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(54) **DEVICE FOR FIXING THE TOILET LID AND THE SEAT FOR SUSPENDED SANITARY BOWLS**

(57) A fastening device for the toilet lid and seat of a suspended sanitary bowl, provided with screws (14) having a head (14a) equipped with a shaped seat (14b) for coupling with a tool, and a threaded hole

(14c), aligned with the axis of said screw (14). The hole (14c) is intended to receive a screw (32) for the fastening of a connection plate (28).

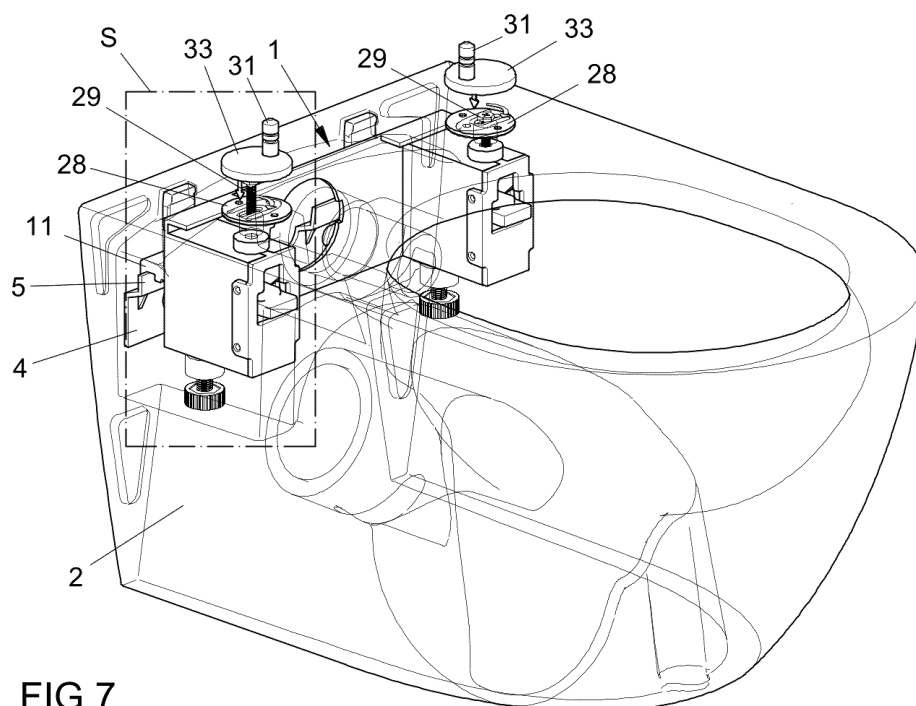


FIG. 7

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Description

BACKGROUND OF THE INVENTION

[0001] The present invention refers to a device for the fastening of the toilet lid and the seat for so-called "suspended" sanitary bowls, that is sanitary bowls that do not rest on the floor of the room in which they are installed, but are raised at a certain height from the floor and are fixed cantilevered to a wall of the room.

[0002] In the installation of the sanitary bowls to which the present invention refers it is fundamental to guarantee that the sanitary bowl is firmly anchored to the wall from which it is suspended. This object is achieved with the wall fastening device for suspended sanitary bowls, described in the Italian patent application no. 102024000016564 filed in the name of the same Applicant.

[0003] In particular the device claimed in said patent application is distinguished by the fact of comprising a frame adapted to be installed on the suspended sanitary bowl, an anchoring support adapted to be wall-mounted, a pair of gripping arms connected to the frame and reversibly movable from a release position to a gripping position. Each of these gripping arms is furthermore anchored to the cited anchoring support and a pair of actuators is provided to determine a reversible displacement of the same gripping arms from a release position to a gripping position of the cited wall anchoring support of the sanitary bowl.

SUMMARY OF THE INVENTION

[0004] In the embodiment described above there exists the need to make possible, in an easy and simplified manner, the fastening of the toilet lid and the seat on the body of the suspended bowl, without having to modify its structure, but instead exploiting the components of the same.

[0005] This object is achieved with the device characterized in claim 1. Preferred embodiments of the invention result from the remaining claims.

[0006] Thanks to the device of the invention, the operations for fastening the toilet lid and the seat on the wall-suspended bowl can be carried out in an easy and simplified manner exploiting, as fastening means, the same components used to anchor the suspended bowl to the wall.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] These and other objects, advantages and characteristics of the device according to the present invention will result more evident from the following detailed description of a preferred embodiment thereof, illustrated by way of example, but not limited to, in the attached drawings, in which:

- Fig. 1 illustrates in perspective view the wall fastening device, already described in the previous Italian patent application no. 102024000016564,
- Fig. 2 illustrates in perspective view the anchoring support of the fastening device of Fig. 1,
- Figs. 3 and 4 are exploded perspective views of the fastening device of Fig. 1,
- Fig. 5 is a perspective and exploded view of the fastening device illustrated in the previous figures, in use on a sanitary bowl with wall fastening,
- Figs. 6A, 6B and 6C schematically show the installation phases of a sanitary bowl by means of the fastening device of Fig. 1,
- Fig. 7 illustrates in perspective view a sanitary bowl adapted for wall fastening and provided with a variant of the fastening device according to the invention,
- Figs. 8 and 9 are an enlarged partial section view of the detail parts indicated with S in Fig. 7 and with T in Fig. 8, respectively, and
- Fig. 10 illustrates in exploded perspective view the sanitary bowl of Fig. 7 together with the relative seat and toilet lid.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[0008] Making reference initially to Figs. 1-5 of the drawings, in them is illustrated a preferred embodiment of the fastening device according to the present invention, indicated as a whole with 1. The fastening device 1 is conceived to allow the wall installation of a suspended sanitary bowl 2 and comprises, for such purpose, a frame 3 adapted to be installed on a sanitary bowl 2 and an anchoring support 4 for said frame 3 intended to be fixed to a mounting wall (not shown) to support the sanitary bowl 2 cantilevered from said wall.

[0009] The anchoring support 4 is constituted by a shaped plate having a pair of projecting anchoring flanges 5 on which the frame 3 is engageable, as will be illustrated in greater detail in the following. The plate forming the anchoring support 4 is provided with slots 6 suitable to receive appropriate threaded studs 7 protruding from the mounting wall and on which hexagonal nuts 8 are screwable to firmly fix the anchoring support 4 to the mounting wall of the sanitary bowl 2. The presence of the slots 6 advantageously allows to be able to compensate possible variations of the center-to-center distance between the threaded studs 7 on the installation wall of the sanitary bowl 2. Obviously, the wall fastening of the anchoring support 4 can be carried out with different means, technically equivalent to those described above, provided they are capable of providing a safe and adjustable fastening of the anchoring support 4 to the mounting wall of the sanitary bowl 2.

[0010] On the anchoring support 4, in an intermediate position between the pair of anchoring flanges 5, an undercut 9 is conveniently realized which allows the

connection with a water inlet tube 10 and a washing conduit (not illustrated) of the sanitary bowl 2.

[0011] In order to allow the anchoring of the frame 3 on the anchoring support 4, the frame 3 is provided with a pair of gripping arms 11 each having an end part 12 bent substantially in an inverted "L" to be able to engage to a corresponding anchoring flange 5 of the anchoring support 4. Each gripping arm 11 is connected to the frame 3 in such a way as to be reversibly movable from a release position to a gripping position in which said gripping arm 11 is firmly anchored to the anchoring support 4.

[0012] In order to carry out the reversible displacement of the gripping arms 11 from the release position to the gripping position, on the frame 3 are provided actuating means 13 constituted by a screw-threaded nut mechanism. The screw 14 of such mechanism has a head 14a provided with a shaped seat 14b, which makes it suitable to receive the appropriate tool, normally passed through the usual fastening holes 15 of the hinges of the seat of the sanitary bowl 2 (Figures 1, 5, 6A, 6B, 6C).

