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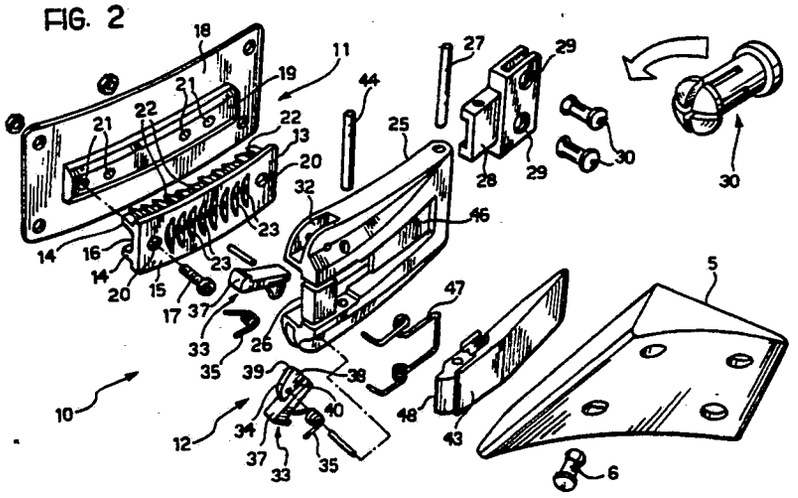
(54) A fastening device for sport shoes, in particular for cross-country motorcycling boots, and a boot incorporating said device.

(57) A fastening device comprises first and second fastening members (11,12) engageable with each other to clasp corresponding parts of the upper of a sport shoe (1) together. The first and second fastening members respectively comprise a guide (13) and a slider (25), the latter being slidable along the guide (13) and held releasably in engagement therewith. Provided between the slider and the guide is a one-way stop means (22,33) for releasably making the slider (25) and guide (13) unitary in one of the two directions.

FIG. 2



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This invention relates to a fastening device for sport shoes, in particular for cross-country motorcycling boots, being of a type which comprises first and second fastening members releasably engageable with each other to hold corresponding parts of the shoe upper clasped together.

The fastening arrangement of this invention is specially designed for application to cross-country motorcycling boots, the term also encompassing motorcycling boots for off-road use.

The devices which are currently employed for fastening on cross-country motorcycling boots belong essentially to two types.

A first type fastening device is lever operated, it including a toothed lever pivoted on a small base which is in turn attached to one of the upper portions to be clasped together and cooperating with a ring attached to the other portion of the upper. By engaging the ring with selected teeth and turning down the lever, the fastening tension can be adjusted.

The second type includes pull-away fastening arrangements, as implemented by a material known in the trade under the trademark of "VELCRO".

A typical drawback of the lever-operated fastening arrangements is that, in order to vary the fastening tension after closing the boot, the fastening arrangement must be fully relaxed to allow the ring to be moved into engagement with a different lever tooth.

This operation, besides leaving the fastening arrangement in a released state for a few moments, almost invariably involves the use of both hands, and accordingly, cannot be performed by the motorcyclist while running.

This prior fastening arrangement type hardly suits, therefore, sport or competitive applications.

Pull-away fastening arrangements are instead easier to adjust, although they have difficulty to allow of relatively high fastening tension forces.

On the other hand, this second fastening arrangement type holding power is apt to deteriorate when the material from which it is formed (VELCRO) becomes fouled with dirt or mud.

The problem that underlies this invention is to provide a fastening device having such construction and performance features as to solve all of the problems with which the cited prior art is beset.

This problem is solved according to the invention by a device as indicated being characterized in that the first fastening member comprises a guide and the second fastening member comprises a slider arranged to be slidable along said guide and being held in releasable engagement therewith, between the guide and the slider a one-way stop means being provided to releasably lock the slider to the guide in either sliding direction.

The features and advantages of this invention will become more clearly apparent from the following detailed description of two exemplary embodiments thereof, given by way of illustration and not of limitation with reference to the accompanying drawings, where:

Figure 1 is a perspective view of a cross-country motorcycling boot incorporating fastening devices according to the invention;

Figure 2 is an exploded perspective view of a detail of the boot shown in Figure 1;

Figure 3 is a perspective view of a detail of the fastening device in Figure 2;

Figure 4 is a longitudinal section view of the fastening device in Figure 2;

Figure 5 is an enlarged scale detail view of the device in Figure 4;

Figure 6 is a cross-sectional view taken along the line VI-VI in Figure 1;

Figure 7 is a perspective view of a modified embodiment of the device according to the invention;

Figures 8 and 9 are further perspective and exploded views, respectively, of a detail of the device in Figure 7 as assembled;

Figure 10 is a sectional view taken along the line X-X in Figure 7 showing the device at rest in a non-operational position; and

Figure 11 is a fragmentary view in longitudinal section of this same device at an operational stage where the fastening tension is being adjusted.

