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CLOSURE FOR FOOTWEAR HAVING INTERCONNECTED ROTATABLE MEMBERS

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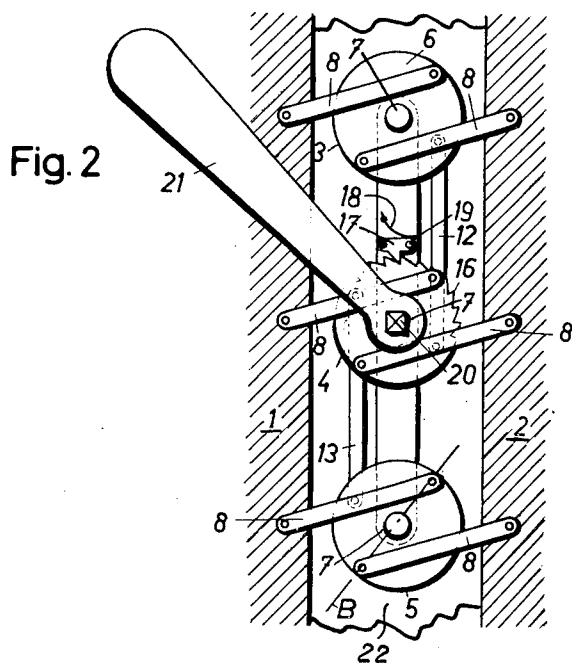
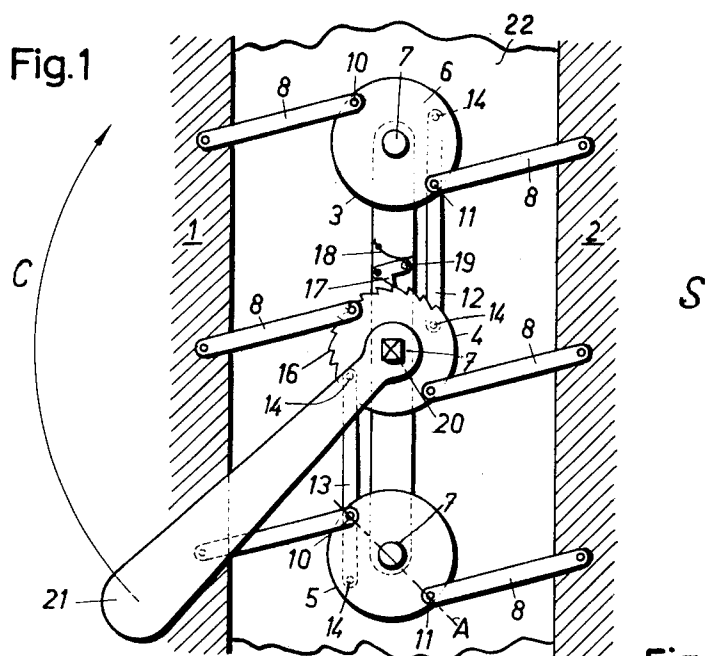
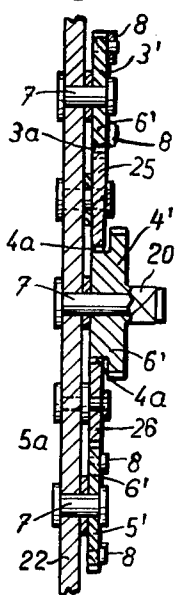


Fig. 3



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CLOSURE FOR FOOTWEAR HAVING INTERCONNECTED ROTATABLE MEMBERS

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10 Claims. (Cl. 24—68)

The present invention has reference to an improved fastener for footwear particularly a fastener for ski-boots of the type possessing closure flaps adapted to be drawn together at the region of the instep.

It is already known to the art with ski-boots to draw together both of the closure flaps of the upper portion of the boot either by means of laces or fastening clamps, such taking place in order to provide as good as possible seat between the foot of the user and the ski. After the descent upon the skis the boots are generally loosened in order not to strongly retard blood circulation and to prevent the feet from becoming cold and frozen. This loosening and subsequent tightening of the boots has been found to be somewhat cumbersome, since in the case of ski-boot laces such must be opened and released, whereas in the case of clamps a plurality of such fastening clamps must be opened and after suspension in a different suspension or clamping position must again be closed.

It is, therefore, a primary object of the present invention to provide an improved fastener construction for ski-boots and the like which can be opened and closed, respectively, with a single manipulation.

