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(71) Applicant: **Teknostampi S.r.l.**
31035 Crocetta del Montello (IT)

(72) Inventor: **Berlese, Remigio**
31044 Montebelluna (IT)

(74) Representative: **Cerbaro, Elena et al**
c/o Studio Torta S.r.l. Via Viotti, 9
10121 Torino (IT)

(54) Clamp for ski boots and similar

(57) A clamp (1) for ski boots and similar, having a supporting plate (2) fixed rigidly to a first portion of the outer shell of the boot; a lock lever (3) hinged at one end (3a) to the supporting plate (2); and a lock arm (4) having a first end (4a) hinged to slide freely along a central portion (3b) of the body of the lock lever (3), and a second end (4b) shaped to engage an anchoring plate (5) fixed rigidly to a second portion of the outer shell of the boot.

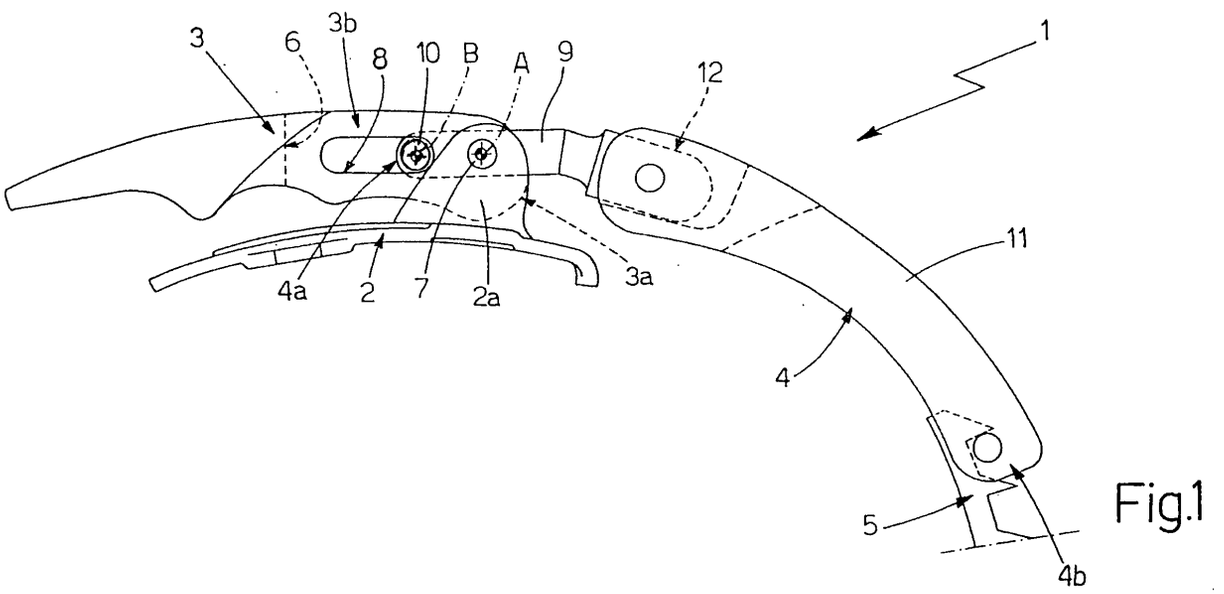

Fig.1

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Description

[0001] The present invention relates to a clamp for ski boots and similar.

[0002] More specifically, the present invention relates to a clamp for ski boots and similar having a rigid plastic outer shell, to which the following description refers purely by way of example.

[0003] As is known, ski boots with a rigid plastic outer shell are equipped with a number of clamps by which to clamp the boot in such a manner as to immobilize the user's leg inside the boot.

[0004] At present, known clamps comprise: a supporting plate fixed rigidly to a first end of the outer shell of the boot; a lock lever hinged at one end to a pair of brackets projecting from the supporting plate; and a lock arm having a first end hinged to the central portion of the lock lever, and a second end shaped to engage an anchoring plate fixed rigidly to a second portion of the outer shell of the boot.

