted to two brackets 4, at the end of the first pair of vertical walls. Brackets 4 protrude from a base plate 5 fixed to one of the flaps to be fastened (not shown in the figures). A traction element, generally designated by the reference numeral 6, is accommodated between the first pair of vertical walls 3 and is articulated, at one of its ends, at a median portion of the lever arm 2 by means of a pivot 7. At the opposite end, the traction element 6 is provided with a hook member, such as a ring 10, a plate provided with a tooth at its end, or equivalent conventional means; said hook member can be fixed in adapted engagement seats provided at the other flap to be fastened.

[0015] The traction element is composed of a resisting element 8, made of metallic or equally strong material, and advantageously of a covering element 9, made of plastics, which has a protective and decorative function.

[0016] The fastening device also comprises elastic means, which are constituted by a spring 11 and act between the lever arm 2 and the traction element 6 and are adapted to keep said traction element always in close contact with the flaps even when the fastening device is in released position.

[0017] The traction element 6, and particularly the resisting element 8, has a containment seat 12 at the lower surface facing the flaps. Spring 11 is accommodated in containment seat 12, coaxially to the pivot 7. This arrangement, inside the traction element 6, allows to use a spring constituted by a single set of turns wound in a single direction instead of being constituted by two sets of turns wound in opposite directions, as in the prior art. The free ends of the spring 11 are associated respectively with the lever arm 2 at a blind hole 13 formed on a wall of the first pair of vertical walls 3 and with the traction element 6 where it rests against the lower edge of the resisting element 8. The resisting element also forms a second pair of vertical walls 14 which face, and are adjacent to, the first pair of walls 3. A third pair of vertical walls 15, formed by the covering element 9, can optionally be interposed between these two pairs of walls.

[0018] The pivot 7 passes through a first pair of holes 16, formed transversely to the lever arm 2 at the first pair of vertical wall 3, a second pair of holes 17, formed transversely to the resisting element 8, and optionally a third pair of holes 18, if the covering element 9 is also provided.

[0019] At the second pair of holes 17, the resisting element 8 has a folded region which forms two bushes 19 protruding from the resisting element and orientated towards the inner surface of the vertical walls 3 of the lever arm 2. By virtue of this refinement, and by virtue of the fact that the free space between the first pair of walls 3 of the lever arm 2 and the second pair of walls 14 of the resisting element 8 is minimal, the pivot 7 is subjected substantially to shearing stresses instead of bending stresses. The length of the cantilevered portions (approximately 1 mm on either side) is in fact absolutely negligible with respect to the length of the portions passing through the pairs of first and second holes 16 and 17 and then supported in a snug-fit manner.

[0020] It has thus been observed that the invention achieves the intended aim and objects, a fastening device for sports shoes having been provided construction whereof allows to considerably reduce production costs whilst improving the technical strength characteristics of the device.

[0021] In particular, the accommodation of the spring 11 in the traction element 6 allows to use a spring wherein the turns are wound in the same direction: this entails considerable savings in the production costs of the spring, because both the operating steps and the machines required for winding the turns are simplified.

[0022] Moreover, the central arrangement of the spring 11 allows to increase the dimensions of the trac-

tion element 6 until it is adjacent to the walls 3 of the lever arm; in this manner, the pivot 7 is subjected substantially to shearing stresses, thus requiring smaller resisting cross-sections than corresponding pivots subjected to bending stresses.

[0023] It is therefore possible to reduce the dimensions of the pivot or to use lower-quality materials with lower technical strength characteristics without diminishing the strength of the pivot, at a lower overall cost, or to keep the dimensions and/or the materials of the pivot unchanged but give the pivot distinctly higher strength at a cost similar to the one currently commercially available.

[0024] The fastening device thus conceived is of course susceptible of numerous modifications and variations within the scope of the appended claims.

[0025] The materials employed, as well as the contingent shapes and dimensions of the individual components of the device, may also be the most pertinent according to specific requirements.

[0026] 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 interpretation of each element identified by way of example by such reference signs.

