

(19)



(11)

**EP 4 154 953 A1**

(12)

**EUROPEAN PATENT APPLICATION**

(43) Date of publication:  
**29.03.2023 Bulletin 2023/13**

(51) International Patent Classification (IPC):  
**A63C 9/08** <sup>(2006.01)</sup> **A63C 9/086** <sup>(2006.01)</sup>  
**A63C 9/085** <sup>(2006.01)</sup>

(21) Application number: **22196900.9**

(52) Cooperative Patent Classification (CPC):  
**A63C 9/0807; A63C 9/08528; A63C 9/08571;**  
**A63C 9/08578; A63C 9/08585; A63C 9/086**

(22) Date of filing: **21.09.2022**

(84) Designated Contracting States:  
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR**  
Designated Extension States:  
**BA ME**  
Designated Validation States:  
**KH MA MD TN**

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(30) Priority: **23.09.2021 IT 202100024442**

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(54) **A TOE-PIECE OF A SKI BINDING FOR SKI MOUNTAINEERING**

(57) A toe-piece of a ski binding (1) for ski (30) mountaineering, comprising: a base (2); a first jaw (11); a second jaw (12); an activating lever (3) which is rotatably coupled to the base (2); a joint (4) which is activatable by the activating lever (3) and which comprises: a first portion of joint (41) which is connected to the first jaw (11); and a second portion of joint (42) which is connected to the second jaw (12) and which is coupled to the first portion of joint (41); a first spring (51) interposed between the first jaw (11) and the first portion of joint (41). The first jaw (11) and the first portion of joint (41) are telescopically coupled to one another. The first spring (51)

is enclosed by the first jaw (11) and by the first portion of joint (41). A toe-piece of a ski binding (1), comprising: a first lateral wall (71) which is flanked to the first jaw (11) and to the first portion of joint (41); a second lateral wall (72) which is flanked to the second jaw (12) and to the second portion of joint (42); a third lateral wall (73) which is arranged posteriorly of the first lateral wall (71) and of the second lateral wall (72), and which is flanked to the first jaw (11), to the first portion of joint (41), to the second portion of joint (42) and to the second jaw (12).

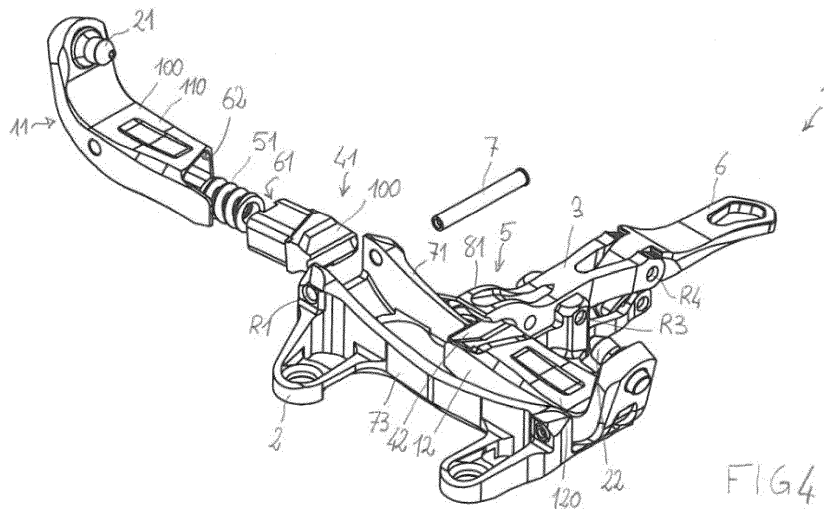


FIG 4

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## Description

**[0001]** The present invention relates to the technical sector concerning ski mountaineering bindings, with particular reference to a toe-piece of the ski binding.

**[0002]** ITM020070365 describes a toe-piece of a ski binding for ski mountaineering, which comprises: a base which is fixable to a ski; a first jaw which is coupled in a revolutive pair to the base so as to rotate with respect to a first axis of rotation which is parallel to the axis of the ski when the base is fixed to the ski; a second jaw which is rotatably coupled in a revolutive pair to the base with respect to a second axis of rotation which is parallel to the first axis of rotation; a first pin which is borne by the first jaw for inserting in a first lateral hole fashioned in a tip of a ski boot; a second pin which is borne by the second jaw for inserting in a second lateral hole opposite the first lateral hole fashioned in the tip of the ski boot; an activating lever which is coupled in a revolutive pair to the base with respect to a third axis of rotation which is perpendicular to the first axis of rotation; a joint which is activatable by the activating lever and which in turn comprises a first portion of joint, which is connected to the first jaw, and a second portion of joint, which is connected to the second jaw and which is coupled to the first portion of joint; a first spring which is interposed between the first jaw and the first portion of joint; a first pin seat fashioned in the first jaw; a second pin seat fashioned in the first portion of joint; a first pin which is arranged slidably between the first pin seat and the second pin seat, and which is arranged at the axis of the first spring to maintain the first spring in guide; a second spring interposed between the second jaw and the second portion of joint; a third pin seat fashioned in the second jaw; a fourth pin seat fashioned in the second portion of joint; a second pin which is slidably arranged between the third pin seat and the fourth pin seat, and which is arranged at the axis of the second spring to maintain the second spring in guide.

**[0003]** A drawback of this toe-piece of the ski binding consists in the fact that during use snow inserts between the joint and the ski, where it might get compacted and thus might be an obstacle to the correct functioning of the toe-piece of the ski binding.

**[0004]** The aim of the present invention consists in at least limiting the above-mentioned drawback.

**[0005]** The above aim is attained by a toe-piece of a ski binding for ski mountaineering, according to claim 1.

**[0006]** The quantity of snow that inserts between the joint and the ski is advantageously smaller. In fact, in the prior art the snow was able to pass between the turns of the springs, while with the invention the first spring is closed by the first jaw and the first portion of joint. Further, the lateral walls that rise from the base flank both frontally and posteriorly the first jaw, the first portion of joint, the second portion of joint and the second jaw in such a measure as to at least limit the passage of snow. Further, the height of the lateral walls at least partially closes the

gap between the lateral walls, on one side, and the first jaw, the first portion of joint, the second portion of joint and the second jaw, on the other side.

**[0007]** Specific embodiments of the invention will be described in the following part of the present description, according to what is set down in the claims and with the aid of the accompanying tables of drawings, in which:

- figure 1 is a view from above of a toe-piece of the ski binding for ski mountaineering object of the present invention, in a configuration ready to receive a ski boot and according to a first embodiment of the invention;
- figures 2 and 3 are two perspective views of the toe-piece of the ski binding of figure 1;
- figure 4 is the same perspective view of figure 2 in which some parts have been shown in exploded view;
- figure 5 is a frontal view of the toe-piece of the ski binding of figure 1, in which a ski has been schematically illustrated in a broken line;
- figure 6 is a lateral view of the toe-piece of the ski binding of figure 1;
- figure 7 is a view of section VII-VII of figure 6;
- figure 8 is a view of section VIII-VIII of figure 6;
- figure 9 is a view from above of the toe-piece of the ski binding of figure 1, but in a descent configuration in which the ski boot, not illustrated, is hooked to the pins;
- figures 10 and 11 are two perspective views of the toe-piece of the ski binding of figure 9;
- figure 12 is a frontal view of the toe-piece of the ski binding of figure 9 in which a ski boot has been illustrated in a broken line and in which a ski is further schematically illustrated in a broken line;
- figure 13 is a lateral view of the toe-piece of the ski binding of figure 9 in which the ski boot has been illustrated in a continuous line;
- figure 14 is the view of section XIV-XIV of figure 13;
- figure 15 is a view of section XV-XV of figure 13;
- figure 16 is a perspective view of the toe-piece of the ski binding for ski mountaineering, object of the present invention, in a configuration ready to receive a ski boot and according to a second embodiment of the invention;

- figure 17 is a section view alike to figure 8 but relating to the toe-piece of the ski binding of figure 16;
- figure 18 is a perspective view of the toe-piece of the ski binding of figure 16, but in a descent configuration in which the ski boot, not illustrated, is hooked to the pins;
- figure 19 is a section view alike figure 15 but relating to the toe-piece of the ski binding of figure 18 and in which the ski boot has not been illustrated;
- figure 20 is a perspective view of the toe-piece of the ski binding for ski mountaineering, object of the present invention, in a configuration ready to receive a ski boot and according to a third embodiment of the invention;
- figure 21 is a section view alike to figure 8 but relating to the toe-piece of the ski binding of figure 20;
- figure 22 is a perspective view of the toe-piece of the ski binding of figure 20, but in a descent configuration in which the ski boot, not illustrated, is hooked to the pins;
- figure 23 is a section view alike figure 15 but relating to the toe-piece of the ski binding of figure 22 and in which the ski boot has not been illustrated.

