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(54) Title: FRAME AND HINGE ASSEMBLY FOR A DOOR OR WINDOW

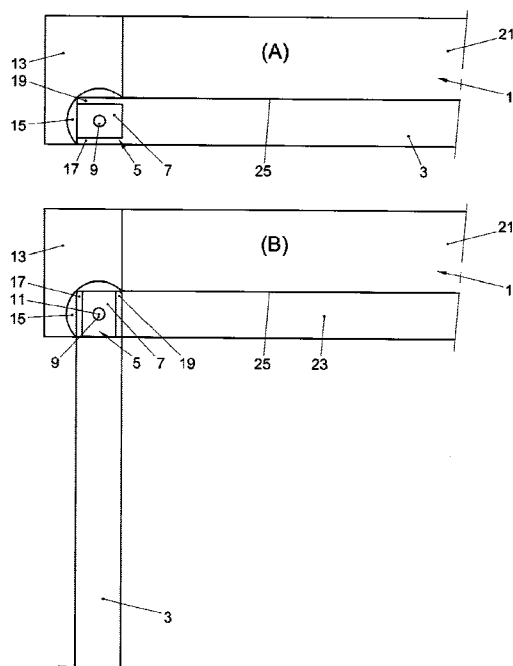


FIG. 1

(57) Abstract: Hinge assembly, provided with a frame with a first pair of substantially mutually parallel running opposite first and second frame elements, which extend in a first direction, and at least a third frame element, which extends in a second direction substantially transverse to the first direction. The first, second, and third frame elements jointly define an opening surface. Hinge means for pivotably receiving a door or window leaf define a hinge axis running parallel to one of the first, second, or the third frame element. The frame element, in the proximity of that hinge axis, is provided with a recess running in a longitudinal direction thereof for receiving a longitudinal edge of a door or window leaf. The recess has an at least partially constant circular cross section, the projection of which coincides with a circumscribed circle from the hinge axis. The hinge axis is then within this recess.



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Title: Frame and hinge assembly for a door or window

The invention relates to a frame and hinge assembly for a door or window, more particularly provided with a pair of substantially vertically running frame elements, including a left jamb and a right jamb, at least one substantially horizontally running frame element in the form of a lintel, and
5 hinge means for pivotably receiving the door or window leaf. The at least one substantially horizontally running frame element is typically part of a pair of substantially horizontally and mutually parallel running frame elements including a lintel and a sill.

10 As a rule, a door or window is composed of two parts, such as a fixed portion, which is called frame, and a moving portion, named leaf or panel, which is composed of minimally one door or window leaf. The frame consists of a composite of frame elements that are fastenable on a wall or themselves constitute a partition. Further, the door or window leaf and the frame are
15 provided with hinge means for pivotably receiving the door or window leaf, which hinge means define a hinge axis running parallel to one of the vertical or horizontal frame elements. Further, a distinction is made between door and window leaves in "butt" and "lipped" variants. The butt version in closed condition is received entirely within a rebate recessed in
20 the frame. The lipped variant is received only partly in the rebate and has a flange overlapping the frame. The lipped variant is normally reserved for system windows or doors, which are supplied in combination with an associated frame. The butt variant is often supplied as a loose part as well, for general application in frames of different origins. As a rule, such
25 windows and doors include a frame and hinge assembly therefor, provided with a first pair of substantially mutually parallel running opposite first and second frame elements, a second pair of substantially mutually parallel

running opposite third and fourth frame elements, the first, second, third and fourth frame elements thereby jointly defining an opening surface, and furthermore hinge means for pivotably receiving a door or window leaf, which hinge means define a hinge axis, which runs parallel to one of the first or second pair of frame elements. The first and second frame elements can then include substantially vertically running left and right jambs, while the third and fourth frame element can include a substantially horizontally running lintel and sill. Such windows and doors are known, but have as a disadvantage that in opened condition they leave the rebate unprotected. This may be especially objectionable on the hinge side, where objects may find a way into the unprotected rebate and upon closure of the door or window leaf may cause damage. Also, this aspect may entail hazards to visually handicapped persons or young children who may unintentionally have parts of their body caught in the rebate. Moreover, the view of the rebate on the hinge side, with the door or window open, is often experienced as unpleasant.

A construction known from the European patent publication EP 0 415 868 has as an object to eliminate the space between a door and an associated frame as much as possible and thereby to achieve more safety as well. In this known construction, a component part having substantially a circular cross section is slipped onto the door edge, which component cooperates with another component, which is mounted in the rebate. A disadvantage of this is that this construction remains visible and gives the door a deviant and less pleasant appearance. A similar construction, but in this instance to enhance burglary security, is described in the German patent publication DE 2 551 880. In this known construction, over the greater part of the height, a form-closed connection with the frame is achieved, with both the frame and the door having a partial cylinder-shaped cross section, which extends coaxially with the hinge axis. In this construction, too, a holder

profile cylindrical in circumference is mounted over the door edge, which holder profile is visible.

5 It is an object of the present invention to eliminate or ameliorate at least one of the disadvantages of the prior art. It is also an object of the present invention to provide alternative solutions which can be more simply implemented and which moreover can be manufactured comparatively advantageously. Alternatively, it is an object of the invention to make an at the least useful option available to the public.

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To this end, the invention provides a hinge assembly for a door or window, provided with a frame with a first pair of substantially mutually parallel running opposite first and second frame elements, which extend in a first direction, and at least a third frame element, which extends in a second
15 direction substantially transversely to the first direction, wherein the first, second, and third frame elements jointly define an opening surface, and hinge means for pivotably receiving a door or window leaf, which hinge means define a hinge axis, which runs parallel to and in the proximity of one of the first, second, or the at least third frame element, wherein the
20 frame element that is situated in the proximity of the hinge axis is provided with a recess running in a longitudinal direction of the respective frame element for receiving a pivotably designed longitudinal edge of a door or window leaf, wherein this recess in longitudinal direction has a constant at least partly circular cross section, the projection of which coincides with a
25 circumscribed circle from the hinge axis and wherein the hinge axis is situated within this recess. This design of a frame and hinge assembly makes it possible for a standard butt-design door to be received in a frame in a hinging manner such that both in closed and in open condition no unprotected recesses in the rebate are left clear. Moreover, in the
30 construction according to the invention, the door panel can remain wholly

flat in aspect. As far as use is at all made of a profile, which is mounted on the door edge, such profile does not need to extend over the front and rear faces of the door. Wherever in this description or in the appended claims reference is made to a frame, this is understood to include a rebate or a
5 frame of a cabinet, as of an accessory cabinet or refrigerator. Use of the invention is not limited to constructional objects, but besides refrigerators or accessory cabinets can also be very usefully applied in furniture. According to a further feature of the invention, it is then advantageous if the circular shape of the recess covers at least 180 degrees and has a perpendicular
10 bisector that includes an angle of 45 degrees with the opening surface defined by the frame elements. It may also be advantageous if the hinge means are arranged to cooperate with pivot pin elements of a door or window leaf equipped therewith. Such hinge elements can be provided so as to be practically invisible and allow a door or window leaf with a preferably
15 right-angled longitudinal edge to be pivotably received, connecting with the recess. Further, it may then be of advantage when the pivot pin elements include first and second pivot pins or first and second pivot pin bearings of a door or window leaf equipped therewith. Also, it is then useful if at least one of the first and second pivot pin bearings, or one of the first or second pivot
20 pins, is part of the hinge means. It is particularly advantageous in this connection when also the at least one of the pivot pin elements forming part of the hinge means is provided with a stop, which is arranged to cooperate with a door or window leaf for limiting pivotability.

In a particular embodiment of a hinge assembly according to the invention,
25 the at least third frame element can be part of a second pair of substantially mutually parallel running opposite third and fourth frame elements. The first pivot pin bearing is then preferably arranged on the third frame element and the second pivot pin bearing on the fourth frame element, such that the hinge axis runs parallel to the first pair of frame elements. The
30 pivot pins in that case are part of the door or window leaf and may be

combined therein with a mechanism for uncoupling, for instance, one of the pivot pins from the associated pivot pin bearing for easily demounting the door or window leaf. In such an embodiment, it is also of advantage when the first pivot pin bearing includes a radial bearing and/or when the second
5 pivot pin bearing includes an axial bearing.

According to yet another feature of the invention, the hinge means may be provided with a profile, cooperating with a right-angled longitudinal edge of a door or window leaf, which movably abuts against a circumferential part of the recess. With this, also in the case of heavy doors a sufficient guidance
10 and force distribution of the door or window leaf relative to the frame can be taken care of. It may then be of further advantage if the profile extends between the third and fourth frame element. Also, it may further be of advantage if the profile then has a constant segment-shaped cross section in a longitudinal direction. Further, the invention provides a particular hinge
15 means, with which a very simple and secure assembly can be obtained. The invention also provides a combination of a frame and hinge assembly having one or more of the preceding features with a door or window leaf, wherein the longitudinal edge of the door or window leaf is of right-angled design. In particular, in this combination the door or window leaf is a specimen of
20 standard butt design.

More generally, according to the invention, the frame and hinge assembly, or combination thereof with a door or window leaf, is preferably of such design that the first frame element includes a substantially vertically running left jamb, the second frame element includes a substantially
25 vertically running right jamb, the third frame element includes a substantially horizontally running lintel and the fourth frame element includes a substantially horizontally running sill.

