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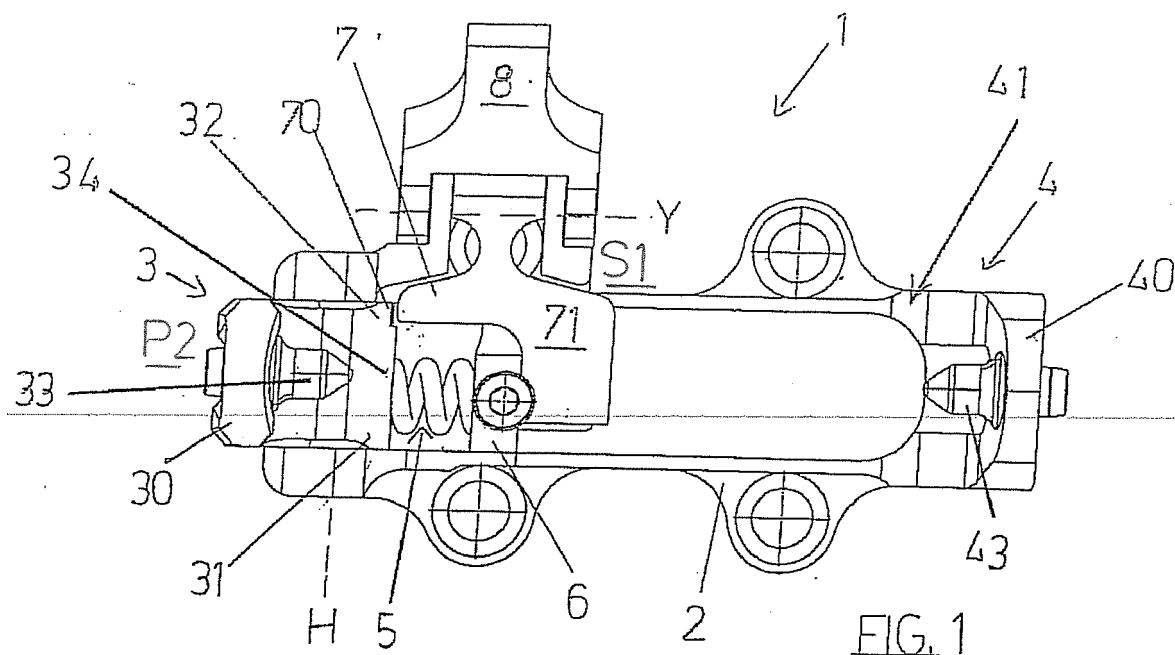
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(54) **A TOE-PIECE FOR AN ALPINE SKI BINDING**

(57) A toe-piece (1) for an Alpine ski binding, comprising: a plate (2) fixable to a ski; a first jaw (3) and a second jaw (4), arranged on the plate (2) in such a way as to be opposite one another and each comprising an external end (30, 40) provided with a pin (33, 43) for engaging a hole of a ski boot; wherein an internal end (41) of the second jaw (4) is solidly constrained to the plate (2); and wherein the first jaw (3) is hinged to the plate (2) at the relative internal end (31) with respect to an axis

(H) so as to be mobile between a first position, in which the first jaw (3) and the second jaw (4) are in an open configuration and the relative pins (33, 43) disengage from the corresponding hole of the ski boot; and a second position in wherein the first jaw (3) and the second jaw (4) are in a closed configuration and the relative pins (33, 43) can engage the corresponding hole of the ski boot.

The toe-piece (1) further comprises first elastic means (5) associated to the first jaw (3).



Description

[0001] The present invention relates to the technical sector of attachments for Alpine skiing, and in particular the invention concerns a toe-piece for an Alpine ski binding.

[0002] A toe-piece for a binding for Alpine skiing of known type comprises: a plate fixable to a ski at the lower surface of the plate, two jaws, each comprising an external end, an internal end and a central body interposed between the external end and the internal end. In particular, the two jaws are arranged above the upper surface of the plate, so as to be facing one another.

[0003] The two jaws are hinged to the plate by means of the relative central body with respect to axes that are parallel to one another. The external end of each jaw bears a pin conformed and arranged so as to insert internally of a hole of an Alpine ski-boot.

[0004] The toe-piece for Alpine skiing further comprises a joint constituted by a first part and a second part hinged to one another ("male" part and "female" part), and each connected to the internal end of a relative jaw. The joint enables the jaw to move from an open configuration into a closed configuration, and vice versa, for engaging or disengaging, with the relative pins, corresponding holes made in a ski boot.

[0005] The toe-piece further comprises a main lever, hinged to the plate according to an axis perpendicular to the hinge axes of the jaws with the plate. An end of the main lever is fork-shaped, for receiving the joint in the recess of the fork.

[0006] The toe-piece further comprises a safety lever, fork-hinged to the main lever on the opposite part with respect to the fork-shaped end. The safety lever is hinged with respect to an axis that is parallel to the hinge axis of the main lever with the plate.

[0007] The toe-piece for Alpine skiing described above has however some drawbacks.

[0008] In fact, the joint of the toe-piece of known type comprises: a large number of components cooperating for functioning of the toe-piece: this involves a very complicated assembly of the toe-piece, as well as difficult cleaning/maintenance/replacement operations of the relative components in case of necessity.

[0009] The final user further encounters a practical disadvantage, as the plurality of components of the toe-piece determine a considerable weight thereof. This is a determining factor, in particular in the ambit of sporting competitions: in this specific sector the market demands ever-lighter toe-pieces.

[0010] The aim of the present invention is to obviate the above-mentioned drawbacks.

[0011] This aim is attained by provided a toe-piece for a binding for Alpine skis according to the contents of claim 1.

[0012] The toe-piece of the invention is advantageously structurally simpler than the known toe-pieces: for this reason there are not only shorter times and lower costs

for assembly and maintenance, but also in terms of overall weight, which is modest. This responds very well indeed to market demands.

[0013] Specific embodiments of the invention will be described in the following description, with the aid of the accompanying tables of drawings, in which:

- figure 1 illustrates a plan view of a toe-piece for an Alpine ski binding according to the invention, in a first embodiment and in a first operating configuration.
- figure 2 is a lateral view of the toe-piece of figure 1;
- figure 3 is a view along section B-B of figure 2;
- figures 4-6 are views alike to the view of figure 1-3 and relate to a second operating configuration of the toe-piece;
- figures 7-9 are views alike to the view of figure 1-3 and relate to a third operating configuration of the toe-piece;
- figures 10, 13, 16 are views alike to figures 1, 4, 7 in a second embodiment of the toe-piece of the invention;
- figures 11 and 14 are respectively sections A-A of figures 10, 13 (rotated by 180 degrees).
- figure 17 is section A-A of figure 16;
- figures 12, 15 and 18 are respectively sections B-B of figures 10, 13, 16;
- figure 19 is a plan view of a toe-piece for an Alpine ski binding according to the invention, in a third possible embodiment and in a relative operating configuration;
- figure 20 is a schematic perspective view of the toe-piece of figure 19;
- figure 21 is a view along section D-D of figure 19, while figure 22 is a view along section E-E of figure 21;
- figure 23 is a plan view of the toe-piece of figure 19 in a second operating configuration thereof;
- figure 24 is a schematic perspective view of the toe-piece of figure 23;
- figure 25 is the view along section F-F of figure 23, while figure 26 is the view along section G-G of figure 25;

- figure 27 is a plant view of the toe-piece of figure 19 in a relative third operating configuration;
- figure 28 is a schematic perspective view of the toe-piece of figure 27;
- figure 29 is the view along section M-M of figure 27, while figure 30 is the view along section N-N of figure 29.

[0014] With reference to the accompanying figures of the drawings, reference numeral (1) denotes a toe-piece for Alpine skiing according to the invention.

[0015] The toe-piece (1) of the invention, in all three possible non-limiting embodiments illustrated in the figures, comprises: a plate (2) fixable to a ski; a first jaw (3) and a second jaw (4), arranged on the plate (2) in such a way as to be opposite one another and each comprising an external end (30, 40) provided with a pin (33, 43) for engaging a hole of a ski boot;

In detail, the toe-piece (1) according to the invention has the internal end (41) of the second jaw (4) solidly constrained to the plate (2), i.e. the second jaw (4) is fixed with respect to the plate (2).

[0016] In the preferred but not exclusive embodiment illustrated in the figures, the toe-piece (1) according to the invention has the second jaw (4) solidly constrained to the plate (2); therefore the second jaw (4) is fixed with respect to the plate (2). In other preferred embodiments, not illustrated, the second jaw (4) might not be in a single piece with the plate but can be rigidly fixed thereto, so that the second jaw (4) is fixed with respect to the plate (2).

[0017] The first jaw (3) is hinged to the plate (2) at the relative internal end (31) with respect to an axis (H) that is perpendicular to the vertical plane containing the axes of the pins. In particular, the first jaw (3) is mobile between a first position (P1), wherein the first jaw (3) and the second jaw are in an open configuration and the relative pins (33, 43) disengage from the corresponding hole of the ski boot; and a second position (P2) wherein the first jaw (3) and the second jaw are in a closed configuration and the relative pins (33, 43) can engage the corresponding hole of the ski boot.

[0018] According to the invention, the fact that the second jaw (4) is solidly fixed to the plate (2) (differently to the prior art, where it was hinged to the plate) advantageously enables a limited number of components for the toe-piece (1), which also has a particularly light weight with respect to known toe-pieces. This is also due to the fact that the toe-piece (1) is lacking the joint present in the prior art mentioned in the preamble.

[0019] The toe-piece (1) of the invention, in all three possible embodiments illustrated, also comprises first elastic means (5), associated to the first jaw (3), in particular the toe-piece (1) comprises an abutting element (6) constrained to the plate (2) and the first elastic means (5) are interposed between the abutting element (6) and

the internal end (31) of the first jaw (3).

[0020] According to the invention, in all three possible illustrative and non-limiting embodiments, illustrated in the accompanying figures, the toe-piece (1) further comprises stabilising means (70, 71, 72, 9, 90, 11) configured so as to assume, when the first jaw (3) is placed in the second position (P2), i.e. in the closed configuration thereof: a first configuration (figures 1-3, 10-12, 23-26) in which they stabilise the first jaw (3) in the relative closed configuration so that the pins (33, 43) of the first jaw (3) and the second jaw (4) can removably engage the corresponding hole of the ski boot; and so as to assume a second configuration (S2) (figures 4-6, 13-15, 27-30), in which they stabilise the first jaw (3) in the relative closed configuration so that the pins (33, 43) of the first jaw (3) and the second jaw (4) can unremovably engage the corresponding hole of the ski boot (as will become clearer in the following).

