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(54) **PROTECTING HELMET WITH RAISING/LOWERING MECHANISM OF THE VISOR**

(57) Protecting helmet (1) comprising a rigid outer shell (2), a front opening (3) in said rigid shell for the face of a user, a protective visor (4) at least rotatable between a lowered position intercepting, at least partially, the front opening (3) and a raised position disengaged from said front opening (3), and a raising/lowering mechanism (10) of the protective visor (4), the raising/lowering mechanism (10) comprising: at least one base member (12), movably or integrally constrained to, or made in a single piece with, the outer shell (2) and arranged in a side position with respect to said front opening (3); at least one

fastening pin (41) constrained in a respective opening (4a) of the protective visor (4); wherein said base member comprises a seat (130) adapted to rotatably and reversibly house said fastening pin; wherein said seat (130) of said base member (12) comprises at least one elastic countering member (131) for said fastening pin (41); wherein said base member (12) comprises an unlocking device (16) configured to act on the elastic countering member (131) to release the fastening pin (41) from the seat (130).

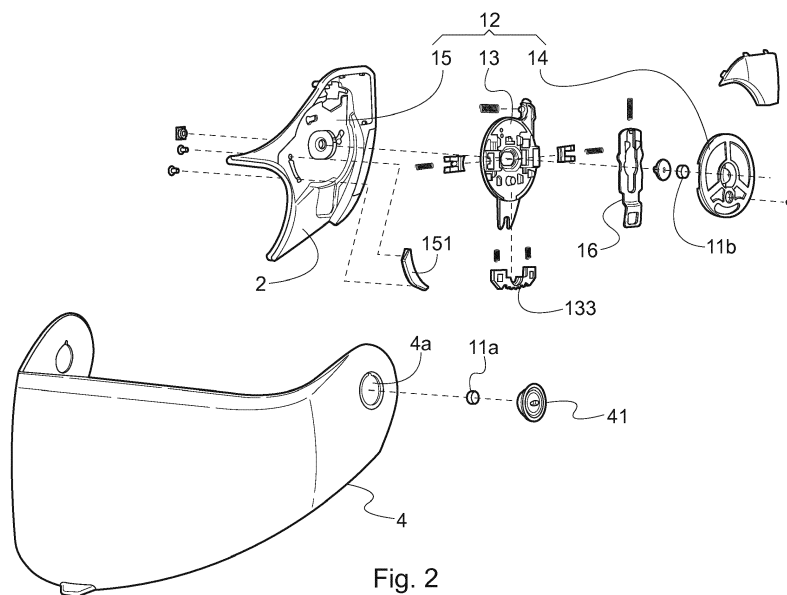


Fig. 2

Description

FIELD OF THE INVENTION

[0001] The present invention concerns a protecting helmet, for example of the type used in the motorcycling field and in particular with vehicles devoid of a passenger compartment, comprising, in addition to a liner intended to house the user's head and at least one inner shell made of a shock-absorbing material, such as expanded polystyrene, at least one rigid outer shell defining a front opening for the user's face, as well as a visor that can be raised and lowered with respect to such front opening, thanks to a respective mechanism, and which allows to reversibly constrain the visor to the helmet.

[0002] More in detail, the present invention concerns a protecting helmet provided with a rigid outer shell, for example made of composite material or polycarbonate or yet of another appropriate thermoplastic material, and at least one protective visor normally made of transparent polycarbonate and constrained to the outer shell by means of a relative raising/lowering mechanism which makes it at least rotatable between a lowered position intercepting, at least partially, the front opening of the helmet and a raised position completely disengaged from the latter.

KNOWN PRIOR ART

[0003] In the art, it is known to provide protecting helmets, especially for motorcycling or motor use in general, with a raising/lowering mechanism of the protective visor with respect to the front opening of the helmet which allows the visor to rotate around a given axis. Moreover, such mechanisms can provide intermediate positions for the visor. When the protective visor is completely lowered, it is in proximity of the outer shell and adheres to the gaskets, if present, or anyhow to the sides of the frame delimiting the front opening; when the visor is raised in an intermediate position intercepting, partially, the front opening, the distance between the visor and the gaskets, or between the visor and the sides of the front opening, allows an adequate air flow inside the helmet, whereas when the visor is completely raised, it remains in close proximity of the outer shell and reduces overall dimensions and incidence surface with the air flow that strikes it when the vehicle is in motion.

[0004] Moreover, a similar raising/lowering mechanism can further allow the visor to be arranged flush with the ends of the outer shell surrounding the aforesaid front opening when it is in its completely lowered position and to simultaneously be easily raised by the user thanks to the translation of the protective visor itself away from the front opening, allowed by such raising/lowering mechanism.

[0005] It should be noted that, for simplicity, here and hereinafter, the protective visor of the helmet is to be understood as being in its completely lowered position

when it completely, or almost completely, covers the aforesaid front opening of the helmet and as being in its completely raised position when it does not or almost does not interfere at all with such front opening.

[0006] Although effective, the various known structures have a high constructive complexity. As a result, they are difficult and costly to produce.

[0007] Moreover, given the high number of members which must cooperate with each other, it is difficult for the user to assemble and disassemble the visor from the helmet.

[0008] An object of the present invention is to provide a protecting helmet provided with a raising/lowering mechanism of the protective visor which allows to move the protective visor in an effective and structurally non-complex manner.

[0009] Another object of the present invention is to provide a protecting helmet having a raising/lowering mechanism of the protective visor which allows the user to easily assemble and disassemble the protective visor from the helmet.

[0010] A further object of the present invention is to make a protecting helmet which allows to effectively manage the raising and lowering of the respective protective visor by means of a raising/lowering mechanism that can easily be implemented on the helmet itself.

SUMMARY OF THE INVENTION

[0011] These and other objects are achieved by the protecting helmet according to embodiments of the present invention, according to one or more of the accompanying claims. In particular, a helmet according to the first independent claim is object of the present invention, whereas preferred aspects are set forth in its successive dependent claims.

[0012] According to an aspect of the present invention, a protecting helmet comprises an inner shock-absorbing shell and a rigid outer shell which define a front opening for the user's face, as well as a protective visor at least rotatable between a lowered position intercepting, at least partially, the front opening and a raised position disengaged from the front opening. The helmet further comprises a raising/lowering mechanism (and of constraint/release) of the protective visor, and the raising/lowering mechanism in turn comprises:

at least one base member, movably or integrally constrained to, or made in a single piece with, the outer shell, arranged in a side position with respect to the front opening;

at least one fastening pin constrained inside a relative opening of the protective visor.

[0013] The base member comprises a seat adapted to reversibly house the fastening pin. In particular, the mechanism comprises at least one elastic countering member for the fastening pin, and the base element com-

prises an unlocking device adapted to release the fastening pin from the seat. More in detail, the unlocking device is configured to act on the elastic countering member in order to release the fastening pin from the seat.

[0014] A so-made raising/lowering mechanism is not complex to make and is thus simple and economic to produce.

[0015] In particular, the interaction between the fastening pin, the elastic countering member and the unlocking device allows to define, in a simple manner, a condition in which the visor is restrained in the respective seat and a condition in which the visor can be easily disassembled from the helmet. The elastic countering members further allow to couple the visor to the helmet again in a simple and fast manner.

[0016] The present solution thus provides a mechanism that allows a simple reversible coupling of the visor on the helmet.

[0017] According to a possible aspect, the unlocking device is translationally movable within said base member.

[0018] According to a possible aspect, the unlocking device comprises at least one portion, preferably at least one protuberance, adapted to move and/or deform the at least one elastic countering member.

[0019] According to a possible aspect, the elastic countering member comprises a body coupled to a spring.

[0020] According to a possible aspect, the elastic countering member comprises a tilted surface adapted to cooperate with the fastening pin, so that a translation of the fastening pin towards the elastic countering member causes a movement and/or deformation of the elastic countering member to allow the fastening pin to be inserted into the seat.

[0021] In other words, when a user couples the visor to the helmet, i.e. brings the fastening pin towards the respective seat, the pin comes into contact with the elastic countering member, which opposes little resistance, thus allowing a user to easily insert the pin in the seat.

[0022] According to a possible aspect, the elastic countering member has a coupling surface adapted to cooperate with the fastening pin, so that a translation of the fastening pin away from the seat is hampered, and is preferably substantially prevented, by the cooperation between the fastening pin and the coupling surface when the fastening pin is inserted in the seat.

[0023] "Substantially prevented" means that the removal of the visor from the helmet is only possible by applying a considerable force to the visor, possibly causing the deformation or breakage of the helmet, i.e. that it is not possible with a normal helmet.

[0024] According to a possible further aspect, the mobile member comprises a toothed portion adapted to cooperate with one or more protuberances of the visor. This allows to define intermediate opening positions of the visor.

[0025] According to a possible further aspect, the base member comprises a housing portion made in the outer

shell or integrally constrained to the outer shell, wherein the body is constrained, preferably rotatably, to the housing portion. This provides a further degree of freedom to the visor.