The invention will now be further elucidated in and by the following detailed description with reference to the accompanying drawing figures, in
30 which:

Fig. 1 shows in top plan view a detail of a frame with a door or window leaf hinged thereto, in closed condition (A) and in open condition (B);

Fig. 2 shows in front view a detail of a hinge;

5 Fig. 3 shows in top plan view a detail of a modified hinge;

Fig. 4 shows in top plan view a detail of a frame with door or window leaf as in Fig. 1 but now provided with an extra stop;

10 Fig. 5 shows in top plan view a detail of a frame with an open door or window leaf, provided with an extra profile according to a particular feature of the invention;

Fig. 6 shows in perspective a particular hinge means for use in the invention;

Fig. 7 shows a longitudinal section of the hinge means from Fig. 6;

15 Fig. 8 shows the hinge means from Fig. 6 mounted in a top corner of a door or window leaf;

Fig. 9 shows a top corner of a frame arranged to cooperate with the top corner of a door or window leaf according to Fig. 8;

Fig. 10 shows the hinge means from Fig. 6 mounted in a bottom corner of the same door or window leaf as in Fig. 8;

20 Fig. 11 shows a bottom corner of a frame arranged to cooperate with the bottom corner of the door or window leaf according to Fig. 10;

Fig. 12 shows a door leaf provided with the hinge means from Fig. 6 in an assembly position with respect to a frame arranged to cooperate therewith;

25 Fig. 13 is an elevational view similar to Fig. 6 of a modified hinge element with a corner of a window or door leaf;

Fig. 14 is a modified form of a counter hinge element as from Fig. 11;

Fig. 15 is a partial section of a bottom corner of a window or door leaf in which a modified hinge element as from Fig. 13 is received; and

30 Figs. 16 (A) and (B) show in top and side view a blocking clip.

In Fig. 1(A) there is shown a top plan view of a frame 1 having received therein, in closed condition, a door or window leaf 3. The door or window leaf 3 is provided with a hinge means 5. The hinge means 5 is provided with a mounting plate 7 which is fastened to the door or window leaf 3 and which is equipped with a bore 9 for receiving a pivot pin. The bore 9 and the pivot pin received therein are arranged, in mirrored relation, at both the top and the bottom of the door or window leaf 3 and jointly define a hinge axis 11. The hinge axis 11 extends in the proximity of substantially a vertically running jamb 13 of the frame 1. For pivotably receiving the door or window leaf 3, the vertical jamb 13 is provided with a recess 15 running in the longitudinal direction thereof. The recess 15 has throughout its vertical length a constant circular cross section, the projection of which coincides with a circumscribed circle from the hinge axis 11 through the corner points 17 and 19 of the door or window leaf 3. The circular form of the recess 15 covers an angle of at least 180 degrees. The frame 1 is further provided with a horizontally running sill 21 which is provided with a horizontal rebate part 23. Although not shown in Fig. 1, the frame 1 includes vertical jambs, arranged in pairs, of which only a left jamb 13 is shown, and horizontal lintel and sill, arranged in pairs, of which only the sill 21 can be seen. The vertical jambs and horizontal lintel and sill constitute in a known manner a first pair of substantially mutually parallel running opposite vertical frame elements and a second pair of substantially mutually parallel running opposite horizontal frame elements, which jointly define an opening surface 25. The circular recess 15 is so provided as to have a perpendicular bisector thereof including an angle of 45 degrees with the opening surface 25. The hinge axis 11, which is also on this perpendicular bisector, is received in the recess 15.

In Fig. 2 there is shown, in front view, a hinge means 5 applicable in the invention. The hinge means 5 here includes a fastening plate 31 which

may be fastened with screws 33 to a lintel 29. Arranged on the fastening plate 31 is a pivot pin 35 which is received in a recess of the door or window leaf 3. The pivot pin 35 is rotatably bearing-mounted in a bearing 37 which can be part of the assembly plate (7 in Fig. 1) which is fastened to the door or window leaf 3. At the top as shown of the door or window leaf 3, there is especially a need for a radial bearing, while at the bottom this may be substantially an axial bearing. The distance 39 to the hinge axis 11 from the circumference of the recess 15 is preferably relatively small with respect to the thickness of the door or window leaf 3. The distance 39 has a dimension of a good half of the thickness of the door, for instance 20 mm.

Fig. 3 shows a detail of a top plan view as in Fig. 1 (A) with a modified hinge which is provided with an assembly plate 7A which is fastened to the door or window leaf 3. The assembly plate 7A is provided with a spring-loaded stop element 41 which in the open position of the door or window leaf 3 can cooperate with a corresponding stop recess 43, arranged in the lintel or sill of the frame 1. The stop recess 43 may also be arranged in the fastening plate (31 in Fig. 2) which is mounted against a lintel 29. The purpose of stop element 41 is to define the extreme opened position of the door or window leaf 3. In the closed position of the door or window leaf, the rebate 23 ensures that the relatively sharp end of the recess 15 does not penetrate into the inner face 3A of the door or window leaf 3 and damage it. In the opened position of the door or window leaf, though, this could happen at the outer surface 3B of the door or window leaf 3. Because the stop element 41 engages in the stop recess 43, the door or window leaf 3 can be prevented from pivoting too far. In the example of Fig. 3, the stop element 41 has a pyramid-shaped top which upon swinging towards closure produces a force component that helps to dislodge the stop element 41, against its spring bias, out of the stop recess 43. Needless to say, the skilled person can also use a ball-shaped or differently configured stop element for this purpose.

Fig. 4 shows yet another solution of further defining the opened position of the door or window leaf 3. The parts, as far as not discussed in detail here, are identical to those in Figs. 1(A) and 1(B). In the embodiment according to Fig. 4, there is provided, for instance on a base plate of the frame 1, a fixed first stop 45. The assembly plate 7 which is arranged at an underside of the door or window leaf 3, carries a second, movable stop 47. Upon pivoting of the door or window leaf 3 to the opened position of Fig. 4 (B), the second stop 47 butts against the first stop 45, thereby preventing any further turning. This solution provides still more security against damage to the outer face 3B upon the door or window leaf 3 swinging open. It is important to note that in all embodiments of the invention a wholly right-angled and planar standard door or window leaf can be used. The door end received in the recess on the hinge side does not need to have any particular thickenings or roundings. Because the pivot pins (35 in Fig. 2) of the hinge means 5 are placed at a relatively large distance from each other, it may happen in the case of large and heavy doors that the guidance of the corner points of the door (17 and 19 in Figs. 1 and 3) along the inner circumference of the recess 15 falls short. For such situations, there is further provided an embodiment according to Fig. 5 showing a top plan view as in Figs. 1(B) and 4(B). Arranged here as an extra provision is a segment-shaped profile 51 cooperating with the right-angled longitudinal edge (between the corner points 17, 19) of the door or window leaf. This segment-shaped profile 51 extends throughout the height of the door or window leaf 3 and abuts in a guiding manner against the inner circumference of the recess 15. For a still better guidance and wear resistance, the recess may be internally provided with a covering profile 53, of preferably a wear-resistant material. The segment-shaped profile 51 may be designed with advantage as an aluminum extrusion, which at its ends is couplable with the mounting plate of the hinge means fastened to the door or window leaf. Fastening of the segment-shaped profile 51 to the door's or window leaf's longitudinal

edge, between the corner points 17 and 19, may further be done by means of screw bores with screws.

A special hinge means 105, eminently lending itself to use in the invention, is shown in Fig. 6. The hinge means 105 includes a body 107
5 which is arranged to be received in a recess of a door or window leaf, in a manner further discussed hereinbelow. The body 107 is provided with a cavity 109, which terminates in both a first and a second of a first and a second surface 111, 113 adjoining each other at substantially a right angle. To this end, the hinge means 105 can be advantageously formed as a
10 molding from metal or plastic. The cavity 109, as can be seen best in Fig. 7, includes a cup-shaped part 115, which is situated practically in the middle of the first surface 111. Adjacent to the cup-shaped part 115, the cavity 109 includes a slotted part 117, which extends from the cup-shaped part 115 up to the second surface 113. Further, the body 107 of the hinge means 105
15 may be provided with a bore 119 for receiving a fastening means (not shown, but known to the skilled person).

In Fig. 8 it can be seen how the hinge means 105 is arranged in a recess in a top corner of a door or window leaf 3. The cavity 109 is here directed towards the interior of the door or window leaf 3.

20 The first surface 111 of the hinge means 105 coincides with an upper edge of the door or window leaf 3. Through this position of arrangement, the slotted part 117 of the cavity 109 is closed off by the recess in the door or window leaf 3. Both the hinge edge 103 of the door or window leaf 3 and the hinge means 105 can have a rounded or circular contour complementary to
25 each other, as can be seen in Fig. 8.

Fig. 9 shows a first (upper) counter hinge means 121 mounted in a top corner of frame 1. This top corner is formed between the substantially vertically extending jamb 13 designed as hinge jamb, and the lintel 29 as in the embodiments described earlier. The first counter hinge means 121 is
30 fastened in the longitudinal recess 15 of circular inner circumference in the

hinge jamb 13 and may be fastened with screws 123. In particular, the first counter hinge means 121 carries a hinge or pivot pin 125 extending along the hinge axis 11. The hinge pin 125 is then so placed that the cup-shaped part 115 of the cavity 109 fits over it when the hinge edge 103 of the door or window leaf 3 is received in the circular recess 15 of the frame 1. This will be further explained below.