Claims

1. A fastening device for sports shoes, comprising: a lever arm (2) pivoted, at one end, to connecting means (5), which can be attached to one of the flaps to be fastened; a traction element (6) articulated at one end, by means of a pivot (7), to a median portion of said lever arm and having, at the other end, a hook member (10) which can be coupled in engagement seats formed at the other flap to be fastened; and elastic means (11) acting between said lever arm and said traction element (6) and adapted to keep said traction element in close contact with said flaps, when the fastening device is attached to said one flap, even in the released position, **characterized in that** a seat (12) for containing said elastic means is provided inside said traction element.
2. A device according to claim 1, **characterized in that** said elastic means is constituted by a spring (11) which is provided with a single set of turns wound in a single direction and accommodated in said containment seat (12) coaxially to said pivot.
3. A device according to claim 2, **characterized in that** the free ends of said spring (11) are associated respectively with said lever arm (2) and with said traction element (6).

4. A device according to one or more of the preceding claims, **characterized in that** said lever arm (2) is substantially U-shaped, its straight portions being constituted by a first pair of substantially vertical walls (3). 5
5. A device according to one or more of the preceding claims, **characterized in that** said traction element (6) is composed of a resisting element (8) made of metallic material or of a material having an equivalent strength and, advantageously, of a covering element (9) made of plastics which has protective and decorative functions. 10
6. A device according to claims 3, 4, and 5, **characterized in that** said free ends of the spring (11) are associated respectively with said lever arm (2), at a blind hole (13) formed on a wall of said first pair of vertical walls (14), and with said traction element (6), which rests against the lower edge of the resisting element. 15 20
7. A device according to claim 5, **characterized in that** said containment seat (12) for said spring (11) is formed on said resisting element (8). 25
8. A device according to claim 7, **characterized in that** said resisting element forms, at said containment seat, a second pair of vertical walls (14) which face, and are adjacent to, said first pair of vertical walls (3). 30
9. A device according to claim 8, **characterized in that** a third pair of vertical walls (15), formed by said covering element (9), is interposed between said first (3) and second (14) pairs of vertical walls. 35
10. A device according to one or more of the preceding claims, **characterized in that** said pivot (7) passes through a first pair of holes (16), formed transversely to said lever arm at the first pair of vertical walls, and a second pair of holes (17) formed transversely to said resisting element. 40
11. A device according to claim 10, **characterized in that** said pivot passes through a third pair of holes (18) formed transversely to said covering element. 45
12. A device according to claim 10, **characterized in that** said resisting element has, at said second pair of holes (17), a folded region which forms a pair of bushes (19) protruding from said resisting element and orientated towards the inner surface of said first pair of vertical walls. 50

