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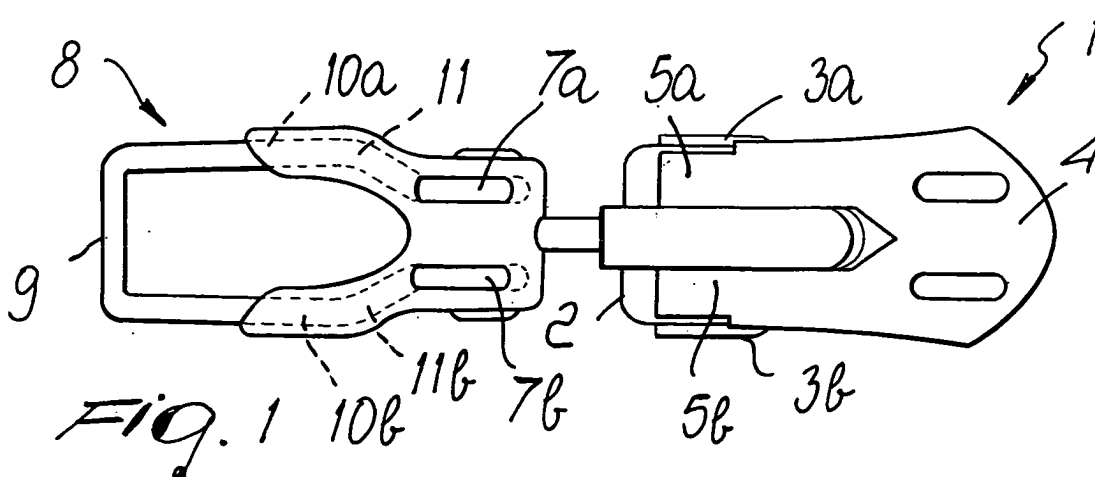
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(54) **Lever particularly for sports shoes**

(57) A lever (1), particularly for sports shoes, having a base (2) that is coupled to a first flap and is provided with two shoulders (3a,3b) between which a U-shaped lever arm (4) is pivoted, a traction member (6) being pivoted between the wings (5a,5b) of the lever arm. The

first curled and tapered ends (7a,7b) of an open ring (8) are pivoted to the traction member; the second closed end (9) of the ring interacts with a rack that is associated with a second flap to be joined. A means (13) for locking the mutual position of the first ends is provided.



Description

[0001] The present invention relates to a lever, particularly for sports shoes.

[0002] A conventional fastening lever includes a base that is rigidly coupled to a first flap to be joined of the shoe, which is provided with two shoulders between which a U-shaped lever arm is articulated.

[0003] A traction member is pivoted between the wings of the lever arm and is connected at its other end to a metal wire ring that has a diameter of usually approximately 2.3 mm.

[0004] The ring is made to interact selectively with one of the teeth of a rack that is associated with the other flap to be joined of the shoe.

[0005] The use of such conventional lever therefore entails that, once the ring has been positioned at the rack, the skier turns the lever arm, consequently tensioning the ring, which accordingly forces the mutual approach of the flaps.

[0006] One drawback that can be observed in these type of lever is that if the skier wishes to achieve a high degree of fastening and therefore applies a chosen and intense force to the lever arm, the ring undergoes deformation at the connection to the traction member and therefore disengages from it.

[0007] This in practice makes the lever unusable forcing the user to take the boot to be repaired and to suspend sports activity.

[0008] In the prior art levers, the ring is in fact of the open type, so as to form free ends that are arranged for example at a hole formed transversely with respect to a block that is associated with a threaded end of the traction member, so that it can rotate about a perpendicular axis.

[0009] As a partial solution to such drawback, an electrowelded metallic strap is applied at the free ends of the ring associated with the block, for limiting the splaying of the ends of the ring.

[0010] However, also such device has drawbacks, because the band can break or undergo deformation during use, for example due to possible impacts received at the poles where the skier is slaloming.

[0011] The aim of the present invention is to overcome the cited technical problems and to eliminate the cited drawbacks, by providing a lever that despite using a ring allows to achieve fastening even for intense loads applied to the lever arm.