Fig. 10 shows how the hinge means 105 is fastened in a recess in a bottom corner of the door or window leaf 3. The cavity 109 has its slotted part 117 directed to the hinge edge 103 of the door or window leaf 3. The slotted part 117 terminates in the second surface 113 of the hinge means 105, which coincides with the hinge edge 103 of the door or window leaf 3. Further, Fig. 10 shows how the hinge means 105 is fastened to the door or window leaf 3 with a fastening screw 127.

Fig. 11 shows a lower end of the substantially vertically running hinge jamb 13. In the circular inner circumference of the recess 15, a second (lower) counter hinge means 131 is arranged. The second counter hinge means 131 is also fastened with screws 133 and includes a ball-shaped pivot 135 extending along the hinge axis 11. The ball-shaped pivot 135 is again so placed as to be receivable in the cup-shaped part 115 of the hinge means 105 when the hinge edge 103 of the door or window leaf 3 is received in the circular recess 15 of the hinge jamb 13 of the frame.

With the above-described hinge means 105 which is identical for the top and bottom corners of the door or window leaf 3, a very simple and secure assembly in a frame according to the invention can be obtained. How such assembly proceeds can be seen in Fig. 12.

Fig. 12 shows a door opening in a wall, defined by a frame 1. A door leaf 3 is shown in a position immediately preceding final assembly. A top corner of the door leaf 3 has been positioned in the immediate proximity of a top corner of the frame 1, formed between the lintel 29 and the hinge jamb 13. In the top corner of the frame is the hinge pin 125, as described with

reference to Fig. 9. At a lower end of the hinge jamb 13 is the ball-shaped pivot 135, as described in relation to Fig. 11. Between the hinge pin 125 and the ball-shaped pivot 135 extends the actual hinge axis 11A, which coincides with the centerline of the circular recess 15. By presently moving the door

5 leaf 3 first in the direction of arrow 141, then, from the position in Fig. 12, the cup-shaped portion (115) of the upper hinge means (105) will receive the hinge pin 125. With the hinge pin 125 fully received in the cup-shaped part of the upper hinge means, the door leaf 3 can perform a turning movement in the direction of arrow 143. As a result, the ball-shaped pivot 135 will, via

10 the slotted part (117) of the cavity 109, come into engagement with the cup-shaped part (115) thereof. In the mounted position, the virtual hinge axis 11B of the door leaf 3, which extends through the cup-shaped parts (115) of the lower and upper hinge means (105), will coincide with the actual hinge axis 11A of the frame 1. By its own weight, the door leaf 3 will be held in its

15 hingeable end position and allow a trouble-free opening and closing of the door. The upper hinge or pivot pin 125 constitutes substantially a radial bearing for the door leaf 3, while the lower ball-shaped pivot 135 functions substantially as axial thrust bearing. An extra stopping of the door leaf 3 in its use position can be obtained by providing a height difference between the

20 cup-shaped part 115 and the slotted part 117, such as this is shown in Fig. 7. Due to this difference in height, as a result of which the cup-shaped part 115 is slightly deeper than the slotted part 117, the door leaf 3 will have its bottom corner, after passing the slotted part, coming down over the ball-shaped pivot 135. With this extra security, the mounted door will first

25 have to be moved in the direction of arrow 141 before the bottom hinge means can be removed from the ball-shaped pivot 135. The movement is then opposite to the arrow direction 143. Needless to say, the upper and lower counter hinge means 121, 131 can also be made identical to each other, for instance, both having a ball shape.

A modified hinge element 205 according to the invention can be seen in Fig. 13. The hinge element 205 according to the invention can be seen in Fig. 13. The hinge element 205 in the embodiment of Fig. 13 enables considerable simplification of the recess to be made in a door 3 for receiving the hinge element 205. Because this recess 103 is open towards both the hinge side 103 and the top side of the door 3, the point is to anchor the hinge element 205 to the door in a different manner. To this end, the hinge element 205 is made of greater length, so that five fastening bores 219 can be provided therein for receiving screws (not represented, but conventional) for fastening the hinge element 205 to the door 3.

As with the hinge element from Fig. 6, also the hinge element 205 from Fig. 13 is provided with a first face 211 and a second face 213, which adjoin each other substantially at a right angle. A cavity 209 terminating in the angle of the mutually adjoining first and second surfaces 211, 213 is provided. The cavity 209 is formed by a cup-shaped part 215 and a slotted part 217. The position of the hinge element 205 in Fig. 13 with the cavity 209 facing away from the door 3 is the position for a bottom corner of a door. If the condition drawn in Fig. 13 were a top corner of the door 3, the hinge element 205 is mounted precisely the other way around, that is, with the cavity 209 facing the door 3.

In Fig. 14 a modified counter hinge element 231 can be seen, with the corresponding bottom corner of a door 3 being shown in Fig. 15, in cross section. The counter hinge element 231, like the counter hinge element shown in Fig. 11, again has a ball-shaped hinge pin 235. Holes 233 for fastening means can again be arranged to mount the counter hinge element 231 in a circular longitudinal recess of a door frame.

Further, the counter hinge element 231 from Fig. 14 is provided with an arcuate recess 237. The arcuate recess 237 has a function in relation to the modified hinge element 205 that is shown in Fig. 15. The hinge element 205 that is shown in a mounted condition in Fig. 15 is only different from

the hinge element shown in Fig. 13 in that one of the bores 219 has been replaced with a blind hole 220 in which, springing outwardly, a stop pin 239 is received. In mounted condition, the cup-shaped recess 215 will be in engagement with the ball-shaped hinge pin 235 of the counter hinge element. The stop pin 239 will then, in extended condition, be received in the arcuate recess 237 and ensure that the turning movement of the door leaf 3 is limited without the front and/or rear surfaces of the door 3 getting damaged in that they may strike against the relatively sharp rebate edges. It will be clear that this turning movement is optional and also might be realized in other manners.

Further, it can be seen in Fig. 15 that the hinge element 205 has been fastened to the door leaf 3 with four screws 227 through the bores 219.

As has been apparent from the description of Fig. 12, the door leaf 3 can be removed from the rebate by lifting it up from the lower ball-shaped hinge pin 135 and 235, respectively, and taking it out by rotation around the upper hinge pin (125). In normal use, the door's own weight is adequate to keep the door in its mounted position.

Nonetheless, there may be circumstances where it is desired that unintentional taking-out of the door be prevented. To this end, the blocking clip 251 shown in Figs. 16 (A) and 16 (B) may be used.

The blocking clip 251 which is shown in Fig. 16 (A) in top plan view is provided with an open slot 253 which is in communication with a somewhat larger circular opening 255 in the central part of the blocking clip. Through this design and a small degree of resilience of the legs 257, 259 defined by the open slot, the opening 255 can snap around the hinge pin 125 of the upper hinge. As can be seen in the side elevational view of Fig. 16 (B), the blocking clip 251 has a thickness 261 that is tailored to the clearance in the upper hinge, such that the door cannot be lifted up sufficiently anymore to allow the ball-shaped hinge pin 235 (or 135) to pass through the slotted part 217 (or 17) of the cavity 209 (109). Further, the blocking clip may be

provided at the end of the legs 257, 259 with a beveled side 263 (Fig. 16 (B)) to facilitate insertion of the blocking clip 251 in the space between the upper side of the door (3) and the lintel (29). The blocking clip 251 for the demounting lock may with advantage be a part made of plastic.

5 It is believed that the construction and operation of the present invention are clearly apparent from the foregoing description. The invention is not limited to any embodiment described herein and, within reach of the skilled person, changes are possible that are understood to be within the scope of protection. As already indicated, the invention is not limited to
10 building applications alone and can be applied with equal success to cupboards, or other furniture, including street furniture. Also, all kinematic reversals are assumed to be included in the scope of protection of the present invention. Expressions such as "consisting of", when used in this description or the appended claims, should be taken not as an exhaustive
15 enumeration, but rather as having an inclusive meaning of at least consisting of. Expressions such as: "means for ..." should be read as: "component configured for ..." or "element constructed to ..." and should be taken to include all equivalents for the constructions described. The use of expressions as: "critical", "advantageous", "desired", etc., is not intended to
20 limit the invention. Moreover, also features that are not specifically or expressly described or required in the construction according to the present invention may be comprised without deviating from the scope of protection.

CLAIMS

1. A hinge assembly for a door or window, provided with a frame with a first pair of substantially mutually parallel running opposite first and second frame elements, which extend in a first direction, and at least a third frame element, which extends in a second direction substantially transverse to the first direction, wherein the first, second, and third frame elements jointly define an opening surface and hinge means for pivotably receiving a door or window leaf, which hinge means define a hinge axis, which extends parallel to, and in the proximity of, one of the first, second, or the at least third frame element, wherein the frame element situated in the proximity of the hinge axis is provided with a recess running in a longitudinal direction of the respective frame element for receiving a pivotably designed longitudinal edge of a door or window leaf, wherein this recess in a longitudinal direction thereof has a constant at least partly circular cross section, the projection of which coincides with a circumscribed circle from the hinge axis and wherein the hinge axis is within this recess.

2. A hinge assembly according to claim 1, wherein the circular form of the recess covers at least 180 degrees and has a perpendicular bisector that makes an angle of 45 degrees with the opening surface defined by the frame elements.

3. A hinge assembly according to claim 1 or 2, wherein the hinge means are arranged to cooperate with pivot pin elements of a door or window leaf equipped therewith.