[0013] On its part the threaded nut 16 is operatively interconnected with an opening 17 in the gripping arm 11 and is equipped with inclined surfaces 18, 19 which, sliding in contact with opposite beveled edges 20, 21 of said opening 17, are suitable to impart to the corresponding gripping arm 11 a forward and backward displacement along the direction of its longitudinal axis.

[0014] The frame 3 is provided, furthermore, with guide surfaces 22 and each gripping arm 11 is equipped with projections 23 cooperating with the guide surfaces 22 on the frame 3 to determine a coupling rotation and, respectively, a decoupling rotation of the gripping arm 11 with the corresponding anchoring flange 5, as will be described in greater detail in the following.

[0015] The frame 3 is configured in such a way as to be able to be placed firmly inside a suitable housing compartment 24 obtained on the back of the sanitary bowl 2. To fix in position the frame 3 inside the housing compartment 24 there can be provided clamps 25 that lock the frame 3 on a rear crossbeam 26 of the sanitary bowl 2. Conveniently, the frame 3 can be provided with height-adjustable feet 27 to allow the correct positioning of the frame 3 inside its housing compartment 24 in the sanitary bowl 2. Through the height adjustment of the feet 27 it is possible to position the frame 3 in a precise way along the vertical axis in its housing compartment 24 inside the sanitary bowl 2 and thus realize an interlocking fastening that is capable of supporting the sanitary bowl 2 absorbing high forces.

[0016] After having fixed the frame 3 to the sanitary bowl 2 it is possible to proceed with the installation of the latter on a mounting wall on which the anchoring support 4 has been previously applied. The installation phases are schematically shown in Figs. 6A, 6B and 6C of the drawings in which, for simplicity of representation, are illustrated only the frame 3, with one of the gripping arms 11 and the corresponding actuator 13, and the wall-mounted anchoring support 4.

[0017] In the first phase (Fig. 6A), the installer operates on the screw-threaded nut mechanism of each actuator 13 to lift the threaded nut 16, as indicated by the arrow F1. During the upward stroke of the threaded nut 16, the inclined surface 18 of the threaded nut 16 slides in contact with the lower beveled edge 20 of the opening 17 in the gripping arm 11 determining a forward displacement of the gripping arm 11, that is, toward the anchoring support 4, as indicated by the arrow F2. While the gripping arm 11 is displaced forward, the projections 23 on the gripping arm 11 slide in contact with the guide surfaces 22 on the frame 3 determining a clockwise rotation of the gripping arm 11, indicated by the arrow F3, which has the effect of lifting the end part 12 of the gripping arm 11 to allow the coupling with the anchoring flange 5 of the anchoring support 4.

[0018] In the second phase (Fig. 6B), the installer moves the sanitary bowl 2 toward the wall anchoring support 4 to bring the end part 12 of the gripping arm 11 beyond the anchoring flange 5 and operates again on the screw-threaded nut mechanism of each of the actuators 13 to lower the threaded nut 16, as indicated by the arrow F4. During the downward stroke of the threaded nut 16, the inclined surface 18 of the threaded nut 16 slides in contact with the lower beveled edge 20 of the opening 17 in the gripping arm 11 determining a backward movement of the gripping arm 11, as indicated by the arrow F5 and, at the same time, a counterclockwise rotation of the gripping arm 11 which has the effect of lowering the end part 12 of the gripping arm 11 to allow the engagement with the anchoring flange 5 of the anchoring support 4. Once the two gripping arms 11 are engaged to the wall-fixed anchoring support 4, the water inlet mouth in the sanitary bowl 2 and the drain tube (siphon) present on the sanitary bowl 2 will result conveniently aligned with the corresponding hydraulic fitting element present on the wall, thus making very simple to finalize the hydraulic connections of inlet and drain.

[0019] In the third and last phase (Fig. 6C), the installer operates again on the screw-threaded nut mechanism of each of the actuators 13 to further lower the threaded nut 16, as indicated by the arrow F6. During the downward stroke of the threaded nut 16, the inclined surface 19 of the threaded nut 16 slides in contact with the upper beveled edge 21 of the opening 17 in the gripping arm 11 determining a further backward displacement of the gripping arm 11 against the anchoring flange 5, as indicated by the arrow F7. Thus, a dynamic coupling, as well as geometric, of the end part 12 of the gripping arm 11 with the anchoring flange 5 of the anchoring support 4 is obtained. By reaction the sanitary bowl 2 is pressed against the mounting wall thus determining its locking by friction. In this way the bowl, thus fixed to the wall according to the invention, has the advantage of being capable of withstanding even high loads.

[0020] Considering now Figs. 7-10 of the drawings, these schematically illustrate a variant of the fastening device of the invention. This variant is designed to allow a

simple and rapid fastening of the connection plates 28 to the sanitary bowl 2 for the connection of the quick-release hinges 29 of the seat and of the toilet lid 30.

[0021] More specifically, for the fastening of each connection plate 28, with the relative mounting pin 31 of the quick-release hinge, an appropriate screw 32 is provided that engages in the head 14a of the screw 14 of the screw-threaded nut mechanisms forming the actuating means 13 of the fastening device 1 of the sanitary bowl 2.

[0022] For this purpose, the head 14a of the screw 14 is hollow and comprises a shaped seat 14b for the coupling with a suitable tool to rotate the screw 14 and adjust the position of the threaded nut 16, and a threaded hole 14c, aligned with the axis of the screw 14 and intended to receive a stem part of the screw 32 for the fastening of the corresponding connection plate 28. Conveniently, on each connection plate 28 a cover cap 33 is removably mounted.

[0023] The advantage of the solution according to this variant of the invention is that the same screws 14 of the screw-threaded nut mechanism of the fastening device 1 serve as fastening elements for the connection plates 28.

[0024] From the above it is understood how the invention allows to reach the intended object. In particular, the device of the invention turns out to be particularly convenient and simple to employ and allows a precise and rapid installation of a suspended sanitary bowl.

[0025] Although the invention has been described and illustrated in relation to a preferred embodiment thereof, it is clear that it is susceptible to numerous modifications and variants that are within the reach of a skilled in the art and that for this reason fall within the scope of the appended claims.

Claims

1. A fastening device for the toilet lid and seat of a suspended sanitary bowl, of the type comprising:

- a frame (3) adapted to be installed on said sanitary bowl (2),
- an anchoring support (4) adapted to be wall-mounted,
- a pair of gripping arms (11) connected to said frame (3) and reversibly movable from a release position to a gripping position, in which each of said gripping arms (11) is anchored to said anchoring support (4) to wall-fix said sanitary bowl (2), and
- a pair of actuators (13) to determine a reversible displacement of said gripping arms (11) from said release position to said gripping position of said anchoring support (4), in which said actuators (13) are each constituted by a mechanism with a screw (14) and a threaded nut (16), in which said threaded nut (16) is operatively interconnected with a corresponding grip-

ping arm (11) and is configured to impart to said gripping arm (11) a reversible displacement along its longitudinal axis upon action of said screw (14), **characterized in that** said screw (14) has a head (14a) provided with a shaped seat (14b) for coupling with a suitable tool to rotate the screw (14) and adjust the position of the threaded nut (16), and with a threaded hole (14c) aligned with the axis of said screw (14), in which said hole (14c) is intended to receive a screw (32) for the fastening of a connection plate (28).

2. The device according to claim 1, **characterized in that** said sanitary bowl (2) is provided with holes (15) for the housing of said screws (14) of said screw-threaded nut mechanism (14, 16).

3. The device according to claim 1, **characterized in that** said wall-mounted anchoring support (4) has an anchoring element (5) projecting from the mounting wall and each of said gripping arms (11) has an end part (12) configured to be able to couple with said anchoring element (5).

4. The device according to claim 3, **characterized in that** said screw (14) has a hollow head (14a) comprising a shaped seat (14b) for coupling with a suitable tool to rotate the screw (14) and adjust the position of the threaded nut (16), and a threaded hole (14c) aligned with the axis of said screw (14) and intended to receive a screw (32) for the fastening of a connection plate (28) provided with a mounting pin (31) for a hinge of the seat and toilet lid (29) of said sanitary bowl (2).