[0012] Within this aim, an object of the invention is to provide a lever that uses a ring that is free from permanent deformations caused by intense loads applied to the lever arm.

[0013] A further object is to provide a lever that withstands high loads, from 200 to 500 kilograms.

[0014] A further object is to provide a lever that allows to maintain an approximately constant closure load even when the flaps, by settling and elongating, tend to reduce the initial closure load of the lever.

[0015] This aim and these and other objects that will become better apparent from the description that follows are achieved by a lever, particularly for sports shoes, comprising a base that is coupled to a first flap and is provided with two shoulders between which a U-shaped lever arm is pivoted, a traction member being pivoted between the wings of said lever arm, characterized in that the first curled and tapered ends of an open ring are pivoted to said traction member, said ring interacting at its second closed end with a rack that is associated with a second flap to be joined, a means being provided for locking the mutual position of said first ends.

[0016] Other objects will become better apparent in the description that follows, which must be considered together with the accompanying drawings, which illustrate a particular embodiment by way of non-limiting example and in which:

Figure 1 is a top view of the lever;

Figure 2 is a side view of the lever;

Figure 3 is a view, similar to Figure 2, of the lever, in which the means for locking the mutual position of the first ends of the ring is shown in a cross-section taken along a central plane that lies longitudinally with respect to the lever;

Figures 4 and 5 are side perspective views of the ring in the conditions with and without the means for locking the mutual position of its first ends;

Figure 6 is a top view of another embodiment;

Figure 7 is a view, similar to Figure 3, of the embodiment of Figure 6;

Figure 8 is an exploded view of components of the lever;

Figure 9 is a side perspective view of the ring with the means and the lever arm associated therewith; Figure 10 is a side perspective view of the means for locking the mutual position of the first ends of the ring;

Figure 11 is a top view of the means of Figure 10; Figure 12 is a rear view of the means of Figure 11; Figure 13 is a sectional view, taken along the line XIII-XIII of Figure 11.

[0017] With reference to the cited figures, and bearing in mind that they exemplify a particular embodiment and are in variable scale and that individual reference numerals designate therein identical or equivalent parts, the reference numeral 1 designates a lever for sports shoes, having a base 2 that is rigidly coupled to a first flap to be joined of the shoe. The base 2 is provided with two shoulders 3a, 3b between which a U-shaped lever arm 4 is articulated. A traction member 6 is pivoted between the wings 5a, 5b of the lever arm.

[0018] The first ends 7a, 7b of a ring 8 are pivoted to the traction member.

[0019] The ring is therefore open at its first ends 7a, 7b, and there is a second end 9 that lies opposite the

first end and is closed.

[0020] The first ends 7a and 7b are curled and are arranged along mutually parallel planes that are approximately perpendicular to the plane of arrangement of the base 2.

[0021] The first and second ends 7a, 7b are tapered, meaning that they are arranged at a distance that is shorter than the width of the second end 9.

[0022] Starting from the second end 9 the ring 8 has two arms 10a, 10b, which protrude approximately at right angles to the second end 9 and then have a portion 11a, 11b that is inclined in mutually opposite directions until it blends with the first ends 7a, 7b, which are thus closer to each other and to the longitudinal central axis of the ring 8.

[0023] The first ends 7a, 7b are curled, the curl being obtained by bending the wire that constitutes the ring in a clockwise direction on a plane of arrangement that lies below the one on which the second end 9 and the arms 10a and 10b lie.

[0024] Pivoting between the lever arm 4 and the first ends 7a, 7b is achieved by a suitable pivot 12.

[0025] The ring 8 is made of steel with a diameter of more than 2.3 mm, as generally used in the prior art. For example, the ring can be made of steel having a diameter of more than 3 millimeters, preferably approximately 3.5 millimeters.

[0026] This increase in the diameter of the wire not only increases the resistance to deformation of the wire but also gives it a function that can be considered equivalent to a leaf spring, in order to also achieve the possibility to keep the closure load approximately constant even when the flaps, by settling and elongating, tend to reduce the initial closure load of the lever.

