



(11) **EP 4 442 335 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
09.10.2024 Bulletin 2024/41

(51) International Patent Classification (IPC):
A63C 9/08 ^(2012.01) **A63C 9/085** ^(2012.01)
A63C 9/088 ^(2012.01)

(21) Application number: **24162523.5**

(52) Cooperative Patent Classification (CPC):
A63C 9/0802; A63C 9/08564; A63C 9/08592;
A63C 9/0885; A63C 2203/12; A63C 2203/18;
A63C 2203/22; A63C 2203/24

(22) Date of filing: **10.03.2024**

(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 ME MK MT NL
NO PL PT RO RS SE SI SK SM TR

Designated Extension States:

BA

Designated Validation States:

GE KH MA MD TN

(30) Priority: **03.04.2023 IT 202300006486**

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(54) **SKI BINDING AND RELATED PROCESS FOR RELEASING A BOOT FROM SAID BINDING**

(57) A ski binding (1) is provided comprising a casing (2) defining at least a seat (20) developing along an axis (2a); elastic opposition means (3) housed in the seat (20) configured, when subject to a dilation, to produce a resistance force to opening of the binding (1); adjusting means (4) suitable to adjust the resistant force and comprising at least a cursor (40) housed in the seat (20), movable along the axis (2a), and configured to determine, when moved along the axis (2a), the dilation on the opposition means (3) so as to define at least a minimum limit position wherein the opposition means (3) is unloaded and a loading position wherein the opposition means (3) subjects a dilation, a control element (41) integral to the cursor (40) and movable along the axis (2a) so as to be able to control the passage from the unloading position to the loading one and vice versa, locking means (5) suitable to lock the control element (41) when actuated; wherein the adjusting means (4) further comprises a control element (42) kinematically constrained to the control element (41) so that when the control element (41) translates along the axis (2a), the monitoring element (42) rotates around the axis (2a), and wherein the locking means (5) comprises an obstruction element (50) defining at least an unlocking configuration wherein the obstruction element (50) interferes with the rotation of the monitoring element (42), and an unlocking configuration wherein the obstruction element (50) does not in-

terfere with the rotation of the monitoring element (42).

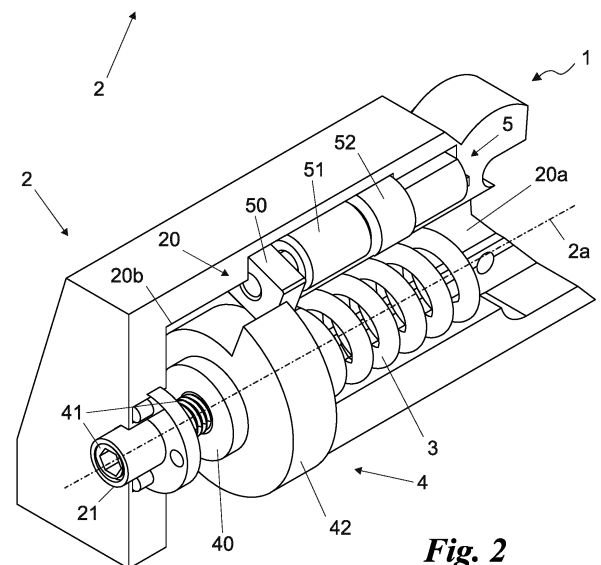


Fig. 2

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Description

[0001] The present invention relates to a ski binding and related process for releasing a boot from said binding of the type specified in the preamble of the first claim.

[0002] In particular, the present invention relates to any binding, both a front or a rear one, suitable to allow to release the boot from a ski through control means preferably acting remotely and related releasing process.

[0003] As it is known, among the various equipment typical of alpine skiing there are the ski bindings.

[0004] The bindings generally include two parts corresponding to a tip portion, also known as toe cap, and a heel portion, also known as heel cap, respectively. Such portions are configured, in particular, to attach a ski boot. Although structured differently, both bindings include compression springs and are constrained, for example through screws, to the plate or directly to the ski.

[0005] The springs, then, can be adjusted so that they can vary, at will, the stability of the binding and, in particular, the resistance force to opening of the binding itself.

[0006] Conventionally, the springs are adjusted based upon a scale called DIN. The correct setting of the DIN values, then, is based on biometrical data of the user, such as for example weight, height, boot size, skiing style, age or more. Wrong settings can create problems, since the ski could detach preventively after a sudden manoeuvre or, on the contrary, could not detach during a fall and cause major trauma. Therefore, the most important drawback of the bindings of known art is given by the fact that the same do not succeed in guaranteeing sufficient safety while using skis and, then, they do not reduce to the minimum the probability of injury of the user for example as a result of a fall.

[0007] This drawback, already marked in the field of the amateur alpine skiing, can assume considerable importance in the field of the professional skiing.

[0008] In fact, the ski bindings for professional skiers are generally calibrated so that the DIN value is extremely higher than, for example, the standard adjustment value of the spring with respect to the above criteria.

[0009] This is commonly done to prevent the ski from having, especially during the competitive competitions, a premature release which could cause a fall at extremely high speed and inertia, as well as the performance impairment.

[0010] In this situation the technical task underlying the present invention is to devise a ski binding, and related process for releasing a boot from said binding, capable of substantially obviating at least part of the mentioned drawbacks.

[0011] Within said technical task an important object of the invention is to obtain a ski binding, and related process for releasing a boot from said binding, allowing to reduce the force for retaining the binding on command, so as to allow to release the ski even and especially to athletes which set the binding at an extremely high DIN

value.

[0012] Another important object of the invention is to implement a ski binding, and related process for releasing a boot from said binding, allowing to maintain a structure similar to the existing bindings or, however, which does not require radical variations in the geometry of the conventional bindings.

[0013] In conclusion, an additional task of the invention is to obtain a ski binding, and related process for releasing a boot from said binding, which is structurally simple and economically and quickly implementable.

[0014] The technical task and the specified objects are achieved by a ski binding, and related process for releasing a boot from said binding, as claimed in the enclosed claim 1.

[0015] Preferred technical solutions are highlighted in the depending claims.

[0016] The features and the advantages of the invention are explained hereinafter by the detailed description of preferred embodiments of the invention, with reference to the enclosed drawings, wherein:

Figure 1 shows a view in longitudinal section of a ski binding according to the invention in a first embodiment;

Figure 2 illustrates a perspective front view of the ski binding of Figure 1;

Figure 3 is a perspective rear view of the ski binding of Figures 1-2;

Figure 4 represents a view in longitudinal section of a ski binding according to the invention in a second embodiment;

Figure 5 illustrates a perspective front view of the ski binding of Figure 4;

Figure 6 is a perspective rear view of the ski binding of Figures 4-5.

Figure 7 represents a perspective front view of the ski binding of Figures 1-3 equipped with tensioning means;

Figure 8 shows a perspective front view of the binding of Figures 4-6 equipped with tensioning means;

Figure 9 illustrates a view in longitudinal section of a ski binding according to the invention in a third embodiment wherein adjusting means and tensioning means are reversed; and

Figure 10 shows a perspective front view of the ski binding of Figure 9.

[0017] In the present document, the measurements, values, shapes and geometrical references (such as perpendicularity and parallelism), when associated to words such as "about" or other similar terms such as "approximately" or "substantially", are to be meant as excluding measurement errors or inaccuracies due to production and/or manufacturing errors and, above all, excluding a slight deviation from the value, measurement, shape or geometrical reference thereto it is associated. For example, such terms, if associated to a value, preferably des-

ignite a deviation not higher than 10% of the value itself.

[0018] Moreover, when used, terms such as "first", "second", "higher", "lower", "main" and "secondary" do not identify necessarily an order, a relation priority or relative position, but they can be simply used to distinguish more clearly components different from each other.

[0019] Unless otherwise specified, as it results from the following discussions, it is considered that terms such as "treatment", "computer science", "determination", "calculation", or the like, relate to the action and/or processes of a computer or similar electronic calculation device which manipulates and/or transforms data represented as physical data, such as electronic quantities of registers of a computer system and/or memories into other data similarly represented as physical quantities within computer systems, registers or other devices for storing, transmitting or displaying information.