**[0008]** With reference to the appended tables of drawings, reference numeral (1) denotes in its entirety a toe-piece of the ski binding for ski mountaineering according to the present invention, comprising: a base (2) which is fixable to a ski (30); a first jaw (11) which is rotatably coupled to the base (2) with respect to a first axis of rotation (R1) which is parallel to the axis of the ski (30) when the base (2) is fixed to the ski (30); a second jaw (12) which is rotatably coupled with the base (2) with respect to a second axis of rotation (R2) which is parallel to the first axis of rotation (R1); a first pin (21) which is borne by the first jaw (11) for inserting in a first lateral hole (31) made in a tip of a ski boot (40); a second pin (22) which is borne by the second jaw (12) for inserting in a second lateral hole (32) fashioned in the tip of the ski boot (40); an activating lever (3) which is rotatably coupled to the base (2); a joint (4) which is activatable by the activating lever (3) and which comprises: a first portion of joint (41) which is connected to the first jaw (11); and a second portion of joint (42) which is connected to the second jaw (12) and which is coupled to the first portion of joint (41); first elastic means (51) which comprise a first spring (51) interposed between the first jaw (11) and the first portion of joint (41). The first portion of joint (41) is provided with a first spring seat (61) for receiving a first end of the first spring (51). Further: the first jaw (11) is provided with a second spring seat (62) for receiving a second end of the first spring (51); the first

jaw (11) and the first portion of joint (41) are telescopically coupled to one another, so as to allow a relative sliding between the first jaw (11) and the first portion of joint (41) when the activating lever (3) activates the joint (4), at least one between the first jaw (11) and the first portion of joint (41) comprising a tubular telescopic coupling portion (see for example figure 8, in which it can be clearly observed that the first jaw (11) is provided with the tubular portion so as to realise the telescopic coupling); the first spring (51) is enclosed by the first jaw (11) and by the first portion of joint (41). Further, the toe-piece of the ski binding (1) comprises a first lateral wall (71), a second lateral wall (72) and a third lateral wall (73). The first lateral wall (71): is solidly constrained to the base (2); extends between the activating lever (3) and the first axis of rotation (R1) in a transversal direction, preferably perpendicular, to the first axis of rotation (R1); it extends in height with respect to the ski (30), when the base (2) is fixed to the ski (30), in a measure such as to at least partially close the gap (70) between the first lateral wall (71), on one side, and the first jaw (11) and the first portion of joint (41), on the other side; and is flanked to the first jaw (11) and to the first portion of joint (41) in such a measure as to at least limit, preferably prevent, the passage of snow during the use of the toe-piece of a ski binding (1). The second lateral wall (72): is solidly constrained to the base (2); it extends between the activating lever (3) and the second axis of rotation (R2) in a transversal direction, preferably perpendicular, to the first axis of rotation (R1); extends in height with respect to the ski (30), when the base (2) is fixed to the ski (30), in a measure such as to at least partially close the gap (70) between the second lateral wall (72), on one side, and the second jaw (12) and the second portion of joint (42), on the other side; and is flanked to the second jaw (12) and to the second portion of joint (42) in such a measure as to at least limit, preferably prevent, the passage of snow during the use of the toe-piece of a ski binding (1). The third lateral wall (73): is arranged posteriorly to the first lateral wall (71) and to the second lateral wall (72) with respect to the tip of the ski (30) when the base (2) is fixed to the ski (30); is solidly constrained to the base (2); extends between the first axis of rotation (R1) and the second axis of rotation (R2), preferably perpendicular, in a transversal direction to the first axis of rotation (R1); extends in height with respect to the ski (30), when the base (2) is fixed to the ski (30), in a measure such as to at least partially close the gap (70) between the third lateral wall (73), on one side, and the first jaw (11), the first portion of joint (41), the second portion of joint (42) and the second jaw (12), on the other side; and is flanked to the first jaw (11), to the first portion of joint (41), to the second portion of joint (42) and to the second jaw (12) in such a measure as to at least limit, preferably prevent, the passage of snow during the use of the toe-piece of a ski binding (1).

**[0009]** The first lateral wall (71) is preferably an integral part of the base (2).

**[0010]** The second lateral wall (72) is preferably an integral part of the base (2).

**[0011]** The third lateral wall (73) is preferably an integral part of the base (2).

**[0012]** A ski (30) is schematically illustrated in a broken line only, in figures 5 and 12.

**[0013]** The activating lever (3) can be arranged parallel to the first axis of rotation (R1).

**[0014]** The activating lever (3) can be centred with respect to the halfway line of the toe-piece of the ski binding (1).

**[0015]** The first jaw (11) is preferably coupled in a revolute pair to the base (2), so as to rotate with respect to the first axis of rotation (R1): in this case, only the first portion of joint (41) can slide with respect to the first jaw (11). The second jaw (12) is preferably coupled in a revolute pair to the base (2), so as to rotate with respect to the second axis of rotation (R2).

**[0016]** The first lateral hole (31) and the second lateral hole (32) as illustrated in figures 14 and 15.

**[0017]** The ski boot (40) is illustrated in figures 12-15.

**[0018]** The activating lever (3) is preferably rotatably coupled to the base (2) with respect to a third axis of rotation (R3) which is transversal, preferably perpendicular, to the first axis of rotation (R1) and thus towards the axis of the ski (30) when the base (2) is fixed to the ski (30).

**[0019]** The activating lever (3) is preferably rotatably coupled in a revolute pair to the base (2), so as to rotate with respect to the third axis of rotation (R3).

**[0020]** The activating lever (3) can form, at a first end, a fork (5) having a first prong (81) and a second prong (82) (see for example figure 19) which are arranged at different heights with respect to the ski (30), when the base (2) is fixed to the ski (30), so that the first prong (81) can contact the joint (4) to push it towards the ski (30), if the activating lever (3) is rotated in a first rotation direction (S1) (see in particular figure 13, in which the ski boot (40) presses on the activating lever (3), determining the rotation in the first rotation direction (S1)), and so that the second prong (82), nearer the ski (30) with respect to the first prong (81), can contact the joint (4) to push it away from the ski (30), if the activating lever (3) is rotated in a second rotation direction, opposite the first rotation direction (S1).

**[0021]** The toe-piece of a ski binding (1) preferably comprises a blocking lever (6) which is rotatably coupled to the activating lever (3) with respect to a fourth axis of rotation (R4) which is transversal, preferably perpendicular, to the first axis of rotation (R1), so as to block the position of the activating lever (3). The blocking lever (6) is preferably rotatable in a revolute pair to the activating lever (3), so as to rotate with respect to the fourth axis of rotation (R4). The activating lever (3) can rotatably couple to the blocking lever (6) at a second end, opposite the first end, see for example figure 2.

**[0022]** The first spring (51) can be a compression spring.

**[0023]** The second end of the first spring (51) is opposite the first end of the first spring (51).

**[0024]** The first lateral wall (71) and the second lateral wall (72) are preferably aligned to one another.

**[0025]** Preferably: a first jaw (11) comprises a first portion of jaw (110) which extends between the first axis of rotation (R1) and the first portion of joint (41), covering the space between the first lateral wall (71) and the third lateral wall (73); the first portion of joint (41) extends covering the space between the first lateral wall (71) and the third lateral wall (73); the second portion of joint (42) extends to cover the space between the second lateral wall (72) and the third lateral wall (73); the second jaw (12) comprises a second portion of jaw (120) which extends between the second axis of rotation (R2) and the second portion of joint (42), to cover the space between the second lateral wall (72) and the third lateral wall (73).