[0027] The lever comprises a means for locking the mutual position of the first ends 7a, 7b, which is constituted by a cover 13 that is overmolded at the interspace provided between the first ends 7a, 7b so as to also affect the inclined portions 11 a, 11 b of the ring 8 and partially affect the arms 10a, 10b, the cover being therefore substantially U-shaped.

[0028] The cover 13 therefore has a shape that keeps the first and second ends 7a, 7b at the same distance regardless of the load applied to the ring 8.

[0029] Figures 6 to 13 illustrate a further embodiment, in which the means for locking the mutual position of the first ends 7a, 7b of the ring 8 is constituted by a cover 13 that is preferably made of metal plate and is approximately shaped like an inverted letter U so as to form a dome 14 that is approximately as wide as the distance between the first ends 7a, 7b. Wings 15a, 15b protrude from the dome, straddle the first ends 7a, 7b and have, at the curled portion, suitable holes 16a, 16b for the passage of the pivot 12.

[0030] The dome 14 is arc-like, with cavities directed toward the pivot 12.

[0031] The stem 17 of a T-shaped plate protrudes from the dome 14 on the opposite side with respect to

the lever arm 4. The tabs 18a, 18b of the plate are bent towards the pivot 12 and interact by abutment with the inclined portions 11a, 11b of the ring 8.

[0032] The intended aim and objects have been achieved, a lever having been provided which while using a ring allows to achieve fastening even for intense loads applied to the lever arm, the ring being free from permanent deformations caused by the intense loads applied.

[0033] The lever allows to keep the closure load approximately constant even when the flaps, by settling and elongating, tend to reduce the initial closure load of the lever, since the ring acts as a leaf spring.

[0034] It should be noted that the described solution is susceptible of numerous modifications and variations, within the scope of the appended claims. The materials used, as well as the dimensions of the individual components of the invention, may be the most pertinent according to specific requirements.