[0020] The measurements and data reported in the present text are to be considered, unless otherwise indicated, as performed under International Standard Atmosphere ICAO (ISO 2533:1975).

[0021] With reference to the Figures, the ski binding according to the invention is designated as whole with number 1.

[0022] The binding 1 is suitable to be positioned on a ski. The ski obviously can be of any type, that is suitable to any discipline, both alpine skiing, cross country skiing, telemark or more.

[0023] The binding 1, generally, is configured to constrain a boot. The boot can be any boot suitable for skiing. The boot too can be of any type depending upon the skiing discipline thereto it is intended.

[0024] In any case, the boot defines a tip and a heel.

[0025] The tip is the boot front portion, that is the portion adjacent to the user toes. The heel is the boot rear portion, opposite the tip and adjacent to the user's foot heel. The binding 1 can be, in detail, configured to allow the constraint of the tip or heel. Therefore, the invention can allow to implement a toe cap including the binding 1, or a heel cap comprising the binding 1.

[0026] The binding 1 then can be configured to interact with the tip or with the heel of the boot.

[0027] On this regard, the binding 1 can comprise conventional attaching means, for example jaw, snap-on attachment or other, common to the vast majority of the skies currently on the market.

[0028] For example, the attaching means could comprise one or more obstruction elements configured to lock the motion of the tip or of the heel with respect to the binding 1.

[0029] The attaching means could be configured to lock integrally the tip or the heel, that is with respect to any translation and rotation direction. Or the attaching means could be configured to lock the mutual translation motion between binding 1 and tip or heel along any direction by leaving free the rotation around an axis perpendicular to the development axis of the ski on which the binding 1 is mounted, when the latter is in use, and

lying on the development plane of the ski itself. A configuration of this type would be useful, for example, for telemark.

[0030] Briefly, the binding 1 comprises at least a casing 2 and opposition means 3.

[0031] The casing 2 substantially is a container, that is a carter, inside which the various components and mechanisms are positioned. The casing 2 can be wholly closed or half-open.

[0032] Moreover, it is operatively connected to the attaching means, or contains them at least partially. The casing 2, as a whole, can be similar to any casing currently present on the market.

[0033] Generally, the casing 2 comprises at least a seat 20.

[0034] The seat 20 substantially is a space, for example formed by a cavity, inside the casing 2. Preferably, the seat 20 develops along a longitudinal axis 2a.

[0035] The longitudinal axis 2a, for example, is parallel to the ski development axis, that is the axis along which the ski develops more in length, when the binding 1 is mounted on the ski and it is part of a toe cap. Alternatively, the longitudinal axis 2a could be also transversal to the ski development axis, when the binding 1 is mounted on the ski and it is part of a heel cap.

[0036] The opposition means 3 is suitable to interact with the attaching means. Therefore, the opposition means 3 is apt to implement a resistance force to opening of the attaching means in order to be able to define the force or stiffness of the binding. For example, the opposition means 3 can be implemented by an elastic element, in particular a spring or other equivalent element in functional terms.

[0037] Similar mechanisms extremely known to the current state of art can have, for example, different geometries or structures which, in any case, very often comprise the opposition means 3.

[0038] In any case, as already said, the opposition means 3 is preferably of elastic type. Moreover, the opposition means 3 is housed in the seat 20.

[0039] Then, the opposition means 3 is configured, when subject to a dilation along the longitudinal axis 2a, to produce a resistance force to opening of the binding 1. The produced resistance force, moreover, is proportional, in particular directly proportional, to the dilation.

[0040] In the preferred embodiment, the opposition means 3 includes, or consists of, one or more springs. The latter preferably develop along or parallelly to the longitudinal axis 2a.

[0041] The binding 1, additionally, comprises even adjusting means 4.

[0042] The adjusting means 4 is suitable to adjust the resistant force. Therefore, they cooperate with the opposition means 3 to be able to increase or decrease the resistant force to the binding 1.

[0043] The adjusting means 4 preferably comprises at least a cursor 40.

[0044] The cursor 40 is housed in the seat 20.

[0045] The cursor 40 is movable along the longitudinal axis 2a.

[0046] The cursor 40, additionally, is operatively connected to the opposition means 3. In order to implement the operating connection, the cursor 40 can be simply rested upon the opposition means 3, for example at one end of the opposition means 3, or it can be constrained thereto.

[0047] The cursor 40 is configured to determine, when moved along the longitudinal axis 2a, the dilation on the opposition means 3.

[0048] In particular, the cursor 40 allows to define at least a minimum limit position and a loading position.

[0049] In the minimum limit position, the opposition means 3 is minimally loaded or unloaded. Therefore, in minimum limit configuration, the opposition means 3 preferably exerts on the binding 1 and/or on the cursor 40, a minimum force, that is a minimum resistant force, in case even null.

[0050] In the loading position, the opposition means 3 is subject to a dilation. The dilation is preferably determined by a compression, but it is not excluded that it could be alternatively determined by a traction. Under the term dilation, for example, an elongation along the longitudinal axis 2a of the opposition means 3 is meant. In this way, the opposition means 3 can exert, on the binding 1 and/or on the cursor 40, a greater resistant force than said minimum force. The resistant force can be any force, preferably defined force, in terms of module, between the minimum force and a maximum force, that is a maximum resistant force. Of course, between minimum force and maximum force different values of the resistant force can be identified which, indeed determine the adjustment.

[0051] The adjusting means 4 also comprises a control element 41.

[0052] The control element 41 is preferably integral to the cursor 40. On this matter, the control element 41 can be constrained to the cursor 40 or can be in one single piece therewith. In any case, preferably, the control element 41 is movable along the longitudinal axis 2a. In this way, the control element 41 can control the passage from the unloading position to the loading position, and vice versa, of the cursor 40. The binding 1 further comprises locking means 5.

[0053] The locking means 5 is operatively connected to the adjusting means 4. Then, the locking means is suitable to lock the control element 41, when actuated. Advantageously, the binding 1 defines a particular connection between control element 41 and locking means 5.

[0054] In fact, the adjusting means 4 further comprises a monitoring element 42.

[0055] The monitoring element 42 is connected at least to the control element 41. Then, the monitoring element 42 is configured to allow the translation of the control element 41 proportionally to its own rotation around the longitudinal axis 2a.

[0056] In particular, the monitoring element 42 is kin-

ematically constrained to the control element 41 so that, when the control element 41 translates along the longitudinal axis 2a, the monitoring element 42 rotates around the longitudinal axis 2a.

[0057] In other terms, the monitoring element 42 allows the translation of the control element 41 when it is free to rotate around the longitudinal axis 2a.

[0058] Then, the locking means 5 comprises an obstruction element 50.

[0059] The obstruction element 50, advantageously, interacts with the monitoring element 42 to determine the locking or unlocking thereof on an alternating basis.

[0060] Then, the obstruction element 50 indeed defines at least a locking configuration and an unlocking one.

[0061] In the locking configuration, the obstruction element 50 interferes with the rotation of the monitoring element 42 at least when the cursor 40 is in loading position. In this way, the obstruction element locks indirectly, that is through the monitoring element 42, the motion of the control element 41 along the longitudinal axis 2a.

[0062] In the unlocking configuration, the obstruction element 50 does not interfere with the rotation of the monitoring element 42. The monitoring element 42, then, is free to rotate around the longitudinal axis 2a so that the control element 41 could be moved along the longitudinal axis 2a.

[0063] In particular, the motion of the control element 41 is implemented at least by the resistant force. Therefore, the control element 41 is configured so that the resistant force produced by the opposition means 3 could push the control element 41 along the motion axis 2a.

[0064] Preferably, the opposition means 3 pushes the control element 41, when the obstruction element 50 is in unlocking configuration, from the loading position to the unloading one.