Patentansprüche

1. Befestigungsvorrichtung für Sportschuhe, umfassend: einen Hebelarm (2), der an einem Ende drehbar an einem Verbindungsmittel (5) gelagert ist, das an einer der zu befestigenden Laschen angebracht werden kann; ein Zugelement (6), das an einem Ende mittels einer Drehachse (7) an einen mittleren Bereich des Hebelarms angelenkt ist und am anderen Ende ein Ösenelement (10) aufweist, das in eine auf der anderen zu befestigenden Lasche ausgebildete Eingriffsaufnahme gekoppelt werden kann; und Elastikmittel (11), die zwischen dem Hebelarm und dem Zugelement (6) wirken und dafür ausgelegt sind, das Zugelement selbst in der entspannten Position in engem Kontakt mit den Laschen zu halten, wenn die Befestigungsvorrichtung an der einen Lasche angebracht ist, **dadurch gekennzeichnet, dass** ein Platz (12) zum Aufnehmen des Elastikmittels in dem Zugelement vorgesehen ist.
2. Vorrichtung gemäß Anspruch 1, **dadurch gekennzeichnet, dass** das Elastikmittel durch eine Feder (11) gebildet ist, die mit einem einzelnen Satz von in einer einzelnen Richtung gewickelten Wicklungen versehen ist und im Aufnahmeplatz (12) koaxial zur Drehachse untergebracht ist.
3. Vorrichtung gemäß Anspruch 2, **dadurch gekennzeichnet, dass** die freien Enden der Feder (11) dem Hebelarm (2) bzw. dem Zugelement (6) zugeordnet sind.
4. Vorrichtung gemäß einem oder mehreren der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** der Hebelarm (2) im wesentlichen U-förmig ist, wobei seine geraden Teile aus einem ersten Paar von im wesentlichen vertikalen Wänden (3) bestehen.
5. Vorrichtung gemäß einem oder mehreren der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** das Zugelement (6) aus einem Widerstandselement (8), das aus einem metallischen Material oder einem Material gleichwertiger Festigkeit hergestellt ist, und vorteilhafterweise aus einem Abdeckelement (9), das aus Kunststoff hergestellt ist, der schützende und dekorative Funktionen hat, zusammengesetzt ist.
6. Vorrichtung gemäß den Ansprüchen 3, 4, und 5, **dadurch gekennzeichnet, dass** die freien Enden der Feder (11) dem Hebelarm (2) in einem an einer Wand des ersten Paares vertikaler Wände (14) gebildeten Sackloch (13) beziehungsweise dem Zugelement (6), das sich gegen die untere Kante des Widerstandselements stützt, zugeordnet sind.

7. Vorrichtung gemäß Anspruch 5, **dadurch gekennzeichnet, dass** der Aufnahmeplatz (12) für die Feder (11) auf dem Widerstandselement (8) ausgebildet ist.
8. Vorrichtung gemäß Anspruch 7, **dadurch gekennzeichnet, dass** das Widerstandselement am Aufnahmeplatz ein zweites Paar vertikaler Wände (14) bildet, die zum ersten Paar vertikaler Wände (3) hinweisen und angrenzend sind.
9. Vorrichtung gemäß Anspruch 8, **dadurch gekennzeichnet, dass** ein vom Abdeckelement (9) gebildetes drittes Paar vertikaler Wände (15) zwischen die ersten (3) und zweiten (14) Paare vertikaler Wände eingeschoben ist.
10. Vorrichtung gemäß einem oder mehreren der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** die Drehachse (7) durch ein erstes Paar von Löchern (16), die quer zu dem Hebelarm am ersten Paar vertikaler Wände gebildet sind und ein zweites Paar von Löchern (17), die quer zu dem Widerstandselement gebildet sind, hindurchgeht.
11. Vorrichtung gemäß Anspruch 10, **dadurch gekennzeichnet, dass** die Drehachse durch ein drittes Paar von quer zum Abdeckelement gebildeten Löchern (18) hindurchgeht.
12. Vorrichtung gemäß Anspruch 10, **dadurch gekennzeichnet, dass** das Widerstandselement an dem zweiten Paar von Löchern (17) einen abgekanteten Bereich aufweist, der ein Paar Buchsen (19) bildet, die aus dem Widerstandselement vorragen und zur inneren Oberfläche des ersten Paares vertikaler Wände hin orientiert sind.

Revendications

1. Dispositif de fermeture pour chaussures de sport, comprenant : un bras de levier (2) pivotant, à une extrémité, par rapport à un moyen d'accouplement (5), qui peut être attaché à un premier des rabats à fermer ; un élément de traction (6) articulé à une première extrémité, à l'aide d'un pivot (7) avec une partie médiane dudit bras de levier et ayant, à l'autre extrémité, un élément formant crochet (10) qui peut être accouplé dans des sièges d'engagement formés sur l'autre rabat à fermer ; et un moyen élastique (11) agissant entre ledit bras de levier et ledit élément de traction (6) et conçu pour maintenir ledit élément de traction tout contre lesdits rabats, lorsque le dispositif de fermeture est attaché audit premier rabat même en position desserrée, **caractérisé en ce qu'un** siège (12) destiné à recevoir ledit moyen élastique est présent à l'intérieur dudit élé-

ment de traction.

