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(12) # EUROPEAN PATENT SPECIFICATION

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(54) **Ratchet pawl device for coupling with a serrated strap of a closure lever, particularly for ski boots.**

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Description

This invention relates to a ratchet pawl device for coupling with a serrated strap of a closure lever, particularly for ski boots.

It is a well-known fact that the closure arrangement of ski boots currently makes use of levers which are connected to a serrated strap adapted to be preliminarly passed through a ratchet device which retains the strap prior to its locking by means of the lever. (DE—4—8310193.4).

That ratchet device or mechanism consists essentially of a small lever which is pivoted at its middle and has a first toothed end adapted to engage with the strap serrations so as to inhibit translation of the strap in a withdrawing direction extending away from the base and to enable translation of the strap in an inserting direction by oscillating said small lever.

Engagement of the strap with the ratchet mechanism permits the first end of the lever to engage with the sawtooth serrations on the strap in a proportional manner to the effort expended.

The adopted configuration allows then, as mentioned above, the lever to be oscillated to allow the strap through the ratchet mechanism in order to adjust its working length; further, the first toothed end of the lever may be disengaged from the serrated strap by acting on the second end of the lever, which will move the first end away and release the serrated strap.

The ratchet mechanism just described has the disadvantage of not providing a reliable locking action with the lever in the closed position.

In fact, in use, the cited lever is specially exposed to shocks at its second end, and consequently liable to release the serrated strap from its coupling and alter the tightening action applied by the closure lever.

It may be appreciated that such a circumstance would be quite dangerous for the skier, because the boot fastening condition is changed such that the foot is no longer held securely therein.

It is the aim of this invention, therefore, to obviate such prior shortcomings by providing a ratchet pawl device for coupling with a serrated strap of a closure lever, particularly for ski boots, which can prevent inadvertent disengagement of the serrated strap from the ratchet pawl device with the lever in the closed position.

Another object of this invention is to provide a ratchet pawl device as indicated which, while notably having improved features, is structurally simple and requires no special or difficult procedures for its operation.

Still another obect of this invention is to provide a ratchet pawl device as indicated, which can be readily manufactured from commercially available elements and materials, and which is competitive from a purely economical standpoint.

The above aim, as well as these and other objects such as will be apparent hereinafter, are achieved by a ratchet pawl device for coupling with a serrated strap of a closure lever, particularly for ski boots, according to the invention, comprising a base attachable to one of the flaps to be brought together and having lateral sides bounding the area of engagement for a serrated strap connected to a lever associable with the other of the flaps to be brought together, also provided being an oscillable body hinged, at a middle portion thereof, to said sides and having a first toothed end engageable with said serrated strap to block translation of said serrated strap in a withdrawing direction extending from said base and to enable translation of said strap in an inserting direction extending through said base on oscillation of said oscillable body, said oscillable body having a second end actuatable for pivotally disengaging said first toothed end from said strap, said ratchet pawl device being characterized in that it further comprises a means of blocking the oscillation of said oscillable body actuable by applying a pulling force, in the withdrawing direction extending from said base, to said serrated strap by means of said lever.

Further features and advantages will become apparent from the following description of a preferred but not exclusive embodiment of a ratchet pawl device for coupling with a serrated strap of a closure lever, particularly for ski boots, with reference to the accompanying illustrative drawing, where:

Figure 1 is an exploded perspective view of this ratchet pawl device;

Figure 2 shows schematically this ratchet pawl device mechanism as applied to a serrated strap connected to a closure lever;

Figure 3 is a partly sectional view showing this ratchet pawl device in the locked condition thereof; and

Figure 4 shows the ratchet mechanism of this invention in the released condition thereof, i.e. when no tension is exerted on the serrated strap by the lever.

With reference to the drawing figures, a ratchet pawl device for coupling with a serrated strap of a closure lever, particularly for ski boots, according to the invention, as genrally indicated at 1, comprises a base 2 having a center portion 3 formed with holes 4 for its attachment to one of the flaps to be brought together.