[0021] In a first embodiment of the invention, illustrated in figures 1-9, the stabilising means (70, 71, 72) comprise: an undercut (70), fashioned at an edge of the first portion (32) of the internal end (31) of the first jaw (3); and a slide (71). The slide (71), comprises an abutting portion (7) which, when the slide (71) is in the relative first configuration (S1) of the stabilising means and the first jaw (3) is in the relative closed configuration (second position (P2)), is arranged at the undercut (70) of the first jaw (3), enabling oscillation thereof about the hinge axis (H) with the plate (2) (therefore without contacting the internal end (31) of the first jaw (3)) (see in particular figures 1-3).

[0022] For example, the slide (71) is mobile along a parallel direction to the hinge axis of the first jaw (3) with the plate (2) (see in particular figures 1, 4, 7).

[0023] This configuration (first configuration (S1) of the stabilising means) is predisposed when the skier is about to commence a descent: in fact, since the oscillation of the first jaw (3) is enabled, as mentioned above, in opposition to the first elastic means (5), the pins (33, 43) of the first jaw (3) and the second jaw (4) are able to disengage the corresponding holes of the ski boot in a case of stress (for example if the skier falls).

[0024] On the other hand, when the slide (71) is in the relative second configuration (S2) of the stabilising means and the first jaw (3) is in the relative closed configuration (second position (P2)), the abutting portion (7) of the slide (71) contacts a second portion (34) of the internal end (31) of the first jaw (3), lacking the undercut (70), blocking oscillation thereof about the hinge axis (H) with the plate (2) (see in particular figure 4).

[0025] This configuration (second configuration (S2) of the stabilising means) is predisposed when the skier is about to commence an uphill tract: in fact, in this situation, the skier is constrained to the ski only with the front part of the ski boot, fixed to the toe-piece (1) so as to enable raising of the heel from the ski for carrying out the uphill climb. Therefore, the pins (33, 43) of the first jaw (3) and the second jaw (4) must in no case disengage from the corresponding holes of the ski boots.

[0026] Further, in the first embodiment of the toe-piece (1) of figures 1-9, the stabilising means (70, 71, 72) comprise second elastic means (72), associated to the slide (71) (so as to maintain it in the relative second configuration) (visible in figures 3, 6, 9).

[0027] In particular, and still with reference to figures 1-9, the toe-piece (1) can further comprise an activating lever (8), hinged to the slide (71) according to an axis (Y) that is perpendicular to the hinge axis (H) of the first jaw (3) with the plate (2), and mobile between a raised position (see for example figures 1 and 2) in which the slide (71) is in the relative first configuration (S1) of the stabilising means and in a lowered position (figures 4, 5) in which the slide (71) is brought into the relative second configuration (S2) of the stabilising means, and vice versa.

[0028] Therefore, by acting on the activating lever (8) the skier can predispose the toe-piece (1) for an ascent or a descent.

[0029] When the first jaw (3) is in the first position (P1), i.e. the first jaw (3) and the second jaw (4) are in the relative open configuration (see figures 7-9), the activating lever (8) is in the relative raised position, but the abutting portion (7) of the slide (71) does not interfere in any way with the undercut (70) of the internal end (31) of the first jaw (3), because of the configuration of the first jaw (3) (see in particular figure 7). In this case the first elastic means (5) keep the first jaw (3) in the relative first position.

[0030] In the first embodiment of the toe-piece (1) according to the invention, of figures 1-9, the abutting element (6) is solidly, i.e. rigidly constrained to the plate (2).

[0031] In a second embodiment of the invention, illustrated in figures 10-18, the stabilising means (9, 90) comprise a blocking lever (90) flanked to the first jaw (3) and hinged to the plate (2) according to an axis (Z) parallel to the hinge axis (H) of the first jaw (3) with the plate (2). The blocking lever (90) comprises an appendage (901) arranged and conformed so that when the blocking lever (90) is in the relative first configuration (S1) of the stabilising means and the first jaw (3) is in the relative closed configuration (second position (P2)), the appendage (901) does not interfere with the internal end (31) of the first jaw (3), enabling oscillation of the first jaw (3) about the hinge axis (H) with the plate (2) about the hinge axis (H) with the plate (2) (see figure 11).

[0032] This configuration (first configuration (S1) of the stabilising means) is predisposed when the skier is about to commence a descent, as it enables the pins (33, 34), in a case of excessive stress beyond a predetermined amount, to disengage the holes of the relative ski boot (i.e. the blocking lever (90) is moved into a position in which the relative appendage (901) does not interfere with the internal end (31) of the first jaw (3)).

[0033] Further, when the blocking lever (90) is in the relative second configuration (S2) of the stabilising means and the first jaw (3) is in the relative closed configuration (second position (P2)), the appendage (901) interferes with the internal end (31) of the first jaw (3),

blocking oscillation of the first jaw (3) about the hinge axis (H) with the plate (2) about the hinge axis (H) with the plate (2) (see the detail of figure 14).

[0034] This configuration (second configuration (S2) of the stabilising means) is predisposed when the skier has to make an ascent, and the pins (33, 34) of the first jaw (3) and the second jaw (4) must not disengage the holes of the ski boots (as explained for the first embodiment described in the foregoing).

[0035] For example, when the blocking lever (90) is in the relative second configuration and the first jaw (3) is in the relative closed configuration, the appendage (901) is arranged between the internal end (31) of the first jaw (3) and an abutting element (250), fixed to the plate (2), contacting both of them (see figure 14).

[0036] As mentioned in the foregoing, the blocking lever (90) is further mobile in a third configuration so that when the first jaw (3) is in the relative open configuration (first position (P1)), the appendage (901) does not interfere with the internal end (31) of the first jaw (17) (and therefore the pins (33, 34) do not engage the holes of the ski boots) (see figures 16, 17).

[0037] In the above-described embodiment, the stabilising means (9, 90) can further comprise a protuberance (9), solidly constrained to the first jaw (3); and the blocking lever (90) can comprise an edge (B) provided with at least a seating (91, 92) (see figure 17 in detail). In the embodiment of the accompanying figures two seatings are provided, a first seating (91) and a second seating (92). In the following reference will be made to this example, even though an expert in the sector will be able to obtain the same technical effect with a single seating.

[0038] In particular, when the blocking lever (90) is in the relative first configuration (first configuration (S1) of the stabilising means) and the first jaw (3) is in the relative closed configuration (second position (P2)) (descent configuration), the first seating (91) is engaged by the protuberance (9): thus the blocking lever (90) is stabilised, without however obstructing the oscillation of the first jaw (3) about the hinge axis (H) with the plate (2) (see figures 10-12) when stress on the plate overcomes the action of the elastic means.

[0039] When, on the other hand, the blocking lever (90) is in the relative second configuration (second configuration (S2) of the stabilising means) and the first jaw (3) is in the relative closed configuration (second position (P2)) (ascent configuration), the second seating (92) is engaged by the protuberance (9), stabilising the position of the blocking lever (90). In detail, the blocking of the first jaw (3) is optimised, as it can therefore not oscillate about the hinge axis (H) with the plate (2) (see figures 13-15).

[0040] Clearly, when the blocking lever (90) is in the relative third configuration and the first jaw (3) is in the relative open position, the protuberance (9) does not engage the first seating (91) or the second seating (92), but can in any case interfere with the edge (B) for stabilising, in this case too, the blocking lever (90) (see figures

16-18). The blocking lever (90) is predisposed in the third configuration when it is necessary to "open" the toe-piece (1), i.e. disengage the pins (33, 34) from the corresponding holes of the ski boot.

[0041] In the embodiment of figures 10-18, the internal end (31) of the first jaw (3) can have a semi-circular section (clearly visible in figures 12, 15, 18). In this case the toe-piece (1) further comprises a connecting arm (95) which: exhibits a first end (93) coupled to the internal end (31) of the first jaw (3) and complementary thereto so as to enable movement thereof; and exhibits a second end (94) which bears the first elastic means (5).

[0042] In particular, the abutting element (6) forms a housing (60) for receiving internally thereof the first elastic means (5) and the second end (94) of the connecting arm (95), and is hinged to the plate (2) according to an axis parallel to the hinge axis (H) of the first jaw (3) with the plate (2).

[0043] In this second embodiment, therefore, the skier acts directly on the blocking lever (90) for predisposing the toe-piece (1) for an ascent or for a descent, or to open it.

[0044] In this third embodiment illustrated in figures from 19 to 30, the toe-piece (1) of the invention is also such that the internal end (31) of the first jaw (3) has a semi-circular section (visible in figures, 21, 25, 29). In this case the toe-piece (1) further comprises a connecting arm (95) which: exhibits a first end (93) coupled to the internal end (31) of the first jaw (3) and complementary thereto so as to enable movement thereof; and exhibits a second end (94) which bears the first elastic means (5).

[0045] In particular, the abutting element (6) forms a housing (60) for receiving internally thereof the first elastic means (5) and the second end (94) of the connecting arm (95), and is hinged to the plate (2) according to an axis parallel to the hinge axis (H) of the first jaw (3) with the plate (2).

[0046] In this way, when the first jaw (3) rotates with respect to the plate (2) about the hinge axis (H), the abutting element (6) also rotates about the hinge axis thereof, in opposition to the action of the first elastic means (5).

[0047] For example, observe figure 21 where the first jaw (3) is in the first position (P1) (open configuration of the jaws) while the abutting element (6) is rotated upwards: this configuration is made possible by the semi-circular shape of the internal end (31) of the first jaw (3) coupled to the first end (93) of the connecting arm (95).

[0048] The action of the first elastic means (5), which push the connecting arm (95) towards the internal end (31) of the first jaw (3) keeps this configuration stable.

[0049] In figures 25 and 29, the second position (P2) of the first jaw (3) is illustrated (closed configuration of the jaws, for engaging to the ski boot) obtained following a rotation of the first jaw (3) with respect to the plate (2) about the hinge axis (H) thereof, in an anticlockwise rotation direction seen in figures 25 and 26 with respect to figure 21, where the abutting element (6) is rotated towards the base (clockwise direction) about the hinge axis

thereof. The reciprocal rotation between the first jaw (3) and the abutting element (6) is made possible by the semi-circular shape of the internal end (31) of the first jaw (3), which is coupled complementarily and movably, as mentioned above, to the first end (93) of the connecting arm (95).

