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(54) HOUSEHOLD COOLING APPLIANCE WITH FAST-LOCKING DEVICE FOR MOUNTING A GUIDING RAIL

(57) A household cooling appliance (1) comprising a receiving space (4) for food, wherein the receiving space (4) is bounded with walls (5, 6, 7, 8, 9) of the household cooling appliance (1), wherein on an surface (5a) of a wall (5, 6, 7, 8) at least one guiding rail (14) is arranged, which is separable thereto, wherein the guiding rail (14) is fastened by a releasable mechanical connection (15), wherein the connection (15) is a fast-locking device (16), which comprises at least one locking element (17) and at least one locking receptacle (18), which is separate thereto and in which the locking element (17) is received, and by a rotating of the locking element (17) relative to the locking receptacle (18) about a coupling axis (A) by a predetermined maximum rotation angle smaller than 360° a locking end position of the locking element (17) is predetermined.

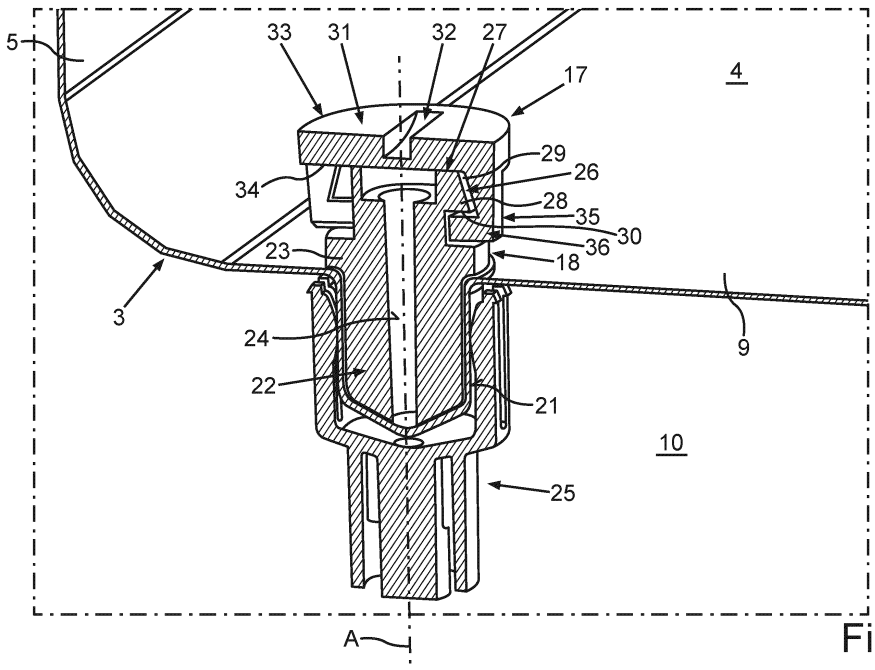

Fig.3

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Description

[0001] One aspect of the invention relates to a household cooling appliance comprising a receiving space for food. The household cooling appliance comprises an inner liner, which at least in part bounds the receiving space with walls. On an inner side of a wall of the inner liner a guiding rail, which is separate thereto, of the household cooling appliance is arranged and fastened by a releasable mechanical connection.

[0002] In the case of household cooling appliances it is known that in the receiving space separate food-receiving containers, such as for example a storage bowl, are arranged. In order to be able to easily shift these in the depth direction of the household cooling appliance, guiding rails are known. These are fastened as separate components on an inner side of a side wall of an inner liner by screw connections. A releasable mechanical connection is provided in the case of corresponding household cooling appliances in order to be able to reversibly attach and detach these guiding rails. Thereby cleaning processes not only of the rail itself, but also of portions covered by the guiding rail in the mounted state, are facilitated. However, in the case of these known screw connections the mounting and demounting is complex since here relatively long screws are required. This is because thread pitches or screw domes are arranged external to the receiving space in a clearance between the inner liner and an outer housing. In order to be able to move such screws into the end position, therefore multiple rotations need to be performed. Moreover, in such solutions it is also the case that a multiple screwing in and screwing out of such a screw causes the mechanical connection to develop increasingly large tolerances. Thereby the attachment of the guiding rail in stable position is no longer reliably achieved in the long term.

[0003] It is the objective of the present invention to provide a household cooling appliance in which the mounting of a guiding rail is easy and the attachment in fixed position is permanently facilitated.