4. A hinge assembly according to claim 3, wherein the pivot pin elements include first and second pivot pins or first and second pivot pin bearings of a door or window leaf equipped therewith.
- 5 5. A hinge assembly according to claim 4, wherein at least one of the first and second pivot pin bearings, or one of the first or second pivot pins, is part of the hinge means.
6. A hinge assembly according to claim 5, wherein the at least one of
10 the pivot pin elements forming part of the hinge means is provided with a stop which is arranged to cooperate with a door or window leaf.
7. A hinge assembly according to claim 5 or 6, wherein the at least
15 third frame element is part of a second pair of substantially mutually parallel running opposite third and fourth frame elements.
8. A hinge assembly according to claim 7, wherein the first pivot pin bearing is arranged on the third frame element and the second pivot pin bearing is arranged on the fourth frame element, such that the hinge axis
20 runs parallel to the first pair of frame elements.
9. A hinge assembly according to claim 8, wherein the first pivot pin bearing includes a radial bearing.
- 25 10. A hinge assembly according to claim 8 or 9, wherein the second pivot pin bearing includes an axial bearing.
11. A hinge assembly according to any one of the preceding claims, wherein the hinge means are provided with a profile cooperating with a

right-angled longitudinal edge of a door or window leaf, said profile movably abutting against a circumferential part of the recess.

12. A hinge assembly according to claim 11, wherein the profile
5 extends between the third and fourth frame element.

13. A hinge assembly according to claim 11 or 12, wherein the profile has a constant segment-shaped cross section in a longitudinal direction.

10 14. A hinge assembly according to any one of the preceding claims, further including a hinge element which is provided with a body having a cavity and which is designed to be received in a recess of at least one of a top and bottom corner of a door or window leaf.

15 15. A hinge assembly according to claim 14, further provided with a counter hinge element for inclusion in the proximity of one of an upper or lower end of the circular longitudinal recess of a frame element designed as hinge jamb.

20 16. A hinge assembly according to claim 15, wherein a first counter hinge element is arranged near an upper end of the hinge jamb and a second counter hinge element is arranged near a lower end of the hinge jamb.

17. A hinge assembly according to claim 16, wherein the first counter
25 hinge element is provided with a hinge pin.

18. A hinge assembly according to claim 16 or 17, wherein the second counter hinge element is provided with a ball-shaped pivot.

19. A hinge assembly according to any one of claims 16-18, wherein in both the top and bottom corner of the door or window leaf a specimen of the hinge element is arranged.
- 5 20. A hinge assembly according to claim 19, wherein the specimen of the hinge element arranged in the top corner of the door or window leaf is arranged with the cavity closed with respect to a hinge edge of the door or window leaf.
- 10 21. A hinge assembly according to claim 19 or 20, wherein the specimen of the hinge element arranged in the bottom corner of the door or window leaf is arranged with the cavity open with respect to a hinge edge of the door or window leaf.
- 15 22. A combination of a hinge assembly according to any one of the preceding claims with a frame and a door or window leaf, wherein the hingeable longitudinal edge of the door or window leaf is right-angled in cross section.
- 20 23. A combination according to claim 22, wherein the door or window leaf is a standard butt-design specimen.
24. A frame and hinge assembly, or combination thereof with a door or window leaf, according to any one of the preceding claims, wherein the first
25 frame element includes a substantially vertically running left jamb, the second frame element includes a substantially vertically running right jamb, the third frame element includes a substantially horizontally running lintel and a fourth frame element includes a substantially horizontally running sill.

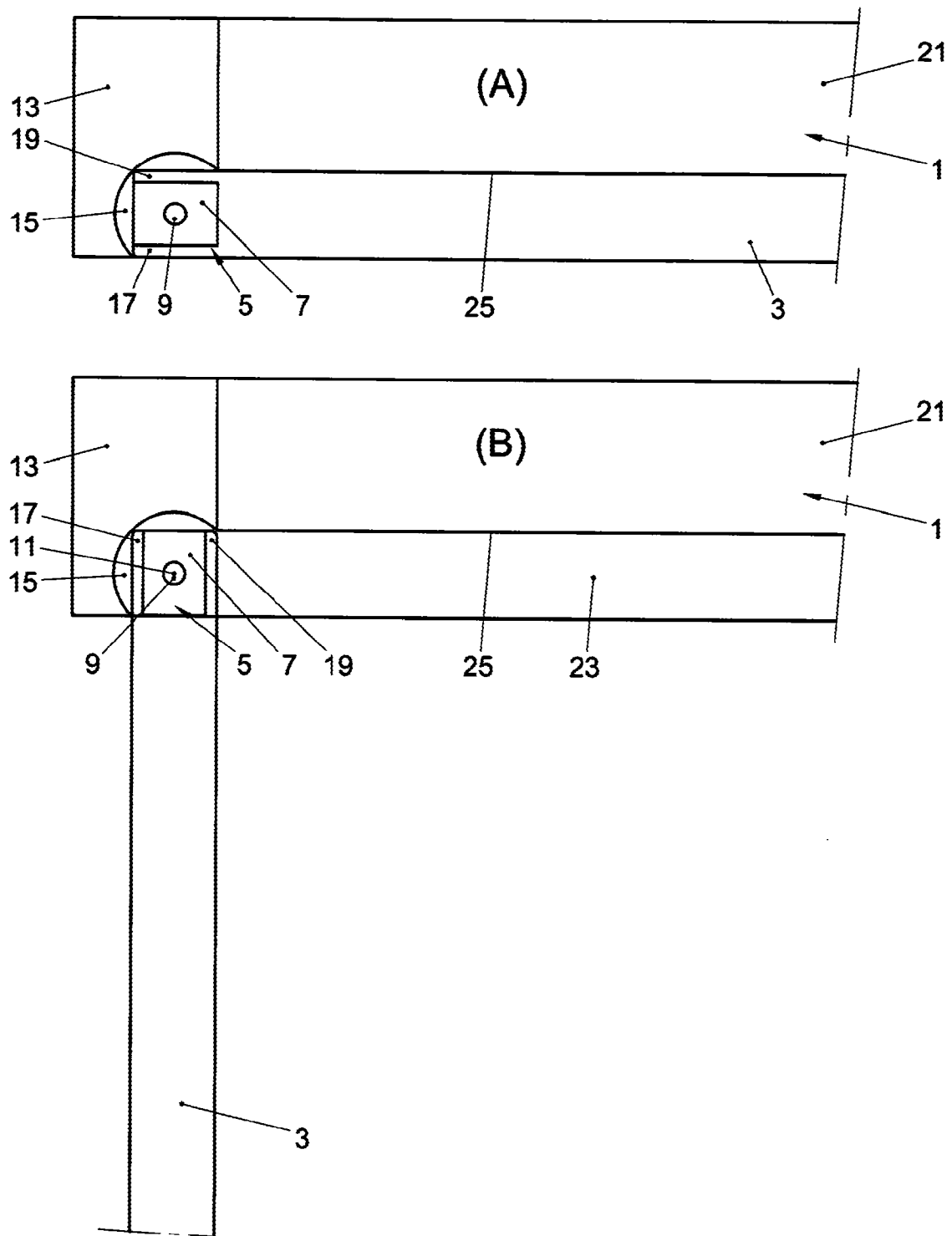


FIG. 1

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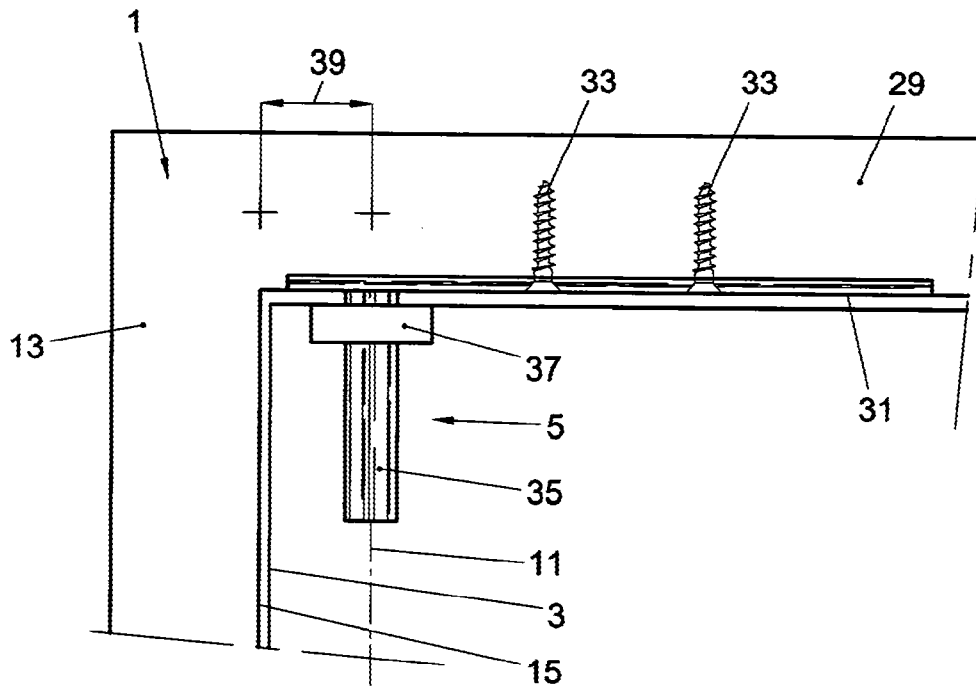