[0050] In this case too, the action of the first elastic means (5), which push the connecting arm (95) towards the internal end (31) of the first jaw (3) keeps this configuration stable.

[0051] In the third possible embodiment, in reference to figures from 19 to 30, the stabilising means (11) comprise a manoeuvring lever (110), hinged to the plate (2) so as to be arranged in a plane parallel to the hinge axis (H) of the first jaw (3), i.e. the manoeuvring lever (110) is hinged to the plate (2) along a hinge axis (W) that is parallel to the movement plane of the first jaw (3) and is perpendicular to the plate (2).

[0052] The manoeuvring lever (110) is hinged to the plate (2) in such a way as to have a first end (111) facing towards inside the plate (2) and a second end (112) facing externally and frontally with respect to the plate (2) when the plate (2) is fixed to the ski.

[0053] The stabilising means (11), in this third embodiment of the toe-piece (1), further comprise a seating (113), realised in the first end (93) of the connecting arm (95) with the manoeuvring lever (110) which is arranged and hinged to the plate (2) in such a way that the relative first end (111) is arranged and inserted internally of the seating (113).

[0054] In this third embodiment, the stabilising means (11) further comprise an appendage (118), in a single piece with the plate (2) and projecting frontally of the plate (2) below the manoeuvring lever, and a command lever (115) which is hinged to the second end (112) of the manoeuvring lever (110) for stabilising and blocking the position of the manoeuvring lever (110) so as to obtain the second configuration (S2) of the stabilising means.

[0055] The command lever (115) is hinged to the manoeuvring lever (110) so as to exhibit a first external arm (116) and a second internal arm (117) which at a lower end thereof bears a rolling element (119), such as for example a small wheel, predisposed to roll on the appendage (118) when the command lever (115) is rotated with respect to the manoeuvring lever (110),

[0056] The appendage (118) has a housing (120) having a complementary shape to the rolling element (119) realised in a position such that when the rolling element (119) inserts in the housing (120), the rotation of the command lever (115) is blocked with respect to the manoeuvring lever (110) and consequently the position of the manoeuvring lever (110) is stabilised and blocked and the position of the first jaw (3) is blocked (second configuration (S2) of the stabilising means, see figure 30).

[0057] In the third embodiment of the toe-piece (1), simply by acting on the command lever (115) it is possible:

- to open and close the toe-piece, i.e. bring the first jaw (3) into both the first position (P1), an open configuration of the jaws (figures from 19 to 22), and bring the first jaw (3) into the second position (P2), the closed configuration of the jaws (figures from 23 to 30),
- once the toe-piece is closed, i.e. once the first jaw (3) has been brought into the second position (P2) (closed configuration of the jaws), to bring the stabilising means into the second configuration (S2), in which the first jaw (3) is removably blocked and stabilised (ascent position) (figures from 27 to 30).

[0058] In fact, by pushing the first external arm (116) of the command lever (115) downwards, i.e. towards the ski, the rolling element (119) is rolled along the appendage (120) towards the plate (2), forcing the manoeuvring lever (110) to rotate about the hinge axis thereof (W) so that the first end (111), situated in the seating (113) of the first end (93) of the connecting arm (95), is raised (see figure 22).

[0059] This causes the raising of the internal end (31) of the first jaw (3) and therefore the rotation of the first jaw (3) into the first position (P1) thereof, and also the rotation of the abutting element (6).

[0060] The first elastic means (5) stabilise this configuration (figure 21).

[0061] Instead, by pushing the first external arm (116) of the command lever (115) upwards, the rolling element (119) is rolled along the appendage (118) distancing it from the plate (2), forcing the manoeuvring lever (110) to rotate about the hinge axis thereof (W) so that the first end (111), situated in the seating (113) of the first end (93) of the connecting arm (95), is lowered (see figure 26).

[0062] This causes the lowering of the internal end (31) of the first jaw (3) and therefore the rotation of the first jaw (3) into the second position (P2) thereof (closed configuration of the jaws, the pins engage in the holes of the ski boot) and also the rotation of the abutting element (6).

[0063] The first elastic means (5) stabilise this configuration (figures 25 and 29).

[0064] In this configuration (see for example figure 26), the rolling element (119) is not yet inserted in the housing (120) present in the appendage (118), and the stabilising means (11) are in the first configuration (S1), i.e. they stabilise the first jaw (3) so that the pins removably engage the holes of the ski boot, for the descent position, enabling the disengaging of the ski boot if the skier should fall.

[0065] By further pulling the second arm (116) of the command lever (115) upwards (figure 30), the command lever (115) is rotated with respect to the manoeuvring lever (110) so that the rolling element (119) further distances from the plate (2) up to when it inserts into the housing (120), blocking any other rotation of the command lever (115).

[0066] In this configuration (see for example figures

28, 30), the rolling element (119) is inserted in the housing (120) present in the appendage (118), and the stabilising means (11) are in the second configuration (S2), i.e. they stabilise and block the position of the first jaw (3) so that the pins unremovably engage the holes of the ski boot, for the ascent position, blocking any oscillation and/or rotation of the first jaw (3) with respect to the plate (2).

[0067] To return the toe-piece into the descent configuration, it will be sufficient to push the first external arm (116) of the command lever (115) downwards, forcing the command lever (115) to rotate with respect to the manoeuvring lever (110), up to causing the rolling element (119) to exit the housing (120), while in order to open the toe-piece, i.e. disengage the ski boot, it will be sufficient to further push the first external arm (116) of the command lever (115) downwards, causing the manoeuvring lever (110) also to rotate up until the first end (111) of the manoeuvring lever (110) is raised, lifting also the internal end (31) of the first jaw (3), which will rotate to move into the second position (P2) thereof (open configuration of the jaws).

Claims

1. A toe-piece (1) for an Alpine ski binding, comprising: a plate (2) fixable to a ski; a first jaw (3) and a second jaw (4), arranged on the plate (2) in such a way as to be opposite one another and each comprising an external end (30, 40) provided with a pin (33, 43) for engaging a hole of a ski boot;
characterised in that an internal end (41) of the second jaw (4) is solidly constrained to the plate (2) so that the second jaw (4) is fixed with respect to the plate (2);
and in that the first jaw (3) is hinged to the plate (2) at the relative internal end (31) with respect to an axis (H), so as to be mobile between a first position (P1), in which the first jaw (3) and the second jaw (4) are in an open configuration and the relative pins (33, 43) disengage from the corresponding hole of the ski boot; and a second position (P2) wherein the first jaw (3) and the second jaw (4) are in a closed configuration and the relative pins (33, 43) can engage the corresponding hole of the ski boot; **and in that** it comprises first elastic means (5) associated to the first jaw (3).
2. The toe-piece (1) of the preceding claim, further comprising an abutting element (6) constrained to the plate (2); the first elastic means (5) being interposed between the abutting element (6) and the internal end (31) of the first jaw (3).
3. The toe-piece (1) of the preceding claim, wherein the internal end (31) of the first jaw (3) has a semi-circular section; the toe-piece further comprises a connecting arm (95) which: exhibits a first end (93)

- coupled to the internal end (31) of the first jaw (3) and complementary thereto so as to enable movement thereof; and exhibits a second end (94) which bears the first elastic means (5); and wherein the abutting element (6): is hinged to the plate (2) according to an axis parallel to the hinge axis (H) of the first jaw (3) with the plate (2); forms a housing (60) for receiving internally thereof the first elastic means (5) and the second end (94) of the connecting arm (95).
4. The toe-piece (1) of claim 2 or 3, further comprising stabilising means (70, 71, 72, 9, 90, 11) configured so as to assume: a first configuration (S1) in which they stabilise the first jaw (3) in the relative closed configuration so that the pins (33, 43) of the first jaw (3) and the second jaw (4) can removably engage the corresponding hole of the ski boot; and so as to assume a second configuration (S2), in which they stabilise the first jaw (3) in the relative closed configuration so that the pins (33, 43) of the first jaw (3) and the second jaw (4) can unremovably engage the corresponding hole of the ski boot.
 5. The toe-piece (1) of claims 2 and 4, wherein the stabilising means (70, 71, 72) comprise: an undercut (70) made at an edge of a first portion (32) of the internal end (31) of the first jaw (3); and a slide (71), comprising an abutting portion (7) which, when the slide (71) is in the relative first configuration and the first jaw (3) is in the relative closed configuration, is arranged at the undercut (70) of the first jaw (3), enabling oscillation thereof about the hinge axis (H) with the plate (2); and wherein when the slide (71) is in the relative second configuration and the first jaw (3) is in the relative closed configuration, it contacts a second portion (34) of the internal end (31) of the first jaw (3), lacking the undercut (70), blocking oscillation thereof about the hinge axis (H) with the plate (2); the stabilising means (70, 71, 72) further comprise second elastic means (72), associated to the slide (71).
 6. The toe-piece (1) of the preceding claim, wherein the slide (71) is mobile along a parallel direction to the hinge axis of the first jaw (3) with the plate (2).
 7. The toe-piece (1) of claim 5 or 6, further comprising an activating lever (8), hinged to the slide (71) according to an axis (Y) that is perpendicular to the hinge axis (H) of the first jaw (3) with the plate (2), and mobile between a raised position in which the slide (71) is in the relative first configuration and a lowered position in which the slide (71) is brought into the relative second configuration, and vice versa.
 8. The toe-piece (1) of claims 3 and 4, wherein the stabilising means (9, 90) comprise: a blocking lever (90), flanked to the first jaw (3), hinged to the plate (2) about an axis (Z) parallel to the hinge axis (H) of the first jaw (3) with the plate (2), and comprising an appendage (901) arranged and conformed so that when the blocking lever (90) is in the relative first configuration and the first jaw (3) is in the relative closed configuration, the appendage (901) enables oscillation of the first jaw (3) about the hinge axis (H) with the plate (2); and wherein when the blocking lever (90) is in the relative second configuration and the first jaw (3) is in the relative closed configuration, the appendage (901) interferes with the internal end (31) of the first jaw (3), blocking the oscillation of the first jaw (3) about the hinge axis (H) with the plate (2).
 9. The toe-piece (1) of the preceding claim, wherein the stabilising means (9, 90) further comprise a protuberance (9), solidly constrained to the first jaw (3); and wherein the blocking lever (90) comprises an edge (B) provided with at least a seating (91, 92); wherein when the blocking lever (90) is in the relative first configuration and the first jaw (3) is in the relative closed configuration, the seating (91, 92) is engaged by the protuberance (9) and stabilises the blocking lever (90), enabling oscillation of the first jaw (3) about the hinge axis (H) with the plate (2); and when the blocking lever (90) is in the relative second configuration and the first jaw (3) is in the relative closed configuration, the seating (91, 92) is engaged by the protuberance (9) and stabilises the blocking lever (90), contributing to block the oscillation of the first jaw (3) about the hinge axis (H) with the plate (2).
 10. The toe-piece (1) of the preceding claim, wherein the blocking lever (90) is further mobile in a third configuration so that when the first jaw (3) is in the relative open position, the protuberance (9) does not engage the seating (91, 92) and the appendage (901) does not interfere with the internal end (31) of the first jaw (3).
 11. The toe-piece (1) of claim 3 and 4, wherein the stabilising means (11) comprise:
 - a manoeuvring lever (110), hinged to the plate (2) so as to be arranged in a plane parallel to the hinge axis (H) of the first jaw (3), i.e. the manoeuvring lever (110) is hinged to the plate (2) along a hinge axis (W) that is parallel to the movement plane of the first jaw (3) and is perpendicular to the plate (2), the manoeuvring lever (110) being hinged to the plate (2) in such a way as to have a first end (111) facing internally of the plate (2) and a second end (112) facing externally and frontally with respect to the plate (2) when the plate (2) is fixed to the ski;