[0004] This objective is solved by a household cooling appliance comprising the features according to claim 1.

[0005] An aspect of the invention relates to a household cooling appliance comprising a receiving space for food, wherein the receiving space is bounded with walls of the household cooling appliance, wherein on an surface of a wall at least one guiding rail is arranged, which is separable thereto, wherein the guiding rail is fastened by a releasable mechanical connection, wherein the connection is a fast-locking device, which comprises at least one locking element and at least one locking receptacle, which is separate thereto and in which the locking element is received, and by a rotating of the locking element relative to the locking receptacle about a coupling axis by a predetermined maximum rotation angle smaller than 360° a locking end position of the locking element is predetermined.

[0006] Preferably the walls are parts of an inner liner of said household cooling appliance. Said inner liner can bound said receiving space at least partly. Preferably said surface is an inner side of a wall facing the receiving space. Preferably at least one or more guide rails may be arranged to an inner surface of a wall of the inner liner and/or to an inner surface of one or more division plates of said household cooling appliance. A division plate may be arranged horizontally or vertically with respect to the household cooling appliance. A division plate is preferably mounted in the inner liner, in order to provide subdivisional storage compartments

[0007] An aspect of the invention relates to a household cooling appliance comprising a receiving space for food. The household cooling appliance comprises an inner liner, which at least in part bounds the receiving space with walls. On an inner side of a wall of the inner liner a guiding rail, which is separate thereto, of the household cooling appliance is arranged and fastened by a releasable mechanical connection.

[0008] This releasable mechanical connection is a fast-locking device. The fast-locking device comprises a locking element and a locking receptacle that is separate thereto. In this locking receptacle the locking element is received. By a rotating of the locking element relative to the locking receptacle about a coupling axis of these two named components and by a predetermined maximum rotation angle smaller than 360° a locked or a locking end position of the locking element is predetermined.

[0009] By such concept the guiding rail is capable of being reversibly mounted and demounted. By the fast-locking device in this connection the mounting effort is clearly reduced. This is because by this specific kind of releasable mechanical connection also a user-friendly handling is facilitated. No longer is it necessary to actuate the fastening element of the prior art, namely a screw, by a defined tool, such as a screw driver. Rather, by the concept of fast locking it is possible to rotate the locking element by this small and limited rotation angle about the coupling axis, even without using a tool or by a random simple actuation element. Thereby, also the end position in the azimuthal direction about the coupling axis is achieved in a very defined way and this is also perceivable. In comparison with a screw, which in the process of being screwed in has no real defined end position, but rather depending on the exerted force may be screwed in more or less, this is different in the case of the fast-locking device. Via the maximum movement of the locking element predetermined by the rotation angle, this rotation angle, which may be smaller than a complete rotation, is also exact and is the same in all repeating processes of the mounting. Thus, also in the case of multiple mounting and demounting the guiding rail is invariably fastened by the same rotation movement of the locking element by the invariably same azimuthal path length and moved into the invariably same end position.

[0010] With this fast-locking device, moreover, viewed over the operating life, a minor wear situation is achieved.

This is because here it is not to be reckoned with a wearing out of the mechanical connection between the locking element and the locking receptacle occurring over time, in particular in comparison with a screw connection.

[0011] Moreover, by this concept also an axial holding force and/or axial holding position along the coupling axis between the locking element and the locking receptacle, which in the case of multiple or frequent, as the case may be, mounting and demounting of the guiding rail is always the same or substantially the same, is permanently achieved. Thus, in particular in this direction the guiding rail may also in the case of frequent mounting and demounting invariably take and keep the same position. Thereby, even very small differences in the position of the guiding rail can stay the same in the case of several mounting and demounting processes. The storage containers, which are attachable to and/or movable on the guiding rail, are therefore equally attachable in the same or in substantially the same position. Thus, the relative movement of such storage containers, which are supported on the guiding rail and can be moved relative thereto, can be permanently maintained. Also thereby, viewed over the operating life of the household cooling appliance, a smooth moving of such storage good containers facilitated without strutting or jamming may be performed.

[0012] In an embodiment this maximum rotation angle around the coupling axis amounts to a value between larger than or equal to 45° and smaller than 360°. In particular this rotation angle amounts to between 60° and 180°. The above-named advantages, in particular with regard to a simple and fast mounting and demounting, are thereby once again increased. Nevertheless the mechanical holding force and the fixing in position of the guiding rail are achieved and also maintained in the case of multiple mounting and demounting processes.