In Figure 1, the reference numeral 1 generally denotes a cross-country motorcycling boot according to this invention.

The boot 1 comprises an upper 2 and a sole 3. A portion of the upper defines a bootleg 4 which is not fully closed to itself. To close the bootleg 4, three fastening devices, each indicated at 10, are provided.

Adjacent to that fastening device 10 which lies closest to the sole 3 is a guard 5 attached to the upper 2 as by means of rivets 6.

Each fastening device 10 comprises first and second fastening members, respectively indicated at 11 and 12.

The first member 11 comprises a guide 13 which extends mainly along the longitudinal direction and has a substantially T-like section profile with a web 14 and a flange 15.

The web 14 is formed with a longitudinal groove 19.

The guide 13 is removably mounted in an adjustable manner to a small base 18 by means of screws 17 passed through holes 20. The base 18 has a bead formation 19 which fits in the groove 16.

Said base 18 is provided with a plurality of

holes 21 set at pitch distances apart (two pairs of such holes are shown in Figure 2) and adapted to receive the screws 17 to thereby enable the guide 13 to be adjusted in position on the base.

On juxtaposed longitudinal surfaces of the web 14, which are set rearwards from the edge of the flange 15, there are formed a plurality of teeth 22. The outward surface of the flange 15 is formed with a plurality of notches 23. The function of the teeth 22 and the notches 23 will be explained hereinafter.

The second fastening member comprises a slider 25 having a longitudinal groove 26 for receiving the guide 13.

A bracket 28 is connected to one end of the slider 25 in a swinging fashion for securing the slider 25 on a corresponding portion of the boot 1 upper.

The bracket 28 has two holes 29 into each of which a plastics button 30 fits removably by snap action, thereby by pulling the buttons 30 out of their respective holes 29, the second fastening member can be removed from the boot and, for instance, replaced if damaged.

A housing 32 for a corresponding pawl 33 is formed at the remote end of the slider 25 from the bracket 28, on either sides of said slider.

The bottom of each housing 32 is apertured to let an end 34 of the corresponding pawl 33 project into the groove 26. A spring 35 is arranged between the slider 25 and each pawl 33 to urge the latter into a working condition with the end 34 projected into the groove 26.

An operation lug 37 is formed at the opposite end of each pawl 33 to move it manually to a rest position against the bias of the spring 35.

The end 34 of the pawls 33 is tooth-shaped with a flank 38 arranged to engage the teeth 22 on the corresponding toothed surface of the web 14, thereby to provide a one-way stop means effective to prevent the slider 25 from sliding along the guide 13 in either of the two longitudinal directions, and having an inclined apical surface 39.

The surface 39 forms a ramp adapted to cooperate with the corresponding longitudinal edges of the flange 15, with the slider 25 forcibly abutting the guide 13, thereby the pawls 33 are spread apart to the rest position and enabled to move over the flange 25 and engage in the corresponding toothed surface of the web 14.

A flat top surface of the tooth-shaped end 34 defines a shoe-like retainer 40 slidable over the bottom surface of the flange 15, which functions thus as a slideway 41, to hold the slider 25 in engagement with the guide 33 once the fastening members 11, 12 have been coupled together.

A lever 43 is supported pivotally on the slider 25 by a pivot pin 44, at a seat 46 in which the lever 43 can be tucked away. A spring 47 acts on the lever 43 to urge it into the the seat 46.

The lever 43 has a free end 48 adapted to cooperate with the notches 23 to provide a rack mechanism for shifting the slider 25 along the guide 13 in the direction allowed by the one-way stop means.

To fasten the boot 1 on, after it has been put on, the slider 25 of each fastening device 10 is pushed against its respective guide 13 so as to engage the pawls 33 with the web 14 as previously described.

This operation provides already an initial coarse adjustment of the fastening tension substantially comparable to the adjustment afforded by the conventional pull-away closures.

To increase the fastening tension, the user is to raise the lever 43 and bring its end 48 to engage in one of the notches 23. The engaged notch 23 will act as a pivot for the lever 43, thereby the slider 25 is driven forward by a short distance with an amplified force by the arm of said lever.

The operation may be repeated until the required fastening tension is achieved.

At each forward movement of the slider 25 along the guide 13, in the one direction allowed by the stop means, the pawls 33 are caused to swing by reason of the inclination of the teeth 22 on the toothed surface. A backward movement of the slider 25 along the guide 13 would be inhibited by the flank 38 of each pawl becoming engaged with the teeth 22.

When one wants to release or just relax the fastening device 10 somewhat, one is merely to act on the operation lugs 37 of the pawls 33 to spread the latter to their rest positions, and then allow the slider 25 to move back into its released position or to disengage altogether from the guide 13. If the setting thus obtained proves inadequate, the user may shift the guide 13 onto the base 18 after taking out the screws 17.