a seating (113), realised in the first end (93) of the connecting arm (95), with the manoeuvring lever (110) which is arranged and hinged to the plate (2) in such a way that the relative first end (111) is arranged and inserted internally of the seating (113);
and a command lever (115) which is hinged to the second end (112) of the manoeuvring lever (110) for stabilising and blocking the position of the manoeuvring lever (110) so as to obtain the second configuration (S2) of the stabilising means.

12. The toe-piece (1) of the preceding claim, wherein the stabilising means (11) further comprise an appendage (118), in a single body with the plate (2) and projecting frontally from the plate (2) below the manoeuvring lever (110), with the command lever (115) hinged to the manoeuvring lever (110) so as to exhibit a first external arm (116) and a second internal arm (117) which at a lower end thereof bears a rolling element (119) predisposed to roll on the appendage (118) when the command lever (115) is rotated with respect to the manoeuvring lever (110), and wherein the appendage (118) has a housing (120) having a complementary shape to the rolling element (119) realised in a position such that, when the rolling element (119) inserts in the housing (120), the rotation of the command lever (115) is blocked with respect to the manoeuvring lever (110) and consequently the position of the manoeuvring lever (110) and the position of the first jaw (3) are stabilised and blocked to obtain the second configuration (S2) of the stabilising means.

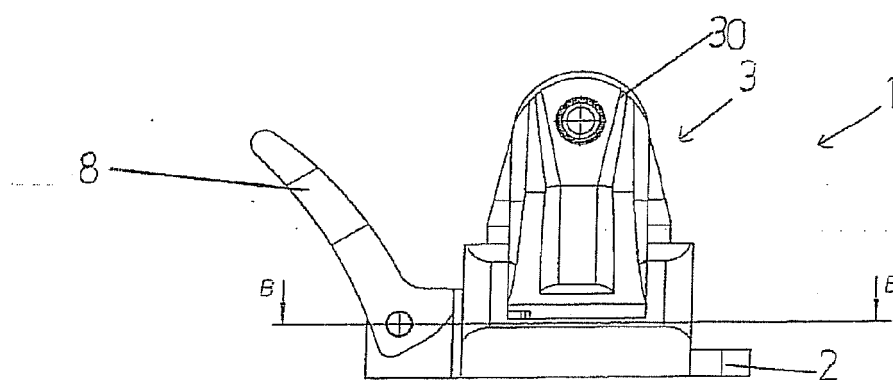
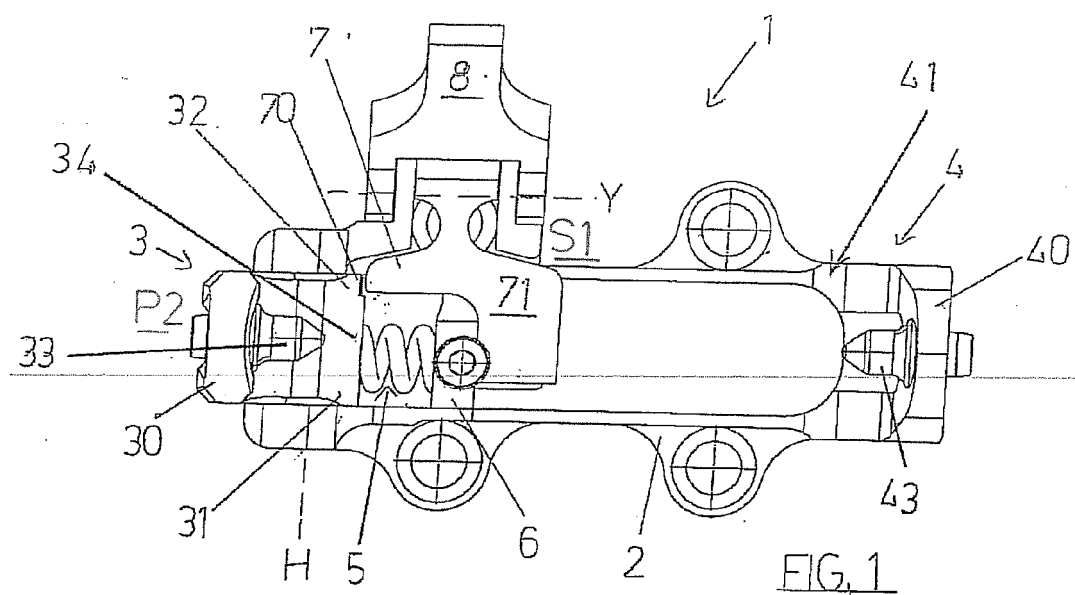