A further important object of the present invention resides in the provision of an improved fastener for footwear which is extremely easy to operate for the purpose of opening and closing the shoe respectively, is of relatively simplified yet robust construction, economical to manufacture as well as not readily subject to jamming and/or malfunction.

Another noteworthy object of the present invention is concerned with providing an improved fastener for footwear incorporating at least two rotatable members, means for connecting said rotatable members to the closure flaps of the footwear, and means for interconnecting such rotatable members with one another so that rotation of one such member is imparted to the other rotatable member.

Generally speaking, the fastener of the present invention is manifested by the features that, at least two members are provided at the tongue of the boot which are rotatable about their own respective axis, each of both of the closure flaps of the boot being secured to such members at a spacing from such respective axis of rotation through the agency of intermediate members, so that such closure flaps can be drawn together and released by rotating the aforesaid rotatable members through an angle which is less than 180°. Apart from the foregoing, there is also disclosed different possibilities for operatively interconnecting the rotatable members with one another. Due to the improved physical structure of the inventive fastener of the ski-boot can be closed and opened very quickly and by means of a simple movement of the hand. Additionally, the components of the fastener are considerably covered so that they cannot become damaged by underbrush, foliage or the like.

Other features, objects and advantages of the invention will become apparent by reference to the following detailed description and drawing, with like reference numerals having been used for the same or analogous

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elements throughout the different embodiments, and in which:

FIGURE 1 schematically illustrates a front view of a first embodiment of inventive fastener in the released or non-tightened position;

FIGURE 2 illustrates the fastener of FIGURE 1 in its drawn together or tightened condition; and

FIGURE 3 is a fragmentary cross-sectional side view of a modified form of fastener.

Describing now the drawing, it will be appreciated that the ski-boot or other footwear, generally schematically represented by reference character S, is formed in the conventional manner, exhibiting in the region of the instep two closure flaps 1 and 2 advantageously formed of leather and which are somewhat spaced from one another. The opening between such closure flaps 1 and 2 directed towards the instep is closed by a suitable tongue member 22 lying beneath the aforesaid closure flaps. In the present embodiment, there are provided at least three rotatable traction or tension members 3, 4 and 5 by means of which both of these closure flaps 1 and 2 can be drawn towards one another or released. Naturally, a different number of such traction members can be used as will become apparent to those versed in the art when considering the physical construction of the footwear with which the inventive fastener is to be employed. In the present instance, these tension or traction members 3, 4 and 5 are each constructed as disk members 6 rotatably mounted at their center by means of a respective bolt member 7. All of these bolt members 7 are rigidly retained upon the aforementioned tongue member 22, preferably formed of leather, and can be connected to the latter by riveting for example.

Two levers or traction straps 8 are connected to each of the disk members 6 of the traction members 3, 4 and 5, the connection being advantageously effected at diametrically opposite locations of the respective disk members 6. The attachment or fastening locations of the traction straps or levers 8 are thus advantageously spaced the same distance, in each instance, in the radial direction from the associated bolt member 7. The other respective end of the individual traction straps 8 is fastened at the region of the edge of the associated closure flaps 1 and 2 and to the latter. This attachment is performed in such a manner that the traction straps 8 are at least capable of detachment from one of the closure flaps 1 or 2, in order to facilitate putting-on and taking-off the boot S. The attachment of the traction strap 8 occurs for all three tension or traction members 3, 4 and 5 at corresponding locations, as such is best ascertained by reference to FIGURE 1. More specifically, a connecting line between the fastening bolts 10 and 11 employed for connecting a specific pair of traction straps 8 to their associated disk 6, in the untensioned or non-tightened condition of the boot S lies transverse to the instep, in other words approximately assumes the position A represented by the connecting line shown in FIGURE 1.

The tension or traction members 3, 4 and 5 are advantageously rotatably connected among themselves. Thus, in each instance two disk members 6 are operatively connected with one another through the agency of an interconnecting rod or bar member 12 or 13. In the illustrated embodiment rod member 12 operatively interconnects the traction members 3 and 4, whereas rod member 13 operatively interconnects the traction members 4 and 5. These rod members 12 and 13 are hingedly connected by means of pins 14 with the associated disks 6, so that rotational movement of one disk is synchronously transmitted to the remaining disks 6. The pin members 14

are spaced from the bolt members 7 of the associated disk 6 and angularly offset with respect to the attachment or fastening bolts 10, 11.