[0013] In an embodiment the fast-locking device comprises a bayonet-like connection. Such a connection is characterized in particular in that the locking element, to start with, is brought together in the axial direction of the coupling axis with the locking receptacle. This means that the locking element and the locking receptacle in the direction of this coupling axis lead into each other. This is in particular a linear movement. Starting from this first coupling process for coupling the locking element and the locking receptacle subsequently then a rotation movement over this above-named maximum rotation angle is then performed. Also thereby the bayonet-like connection is characterized. In particular here a relative movement about this coupling axis is achieved to the effect that the locking element is rotated relative to the locking receptacle, which preferably is arranged stationary.

[0014] In an embodiment, the locking end position explained above especially in the case of an embodiment of a bayonet-like connection may also additionally be fixed. This means that for example the locking element at the end of this rotation movement about the coupling axis for instance is moved once again slightly in the axial direction of the coupling axis. Thus, a particularly advantageous fixing in position between the locking element and the locking receptacle in the circumferential direction around the coupling axis is achieved. For releasing this locked end position then to start with the locking element is to be moved slightly in the axial direction of the coupling axis, in order to then be able to perform the reverse movement about the coupling axis.

[0015] In an embodiment, the fast-locking device comprises a snap-fit connection. This is a further very advantageous embodiment, because also this specific mechanical connection, on the one hand, is fast to be generated, on the other hand, though, facilitates equally high holding forces. Moreover, such a mechanical connection is also of a simple and robust setup so that it is also permanently highly functional and low in wear. Moreover, such a snap-fit connection is also easy to be released so that a demounting process may be effected fast and with little effort. It is possible that in one embodiment the fast-locking device comprises only one bayonet-like connection. Then no snap-fit connection is provided. In another embodiment the fast-locking device may, however, only comprise the snap-fit connection.

[0016] It is advantageous if the fast-locking device comprises both a bayonet-like connection as well as a snap-fit connection. In such an embodiment it may then be envisaged that for mechanical connecting the locking element, to start with, is moved in particular in a linear way in the direction of the coupling axis and is inserted into the locking receptacle. If in this respect a specific axial insertion length is achieved, then the rotation movement is effected about the coupling axis. This may be effected by the maximum rotation angle. In particular at the end of this rotation movement about the coupling axis then the snap-fit connection may be realized so that the locking end position is also fixed by the snap-fit connection being realized. In particular then exactly in this locking end position a snap-fit element of the snap-fit connection is snap-fitted into a counter-snap element of the snap-fit connection. In particular this may be performed to the effect that only an azimuthal movement about the coupling axis is effected to adjust this snap-fitted state of the snap-fit connection.

[0017] In an embodiment the locking element comprises at least one sap-fit element and at least one centering element. These elements are preferably integrates in a base body of the locking element. The snap-fit element can be snap-fitted with a snap-fir receptacle being arranged at the locking receptacle. The centering element can be mechanically coupled to a counter centering element by a bayonet-like connection. Said counter centering element can be integrated in an inner side of a wall of a pot-like locking receptacle.

[0018] The snap-fit connection may in an embodiment be designed in such a way that it predetermines in the snap-fitted state a specific predetermined force threshold value for releasing the snap-fit connection. This means

that the snap-fit connection may be released to the effect that the locking element may be automatically released again by a reverse movement about the coupling axis with a force value that is larger than this threshold value. In particular this force threshold value, however, is already predetermined in such a way that an undesired release, for instance by slight force effects acting upon the locking element or an undesired striking against the locking element, does not occur.

[0019] In an embodiment, the locking receptacle comprises an integrated locking structure. This means that the locking structure is configured to be integrally formed with the locking receptacle. This locking structure in the mounted state or, when the locked end position is reached, is directly mechanically coupled with the locking element. A mechanically compact setup with a minimized number of components is thereby facilitated. Nevertheless here high mechanical holding forces are facilitated.

[0020] In an embodiment, the locking receptacle is configured to be pin-like. It is in particular a component that is separate from the guiding rail. The pin-like shape design may also be referred to as bolt-like. By such a design of the locking receptacle, on the one hand, the same may be produced and manufactured individually, on the other hand, in terms of its shape be adapted to specific installation situations. In particular thus also an easy insertion into a blind hole depression in a wall of the inner liner is facilitated.