FIG. 2

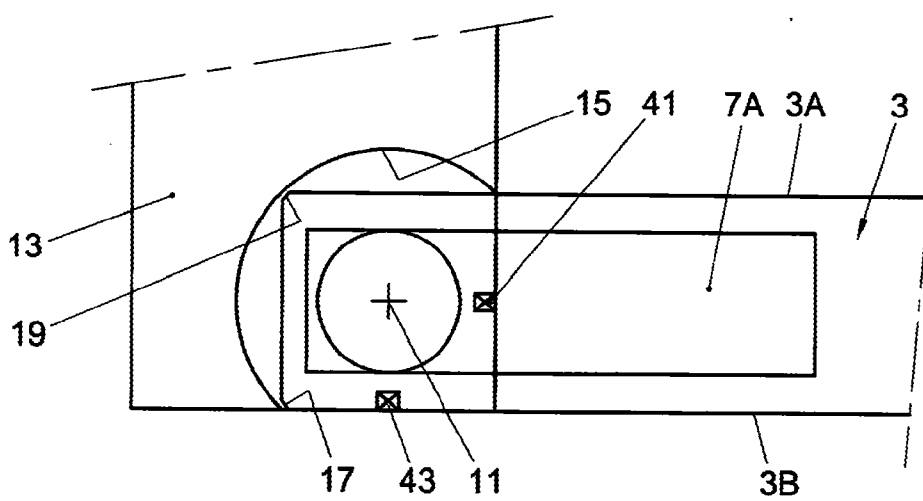


FIG. 3

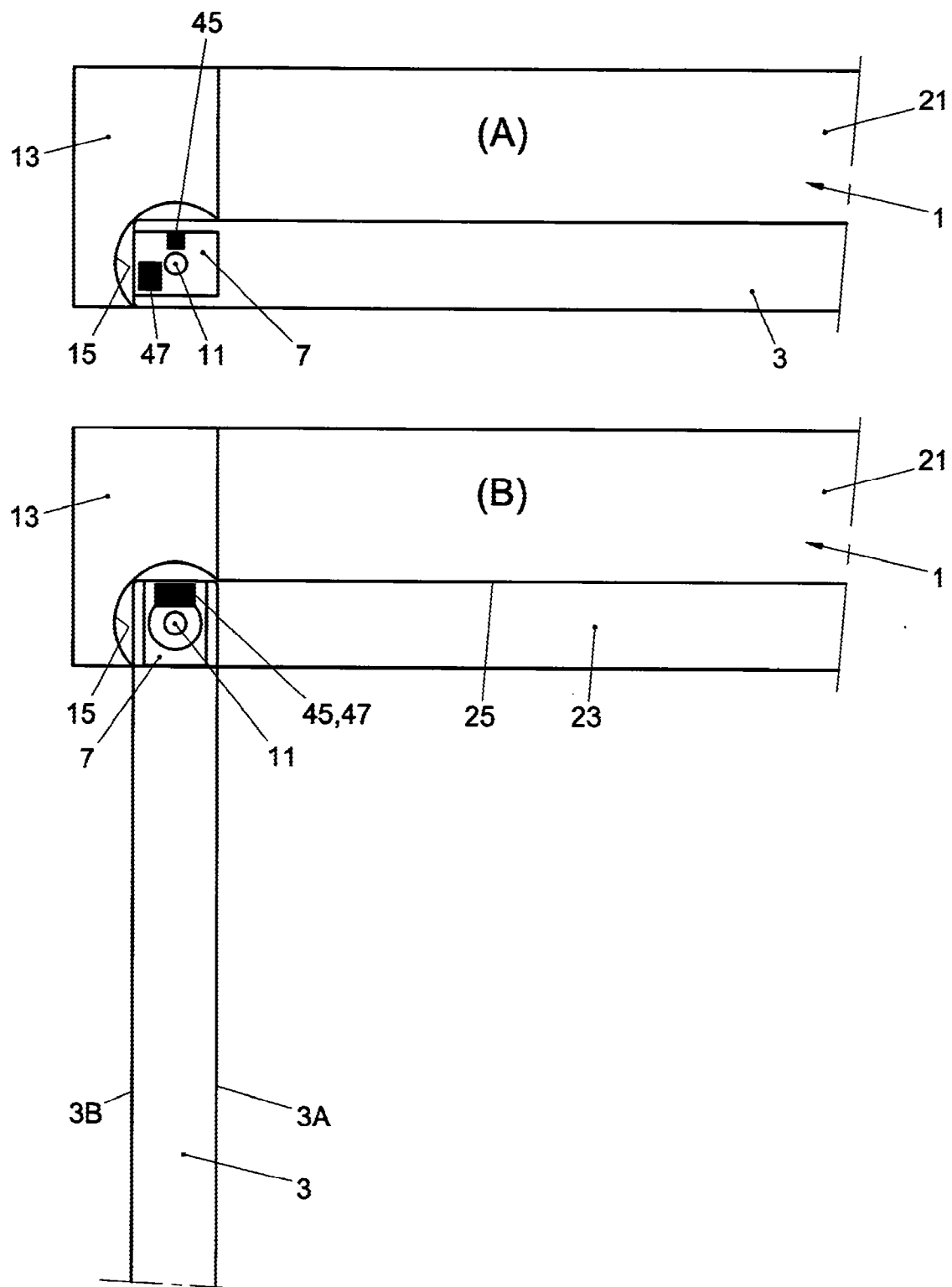


FIG. 4

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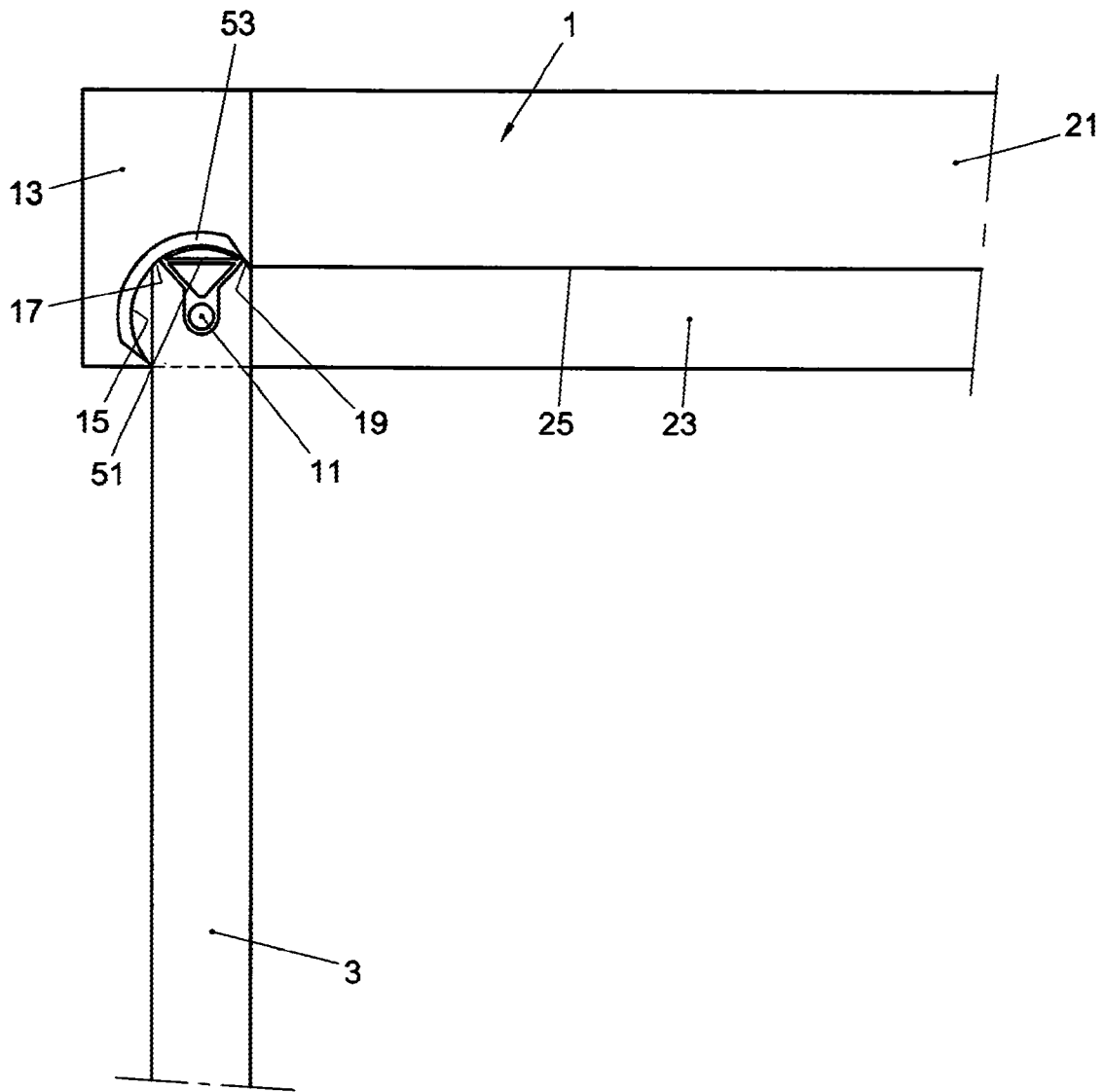