The central tension or traction member 4 which, in the present embodiment, is directly operated as will be more fully explained shortly, is provided with teeth means 16 at the periphery of its disk member 6 and with which engage a detent or pawl 17. This pawl 17 is biased or loaded by a spring member 18 and can be manually brought out of meshing engagement with the teeth means 16 through the agency of an operating pin or shaft 19 or similar expedient. The bolt member 7 of the central disk 6, that is traction member 4, is provided at its outwardly extending end with a polygonal bolt, for example constructed in the form of a square bolt or shaft 20, upon which there can be inserted a detachable operating lever or key 21. By means of this lever or key 21 it is possible to carry out a rotation of the traction members 3, 4 and 5, and indeed, when the fastener is to be placed into closed position such lever 21 is rotated or rocked in the direction of the arrow C (FIGURE 1). In consequence of this rotational movement which, as should be appreciated, is transmitted via the rods 12 and 13 to both of the traction members 3 and 5, the traction straps 8 are displaced towards the corresponding confronting closure flap 1 or 2, to thereby effect a drawing together of both such closure flaps 1 and 2, so that in the drawn together condition thereof they either lie completely against one another, possess a small spacing from one another or, in fact, overlap one another.

In so doing, the connecting line between the points of attachment defined by the fastening bolts 10 and 11 now assumes the position B (FIGURE 2). The angular rotation of the disks 6 between position A and position B lies approximately in the order of magnitude of 70° to 120°, in any case is smaller than 180°. The teeth means 16 and the pawl 17 are advantageously constructed such that the fastener in drawn together condition of the closure flaps 1 and 2 remains blocked or arrested. In order to release the fastener the pawl 17 is merely brought out of engagement with the teeth means 16 by means of the pin member 19, whereupon the traction members 3, 4 and 5 open or release by virtue of the existing tension which the closure flaps 1 and 2 exert in the opening direction, or, however, opening of the fastener can take place by return rotational movement of the operating lever 21 with simultaneous disengagement of the pawl 17. The detachable operating key or lever 21 can, for example, be inserted into a suitable pocket of the boot leg or, however, can be loosely carried in an article of clothing of the user.

The tension or traction members 3, 4 and 5 as well as the tension or traction straps 8 are conveniently covered from above by means of a non-illustrated leather covering so that, on the one hand, no snow or dirt can penetrate into the mechanism and, on the other hand, a genuine appearance of the boot is achieved, since then only the square bolt 20 and the pin 19 extends out of such covering member and is visible from the outside.

It should be appreciated that in lieu of three disk-like traction members 3, 4 and 5 there can also be employed a larger number of such traction members arranged in accordance with the teachings of the heretofore described embodiment. Moreover, with simple constructions it would also be conceivable to get along with only two such traction members. It is further conceivable to use a single throughpassing or continuous flexible rod in place of the two rods 12, 13.

It will be recalled that in the aforescribed embodiment rotation of the central traction member 4 was transmitted to the other traction members 3 and 5 through the agency of the interconnecting rods 12 and 13, respectively. However, it would also be possible to transmit such rotational movement by means of other expedients, gears for example. Such a variant form of the invention is

depicted in FIGURE 3. Since this embodiment differs from the previous embodiment only insofar as the physical structure of the traction members 3, 4 and 5 is concerned and the provision of interconnecting gears in place of the rods 12 and 13, it will be appreciated that for convenience like reference numerals have again been employed for the same or analogous elements. In this embodiment, then, the traction members 3', 4' and 5', also conveniently constructed as disk members 6', are provided at their periphery with teeth 3a, 4a and 5a respectively. Furthermore, a gear 25 is disposed between the traction members 3' and 4' and a further gear 26 between the traction members 4' and 5'. The gear member 25 meshes with the teeth 3a and 4a of traction members 3' and 4' respectively, while the gear member 26 meshes with the teeth 4a and 5a of the traction members 4' and 5', respectively. It should thus be apparent that rotational movement imparted to the central traction member 4' is transmitted to the remaining traction members 3' and 5' through the intermediary of the associated gears 25 and 26, respectively. In all other respects the operation of fastener described in this embodiment is similar to the embodiment of FIGURES 1 and 2.

The attachment between the traction straps 8 and the closure flaps 1 and 2 of all embodiments herein disclosed is advantageously effected such that, an individual adjustment of each boot in accordance with the dimensions of the user is possible, in the sense that either the ends of the traction straps 8 are adjustable in lengthwise direction or else the attachment elements (e.g. hooks) at the closure flaps can change their relative position with respect to the marginal edge of the aforesaid closure flaps.