5. The device according to claim 4, **characterized in that** said frame (3) is equipped with guide surfaces (22) and each gripping arm (11) is equipped with projections (23) cooperating with said guide surfaces (22) to determine a coupling rotation and, respectively, a decoupling rotation of said gripping arm (11) with the anchoring support (4).

6. The device according to claim 5, **characterized in that** said end part (12) of the gripping arms (11) is bent substantially in an inverted "L" to be able to engage to said anchoring element (5) of the anchoring support (4).

7. The device according to claim 6, **characterized in that** said anchoring support (4) is configured as a shaped plate and said anchoring element (5) is configured as a flange projecting from said shaped plate.

8. The device according to claim 7, **characterized in that** said plate-shaped anchoring support (4) is pro-

vided with slots (6) suitable to receive appropriate fastening screws (7) to firmly fix said anchoring support (4) to a mounting wall of said sanitary bowl (2) and to compensate possible variations of the center-to-center distance between said fastening screws (7). 5

9. The device according to claim 6, **characterized in that** said anchoring support (4) has an undercut (9) adapted to allow the connection with a water inlet tube (10) and a washing conduit of said sanitary bowl (2). 10

10. A suspended sanitary bowl, **characterized by** the fact of being provided with the seat and toilet lid fastening device according to one or more of the preceding claims. 15

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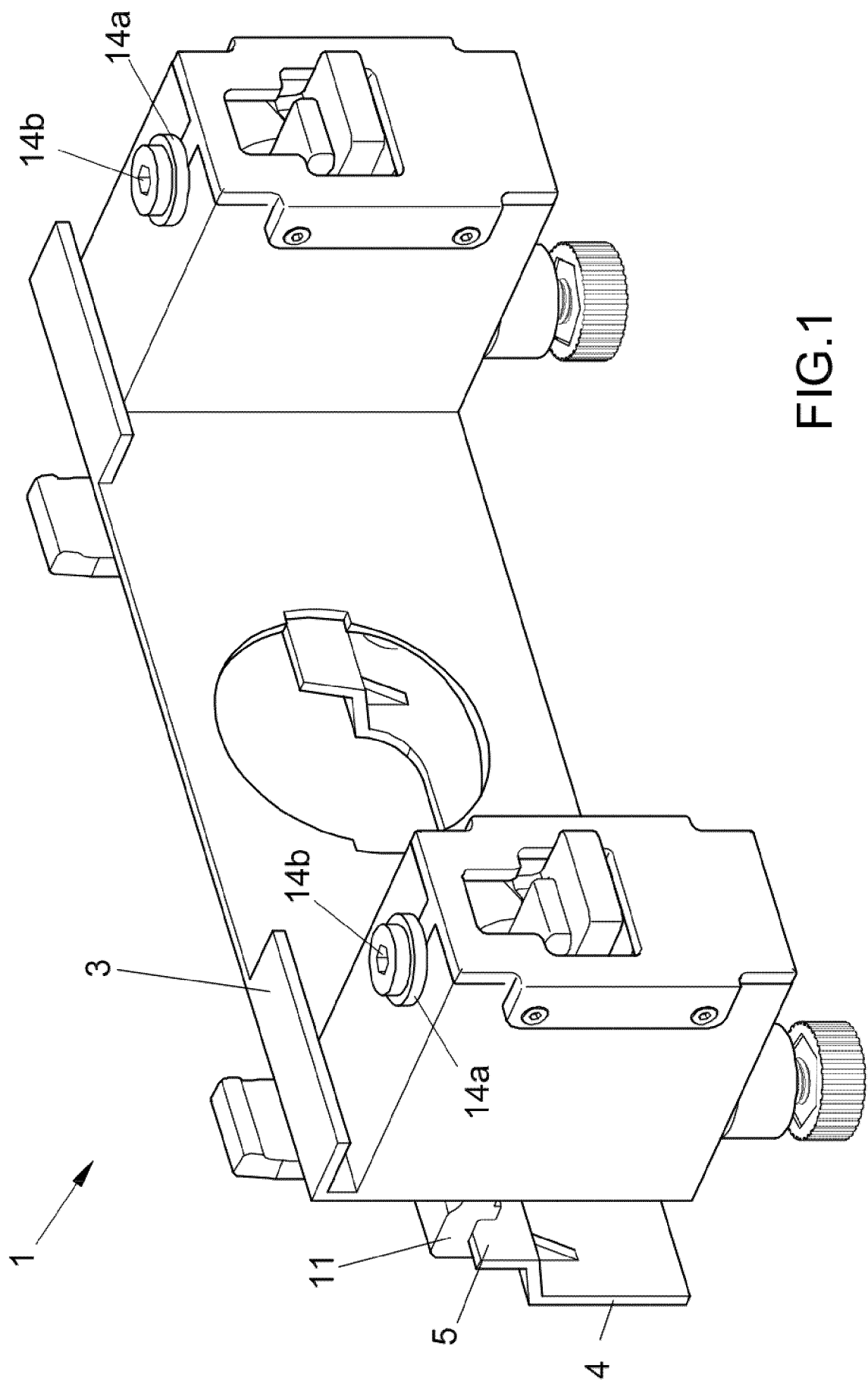