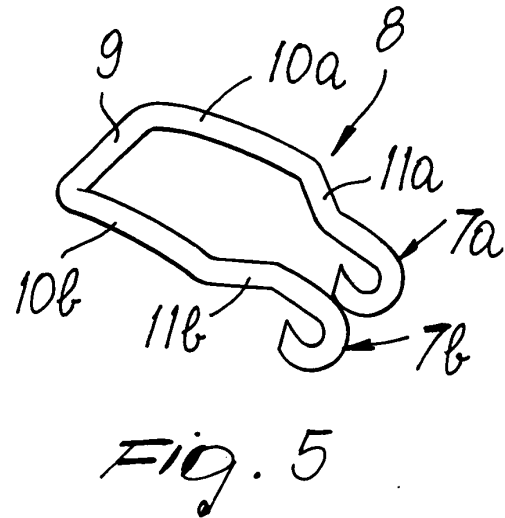
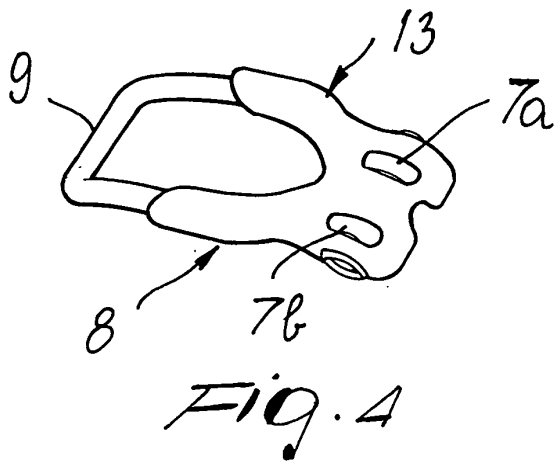
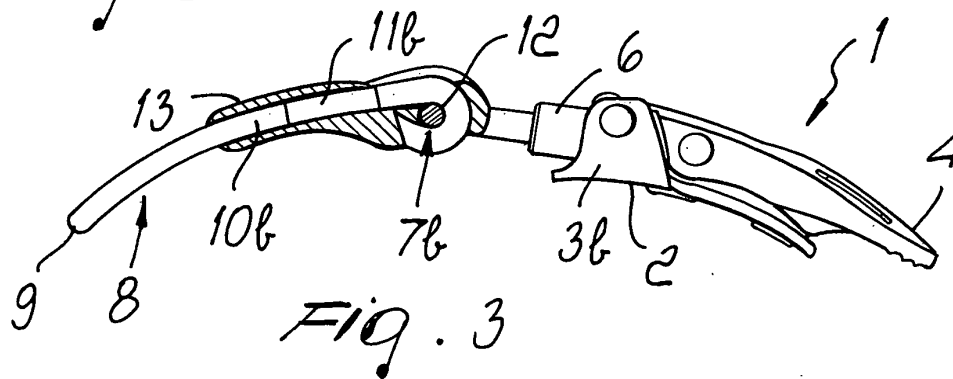
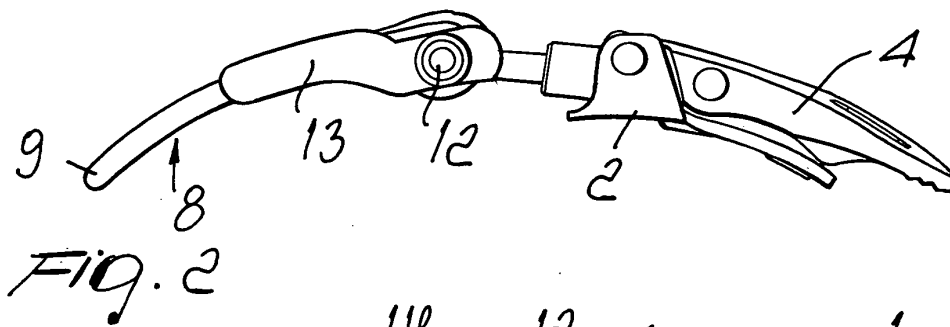
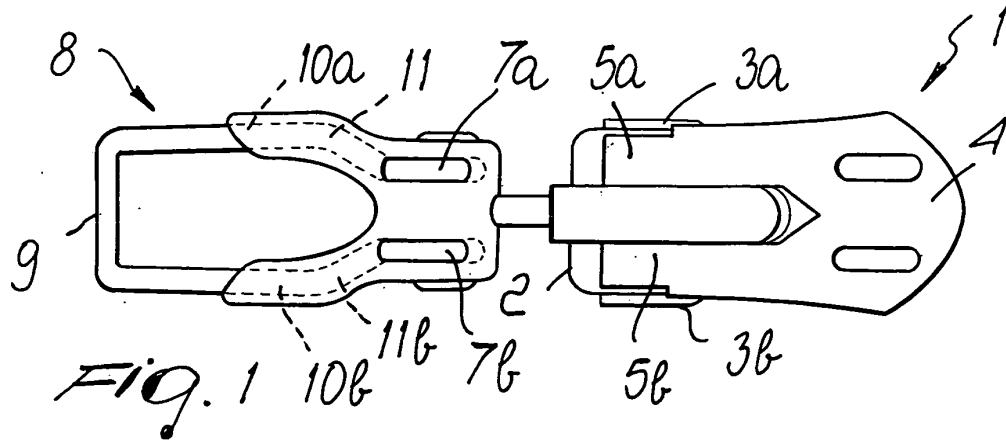
Claims

1. A lever, particularly for sports shoes, comprising a base that is coupled to a first flap and is provided with two shoulders between which a U-shaped lever arm is pivoted, a traction member being pivoted between the wings of said lever arm, **characterized in that** the first curled and tapered ends of an open ring are pivoted to said traction member, said ring interacting at its second closed end with a rack that is associated with a second flap to be joined, a means being provided for locking the mutual position of said first ends.
2. The lever according to claim 1, **characterized in that** said first curled ends are arranged along mutually parallel planes that are approximately perpendicular to the plane of arrangement of said base, said first and second ends tapering, being arranged at a distance that is shorter than the width of said second end of said ring.
3. The lever according to claim 2, **characterized in that** said ring has, starting from said second end, two arms which protrude approximately at right angles to said second end and then have a portion that is inclined in mutually opposite directions until it blends with said first ends, which are thus closer to each other and to the longitudinal central axis of said ring.
4. The lever according to claim 2, **characterized in that** said first ends are curled, said curl being obtained by bending the wire that constitutes said ring in a clockwise direction on a vertical plane that lies below the plane on which said second end and said arms lie.