2. Dispositif selon la revendication 1, **caractérisé en ce que** ledit moyen élastique est constitué par un ressort (11) pourvu d'un seul ensemble de spires enroulées dans un seul sens et logées dans ledit siège de réception (12) de manière coaxiale audit pivot.
3. Dispositif selon la revendication 2, **caractérisé en ce que** les extrémités libres dudit ressort (11) sont respectivement associées audit bras de levier (2) et audit élément de traction (6).
4. Dispositif selon une ou plusieurs des revendications précédentes, **caractérisé en ce que** ledit bras de levier (2) est sensiblement en U, ses parties rectilignes étant constituées par une première paire de parois sensiblement verticales (3).
5. Dispositif selon une ou plusieurs des revendications précédentes, **caractérisé en ce que** ledit élément de traction (6) est composé d'un élément résistant (8) en matière métallique ou en matière à résistance mécanique équivalente et, avantageusement, d'un élément de recouvrement (9) en matière plastique à fonctions de protection et de décoration.
6. Dispositif selon les revendications 3, 4 et 5, **caractérisé en ce que** lesdites extrémités libres du ressort (11) sont respectivement associées audit bras de levier (2), au niveau d'un trou borgne (13) formé dans une paroi de ladite première paire de parois verticales (14), et audit élément de traction (6), qui repose contre le bord inférieur de l'élément résistant.
7. Dispositif selon la revendications 5, **caractérisé en ce que** ledit siège de réception (12) pour ledit ressort (11) est formé sur ledit élément résistant (8).
8. Dispositif selon la revendication 7, **caractérisé en ce que** ledit élément résistant forme, au niveau dudit siège de réception, une deuxième paire de parois verticales (14) en regard de ladite première paire de parois verticales (3), et de manière adjacente à celle-ci.
9. Dispositif selon la revendication 8, **caractérisé en ce qu'une** troisième paire de parois verticales (15), formées par ledit élément de recouvrement (9), est intercalée entre lesdites première (3) et deuxième (14) paires de parois verticales.
10. Dispositif selon un ou plusieurs des revendications précédentes, **caractérisé en ce que** ledit pivot (7) passe par une première paire de trous (16), formés

transversalement par rapport audit bras de levier dans la première paire de parois verticales, et par une deuxième paire de trous (17) formés transversalement par rapport audit élément résistant.

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11. Dispositif selon la revendication 10, **caractérisé en ce que** ledit pivot passe par une troisième paire de trous (18) formés transversalement par rapport audit élément de recouvrement.

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12. Dispositif selon la revendication 10, **caractérisé en ce que** ledit élément résistant a, au niveau de ladite deuxième paire de trous (17), une région pliée qui forme une paire de manchons (19) dépassant dudit élément résistant et orientés vers la surface intérieure de ladite première paire de parois verticales.

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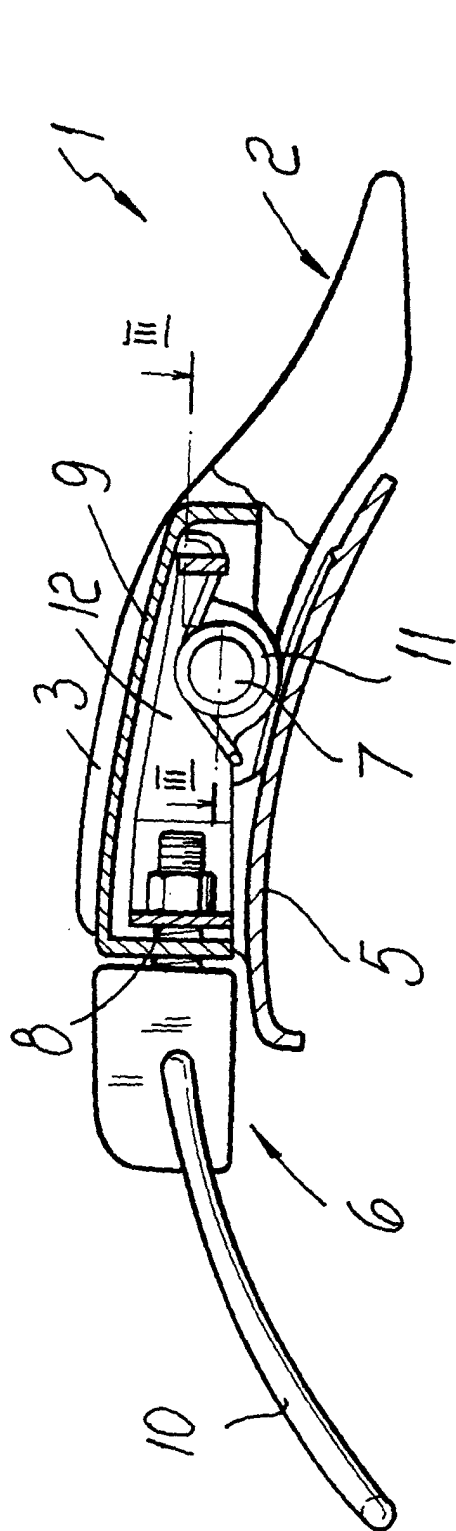