[0065] Therefore, when the unlocking takes place, the opposition means 3 brings automatically and autonomously the cursor 40 in unloading position.

[0066] In order to be able to implement this mechanism, it is possible to structure the binding 1 in different ways.

[0067] For example, in a first embodiment, as shown in Figures 1-3, the casing 2 can comprise a first coupling portion 21.

[0068] If present, the first coupling portion 21 is arranged between the seat 20 and outside. Moreover, preferably it is integral to the casing 2. However, in the embodiment shown in Figures 9-10, the coupling portion 21 can be movable, in particular in the seat 20, with respect to the remaining of the casing 2 and proportionally to one or more components that are part of an area for attaching to the boot of the binding 1. Then, the first coupling portion 21 is operatively connected to at least part of the control element 41. Therefore, the first coupling portion 21 can be configured so that the control element 41 moves along the longitudinal axis 2a with respect to the casing 2 proportionally to a rotation around the longitudinal axis 2a

of the control element 41 with respect to the first coupling portion 21.

[0069] In this embodiment, the monitoring element 42 is preferably integral to the control element 41 so that, at least when the cursor 40 is in loading position and the locking means 5 is actuated, the control element 41 could not move along the longitudinal axis 2a.

[0070] In order that monitoring element 42 and control element 41 are integral, the monitoring element 42 can be constrained to the control element 41 or to the cursor 40. In case, the monitoring element 42 can also be in one single piece with the cursor 40.

[0071] In a second embodiment, shown in Figures 4-6, the monitoring element 42 is preferably at least partially accessible from outside.

[0072] Then, the monitoring element 42 comprises a second coupling portion **42a**.

[0073] The second coupling portion 42a is connected to at least part of the control element 41. Then, the second coupling portion 42a is configured so that the control element 41 moves along the longitudinal axis 2a with respect to the casing 2 proportionally to a rotation around the longitudinal axis 2a of the second coupling portion 42a with respect to the control element 41. In other words, the second coupling portion 42a behaves like the first coupling portion 21 with the difference that the first coupling portion 21 is integral to the casing 2, whereas the second coupling portion 42a is integral to the monitoring element 42.

[0074] In this second embodiment, preferably, the seat 20 is configured to as to prevent the translation of the monitoring element 42 along the longitudinal axis 2a. Moreover, the seat 20 is configured to prevent or impede the rotation of the cursor 40 around the longitudinal axis 2a with respect to the casing 2.

[0075] In this way, at least when the cursor 40 is in loading position and the locking means 5 is actuated, the monitoring element 42 cannot rotate and at the same time the control element 41 cannot move along the longitudinal axis 2a.

[0076] Then, in the first embodiment, the control element 41 roto-translates with respect to the longitudinal axis 2a together and integrally with the monitoring element 42, whereas in the second embodiment, the control element 41 translates without rotating along the horizontal axis 2a whereas the monitoring element 42 rotates without translating.

[0077] In order to implement the described embodiments, the control element 41 can comprise a screw. The latter preferably develops along the longitudinal axis 2a. Then, the coupling portions 21, 42a can be configured to engage the thread of the screw and preferably include a thread developing around the longitudinal axis 2a and counter-shaped to the screw.

[0078] Then, the screw engages in the coupling portions 21, 42a and, in case of the first coupling portion 21, the screw rotates and translates with respect thereto, whereas in case of the second coupling portion 42a, the

screw moves in response to a rotation of the latter.

[0079] The thread of the screw of course impacts on the possibility of moving the screw. In particular, it is preferred that the screw defines a thread with higher helix angle than the friction angle with the purpose of allowing the autonomous screwing or unscrewing, that is mainly caused by the resistant force of the opposition means 3. For example, the screw could be of trapezoidal type or ball type to reduce the friction which opposes to the rotation around the longitudinal axis 2a of the screw with respect to the casing 2.

[0080] In this way, the advancement allows the opposition means 3 to push the control element 41 when the locking means 5 is in unlocking configuration.

[0081] Moreover, the seat 20 can be formed so as to cooperate with the adjusting means 4.

[0082] In detail, preferably, the seat 20 comprises a first guide **20a** and a second guide **20b**.

[0083] The first guide 20a, if present, is suitable to house at least the opposition means 3 so that the opposition means 3 could dilate along the longitudinal axis 2a in the first guide 20a.

[0084] The second guide 20b, if present, is suitable to house at least the monitoring element 42. Then, the second guide 20b is suitable to determine a stroke of the monitoring element 42 in the seat 20 along the longitudinal axis 2a.

[0085] For example, the stroke can be null, as in case of the second embodiment, or can be equal to the distance defined along the longitudinal axis 2a between the unloading position and the maximum loading position.

[0086] Moreover, the cursor 40 can be counter-shaped to the seat 20. Preferably, the seat 20 and the cursor 40 can be shaped, for example both of them with polygonal section, and in detail counter-shaped so as to prevent by interference the rotation of the cursor 40 around the longitudinal axis 2a, for example for the second embodiment.

[0087] Then, seat 20 and cursor 40 can define a mutual rotational constraint. Considering that the cursor 40 interacts with the opposition means 3, it is preferred that the cursor 40 is housed in the first guide 20a and that the latter is shaped like the cursor 40.

[0088] Considering the interactions between the components, the adjusting means 4 can also comprise a bearing **43**.

[0089] The bearing 43 is preferably of rolling type. Moreover, if present, it can be arranged between cursor 40 and opposition means 3, especially in the first embodiment, or between monitoring element 42 and casing 2, especially in the second embodiment. Moreover, the locking means 5 preferably comprises an actuator **51**.

[0090] The actuator 51 can be configured to bring the obstruction element 50 from the locking configuration to the unlocking configuration, or vice versa, whenever the locking means 5 is actuated.

[0091] For example, the actuator 51 can be linear. In case, the actuator 51 can be configured to move the ob-

struction element 50 along the longitudinal axis 2a or around it. Then, the obstruction element 50 can be a protruding element suitable to interfere, in contact, with the monitoring element 42. The latter can include a cam, or other rotating element, including at least an abutment against which the obstruction element 50 can go in contact by preventing the rotation of the monitoring element 42, for example the abutment can be defined by a housing obtained on the monitoring element 42 inside which the obstruction element 50 can be housed to allow the obstruction of the rotation of the monitoring element 42, when wished. Of course, the monitoring element 42 could also comprise a gear or other toothed wheel.

[0092] Advantageously, the locking means 5 comprises connection means 52.

[0093] The connection means is operatively connected to the actuator 51. Then, the connection means 52 is configured to allow to remotely control the actuator 51. The control can be implemented by any external device. In case, the connection means 52 can be configured to operate through any wireless technology, for example Bluetooth™, radio frequency, infrared or more.

[0094] In particular, the binding 1 could be part of a system wherein the external device includes one or more sensors suitable to detect a possible fall of the skier.

[0095] Then, the external device can be configured to communicate to the connection means 52 the imminent fall of the user and the connection means 52 can activate the locking means 5, in detail the actuator 51, at least to bring the obstruction element 50 from the locking configuration to the unlocking one and to allow the control element 41 to step back and to unload the opposition means 3 to unload the binding 1.

[0096] Of course, the locking means 5 can comprise a power supply unit. The latter is preferably housed in the casing 2. Moreover, it is operatively connected at least to the actuator 51 and, if present, even to the connection means 52. Then, the power supply unit is configured to power at least the actuator 51 and in case even the connection means 52.

[0097] The power supply unit can be of any type. For example, it can comprise one or more to be selected from a battery or a solar panel, in the latter case outside the casing 2.

[0098] Of course, the binding 1 can be also adjusted manually in order to be able to set the resistant force suitable for the user. On this matter, in the first embodiment, the control element 41 can be equipped with a gripping element such as a head through which a rotation and translation can be set to the control element 41, for example through suitable tool such as screwdriver, pliers, hex key or other, as shown for example in Figure 2.