5. The lever according to one or more of the preceding claims, **characterized in that** said ring is made of steel with a diameter of more than 2.3 millimeters.
6. The lever according to claim 5, **characterized in that** said ring has a diameter of more than 3 millimeters, preferably approximately 3.5 millimeters. 5
7. The lever according to one or more of the preceding claims, **characterized in that** said means for locking the mutual position of said first ends are constituted by a cover that is overmolded at the interspace provided between said first ends so as to also affect said inclined portions of said ring and partially affect said arms, said cover being substantially U-shaped. 10 15
8. The lever according to claim 7, **characterized in that** said cover has a shape that keeps said first and second ends at the same distance regardless of the load applied to said ring. 20
9. The lever according to one or more of the preceding claims, **characterized in that** said means for locking the mutual position of said first ends of said ring are constituted by a cover that is made of metal plate and is approximately shaped like an inverted letter U so as to form a dome that is approximately as wide as the distance between said first ends. 25
10. The lever according to claim 9, **characterized in that** wings protrude from said dome, straddle said first ends and have, at the curled portion, holes for the passage of the pivot for pivoting to said traction member. 30 35
11. The lever according to claim 10, **characterized in that** said dome is arc-like, with cavities directed toward said pivot.
12. The lever according to claim 10, **characterized in that** a T-shaped plate has a stem that protrudes from said dome on the opposite side with respect to said lever, said plate having tabs folded toward said pivot, interacting by abutment with said inclined portions of said ring. 40 45

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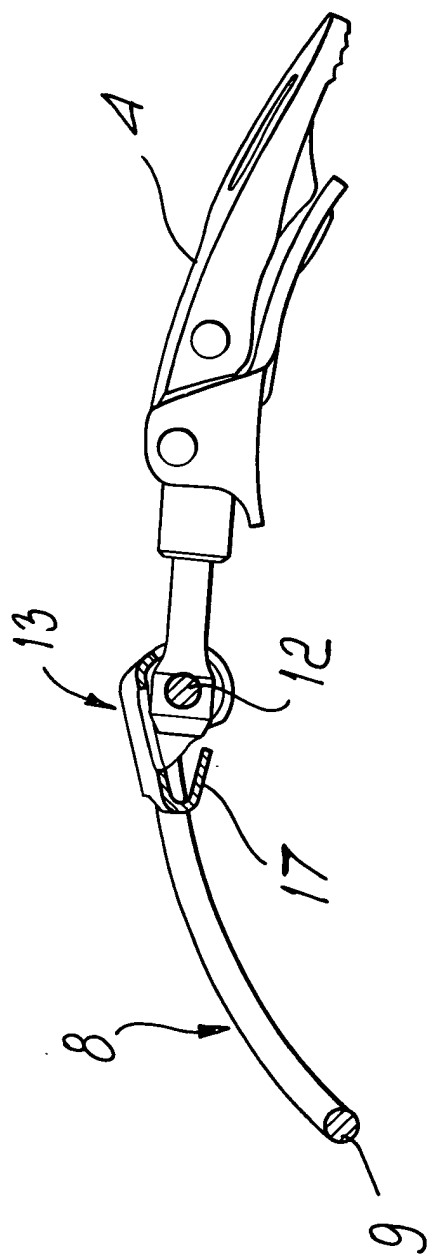


