United States Patent [19]

Baso

[11] **3,818,547**

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[54] **TENSIONING LEVER BUCKLE, PARTICULARLY FOR PLASTIC SKI BOOTS**

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[52] **U.S. Cl.** ..... **24/70 SK,** 36/2.5 AL

[51] **Int. Cl.** **A43c 11/14**

[58] **Field of Search** ... 36/2.5 AL; 24/68 SK, 69 SK, 24/70 SK, 271, 272

[56] **References Cited**

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Attorney, Agent, or Firm—Woodhams, Blanchard & Flynn

[57] **ABSTRACT**

A buckle for plastic ski boots having a toothed tensioning lever pivotally supported on one instep portion and a tension lever pivotally supported on the other instep member and having means thereon engageable with the gaps between the teeth on the toothed tensioning lever. The tension lever is constructed as a narrow member and has at its free end two lateral pins which project outwardly therefrom. The toothed tensioning lever is substantially U-shaped and the legs of the U-shaped member are toothed so that the tension lever engages the U-legs in the gaps between the teeth thereon.

11 Claims, 8 Drawing Figures

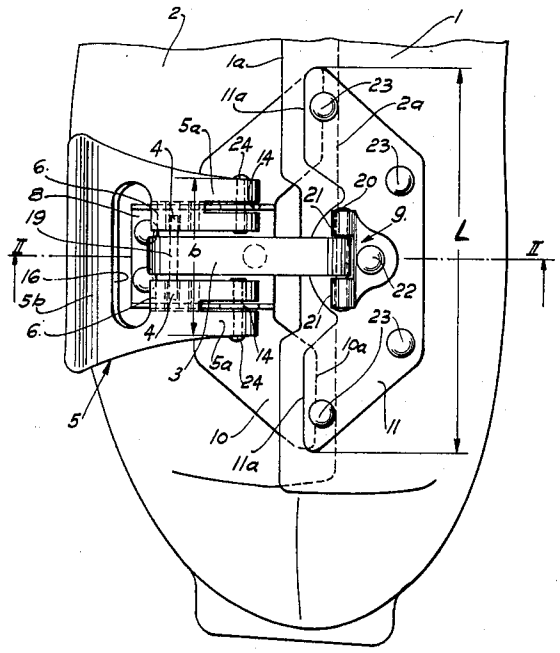
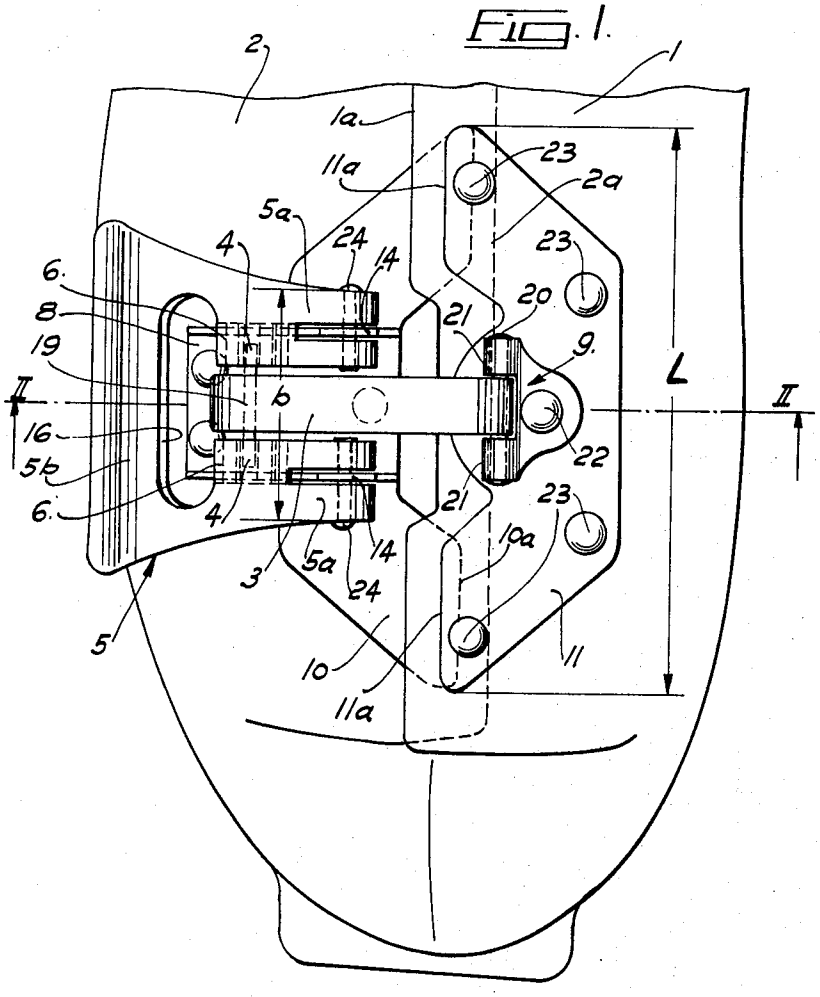


