(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 093 371**
A1

(12) # EUROPEAN PATENT APPLICATION

(21) Application number: **83104032.4**

(22) Date of filing: **25.04.83**

(51) Int. Cl.³: **A 43 C 11/00**
A 43 C 11/14

(30) Priority: **03.05.82 IT 2103382**

(43) Date of publication of application:
09.11.83 Bulletin 83/45

(84) Designated Contracting States:
AT CH DE FR LI SE

(71) Applicant: **Valsecchi, Carlo**
Via Cipollina, 3
I-22050 Colico Como(IT)

(71) Applicant: **Piatti, Franco**
Via Nazionale, 43
I-22050 Colico Como(IT)

(71) Applicant: **Bianchi Bazzi, Giuseppe**
Via Campione
I-22050 Colico Como(IT)

(72) Inventor: **Valsecchi, Carlo**
Via Cipollina, 3
I-22050 Colico Como(IT)

(72) Inventor: **Piatti, Franco**
Via Nazionale, 43
I-22050 Colico Como(IT)

(72) Inventor: **Bianchi Bazzi, Giuseppe**
Via Campione
I-22050 Colico Como(IT)

(74) Representative: **Modiano, Guido et al,**
MODIANO, JOSIF, PISANTY & STAUB Modiano & Associati Via Meravigli, 16
I-20123 Milan(IT)

(54) **Adjusting and fastening device particularly for ski boots.**

(57) This invention relates to a ski boot adjusting and fastening device which comprises a body (1) adapted for association with one of the flaps to be tightened and having a first actuating element (2) carried pivotally on the body (1) itself and reachable from the outside. The first actuating element (2) interacts with a rotary to translatory motion conversion unit (10-12) associated with a link element (21) which is connected to an engagement member interacting with the other of the flaps to be brought together.

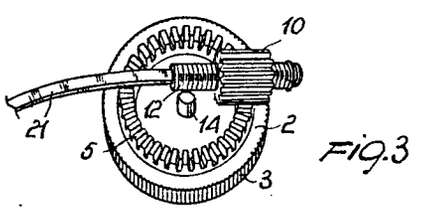


Fig.3

EP 0 093 371 A1

0093371

"ADJUSTING AND FASTENING DEVICE PARTICULARLY FOR SKI BOOTS"

This invention relates to an adjusting and fastening device particularly for ski boots.

As is known, to fasten ski boots or skiing footwear, a lever arrangement is currently used which, in its more general embodiment, includes a part articulated to one of the flaps to be secured together, to which part a ring or hook arrangement is connected for engagement with a mating part attached to the other of the flaps to be secured together, a rotation movement of the lever being effective to bring together and tighten such flaps.

With this type of lever arrangement, to make the fastener adjustable, i.e. to adjust the useful length of the link whereto the fastening hook or ring is connected, it is common practice to provide a threaded rod which is carried rotatably either on the lever or its mating part and is turned to effect a translation of the link , thereby the useful length of the latter is changed.

This form of adjustment has, first of all, the disadvantage that it must be performed with the lever in the open, i.e. unlatched, position, and moreover, cannot provide fine adjustment capabilities because, in order not to have the hook or ring located at the wrong position, it is generally required that a 360° rotation be completed, which results in a one pitch length translation of the threads utilized.

It is a primary object of this invention to

remove such prior drawbacks by providing an adjusting and fastening device specially designed for ski boot applications, which allows the useful length of the link to be adjusted even with the device in its closed position, that is with the link under tension, thus enabling the user to directly perform an accurate adjustment without going through the trial-and-error procedure involved by conventional devices.

It is another object of the invention to provide an adjusting and fastening device which, by virtue of its constructional features, can be used directly as a fastener without involving its attachment to a traditional tightening lever as usually employed in ski boot fasteners.

A further object of this invention is to provide an adjustment device which, owing to its peculiar design, can give full assurance of reliable and safe operation, while affording a high degree of versatility of the device.

A not unimportant object of the invention is to provide such a device, which is of simple construction and can be readily manufactured from widely available elements and materials.

These and other objects, such as will be apparent hereinafter, are achieved by an adjusting and fastening device particularly for ski boots, comprising a body adapted for association with one of the ski boot flaps to be secured together and being characterized in that it comprises a first actuating element carried rotatably on said body and being

accessible from outside of said body, said first actuating element interacting with a rotary to translatory motion conversion unit associated with a link element connected to engagement means interacting with the other of said ski boot flaps to be secured together.