BRIEF DESCRIPTION OF THE DRAWINGS

[0026] These and further aspects of the present invention will be described herein in more detail, by way of example and without any limitations, with reference to the accompanying figures, in which:

- figure 1 is a side view of a helmet according to an embodiment of the present invention;
- figure 2 is a perspective view of the raising/lowering mechanism of the visor of the helmet of figure 1;
- figure 3 is a perspective view from a framing opposite to what is shown in figure 2;
- figure 4 is a detailed view of the base member of the mechanism of figure 2;
- figure 4a is a detail of figure 4;
- figure 5 is a view similar to the one of figure 4, but from an opposite framing;
- figure 5a is a detailed view of the pin and the respective magnetic member which are adapted to cooperate with the visor, according to the perspective of figure 5;
- figure 5b is an enlarged view of the elastic countering member;
- figure 6 is a partial view of a detail of the visor;
- figure 6a is an enlarged view of the guide of the base member;
- figures 6b and 6c are schematic views of the coupling between the guide of figure 6a and the hooking pin of the visor, in different positions of the visor with respect to the shell;
- figures 7a - 7b - 7c show successive coupling steps of the pin of the visor with the seat of the shell;
- figures 7d - 7f are schematic views of that which is shown in figures 7a - 7c;
- figure 8 is a partial view of members of the helmet of figure 1, along the B-B plane of figure 1, in which the visor is shown separated from the helmet;
- figure 9 is a partial view of members of the helmet of figure 1, along the A-A plane of figure 1;
- figure 10 is a view of a pin of an alternative embodiment;
- figure 11 is a view of a body adapted to couple with the pin of figure 10;
- figures 12a and 12b are schematic views showing the coupling between the pin and the body of figures 10 and 11.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT OF THE INVENTION

[0027] In general, with reference to the accompanying figures, the protecting helmet 1 according to the present

invention, preferably adapted for use with vehicles devoid of a passenger compartment, such as motorcycles or snowmobiles, according to the known art comprises a rigid outer shell 2, for example made of polycarbonate or ABS (Acrylonitrile Butadiene Styrene), or also of glass fiber, or carbon or aramid fiber (i.e.: Kevlar®), etc. The rigid outer shell 2 (hereinafter also "shell 2") is typically internally covered by a layer (also denoted by "inner shell," not shown in the figures) made of a material that is able to absorb any shock, such as expanded polystyrene. A liner, not shown in detail, for example in foam rubber, is typically arranged inside the helmet 1 to favor the comfort of the user.

[0028] At least one front opening 3 of the protection helmet 1, which leaves part of the face uncovered, and in particular at least the eyes of the user of the helmet 1, is defined in the shell 2. Such front opening 3 is susceptible to being covered, at least partially, by a protective visor 4, usually transparent, constrained at least in a rotatable manner to the shell 2 of the helmet itself.

[0029] The protective visor 4 (hereinafter also "visor 4") is normally made of a polymeric material such as polycarbonate, and is constrained to the outer shell 2 of the protecting helmet 1 by means of a raising/lowering mechanism 10 of the visor 4 itself. In particular, the raising/lowering mechanism (for simplicity also named "mechanism 10") allows the protective visor 4 to be raised and lowered between a position intercepting, at least partially and preferably completely, the front opening 3 of the helmet 1 and a position disengaged, completely or almost completely disengaged, from this front opening 3. As is known, the aforesaid intercepting position assumed by the protective visor 4 coincides with the completely lowered position, whereas the aforesaid disengaged position corresponds to the completely raised position of the visor 4 itself.

[0030] The mechanism 10 comprises at least one base member 12, movably or integrally constrained to, or at least partially made in a single piece with, the shell 2. Such mechanism is arranged in a side position with respect to the front opening 3.

[0031] The base member 12 is typically composed of several components. At least part of such components can be made in a single piece, or anyhow integrally constrained to the shell 2.

[0032] In the shown embodiment, the base member comprises a body 13 constrained to a housing portion 15 obtained in the shell 2. The body 13 is rotatably constrained, with a limited freedom of rotation, with respect to the housing portion 15. An elastic return member 132 adjusts the relative rotation between the body 13 and the housing portion 15. In a possible embodiment, the body 13 is rotatably constrained to the housing portion 15 in a similar manner as the one described in EP 3132702 A1.

[0033] A lid 14 is adapted to cover the body 13. The lid 14 is preferably perforated, so that to allow the passage of at least part of a fastening pin 41 (better described below) integrally constrained to the visor 4.

[0034] As mentioned above, the solution shown in the figures is only a possible embodiment of a helmet 1 according to the present invention. Different variants are possible. By way of example, some possible alternative embodiments are listed hereunder (such list is not to be considered exhaustive).

[0035] In a possible variant, the lid 14 is not present.

[0036] In a possible further variant, the lid 14 is made in a single piece with the body 13.

[0037] In a possible further variant, the housing portion 15 is a member distinct from the shell 2 and is typically integrally constrained thereto.

[0038] In a possible further variant, the body 13 is integrally constrained to the housing portion 15.

[0039] In a possible further variant, the body 13 is made in a single piece with the shell 2. Possible further variants have combinations of the features of the variants described above.

[0040] In general, the base member 12 is designed to be constrained to the shell 2 and to rotatably and reversibly receive the fastening pin 41.

[0041] In order to cooperate with the fastening pin 41 (hereinafter also "pin 41"), better described below, the base member 12 comprises at least one seat 130 adapted to reversibly house, or to anyhow be constrained to, the pin 41. In particular, the seat 130 is shaped so that to allow the pin 41 to rotate with respect to the base member, despite being reversibly restrained by it. Typically, such effect is achieved by allowing a sliding between the fastening pin 41 and the seat 130.

[0042] Preferably, the seat 130 has at least one elastic countering member 131. In the shown embodiment, there are two elastic countering members 131 arranged facing each other.

[0043] "Elastic countering member" is to be understood as a member that is elastically movable and/or elastically deformable (or anyhow elastically yielding).

[0044] In the shown embodiment, the elastic countering members 131 are spring members. In particular, according to a preferred embodiment, the elastic countering members have a body 131a constrained to a spring 131b. The body 131a is thus movable, and its movement is countered by the spring 131b. Typically, the spring 131b pushes the elastic countering members to a "closed" position of the seat 130, i.e. a position that does not allow the pin to be inserted into or to come out of the seat 130 without displacing the elastic countering members 131.

[0045] Preferably, the elastic countering members 131 are shaped so that, when they come into contact with the pin 41, they allow (i.e. do not oppose, or oppose with little resistance) the pin 41 to move towards the shell 2 and the pin 41 entering the seat 130. Moreover, the elastic countering members 131 are shaped so that to resist a moving away movement between the pin 41 and the shell 2 if the pin is inside the seat 130. Preferably, for such purpose, the elastic countering members 131 (hereinafter also "countering members") are flared, or anyhow provided with a tilted surface S1 (as shown in particular in

figures 7a - 7f) typically facing the outside of the helmet (i.e. not facing the shell 2). The contact between the pin 41 and the elastic countering members 131, in a direction of the pin 41 moving towards the shell 2, causes the elastic countering members to move away. In particular, in the shown embodiment, the pin 41 slides along the surface S1 of each countering member 131, causing the separation thereof and countering the action of the spring 131b. The surface S1 is typically arranged on the body 131a of the elastic countering members 131.

[0046] In the shown embodiment, as will be better discussed below, the pin 41 has a flange 41a, or anyhow a protrusion or portion adapted to cooperate with the countering members 131. With particular reference to figures 7a - 7f, when the pin 41 moves towards the shell, the flange 41a pushes the tilted surface S1 of the countering members 131 so that to move them away, countering the action of the spring 131b, to be able to go beyond them. When the pin 41 is inside the seat (as visible in figure 7c, and in the schematic view 7f), a possible moving away of the pin 41 from the shell 2 (i.e. a movement towards the right, considering the orientation of figures 7c and 7f) is hampered by the engagement between the countering members 131 and the pin 41, and in particular between the pin 41 and a coupling surface S2 of the countering members 131. Such coupling surface S2, when coupled to the flange 41a, is arranged to interfere with the flange 41a, and is typically arranged substantially parallel to the flange 41a.

[0047] The above description is also applied to elastic countering members 131 that are elastically deformable, possibly not provided with a spring. In other words, the coupling between the pin 41 and the elastic countering member 131 could substantially be a snap-coupling, or anyhow a shape coupling. For example, a first surface (similar to the tilted surface S1) could be deformed by the movement of the pin 41 towards the seat 130, favoring the entry thereof. A second surface (similar to the coupling surface) could instead be coupled to the pin 41 in a substantially non-deformable manner, when the latter is inside the seat 130, so that to counter its coming out.

[0048] The base member 12 comprises an unlocking device 16 configured to allow the release of the pin 41 from the seat 130.

[0049] Preferably, the unlocking device 16 is movable so that its movement operates onto the seat 130 (and in particular on the elastic countering members 131), so that the pin 41 can be released from the seat 130. In particular, the unlocking device 16 is preferably at least translatable with respect to the shell 2.

[0050] According to a possible aspect, the unlocking device 16 comprises a handle 16b, or similar member, that allows a user to grasp and operate the unlocking device 16.

[0051] With reference to the embodiment shown in the figures, the unlocking device 16 preferably comprises at least one protuberance 16a (Fig. 4a) adapted to cooperate at least with one tilted (or at least partly tilted) surface

131c (Fig. 5b) of the countering members 131. Typically, the number of protuberances 16a is equal to the number of countering members 131. In fact, two countering members 131 and two protuberances 16a of the unlocking device 16 are shown in the figures.

[0052] By moving the unlocking device 16 (downwards with reference to the orientation of the pieces shown in figure 4a), the protuberances 16a couple with tilted walls 131c of the countering members 131, so that to separate them. According to a possible aspect, the unlocking device 16 comprises protrusions 16d adapted to favor the movement of the pin 41 in a direction axial to the pin itself. In particular, after the pin 41 has been released from the countering members 131, the protrusions 16d come into contact with the lower part of the flange 41a that is on the pin 41. The obstacle provided by the coupling surfaces S2 of the countering members 131 no longer being present, the coupling between these protrusions 16d and the pin 41 causes an axial translation towards the outside of the visor which is consequently gradually moved away and ejected from the seat 130.