FIG.1

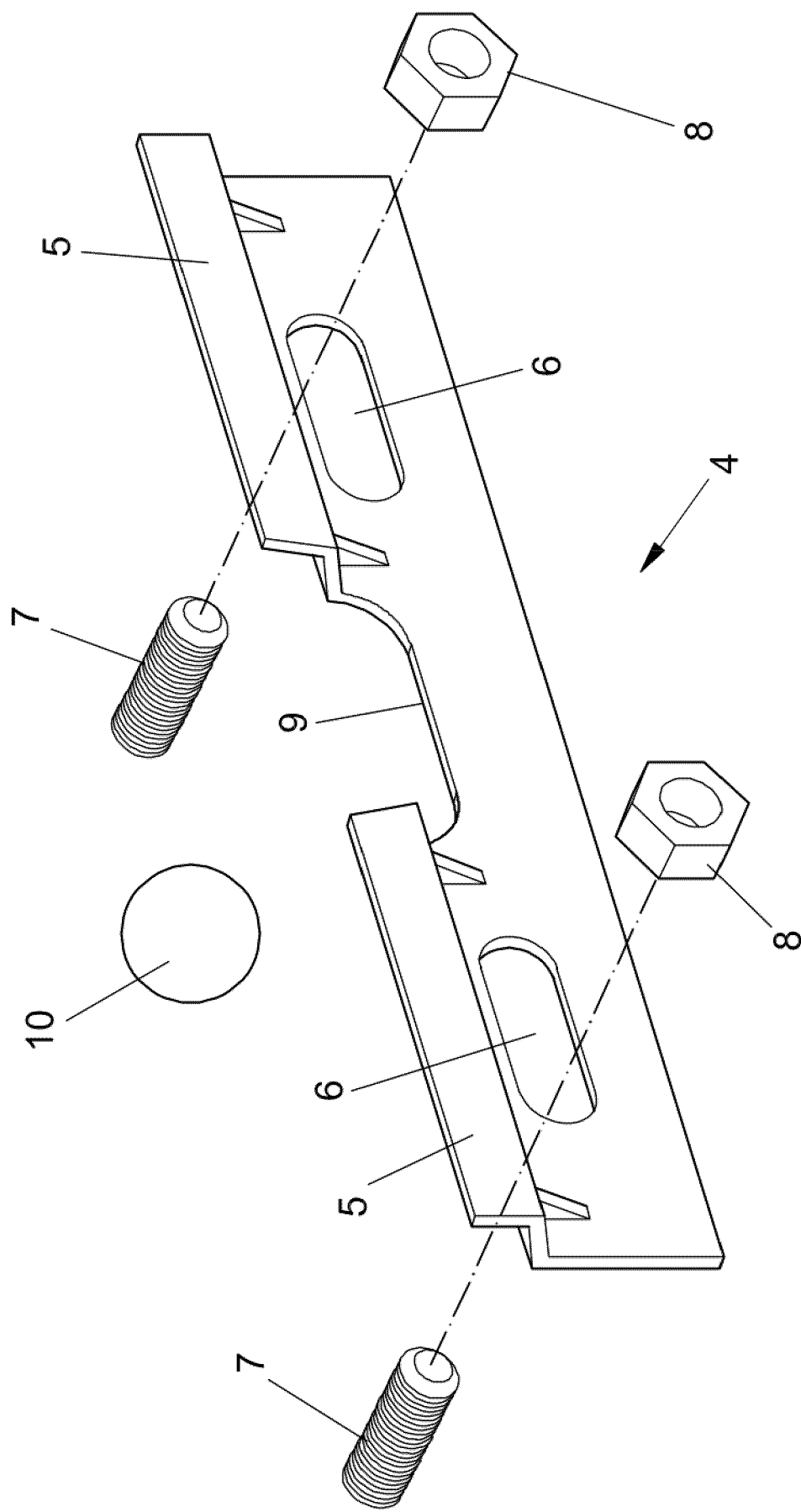


FIG.2

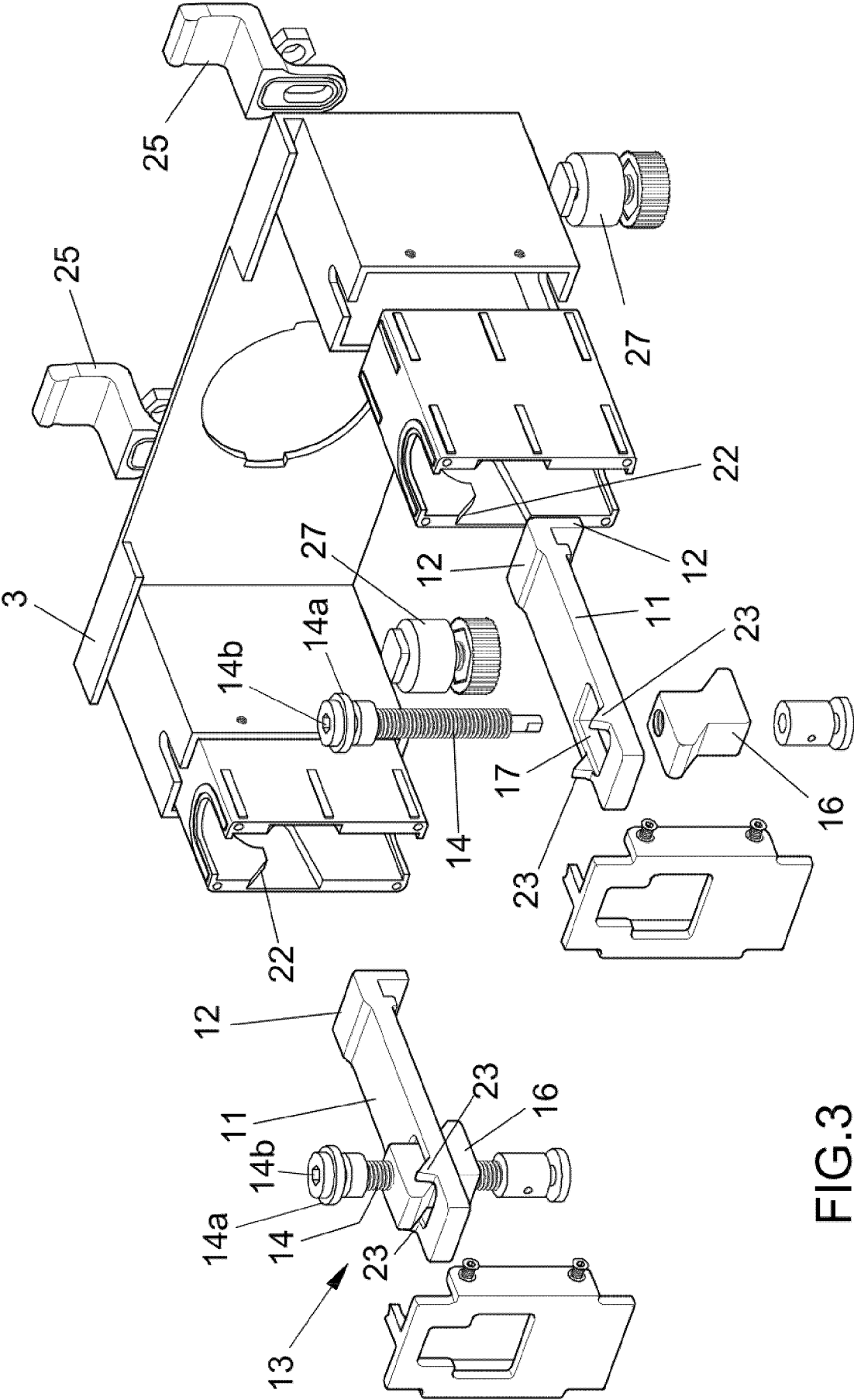


FIG.3