Further features and advantages will be apparent from the following description of a preferred, though not limitative, embodiment of an adjusting and fastening device particularly for ski boots, as illustrated by way of example only in the accompanying drawing, where:

Figure 1 is a sectional view of this device;

Figure 2 is a sectional view of this device as attached to an actuating lever;

Figure 3 is a perspective view showing in detail the first actuating means and rotary to translatory motion conversion means; and

Figure 4 is a top plan view of the device, as attached to a lever.

Making reference to the drawing figures, the adjusting and fastening device particularly for ski boots, according to the invention, comprises a body, indicated at 1, which can be associated with either of the ski boot flaps to be secured together.

Mounted rotatably on said body 1 is a first actuating element which advantageously comprises a small wheel 2 having a knurled outer surface 3 and

an axial center pin 4 which performs the dual function of an axle and element of engagement with the body 1.

Said wheel 2 has on one face thereof a flat serration 5 extending circumferentially around said pin 4.

The wheel 2 is attached to the body 1 and held in position by a small cover 6 from which portions of the wheel periphery protrude sidewards to allow the wheel to be operated from the outside.

The wheel 2 interacts with a rotary to translatory motion conversion unit which advantageously comprises a pinion gear 10 arranged for rotation about a substantially perpendicular axis to the rotation axis of the wheel 2 and having an axially mounted nut screw 11 which engages with a threaded rod 12 which is acted upon by means effective to prevent the rod from rotating about its own axis, thereby the rotary motion imparted to the gear 10 is converted into a translation of the rod 12.

The rod 12 is translatable within a recess 20 defined on the interior of the body 1 and is connected, at one end thereof, to a link 21 protruding out of the body 1 and having at its other end engagement means interacting with the other of the flaps to be secured together which may comprise either a ring or hook, in conformity with conventional practice.

The means which prevents the rod 12 from rotating may comprise a slot 30 formed through the body 1, wherethrough the link 21 projects outwardly which is advantageously of a foil-like shape; similarly,

the rod may have a polygonal shank which engages in a corresponding recess 20 of polygonal shape.

The pitch of the thread of the rod 12 and nut screw 11 is a very fine one, so that, owing to the gear 10 engaging with the wheel 2, a considerable tensile force may be applied by virtue of the large speed reduction effect provided by the fine pitch thread, whereby by manipulating the wheel 2 it becomes possible to apply such a pull force as to enable the ski boot to be tightened without the assistance of the conventional lever; moreover, the provision of the mechanisms just described affords a very fine adjustment capability of the useful length and, hence, enables the user to adjust at will the tightening force.

It should be noted that, owing indeed to the very high force which can be developed by acting on the wheel 2, the adjustment can be performed with the device in its fastened position, i.e. with the link under tension, in contrast with similar prior devices.

Furthermore, in order to favor an accurate adjustment, the link element 21 may be provided with an indexed scale displaying its useful length, and consequently the applied pull force.

It should be added to the foregoing that the body 1 may be hinge connected to a closure lever 50 attached to either of the flaps to be secured together, in which case the device would mainly perform an adjusting function, the fastening function proper of the fastening device being performed by the lever,

which may be of conventional design.

The operation of the device described hereinabove is quite simple: in fact, the user, in order to effect an accurate adjustment of the applicable fastening force, is simply required to operate the wheel 2, turning it such as to alter, in either direction, the useful length of the link 21 and while being enabled to exert a considerable tightening force, owing to the coupling of the mechanisms just described which are of a non-reversible type, that is such that a tension applied on the link cannot result in the wheel 2 rotating, only the rotation of the wheel 2 being able of producing a translation of the link.

It will be appreciated from the foregoing description that the invention achieves its objects, and in particular that the provision of a geared device with a high reduction ratio, resulting from the fine pitch of the threads of the rod 12 and nut screw 11, enables the development of high tensile forces for an adequately small effort to operate the wheel 2.

The invention as described is susceptible of many modifications and variations without departing from the true scope of the instant inventive concept.

Moreover, all the details may be replaced with other technically equivalent elements.

In practicing the invention, the materials used, and the dimensions and contingent shapes, may be any selected ones to meet individual application requirements.

CLAIMS

1. An adjusting and fastening device particularly for ski boots, comprising a body (1) adapted for association with one of the ski boot flaps to be secured together and being characterized in that it comprises a first actuating element (2) carried rotatably on said body (1) and being accessible from outside of said body (1), said first actuating element (2) interacting with a rotary to translatory motion conversion unit (10-12) associated with a link element (21) connected to engagement means interacting with the other of said ski boot flaps to be secured together.

2. A device according to Claim 1, characterized in that said first actuating element comprises a small wheel (2) having a knurled peripheral edge surface (3).