Fig. 1

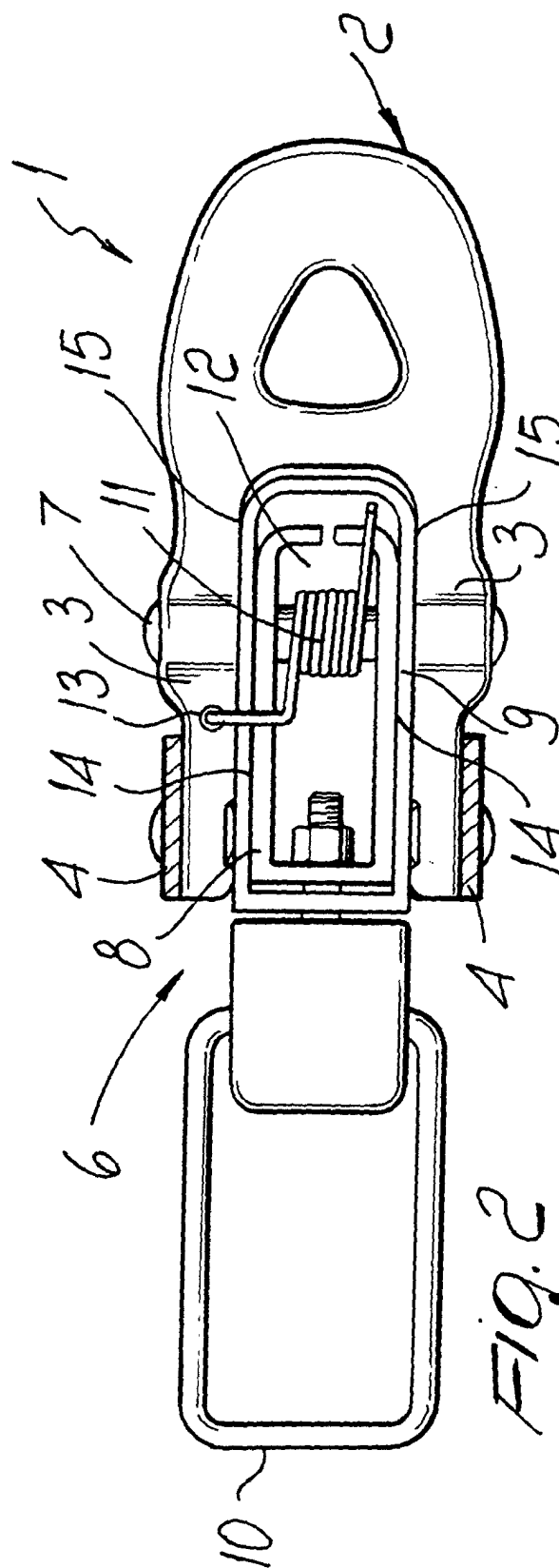