From the center portion 3, there extend lateral sides 5 which are located oppositely to each other and substantially delimit the area of engagement for a serrated strap 6 which is connected, with one end thereof, to a closure lever, of a type known per se, which is generally indicated at 7.

The ratchet pawl device 1 further includes an oscillable body 10, which advantageously has a substantially flattened configuration and hingedly connectable, at a middle portion thereof, to a pin 11 supported on the lateral sides 5.

The oscillable body 10 has a first toothed end, indicated at 12, which is engageable with the serrations 6a on the serrated strap 6.

The serrations 6a of the serrated strap 6, and the teeth 12a on the toothed end 12, are shaped to effect blocking of the serrated strap, 6 preventing it from translating in a withdrawing direction (as

indicated by the arrow 100 in figure 3), extending off the base 2, while they enable the serrated strap 6 to be inserted with a resultant oscillation of the body 10 about the hinge connection point.

The first toothed end 12 is held elastically in contact with the serrated strap by the elastic biasing action of a spring means which advantageously comprises a hairpin spring 15 associated with the pin 11 and having a first end 16 coupled with one of the sides 5 and the other end 17 received in a recess 18 defined in a side of the body 10.

The body 10 defines, at the opposite end from the first toothed end 12, a second end 19 whereon a pressure may be exerted to oscillate the body 10 about the hinge connection point against the bias of the spring 15 thereby removing the first toothed end 12 from its engagement with the serrations 6a of the serrated strap 6.

A peculiarity of the invention resides in the fact that the cited ratchet pawl device has a means of blocking the oscillation of the oscillable body 10 which is actuatable by the pull applied to the serrated strap by the closure lever, on tightening the closure lever; this is very important because it prevents any inadvertent striking against the body 10 from causing an undesired release or withdraw of the serrated strap from the ratchet mechanism.

Such locking arrangement is provided, in essence, by the provision for a limited translation of the body 10 relatively to its point of hinge connection such as to bring lugs 20 projecting laterally from the body itself into notches or locking seats 25 formed in the lateral sides 5.

More specifically, the body 10 engages with the hinge pin 11 by means of a channel 21 which has, in cross-section, a substantially oval or otherwise elongate shape having a major axis extending in the direction of extension of the serrated strap.

The cited lugs are provided at the first toothed end 12 and may be formed of a throughgoing pin which projects laterally from the body 10, or may be formed integrally with the oscillable body 10 itself.

The cited lugs are receivable in the side notches or cutouts 25, defined by the sides 5, on engaging the pin 11 with the front portion of the oval channel 21, the front portion being herein the portion located at the end of the channel 21 which is remote from the closure lever 7.

With the pin located at the rear portion of the oval channel 21 that is, the end of the channel which is closest to the closure lever 7, the lugs 20 will not interfere with the notches 25, and accordingly, the body 10 can be oscillated in the traditional manner to disengage its toothed end 12 from the serrated strap.

In practical use, on applying a closure pull to the serrated strap 6, through the lever 7, and owing to the teeth 12a engaging with the serrations 6a of the serrated strap, there occurs a translation of the body 10 relatively to the hinge pin 11 and consequent seating of the lugs 20 into the notches 25, thereby the body 10 cannot be oscillated, even if a pressure is effected on the second end of the body 10 itself.

On re-opening the lever 7, and hence removing the pull action exerted on the serrated strap, the lugs 20 come out of the notches 25 and, accordingly, it becomes possible to effect disengagement oscillation of the oscillable body 10 which moves the first toothed end 12 away from the serrated strap 6, thus allowing the ratchet pawl device to be opened.

It may be appreciated from the foregoing description that the invention achieves its objects, and in particular that blocking of the oscillation of the oscillable body 10, with the serrated strap under tension, that is with the lever in the closed position, may be obtained in an extremely simple and quick fashion.

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

In practicing the invention, any materials, so long as compatible with the specific use, as well as any dimensions and contingent shapes may be selected and used depending on requirements.