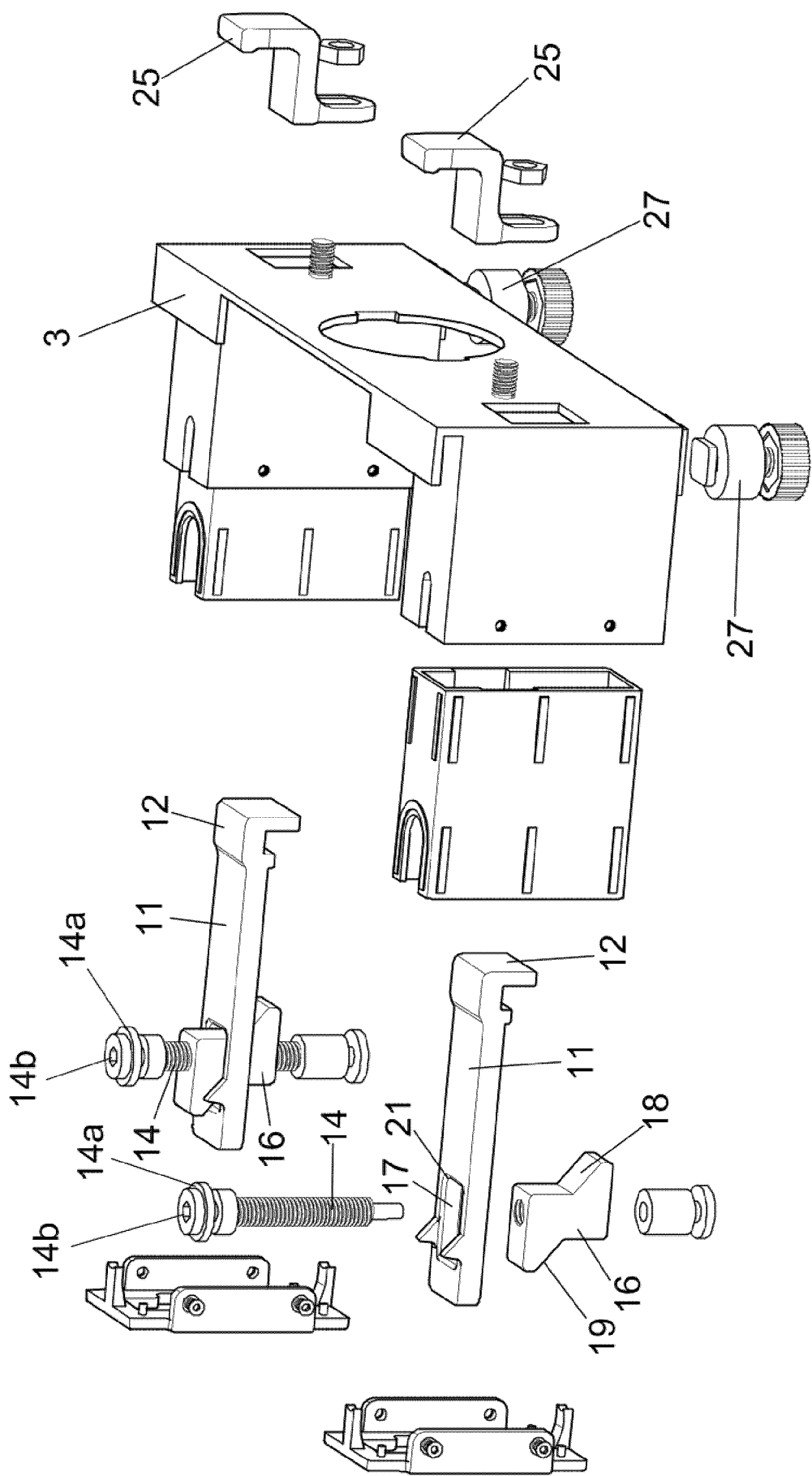


FIG.4

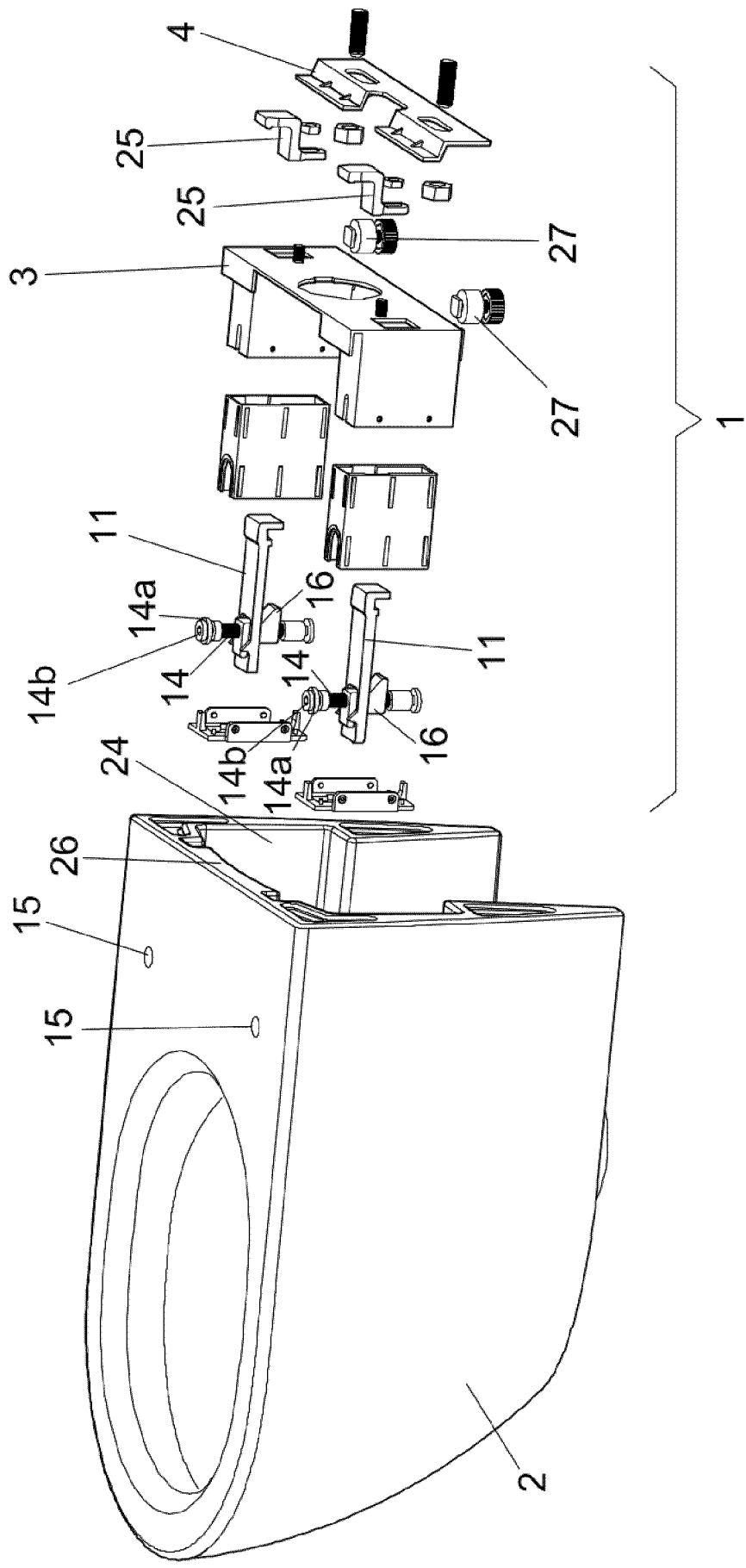
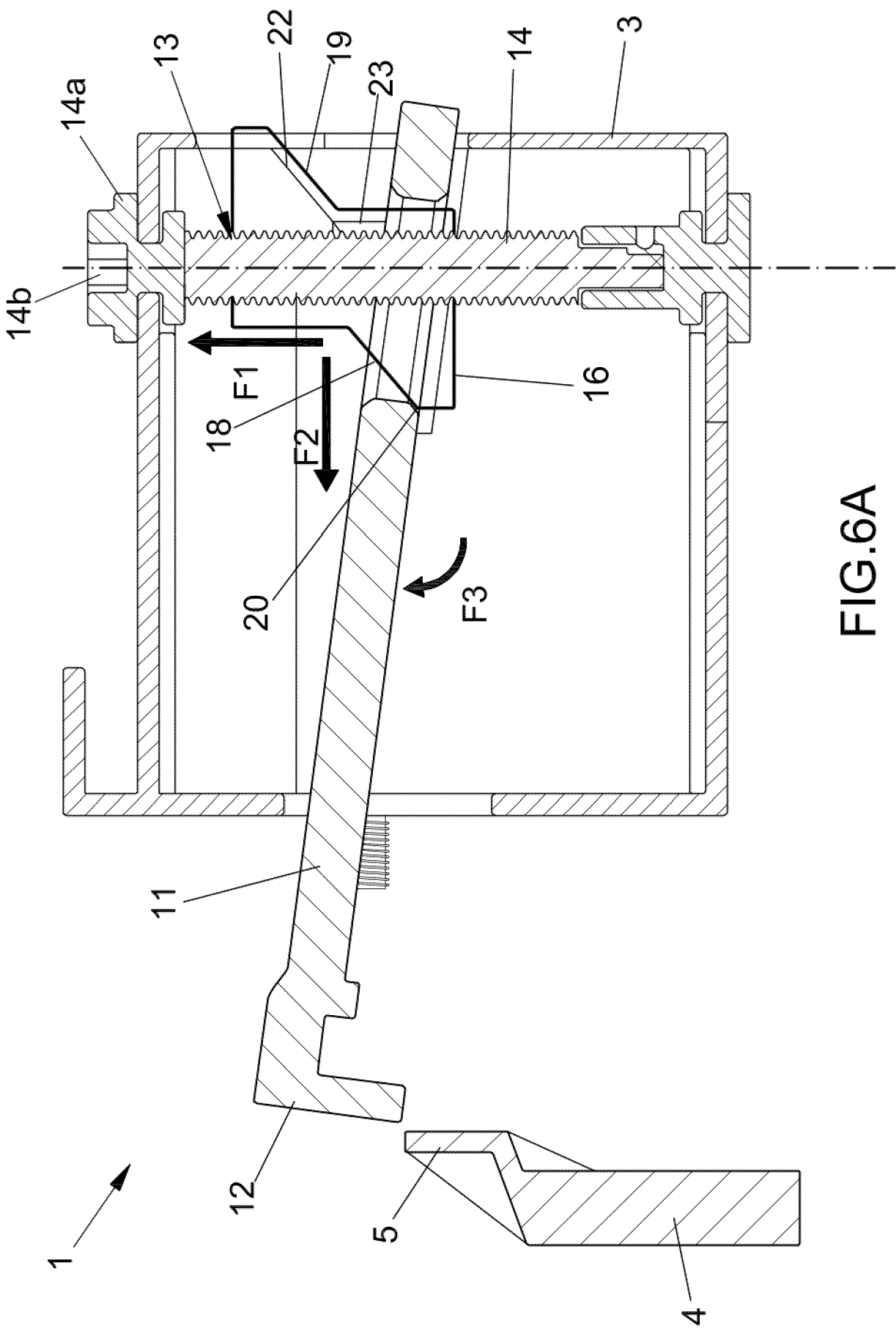


