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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); a first jaw (3) and a second jaw (4), each comprising an external end (30, 40), an internal end (31, 41), and a central body (32, 42); the central body (32) of the first jaw (3) is hinged to the plate (2) with respect to a first hinge axis (X), and the central body (42) of the second jaw (4) is hinged to the plate (2) with respect to a second hinge axis (Y); the internal end (31) of the first jaw (3) and the internal end (41) of the second jaw (4) are hinged to one another with respect to a hinge axis (H), in such a way that the first jaw (3) and the second jaw (4) are mobile such as to define two end configurations, open (O) and closed (C); the second jaw (4) comprises: elastic means (5) arranged between the relative internal end (41) and the relative central body (42); and at least a guide pin (7) for supporting the elastic means (5), such that during the movement of the second jaw (4) from the open configuration (O) to the closed configuration (C), the internal end (41) is mobile along a guide pin (7), determining a variable distance between the second hinge axis (Y) and the central hinge axis (H); and wherein the first jaw (3) constitutes a rigid element which develops from the relative external end (30) to the relative internal end (31), wherein the distance between the first axis (X) and the central hinge axis (H) remains constant during the movement of the first jaw (3) from the open configuration (O) to the closed configuration (C).

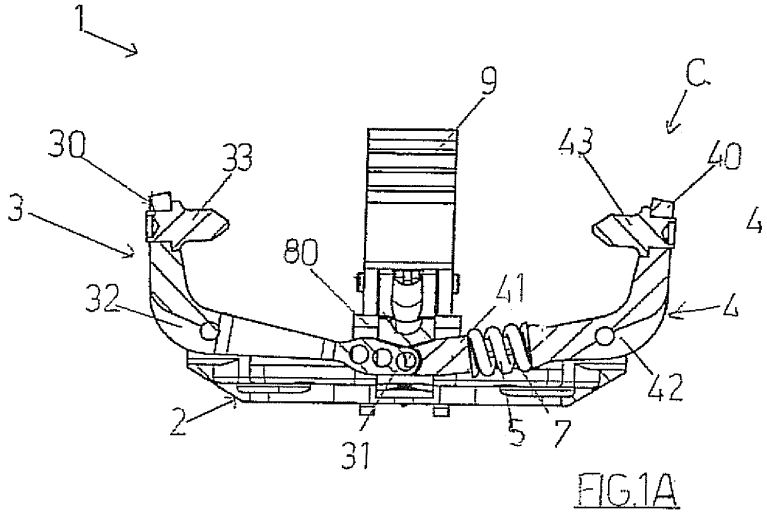

FIG.1A

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Description

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

[0002] A toe-piece for a binding for Alpine ski bindings of a known type comprises: a plate fixable to a ski at the lower surface of the ski; 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 (i.e. on the opposite surface to the lower surface), in such a way 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 toe-piece conformed and arranged such as to insert internally of a hole in an Alpine ski boot.

[0004] Further, the ends of the two jaws are hinged to one another with respect to a central hinge axis, such that they are mobile so as to define two end configurations, open and closed.

[0005] The two jaws further each comprise: two springs arranged between the relative internal end and the relative central body and two guide pins for supporting the springs, connected to the relative central body and partially inserted in the relative internal end. In this way, during the movement of the jaws from the open configuration to the closed configuration, and vice versa, each internal end is mobile along the corresponding guide pins. Therefore, the distance between the hinge axes of the jaws with the plate and the central hinge axis is variable during the movement of the jaws from the open configuration to the closed configuration, and vice versa.

[0006] The presence of the four springs and the four guide pins enables the jaws to be brought from the open configuration to the closed configuration, and vice versa, for engaging or disengaging, with the relative toe-pieces, corresponding holes afforded in a ski boot.

[0007] The toe-piece further comprises a main lever, hinged to the plate along a perpendicular axis to the hinge axes of the jaws with the plate. An end of the main level is fork-shaped such as to receive, in the recess of the fork, the internal ends of the jaws.

[0008] The toe-piece further comprises a safety lever, scissor-hinged to the main level on the opposite side with respect to the fork-shaped end. The safety lever is hinged with respect to an axis parallel to the hinge axis of the main level with the plate.

[0009] The toe-piece for Alpine skiing described above exhibits however some drawbacks.

[0010] The known toe-piece comprises, for example, a high number of components which cooperate with one another: this results in a very complicated assembly of the toe-piece, as well as difficult operations of cleaning/maintenance/replacement of the relative components when required.

[0011] The final user further encounters another practical disadvantage, as the plurality of components making up the toe-piece determine a considerable overall weight thereof.