[0099] Analogously, in the second embodiment, the part of monitoring element 42 exposed outside the casing 2 can comprise a gripping element, for example similar to a bolt-like shape as shown in Figure 5. Even this gripping element allows to set a rotation of the monitoring element 42 to impose a translation of the control element

41, for example through suitable tool such as screwdriver, pliers, hex key or other.

[0100] The binding 1 can also comprise specific tensioning means 6.

5 **[0101]** In particular, the tensioning means 6 can be present both in the first embodiment, as shown in Figure 7, and in the second embodiment, as shown in Figure 8.

[0102] The tensioning means 6, if present, is preferably arranged at one side of the opposition means 3 opposite to the adjusting means 4.

10 **[0103]** Then, the tensioning means 6 can comprise a tensioning screw 60 and a pushing component 61.

[0104] Tensioning screw 60 and pushing component 61 are preferably coupled so that a rotation around its own axis of the tensioning screw 60 imposes a translation along the same rotation axis of the pushing component 61.

15 **[0105]** Then, the tensioning screw 60 can comprise, analogously to the control element 41, a head on which a rotation can be set through suitable tool such as screwdriver, pliers, hex key or other.

20 **[0106]** The pushing component 61 preferably is an annular device, including a thread which can be coupled with the tensioning screw 60, and which can have a profile counter-shaped to the first guide 20a.

25 **[0107]** Generally, the pushing component 61 is shaped so as not to be able to rotate with respect to the casing 2.

[0108] Of course, the adjusting means 4 and the opposition means 3 can also be reversed in position with respect to the binding 1, such as for example shown in Figures 9-10 wherein there are also the tensioning means 6.

30 **[0109]** Additionally, the invention comprises a new process for releasing a hook from the the binding 1 as described previously.

35 **[0110]** The process mainly comprises two steps: an actuation step and a waiting step.

[0111] In the actuation step, substantially, the locking means 5 is actuated so that the obstruction element 50 passes from the locking configuration to the unlocking configuration.

40 **[0112]** Then, preferably, in the waiting step the resistant force of the opposition means 3 brings the cursor from the loading position to the minimum limit position.

45 **[0113]** Of course, the waiting step is influenced by the shape of the control element 41 in particular, for example, by the advancement of the screw. If configured effectively, the waiting step concretizes in a few fractions of a second and thus it is impulsive so as to allow the unlocking of the binding 1 before the user can touch the ground. The binding 1 for ski according to the invention achieved important advantages.

50 **[0114]** In fact, the binding 1 for ski, and related process for releasing a boot from said binding 1, allows to reduce the retaining force of the binding, on command, so as to allow to release the ski quickly and effectively even and especially to athletes who set the binding at an extremely high DIN value.

[0115] Moreover, the binding 1 for ski, and related process for releasing a boot from said binding 1, can easily be adapted to structures of already existing bindings or, however, it does not require radical variations in the geometry of the conventional bindings.

[0116] In conclusion, the binding 1 for ski, and related process for releasing a boot from said binding 1, is structurally simple and economically and quickly implementable. The invention can be subject to variants within the scope of the inventive concept defined by the claims.

[0117] Within such scope, all details can be replaced by equivalent elements and the materials, shapes and sizes can be any.

Claims

1. A ski binding (1) comprising:

- a casing (2) defining at least a seat (20) developing along a longitudinal axis (2a);
- elastic opposition means (3) housed in said seat (20) and configured, when subject to dilation along said longitudinal axis (2a), to produce a resistance force to opening of said binding (1) proportional to said dilation;
- adjusting means (4) suitable to adjust said resistant force and comprising at least:

- a cursor (40) housed in said seat (20), movable along said longitudinal axis (2a), operatively connected to said opposition means (3) and configured to determine, when moved along said longitudinal axis (2a), said dilation on said opposition means (3) so as to define at least:

- a minimum limit position wherein said opposition means (3) is minimally loaded or unloaded and exert said minimum force, and
- a loading position wherein said opposition means (3) undergoes said dilation so as to exert said greater resistant force than said minimum force,

- a control element (41) integral to said cursor (40) and movable along said longitudinal axis (2a) so as to be able to control the passage from said unloading position to said loading position and vice versa,

- locking means (5) operatively connected to said adjusting means (4) and suitable to lock said control element (41) when actuated;

and characterized in that

- said adjusting means (4) further comprises a control element (42) kinematically constrained to said control element (41) so that, when said control element (41) translates along said longitudinal axis (2a), said control element (42) rotates around said longitudinal axis (2a), and
- said locking means (5) comprises an obstruction element (50) defining at least:

- a locking configuration wherein said obstruction element (50) interferes with the rotation of said control element (42) at least when said cursor (40) is in loading position by locking the motion of said control element (41) along said longitudinal axis (2a), and
- an unlocking configuration wherein said obstruction element (50) does not interfere with the rotation of said control element (42) and said control element (42) is free to rotate around said longitudinal axis (2a) so that said control element (41) could be moved along said longitudinal axis (2a) at least by said resistant force.

2. The binding (1) according to claim 1, wherein said casing (2) comprises a first coupling portion (21) arranged between said seat (20) and outside, operatively connected to at least part of said control element (41) and configured so that said control element (41) moves along said longitudinal axis (2a) with respect to said casing (2) proportionally to a rotation around said longitudinal axis (2a) of said control element (41) with respect to said first coupling portion (21) and said control element (42) is integral to said control element (41) so that, at least when said cursor (40) is in loading position and said locking means (5) is actuated, said control element (41) could not move along said longitudinal axis (2a).

3. The binding (1) according to claim 1, wherein said control element (42) is at least partially accessible from outside and comprises a second coupling portion (42a) connected to at least part of said control element (41) and configured so that said control element (41) moves along said longitudinal axis (2a) with respect to said casing (2) proportionally to a rotation around said longitudinal axis (2a) of said second coupling portion (42a) with respect to said control element (41) and said seat (20) is configured to as to prevent the translation of said control element (42) along said longitudinal axis (2a) and the rotation of said cursor (40) around said longitudinal axis (2a) with respect to said casing (2) so that, at least when said cursor (40) is in loading position and said locking means (5) is actuated, said control element (42) could not rotate and at the same time said control element (41) could not move along said longitudinal axis (2a).

- 4. The binding (1) according to any one of claims 2-3, wherein said control element (41) comprises a screw developing along said longitudinal axis (2a) and said coupling portions (21, 42a) include a thread developing around said longitudinal axis (2a) and counter-shaped to said screw. 5
- 5. The binding (1) according to the preceding claim, wherein said screw defines a thread with higher helix angle than the friction angle with the purpose of allowing the autonomous screwing or unscrewing, that is mainly caused by said resistant force of said opposition means (3). 10
- 6. The binding (1) according to any one of the preceding claims, wherein said opposition means (3) include one or more springs developing along said longitudinal axis (2a). 15
- 7. The binding (1) according to any one of the preceding claims, wherein said seat (20) comprises a first guide (20a) suitable to house at least said opposition means (3) so that said opposition means (3) could dilate along said longitudinal axis (2a) in said first guide (20a) and a second guide (20b) suitable to house at least said control element (42) and to determine a stroke of said control element (42) in said seat (20) along said longitudinal axis (2a). 20
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- 8. The binding (1) according to the preceding claim, wherein said stroke is null or equal to the defined distance along said longitudinal axis (2a) between said unloading position and said maximum loading position. 30
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- 9. The binding (1) according to claim 3 and any one of claims 7-8, wherein said cursor (40) is counter-shaped to said seat (20) and said seat (20) is shaped so as to prevent the rotation of said cursor (40) around said longitudinal axis (2a). 40
- 10. The binding (1) according to any preceding claim, wherein said locking means (5) comprises an actuator (51) configured to bring said obstruction element (50) from said locking configuration to said unlocking configuration, or vice versa, whenever said locking means (5) is actuated. 45
- 11. The binding (1) according to the preceding claim, wherein said locking means (5) comprises connection means (52) operatively connected to said actuator (51) and configured to allow the remote control of said actuator (51). 50
- 12. The binding (1) according to any preceding claim, wherein said adjusting means (4) comprises a bearing (43) arranged between said cursor (40) and said opposition means (3) or between said control ele-

ment (42) and said casing (2).