[0021] In an embodiment, the locking structure is configured on a basic carrier of the locking receptacle. The basic carrier may be pin-like or bolt-like. The locking structure comprises at least one locking blade radially projecting from the basic carrier. In particular the locking blade is configured to be only in part circumferentially extending around a longitudinal axis of the basic carrier. The longitudinal axis of the basic carrier is in particular coaxial relative to the coupling axis between the locking receptacle and the locking element. In particular these locking blades are configured on an end of the basic carrier facing the receiving space. By such exposed position of the locking blade the coupling with the locking element is particularly easy. Complex coupling processes, which may also lead to strutting of the so-called components, can thereby be avoided. A very simple and still highly functional coupling process is thereby rendered possible.

[0022] By the locking blade being configured to be only in part circumferentially extending around the longitudinal axis, also an axial passing of a corresponding counter-coupling structure by the locking element can be achieved. Thus, in a particularly advantageous way also a coupling by gripping behind between the locking element and the locking receptacle is facilitated.

[0023] In an embodiment the basic carrier has a through-hole. Into this hole a separate fastening element is introduced. By this fastening element in an embodiment the locking receptacle, which preferably is arranged completely in the receiving space, may be attached to a holder arranged external to the receiving space. This is a further very advantageous embodiment. This is because thereby this locking receptacle may be arranged on a side of the wall bounding the receiving space. It is thus capable of being positioned completely on the side of the receiving space. In order to keep the openings in the wall to a minimum, on the other hand, in such an embodiment then only a small hole is required to be able to pass through the fastening element, such as for instance a screw. By this concept with the holder arranged external to the receiving space the mechanical fastening of the locking receptacle to the inner liner may be achieved in a particularly advantageous way. This is because the walls of the inner liner need not absorb any major mounting and holding forces. These are absorbed by the holder. The holder, which is also separate from the wall of the inner liner, is arranged on the side of the foam. This means that in a clearance between the wall of the inner liner and a wall of the outer housing of the household cooling appliance a clearance is configured, into which a thermally insulating material is inserted. This thermally insulating material may for instance be an insulating foam. The holder in an embodiment is completely arranged in this clearance. This means that in the mounted state the wall of the inner liner is arranged between the holder and the locking receptacle.

[0024] By this concept a permanently stable arrangement in secured position of the locking receptacle on the wall of the inner liner is enabled. This mounting is envisaged only once. A permanent removing and screwing in again of the fastening element is therefore not intended and will not be performed either. In this concept therefore also a screw connection is provided, however, in a different place within the functional chain of effects of the named separate components than it is provided in the prior art. As a result, if the guiding rail is to be or is multiply mounted and demounted, this merely happens at the interface between the locking element and the locking receptacle via the fast-locking device configured there. The fact that, on the other hand and in a different place, this locking receptacle is fastened to the inner liner by this holder, has nothing to do with it. This then is merely the individual permanent fastening of the locking receptacle to the inner liner.

[0025] In an embodiment the locking receptacle is arranged at least in part within a blind hole depression formed in a wall, especially a wall of an inner liner or a division plate. Thus, an improved mechanical positioning and holding of the locking receptacle is facilitated. Moreover, it is thus also arranged to be partly sunk and thus hidden. Thus, an excessive projecting into the receiving space and a thereby caused jolting or possibly undesired bending can thereby be avoided.

[0026] In an embodiment the blind hole depression is integrally formed with the wall of the inner liner. For example the wall, as well as the entire inner liner, may be configured to be made of plastic. It may be formed by injection molding or deep drawing. In an embodiment the

locking element is configured as a closure-like cap. This preferably comprises a plate-like lid. On a bottom side of this lid, which faces the locking receptacle, in an embodiment a counter-locking structure is configured. It is in particular configured to be integrally formed with the lid. This means that it is manufactured as a single piece with it. Such an embodiment of a locking element allows for a compact setup and still a mechanically highly stable structure. Both the handling for coupling and decoupling the locking element with the locking receptacle as well as the holding forces that can be achieved thereby are particularly advantageous. Moreover, by this shape design of the locking element in the locked state of the fast-locking device the counter-locking structure is quasi no longer existent or accessible, respectively, in an outwardly projecting way. With the lid then the interface between the locking structure and the counter-locking structure is then covered.