[0005] The lever is hinged to the supporting plate so as to rotate between a lock position, in which the body of the lock lever is parallel to and facing the supporting plate, so that part of the arm is located astride the brackets on the supporting plate, and the free end of the lock arm is at a minimum distance from the supporting plate; and a release position, in which the body of the lock lever is rotated frontwards with respect to the supporting plate, so that the whole lock arm is located downstream from the brackets on the supporting plate, and the free end of the lock arm is at a maximum distance from the supporting plate.

[0006] Unfortunately, the structure of known clamps seriously limits the amount of forward travel the free end of the lock arm is permitted when the lock lever is switched from the lock to the release position.

[0007] To increase travel of the lock arm, the distance between the point at which the lock lever is hinged to the supporting plate, and the point at which the lock arm is hinged to the lock lever, would have to be increased, thus resulting in an unacceptable increase in the force required of the user on the lock lever to clamp the boot.

[0008] It is an object of the present invention to provide a clamp for ski boots and similar, designed to eliminate the aforementioned drawbacks.

[0009] According to the present invention, there is provided a clamp for ski boots and similar, comprising a supporting plate fixed to the outer shell of the boot; a lock lever hinged at a first end to said supporting plate; and a lock arm fixed at a first end to said lock lever; said clamp being characterized in that the first end of said lock arm is hinged to slide freely along a central portion of the body of said lock lever.

[0010] A non-limiting embodiment of the present invention will be described by way of example with reference to the accompanying drawings, in which:

Figure 1 shows a schematic view, with parts removed for clarity, of a clamp for ski boots and similar, in accordance with the teachings of the present invention;

Figure 2 shows a plan view, with parts in section and parts removed for clarity, of the Figure 1 clamp;

Figure 3 shows a schematic view, with parts removed for clarity, of the Figure 1 and 2 clamp in the release position;

Figures 4, 5, 6 and 7 show detailed views of four variations of a component part of the Figure 1-3 clamp for ski boots and similar.

[0011] With reference to Figures 1 and 2, number 1 indicates as a whole a clamp particularly suitable for ski boots, mountaineering boots, roller-blade skate boots, ice-skate boots, and numerous other types of sports boots comprising an outer shell of rigid material (e.g. plastic), so as to enable the user to clamp the boot quickly and effectively to immobilize the leg inside the boot.

[0012] Clamp 1 comprises a supporting plate 2 fixed rigidly to a first portion of the outer shell (not shown) of the boot; a lock lever 3 hinged at one end 3a to supporting plate 2; and a lock arm 4 having a first end 4a hinged so as to slide freely along a central portion 3b of the body of lock lever 3, as explained in detail later on, and a second end 4b shaped to engage a known anchoring plate 5 fixed rigidly to a second portion (not shown) of the outer shell of the boot.

[0013] With reference to Figures 1 and 2 in particular, lock lever 3 is hinged to two flat parallel facing brackets 2a projecting from supporting plate 2, so as to rotate freely about an axis A of rotation perpendicular to the mid-plane M of the lever, and has a central opening 6 extending from end 3a inwards of the body of lock lever 3 and parallel to mid-plane M of the lever.

[0014] More specifically, end 3a of lock lever 3 is located between the two flat brackets 2a on supporting plate 2, and central, opening 6 divides end 3a into two parallel facing appendixes, each of which is hinged to a respective bracket 2a by a cylindrical pin 7 extending parallel to axis A through the body of bracket 2a and the appendix.

[0015] With reference to Figures 1 and 2, at central portion 3b of its body, lock lever 3 comprises two contoured transverse slots 8, each formed in a corresponding appendix of end 3a of lock lever 3. The two contoured slots 8 are obviously located on opposite sides of mid-plane M of the lever, and extend along the same axis parallel to axis A, so as to be aligned with each other.

[0016] With reference to Figures 1, 2 and 3, lock arm 4 is divided into two longitudinal portions, to which correspond the two ends 4a and 4b of lock arm 4.