Fig. 1.


2
1
1a
11a
23
2a
5a
4
24
14
23
6
8
19
20
21
9
L
II
II
b
16
5b
6
22
21
23
4
10a
14
5a
3
24
5
10
11
11a

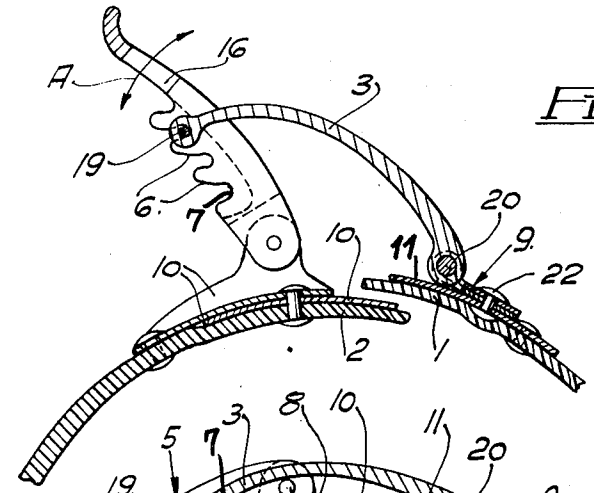


FIG. 3

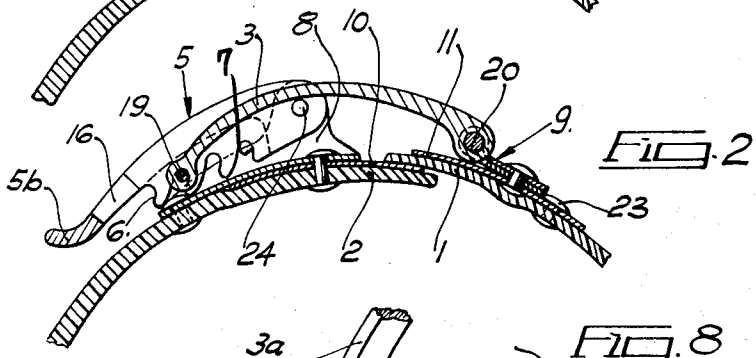


FIG. 2

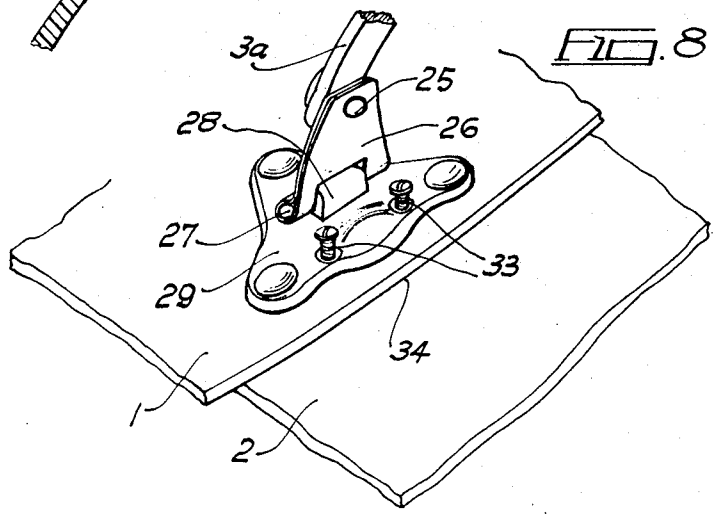


FIG. 8

FIG. 5

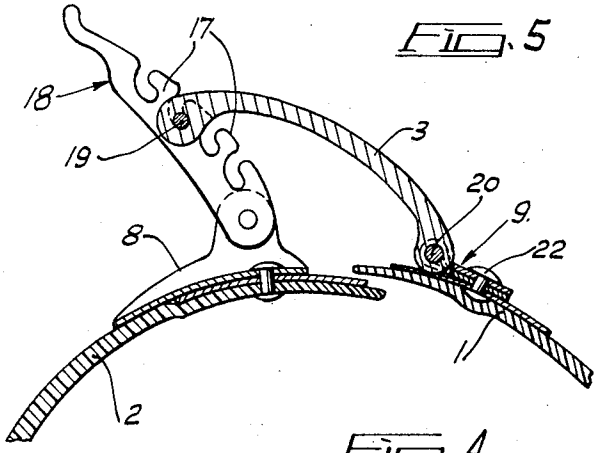
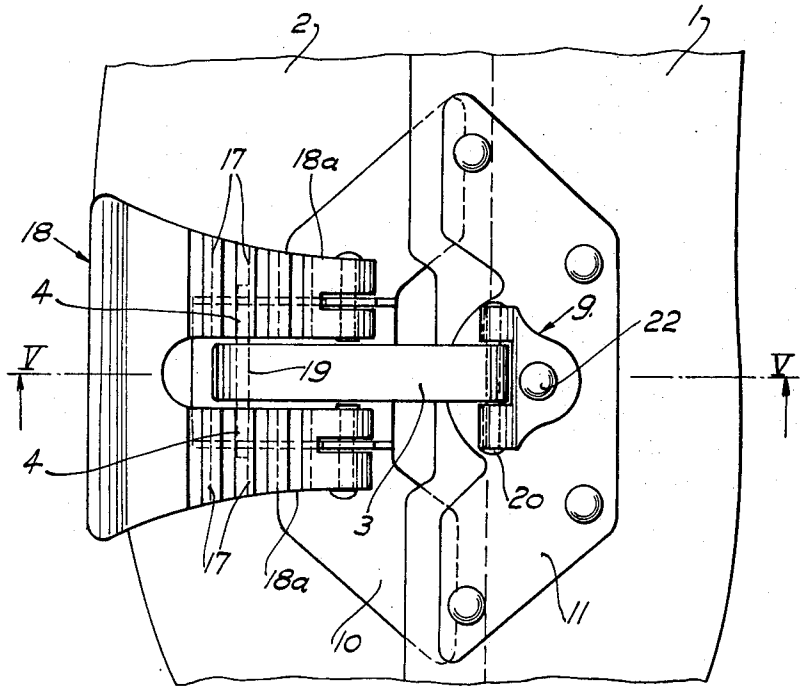