Fig. 2

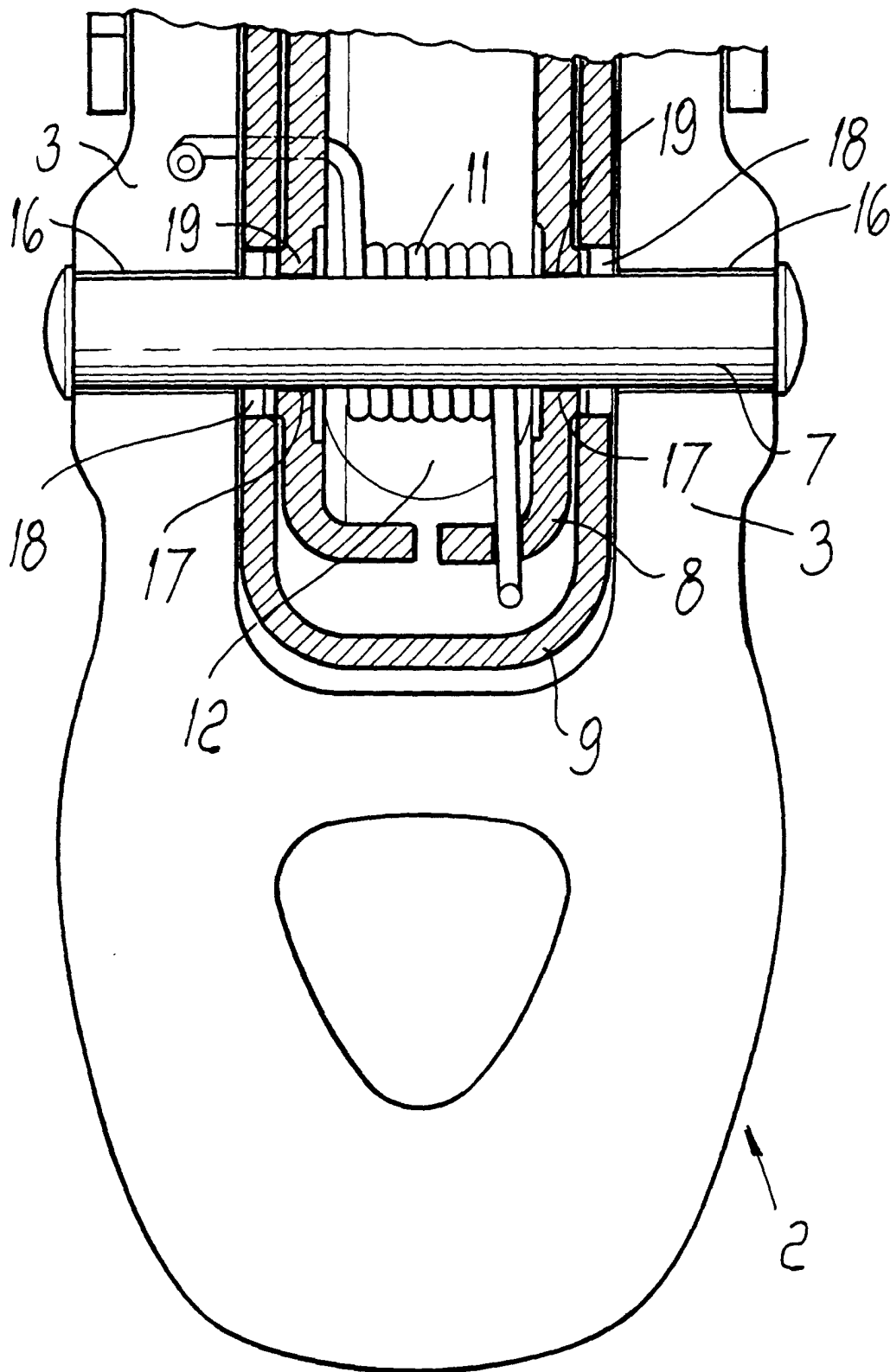


Fig. 3