[0017] The longitudinal portion comprising end 4a of the arm - hereinafter indicated 9 - is shaped to engage and slide along central opening 6 formed in the body of lock lever 3, and has on the end, i.e. at end 4a of the arm, two cylindrical pins 10 extending on opposite sides

of the body of longitudinal portion 9, so as each to engage and slide along a respective contoured slot 8.

[0018] Both pins 10 extend coaxially with an axis B parallel to the axis A of rotation of lock lever 3, so as to slide freely, inside contoured slots 8, between a first work position (Figures 1 and 2) in which pins 10 rest against the inner lateral surface portions of the two contoured slots 8 closest to cylindrical pins 7, and axis B is at a minimum distance from axis A; and a second work position (Figure 3) in which pins 10 rest against the inner lateral surface portions of the two contoured slots 8 furthest from cylindrical pins 7, and axis B is at a maximum distance from axis A. In addition, pins 10 are shaped to rotate freely about axis B inside the two contoured slots 8, so as to allow lock arm 4 to rotate freely with respect to lock lever 3.

[0019] In other words, end 4a of lock arm 4 is hinged to slide freely along central portion 3b of the body of lock lever 3, in which the two contoured slots 8 are formed.

[0020] With reference to Figures 1 and 3, the second longitudinal portion of lock arm 4 comprising end 4b of the arm - hereinafter indicated 11 - is shaped to permit fast engagement and troublefree release of anchoring plate 5 by the free end, and is preferably, though not necessarily, connected to longitudinal portion 9 by a known mechanical articulated joint 12 enabling the two portions to move with respect to each other.

[0021] Operation of clamp 1 as described and illustrated is easily deducible from the foregoing description with no further explanation required.

[0022] The advantages of clamp 1 are obvious: the fact that lock arm 4 is mounted to slide along central portion 3b of the body of lock lever 3 greatly increases the forward travel of the free end 4b of lock arm 4 when lock lever 3 is switched from the lock position to the release position, thus simultaneously reducing the effort required of the user on lock lever 3 to clamp the boot. In the example shown, as lock lever 3 is rotated into the lock position, pins 10 connecting lock arm 4 to the lever move along respective contoured slots 8 towards the axis A of rotation of lock lever 3, so as to reduce the arm (i.e. the distance between axes A and B) of the resisting force transmitted by lock arm 4 to the lever.

[0023] Clearly, changes may be made to the clamp as described and illustrated herein without, however, departing from the scope of the present invention.

[0024] In particular, in the variations shown in Figures 4, 5, 6 and 7, contoured slots 8 of lock lever 3 are so shaped that pins 10 of lock arm 4 remain stationary as they slide along the slots, and axis B does not lie in the same plane through axis A at all times.

[0025] In particular, the path of axis B may be in the form of a broken line (Figure 4), an arc (Figure 5), or a straight line (Figures 6 and 7), but lying in a plane not intersecting the axis A of rotation of lock lever 3.

[0026] Contoured slots 8 may also be shaped so that, when axes A and B are a minimum distance apart, axis B is closer than axis A to supporting plate 2, so as to produce a torque by which to keep the lever in the lock position.

Claims

1. A clamp (1) for ski boots and similar, comprising a supporting plate (2) fixed to the outer shell of the boot; a lock lever (3) hinged at a first end (3a) to said supporting plate (2); and a lock arm (4) fixed at a first end (4a) to said lock lever (3); said clamp (1) being **characterized in that** the first end (4a) of said lock arm (4) is hinged to slide freely along a central portion (3b) of the body of said lock lever (3).

2. A clamp as claimed in Claim 1, **characterized in that** said lock lever (3) comprises, at the central portion (3b) of its body, at least one contoured slot (8); and the first end (4a) of said lock arm (4) is mounted to slide freely inside said at least one contoured slot (8).

3. A clamp as claimed in Claim 1 or 2, **characterized in that** the first end (3a) of said lock lever (3) is hinged to a pair of flat brackets (2a) projecting from said supporting plate (2), so as to rotate freely about a first axis of rotation (A) perpendicular to the mid-plane (M) of the lock lever.

4. A clamp as claimed in Claim 3, **characterized in that** said lock lever (3) has a central opening (6) extending from said first end (3a) of the lock lever inwards of the body of the lock lever, and parallel to the mid-plane (M).