Fig. 7

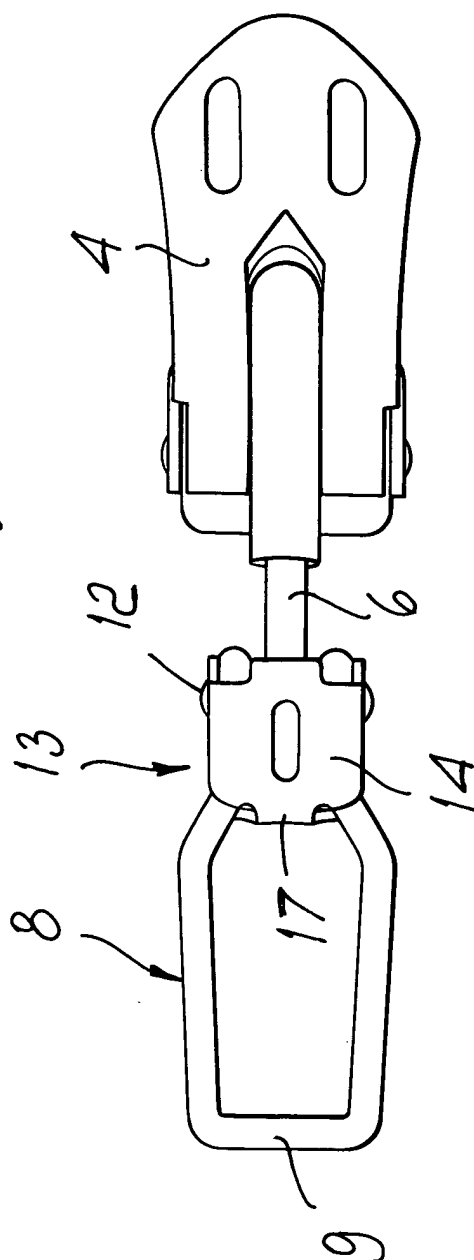
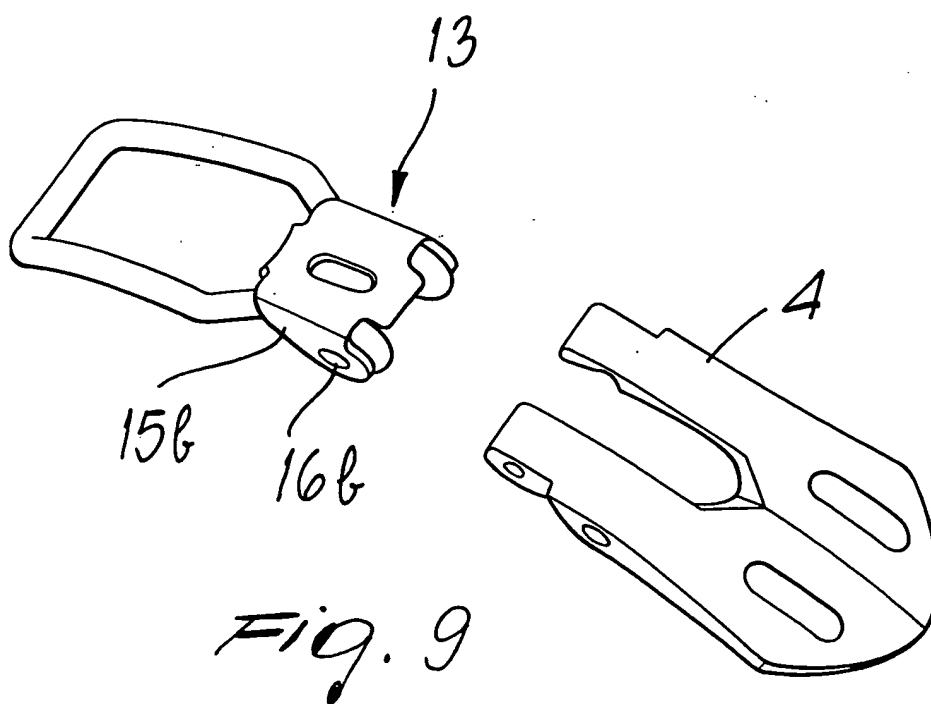
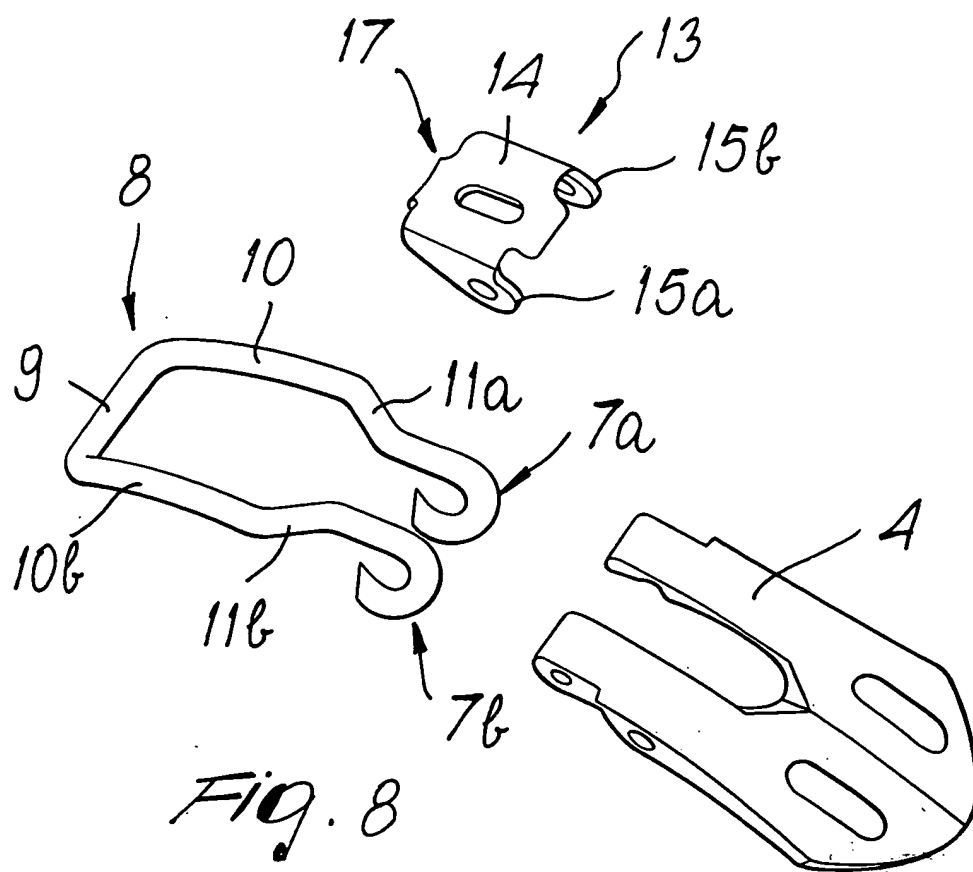
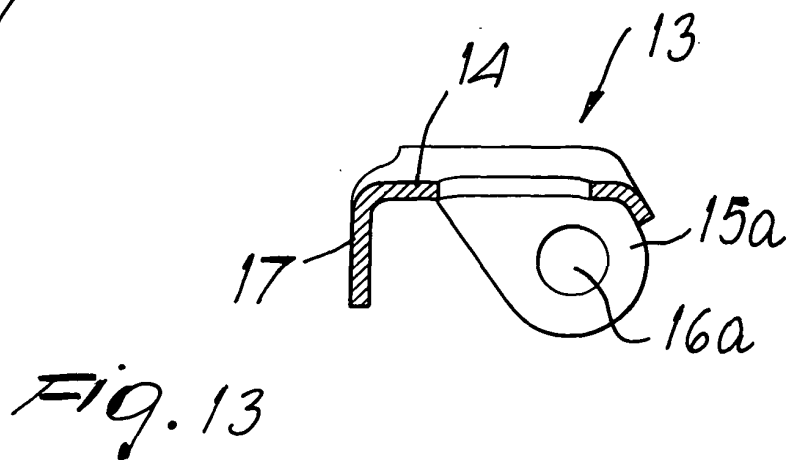
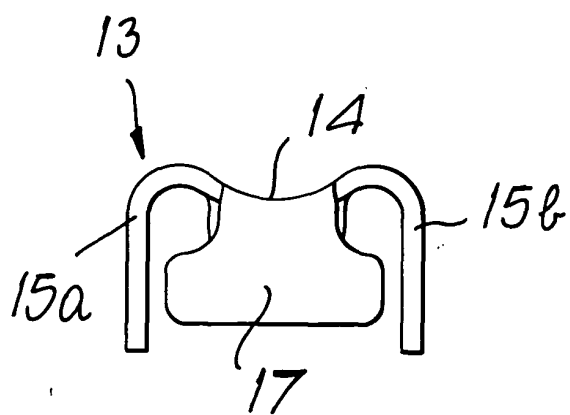