Figures 7 to 11 show a modified embodiment of the device described so far, which affects the second fastening member, generally indicated at 100.

Similar parts carry the same references as in the preceding views.

The fastening member 100 also comprises a slide 25 whose surface facing the first member 11, in use, is formed with a longitudinal groove 26 for accommodating the guide 13 therein, as in the previous embodiment.

The main difference from the fastening member 12 resides in the lever configuration, which is generally designated by the reference numeral 101 in this variation. The lever 101 comprises an operation portion 102 and a working portion 103 which is guided slidably on the operation portion and retractable thereinto against the bias force of a spring

104.

The operation portion 101 is journalled at one of its ends on the slider 25 about a pin 105 passed with some radial clearance through holes 106 and is tucked away, in a non-operational position shown in Figure 10, into the seat 46 on the slider 25.

The working portion 103 is slidable within a recess 107 provided on the operation portion at the end attached to the slider 25.

The recess 107 causes two parallel prongs 108 to be formed on the lever portion 102, each of which prongs has, besides the corresponding hole 106 for the pin 105, a slotted hole 110 extending along the sliding direction (arrow A in Figure 9) of the working portion 103.

A peg 111 is captive across the working portion 103 so as to project sideways thereform and loosely engage in corresponding slotted holes 110; in a corresponding way, a slotted hole 112 is provided transversely through the working portion 103 wherein the pin 105 is loosely received to hold the working portion 103 guided on the operation portion 102.

On the free end of the working portion 103 adapted to engage in the notches 23, in use, there is defined a tooth 115 which has a ramp-like back surface 116 and is arranged to cooperate with a lip 118 formed in the seat 46 on the slider 25 so as to hold releasably by snap action the lever 101 in the non-operational position shown in Figure 10.

In operation, when the slider 25 is to be advanced along the guide 13 in order to increase the boot fastening tension, the lever 101 is grasped and forced to pivot from the position of Figure 10 into the operational position of Figure 7.

During the initial stage of this operation, the tooth 115 will cause, by interfering with the lip 118, the working portion 103 to move backwards against the bias from the spring 104 past the lip 118.

As the fastening tension is being adjusted, the tooth 115 will engage in a corresponding notch 23 on the guide 13. Accordingly, in turning the lever 101, as the distance of the pivot axis provided by the pin 105 from the bottom of the notch 23 engaged by the tooth 115 decreases (due to the slider 25 being moved forward on the guide 13), a backward movement of the working portion 103 into the recess 107 is brought about which is resisted elastically by the action of the spring 104.

This feature enables the length of the lever 101 to be adapted continuously to the distance of the pin 105 from the engaged notch 23, thereby the tooth 115 can be fully and effectively engaged with its corresponding notch at any stage of the lever pivotal movement without simultaneously causing the tooth to interfere with the notch bottom as the distance between said bottom and the pin 105 decreases.

It is for this reason that, with this arrangement, both the lever 101 and the guide 13 may be formed from plastics with no loss in strength and reliability of the fastening device.

Once the desired setting has been achieved, the lever 101 will be moved back toward the non-operational position shown in Figure 10. During the lever pivoting, the working portion 103 will be moved with the tooth 115 past the lip 118, being initially moved backwards on the operation portion on account of the ramp-like configuration of the back 116, thereby the lever 101 can be tucked away into the seat 46 and held stably therein.

A major advantage afforded by the fastening device of this invention is that the effectiveness of the device is unimpaired by the presence of mud, water, or dirt, which makes this device particularly suitable for off-road motorcycling footwear.

In addition, the fastening device just described allows a significantly accurate adjustment of the fastening tension without requiring disengagement of the first and second members from each other. Thanks to the latter feature, the fastening tension may be adjusted while running with one hand.

On the moto-cross boot of this invention, the provision of a guard over the closest binder to the boot sole effectively reduces the likelihood of damaging the corresponding slider, especially when the foot is brought to contact the ground while the vehicle is running. In all cases, any damaged fastening devices can be readily replaced by virtue of the arrangement provided for connecting the second fastening member to the boot upper.

Claims

1. A fastening device for sport shoes, in particular for cross-country motorcycling boots, comprising first and second fastening members (11,13) releasably engageable with each other to hold corresponding parts of the footwear upper clasped together, characterized in that the first fastening member comprises a guide (13) and the second fastening member comprises a slider (25) arranged to be slidable along said guide (13) and being held in releasable engagement therewith, between the slider and the guide there being provided a one-way stop means (22,33) for releasably making the slider unitary with the guide in one of the two sliding directions.

2. A device according to Claim 1, characterized in that at least one slideway (41) is defined on said guide (13) for sliding engagement by a retainer (34) mounted on said slider and shiftable between a working position on said slideway (41), whereat said slider (25) is held hooked to said guide (13), and a non-operational position, whereat said slider

can be removed from said guide.