3. A device according to the preceding claims, characterized in that said wheel (2) is provided, on one face thereof, with an axial pin (4) for pivotal engagement with said body (1), means being further provided for holding said wheel (2) in position and including a small cover (6) associated with said body (1), said wheel (2) projecting outwardly with respect to said cover (6) by at least part of its lateral surface.

4. A device according to one or more of the preceding claims, characterized in that said wheel (2) has, formed on one face thereof, a flat serration (5) of circular configuration extending around a circumference centered on said pin (4).

5. A device according to one or more of the preceding claims, characterized in that said wheel has,

formed on a face thereof, a flat serration and said rotary to translatory motion conversion unit (10-12) comprises a gear (10) interacting with said flat serration (5) and defining on the interior thereof a threaded nut screw (11) engaging a threaded rod (12), said rod being displaceable along an axis extending substantially perpendicularly to the rotation axis of said wheel (2).

6. A device according to one or more of the preceding claims, characterized in that it comprises means (30) for preventing said rod (12) from rotating about its own axis.

7. A device according to one or more of the preceding claims, characterized in that said means for preventing said rod (12) from rotating about its own axis comprise a slot (30) formed through said body (1) and having a matched configuration to said link element (21), said link element being in the form of a foil protruding out of said body (1).

8. A device according to one or more of the preceding claims, characterized in that said means for preventing said rod (12) from rotating comprise a polygonal shank slidably engaged in a recess (20) of matched configuration formed on the interior of said body (1).

9. A device according to one or more of the preceding claims, characterized in that said body (1) is hinge connected to an actuating lever (50) journalled to said one of said flaps to be secured together.

10. A device according to one or more of the

preceding claims, characterized in that said first actuating element (2) can be operated with said device in the closed position, i.e. with said link element (21) under tension.

11. A device according to one or more of the preceding claims, characterized in that it comprises an indexed scale on said link element (21).