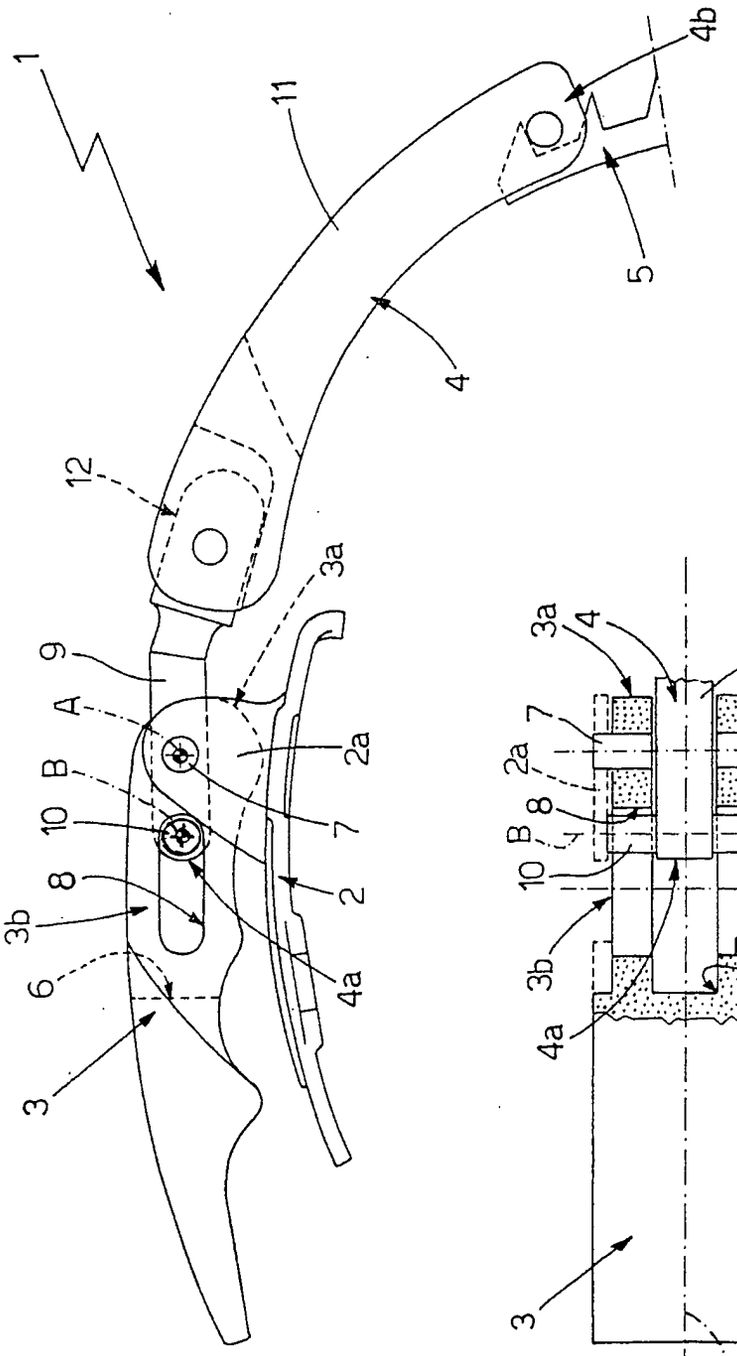
5. A clamp as claimed in Claim 4, **characterized in that** said lock arm (4) is divided into two longitudinal portions (9, 11); and the longitudinal portion (9) comprising the first end (4a) of said lock arm (4) is shaped to engage and slide along said central opening (6).

6. A clamp as claimed in Claim 4, **characterized in that** said central opening (6) divides the first end (3a) of said lock lever (3) into two parallel facing appendixes, each having a respective contoured slot (8); the two contoured slots (8) being located on opposite sides of the mid-plane (M) of the lock lever and aligned with each other; and the longitudinal portion (9) of the lock arm (4) comprising the first end (4a) of the lock arm having a pair of pins (10) extending on opposite sides of the body of said longitudinal portion (9), so as each to engage and slide along a respective contoured slot (8).