3. A device according to Claim 2, characterized in that said retainer (34) forms a part of said stop means (33).

4. A device according to either Claim 2 or 3, characterized in that the retainer comprises a pawl (33) adapted to become engaged by snap action with said slideway (41) on said slider (25) being pushed down onto said guide (13).

5. A device according to Claim 4, characterized in that said pawl (33) is urged into said working position by a spring (35), on said pawl and said guide there being defined cooperating surfaces (39,41) shaped to bias said pawl (33) toward said non-operational position as said slider (25) is pushed down onto said guide to engage it by snap action with said guide.

6. A device according to one or more of Claims 2 to 5, characterized in that said guide (13) comprises a web (14) having juxtaposed toothed surfaces (22) each cooperating with a corresponding pawl (33) to provide said stop means and a flange (15) the opposed sides whereof have a slideway (41) defined thereon for each pawl.

7. A device according to one or more of Claims 4 to 6, characterized in that each pawl (33) is provided with operation lugs (37) projecting from said slider (25).

8. A device according to one or more of the preceding claims, characterized in that it comprises a rack mechanism (43) associated with said slider (25) and acting on said guide (13) to shift said slider along said guide.

9. A device according to Claim 8, characterized in that the rack mechanism comprises a lever (43,101) pivoted on the slider (25) and a plurality of notches (23) on said guide (13) adapted to form pivot centers for said lever (43,101).

10. A device according to Claim 9, characterized in that said lever (43,101) is tucked away into a seat (46) on the slider.

11. A device according to Claim 10, characterized in that a spring is arranged to urge said lever into said seat (46).

12. A device according to Claim 9, characterized in that said lever (101) includes an operation portion (102) journalled on said slider (25) and a working portion (103) guided for sliding movement on said operation portion (102) and being retractable thereinto against the bias of an elastic means (104).

13. A device according to Claim 12, characterized in that defined on said slider (25) is a lip formation (118) for cooperation with said working portion (103) to releasably hold by snap action said lever (101) in a non-operational position within a seat (46) on said slider.

14. A device according to one or more of the preceding claims, characterized in that said guide (13) is removably secured and adjustably shiftable on a base (18).

15. A device according to one or more of the preceding claims, characterized in that the slider (25) comprises a mounting bracket (28) for attachment to a corresponding portion of the boot upper, said bracket (28) having at least one hole (29) wherein a snap button (30) is received in a releasable manner.

16. A device according to Claim 15, characterized in that the mounting bracket (28) can be swung relatively to the slider (25).

17. An article of sport footwear incorporating at least one fastening device according to one or more of the preceding claims.

18. A cross-country motorcycling boot incorporating a fastening device according to one or more of the preceding claims.

19. A cross-country motorcycling boot according to Claim 18, including an upper (2) and a sole (3) and a guard (5) attached to the upper at least over the closest fastening device (10) to said sole (3).

