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Maurer

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[54] **SHOE FASTENING**

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[52] **U.S. Cl.** ..... **36/50,** 24/68 SK, 24/117 A, 24/203

[51] **Int. Cl.** **A43b 11/00,** A43c 11/00

[58] **Field of Search** .... 24/68 R, 68 SK, 68 B, 70 R, 24/70 SK, 71.1, 71.2, 269, 270, 271, 117 A, 117 R, 118, 203; 36/2.5 AL, 50

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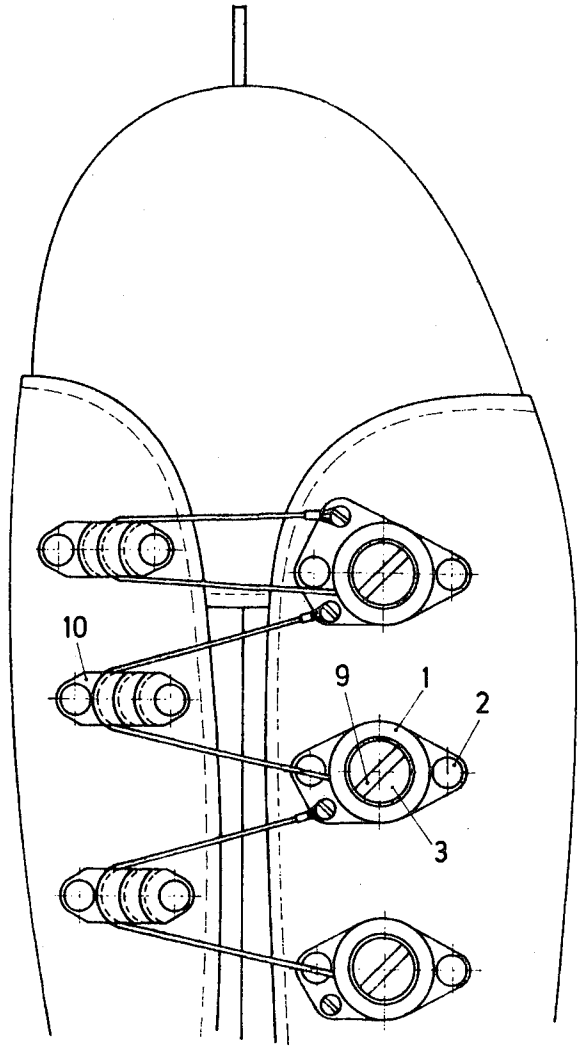
[57] **ABSTRACT**

A shoe fastening for a ski boot or the like comprises a housing, a body mounted for unidirectional rotation in the housing and a serration coupling between the housing and the unidirectionally rotatable body for holding the body against rotation in the opposite direction while permitting the unidirectional rotation thereof. A shoe lace has one end affixed to the rotatable body and the other end affixed to the housing, the lace being looped about a counter-support arranged to receive the shoe lace from the rotatable body.