[0053] Preferably, the movement of the unlocking device 16 in the direction that allows to release the pin 41 from the seat 130 is hampered by a spring 16c, or by a similar elastic device. The unlocking device 16 is preferably placed between the body 13 and the lid 14. This way, when the unlocking member 16 is not operated, it automatically stays positioned underneath the lid 14 and its protrusions 16d do not obstruct the possible entry of the pin 41 of the visor into the seat 12.

[0054] However, there are possible embodiments in which, to release the pin 41 from the seat 130, it is sufficient to exert a force above a given threshold, so that to move and/or deform the countering members 131. For safety reasons, such force must be sufficiently high, so that to prevent the visor 4 from being released from the shell 2. In such embodiments, the unlocking device could be absent.

[0055] According to a possible embodiment, the base member 12 comprises a toothed portion 133 adapted to cooperate with one or more protuberances 4b of the visor 4. The coupling between the protuberances 4b and the toothed portion 133 allows to define a stable angular position of the visor 4 with respect to the shell 2. By operating a force above a given threshold on the visor 4, it is possible to elastically move and/or deform the toothed portion 133 (by compressing the springs 133a for example), so that to allow the visor 4 to move with respect to the stable position mentioned.

[0056] Moreover, preferably, the base portion 12 is provided with a guide 151 adapted to cooperate with a hooking pin 4c of the visor 4. The hooking pin 4c preferably is, in a side view, substantially "L-shaped," so that a portion of the hooking pin couples to the guide 151. In particular, the guide 151 has a groove 151a of variable depth along its length. The hooking pin 4c can be made in a single piece with the visor, or it can be a member constrained thereto.

[0057] The hooking pin 4c thus couples with the guide 151 so that a part thereof (typically the short side of the "L") at least partially enters the groove 151a, as schematically shown in figure 6b. In such condition, the coupling between the hooking pin 4c and the groove 151a of the guide 151 contributes in preventing an accidental detachment between the visor 4 and the shell 2. The groove 151a is shaped so that when the visor 4 is in the position of maximum opening, its height is null, as schematically shown in figure 6c. In such condition, the hooking pin 4c is not restrained by the guide 151. Instead, in other positions of the visor 4, preferably there is the coupling between the hooking pin 4c and the groove 151a such as to prevent a moving away movement between the shell 2 and the visor 4.

[0058] This way, it is only possible to carry out the removal of the visor 4 from the shell 2 when the visor 4 is in its position of maximum opening.

[0059] According to a possible aspect, the groove 151a can have hollows adapted to define predetermined positions for the hooking pin 4c (and thus for the visor). Such positions typically have certain stability, such as small forces are not sufficient to move the hooking pin 4c out of one of the hollows.

[0060] The pin 41 can be integrally constrained to the visor 4, for example by inserting it into a respective opening 4a of the visor 4. Moreover, the pin 41 is configured to cooperate with the seat 130 so that to selectively allow to constrain and release the visor 4 from the shell 2.

[0061] As mentioned, in a possible embodiment, the pin 41 has a flange 41a adapted for selectively constraining and releasing the pin in a substantially "snap-fit" manner with the countering members 131 of the seat 130.

[0062] With reference to the figures, in a possible embodiment, the pin 41 has a substantially two-dimensional base 41b from which a hollow cylindrical member 41c protrudes. The flange 41a is obtained on the outer wall of the cylindrical member 41c. It should be noted that "flange" means any portion or protrusion protruding sideways from the hollow cylindrical member 41c.

[0063] It should be noted that in a possible variant, the pin 41 could be provided with a groove, inside which a portion of a relevant countering member 131 could be coupled, for example by a snap-coupling.

[0064] According to a possible aspect, the mechanism 10 comprises at least a first and a second magnetic-coupling member 11a, 11b. Typically, at least one of the two magnetic-coupling members 11a, 11b is a magnet, whereas the other member can be made of magnetic or ferromagnetic material. For convenience of description, such members will henceforth also be referred to as "magnetic members," without excluding that one of such members can actually be made, at least in part, of ferromagnetic material.

[0065] The first magnetic member 11a is constrained, or made in a single piece, with the fastening pin 41. In the shown embodiment, the first magnetic member 11a is a magnet inserted inside the cylindrical member 41c

of the pin 41. A portion of the pin 41 could be made of magnetic or ferromagnetic material. Such embodiment falls within the "magnetic member made in a single piece with the pin 41" definition.

[0066] A second magnetic member 11b is constrained to, or made in a single piece with, the base member 12. In the shown embodiment, the second magnetic member 11b is a magnet constrained to the lid 14 of the base member 12.

[0067] The magnetic members 11a, 11b are arranged so that, when the visor 4 is assembled on the shell 2, the two magnetic members are sufficiently close to attract each other, so that to counter the removal of the visor 4 from the shell 2.

[0068] In particular, according to a preferred aspect described above, the pin 41 must move and/or deform the countering members 131 in order to be inserted into the seat 130. The magnetic members are thus preferably shaped and arranged so that, when the pin 41 is arranged in proximity of the seat 130, the force of attraction between the two magnetic members 11a, 11b is greater than the resistance of the countering members 131. In other words, the moving of the two magnetic members 11a, 11b closer one to the other is sufficient to cause the insertion of the pin 41 into the seat 130, without requiring further external forces, in particular without requiring the user to push.

[0069] In a possible embodiment shown in figures 10 - 12b, the flange 41a cooperates with at least one tooth 134. Preferably, there are two or more teeth 134. The following description, for simplicity, discusses the case of two teeth 134, but it can also be applied to a different number, i.e. greater or lower, of teeth 134. The pin 41 is rotatable with respect to the teeth 134 (or to the single tooth 134), so that to define relative positions between the flange 41a and teeth 134 in which the teeth 134 couple with the flange 41a and hamper the pin 41 from moving away from the shell 2, and relative positions in which such movement is not hampered.

[0070] The teeth 134 are integrally constrained to the base member 12, preferably to the body 13. The flange 41a has missing portions 41b, which can be placed at the teeth 134. In particular, the teeth 134 are arranged on the base member 12 so that when the pin 41 is moved towards the shell 2, so that to be inserted into the seat 130, the teeth 134 are arranged at the missing portions 41b of the flange 41a. The movement of the pin 41 is thus not hampered by the presence of the teeth 134. Typically, the matching between the teeth 134 and portions 41b occurs at a position of full opening of the visor 4. Successively, when the pin 41 is inserted into the seat 130 and the visor is at least partially closed, the tooth 134 (and in particular the head of the tooth 134) is at the flange 41a. The pin 41 is thus hampered from possibly moving away from the seat 2, also by the engagement of the teeth 134 and the flange 41a of the pin.

[0071] It should be noted that only some members of the helmet 1 are shown in figures 10 - 12b. The remaining

members are substantially identical to those in the embodiment of figures 1 - 9. Minor shape modifications can be made to such members so that to ensure sufficient space to the teeth 134.

[0072] In use, a visor 4 is initially separated from the shell 2. Then, the visor is moved towards the shell 2, so that to bring the pin 41 in the proximity of the respective seat 130.

[0073] As mentioned above, according to a preferred aspect, thanks to such nearing, the visor 4 is automatically hooked to the shell 2. The attraction between the two magnetic members in fact allows the pin 41 to enter the seat 130. In particular, with reference to the preferred embodiment described above, the attraction between the magnetic members 11a, 11b allows the pin 41 to move and/or deform the countering members 131 of the seat 130.

[0074] Such situation is shown in figures 7a - 7c and is further schematized in figures 7d - 7f. In figures 7a and 7d, the pin 41 is placed in the proximity of the seat 130. In figures 7b and 7e, the pin 41 is further moved towards the seat 130 and comes into contact with the countering members 131 so that to move them, separating them. In particular, according to the shown embodiment, the flange 41a cooperates with the tilted surface S1 of the countering members 131.

[0075] In figures 7c and 7f, the pin 41 has definitely entered the seat 130. In particular, in the shown embodiment, the flange 41a has gone beyond the countering members 131. The visor 4 is thus rotatably constrained to the shell 2.

[0076] The pin 41 can in fact rotate inside the seat 130. Whenever the visor 4 needs to be released from the shell 2, the pin 41 must be removed from the seat 130. Typically, the seat 130 hampers such movement. With reference to the shown embodiment, the pin 41 is in the condition of figure 7c. A possible moving of the visor 4 away from the shell 2 (i.e. a movement towards the right, considering the orientation of figure 7c), is hampered by the engagement between the flange 41a and the coupling surface S2 of the countering members 131.

[0077] It should be noted that the embodiment shown in the figures and herein discussed in detail provides that the countering members are provided with tilted surfaces S1, whereas the side surface of the pin 41 is substantially parallel to the axis of the pin itself. Alternative and equivalent embodiments provide that also (or only) the pin 41 is equipped with tilted surfaces. It is thus possible to provide alternative and equivalent solutions which implement the kinematic reversals with respect to that which has been shown.

[0078] In order to allow the movement of the pin 41, a user thus preferably operates on the unlocking device 16.