FIG. 1

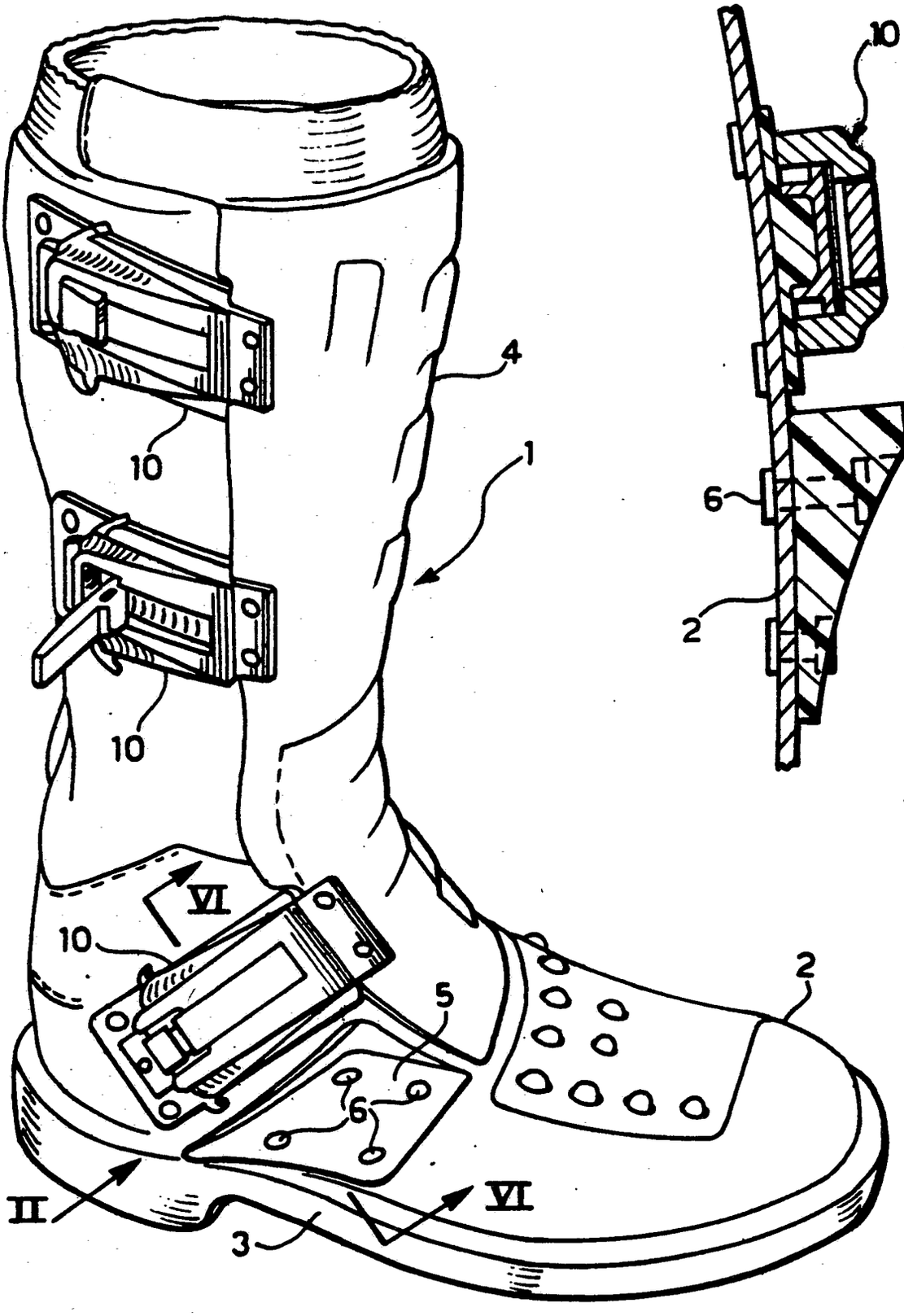

FIG. 6

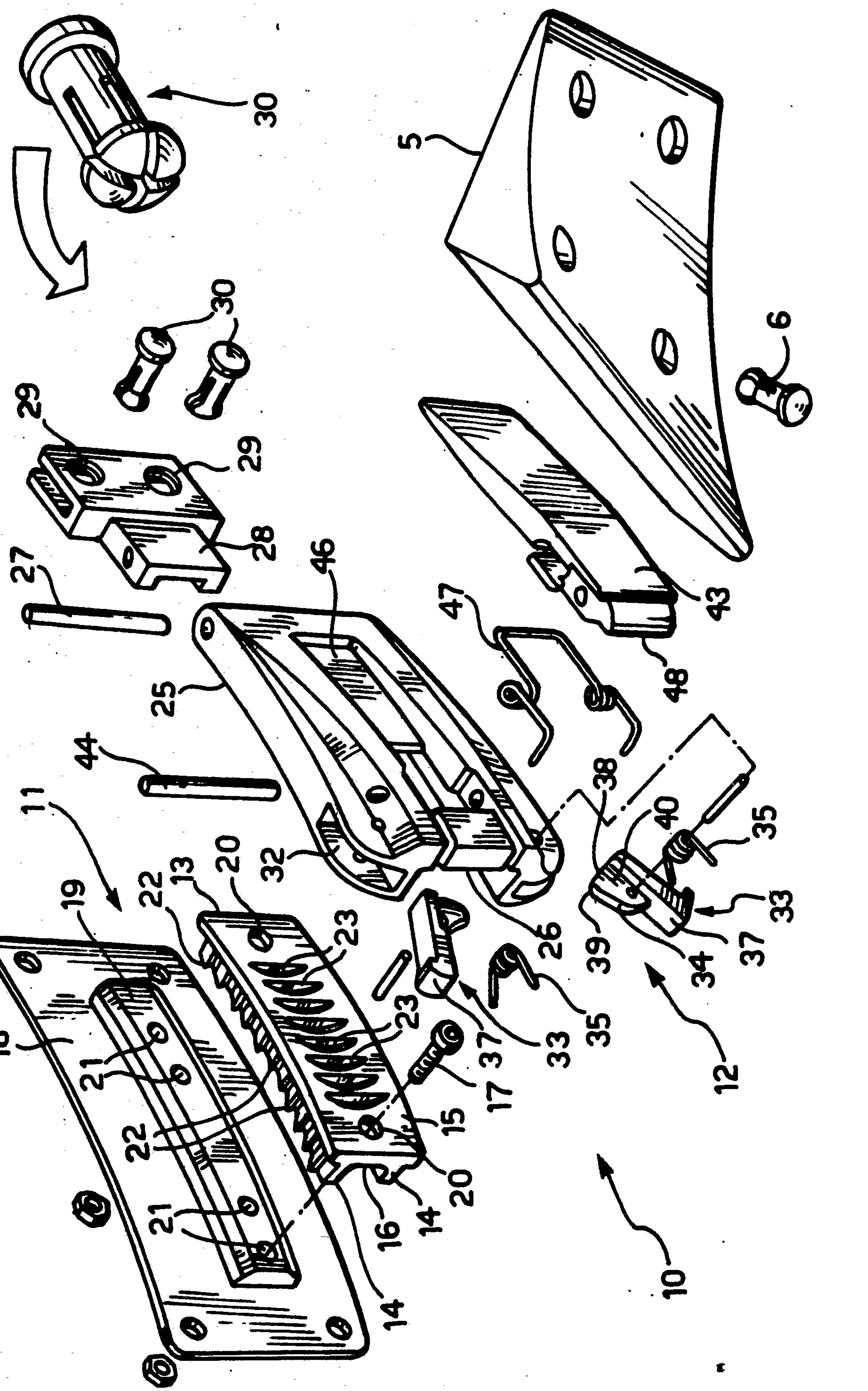
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FIG. 2