FIG.5



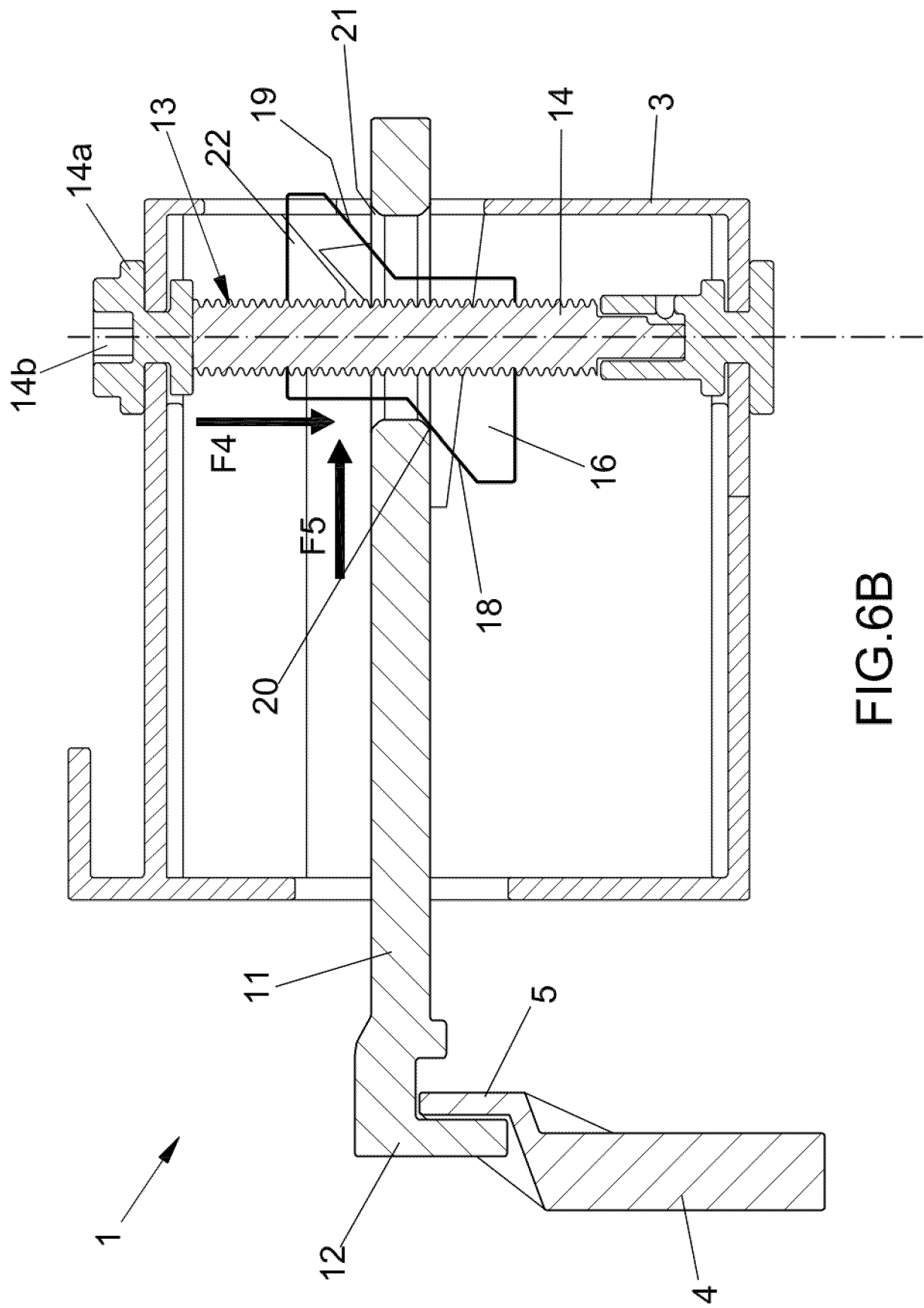


FIG.6B

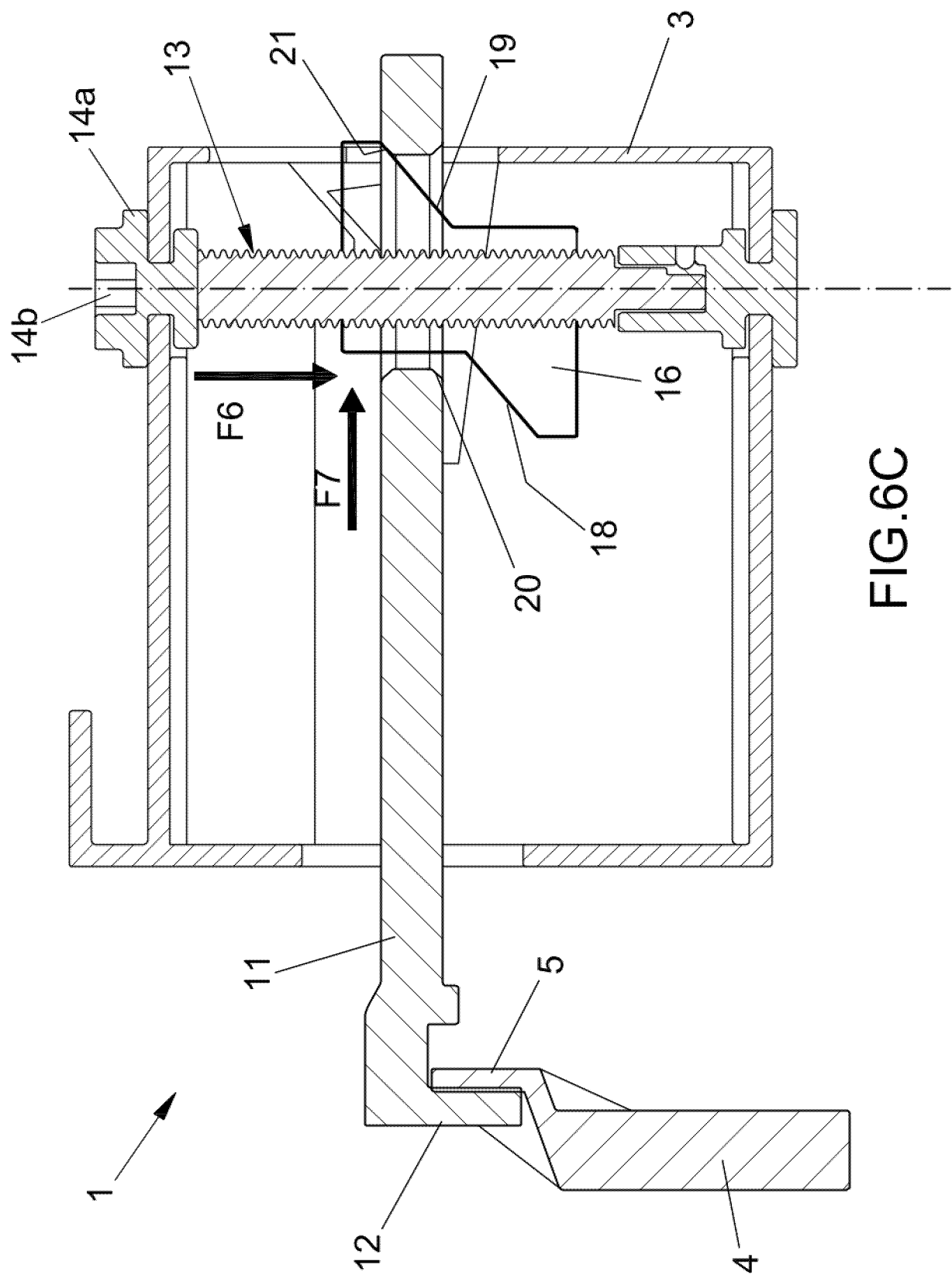


FIG. 6C

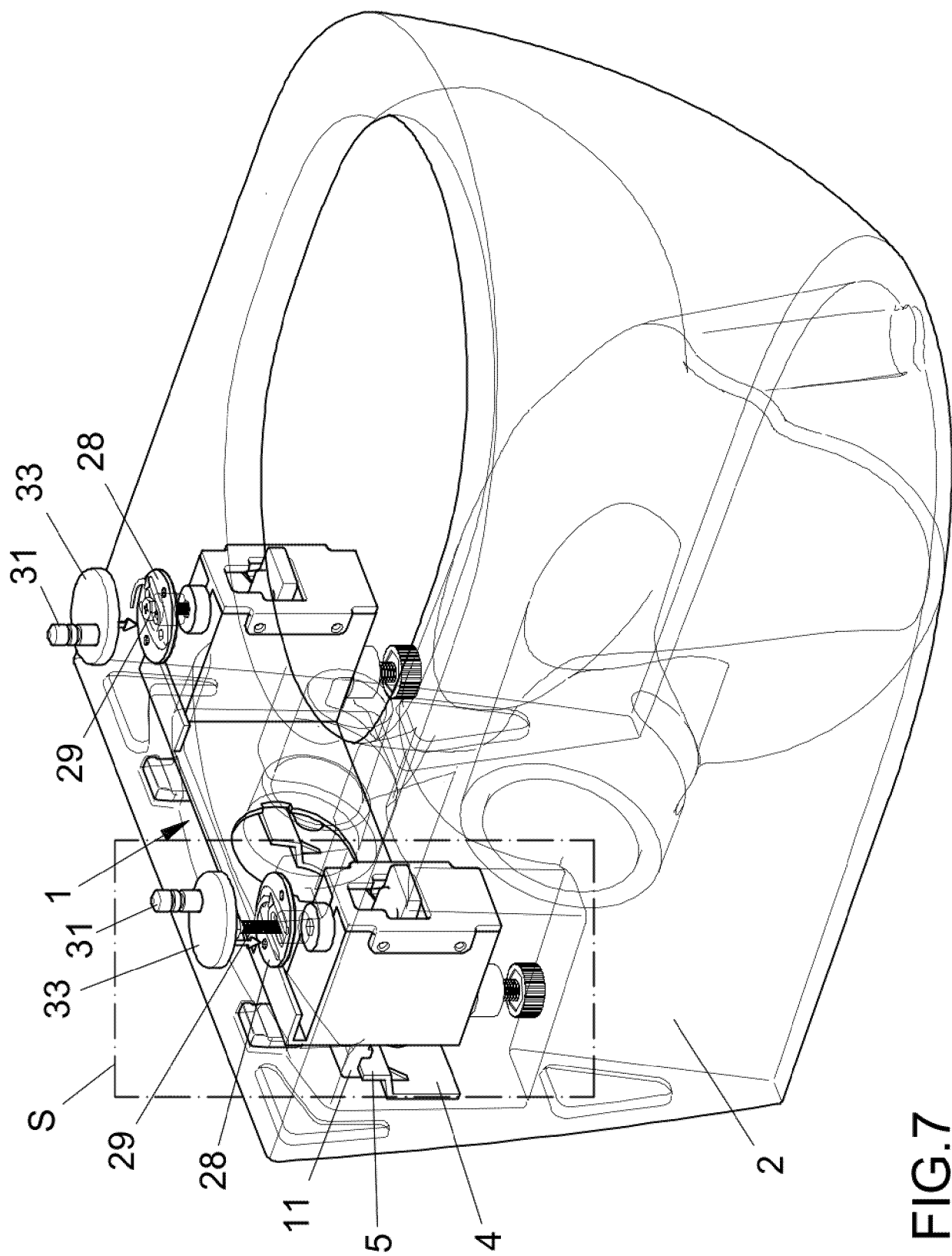


FIG.7

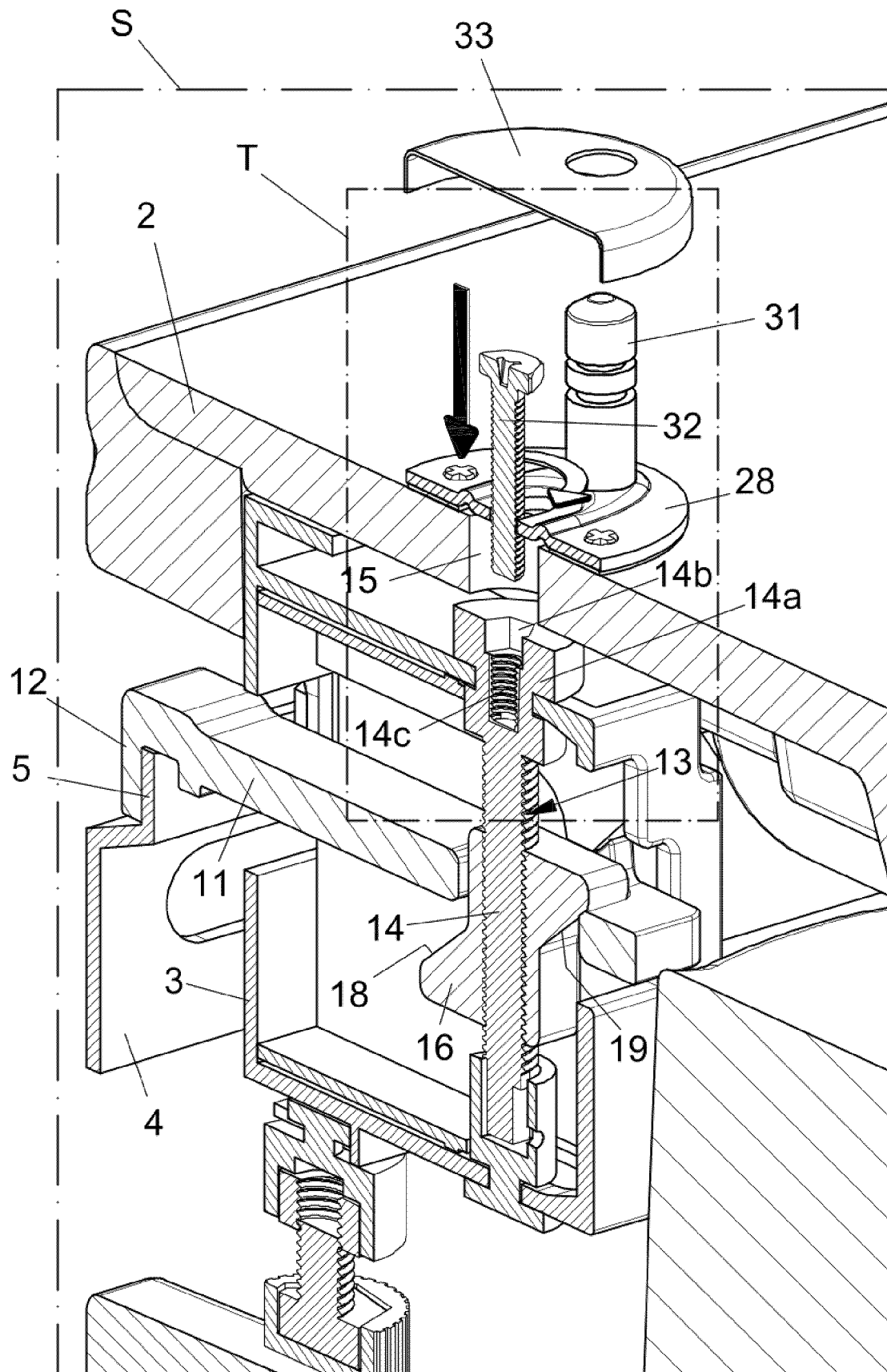


FIG.8