[0079] In the shown embodiment, a user operates on the handle 16b to push the unlocking device 16. This way, the protuberances 16a come into contact with the tilted walls 131c present on the countering members 131, separating them. Thanks to this, the countering members

131 are sufficiently spaced to allow the removal of the pin 41 from the seat 130, and thus the separation of the visor 4 from the shell 2. By continuing to exert the thrust on the unlocking device 16, the protrusions 16d begin to act on the pin 41, causing the visor 4 to axially move away from the seat 130, i.e. an ejection thereof from the mechanism 10.

[0080] Moreover, in the shown embodiment, the operation of the unlocking device can only be carried out when the visor 4 is in its position of maximum opening. In this configuration, the hooking pin 4c is not restrained by the grooved guide 151 and, consequently, the visor 4 can definitely be moved away from the mechanism 10 of the helmet.

[0081] With reference to the embodiment of figures 10 - 12b, in the closed position, in addition to the members mentioned above, the engagement of the teeth 134 and flange 41a also hinders the removal of the visor. Instead, in the open position, the teeth 134 are placed at the missing portions 41b, so that the movement of the pin 41 is not hampered by the teeth 134.

Claims

1. Protecting helmet (1) comprising a rigid outer shell (2), a front opening (3) in said rigid shell for the face of a user, a protective visor (4) at least rotatable between a lowered position intercepting, at least partially, the front opening (3) and a raised position disengaged from said front opening (3), and a raising/lowering mechanism (10) to raise/lower the protective visor (4), the raising/lowering mechanism (10) comprising:

- at least one base member (12), movably or integrally constrained to, or made in a single piece with, the outer shell (2), and arranged in a side position with respect to said front opening (3);
- at least one fastening pin (41) constrained in a respective opening (4a) of the protective visor (4);

wherein said base member (12) comprises a seat (130) adapted to rotatably and reversibly house said fastening pin (41);

wherein said seat (130) of said base member (12) comprises at least one elastic countering member (131) for said fastening pin (41);

wherein said base member (12) comprises an unlocking device (16) configured to operate on the elastic countering member (131) to release the fastening pin (41) from the seat (130).

2. Helmet (1) according to claim 1, wherein said base member (12) comprises a body (13) and a lid (14) constrained to said body (13).

3. Helmet (1) according to claim 1 or 2, wherein said unlocking device (16) is translationally movable in said base member (12). said fastening pin (41), said second magnetic-coupling member (11b) being constrained to, or made in a single piece with, said base member (12).

4. Helmet (1) according to one of the preceding claims, wherein said unlocking device (16) comprises a portion, preferably at least one protuberance (16a), adapted to move and/or deform said at least one elastic countering member (131). 5

5. Helmet (1) according to one of the preceding claims, wherein said elastic countering member (131) comprises a body (131a) coupled to a spring (131b). 10

6. Helmet (1) according to one of the preceding claims, wherein said elastic countering member (131) comprises inclined tilted surface (S1) adapted to cooperate with said fastening pin (41), so that a translation movement of the fastening pin (41) closer to said elastic countering member (131) causes a movement and/or deformation of said elastic countering member (131) to allow the fastening pin (41) to be inserted into the seat (130). 15
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7. Helmet (1) according to one of the preceding claims, wherein said elastic countering member has a coupling surface (S2) adapted to cooperate with said fastening pin, so that when the fastening pin (41) is inserted into the seat (130), a translation movement of the fastening pin (41) away from said seat is hampered, and preferably is substantially prevented, by the cooperation between said fastening pin and said coupling surface (S2). 25
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8. Helmet (1) according to one of the preceding claims, wherein said unlocking device (16) comprises at least one protrusion (16d) adapted to cooperate with said fastening pin (41) so as to axially move said at least one fastening pin (41) to move said visor (4) away from the seat (130) of the mechanism (10). 35
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9. Helmet (1) according to one of the preceding claims, wherein said base member (12) comprises a toothed portion (133) adapted to cooperate with one or more protuberances (4b) of said visor (4). 45

10. Helmet (1) according to one of the preceding claims, wherein said base member (12) comprises a housing portion (15) made in said outer shell (2) or integrally constrained to said outer shell (2), wherein said body (13) is constrained, preferably in a rotatable way, to said housing portion (15). 50

11. Helmet (1) according to one of the preceding claims, wherein said mechanism (10) comprises at least a first and a second magnetic-coupling member (11a, 11b), said first magnetic-coupling member (11a) being constrained to, or made in a single piece with, 55