FIG. 3

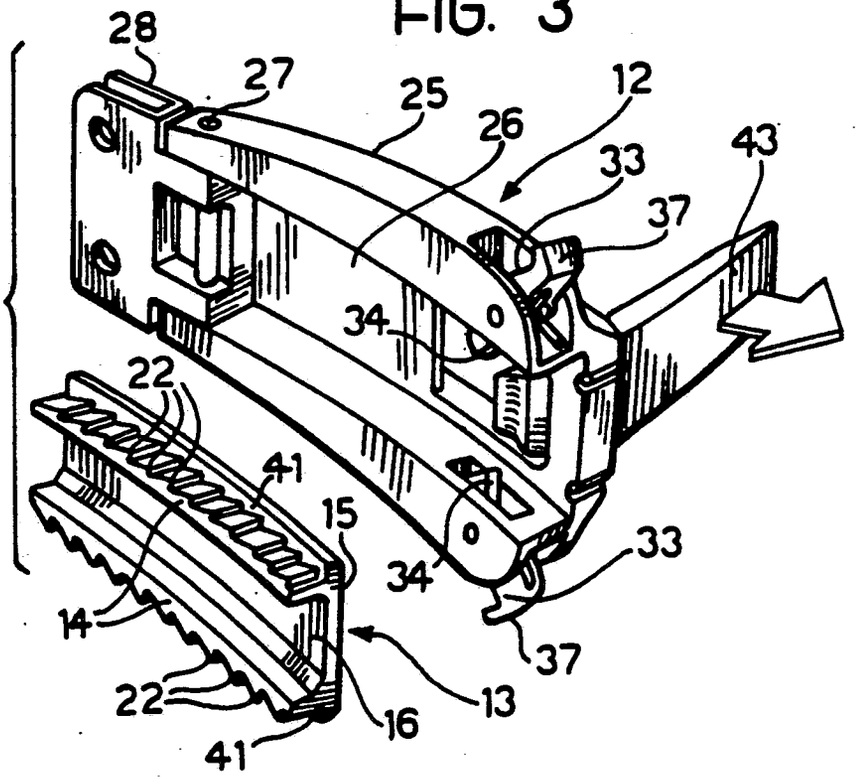


FIG. 4

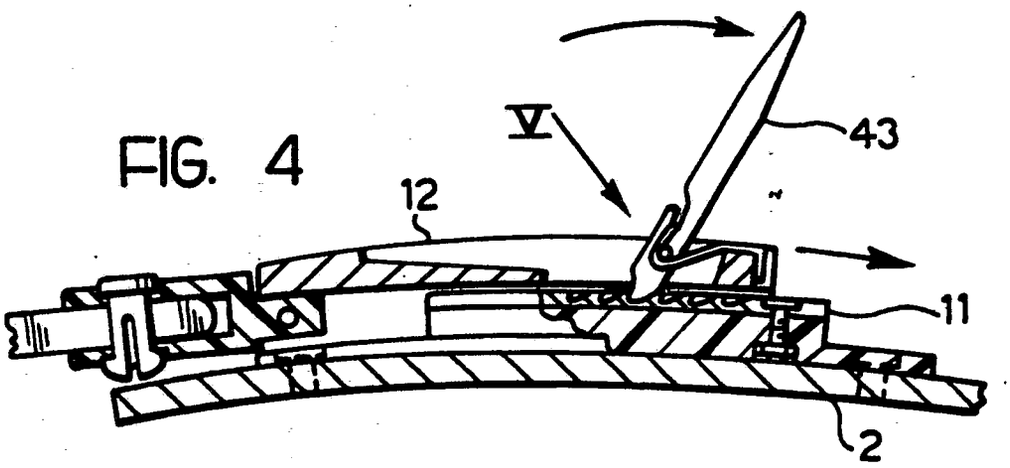


FIG. 5