7. A clamp as claimed in any one of the foregoing Claims, **characterized in that** said lock arm (4) has a second end (4b) shaped to rapidly engage and

easily release an anchoring plate (5) also fixed to the outer shell of said boot.

Fig.1



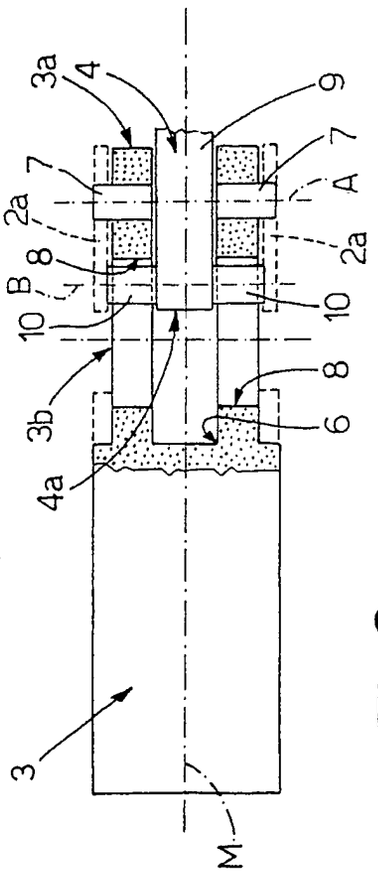


Fig.2

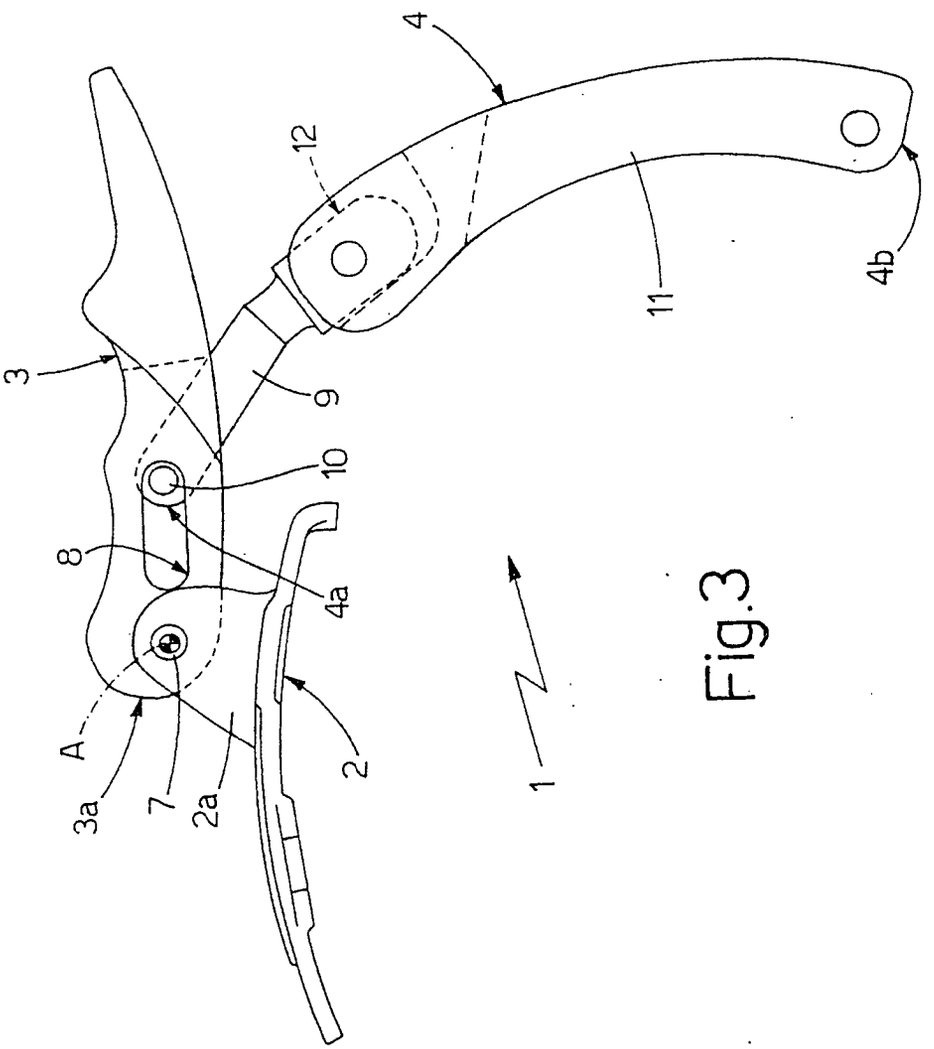


Fig.3

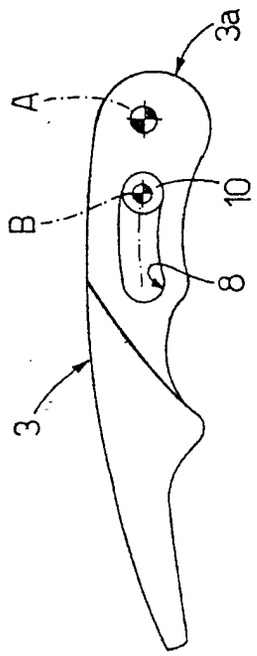


Fig.5

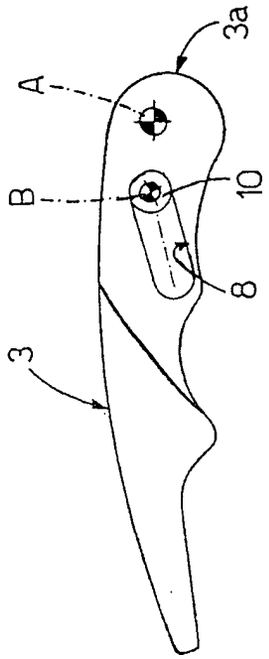


Fig.7

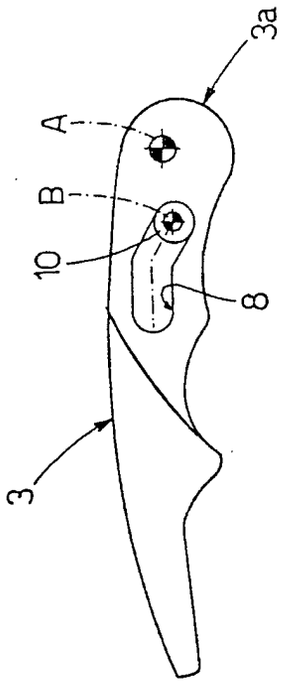


Fig.4

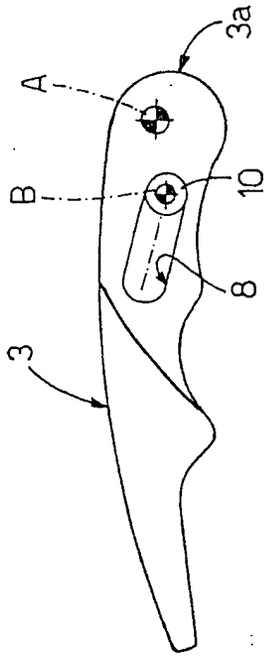


Fig.6

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EUROPEAN SEARCH REPORT

Application Number
EP 02 01 6790

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.7)
X	EP 0 860 122 A (DOLOMITE SPA) 26 August 1998 (1998-08-26) * column 1 - column 4; claims; figure 8 *	1-7	A43C11/14
X	EP 0 733 313 A (LANGE INT SA) 25 September 1996 (1996-09-25) * column 1 - column 3; claims; figures 6,7 *	1-7	
A	FR 2 784 554 A (SALOMON SA) 21 April 2000 (2000-04-21) * page 5, line 25 - page 6, line 4; claims; figures *	1	

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

A43C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
MUNICH	4 November 2002	Herry, M

CATEGORY OF CITED DOCUMENTS

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