FIG. 4



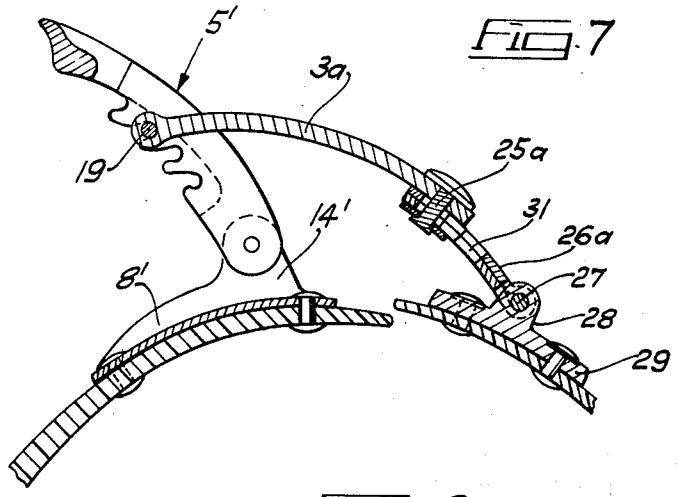

5'
3a
19
25a
31
26a
14'
27
8'
28
29

FIG. 7

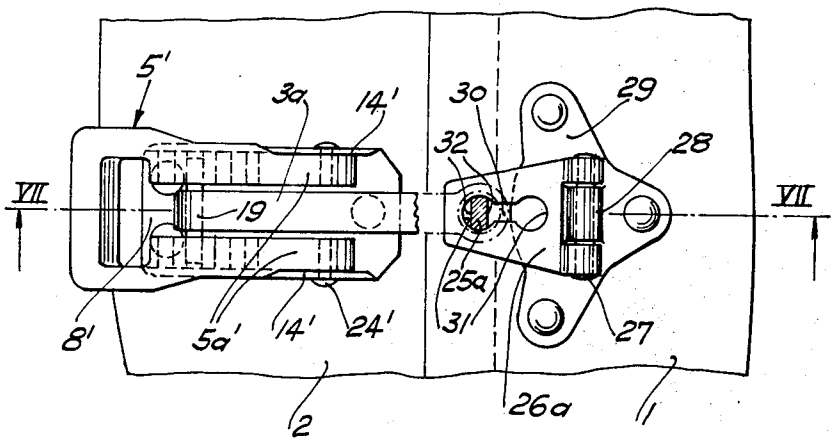

5'
3a
14'
30
29
32
28
VII
VII
19
25a
8'
5a'
14'
24'
31
27
26a
2
1

FIG. 6

TENSIONING LEVER BUCKLE, PARTICULARLY FOR PLASTIC SKI BOOTS

The invention relates to a tensioning lever buckle for ski boots, particularly for plastic ski boots, comprising a toothed tensioning lever pivotably supported on the one instep portion and a tension member which engages the gaps between the teeth of said tensioning lever and which is pivotably supported on the other instep portion. In known tensioning lever buckles of this type, a relatively narrow tensioning lever is provided, the gaps between the teeth of which are engaged by a tension member which is constructed as a wire bar. Several of these buckles are provided on the instep of the boot of leather ski boots. These known tensioning lever buckles are not suitable for plastic ski boots.

The basic purpose of the present invention is to produce a tensioning lever buckle, mainly for plastic ski boots, which has a simple, strong structure capable of receiving great tension forces, furthermore makes possible an even distribution of the tension force over a larger instep length, and in which only one single tensioning lever buckle is required for the entire instep, at most, however, two buckles.

Conventional tensioning lever buckles for plastic ski boots do not meet this purpose. Thus, a tensioning lever buckle is known in which a toothed plate of a larger width is secured on the one instep portion, and a tensioning lever is provided on the other instep portion, which tensioning lever extends over a great length of the instep and which with its ends is supported on two bearing blocks on the instep which are spaced apart a large distance. This structure has the disadvantage that the tension force is transmitted onto the one instep portion only at two points which are spaced far from one another. The tensioning lever is connected through an adjusting screw to a rectangular wire bar having a great width and engaging the gaps of teeth of the wide toothed plate. Such a wire bar is not suitable for transmitting great tension forces. Furthermore, this is a relatively expensive structure.

To attain the aforementioned purpose, a tensioning level buckle of the type mentioned in the beginning is provided in which according to the invention the tension member is constructed as a narrow tension lever which at the end has two lateral pins projecting on both sides, and a wide, substantially U-shaped tensioning lever is provided, the two U-legs of which are toothed, whereby the tension lever engages between the U-legs and its lateral pins engage the gaps between the teeth of the U-legs. For an even transmission of the great tension force furthermore a swivel bearing for the tension lever, or also a bearing block for the tensioning lever, are arranged on base plates and these are secured on the instep portion longitudinally of the instep edges, whereby the length of these plates is substantially greater than the width of the tensioning lever.