6 Claims, 3 Drawing Figures



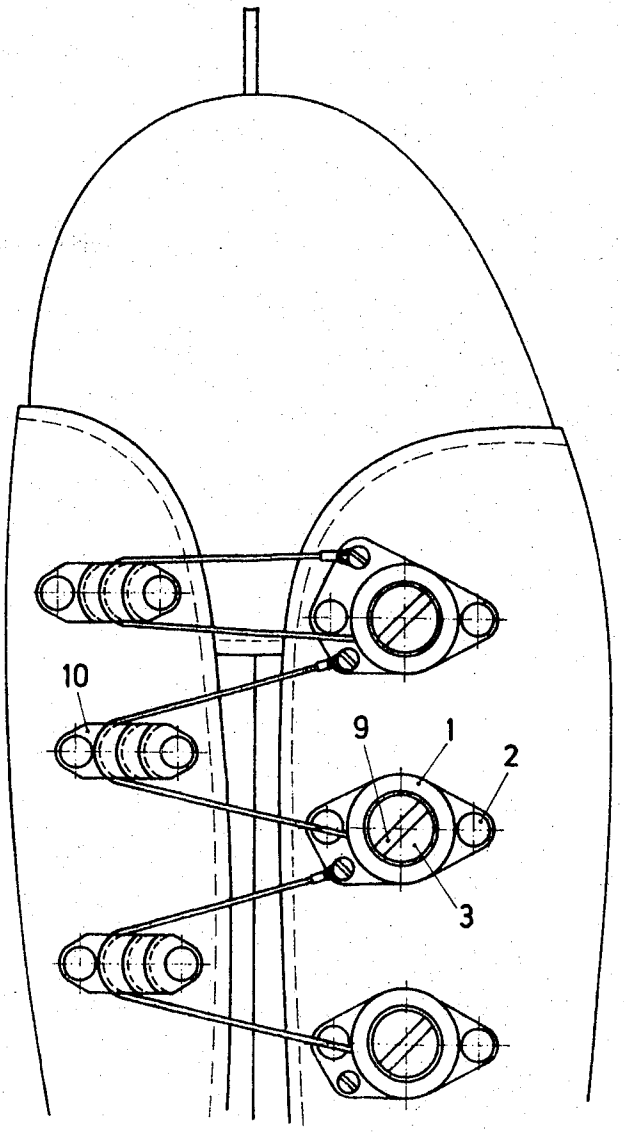


FIG.1

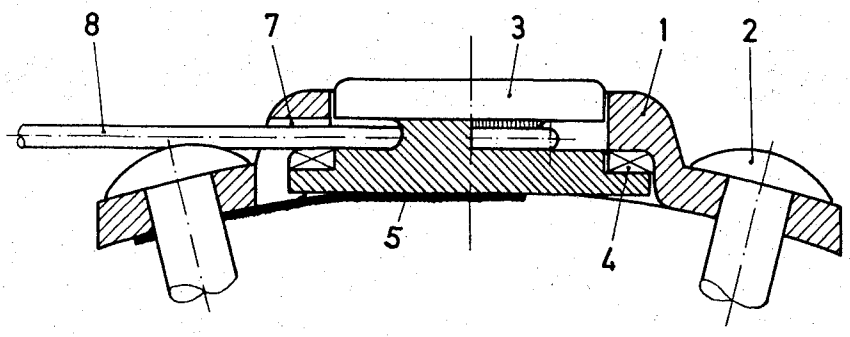


FIG.2

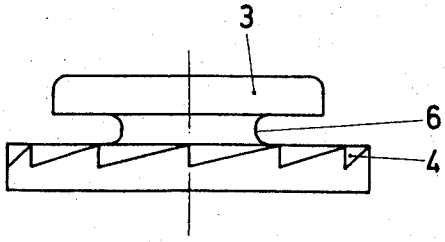


FIG.3

SHOE FASTENING

The present invention relates to an improved fastening for winter sport shoes.

Many types of shoe fastenings have been proposed, including hooks and buckles, the latter being preferred because they can be operated rapidly and simply. Therefore, buckles have recently been used almost exclusively for fastening together the two associated parts forming the top or upper of ski boots and the like. However, buckles have the disadvantage that they are opened unintentionally, for instance by contact with the ski poles or with obstacles on the ground. Neither buckles nor hooks have been used for fastening ice skating boots because they are opened readily and without the intention of the wearer by contact with obstacles and the like.

It is the primary object of this invention to provide an effective fastening for all types of winter sport shoes and boots.

It is a more specific object of the invention to provide a shoe fastening of the indicated type which is secure against unintentional opening.

The above and other objects advantages are accomplished in accordance with the present invention with a fastening which comprises a housing defining an opening, a body mounted in the housing for unidirectional rotation, and a serration coupling between the housing and the unidirectionally rotatable body for holding the body against rotation in the opposite direction while permitting the unidirectional rotation thereof. A flexible elongated fastening element having two ends has one end affixed to the rotatable body and a counter-support for the fastening element is arranged to receive the fastening element from a peripheral annular groove in the rotatable body wherein the element is guided from the one end and through the housing opening, and to have it looped about the counter-support for return to the housing. The other fastening element end is affixed to the housing.

A fastening of this type need to be only of very limited height so that it will not project from the shoe sufficiently to get caught by outside obstacles and is unintentionally loosened or opened. When in contact with such obstacles or the other skate, for instance, when the skater crosses one foot over the other, the fastening of this invention will not be opened. Furthermore, this fastening has the advantage that it may be readily tightened or loosened with a simple tool for turning the rotatable body, for instance the tip of a ski pole. In this case, the fastening may be operated without the need of the skier to bend down.

The invention will become more apparent from the following detailed description of a now preferred embodiment thereof, taken in conjunction with the accompanying drawing wherein

FIG. 1 is a partial top view of an ice skating shoe with a fastening according to the present invention;

FIG. 2 shows a side elevational view of one part of the fastening of FIG. 1, partly in section; and

FIG. 3 is a side elevational view of the rotatable body of FIG. 2.