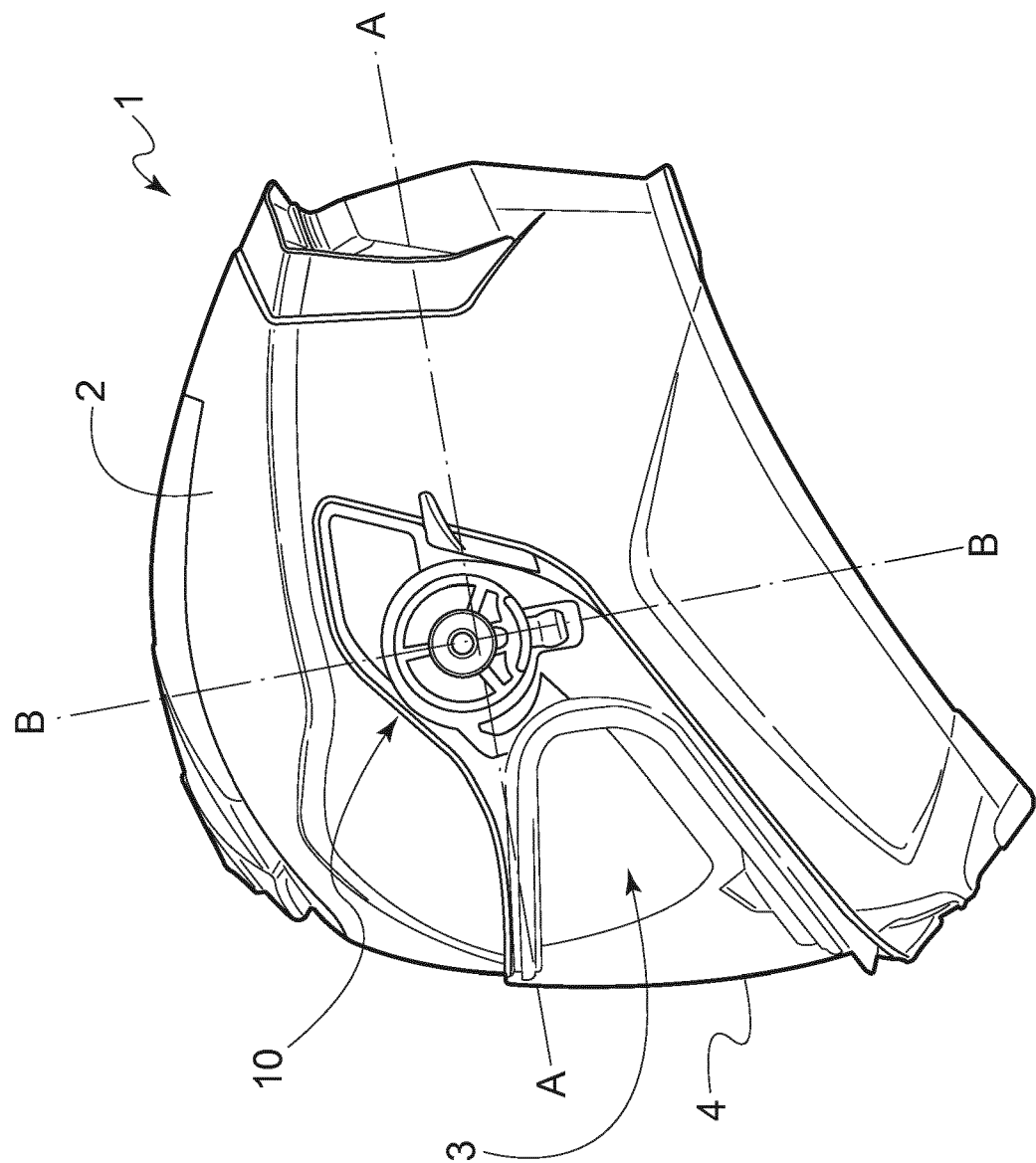


Fig. 1

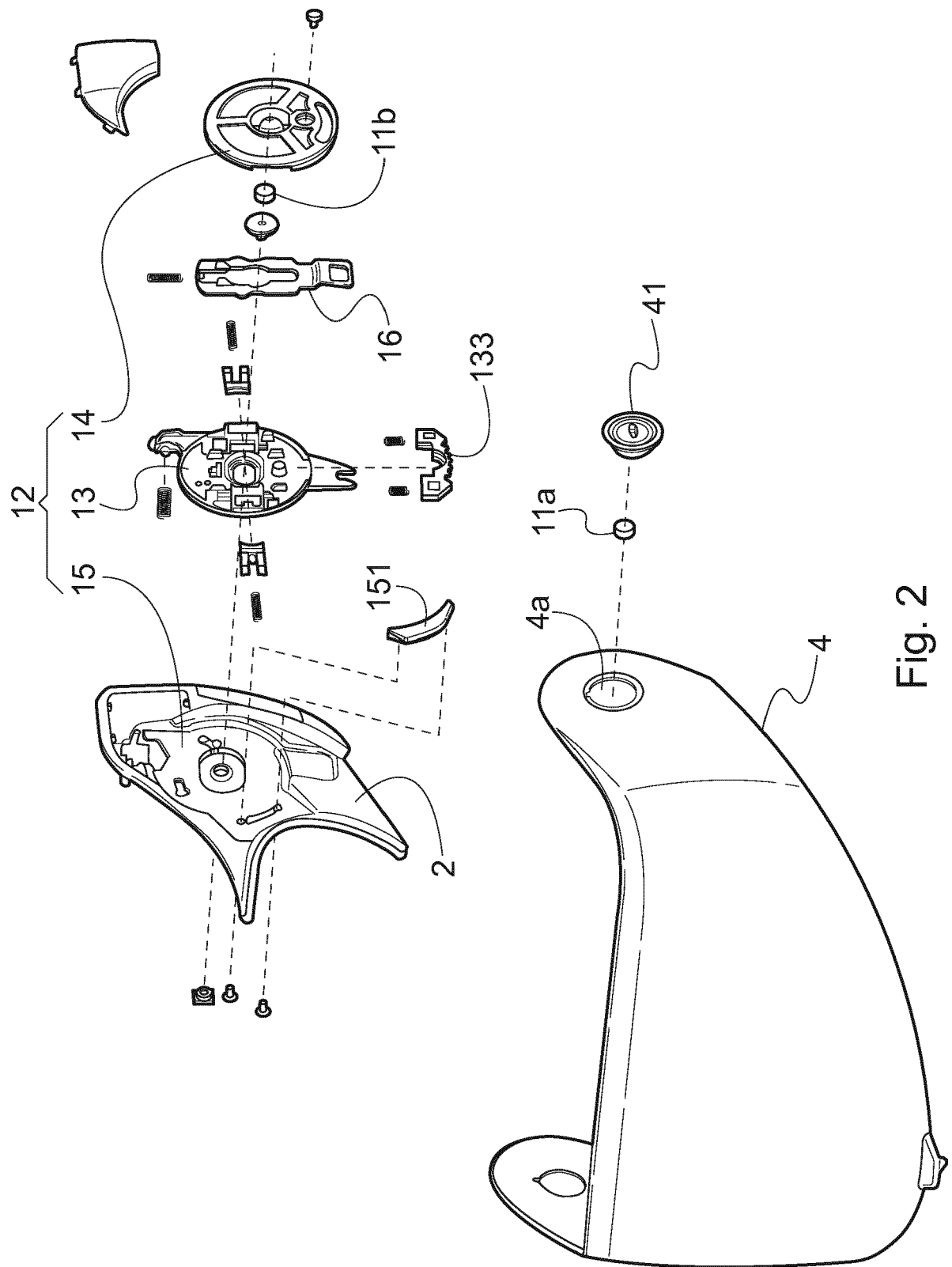


Fig. 2

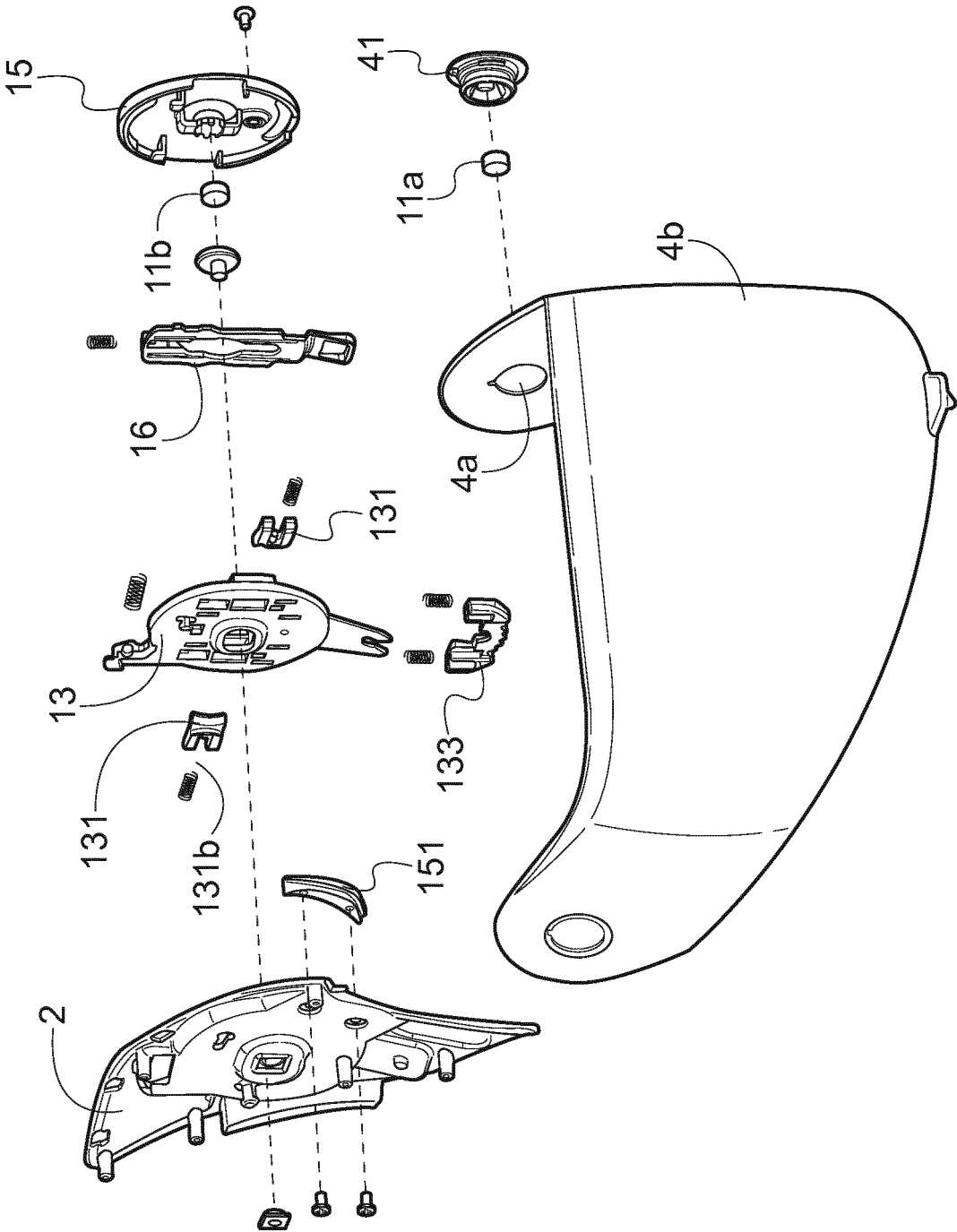


Fig. 3

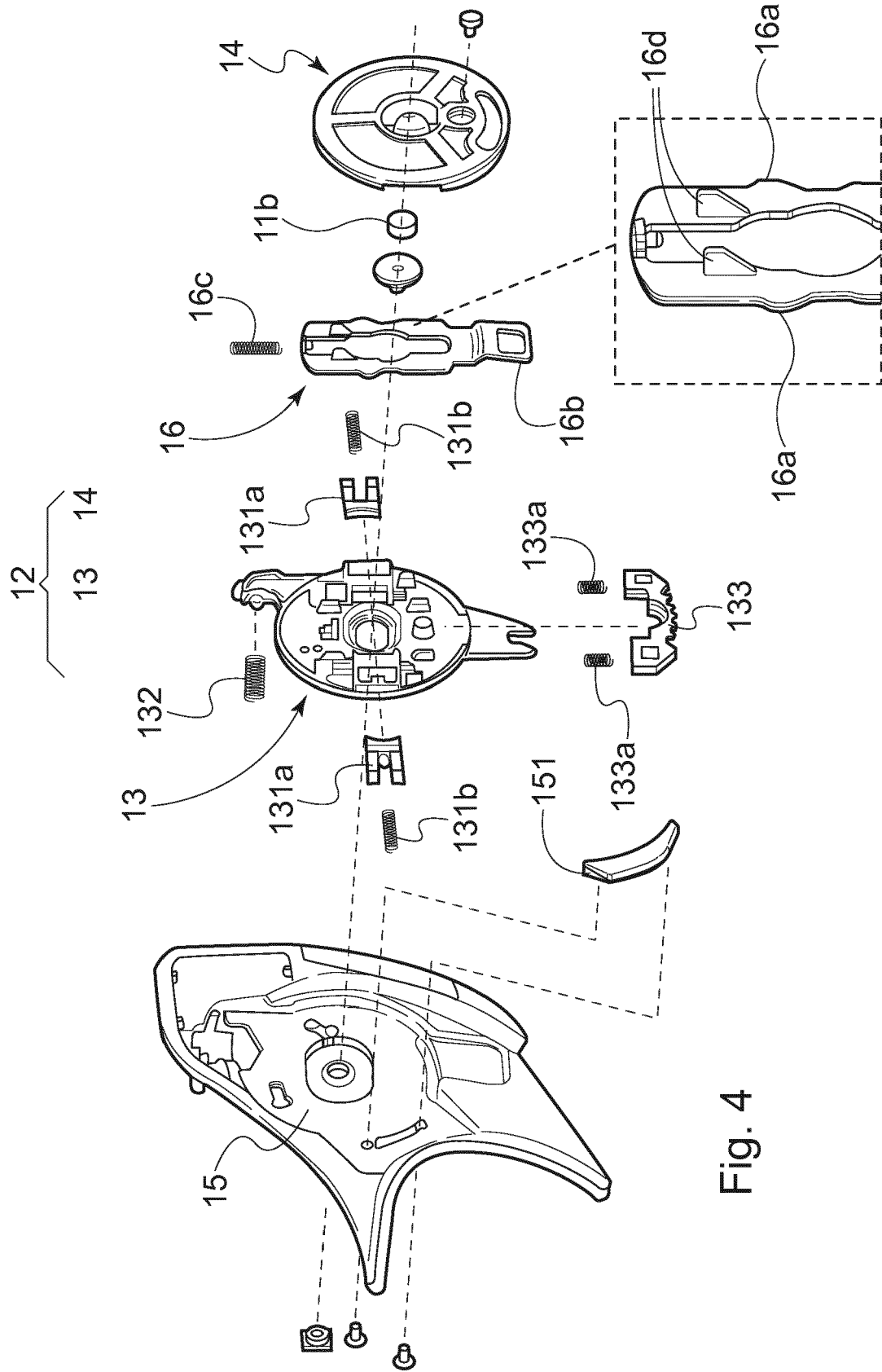


Fig. 4

Fig. 4a

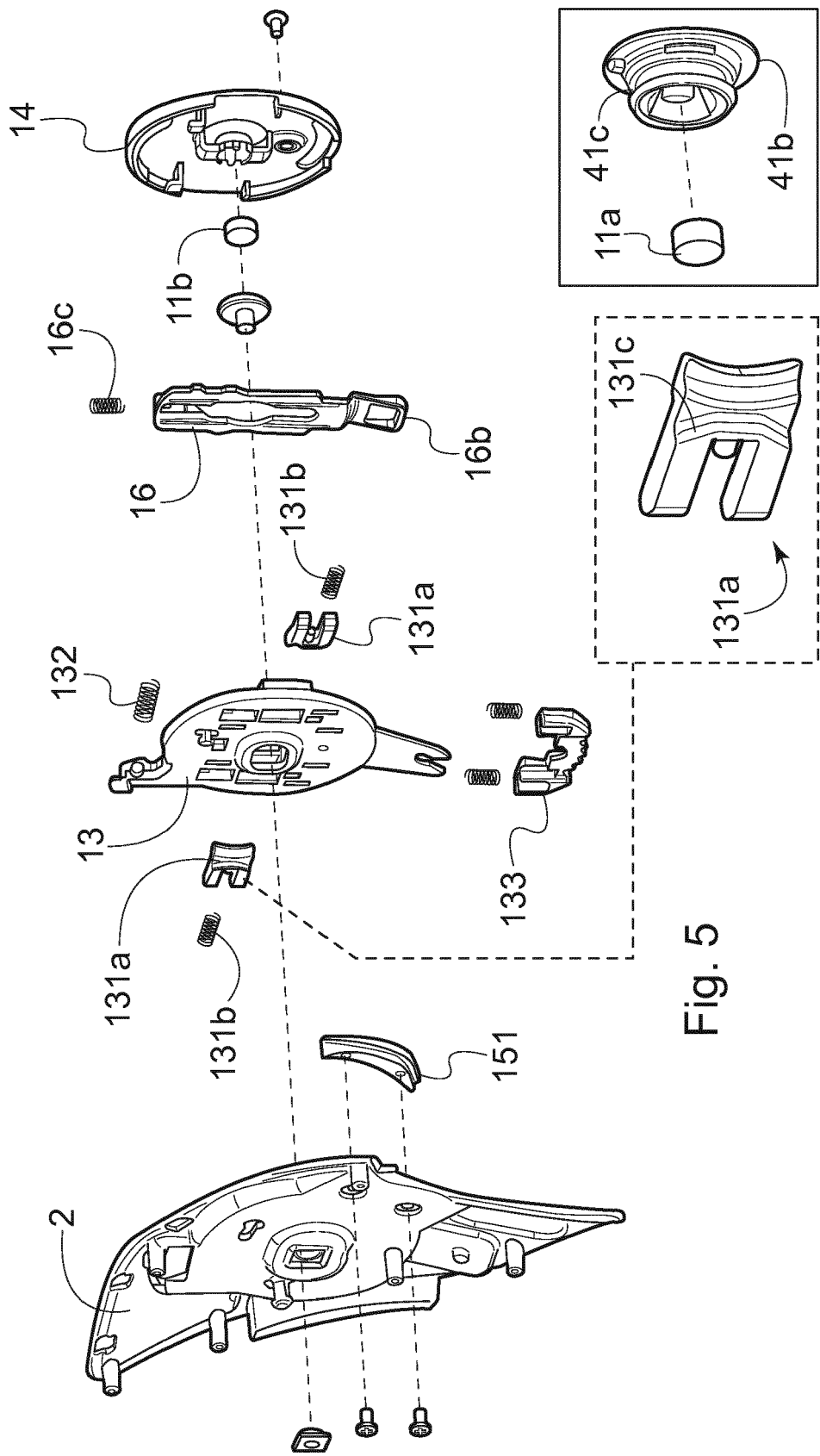


Fig. 5

Fig. 5a

Fig. 5b

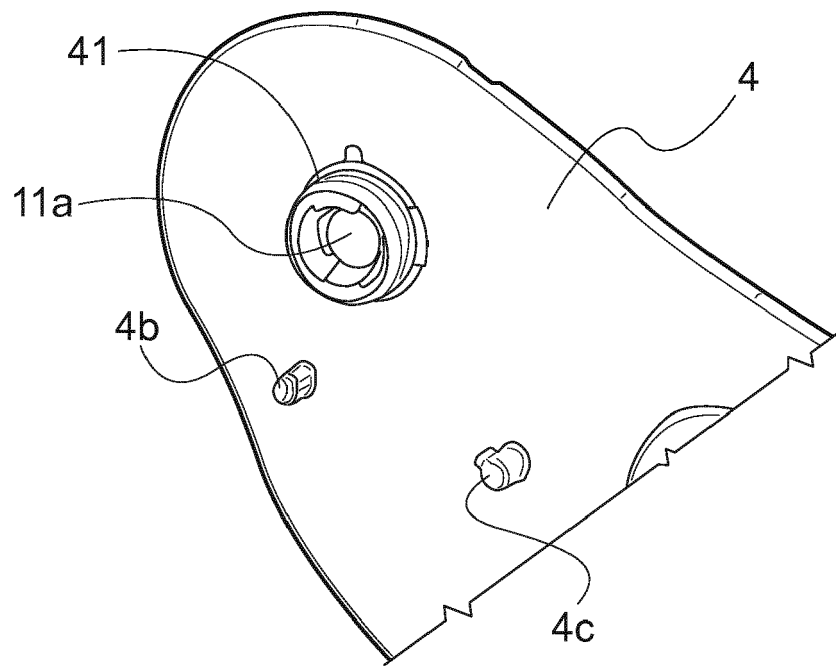