FIG. 2

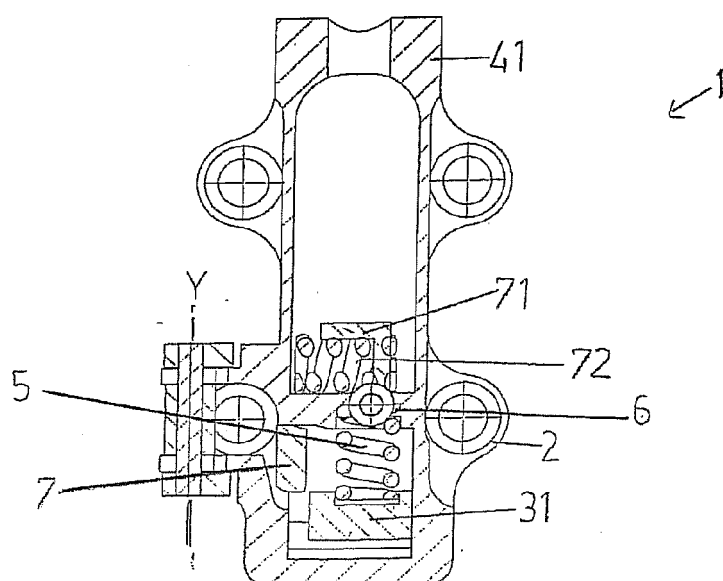
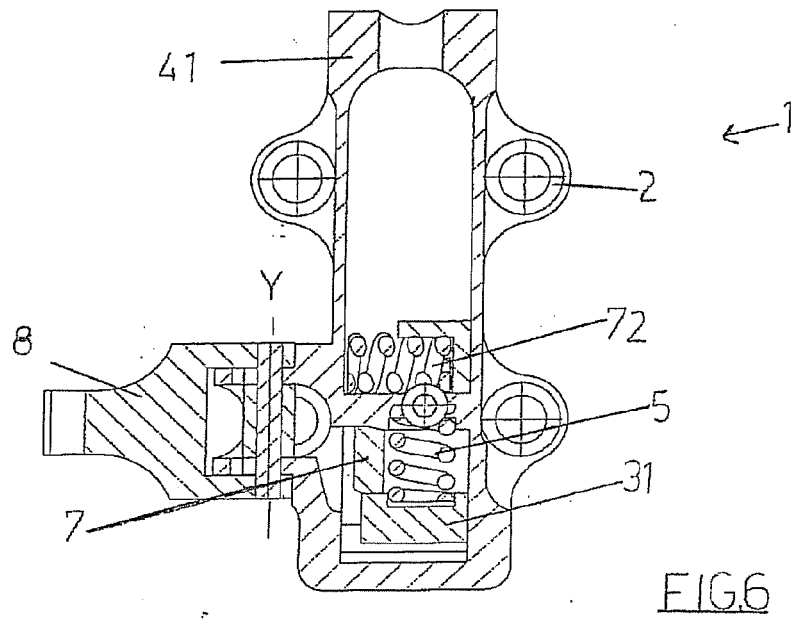
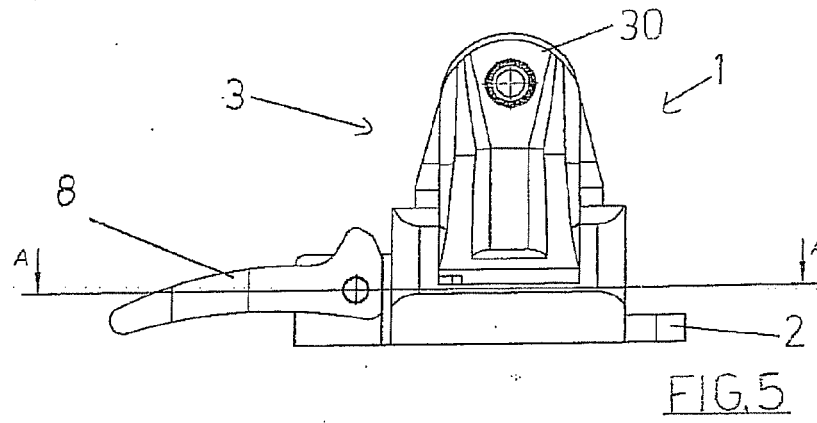
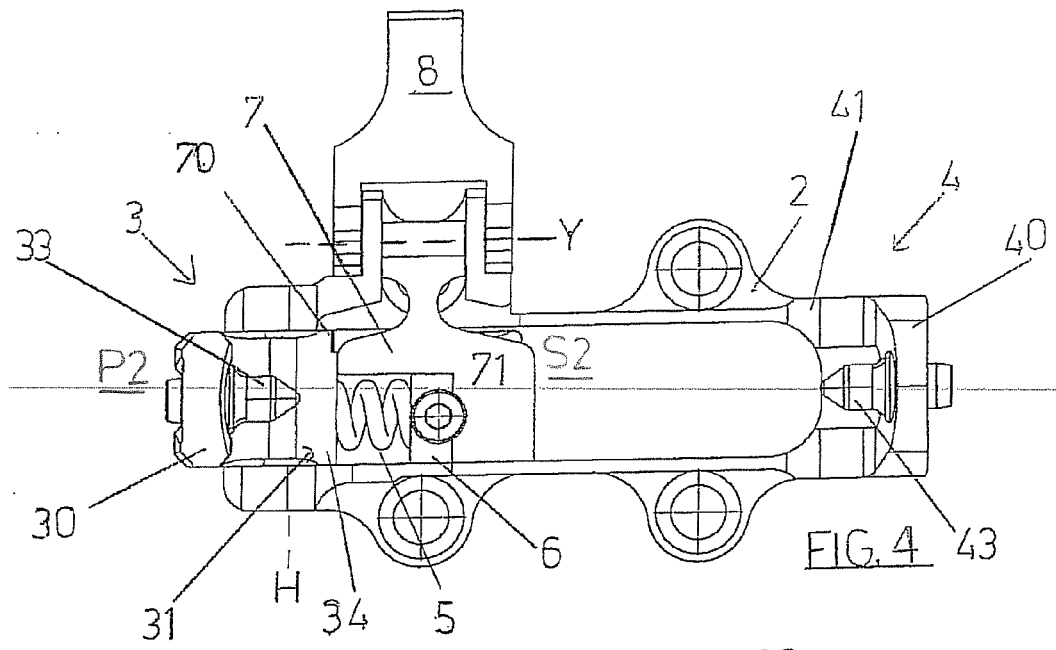
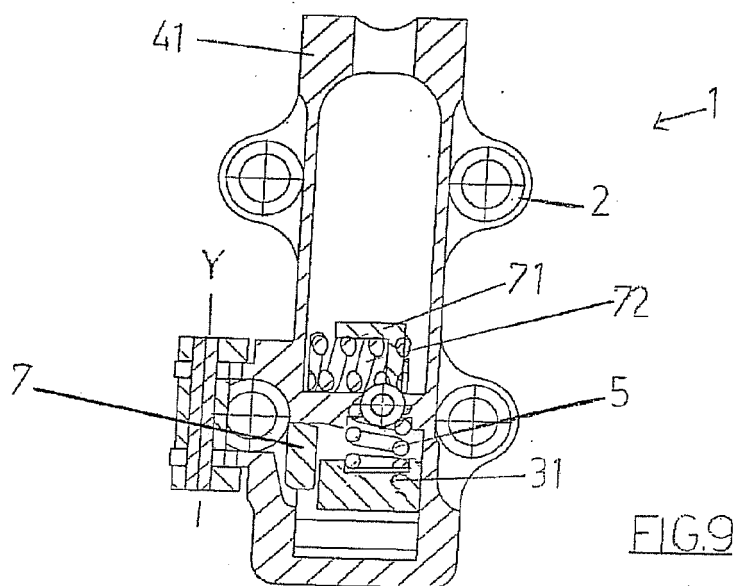
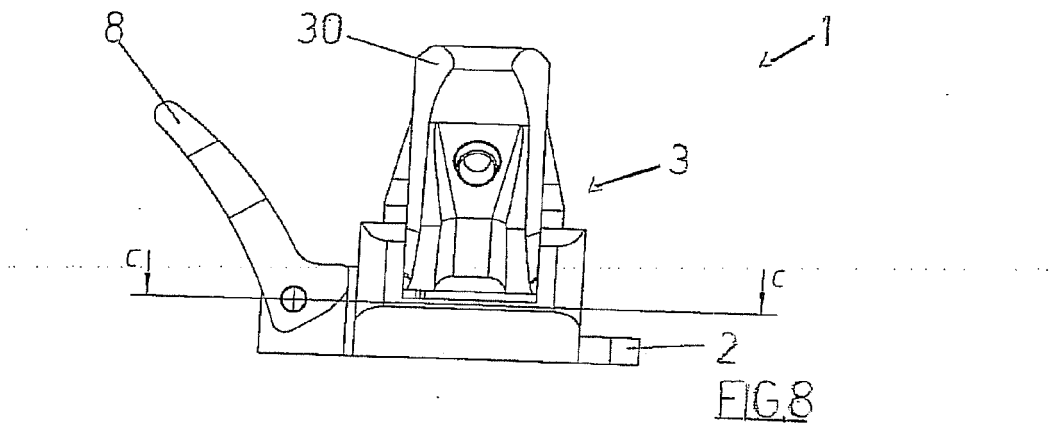