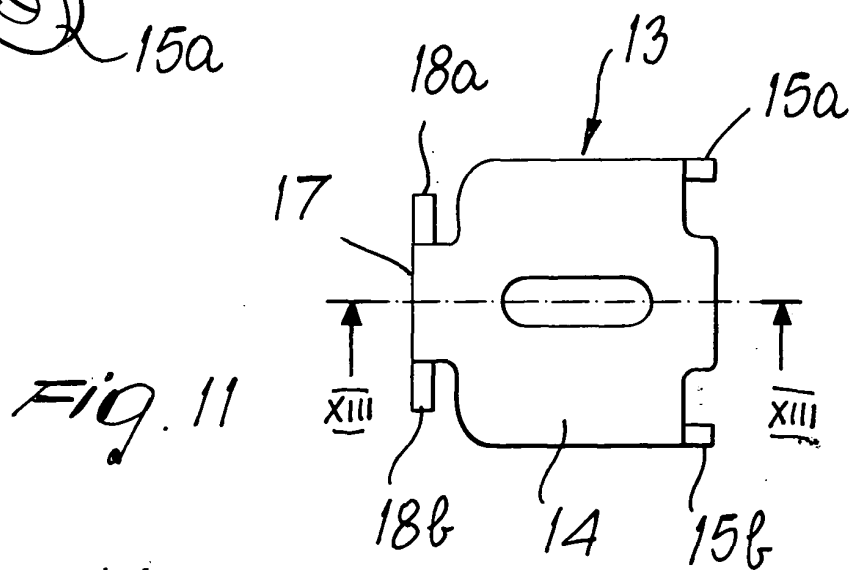
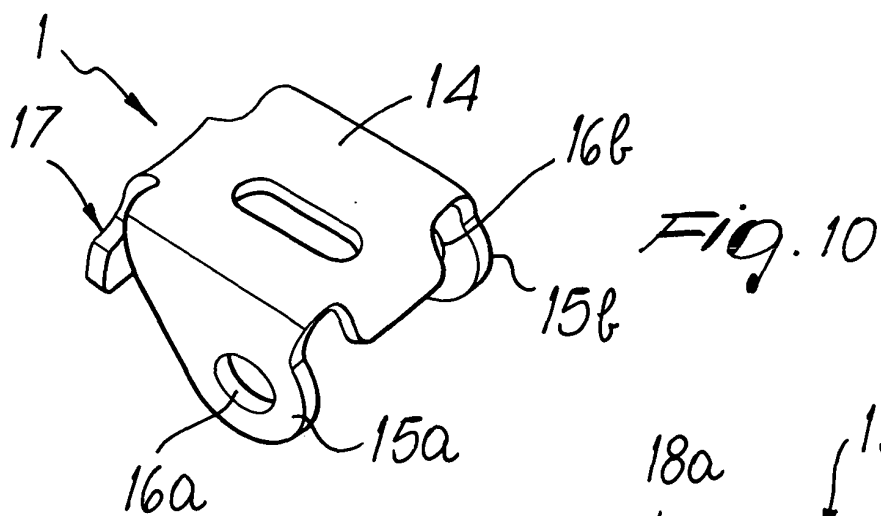


Fig. 6







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Application Number
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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			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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