1/1

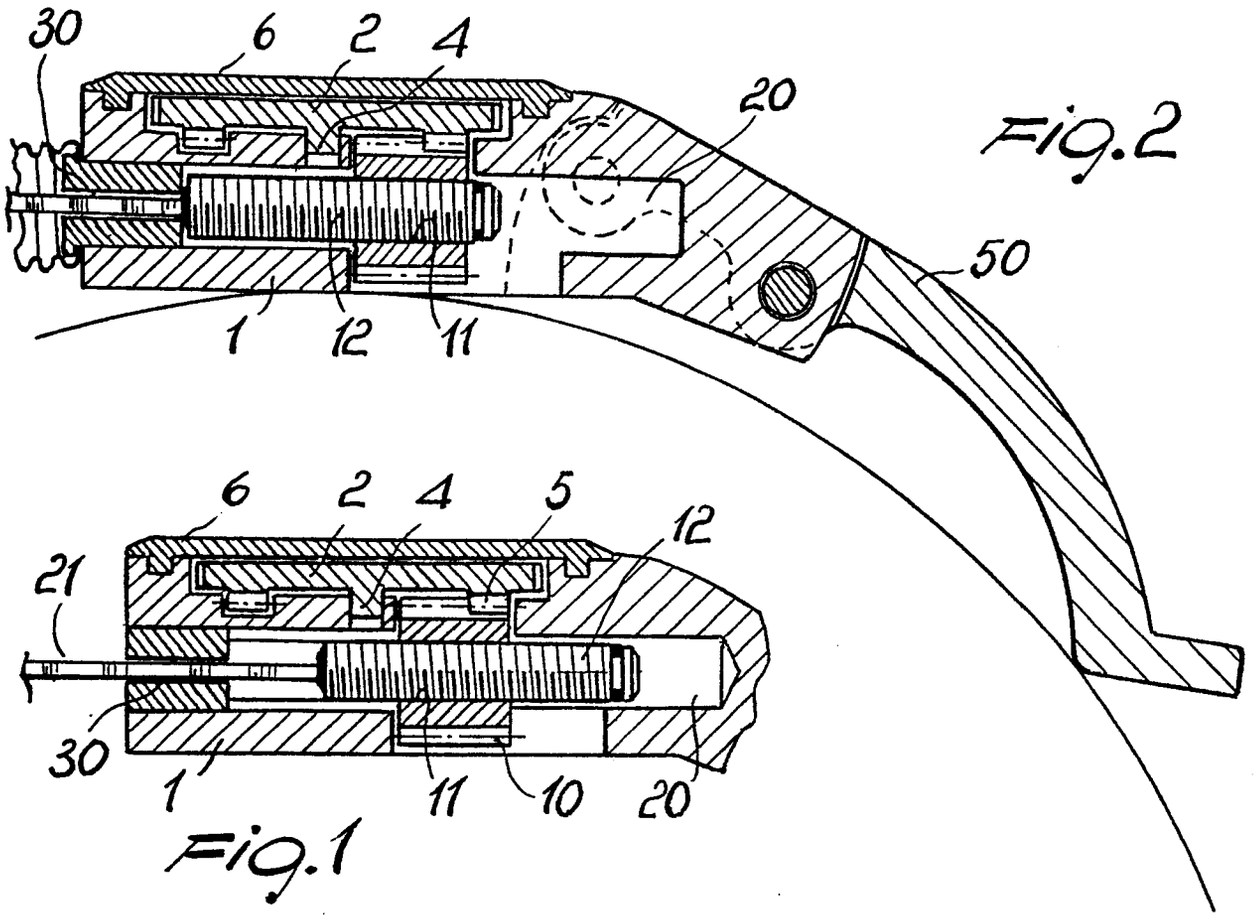


Fig.2

Fig.1

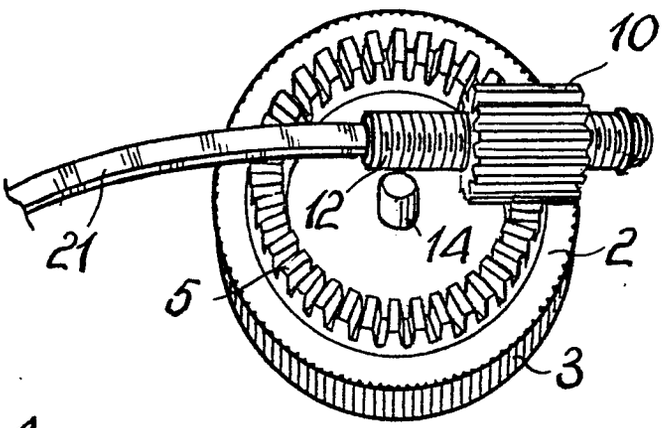
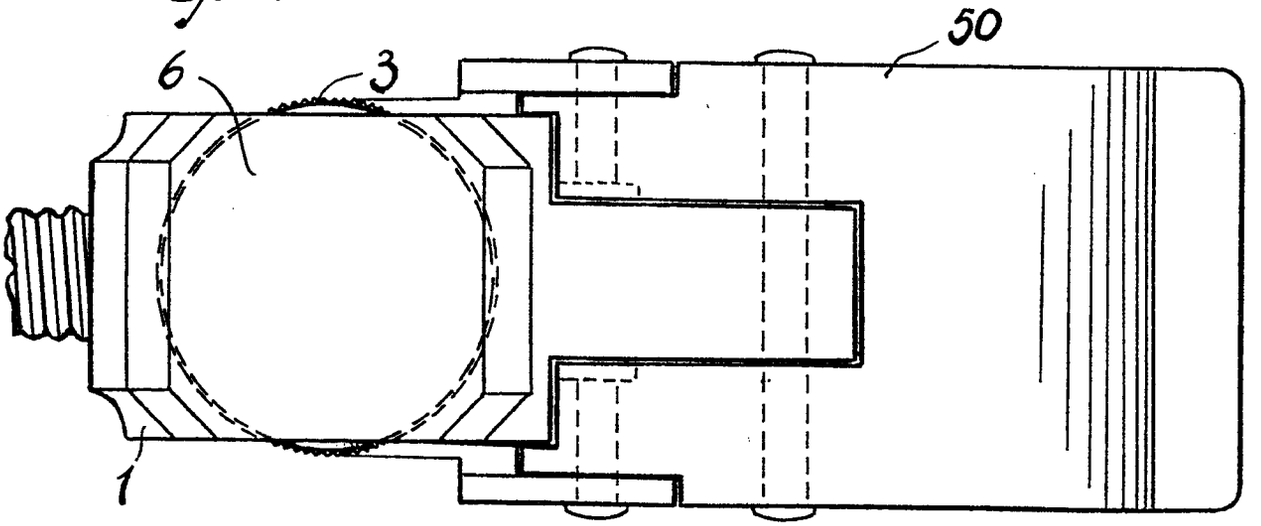


Fig.3

Fig.4



European Patent Office

EUROPEAN SEARCH REPORT

0093371

Application number

EP 83 10 4032

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. ³)
X	FR-A-2 068 227 (J. GRAUP) * Claims 1,2,5; figures 1-5 *	1	A 43 C 11/00 A 43 C 11/14
A	US-A-3 065 007 (H.G. COLMER) * Column 2, lines 55-71; figures 2,4 *	2-8	

TECHNICAL FIELDS SEARCHED (Int. Cl. ³)

A 43 C
B 25 B
F 16 G

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	22-07-1983	MALIC K.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO Form 1503. 03.82