FIG. 5

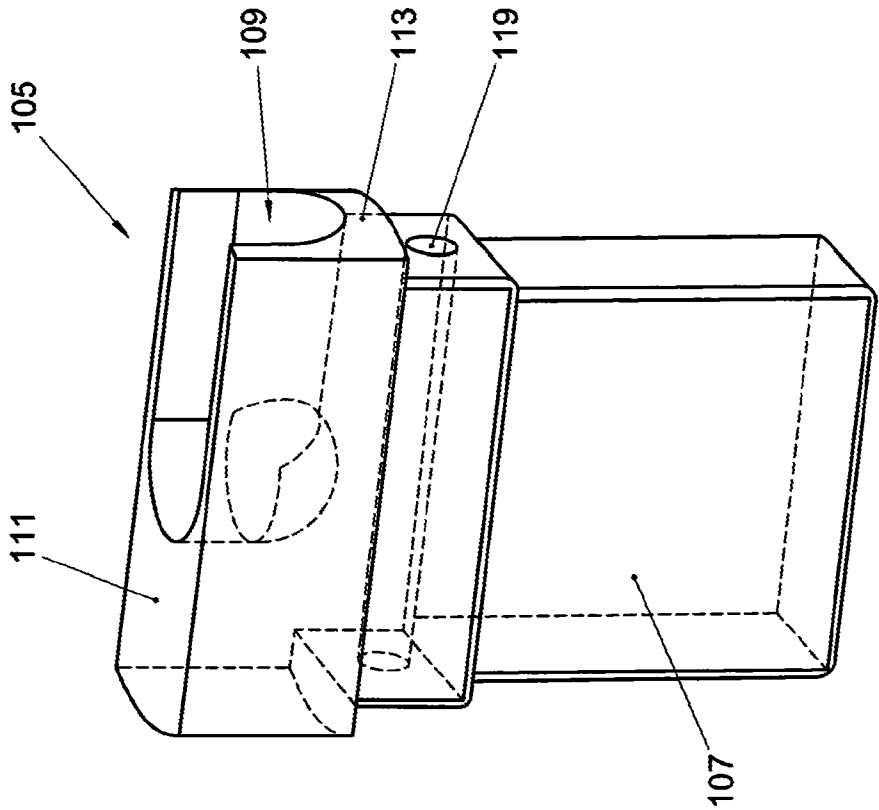


FIG. 6

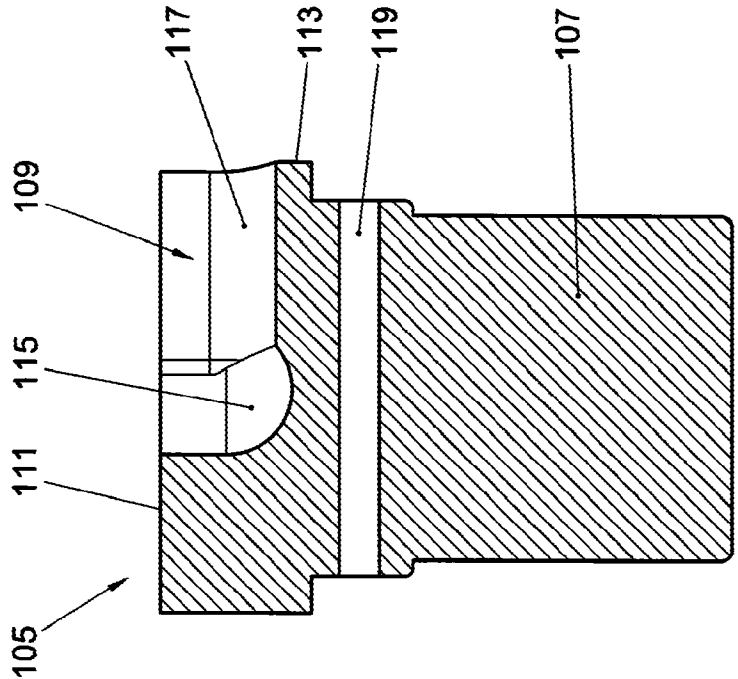


FIG. 7

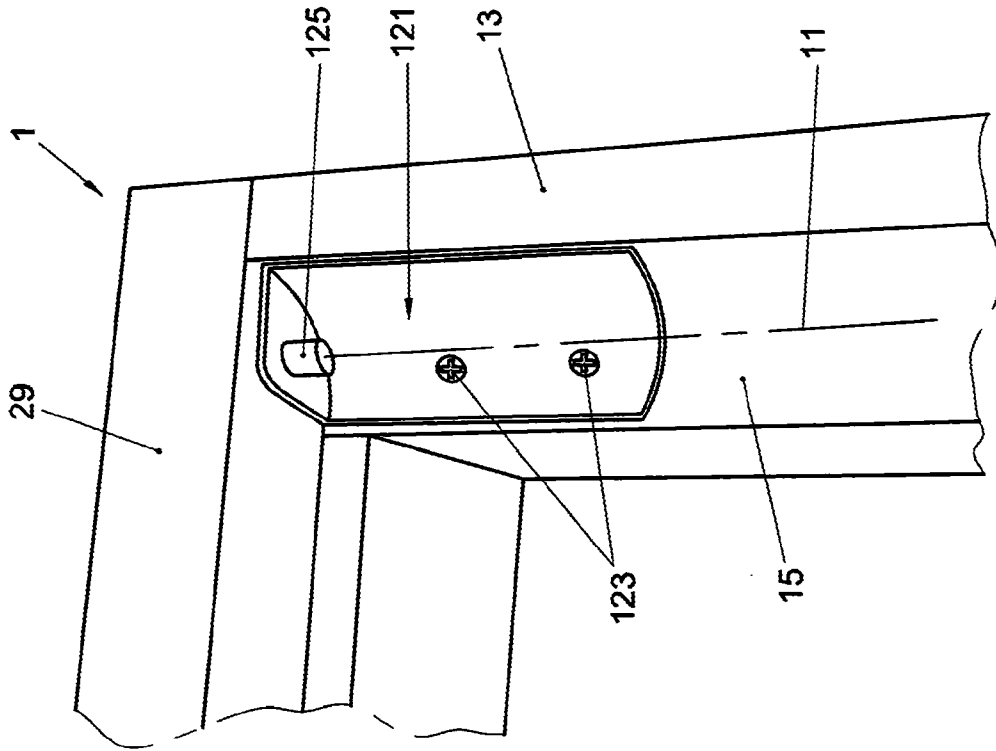


FIG. 9

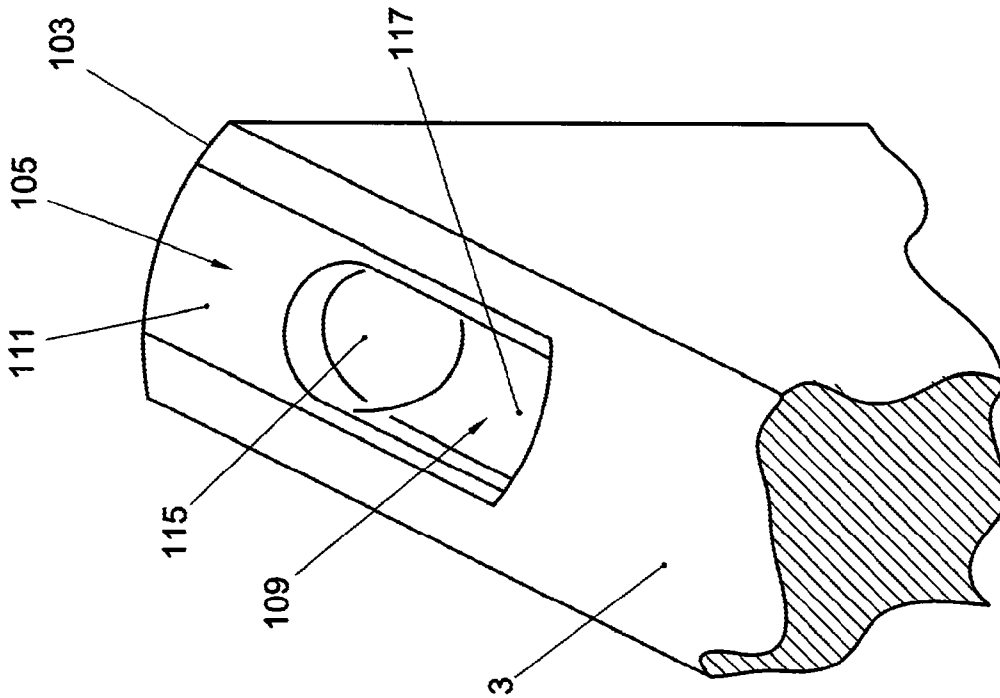


FIG. 8

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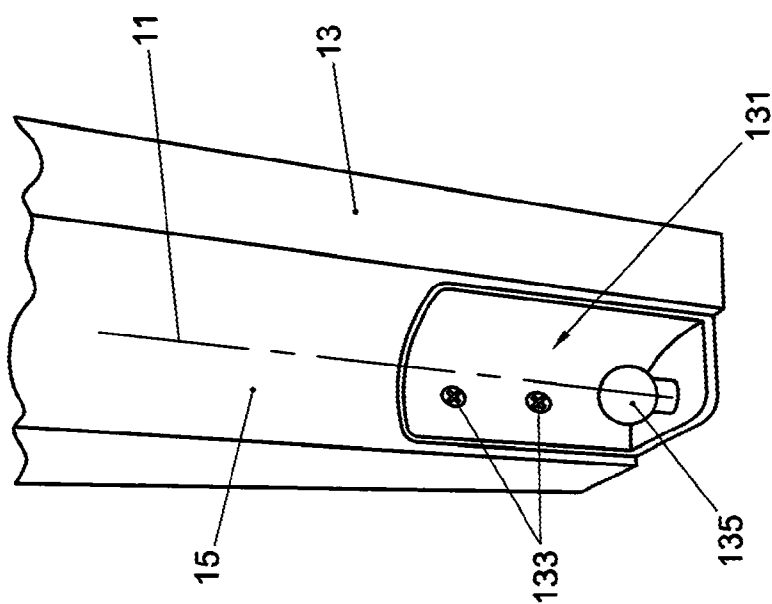