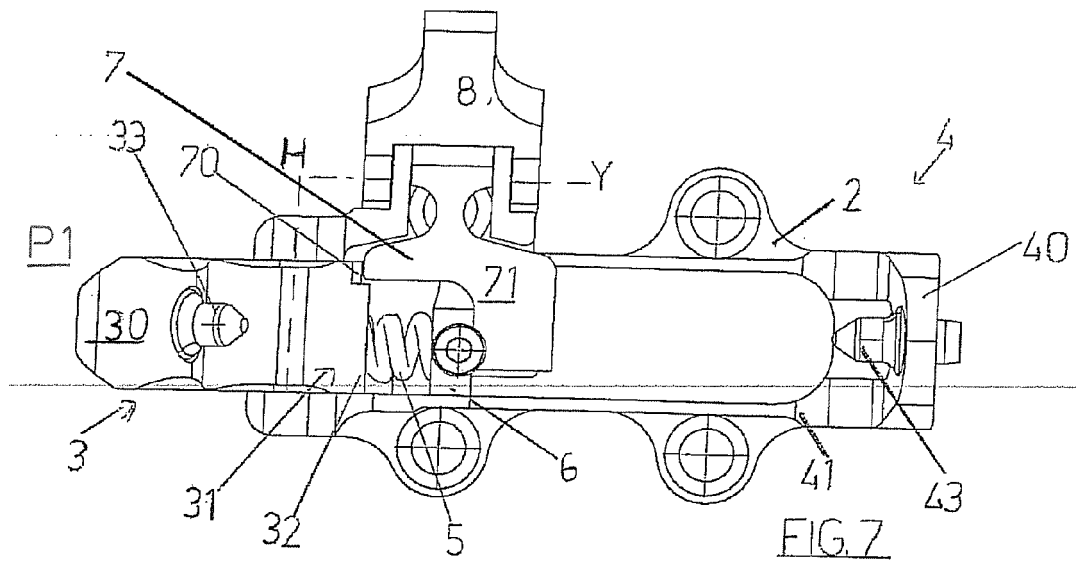
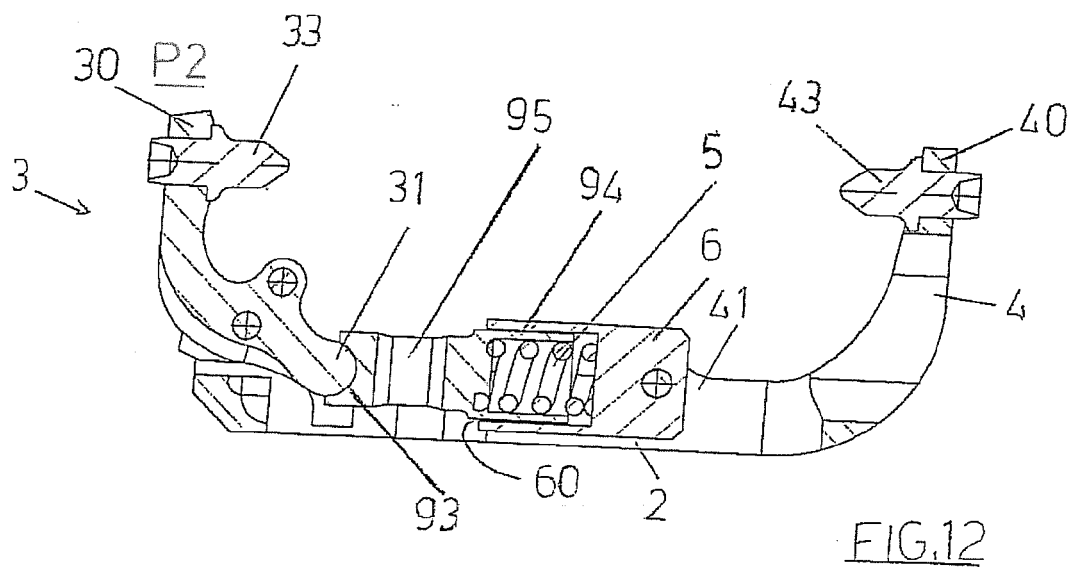
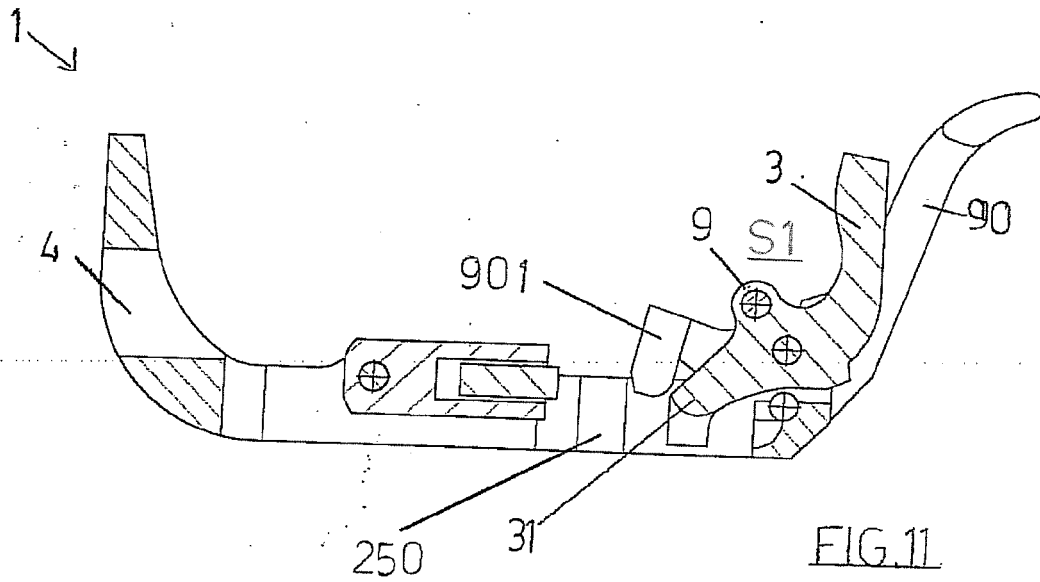
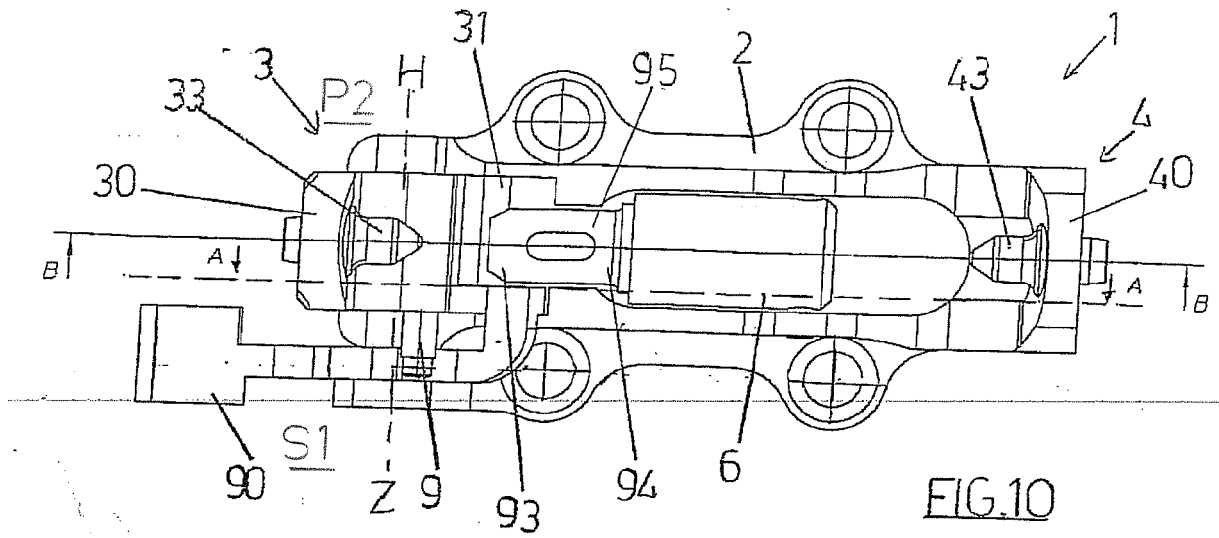
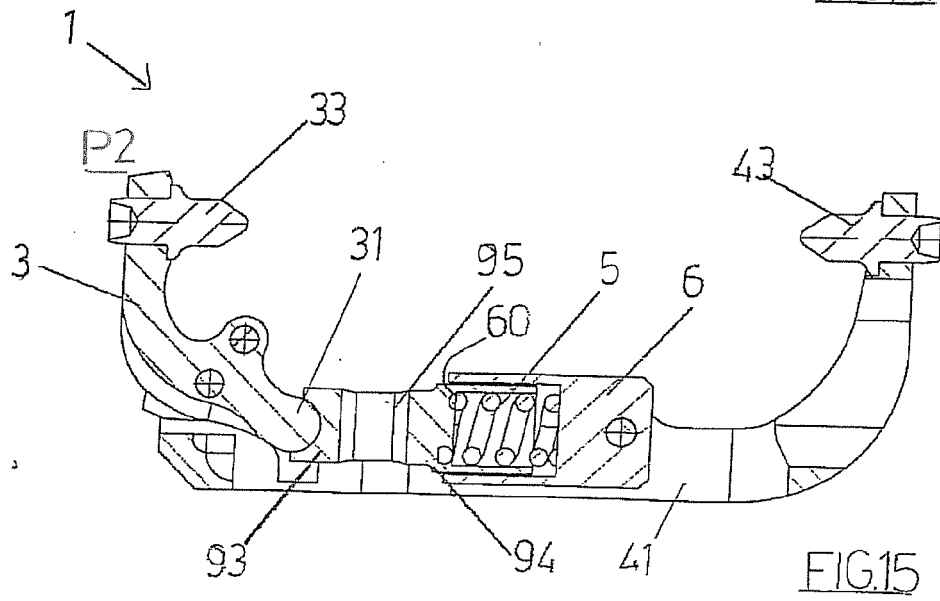
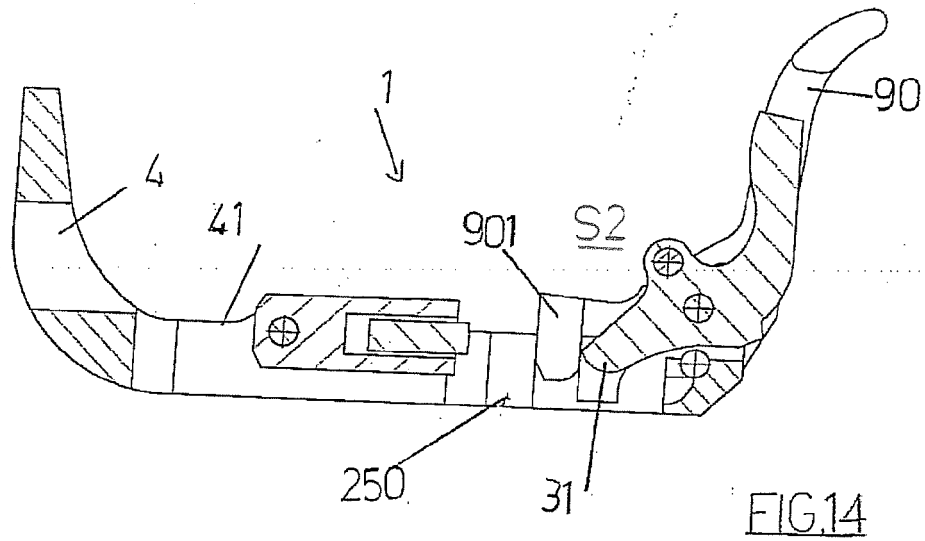
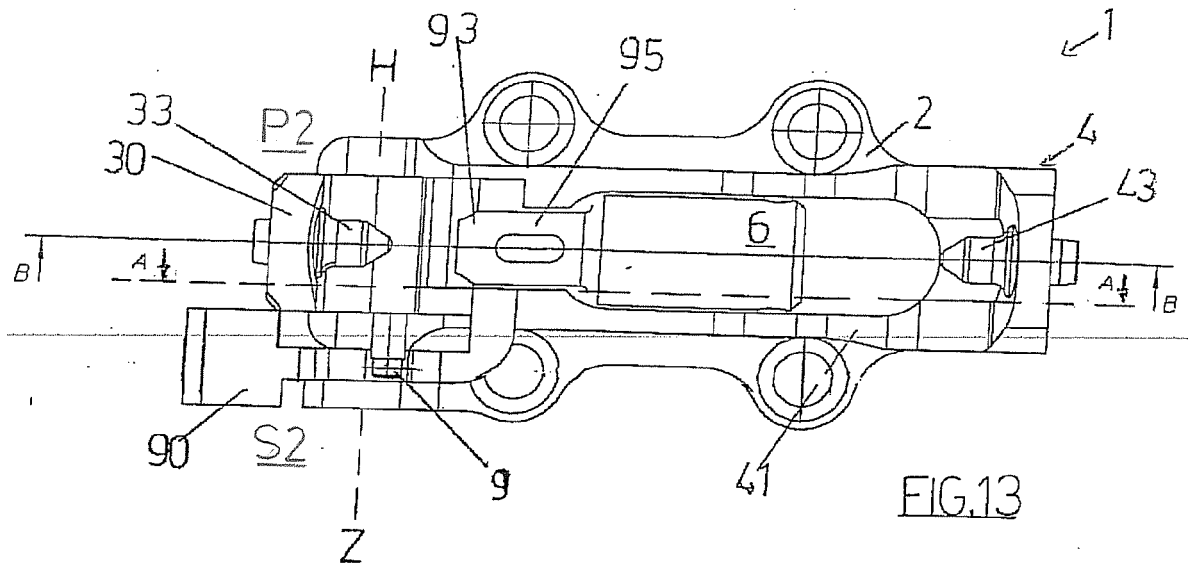