[0012] An aim of the present invention is to obviate the above-mentioned drawbacks.

[0013] This aim is attained by disclosing a toe-piece for an Alpine ski binding according to the contents of claim 1.

[0014] The toe-piece of the invention comprises a reduced number of components with respect to a known toe-piece: this leads to a simple assembly of the toe-piece, and also facilitates the cleaning/maintenance/replacement operations of the relative components in a case of need.

[0015] Further, the final user notes, with the toe-piece of the invention, a considerably practical advantage, as the constructional simplicity of the proposed solution guarantees a limited weight thereof, especially appreciated by those using the toe-piece for sports competitive purposes.

[0016] Further advantages will more fully emerge during the course of the following description, with the aid of the tables of drawings, in which:

- figures 1 and 2 illustrate two plan views of a toe-piece for Alpine skiing according to the invention, respectively in a closed and open configuration of the jaws;
- figures 1A, 2A illustrate two views, respective along section A-A of figure 1 and section B-B of figure 2.

[0017] With reference to the accompanying figures of the drawings, 1 denotes in its entirety a toe-piece for an Alpine ski binding according to the present invention.

[0018] The toe-piece 1 of the invention comprises: a plate 2 fixable to a ski (not illustrated); a first jaw 3 and a second jaw 4, each comprising an external end 30, 40, an internal end 31, 41 and a central body 32, 42, interposed between the external end 30, 40 and the internal end 31, 41. The first jaw 3 and the second jaw 4 are arranged on the plate in such a way as to be facing one another, and in particular the central body 32 of the first jaw 3 is hinged to the plate 2 with respect to a first hinge axis X, and the central body 42 of the second jaw 4 is hinged to the plate 2 with respect to a second hinge axis Y parallel to the first hinge axis X. Each external end 30, 40 of the first jaw 3 and the second jaw 4 is provided with a pin 33, 43 for engaging a hole of a ski boot (not illustrated). The internal end 31 of the first jaw 3 and the internal end 41 of the second jaw 4 are hinged to one another with respect to a central hinge axis H parallel to the first hinge axis X and the second hinge axis Y, such that the first jaw 3 and the second jaw 4 are mobile so as to define two end configurations, open O and closed C.

[0019] The second jaw 4 further comprises: elastic means 5 arranged between the relative internal end 41 and the relative central body 42; and a seating (not visible

in the figures) in the relative internal end 41; and at least a guide pin 7 for supporting the elastic means 5, connected to the relative central body 42 and partially inserted in the seating of the relative internal end 41 such that during the movement of the second jaw 4 from the open configuration O to the closed configuration C, and vice versa, the internal end 41 is mobile along the guide pin 7. Consequently, during the movement of the second jaw 4 from the open configuration O to the closed configuration C (and vice versa) a variable distance is determined between the second hinge axis Y and the central hinge axis H (since, during the movement of the second jaw 4 from the open configuration O to the closed configuration C and vice versa, the relative internal end 41 nears and distances to and from the relative central body 42, moving along the pin 7).

[0020] In particular, the first jaw 3 constitutes a rigid element which develops from the relative external end 30 to the relative internal end 31, in which the distance between the first axis X and the central hinge axis H remains constant during the movement of the first jaw 3 from the open configuration O to the closed configuration C.

[0021] In other words, the first jaw 3 comprises neither elastic means nor guide pins as was the case in toe-pieces of known type, in which both the jaws comprised both elastic means and guide pins.

[0022] The first jaw 3 and the second jaw 4 are thus differently conformed, as the central body 32 of the first jaw 3 is prolonged up to the axis of the relative internal end 31, while the elastic means 5 and the guide pin 7 are arranged between the central body 42 of the second jaw 4 and the internal end 41.

[0023] For example, the first jaw 3 can be realised in a single body or can be constituted by two or more parts connected to one another.

[0024] The toe-piece 1 of the present invention is advantageously structurally simpler and lighter with respect to known toe-pieces, as it exhibits a limited number of components with respect to known toe-pieces.

[0025] In fact, the toe-piece 1 of the invention exhibits elastic means 5 and at least a guide pin 7 associated exclusively to the second jaw 4, in particular by simplifying the structure of all the toe-piece 1.

[0026] The excellent functioning of the toe-piece 1, i.e. the contextual movement of the two jaws 3, 4 from the open configuration O (figures 2, 2A)to the closed configuration C (figures 1, 1A) and vice versa, is however guaranteed.