[0027] In an embodiment the counter-locking structure comprises at least one hook. The same is coupled directly with the locking receptacle for adjusting the locked end position. This hook, viewed in the cross-section of the locking element, is L-shaped. This cross-section is a vertical section, wherein the longitudinal axis of the locking element extends completely in this plane. By such a geometry of the counter-locking structure a very simple and still highly functional gripping behind the locking structure is enabled. Thus, also a high axial holding force and a high axial position securing between the locking element and the locking receptacle in the locked end position is achieved.

[0028] In particular in the locked end position this hook grips behind the locking blade of the locking receptacle. Thereby an axial position securing is configured.

[0029] In an embodiment, the locking receptacle may be configured to be cup-shaped. In an embodiment the locking receptacle comprises a side wall. This is the side wall for example of a cylinder shape of the locking receptacle. In this side wall a snap-fit element receptacle is configured. This is advantageous in particular when the fast-locking device comprises a snap-fit connection. The snap-fit element receptacle may be a depression, which, viewed in the radial direction relative to the coupling axis, is bulging outward.

[0030] In an embodiment the locking element comprises an, in particular cylinder-like, basic body. The locking element moreover comprises at least one actuating bracket projecting radially from the basic body. According to the intended purpose, the same is provided for rotating the locking element about its longitudinal axis. Thereby, a particularly easy handling of this locking element is facilitated. The adjusting of the locked or unlocked state or the involved end positions is thereby enabled in a particularly reliable and user-friendly way. Not least, by this actuating bracket and the stationary connection to the basic body, then it is also already visually recognizable whether the locked end position or the unlocked end position is adjusted. This may be easily recognized depending on the position of the actuating bracket in the circumferential direction around the longitudinal axis. Thus, by this actuating bracket also a multi-functionality is linked. This is because it then also acts as visual position indicator, by which also the locked end position and the unlocked end position are indicated.

[0031] In an embodiment the guiding rail comprises a first stop, against which the actuating bracket stops in the locked end position. In particular the guiding rail comprises a second stop, against which the actuating bracket stops in the unlocked end position. By these preferably two stops now the movement path of the locking element may also be predetermined and bounded/limited in a very simple way. A moving over and across is thereby excluded. Thus, both a quasi azimuthal overwinding of the locking element and also an underwinding to reach the respective end positions in a defined way, can thus be avoided. A particularly advantageous concept for permanently the same and very purposeful adjustment of the end positions is thereby achieved.

[0032] In an embodiment on an outer surface of an, in particular cylinder-shaped, basic body of the locking element a springy snap-fit element is configured. In particular, this at least one springy snap-fit element is configured to be integrated on this basic body. This means that it is integrally formed with it. The spring effect may be effected in this connection in the radial direction relative to the longitudinal axis of the locking element. Thus, upon rotating the locking element about the coupling axis when coupling with the locking receptacle an automated and reliable snap-fitting of this springy snap-fit element into the snap-fit element receptacle is achieved.

[0033] In an embodiment the guiding rail has a through-hole. Through same the locking element extends for direct coupling with the locking receptacle. In particular the locking element is arranged to be completely sunk in the hole. A projecting of this locking element in the locked end position beyond a top surface of the guiding rail bounding the hole and facing the receiving space is thereby avoided. An undesired striking against a locking element and a possibly accidental or undesired releasing of the locking element are thereby particularly advantageously avoided.

[0034] By the indications "top", "bottom", "front", "back", "horizontal", "vertical", "depth direction", "width direction", "height direction" the positions and orientations given in the case of intended use and intended positioning of the household cooling appliance are indicated.

[0035] Further features of the invention derive from the claims, the figures, and the description of the figures. The features and feature combinations previously named in the description, as well as the features and feature combinations named in the following in the description of the figures and/or shown in the figures alone can be used not only in the respectively indicated combination, but also in other combinations or alone, without leaving the scope of the invention. Thus, also implementations of the inven-

tion are to be considered as comprised and disclosed, which are not explicitly shown and explained in the figures, however derive from separated feature combinations from the explained implementations and can be generated from them. Also explanations and feature combinations are to be regarded as disclosed, which thus do not comprise all features of an originally formulated independent claim.