The invention will be explained hereinafter in connection with exemplary embodiments illustrated in the drawings, in which:

FIG. 1 is a top view of the front part of a plastic ski boot;

FIG. 2 is a cross section along the line II—II of FIG. 1 with a closed buckle;

FIG. 3 is the same illustration with an opened buckle;

FIG. 4 is a top view of the front part of a ski boot having a buckle of a different construction;

FIG. 5 is a cross-sectional view along the line V—V of FIG. 4 with the buckle opened;

FIG. 6 is the top view of a third construction of the buckle;

FIG. 7 is a cross-sectional view along the line VII—VII of FIG. 6;

FIG. 8 is a further construction of the buckle in a perspective view.

In FIG. 1, the instep portions of a ski boot are identified with 1 and 2, which instep portions overlap one another and consist of a plastic material. The instep edges are indicated at 1*a* and 2*a*. The tensioning lever buckle consists substantially of a narrow tension lever 3 which is constructed as a tension member and which is pivotably supported on the instep portion 1 and which has at the free end two lateral pins 4 which project on both sides, and of a wide, substantially U-shaped tensioning lever 5, the two U-legs 5*a* of which are toothed, that is, are provided with rows of teeth 6, whereby the tension lever 3 engages between the U-legs 5*a* of the tensioning lever, and the lateral pins 4 of the tension lever are received in the gaps 7 between the teeth 6 of the U-legs 5*a*. This tensioning lever 5 is supported pivotably about the bolts 24 on the instep portion 2 on a bearing block 8, while the tension lever 3 is pivotably supported on a swivel bearing 9. As can be seen from the drawing, the swivel bearing 9 and also said bearing block 8 are arranged each on a base plate 10 or 11, and these plates are secured on the instep portions 1 or 2 longitudinally of the instep edges 1*a* or 2*a*, so that the length L of said plates is substantially greater than the width *b* of the tensioning lever 5. Said plates and also the bearing block 8 are secured to the instep portions 1 and 2 by means of rivets 23 or the like. The plates 10 and 11 are advantageously arranged with their edges 10*a* and 11*a* facing one another in the vicinity of the instep edges 2*a*, 1*a*.

The aforementioned, new construction of the tensioning lever buckle permits not only the exerting of great tension forces onto the relatively strong and stiff material of the plastic ski boot, but also the even distribution of this great tension force over a greater instep or rather arch length, namely, due to the arrangement of the base plates 10 and 11 which have a relatively great length L.

As can be seen from the drawing, the two cheeks 14 of the bearing block 8 engage corresponding slots in the U-legs 5*a* of the tensioning lever. A very strong support is created for the tensioning lever 5 through this arrangement and the bearing bolts 24.

In the advantageous structure according to FIGS. 1 to 4, the teeth 6 of the tensioning lever 5 are arranged on the bottom side of the two U-legs 5*a*, and a lateral slot 16 is provided in the tensioning lever near the U-web 5*b*, which lateral slot permits the tension lever end and its lateral pins 4 to penetrate therethrough as indicated by the arrow A in FIG. 3.

In a different embodiment illustrated in FIGS. 4 and 5, a tensioning lever 18 is provided in which the teeth 17 are arranged on the upper side of the two U-legs 18*a*.

In order to make possible the transmission of great tension forces, in all illustrated embodiments a steel bolt 19 is provided at the end of the tension lever 3, the

ends of which steel bolt form the aforementioned lateral pins 4 of said tension lever.

In order to assure at all times an even transmission of the great tension force of the tension lever 3 with the ends 4 of the steel bolt 19 onto both rows of teeth of the U-legs 5*a*, it is possible, if necessary, to support the steel bolt 19 slightly swingably in the tension lever 3 (not illustrated in the drawing). The same effect can, if necessary, also be achieved by making the tension lever 3 of elastically flexible material.

For the same aforementioned purpose, the tension lever 3 is pivotable about two axes which stand perpendicularly to one another. According to FIGS. 1 to 5, the swivel bearing 9 can be pivoted about a rivet 22 and furthermore the tension lever 3 is pivotable about a bolt 20 which is supported in the eyes 21 of the swivel bearing 9.