[0027] In the preferred embodiment illustrated in the accompanying figures, the toe-piece 1 comprises two guide pins 7 (visible only partially in the figures), and the elastic means comprise a spring 5, preferably two springs 5, each associated to a guide pin 7.

[0028] In the prior art, on the other hand, there were two springs and two guide pins for each jaw, making in total four springs and four guide pins.

[0029] The simplicity of construction of the toe-piece 1 of the invention is thus clear, and leads to a reduction of times and costs linked to the assembly of the toe-piece and the replacement/cleaning/maintenance of the various components with respect to the prior art.

[0030] The toe-piece 1 of the invention is further sturdier than known toe-pieces. In fact, in order to enable fixing the guide pins to the remaining part of the corresponding jaw, seatings are provided in which the ends of the guide pins are inserted. The seatings can however constitute a potential weakening element for the toe-piece.

[0031] As the known toe-pieces include the guide pins being associated to both jaws, the known toe-pieces exhibit a greater number of seatings with respect to the toe-piece 1 of the invention, and are therefore subjected to a greater weakening.

[0032] With reference to the accompanying figures, the toe-piece 1 of the invention further comprises a main level 8, hinged to the plate 2 according to a perpendicular axis to the first hinge axis X and to the second hinge axis Y. An end 80 of the main lever 8 is fork-shaped so as to (at least partially) receive, in the recess of the fork 1, the internal end 31 of the first jaw 3 and the internal end 41 of the second jaw 4.

[0033] The toe-piece 1 further comprises a safety lever 9, fork-hinged to the main lever on the opposite side to the fork-shaped end 80.

[0034] The safety lever 9 is hinged with respect to a parallel axis 91 to the hinge axis of the main lever 8 with the plate 2 (see figures 1 and 2).

[0035] In a preferred embodiment, the safety lever 9 is subjected to elastic means 92, constituted for example by a spring (see figure 2), as described in Italian patent IT 1.378.791 belonging to the same Applicant.

[0036] The above has been described by way of non-limiting example, and any eventual constructional variants are understood to fall within the scope of the following claims.

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), each comprising an external end (30, 40), an internal end (31, 41), and a central body (32, 42) interposed between the external end (30, 40) and the internal end (31, 41), and arranged on the plate (2) in such a way as to be opposite one another;
wherein the central body (32) of the first jaw (3) is hinged to the plate (2) with respect to a first hinge axis (X), and the central body (42) of the second jaw (4) is hinged to the plate (2) with respect to a second hinge axis (Y) parallel to the first hinge axis (X);
and wherein each external end (30,40) of the

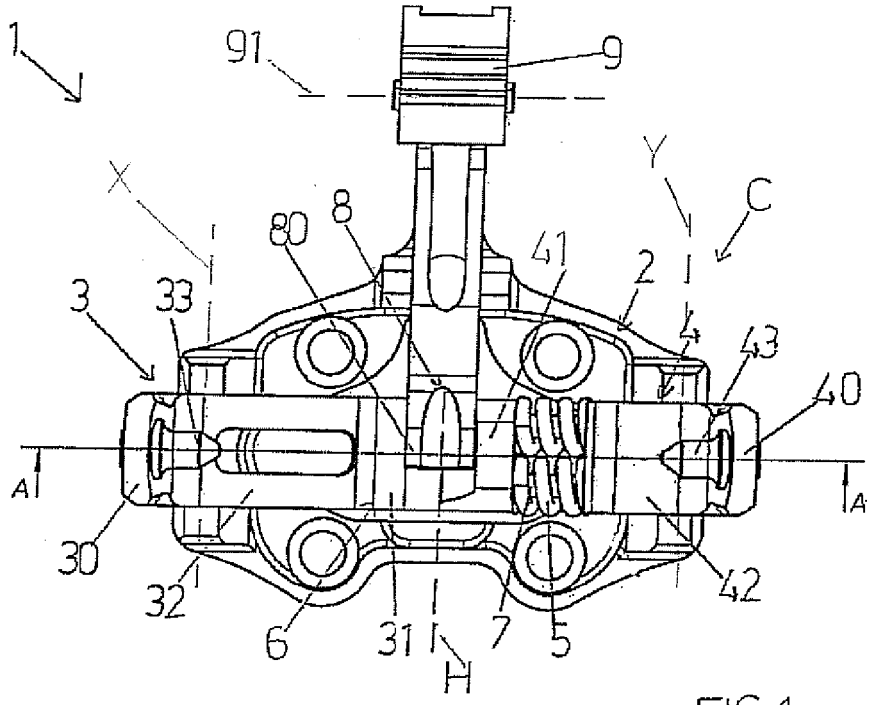
first jaw (3) and the second jaw (4) is provided with a pin (33, 43) for engaging a hole of a ski boot;
the internal end (31) of the first jaw (3) and the internal end (41) of the second jaw (4) are hinged to one another with respect to a central hinge axis (H) parallel to the first and second hinge axis (X, Y), in such a way that the first jaw (3) and the second jaw (4) are mobile such as to define two end configurations, open (O) and closed (C);
the second jaw (4) further comprises: elastic means (5) arranged between the relative internal end (41) and the relative central body (42); a seating in the relative internal end (41); and at least a guide pin (7) for supporting the elastic means (5), connected to the relative central body (42) and partially inserted in the seating of the relative internal end (41) such that during the movement of the second jaw (4) from the open configuration (O) to the closed configuration (C), and vice versa, the internal end (41) is mobile along a guide pin (7), consequently determining a variable distance between the second hinge axis (Y) and the central hinge axis (H); **characterised in that**:

the first jaw (3) constitutes a rigid element which develops from the relative external end (30) to the relative internal end (31), wherein the distance between the first axis (X) and the central hinge axis (H) remains constant during the movement of the first jaw (3) from the open configuration (O) to the closed configuration (C).

2. The toe-piece (1) of the preceding claim, wherein the elastic means comprise at least a spring (5) associated to the pin (7).

3. The toe-piece (1) of any one of the preceding claims, further comprising a main lever (8), hinged to the plate (2) according to an axis perpendicular to the first and second hinge axes (X, Y); an end (80) of the main lever (8) being fork-shaped, so as to at least partially receive, in a recess of the fork-shape, the internal end (31) of the first jaw (3) and the internal end (41) of the second jaw (4); the toe-piece (1) further comprising a safety lever (9), hinged to the main lever (8) on an opposite side with respect to the fork-shaped end (80), with respect to an axis (91) that is parallel to the hinge axis of the main lever (8) with the plate (2).

4. The toe-piece of the preceding claim, further comprising elastic means (92), associated to the main lever (8) and to the safety lever (9), at the relative hinge axis (91).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C
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H

FIG.1

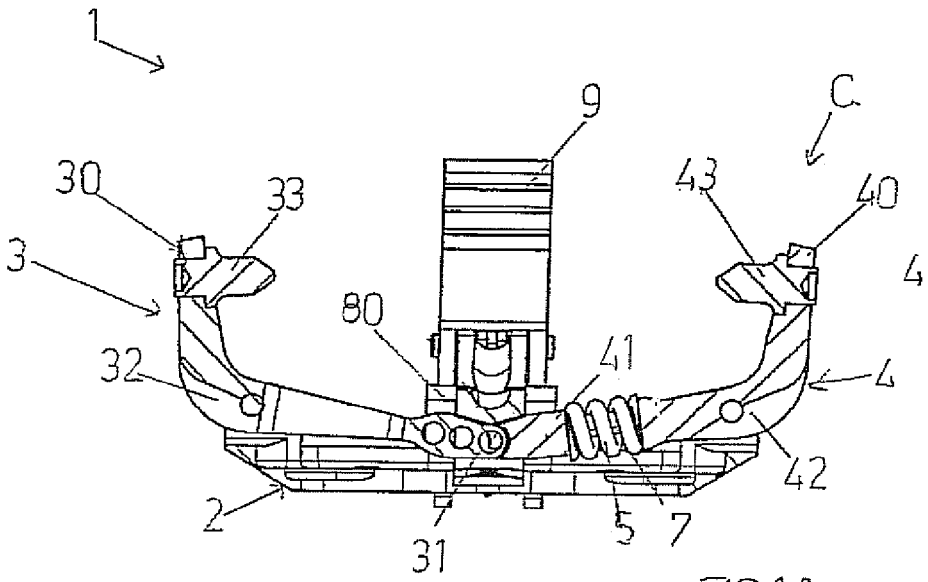
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FIG.1A