[0036] Embodiments of the invention are explained in more detail in the following by reference to schematic drawings. These show in:

Fig. 1 a schematic representation of an embodiment of a household cooling appliance according to the invention;

Fig. 2 an enlarged view of a sub-portion of the household cooling appliance according to Fig. 1 with an exploded view of a demounted state of a guiding rail with a fast-locking device;

Fig. 3 a perspective cross-sectional view through subcomponents of the fast-locking device according to Fig. 2 in the mounted state;

Fig. 4 a perspective view of subcomponents according to Fig. 2 and Fig. 3;

Fig. 5 a perspective view of an embodiment of a locking receptacle of the mechanically releasable connection;

Fig. 6 a perspective view of an embodiment of a locking element of this mechanically releasable connection;

Fig. 7 an exploded view of a further embodiment of a guiding rail with an embodiment of a fast-locking device as releasable mechanical connection;

Fig. 8 a perspective view of a further embodiment of a locking element of such a mechanically releasable connection;

Fig. 9 a side view of the locking element according to Fig. 8;

Fig. 10 a top view of the embodiment according to the locking element according to Fig. 8 and Fig. 9;

Fig. 11 a top view of a sub-portion of an embodiment of the guiding rail according to Fig. 7;

Fig. 12 a perspective view of subcomponents of an inner liner of the household cooling appliance according to Fig. 1 and a still demounted guiding rail according to Fig. 7;

Fig. 13 a perspective view of the mounted guiding rail according to Fig. 12, however, without the inner liner shown in Fig. 12;

Fig. 14 an enlarged view of a sub-portion I in Fig. 12;

Fig. 15 a perspective view of a locking receptacle, as it is configured in an embodiment according to Fig. 7 to 14;

Fig. 16 a perspective cross section view of the locking receptacle according to Fig. 15; and

Fig. 17 a further embodiment of a positioning of a guiding rail on a wall of an inner liner by a fast-locking device.

[0037] In the figures identical or functionally identical elements are equipped with the same reference signs.

[0038] In Fig. 1 in a perspective schematic view an embodiment of a household cooling appliance 1 is shown. The household cooling appliance 1 is configured for storing and preserving food. In Fig.1, x-axis corresponds to a width direction x, y-axis corresponds to a height direction y, and z-axis corresponds to a depth direction z.

[0039] The household cooling appliance 1 may be a cooling appliance or a freezer or a fridge-freezer combination device. The household cooling appliance 1 comprises a housing 2. In the housing 2 an inner liner 3 that is separate therefrom is received. The inner liner 3 with its walls bounds a receiving space 4 for food. The at least one receiving space 4 may be a cooling compartment or a freezer compartment. The walls of the inner liner 3 are in particular vertical first side wall 5 and second side wall 6, a first rear wall 7, a ceiling wall 8, and a bottom wall 9. In a clearance 10 between the inner liner 3 and the housing 2, which may also be referred to as outer housing, a thermally insulating material is inserted. This may for instance be insulating foam. The household cooling appliance 1 moreover comprises a door 11. The same is provided for closing the receiving space 4 on the front side. The door 11 is here pivotably arranged on a corpus 12 of the household cooling appliance 1.

[0040] Moreover, the household cooling appliance 1 comprises a guiding system 13. The guiding system 13 according to its intended purpose is provided for receiving and guiding storage good containers. In particular a storage good container 1a, such as for instance a bowl, should thereby be capable of being easily pushed in and drawn out in the depth direction (z direction) of the household cooling appliance 1 into the receiving space. The guiding system 13 in the embodiment comprises guiding rails. In Fig. 1 accordingly a guiding rail 14 is shown. Same is arranged in the receiving space 4 on a wall of the inner liner 3. It is here arranged on a vertical first side wall

5, in particular fastened in a non-destructively releasable way. In Fig. 1 a further guiding rail cannot be recognized, which is fastened to the opposite side wall 6. This guiding rail is at the same height level with the shown guiding rail 14 (height direction is the y direction) so that here a guiding plane for the storage good container 1a shown here is formed.