**[0026]** Still more preferably, the external walls (100) of the first portion of jaw (110), of the first portion of joint (41), of the second portion of joint (42) and of the second portion of jaw (120), which face in an opposite direction with respect to the tip of the ski (30) (see for example figure 2), when the base (2) is fixed to the ski (30), form a continuous surface in order at least to limit the passage of snow.

**[0027]** According to a first embodiment, the toe-piece of the ski binding (1) comprises second elastic means (52) which comprise a second spring (52) interposed between the second jaw (12) and the second portion of joint (42). Further: the second portion of joint (42) is provided with a third spring seat (63) for receiving a first end of the second spring (52); the second jaw (12) is provided with a fourth spring seat (64) for receiving a second end of the second spring (52); the second jaw (12) and the second portion of joint (42) are telescopically coupled to one another, so as to allow a relative sliding between the second jaw (12) and the second portion of joint (42) when the activating lever (3) activates the joint (4), at least one from between the second jaw (12) and the second portion of joint (42) comprising a tubular telescopic coupling portion (see for example figure 8, in which it can be clearly observed that the second jaw (12) is provided with the tubular portion so as to realise the telescopic coupling); the second spring (52) is enclosed by the second jaw (12) and by the second portion of joint (42).

**[0028]** The second spring (52) can be a compression spring.

**[0029]** The second end of the second spring (52) is opposite the first end of the second spring (52).

**[0030]** Figures from 1 to 15 illustrate the first embodiment. In particular, figures 1-8 show a configuration ready to receive the ski boot: the first pin (21) and the second pin (22) are sufficiently moved away from one another in order to allow the tip of the ski boot (40) to insert between the pins and press on the activating lever (3): in turn, the activating lever (3), by means of the first prong (81), presses on the joint (4), leading to the consequent transition of the toe-piece of the ski binding to a descent con-

figuration, figures 9-15, in which the ski boot (40) is hooked to the first pin (21) and to the second pin (22). Starting from the descent configuration, as is known, the skier can activate the blocking lever (6) to block the activating lever (3) and walk uphill (the ascent configuration is not illustrated).

**[0031]** Instead, figures 16-19 and 20-23 show a second and third embodiment, respectively, in which the second elastic means (52) have not been used. In this case the second jaw (12) and the second portion of joint (42) are connected to one another to form a single body, see for example figure 23.

**[0032]** The joint (4) preferably comprises a pin (7); further, the first portion of joint (41) and the second portion of joint (42) are coupled to one another by means of the pin (7).

**[0033]** The first portion of joint (41) preferably comprises a first pin seat (91) for rotatably coupling to the pin (7), and the second portion of joint (42) comprises a second pin seat (92) for rotatably coupling to the pin (7).

**[0034]** The pin (7) preferably has a cylindrical shape; further, the first pin seat (91) forms a first portion of cylindrical wall in order to realise a form coupling with the pin (7), see for example figure 8; the second pin seat (92) forms a second portion of cylindrical wall in order to realise a form coupling with the pin (7).

**[0035]** The first embodiment illustrated in figures 1-15 uses the pin (7).

**[0036]** In alternative, figures 20-23: the first portion of joint (41) comprises a third portion of cylindrical wall (93); the second portion of joint (42) comprises a fourth portion of cylindrical wall (94); the third portion of cylindrical wall (93) and the fourth portion of cylindrical wall (94) are directly coupled to one another realising a form coupling.

**[0037]** It is specified that also the third embodiment of figures 20-23 might, alternatively, use the pin (7) according to what is indicated in the foregoing and with what is illustrated in figures 1-19.

**[0038]** Likewise, the first embodiment illustrated in figures 1-15 and the second embodiment illustrated in figures 16-19 might, alternatively, not use the pin (7) and use a direct coupling between the first portion of joint (41) and the second portion of joint (42), as explained in the foregoing with reference to figures 20-23 and to the third portion of cylindrical wall (93) and the fourth portion of cylindrical wall (94).

**[0039]** It is understood that the above has been described by way of non-limiting example and that any technical-functional variants are considered to fall within the protective scope of the present technical solution, as claimed in the following.

## Claims

1. A toe-piece of a ski binding (1) for ski (30) mountaineering, comprising:

a base (2) which is fixable to a ski (30);  
 a first jaw (11) which is rotatably coupled to the base (2) with respect to a first axis of rotation (R1) which is parallel to the axis of the ski (30) when the base (2) is fixed to the ski (30);  
 a second jaw (12) which is rotatably coupled to the base (2) with respect to a second axis of rotation (R2) which is parallel to the first axis of rotation (R1);  
 a first pin (21) which is borne by the first jaw (11) for inserting in a first lateral hole (31) made in a tip of a ski boot (40);  
 a second pin (22) which is borne by the second jaw (12) for inserting in a second lateral hole (32) fashioned in the tip of the ski boot (40);  
 an activating lever (3) which is rotatably coupled to the base (2);  
 a joint (4) which is activatable by the activating lever (3) and which comprises:

a first portion of joint (41) which is connected to the first jaw (11); and a second portion of joint (42) which is connected to the second jaw (12) and which is coupled to the first portion of joint (41);  
 first elastic means (51) which comprise a first spring (51) interposed between the first jaw (11) and the first portion of joint (41);

## characterised in that:

the first portion of joint (41) is provided with a first spring seat (61) in order to receive a first end of the first spring (51);  
 the first jaw (11) is provided with a second spring seat (62) for receiving a second end of the first spring (51);  
 the first jaw (11) and the first portion of joint (41) are telescopically coupled to one another, so as to allow a relative sliding between the first jaw (11) and the first portion of joint (41) when the activating lever (3) activates the joint (4), at least one between the first jaw (11) and the first portion of joint (41) comprising a tubular telescopic coupling portion;  
 the first spring (51) is enclosed by the first jaw (11) and by the first portion of joint (41); it comprises a first lateral wall (71) which: is solidly constrained to the base (2); extends between the activating lever (3) and the first axis of rotation (R1) in a transversal direction to the first axis of rotation (R1); it extends in height with respect to the ski (30), when the base (2) is fixed to the ski (30), in a measure such as to at least partially close the gap (70) between the first lateral wall (71), on one side, and the first jaw (11) and