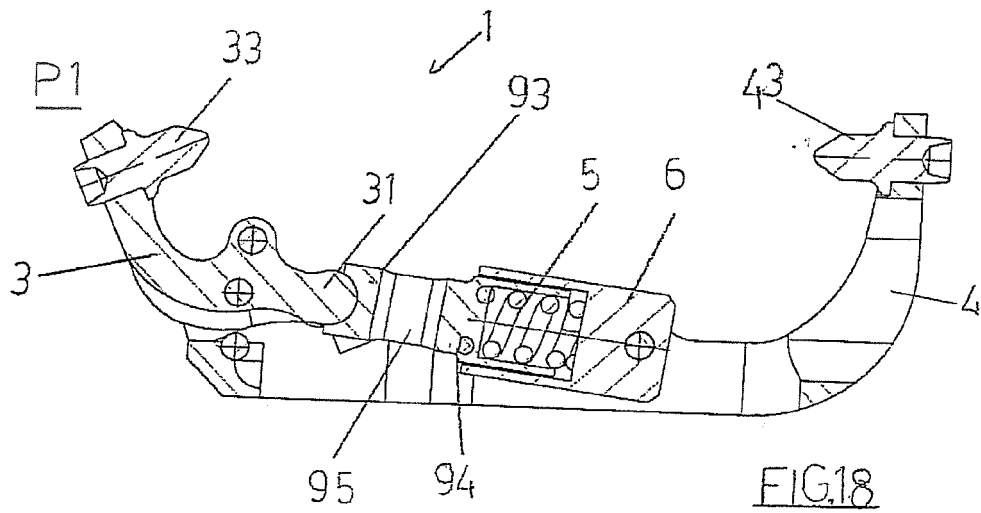
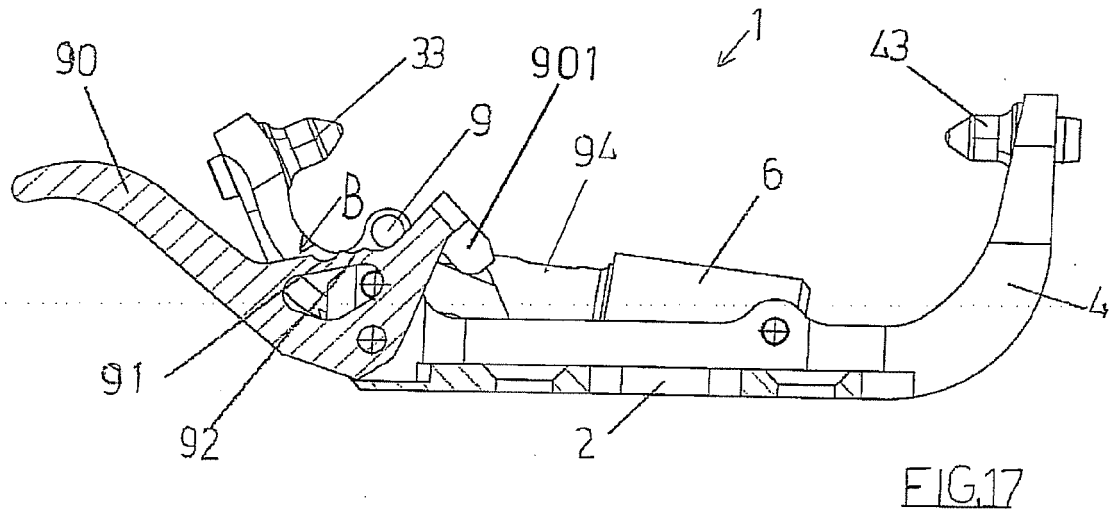
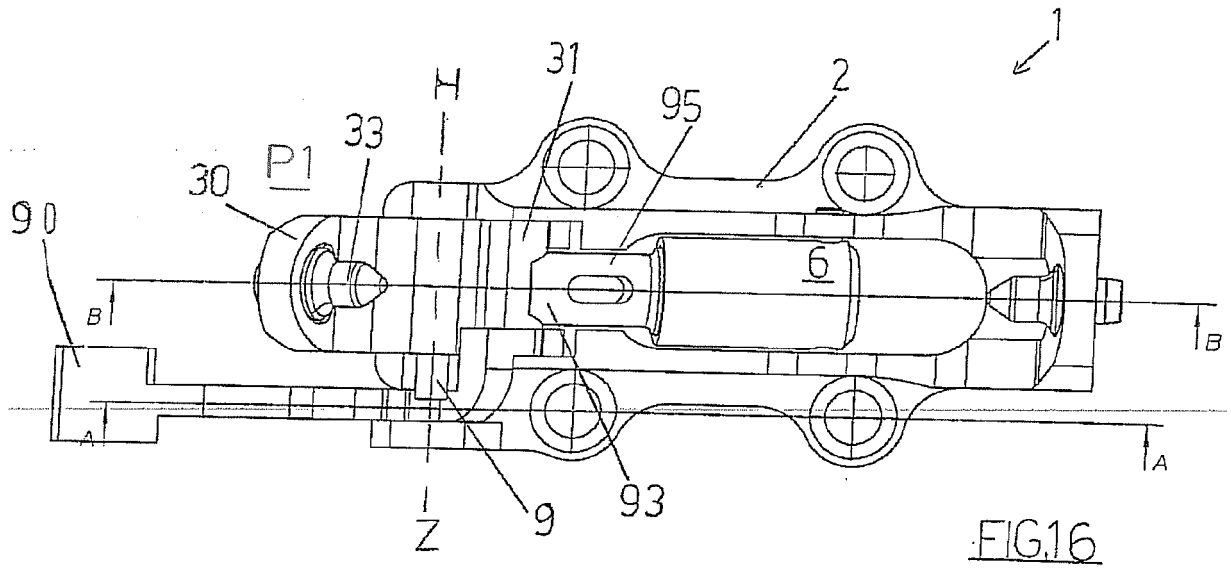
FIG. 3