FIG. 11

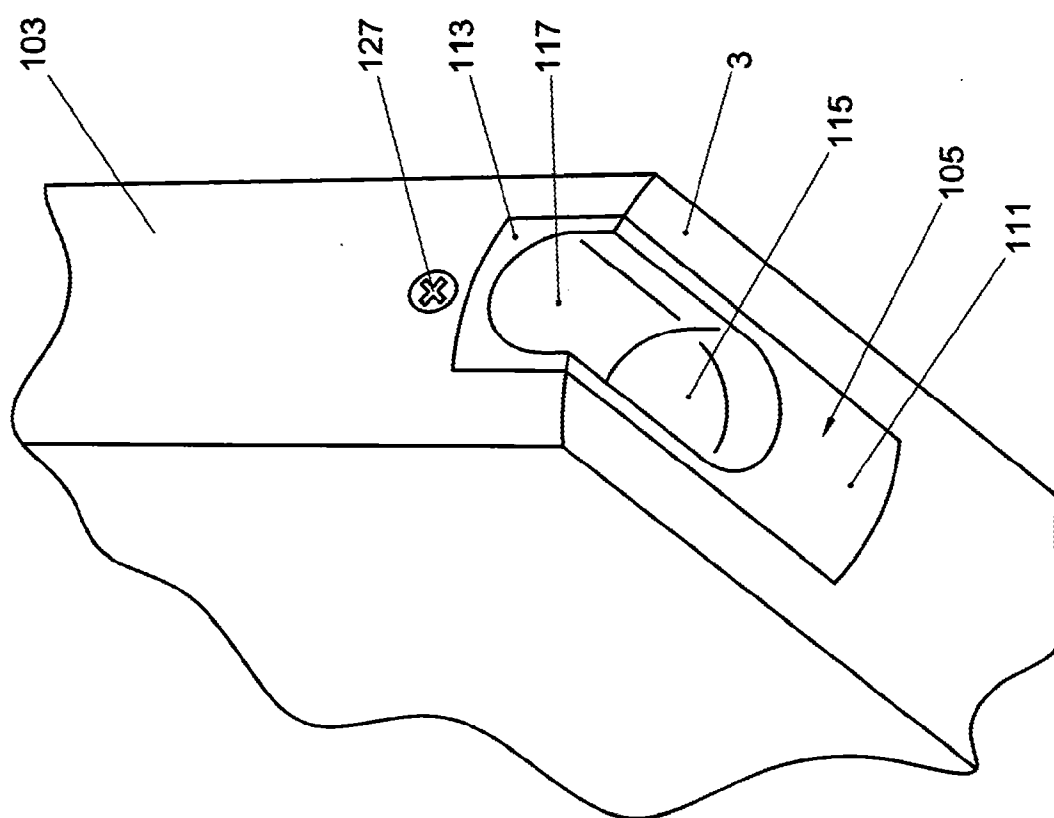


FIG. 10

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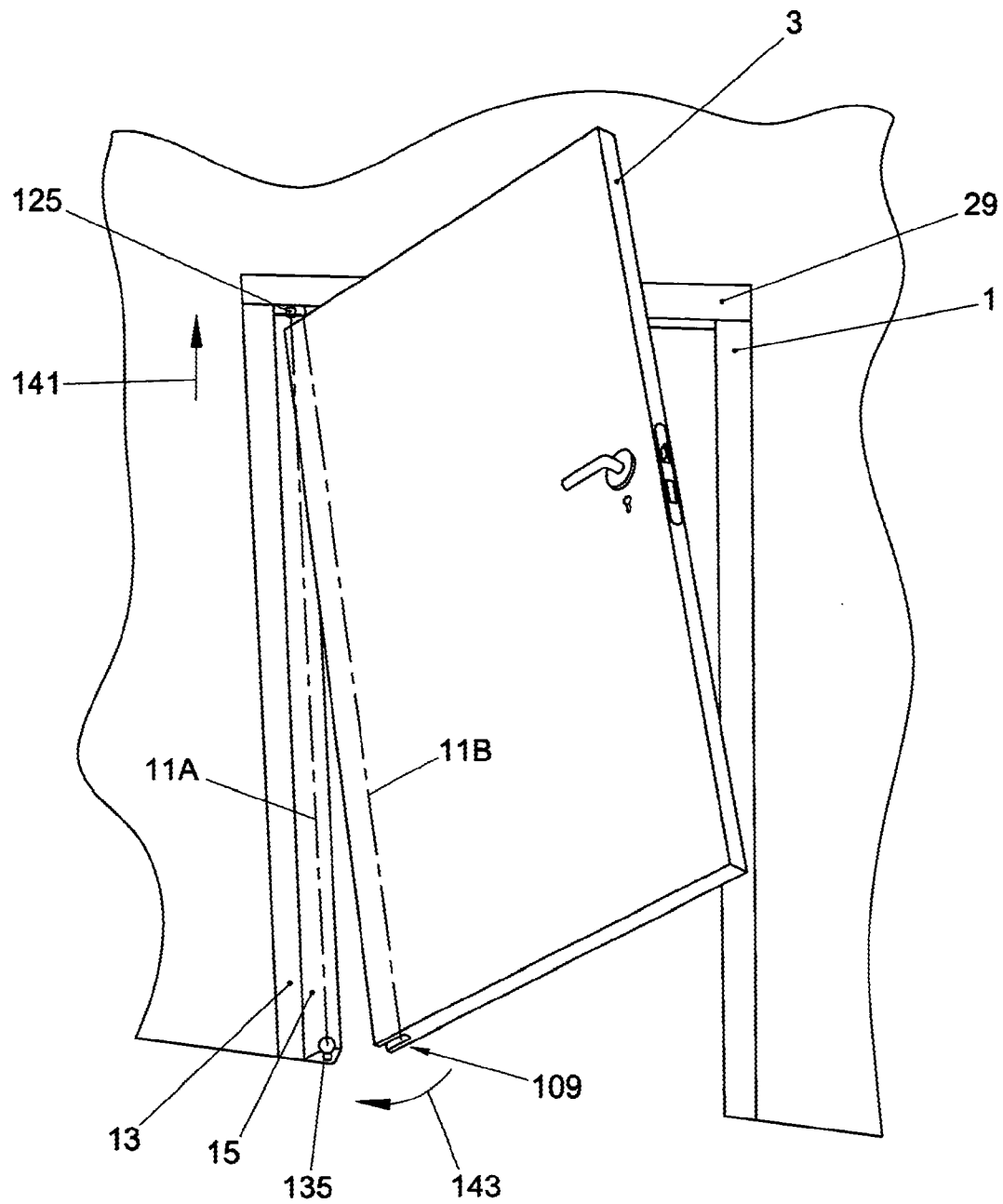