- the first portion of joint (41), on the other side; and is flanked to the first jaw (11) and to the first portion of joint (41) in such a measure as to at least limit the passage of snow during the use of the toe-piece of a ski binding (1);
- it comprises a second lateral wall (72) which: is solidly constrained to the base (2); it extends between the activating lever (3) and the second axis of rotation (R2) in a transversal direction to the first axis of rotation (R1); it extends in height with respect to the ski (30), when the base (2) is fixed to the ski (30), in a measure such as to at least partially close the gap (70) between the second lateral wall (72), on one side, and the second jaw (12) and the second portion of joint (42), on the other side; and is flanked to the second jaw (12) and to the second portion of joint (42) in such a measure as to at least limit the passage of snow during the use of the toe-piece of the ski binding (1);
- it comprises a third lateral wall (73) which: is arranged posteriorly to the first lateral wall (71) and to the second lateral wall (72) with respect to the tip of the ski (30) when the base (2) is fixed to the ski (30); is solidly constrained to the base (2); it extends between the axis of rotation (R1) and the second axis of rotation (R2) in a transversal direction to the first axis of rotation (R1); it extends in height with respect to the ski (30), when the base (2) is fixed to the ski (30), in a measure such as to at least partially close the gap (70) between the third lateral wall (73), on one side, and the first jaw (11), the first portion of joint (41), the second portion of joint (42) and the second jaw (12), on the other side; and is flanked to the first jaw (11), to the first portion of joint (41), to the second portion of joint (42) and to the second jaw (12) in such a measure as to at least limit the passage of snow during the use of the toe-piece of the ski binding (1).
2. The toe-piece of the ski binding (1) of the preceding claim, wherein: it comprises second elastic means (52) which comprise a second spring (52) interposed between the second jaw (12) and the second portion of joint (42); the second portion of joint (42) is provided with a third spring seat (63) for receiving a first end of the second spring (52); the second jaw (12) is provided with a fourth spring seat (64) for receiving a second end of the second spring (52); the second jaw (12) and the second portion of joint (42) are telescopically coupled to one another, so as to allow a relative sliding between the second jaw (12) and the second portion of joint (42) when the activating lever (3) activates the joint (4), at least one from between the second jaw (12) and the second portion of joint (42) comprising a tubular telescopic coupling portion; the second spring (52) is enclosed by the second jaw (12) and by the second portion of joint (42).
  3. The toe-piece of the ski binding (1) according to claim 1 or 2, wherein: the first jaw (11) comprises a first portion of jaw (110) which extends between the first axis of rotation (R1) and the first portion of joint (41), to cover the space between the first lateral wall (71) and the third lateral wall (73); the first portion of joint (41) extends to cover the space between the first lateral wall (71) and the third lateral wall (73); the second portion of joint (42) extends to cover the space between the second lateral wall (72) and the third lateral wall (73); the second jaw (12) comprises a second portion of jaw (120) which extends between the second axis of rotation (R2) and the second portion of joint (42), to cover the space between the second lateral wall (72) and the third lateral wall (73).
  4. The toe-piece of the ski binding (1) of any one of the preceding claims, wherein the external walls (100) of the first portion of jaw (110), of the first portion of joint (41), of the second portion of joint (42) and of the second portion of jaw (120), which face in an opposite direction with respect to the tip of the ski (30), when the base (2) is fixed to the ski (30), form a continuous surface in order at least to limit the passage of snow.
  5. The toe-piece of the ski binding (1) of any one of the preceding claims, wherein: the joint (4) comprises a pin (7); and the first portion of joint (41) and the second portion of joint (42) are coupled to one another by means of the pin (7).
  6. The toe-piece of the ski binding (1) of the preceding claim, wherein: the first portion of joint (41) comprises a first pin seat (91) for rotatably coupling to the pin (7), and the second portion of joint (42) comprises a second pin seat (92) for rotatably coupling to the pin (7).
  7. The toe-piece of the ski binding (1) of the preceding claim, wherein: the pin (7) has a cylindrical shape; the first pin seat (91) forms a first portion of cylindrical wall in order to realise a form coupling with the pin (7); the second pin seat (92) forms a second portion of cylindrical wall in order to realise a form coupling with the pin (7).
  8. The toe-piece of the ski binding (1) of any one of claims from 1 to 4, wherein: the first portion of joint (41) comprises a third portion of cylindrical wall; and the second portion of joint (42) comprises a fourth portion of cylindrical wall; the third portion of cylindrical wall

dical wall and the fourth portion of wall are directly coupled to one another realising a form coupling.

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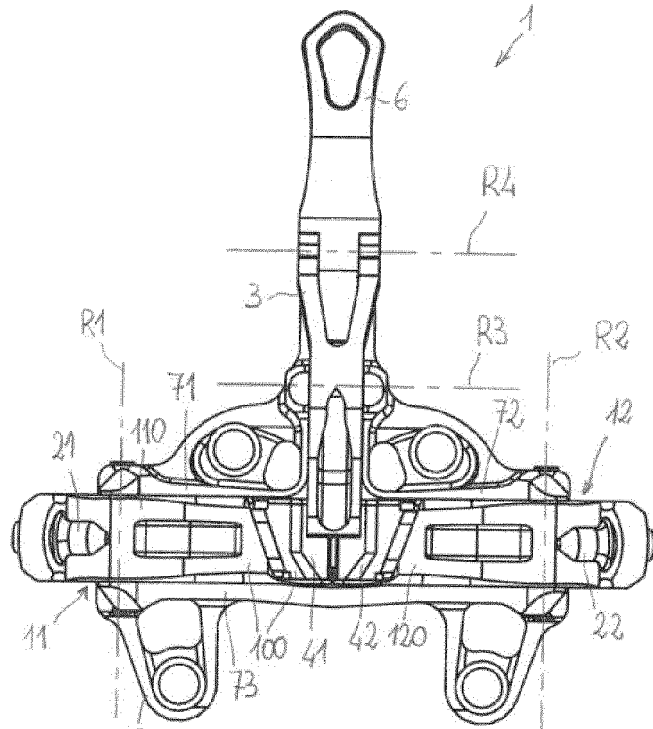