- 13. The toe cap comprising a binding (1) according to any preceding claim.
- 14. The heel cap comprising a binding (1) according to any preceding claim.
- 15. The process for releasing a boot from a binding (1) according to any one of claims 1-12, **characterized in that** is comprises an unloading step including:

- actuating said locking means (5) so that said obstruction element (50) goes from said locking configuration to said unlocking configuration;
- waiting that said resistant force of said opposition means (3) brings said cursor (40) from said loading position to said minimum limit position.

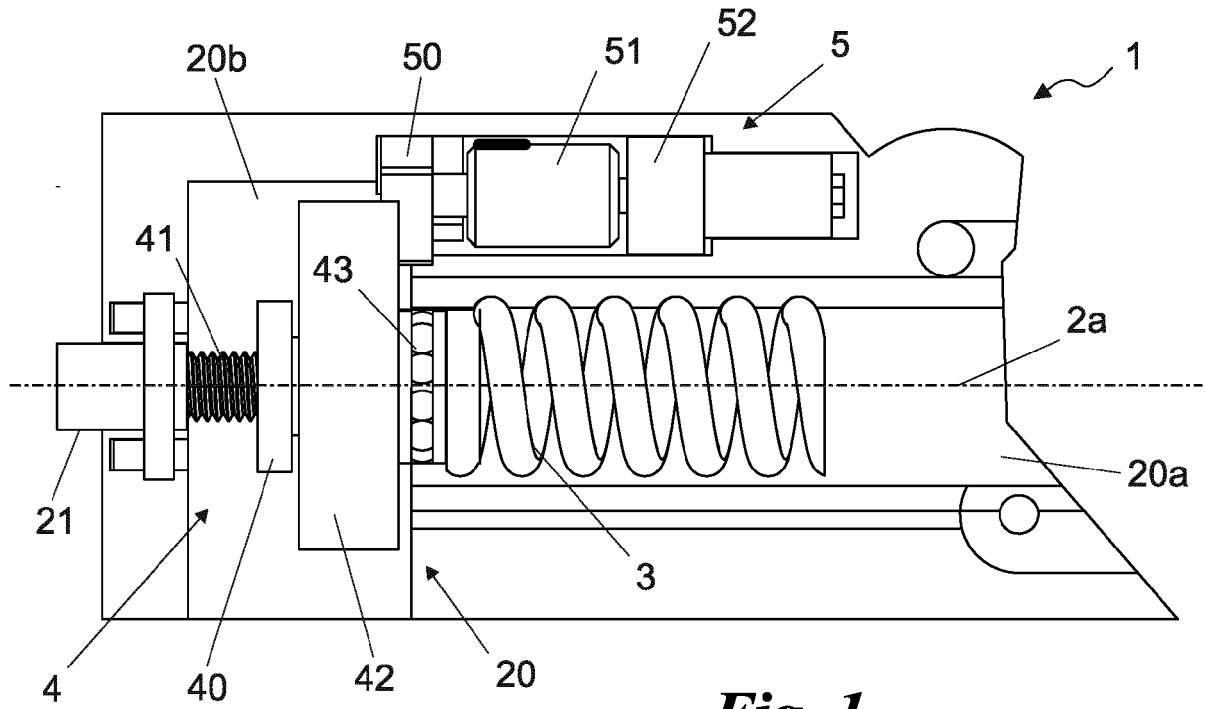


Fig. 1

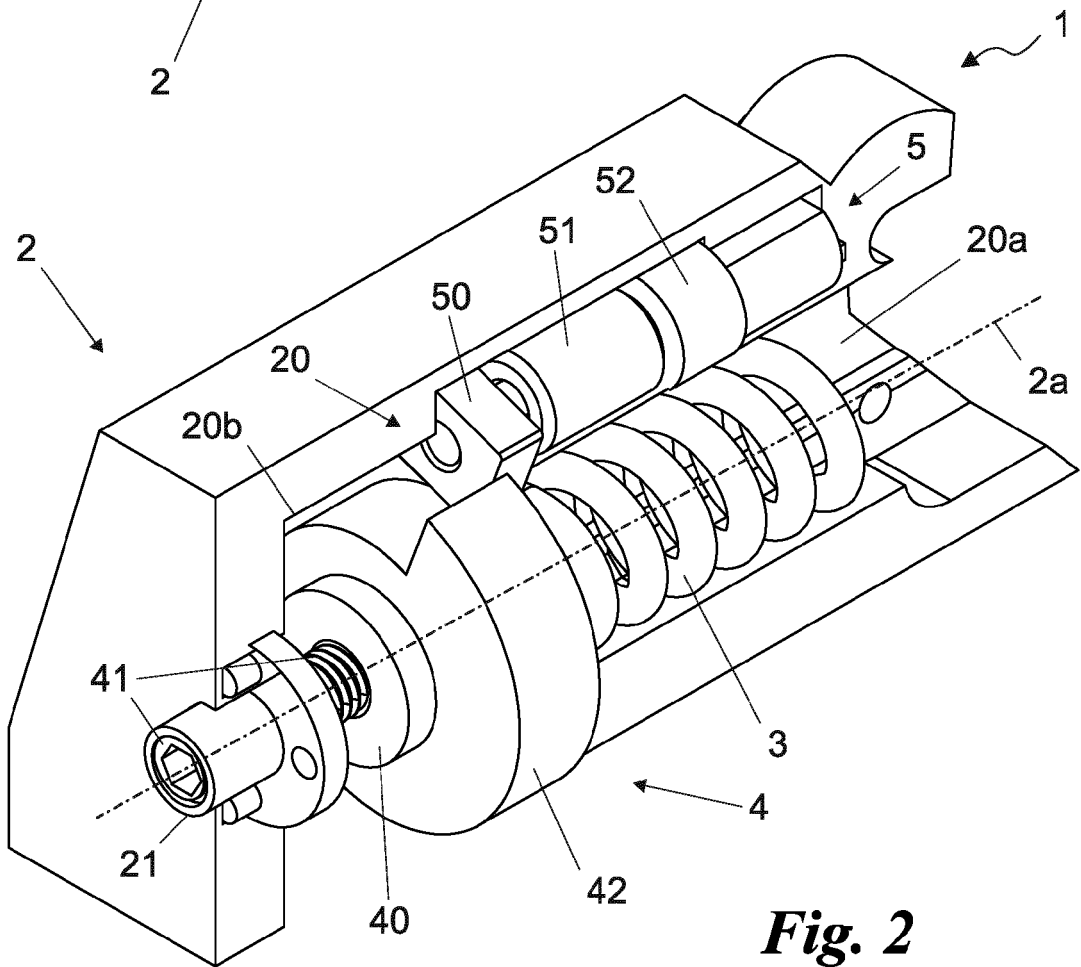


Fig. 2

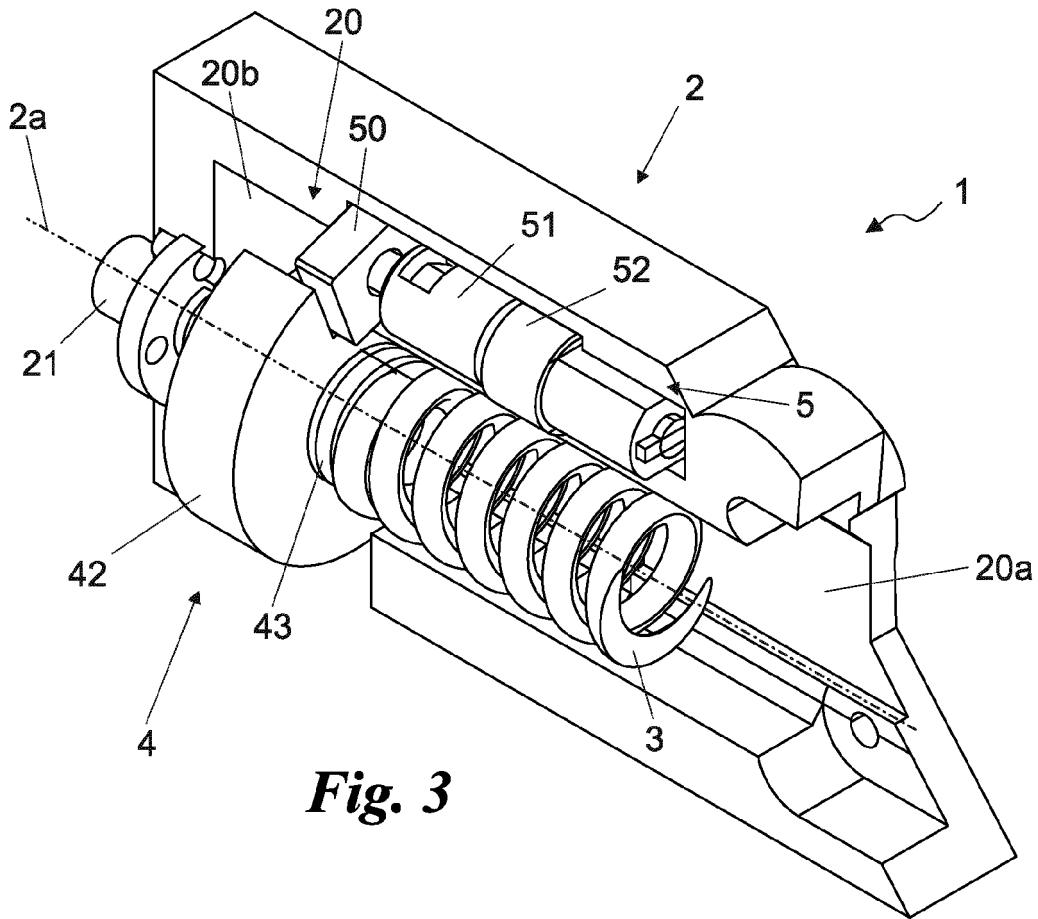


Fig. 3

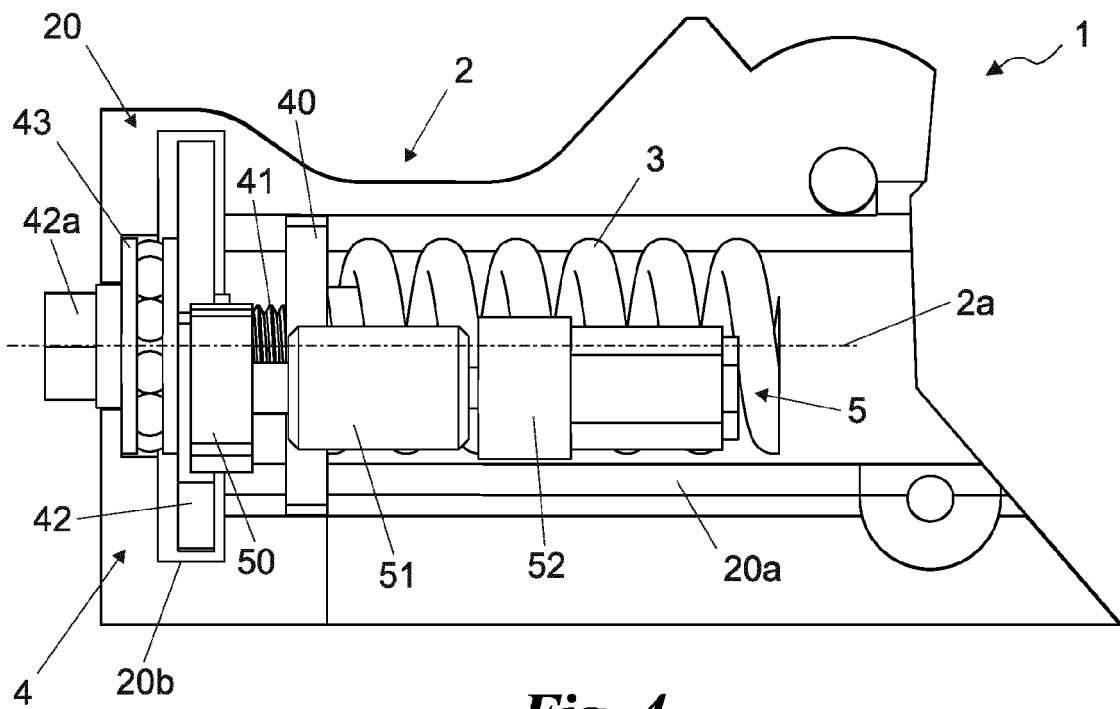


Fig. 4

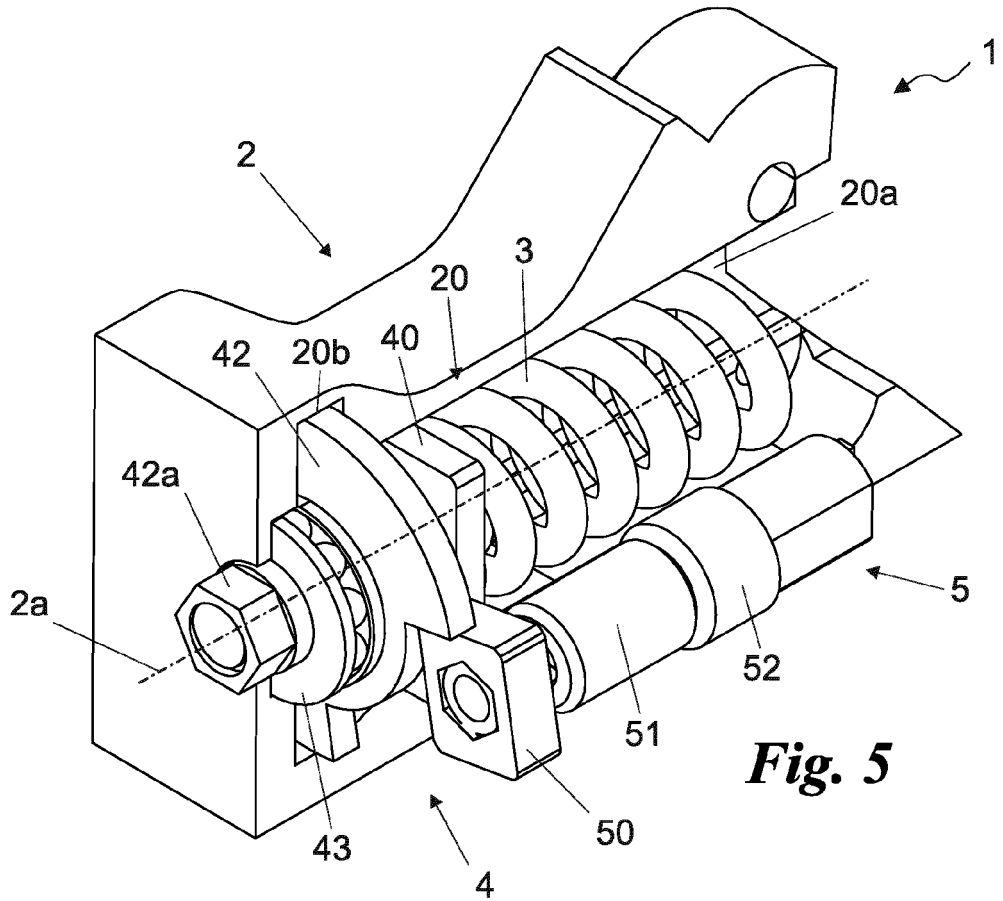


Fig. 5

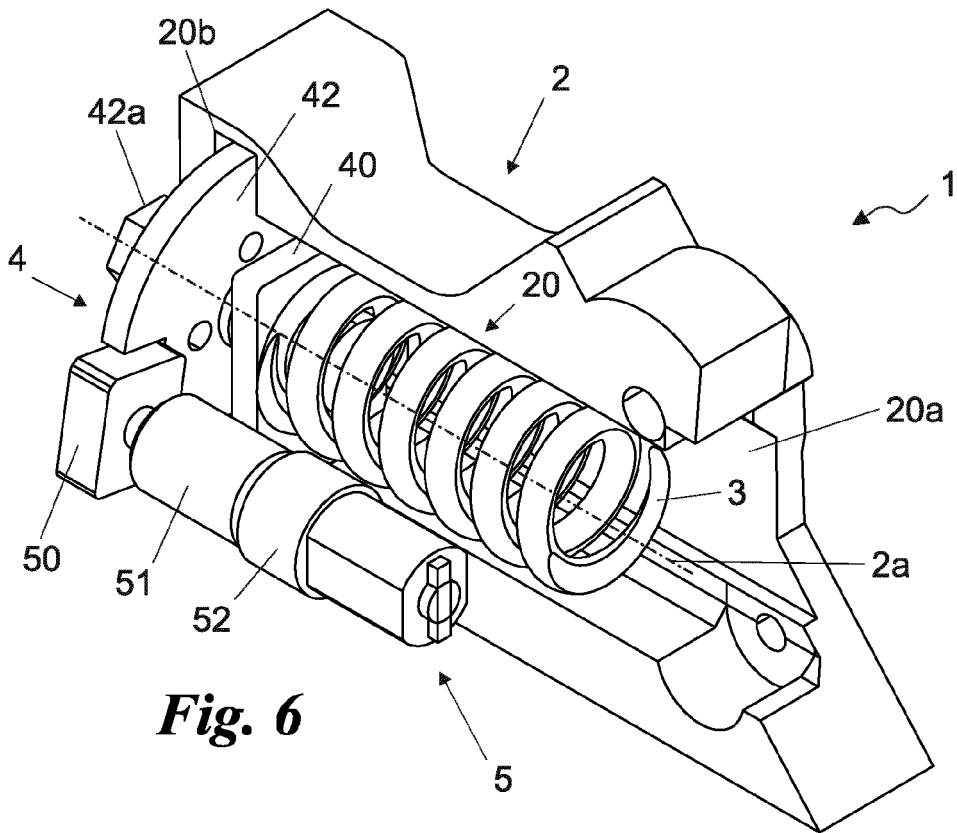