Claims

1. A ratchet pawl device (1) for coupling with a serrated strap (6) of a closure lever (7) particularly for ski boots, comprising a base (2) attachable to one of the flaps to be brought together and having lateral sides (5) bounding the area of engagement for the serrated strap (6) connected to the lever (7) associable with the other of the flaps to be brought together, there also being provided an oscillable body (10) hinged, at a middle portion thereof, to said sides (5) and having a first toothed end (12) engageable with said serrated strap (6) to block movement of said serrated strap (6) in a withdrawing direction extending from said base (2) and to enable translation of said strap (6) in an inserting direction extending through said base (2) on oscillation of said oscillable body (10), said oscillable body having and a second end (19) actuatable for pivotally disengaging said first toothed end (12) from said serrated strap (6), said ratchet pawl device (1) being characterized in that it further comprises a means (20, 25) for blocking the oscillation of said oscillable body (10) actuatable by applying a pulling force, in a withdrawing direction extending from said base (2), to said serrated strap (6) by means of said lever (7).

2. A ratchet pawl device according to claim 1, characterized in that said means of blocking the oscillation of said oscillable body comprises lugs (20) projecting laterally from said oscillable body (10) and engageable in seats (25) defined on said lateral sides (5).

3. A ratchet pawl device according to claim 1 or 2, characterized in that lugs (20) are provided on said oscillable body on the end thereof closest to said first toothed end (12) with respect to the middle region of pivotal connection of said body (10).

4. A ratchet pawl device according to claims 1, 2

and 3, characterized in that said oscillable body is hinged about a pin (11) supported on said lateral sides (5), said pin (11) being housed inside a channel (21) defined in said oscillable body (10) and having, in cross-section, an elongate configuration extending in the direction of the extension of said serrated strap (6).

5. A ratchet pawl device according to one or more of the preceding claims, comprising an elastic means (15) acting between the base (2) and said oscillable body (10) to elastically press said first toothed end (12) against said serrated strap (6), characterized in that said elastic means includes a hairpin spring (15) associated with said pin (11) and having a first end (16) associable with one of said lateral sides (5) and the other end received in a recess (18) defined laterally on said oscillable body (10).

Patentansprüche

1. Ratschenverschlußvorrichtung (1) zur Kupplung mit einem Zahnriemen (6) eines Verschlußhebels (7), insbesondere für Skischuhe, mit einer Basis (2), die an einen der miteinander zu verbindenden Lappen befestigbar ist und Seitenteile (5) aufweist, welche den Eingriffsbereich für den Zahnriemen (6) begrenzen, der mit dem Hebel (7) verbunden ist, welcher mit dem anderen der miteinander zu verbindenden Lappen verbunden ist, wobei weiters ein Schwingkörper (10) vorgesehen ist, der mit seinem Mittelteil an den Seitenteilen (5) angelenkt ist und ein erstes gezahntes Ende (12) besitzt, das mit dem Zahnriemen (6) in Eingriff bringbar ist, um die Bewegung des Zahnriemens (6) in der sich von der Basis (2) aus erstreckenden Ausziehrichtung zu blockieren und eine Verschiebung des Riemens (6) in der durch die Basis (2) verlaufenden Einziehrichtung durch die Schwingung des Schwingkörpers (10) zu ermöglichen, wobei der Schwingkörper ein zweites Ende (19) besitzt, das betätigbar ist, um durch Schwenkung das erste gezahnte Ende (12) aus dem Eingriff mit dem Zahnriemen (6) zu führen, dadurch gekennzeichnet, daß die Ratschenverschlußvorrichtung (1) weiters eine Einrichtung (20, 25) für die Blockierung der Schwingung des Schwingkörpers (10) aufweist, die durch Ausübung einer Zugkraft in der von der Basis (2) aus verlaufenden Ausziehrichtung auf den Zahnriemen (6) mittels des Hebels (7) betätigbar ist.

2. Ratschenverschlußvorrichting nach Anspruch 1, dadurch gekennzeichnet, daß die Einrichtung zur Blockierung der Schwingung des Schwingkörpers aus Fortsätzen (20) besteht, die seitlich vom Schwingkörper (10) wegstehen und befähigt sind, in Sitze (25) einzugreifen, die an den Seitenteilen (5) ausgebildet sind.