[0041] In Fig. 2 in an enlarged view a sub-portion of the household cooling appliance 1 according to Fig. 1 is shown. An embodiment of a guiding rail 14 is represented here. This is designed as elongated rail body. It extends with its longitudinal axis in the depth direction of the household cooling appliance 1. In the embodiment shown in Fig. 2 in contrast to Fig. 1 it is provided that the guiding rail 14 is not directly fastened to the vertical side wall 15, but here is fastened directly to the bottom wall 9. For this purpose a mechanically releasable connection 15 is provided. This is here a fast-locking device 16. The fast-locking device 16 comprises a locking element 17 and an element that is separate therefrom, namely a locking receptacle 18. The locking receptacle 18 is here also a self-contained separate component. As may be recognized here, the guiding rail 14 has a through-hole, which is called as a first hole 19 in a beam-like bottom part 20. Into this first hole 19 during mounting the locking element 17 is introduced in order to mechanically couple with the locking receptacle 18. In Fig. 2 moreover a coupling axis A is represented. The same is here oriented in the height direction. The coupling axis A shows the axis, along which the locking element 17 and the locking receptacle 18 are brought together, in particular guided into each other. The fast-locking device 16 according to the intended purpose is also designed and defined by the fact that when the locking element 17 in the axial direction is partly introduced into the locking receptacle 18, by a subsequent rotating of the locking element 17 relative to the locking receptacle 18 a locked end position is achievable. According to the intended purpose the same is thereby predetermined exactly and in invariably the same way by the fact that this rotating of the locking element 17 about the coupling axis A is effected by a predetermined maximum rotation angle that is smaller than 360°. In particular it is envisaged that this locked end position is to be rotated by an in this regard exact value of the maximum rotation angle in order to achieve this locked end position, which means that it is not smaller or larger. This maximum rotation angle is preferably larger than or equal to 45° and smaller than 360°, in particular between 60° and 180°.

[0042] The fast-locking device 16, viewed in general, comprises a bayonet-like connection. This means that for defined coupling, to start with, the locking element 17 has to be axially brought together with the locking receptacle 18 and thus these two components are guided into each other. If this intermediate mounting state is reached, for the bayonet-like connection then in the following additionally a rotation movement about the coupling axis A is required. This is effected by this predetermined maximum rotation angle of smaller than 360°. For the predefined locked end position this rotation movement is also required by this maximum rotation angle.

[0043] In Fig. 3 in a perspective sectional view the component arrangement according to Fig. 2 is shown. Here the locked end position of the fast-locking device 16 is represented. For the sake of clarity, here the guiding rail 14 is not shown. As may be discerned in Fig. 3, in an embodiment here in the bottom wall 9 a blind hole depression 21 is configured. Into this blind hole depression 21 extends the locking receptacle 18. The locking receptacle 18 in this embodiment is configured with a pin-like or bolt-like first basic body 22. The same comprises a radially projecting bar 23. This bar 23 also defines the insertion depth of the first basic body 22 into the blind hole depression 21. Moreover, this bar 23, which may also be referred to as collar, serves as deposit base for placement on the bottom wall 9. In particular this bar 23 is configured to be completely circumferentially extending and in this regard without interruptions.

[0044] As may be discerned, this first basic body 22 comprises an axial through-hole which is called as a second hole 24. The same is provided for introducing a fastening element, in particular a screw, that is separate therefrom. Thus, it is facilitated that this locking receptacle 18 can be fastened, in particular screwed, to a holder 25 that is separate thereto. This tulip-like holder 25 is arranged completely external to the receiving space 4. In particular it is arranged completely in the clearance 10. This holder 25 is therefore arranged on the side of the foam. Preferably, it is completely surrounded by this insulating material, in particular the insulation foam.

[0045] The locking receptacle 18 comprises an integrated locking structure 26. According to the intended purpose, the same is provided for direct coupling with the locking element 17. The locking structure 26 is configured on the basic carrier 22, in particular integrally formed therewith. Thus, in this regard it is integrated in the basic carrier 22. In particular, it is configured on an end 27 of the basic carrier 22, which faces the receiving space 4. This locking structure 26 in the embodiment is configured with at least one locking blade 28 projecting radially relative to the coupling axis A. The locking blade 28 is not only configured to extend circumferentially around the coupling axis A. In particular it is here only configured by an angle segment. This angle segment may amount to between 10° and 45°. Preferably, two such separate locking blades 28, which are spaced apart in the circumferential direction around the coupling axis A, are molded on. As may be discerned here, the locking blade 28 in the vertical sectional view is of a trapezoidal shape. This means that a radially outer wall 29 is not axially oriented, but oriented at an angle. Towards the end 27 it is inclined towards the coupling axis A. A second rear wall 30 is here oriented in the sectional view in particular perpendicular to the coupling axis A.