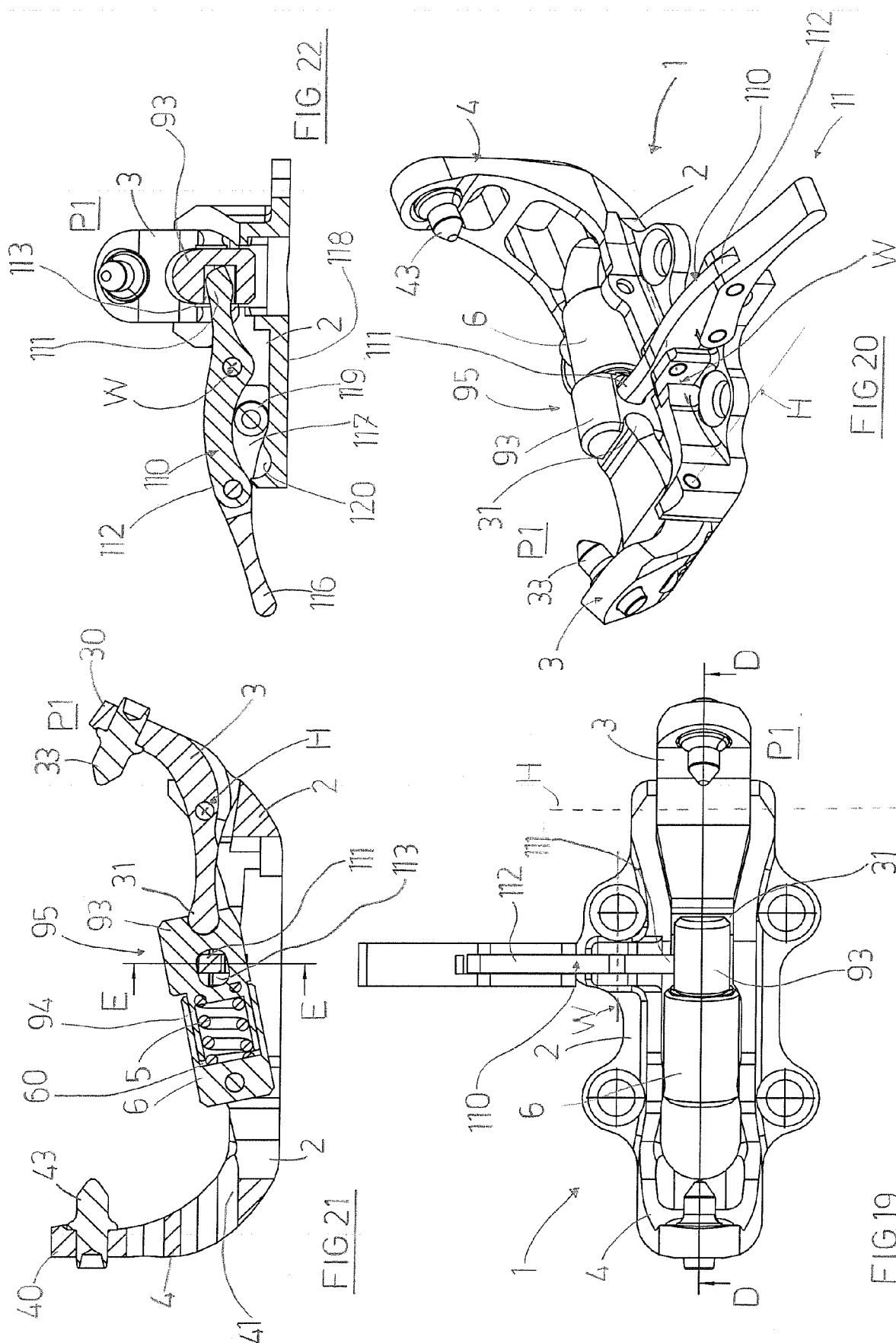


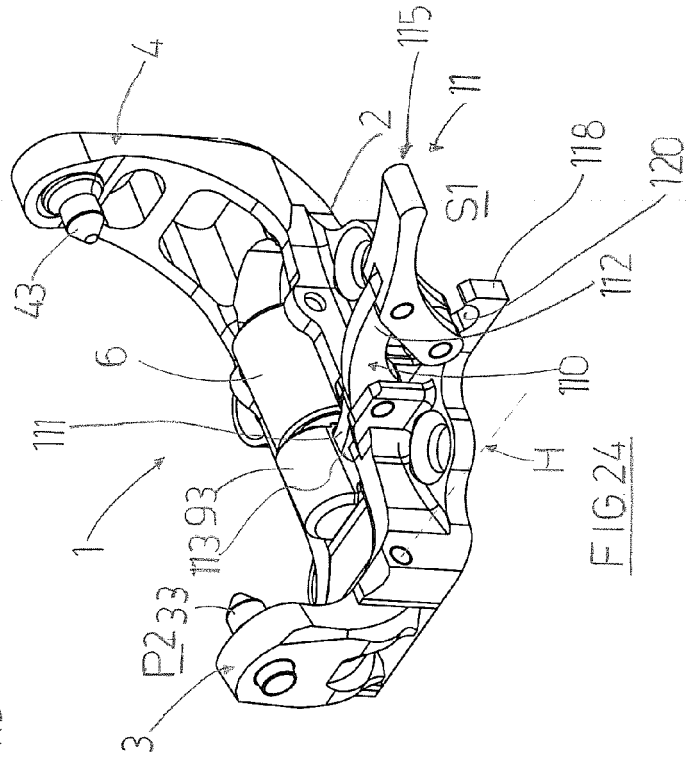
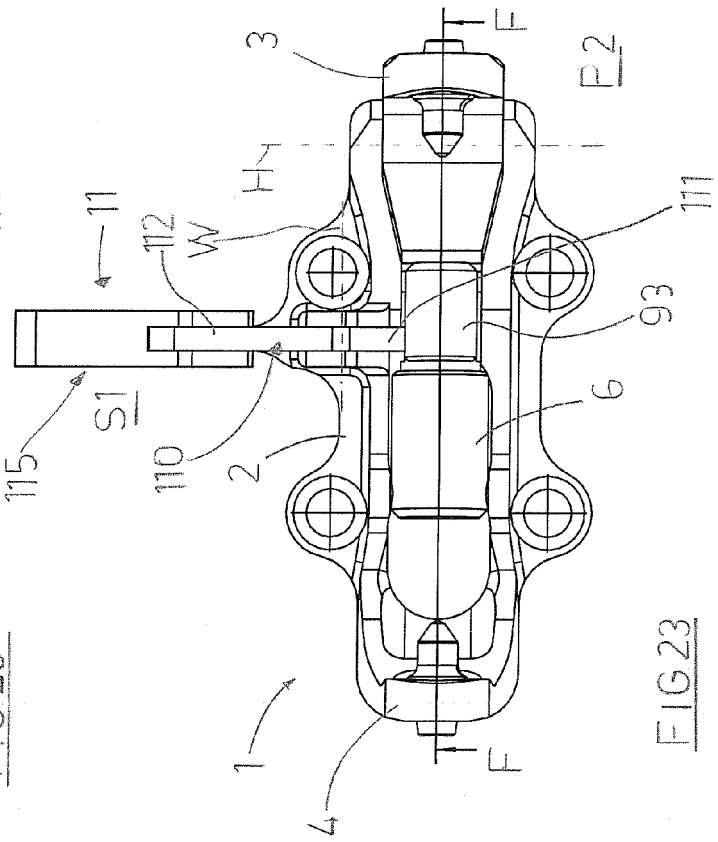
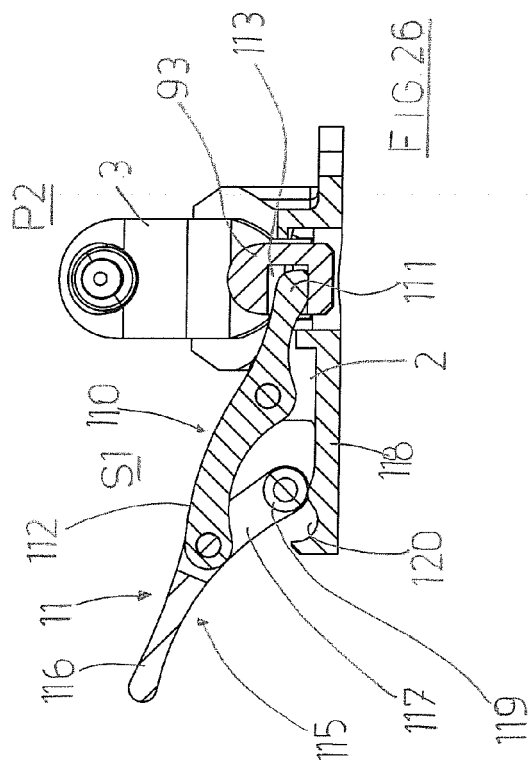
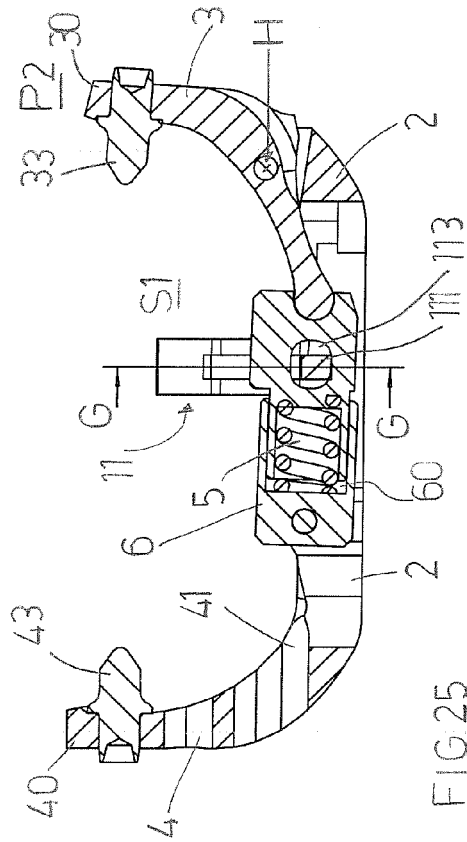


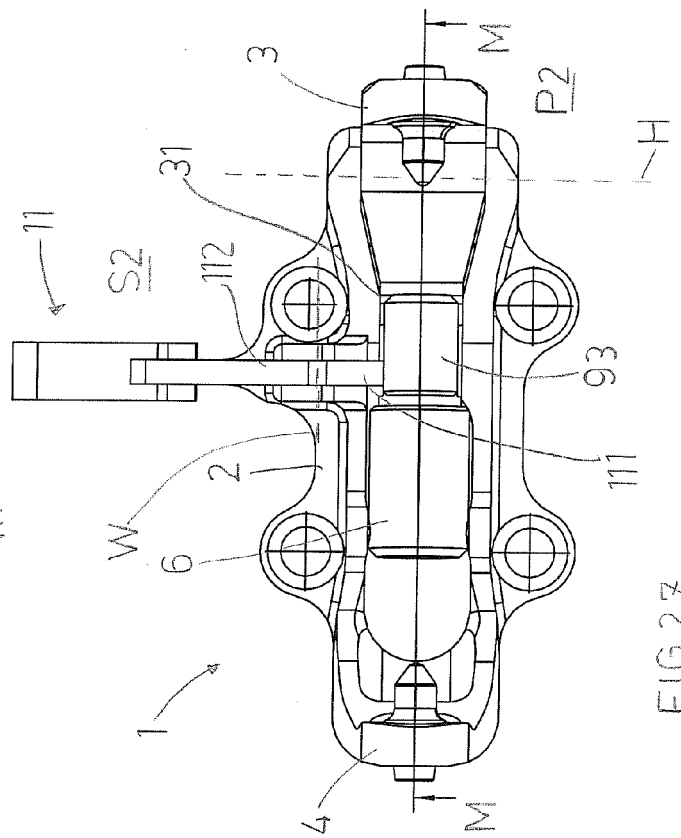
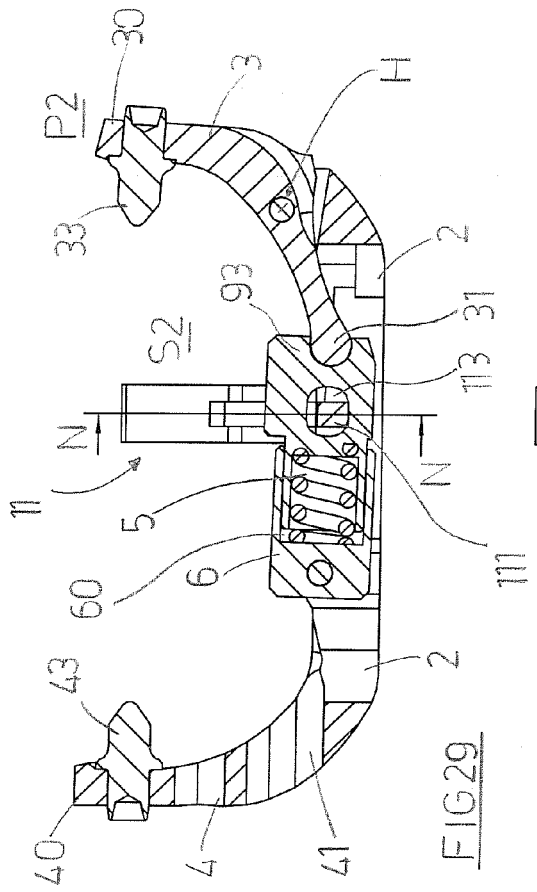
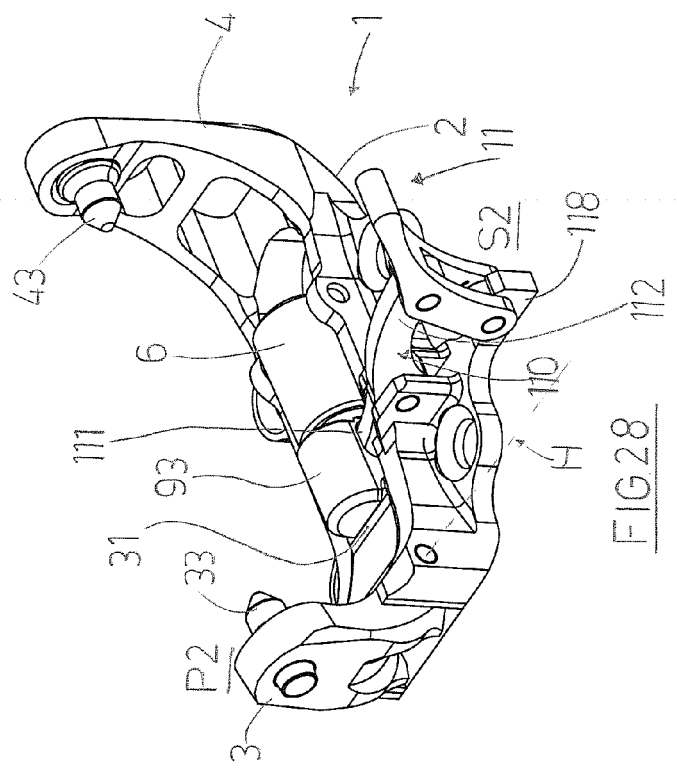
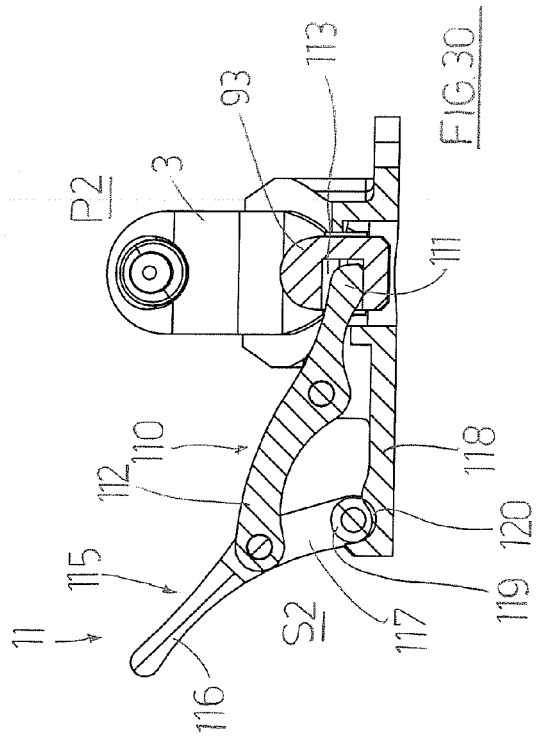














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Place of search Munich		Date of completion of the search 30 May 2016	Examiner Vesin, Stéphane
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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