3. Ratschenverschlußvorrichting nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß die Fortsätze (20) auf dem Schwingkörper an dem Ende desselben, das zum gezahnten ersten Ende (12) in bezug auf den Mittelbereich der Anlenkung des Schwingkörpers (10) am nächsten liegt, vorgesehen sind.

4. Ratschenverschlußvorrichting nach den Ansprüchen 1, 2 und 3, dadurch gekennzeichnet, daß der Schwingkörper um einen in den Seitenteilen (5; gelagerten Zapfen (11) angelenkt ist, welcher in einer Ausnehmung (21) untergebracht ist, die im Schwingkörper (10) ausgebildet ist und im Querschnitt eine langgestreckte Form besitzt, die in der Richtung der Erstreckung des Zahnriemens (6) verläuft.

5. Ratschenverschlußvorrichting nach einem oder mehreren der vorhergehenden Ansprüche, mit einer elastischen Einrichtung (15), die zwischen der Basis (2) und dem Schwingkörper (10) wirkt, um das gezahnte erste Ende (12) federnd gegen den Zahnriemen (6) zu drücken, dadurch gekennzeichnet, daß die elastische Einrichtung aus einer Haarnadelfeder (15) besteht, die dem Zapfen (11) zugeordnet ist und von der ein erstes Ende (16) einem der Seitenteile (5) zugeordnet und das andere Ende in eine seitliche Vertiefung (18) auf dem Schwingkörper (10) eingesetzt ist.

Revendications

1. Dispositif encliquetable (1) pour un accouplement avec une lanière crantée (6) d'un levier de fermeture (7), en particulier pour chaussures de ski, comportant une base (2) fixable à l'une des languettes à réunir et ayant des côtés latéraux (5) délimitant la zone d'enclenchement pour la lanière crantée (6) reliée au levier (7) associable avec l'autre des languettes à réunir, un corps oscillant (10) qui s'y trouve également s'articulant, au niveau d'une partie médiane de celui-ci, sur lesdits côtés (5) et ayant une première extrémité dentée (12) qui peut s'enclencher avec ladite lanière crantée (6) pour bloquer le déplacement de ladite lanière crantée (6) dans le sens du retrait depuis ladite base (2) et pour permettre le déplacement de ladite lanière (5) dans le sens de l'insertion à travers ladite base (2) au moment de l'oscillation dudit corps oscillant (10), ledit corps oscillant ayant aussi une seconde extrémité (19) actionnable pour dégager par pivotement de ladite lanière crantée (6) ladite première extrémité dentée (12), ledit dispositif encliquetable (1) étant caractérisé en ce qu'il comporte en outre un moyen (20, 25) pour bloquer l'oscillation dudit corps oscillant (10), actionnable en exerçant un effort de traction, dans le sens du retrait depuis ladite base (2), sur ladite lanière crantée (6) à l'aide dudit levier (7).

2. Dispositif encliquetable selon la revendication 1, caractérisé en ce que ledit moyen de blocage de l'oscillation dudit corps oscillant comporte des pattes (20) faisant latéralement saillie depuis ledit corps oscillant (10) et pouvant s'enclencher dans des surfaces d'appui (25) définies sur lesdits côtés latéraux (5).

3. Dispositif encliquetable selon la revendication 1 ou 2, caractérisé en ce que des pattes (20) sont présentes sur ledit corps oscillant à l'extrémité de celui-ci la la plus proche de ladite première extrémité dentée (12) par rapport à la région médiane de liaison pivotante dudit corps (10).

4. Dispositif encliquetable selon les revendications 1, 2 et 3, caractérisé en ce que ledit corps oscillant s'articule autoure d'un pivot (11) supporté sur lesdits côtés latéraux (5), ledit pivot (11) étant logé à l'intérieur d'une rainure (21) définie dans ledit corps oscillant (10) et ayant, en section transversale, une configuration allongée s'étendant dans le sens de l'extension de ladite lanière crantée (6).