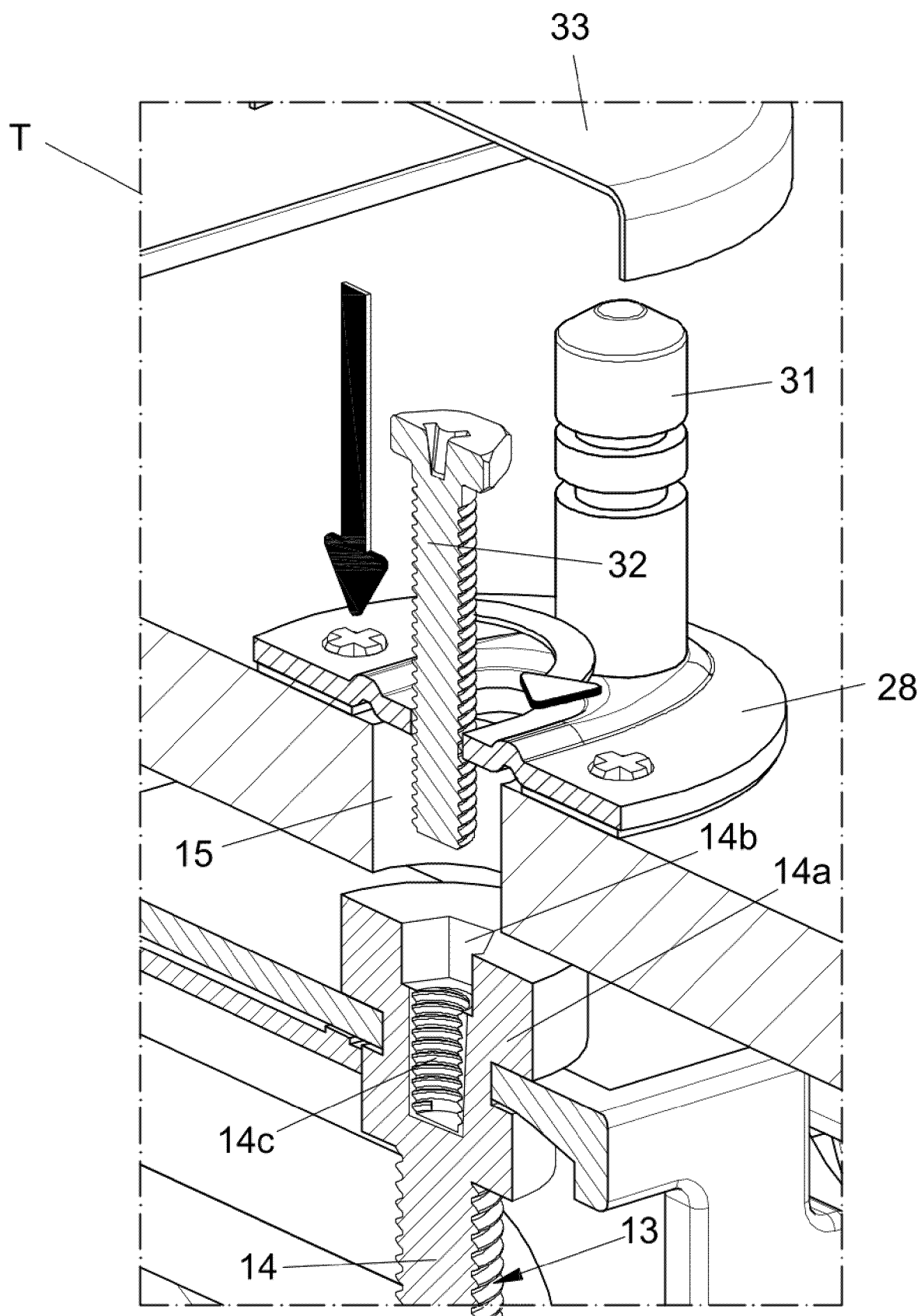


FIG.9

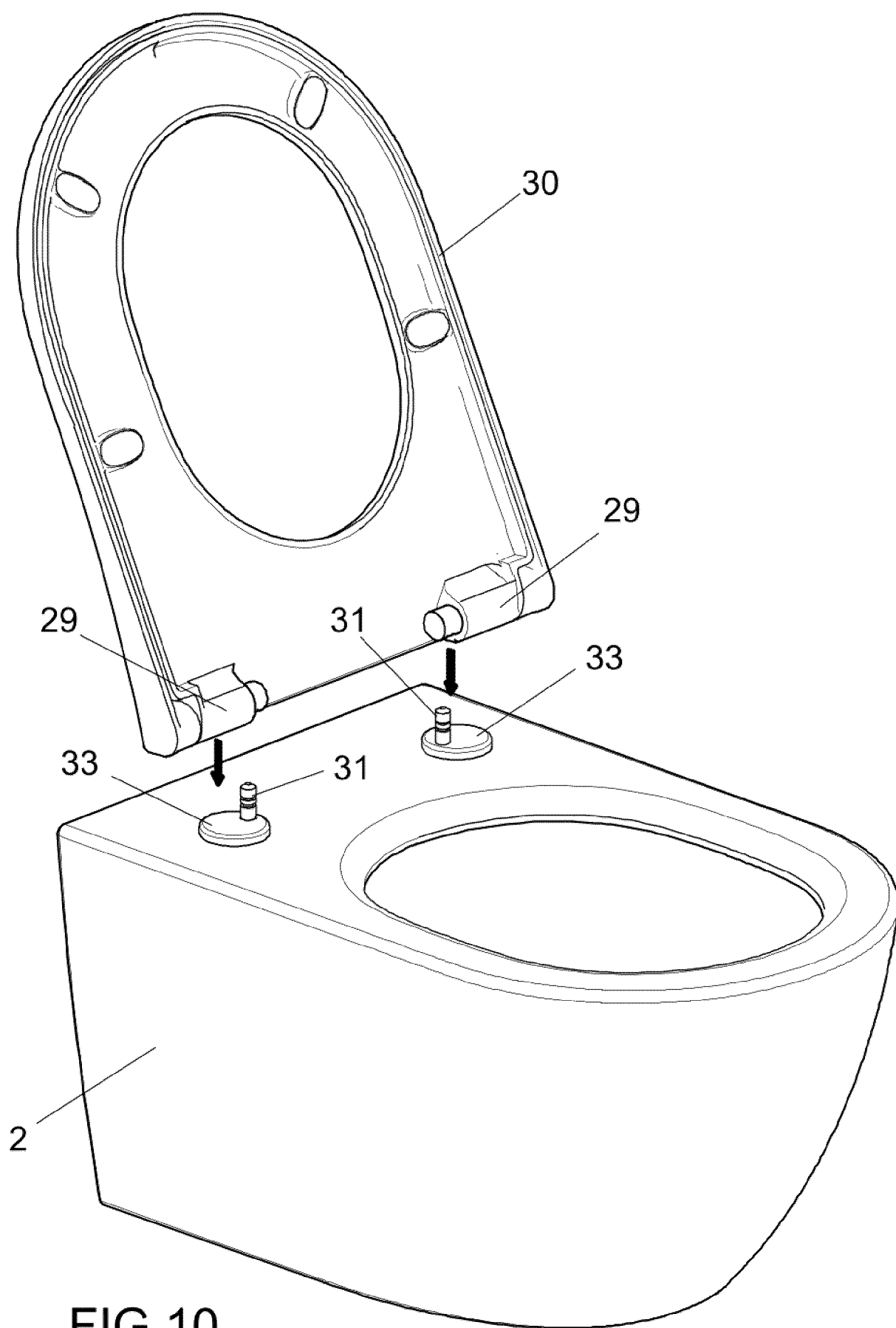


FIG.10



EUROPEAN SEARCH REPORT

Application Number

EP 25 18 9804

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The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
Munich		11 November 2025	Isailovski, Marko
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			
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