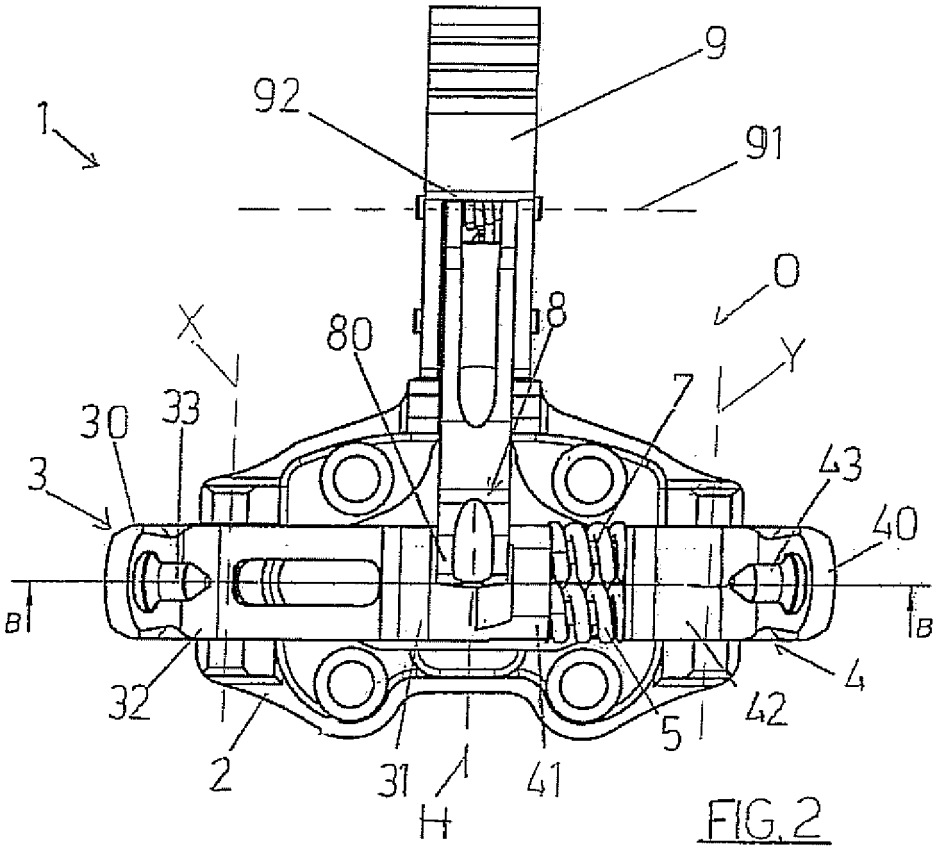
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FIG. 2

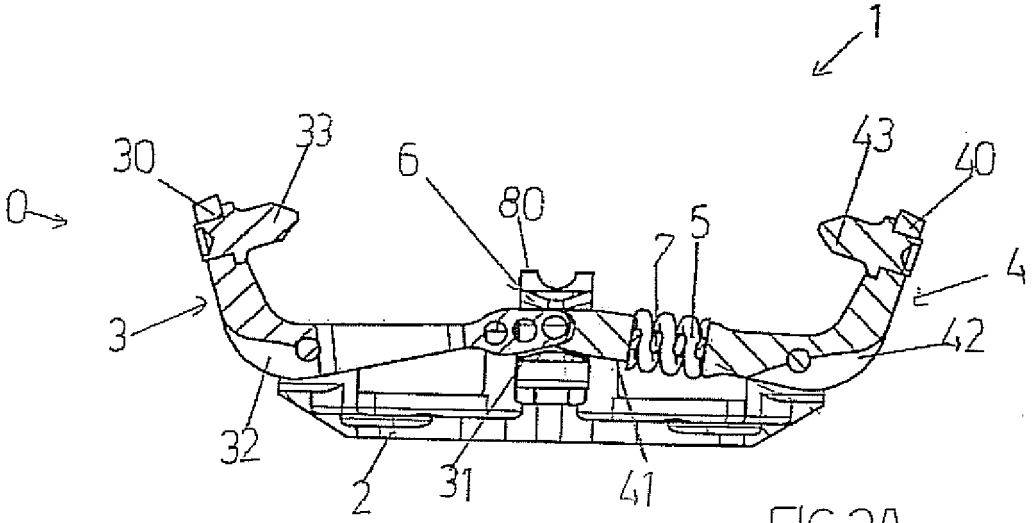
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FIG.2A

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EUROPEAN SEARCH REPORT

Application Number
EP 14 17 2027

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	EP 2 347 807 A1 (ATK RACE S R L [IT]) 27 July 2011 (2011-07-27) * the whole document *	1-4	INV. A63C9/086 A63C9/085
A	EP 2 392 388 A1 (SALEWA SPORT AG [CH]) 7 December 2011 (2011-12-07) * the whole document *	1-4	
A	EP 2 308 568 A1 (GIORDANI ROBERTO [IT]) 13 April 2011 (2011-04-13) * the whole document *	1-4	

TECHNICAL FIELDS SEARCHED (IPC)
A63C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	5 November 2014	Haller, E

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EP 2308568 A1	13-04-2011	NONE	

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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