FIG 1

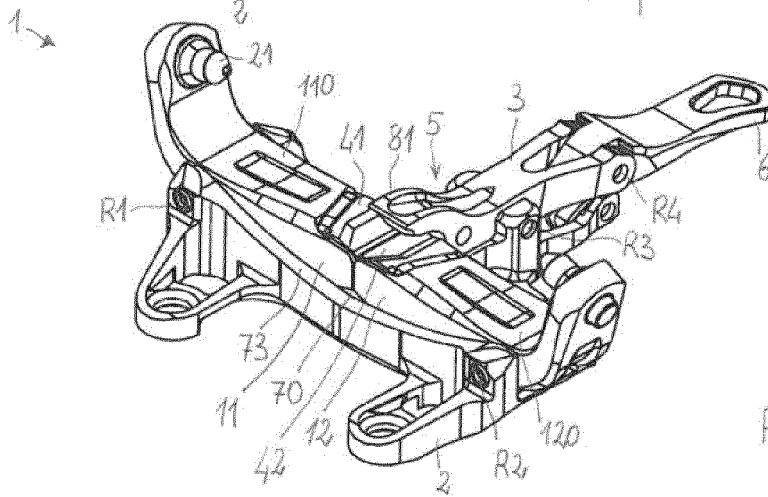


FIG 2

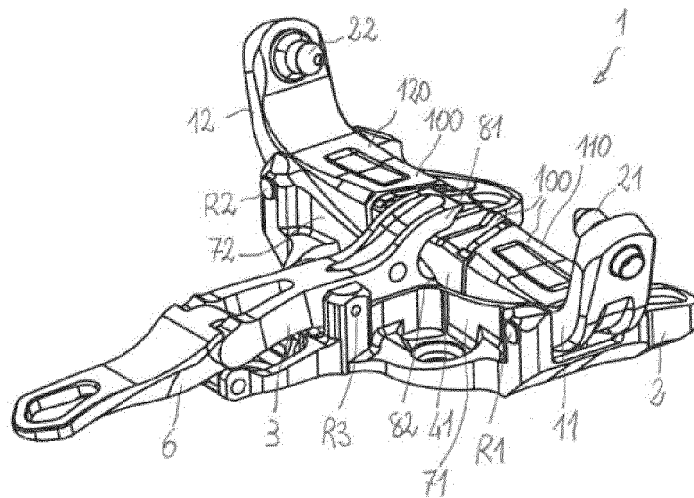


FIG 3



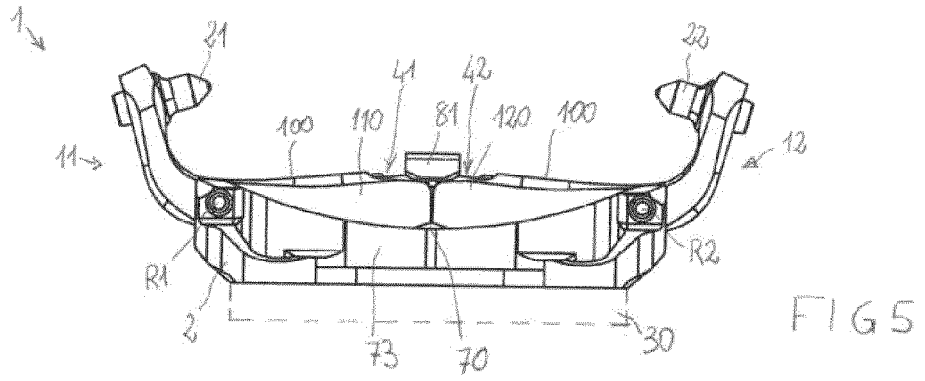


FIG 5

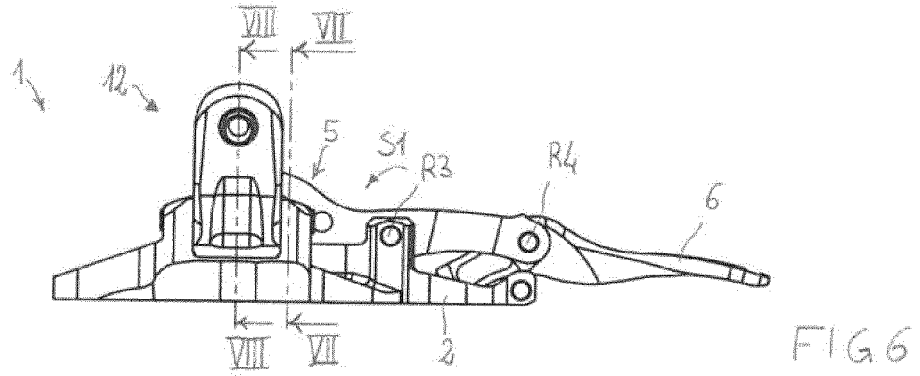


FIG 6

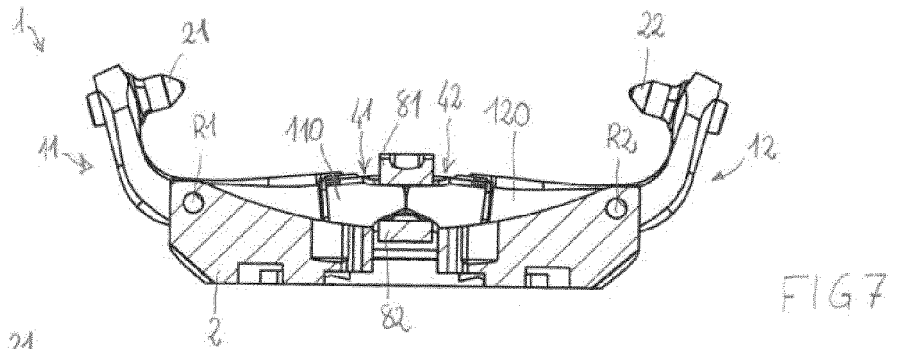


FIG 7

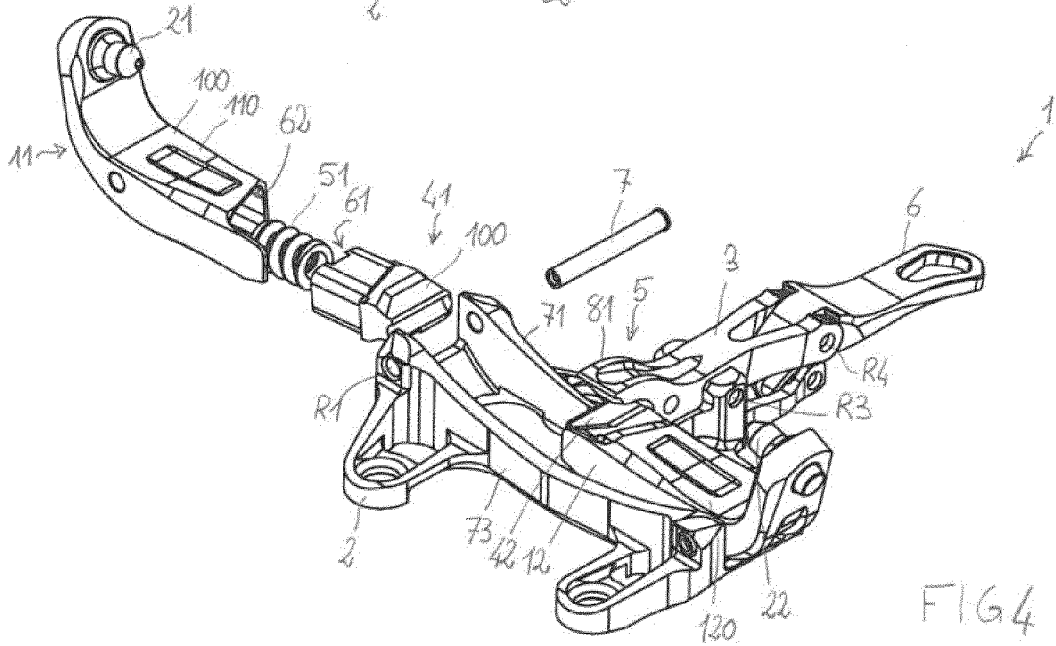


FIG 4

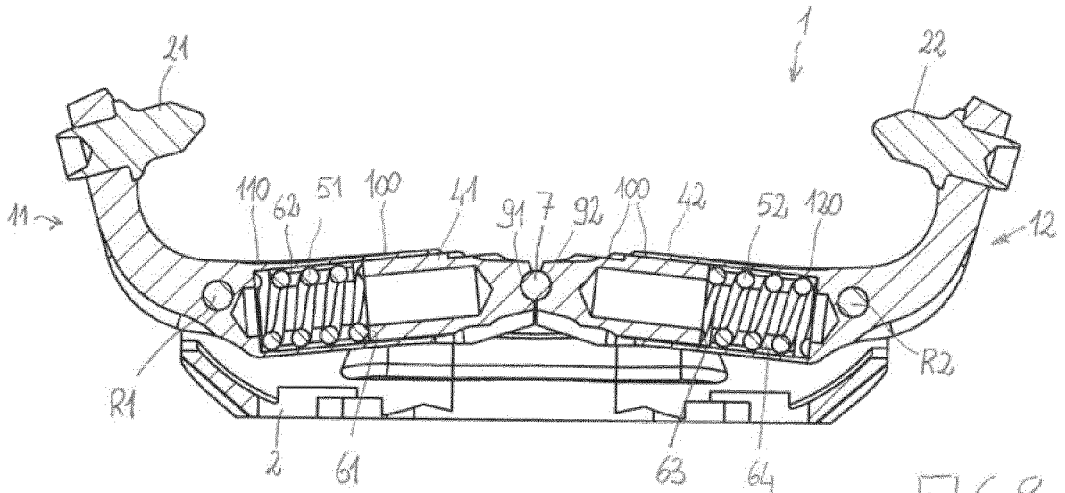


FIG 8