Fig. 6

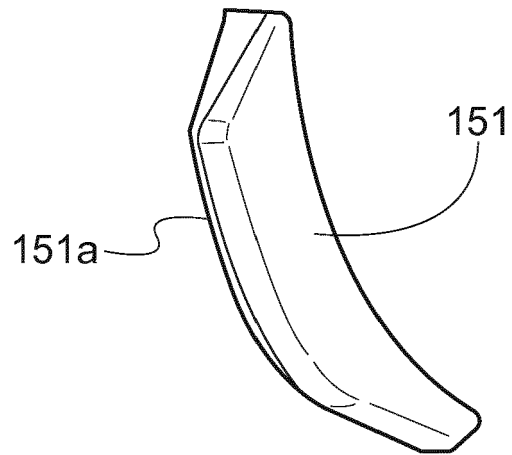


Fig. 6a

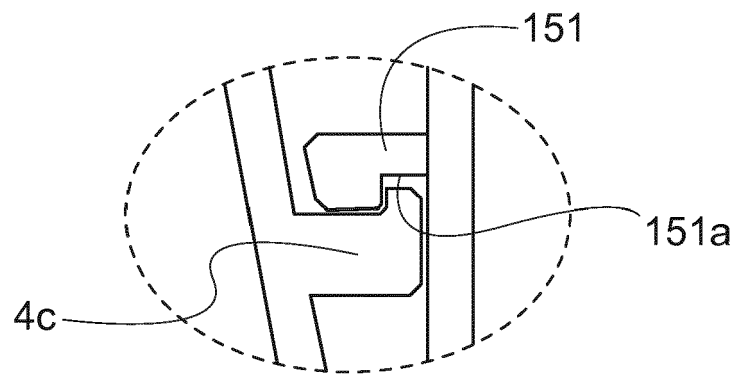


Fig. 6b

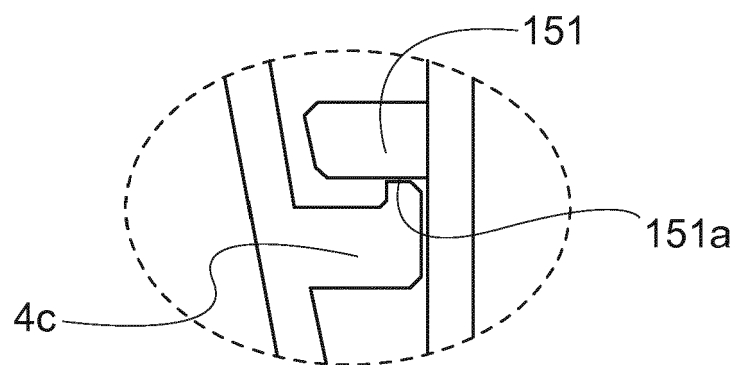


Fig. 6c

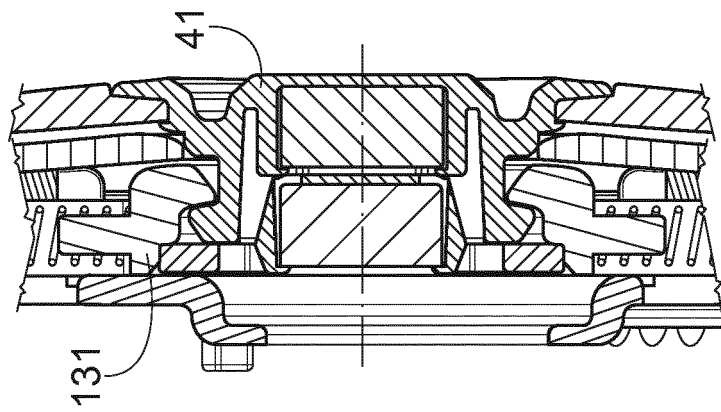


Fig. 7c

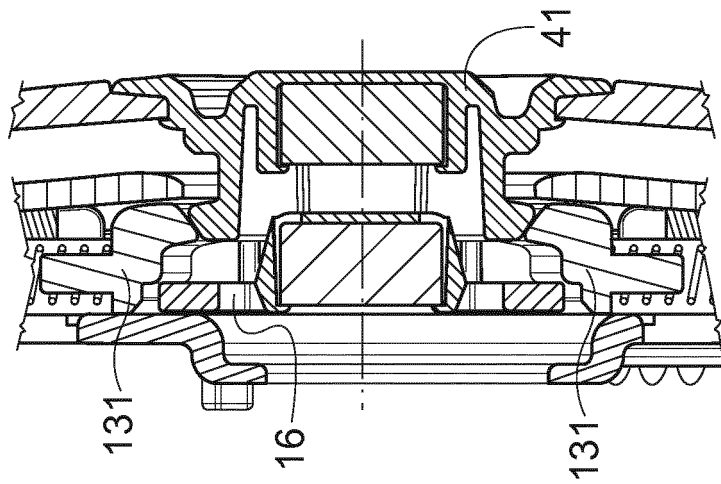


Fig. 7b

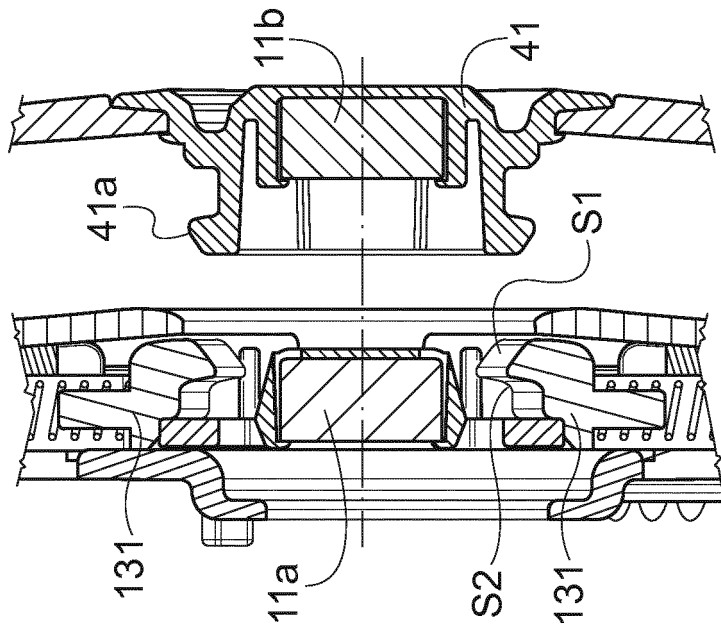