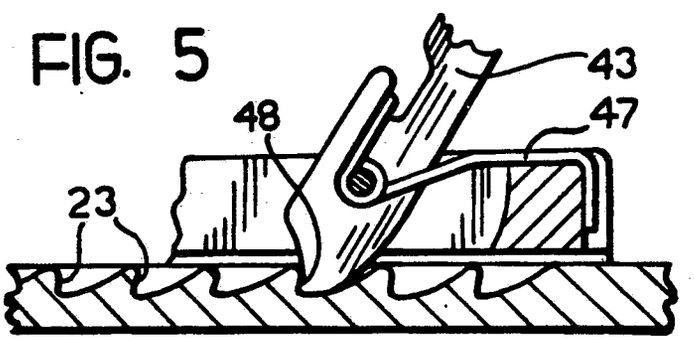


FIG. 7

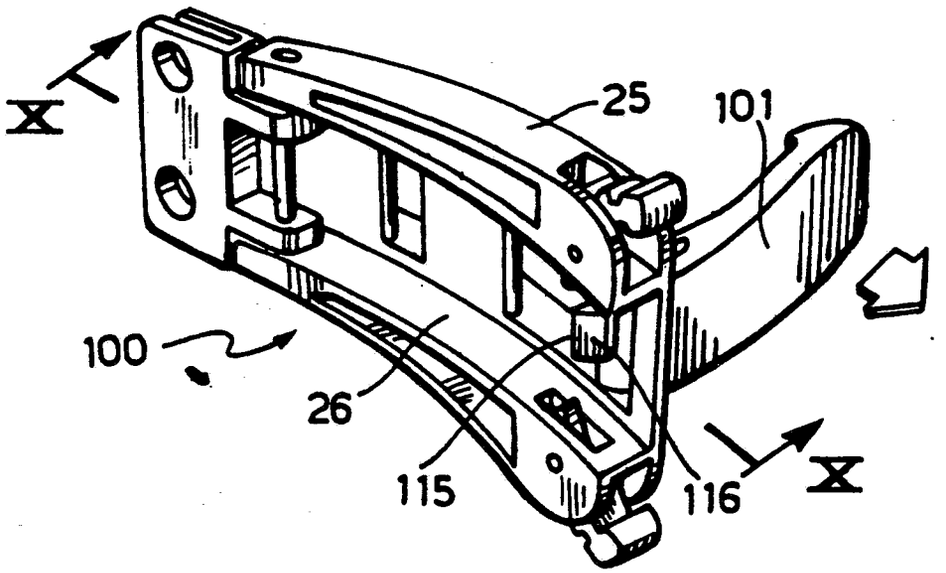
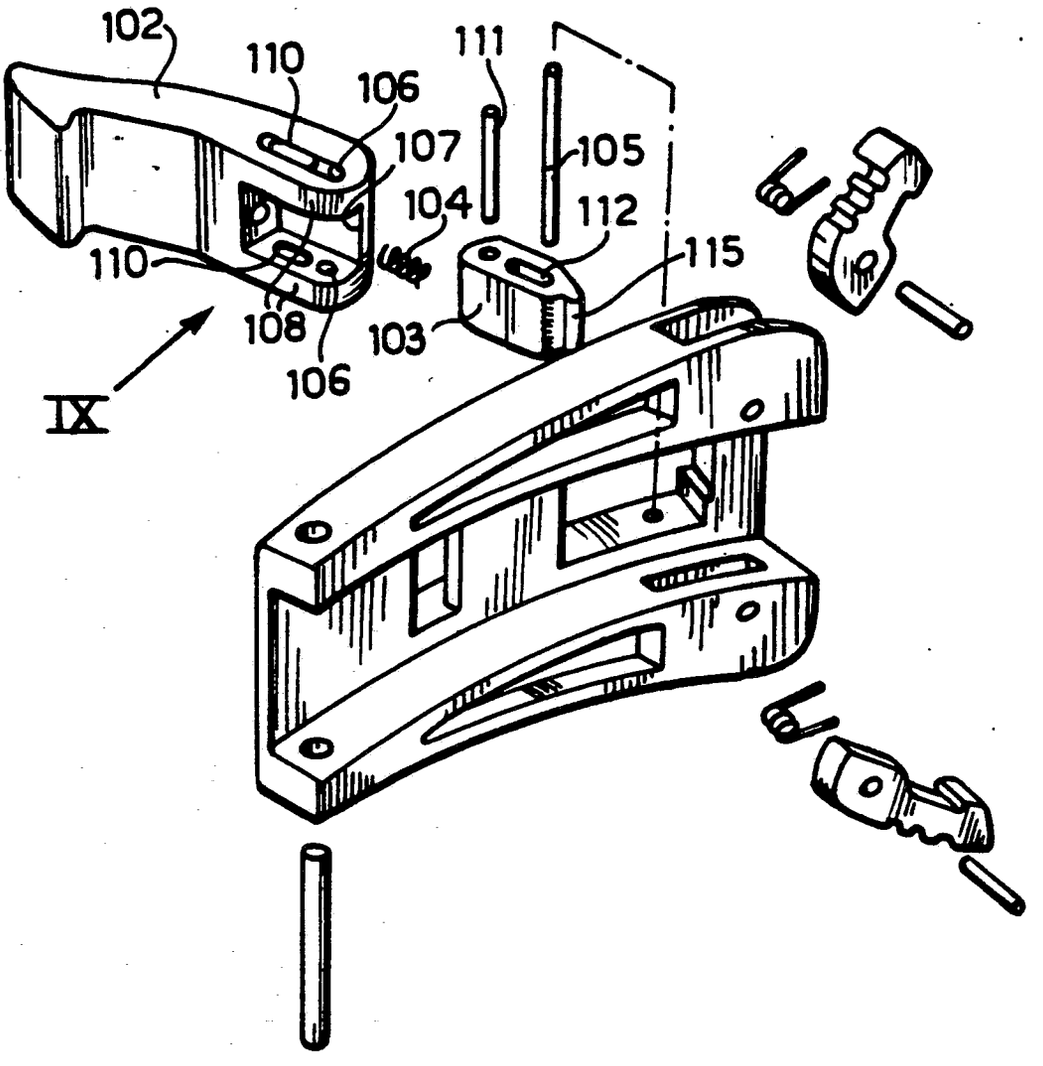