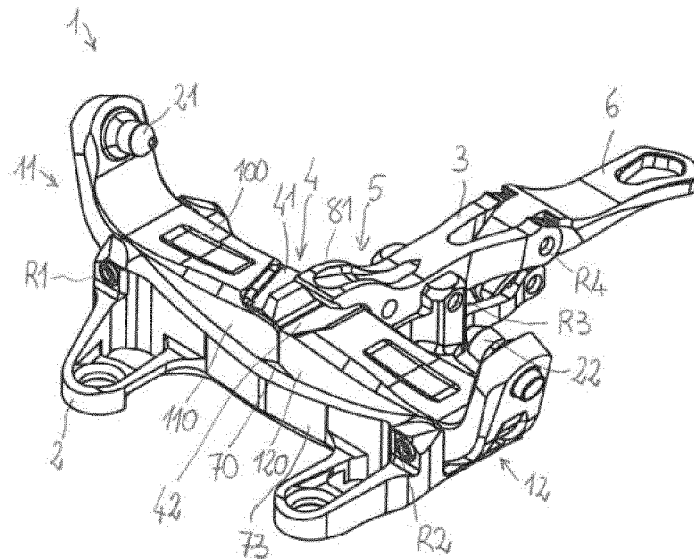


FIG 16

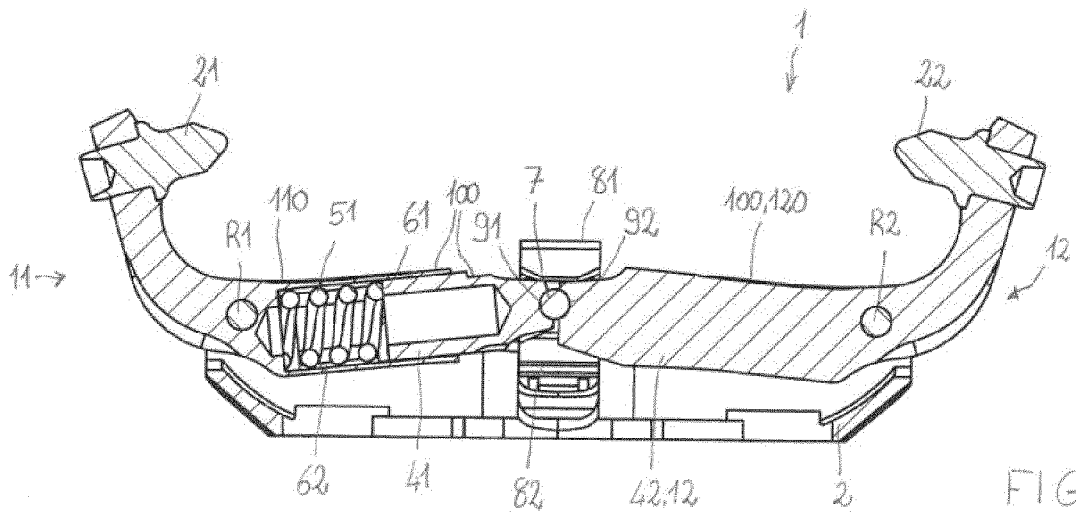


FIG 17

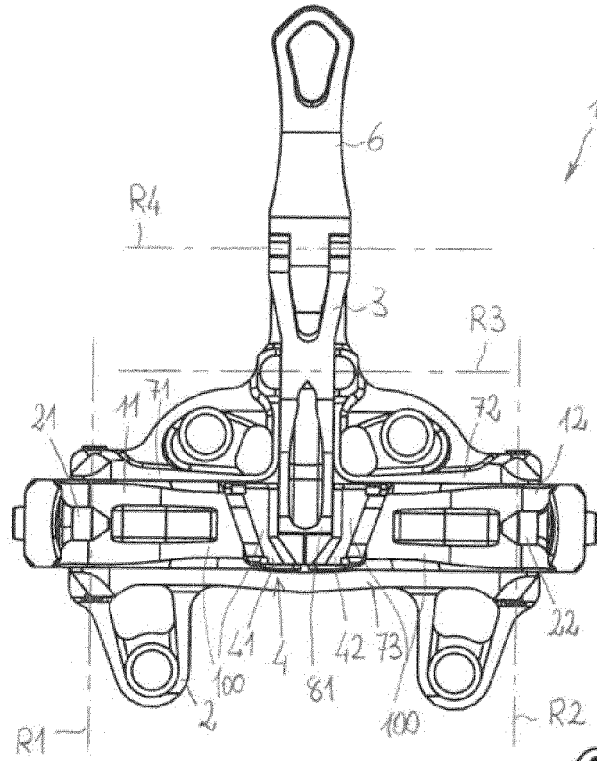


FIG 9

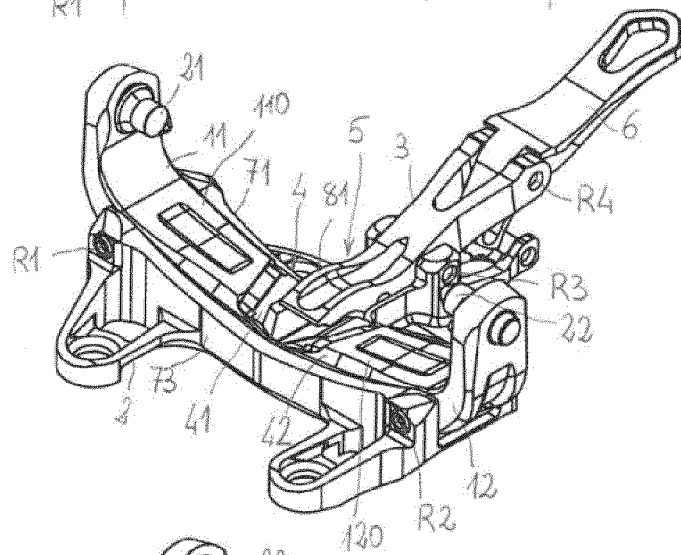


FIG 10

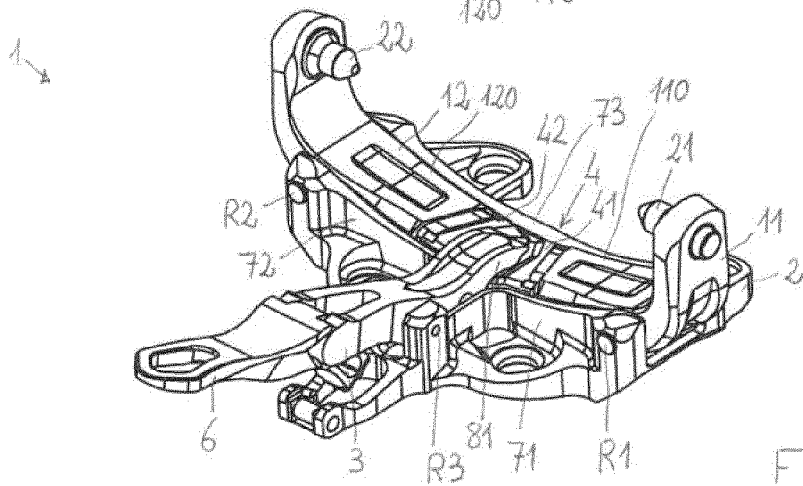
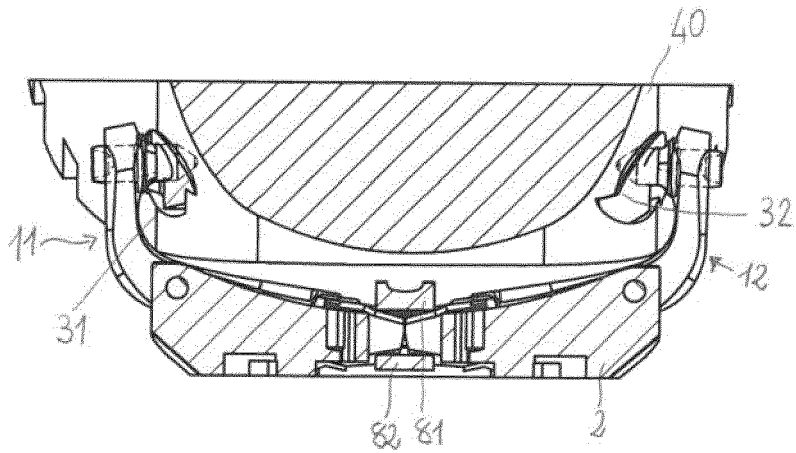
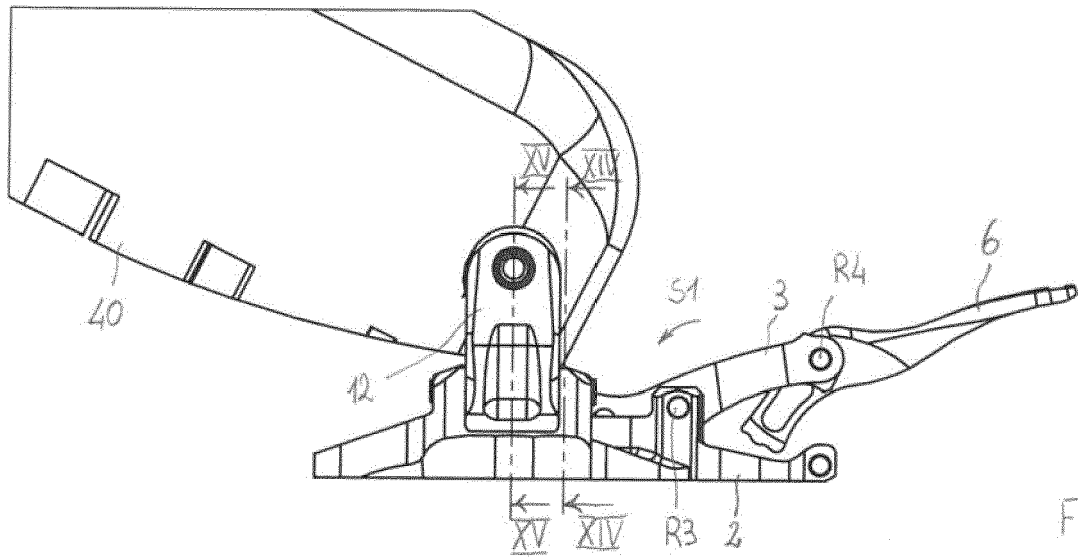
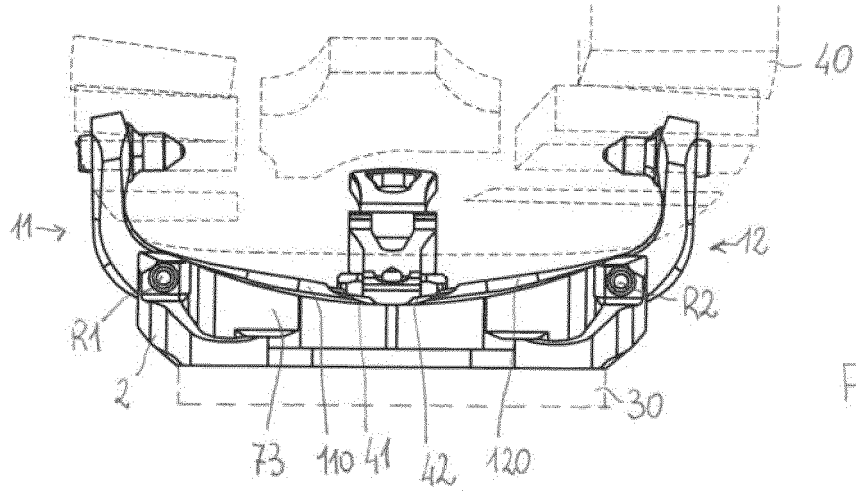