FIG. 12

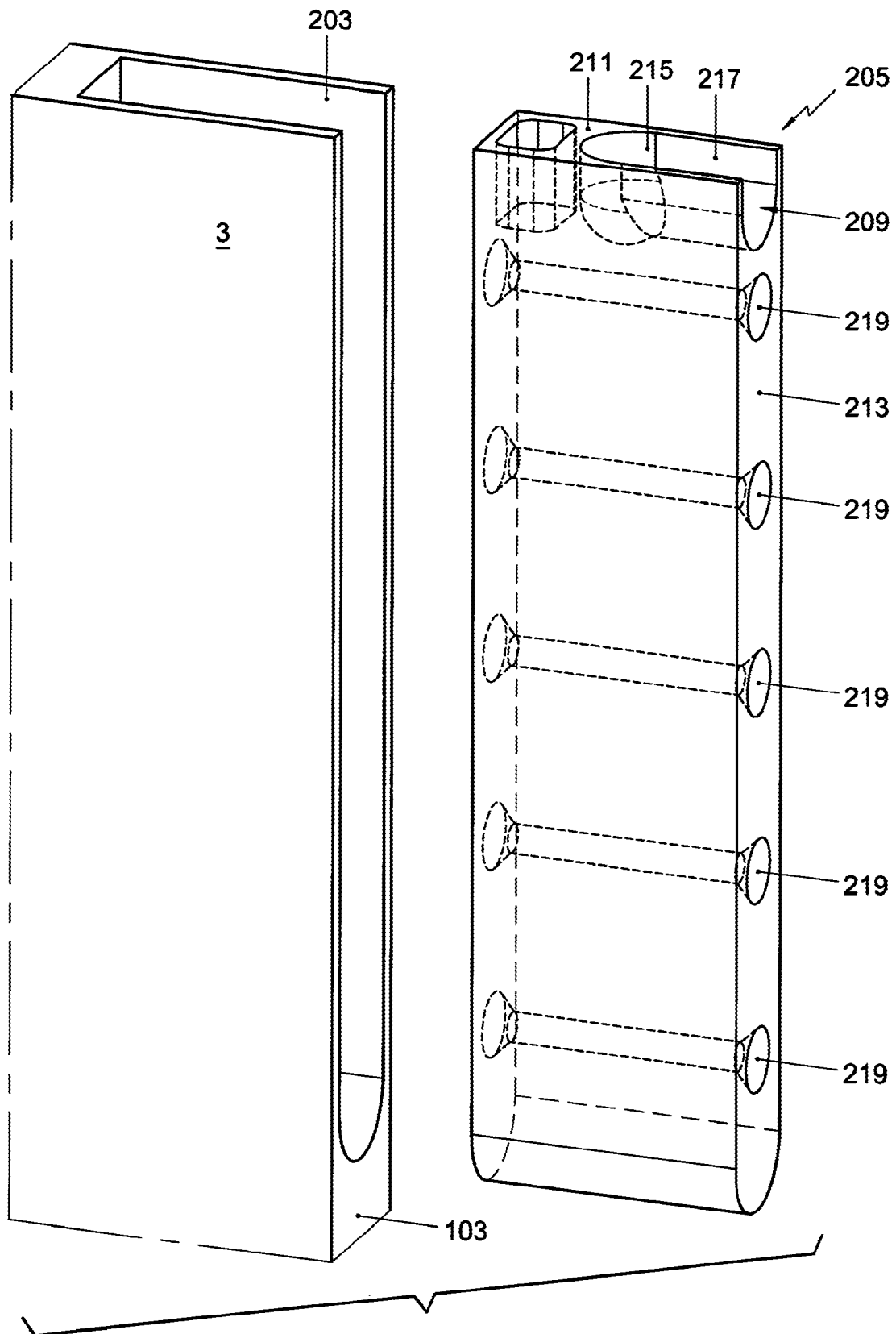


FIG. 13

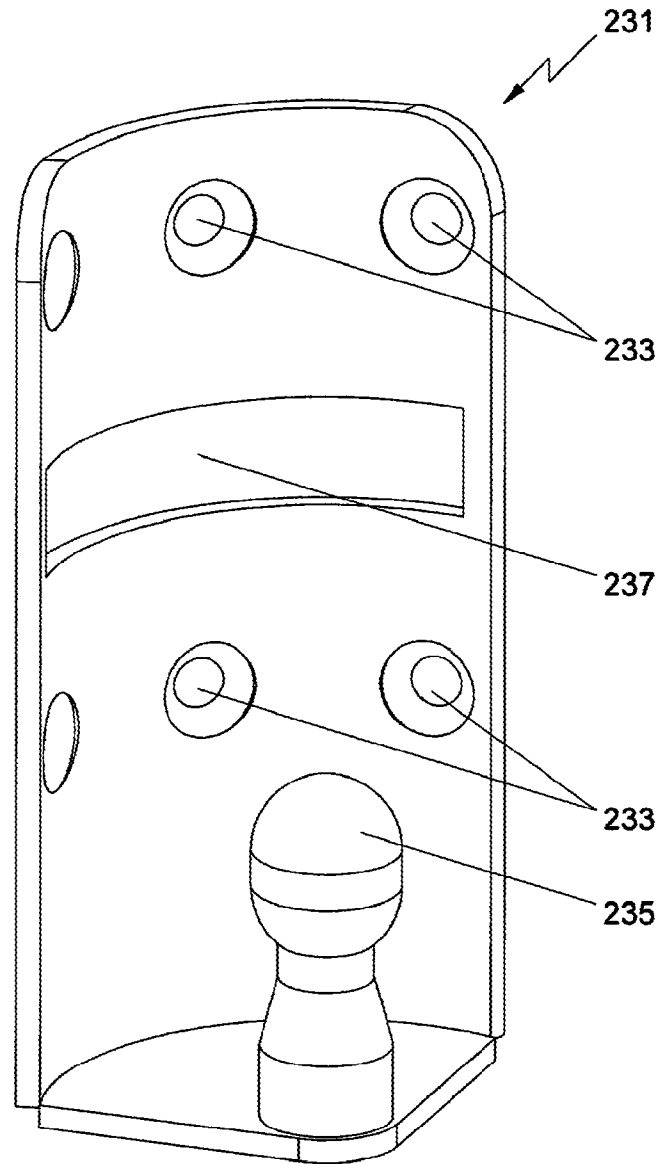


FIG. 14

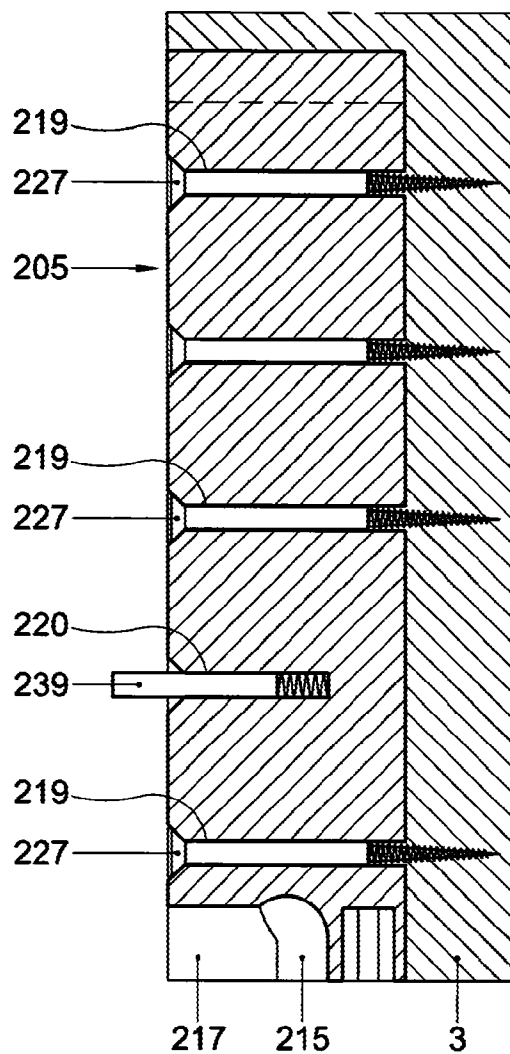


FIG. 15

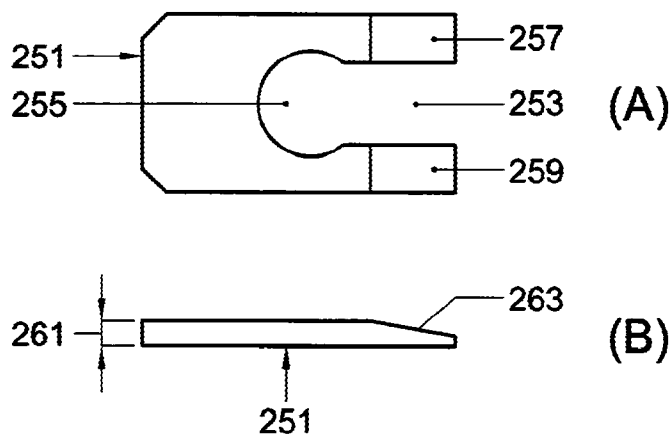


FIG. 16

INTERNATIONAL SEARCH REPORT

International application No
PCT/NL2009/050707

A. CLASSIFICATION OF SUBJECT MATTER INV. E06B7/36 E05D11/08 E05D11/06 E05D7/08 E05D7/06 E05D7/10 E05D5/14		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) E05D E06B		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practical, search terms used) EPO-Internal		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 415 868 A (DOMINGO RIBOT ANGEL [ES]) 6 March 1991 (1991-03-06)	1-5, 7-13, 22-24
Y	column 2, line 39 - column 3, line 37 figures 1,2	6,14-17, 19
X	DE 25 51 880 A1 (TELTING EWALD EUGENE) 26 May 1977 (1977-05-26) page 12, last paragraph - page 13 figures 1,3	1-5,7, 11-13, 22,24
Y	US 3 531 824 A (HAGENDOORN WILLEM J ET AL) 6 October 1970 (1970-10-06) column 2, line 37 - line 57 figures 1-4	6
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☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.		
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Date of the actual completion of the international search 5 February 2010		Date of mailing of the international search report 19/02/2010
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016		Authorized officer Van Kessel, Jeroen

INTERNATIONAL SEARCH REPORT

International application No
PCT/NL2009/050707

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	DE 295 18 092 U1 (AEG HAUSGERAETE GMBH [DE]) 13 March 1997 (1997-03-13) page 1, paragraph 2 page 3, paragraph 2 - last paragraph figures -----	14-17,19
A	US 2 323 625 A (SEAMAN DAVID J) 6 July 1943 (1943-07-06) page 2, right-hand column, line 1 - line 9 page 2, right-hand column, lines 37-42 figures 1,2 -----	4-5,7-10
A	GB 2 255 123 A (EXITILE LTD [GB]) 28 October 1992 (1992-10-28) page 3, last paragraph - page 4, paragraph 3 figures -----	17,19-21

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/NL2009/050707

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 0415868	A	06-03-1991	NONE	
DE 2551880	A1	26-05-1977	NONE	
US 3531824	A	06-10-1970	NONE	
DE 29518092	U1	13-03-1997	NONE	
US 2323625	A	06-07-1943	NONE	
GB 2255123	A	28-10-1992	NONE	