Referring now to the drawing, the fastening is shown to comprise flat housing 1 which may be pressed, injection molded or machined, as desired. Housing 1 is attached to one part of the shoe top or upper, for instance by illustrated rivets 2. Body 3 is mounted within

the housing for unidirectional rotation, the body defining peripheral annular groove 6. Coupling 4 with radially extending, meshing serrations on housing 1 and body 3 holds the body against rotation in the opposite direction while permitting the unidirectional rotation thereof. If desired, a leaf spring 5 may be mounted on the housing and biased against the rotatable body so as to assure engagement of the coupling serrations at all times.

A flexible fastening element has one end affixed to the rotatable body and is guided from the one end in groove 6 and then through a bore 7 in housing 1 to counter-support 10. The fastening element may be a wire rope. If desired, the bottom of annular groove 6 may be roughened to increase the friction between rotatable body 3 and the fastening element. Upon rotation of the body, the fastening element will be wound thereon in the groove.

The counter-support is attached to the associated part of shoe top or upper so that it receives the fastening element passing through bore 7. The fastening element is looped about counter-support 10 (see FIG. 1) and returned to the same housing or a housing adjacent thereto in a row of housings, where the other fastening element end is then affixed. In the illustrated and preferred embodiment, the counter-support is constituted by a multi-stage, hook-like device and the fastening element is looped thereabout under one of the multiple hooks so as to be prevented from slipping off the device. The hereinabove described fastening operates as follows:

When it is desired to close the fastening, the wire rope 8 is hooked onto counter-support 10 and looped therabout, whereupon the rope is tensioned by rotating body 3. For this purpose, the rotatable body carries means 9, such as a slot, for operationally engaging a tool detachably associated with the body for rotating the same. Such a tool may be a coin, a suitable key, a screw driver, or the suitably shaped end of a ski pole which may be detachably engaged by means 9. Since serration coupling 4 functions like a detent, rotation of body 3 in the opposite direction will be prevented and a loosening of the tightened rope will be impossible. This rotational closing movement makes it possible to adjust the tension of the fastening element very finely to assure utmost comfort for the wearer of the shoe.

When it is desired to open the fastening, the rotatable body is simply depressed axially in respect of the housing so as to disengage the serrations of the coupling. This will uncouple rotatable body 3 and the tension of the fastening element will rotate the body in the opposite direction to unwind the fastening element. If only partial opening is desired, it will be useful to rotate the body in the opposite direction, too, by means of a tool while keeping the body depressed. In this manner, the unwinding of the fastening element may be limited to the desired extent.

The number of associated housings and counter-supports depends on the type and size of the shoe, as well as the desired closure pressure on selected portions of the foot of the wearer. In this respect, the same criteria are used as in the known buckle fastenings.

I claim:

1. A fastening for winter sport shoes, comprising
   1. a housing defining an opening,
   2. a body mounted in the housing for unidirectional rotation,

a. the body defining a peripheral annular groove,

3. a serration coupling between the housing and the unidirectionally rotatable body for holding the body against rotation in the opposite direction while permitting the unidirectional rotation thereof,

4. a flexible elongated fastening element having two ends,

a. one of the fastening element ends being affixed to the rotatable body, and

5. a counter-support for the fastening element, the counter-support being arranged to receive the fastening element from the rotatable body groove wherein the element is guided from the one end and through the housing opening, and to have it looped about the counter-support for return to the housing,

a. the other fastening element end being affixed to the housing.

2. The fastening of claim **1,** wherein the rotatable body is mounted in the housing for axial movement in respect thereto, the axial movement causing disengagement of the serration coupling and permitting rotation of the body in the opposite direction.

3. The fastening of claim **2,** further comprising resilient means biased to hold the rotatable body against the axial movement and for keeping the serration coupling engaged in the absence of pressure in the opposite direction to the bias of the resilient means.

4. The fastening of claim **1,** wherein the rotatable body carries a means for operationally engaging a tool detachably associated with the body for rotating the same.

5. The fastening of claim **2,** wherein the tool engaging means is a slot in the body.

6. The fastening of claim **1,** wherein the shoe has two associated parts forming the top of the shoe, a plurality of said housings are mounted in a row on one top part, a like plurality of said counter-supports are mounted in a substantially parallel row on the other top part, and all but one of the fastening elements have their one end affixed to the rotatable body of one of the housings in the row while the other end thereof is affixed to the housing adjacent thereto.

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