FIG 11



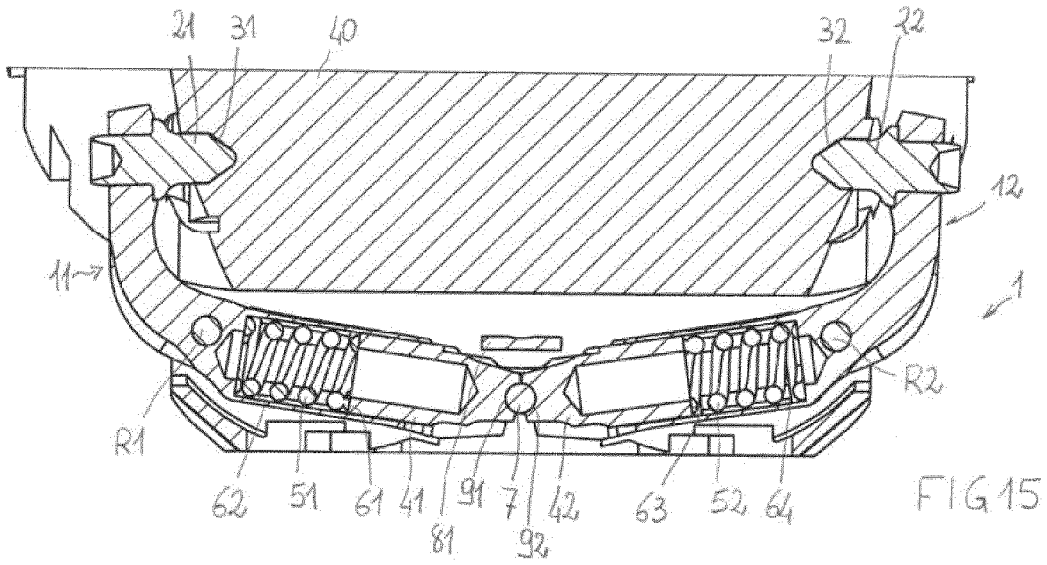


FIG 15

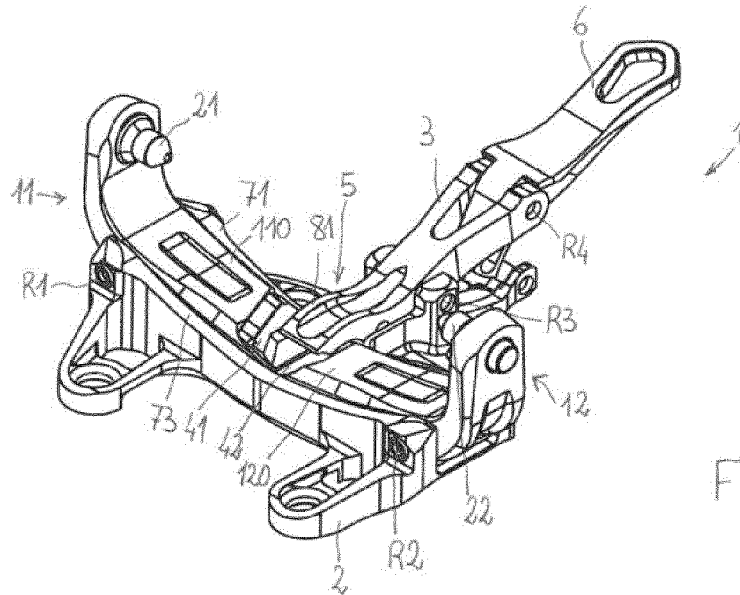


FIG 18

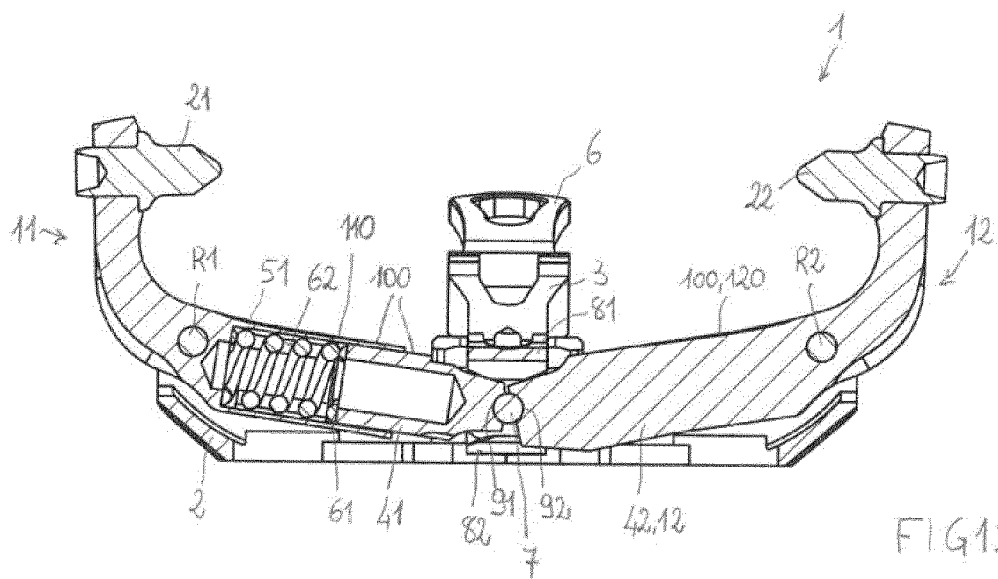


FIG 19

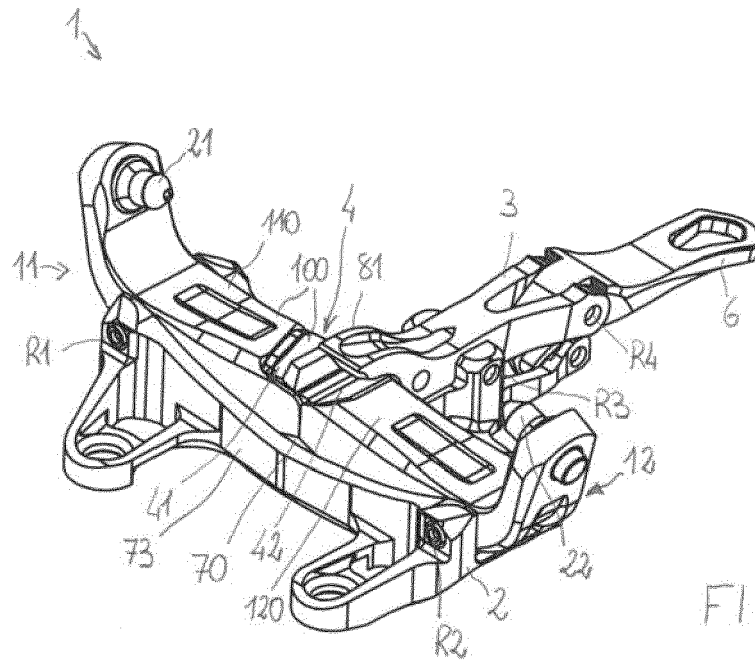


FIG 20

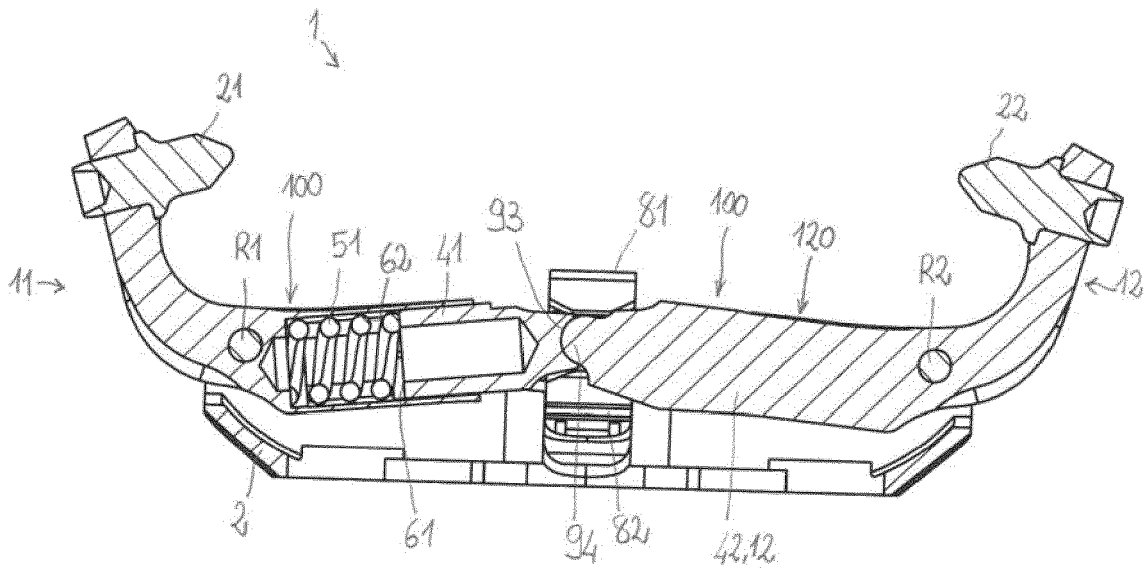


FIG 21

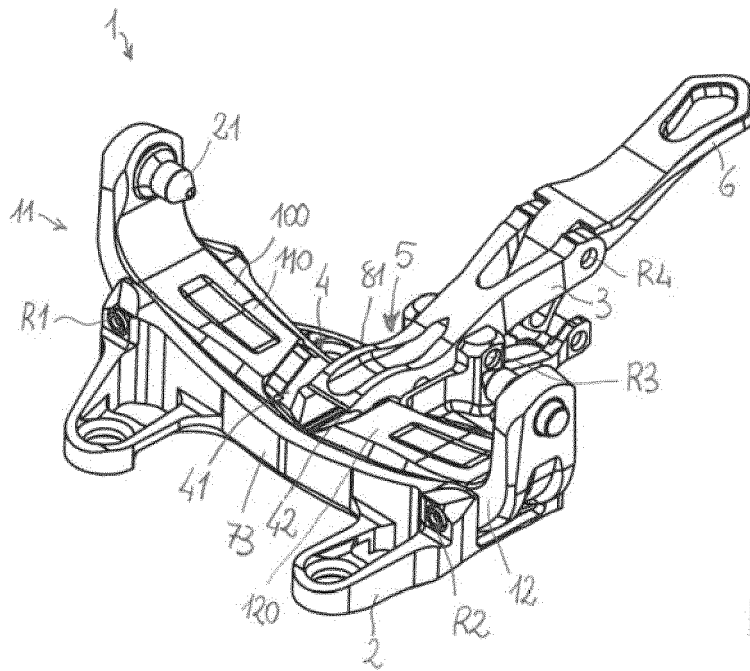


FIG 22

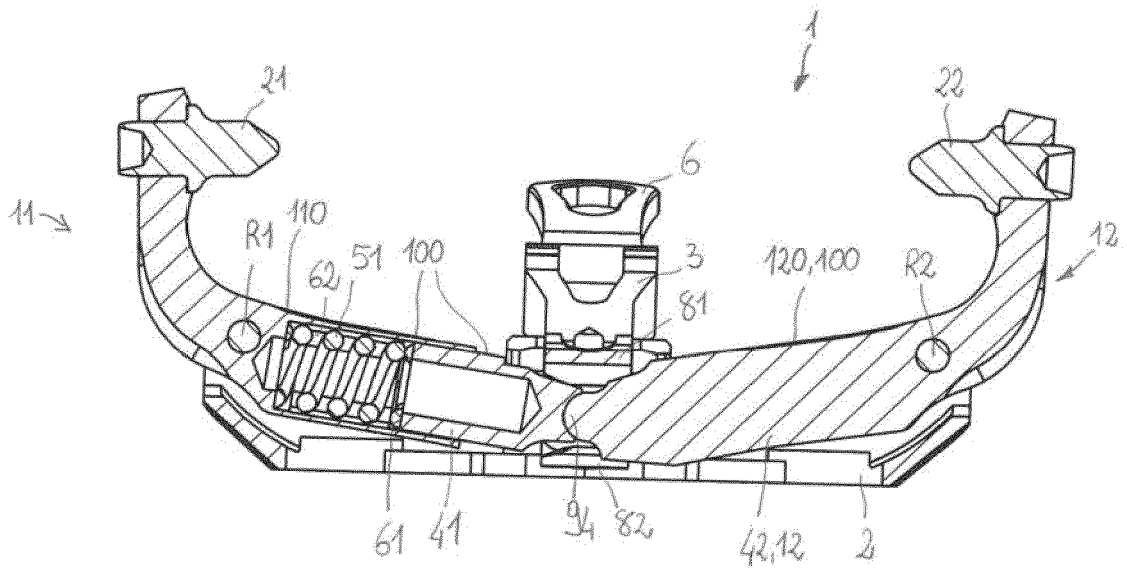


FIG 23



EUROPEAN SEARCH REPORT

Application Number

EP 22 19 6900

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A	* paragraph [0019] - paragraph [0031]; claim 1; figure 4 *	5-8	
Y	EP 3 050 601 A1 (ATK RACE SRL [IT]) 3 August 2016 (2016-08-03) * paragraphs [0031] - [0049]; figures 12,15-30 *	1-4	
Y	EP 2 769 755 A1 (ROSSIGNOL SA [FR]) 27 August 2014 (2014-08-27) * figure 8 *	1-4	
			TECHNICAL FIELDS SEARCHED (IPC)
			A63C
The present search report has been drawn up for all claims			
Place of search <b>Munich</b>		Date of completion of the search <b>29 November 2022</b>	Examiner <b>Murer, Michael</b>
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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ON EUROPEAN PATENT APPLICATION NO.

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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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29-11-2022

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			<b>EP 2300111 A1</b>	<b>30-03-2011</b>
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