5. Dispositif encliquetable selon une ou plusieurs des revendications précédentes, comportant un moyen élastique (15) agissant entre la base (2) et ledit corps oscillant (10) pour pousser élastiquement ladite première extrémité dentée (12) contre ladite lanière crantée (6), caractérisé en ce que ledit moyen élastique comprend un ressort en U (15) coopérant avec ledit pivot (11) et ayant une première extrémité (16) associable avec l'un desdits côtés latéraux (5), et l'autre extrémité reçue dans un évidement (18) défini latéralement sur ledit corps oscillant (10).

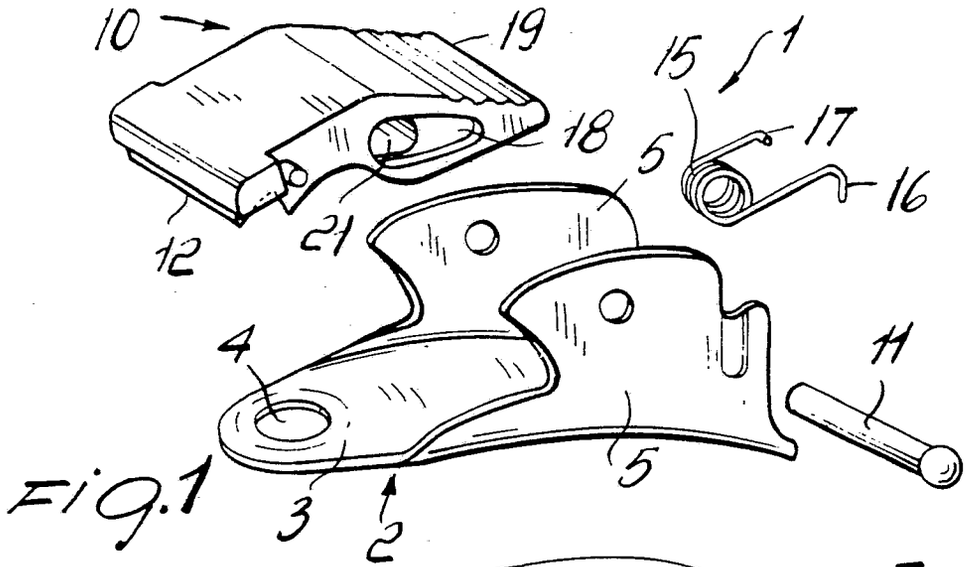

Fig.1

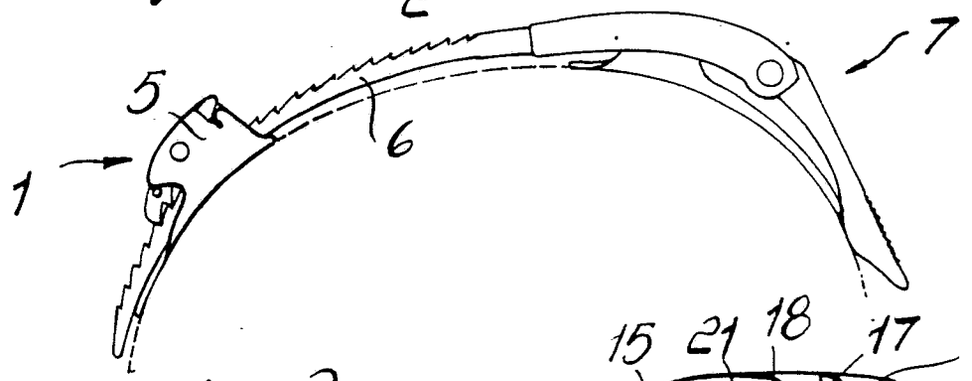

Fig.2

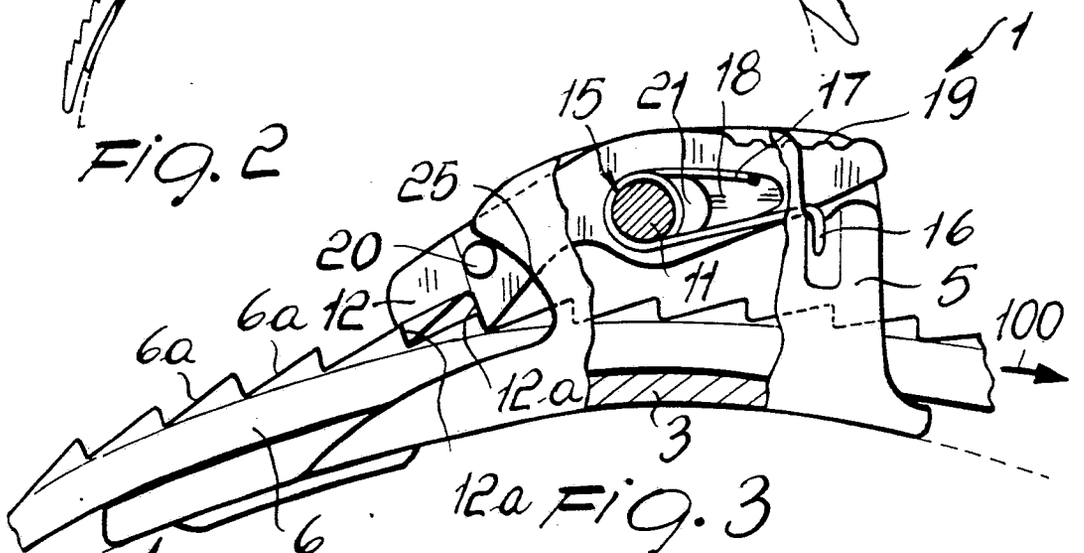

Fig.3

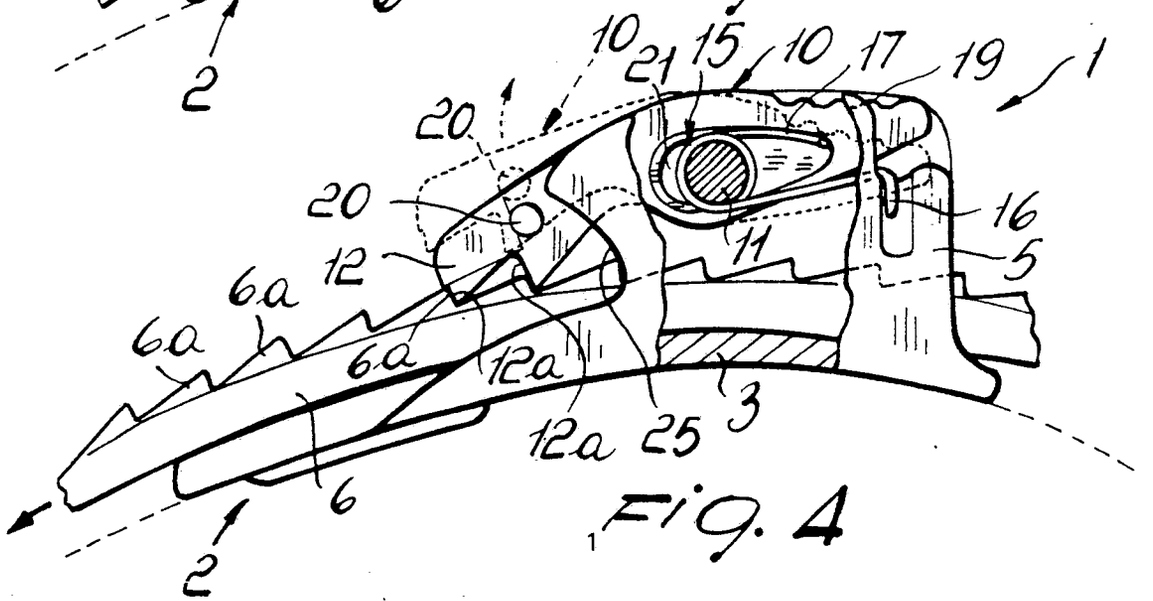

Fig.4