X
25
101
100
26
115
116
X

FIG. 8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106
IX

FIG. 9

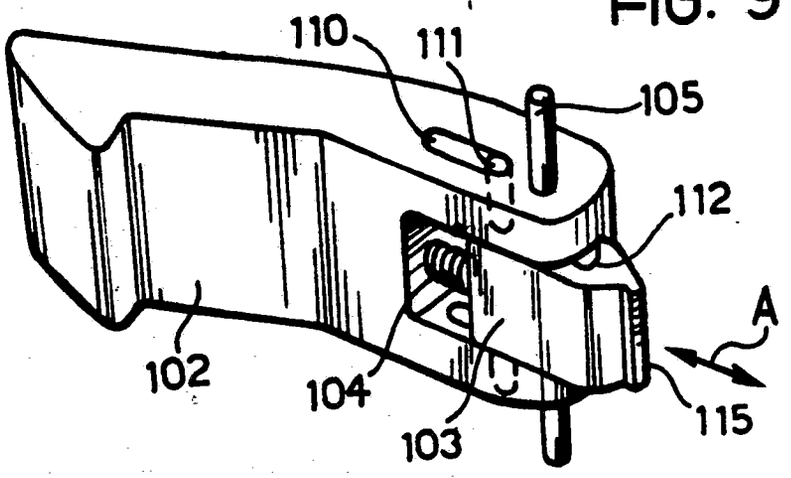

FIG. 10

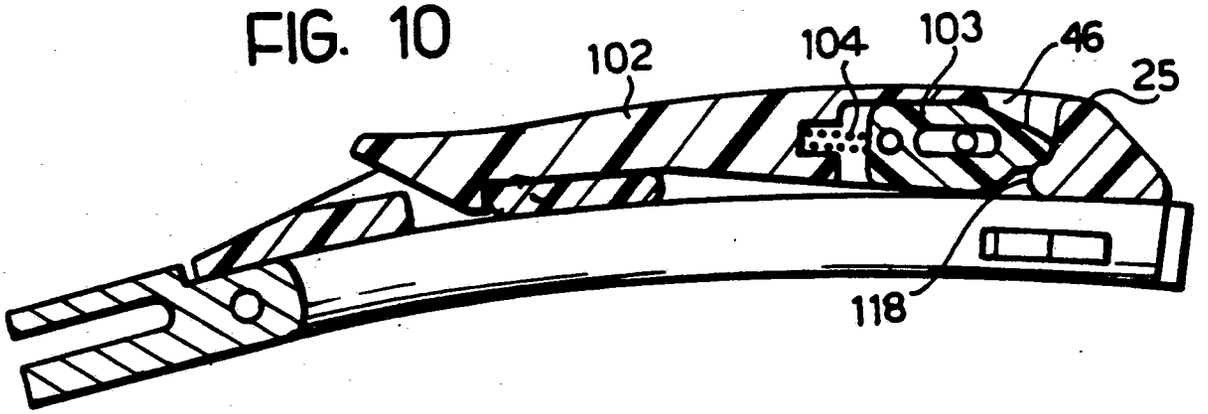

FIG. 11