Fig. 6

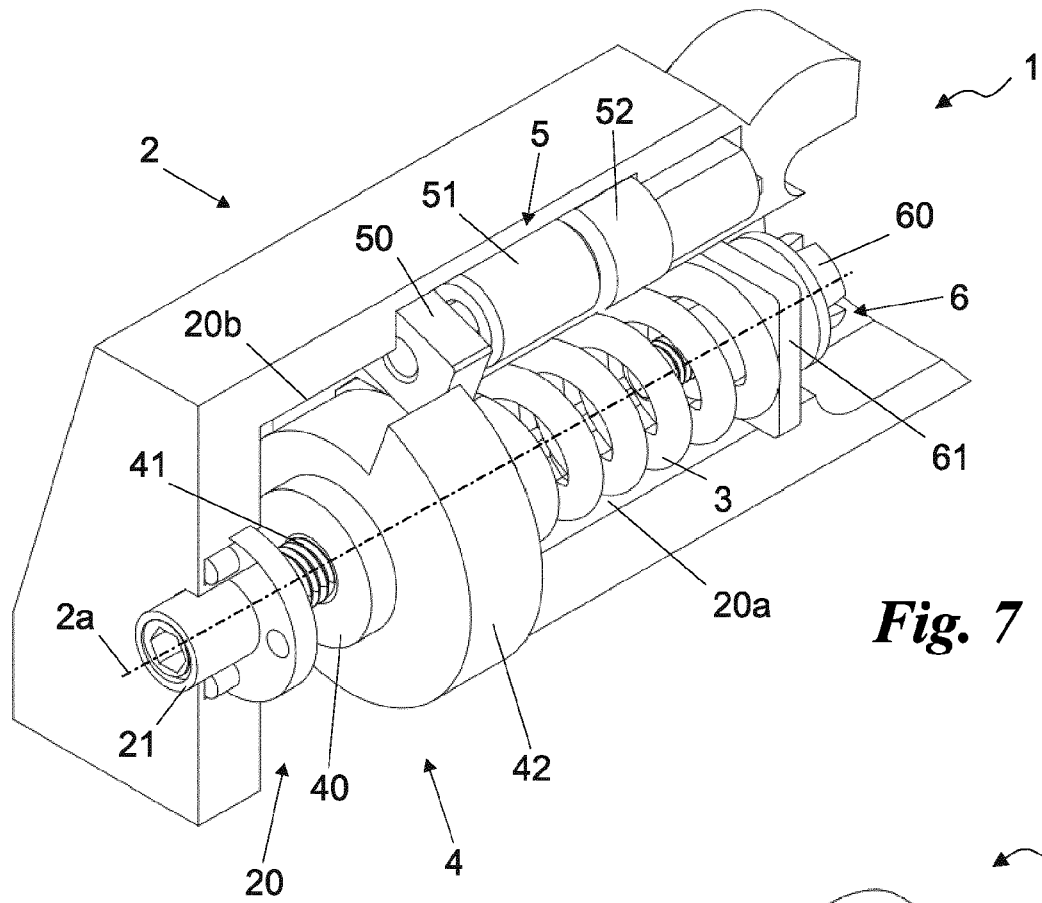


Fig. 7

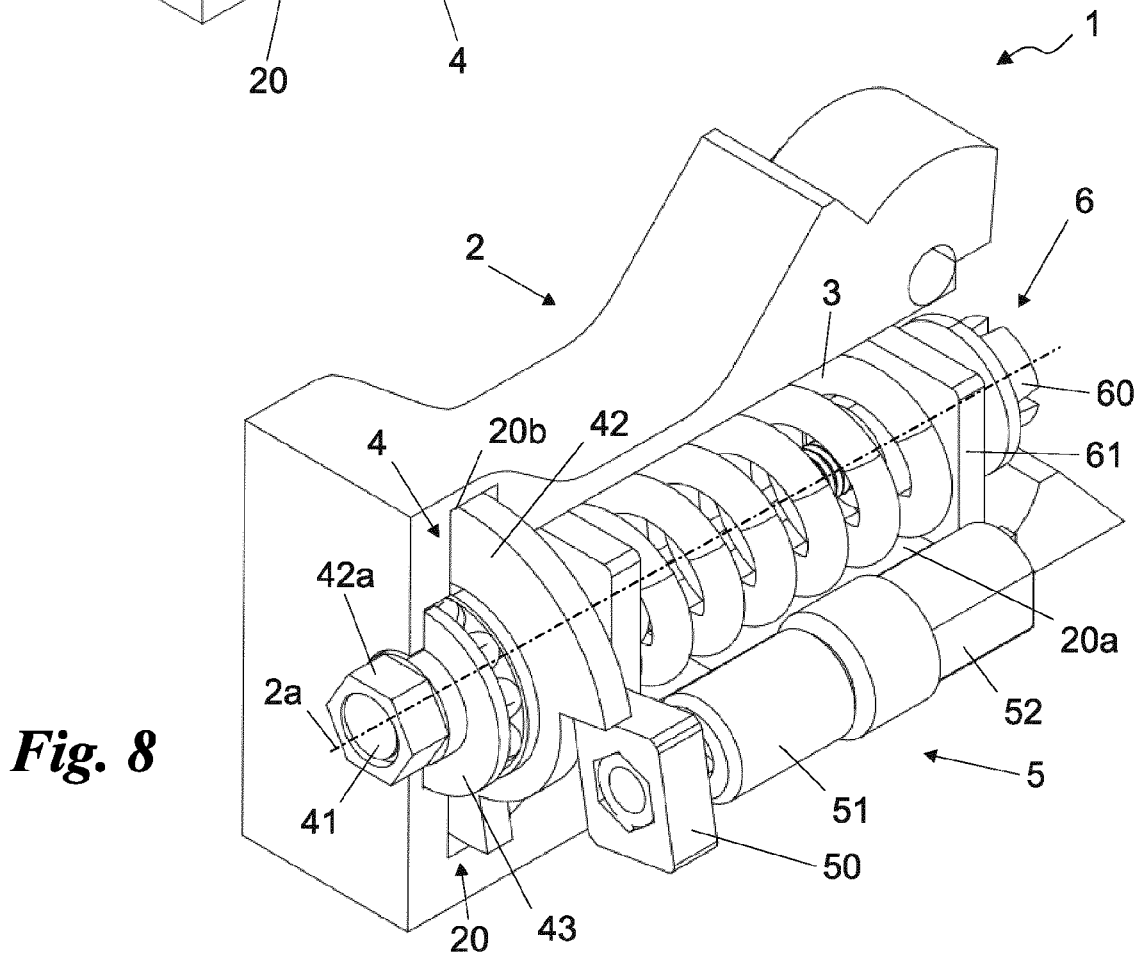


Fig. 8

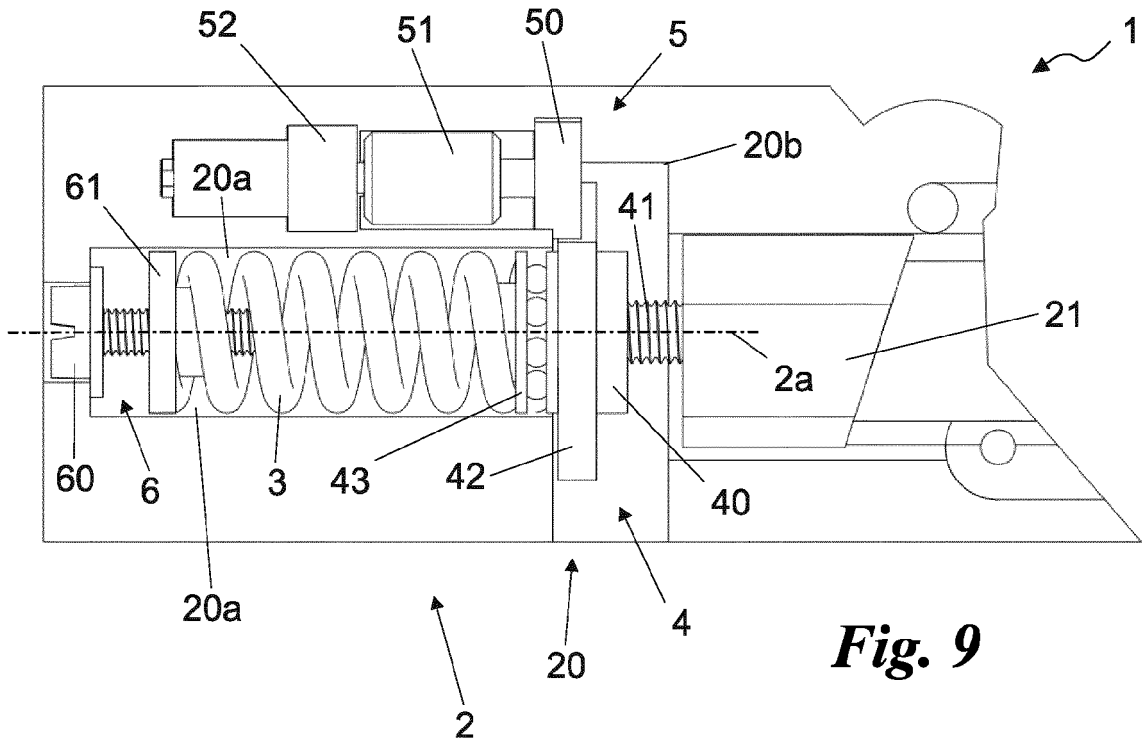


Fig. 9

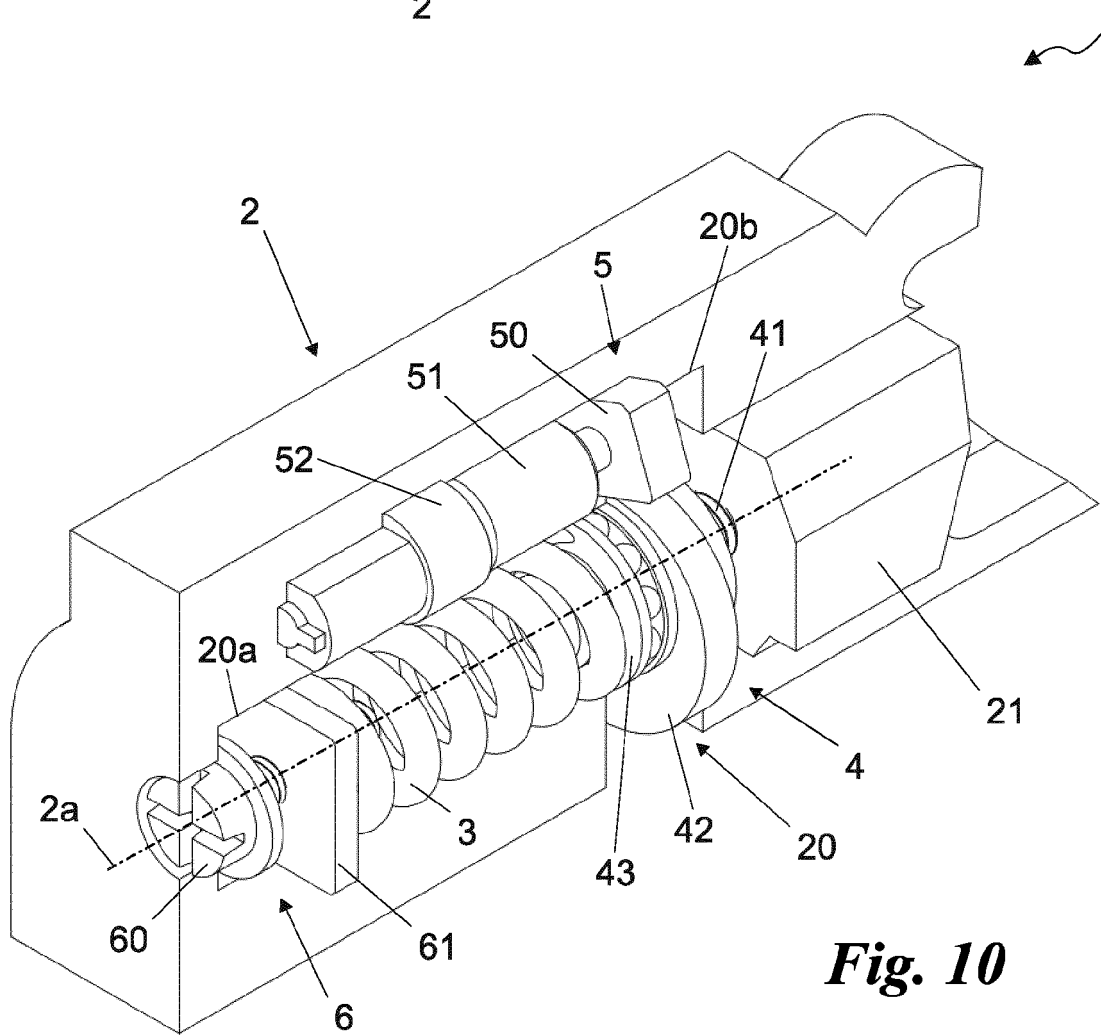


Fig. 10



EUROPEAN SEARCH REPORT

Application Number

EP 24 16 2523

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A	US 6 769 711 B1 (MARTIN RALPH M [US] ET AL) 3 August 2004 (2004-08-03) * column 3, line 59 - column 5, line 30; figures 2,3,6,8 *	1-15	
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			A63C
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 28 August 2024	Examiner Murer, Michael
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.
The members are as contained in the European Patent Office EDP file on
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28 - 08 - 2024

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