Moreover, it should be appreciated that the traction members 3, 4 and 5 do not of necessity, in each instance, have to partake the form of a full disk, rather can also be constructed as double-arm lever means or in the form of a cross and can carry out the same functions as the disk members 6 herein disclosed. Also, the teeth provided at the elements herein disclosed do not, in all cases, have to extend completely about the periphery of the corresponding element.

While there is shown and described present preferred embodiments of the invention it is to be distinctly understood that the invention is not limited thereto but may be otherwise variously embodied and practised within the scope of the following claims.

What is claimed is:

1. A fastener for footwear, particularly ski-boots of the type having a pair of spaced closure flaps capable of being drawn together and a tongue member disposed in the region of the spacing between said closure flaps, comprising at least two members each mounted in spaced relation from one another for rotation about their own respective axis of rotation upon the tongue member, means for connecting each rotatable member to the closure flaps, means for operably interconnecting said rotatable members with one another such that rotational movement of one rotatable member is transmitted to the other, so that the closure flaps can be drawn together or released due to rotation of the rotatable members through an angle which is less than 180°.

2. A fastener for footwear, particularly ski-boots of the type having a pair of spaced closure flaps capable of being drawn together and a tongue member disposed in the region of the spacing between said closure flaps, comprising at least two members each mounted in spaced relation from one another for rotation about their own respective axis of rotation upon the tongue member, means for operably interconnecting said rotatable members with one another such that rotational movement of one rotatable member is transmitted to the other, and means for connecting each rotatable member to the closure flaps, so that the closure flaps can be drawn together or released due to rotation of the rotatable members through an angle which is less than 180°.

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3. In a fastener for footwear of the type having a tongue member, at least two rotatable members each directly mounted at the tongue member for rotation about a respective axis of rotation which are spaced from one another in the lengthwise direction of said tongue member, and said axes of rotation lying along a common line extending lengthwise of said tongue member, and means for operably interconnecting said rotatable members with one another so as to transmit rotational movement of one rotatable member to the other.

4. In a fastener for footwear as defined in claim 3 wherein said means for operably interconnecting said rotatable members with one another comprises rod means connected to said rotatable members at a spacing from the associated axis of rotation thereof.

5. In a fastener for footwear as defined in claim 3 wherein each of said rotatable members comprise a disk member.

6. A fastener for footwear, particularly ski-boots of the type having a pair of spaced closure flaps capable of being drawn together and a tongue member disposed in the region of the spacing between said closure flaps, comprising at least two members each mounted for rotation about a respective axis of rotation upon the tongue member, means for connecting each rotatable member to the closure flaps, means for operably interconnecting said rotatable members with one another, so that the closure flaps can be drawn together or released due to rotation of the rotatable members through an angle which is less than 180°, said interconnecting means incorporating rod means connected to said rotatable members at a spacing from the associated axis of rotation thereof.

7. A fastener for footwear as defined in claim 6, wherein at least one of said rotatable members is provided with teeth means, a pawl engageable with said teeth means for locking said rotatable members.

8. A fastener for footwear, particularly ski-boots of the type having a pair of spaced closure flaps capable of being drawn together and a tongue member disposed in the region of the spacing between said closure flaps, comprising at least two members each mounted for rotation about a respective axis of rotation upon the tongue

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member, means for connecting each rotatable member to the closure flaps, means for operably interconnecting said rotatable members with one another, so that the closure flaps can be drawn together or released due to rotation of the rotatable members through an angle which is less than 180°, said interconnecting means incorporating gear means.

9. In a fastener for footwear of the type having a tongue member, at least two rotatable members each mounted at the tongue member for rotation about a respective axis of rotation which are spaced from one another in the lengthwise direction of said tongue member, and means for operably interconnecting said rotatable members with one another so as to transmit rotational movement of one rotatable member to the other, said operably interconnecting means comprising rod means connected to said rotatable members at a spacing from the associated axis of rotation thereof, at least one of said rotatable members being provided with teeth means, a pawl engageable with said teeth means for locking said rotatable members.

10. In a fastener for footwear of the type having a tongue member, at least two rotatable members each mounted at the tongue member for rotation about a respective axis of rotation which are spaced from one another in the lengthwise direction of said tongue member, and means for operably interconnecting said rotatable members with one another so as to transmit rotational movement of one rotatable member to the other, said operably interconnecting means comprising gear means.

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