Fig. 7a

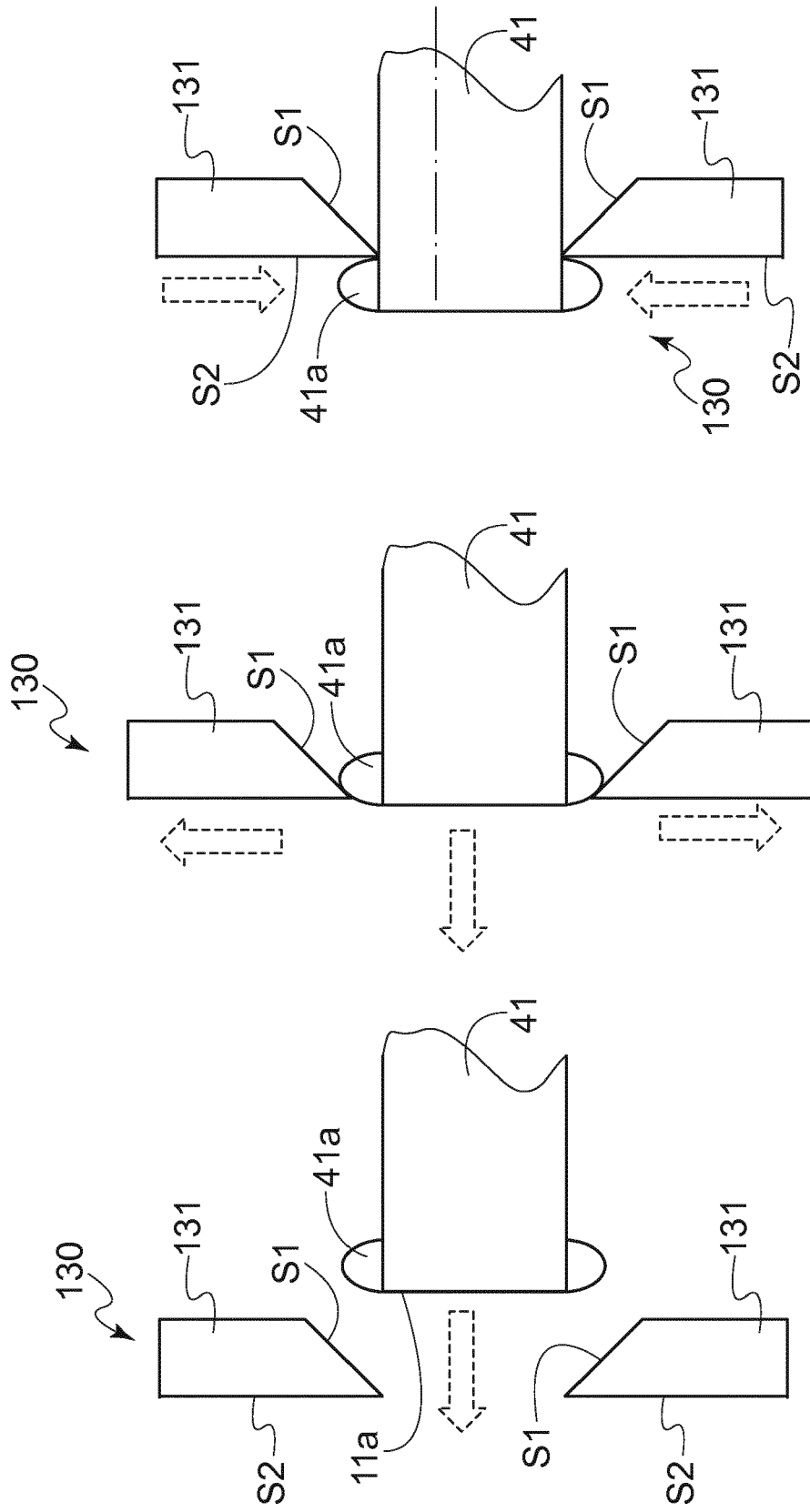


Fig. 7d

Fig. 7e

Fig. 7f

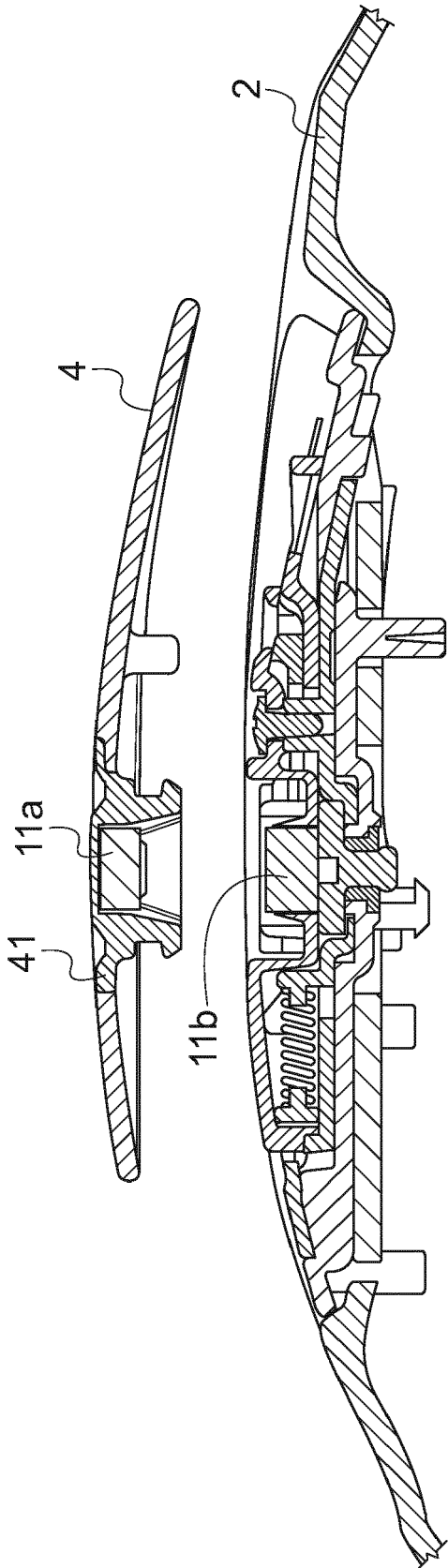


Fig. 8

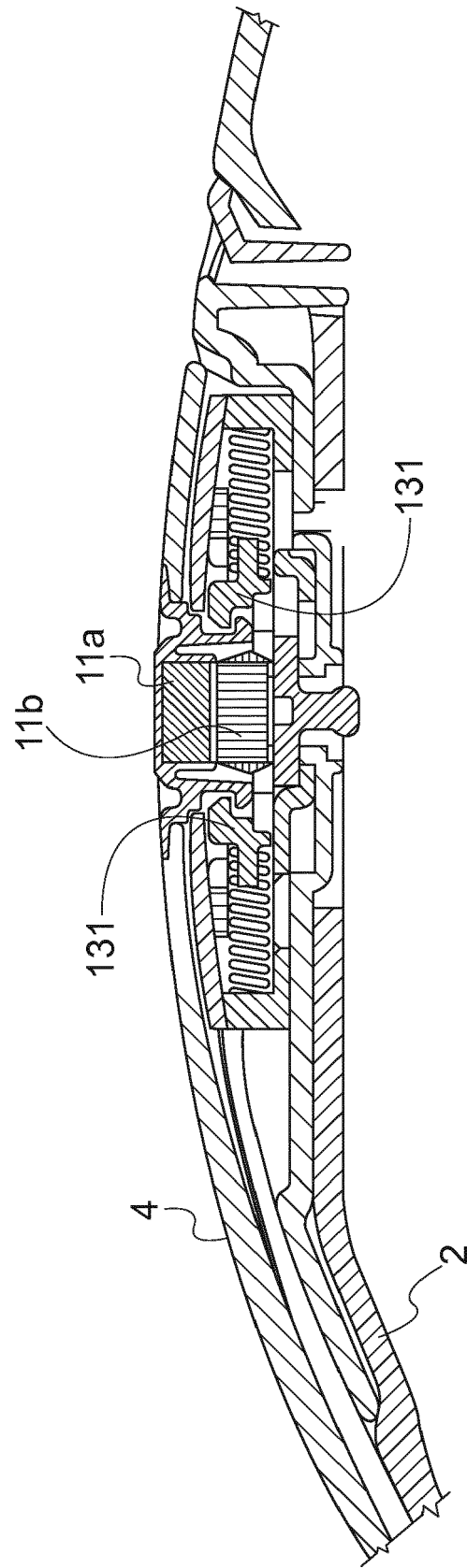


Fig. 9

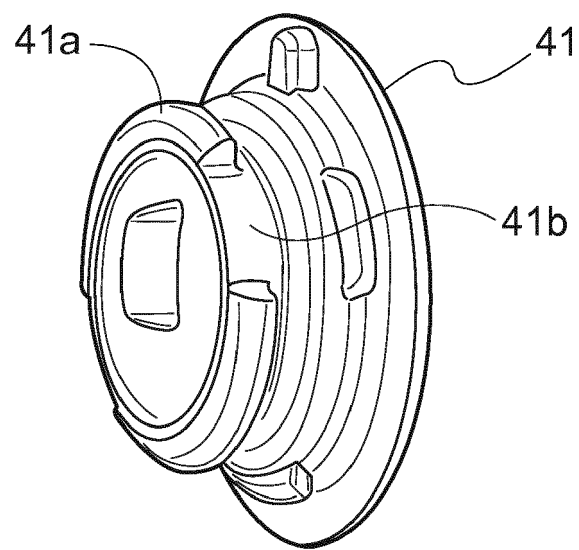


Fig. 10

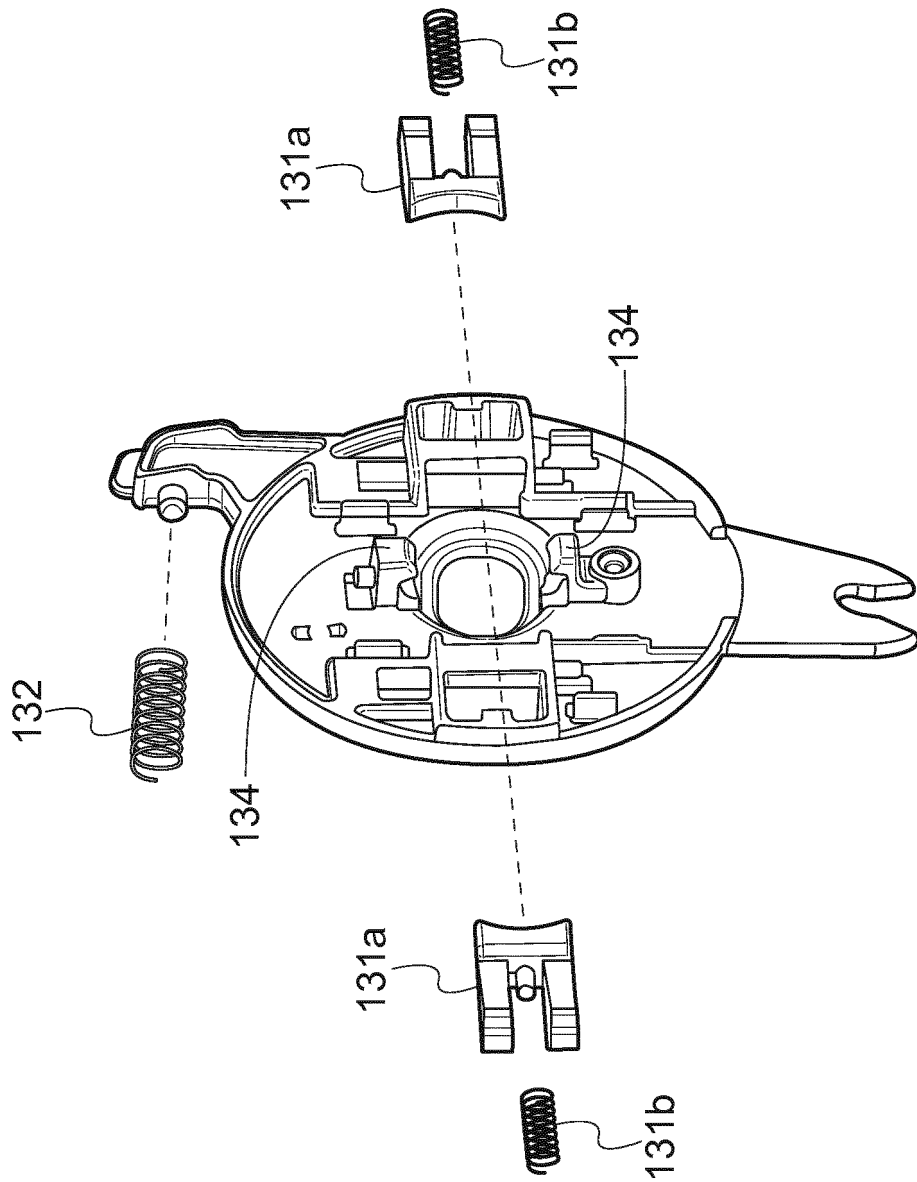


Fig. 11

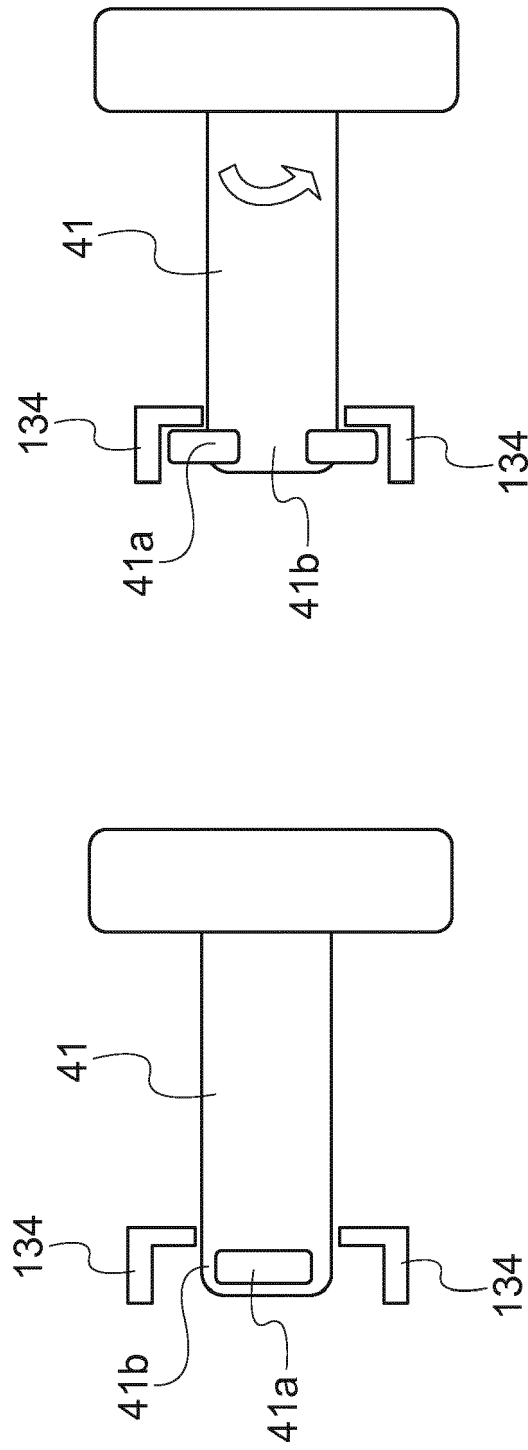


Fig. 12b

Fig. 12a



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Application Number
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Place of search The Hague		Date of completion of the search 19 November 2019	Examiner D'Souza, Jennifer
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