FIGS. 6 to 8 illustrate further embodiments of the new buckle in which the tension lever 3a is hingedly connected by a rivet bolt 25 or 25*a* to a swivel plate 26 or 26*a* which forms an extension of the tension lever and which itself is pivotably supported about an axis 27 which is positioned perpendicularly to the rivet bolt on a bearing block 28 of the base plate 29. In this construction, the tension force of the lever 3, also 3*a*, is favorably transmitted onto the swivel plate 26 or 26*a* which is only stressed by tension.

The special construction according to FIGS. 6 and 7 permits a longitudinal adjustment of the tension lever 3*a* on the swivel plate 26*a*. For this purpose, several circular holes 31 which are each connected by a slot 30 are provided in said swivel plate, the diameter of said holes corresponding to the diameter of the rivet bolt 25*a*, whereby the rivet bolt which is fixedly connected to the tension lever 3*a* is flattened transversely to the tensioning lever (indicated at 32) in such a manner that it, after swinging of the tension lever 3*a* for 90°, can be moved through the slot 30 to the next hole 31.

In the embodiment according to FIG. 8, two adjusting screws 33 are arranged in the base plate 29 which pivotably support the tension lever 3a so that at a closed tensioning lever buckle, the swivel plate 26 exerts a pressure on the heads of the adjusting screws 33. Through this pressure, the upper instep portion 1 is pressed firmly and tightly onto the lower instep portion 2 at 34 so that therewith effectively the penetration of rain or snow water into the inside of the boot is prevented. This pressure can be regulated by the adjusting screws 33 which can be screwed into the base plate 29.

The embodiments of the invention in which exclusive property or privilege is claimed are defined as follows:

1. A tensioning lever buckle, particularly for ski boots, having a toothed tensioning lever pivotably supported on the one instep portion and a tension member which engages the gaps between the teeth of said tensioning lever and which is pivotably supported on the other instep portion, comprising the improvement wherein said tension member is constructed as a narrow tension lever which, at the free end thereof, has two laterally extending pins which project laterally on both sides thereof, and wherein said tensioning lever is wide and substantially U-shaped, the two U-legs of said tensioning lever having teeth thereon whereby said tension lever is received between said U-legs and said lateral pins are received in the gaps between said teeth of said U-legs.

2. The improved tensioning lever buckle according to claim 1, including a swivel bearing for the tension lever and a bearing block for the tensioning lever, both of said swivel bearing and said bearing block being arranged on separate base plates secured on the instep portions longitudinally of the instep edges whereby the length (L) of these plates is substantially greater than the width (b) of the tensioning lever.

3. The improved tensioning lever buckle according to claim 2, wherein said bearing block has a pair of cheeks; and

wherein each of said U-legs of said tensioning lever has a slot therein adapted to receive one of said cheeks.

4. The improved tensioning lever buckle according to claim 2, wherein said tension lever is hingedly connected to a swivel plate by a rivet bolt, which swivel plate forms an extension of the tension lever and which itself is pivotably supported about an axis which is positioned perpendicularly to the rivet bolt on a bearing block mounted on a base plate.

5. The improved tensioning lever buckle according to claim 4, wherein said swivel plate has several circular holes therein which each are connected by a slot, the diameter of said holes corresponding to the rivet bolt diameter, and the rivet bolt, which is fixedly connected to the tension lever, is flattened transversely to the tension lever in such a manner that it after deviation of 90° can be moved through the slot.

6. The improved tensioning lever buckle according to claim 4, wherein two adjusting screws are arranged in the base plate in such a manner that at a closed tensioning lever buckle position, the swivel plate exerts a pressure onto the heads of the adjusting screws.

7. The improved tensioning lever buckle according to claim 1, wherein said plates are arranged with their edges facing one another in the vicinity of the instep edges.

8. The improved tensioning lever buckle according to claim 1, wherein said teeth of the tensioning lever are arranged on the underside of said two U-legs and the tensioning lever has near the U-web a lateral slot for receiving the tension lever end and its lateral pin.

9. The improved tensioning lever buckle according to claim 1, wherein said lateral pins form the ends of a steel bolt supported in the tension lever.

10. The improved tensioning lever buckle according to claim 9, wherein said steel bolt is pivotably supported in the tension lever.

11. The improved tensioning lever buckle according to claim 9, wherein said tension lever consists of elastically flexible material.

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