[0046] In the embodiment the locking element 17 com-

prises a lid 31. The same is here designed as flat cylinder or disk-like. In the embodiment the lid 31 has an engagement portion 32. The same is here configured as engagement slot. Thus, it can easily be engaged by an auxiliary element in order to cause a rotation movement of the locking element 17 about the coupling axis A. This may for instance also be effected by a coin or the like. Thus, no tool that is explicitly provided for screwing in, such as a screw driver or the like, needs to be given to be able to initiate this rotation movement. However, it is also possible that this locking element 17 can be screwed in by a user only by hand. This locking element 17 in the embodiment is configured as closure-like cap 33. This means that, as it is shown in Fig. 3, in the locked end position the locking receptacle 18 is completely covered from the top. The plate-like lid 31 here is then to be understood as cap. On a bottom side 34 of this lid 31 a counter-locking structure 35 is configured. The counter-locking structure 35 is configured to be integrally formed with the lid 31 and thus manufactured as a single piece with it. The counter-locking structure 35 in the embodiment comprises a hook 36 projecting from the lid 31. The hook 36 is here configured to project from the lid 31 facing the locking receptacle 18. Viewed in the height direction, it is here configured to project towards the bottom. This hook 36 is coupled for adjusting the locking end position directly with the locking receptacle 18, in particular the locking structure 26. As may be discerned in Fig. 3, in which the locking end position of the fast-locking device 16 is represented, this hook 36 engages behind the locking blade 28. Thereby, also an axial position securing between the components is configured. The hook 36 in this connection is arranged to be overlapping with the locking blade 28 in the radial direction relative to the coupling axis A. Here, too, the number of hooks 36 may correspond to the number of locking blades 28. Thus, for example also a double securing may be achieved.

[0047] In Fig. 4 in a perspective view of the mounted end state of the guiding rail 14 on the bottom wall 9 according to the representation shown in Fig. 2 and Fig. 3 is shown. Here as mounting aid also a disk-like element 37, such as for example a coin, is represented. Here, the same engages the engagement portion 32. As may be discerned, in this mounted end state the top side of the lid 31 is flush with a top side 38 adjacent to the first hole 19 of the guiding rail 14, in particular of this bottom leg 20.

[0048] In Fig. 5 in a perspective view an embodiment of the locking receptacle 18, as it has been explained with regard to Figs. 2 to 4, is shown. The here two locking blades 28 are shown. In the shown embodiment they are arranged offset by 180° in the circumferential direction around the coupling axis A, which here in particular also defines a longitudinal axis of this locking receptacle 18.

[0049] In Fig. 6 in a perspective view the embodiment of the locking element 17 according to the explanations given as to Figs. 2 to 4 is represented. The hook 36 with its respective specific shape design may be discerned. An inner side 39, which is oriented in the axial direction, of the L-shaped hook 36 is here equally inclined. The inclination is here in particular complementary for inclination of the walls 29 of the locking blade 28.

[0050] In Fig. 7 here in a perspective representation a further embodiment is shown. Here the fast-locking device 16 is represented with different embodiment. The locking receptacle 18 is here also configured as separate self-contained element. It is here of a cup-shaped design.

[0051] The locking element 17 is here of a cylinder-like design. For this purpose a corresponding second basic body 40 is provided.

[0052] The locking receptacle 18 here comprises a third side wall 41. In this third side wall 41 in the embodiment a snap-fit element receptacle 41a is configured. This may be a recess or a depression. The snap-fit element receptacle 41a according to the intended purpose is provided for snap-fitting a snap-fit element 42 therein. This snap-fit element 42 in the shown embodiment is configured in a fourth side wall 43 of this locking element 17. It is in particular configured to be integrated. In particular, this snap-fit element 42 is a springy snap-fit element. In particular it springs in the radial direction relative to the coupling axis A.

[0053] Moreover, in an embodiment also at least one centering element 44 is configured on this fourth side wall 43. In particular it is equally integrated in this fourth side wall 43. The centering element 44 projecting in an elevated manner in the radial direction from the fourth side wall 43 in the azimuthal direction extends therefrom immediately adjacent to the snap-fit element 42.

[0054] In this embodiment thus the fast-locking device 16 is configured to comprise a snap-fit connection This means that in the case of a rotating of the locking element 17 about the coupling axis A, the snap-fit element 42 snap-fits into the snap-fit element receptacle 41a, if the rotation movement is, in particular exactly, effected by the predetermined maximum rotation angle. Also in the locked end position precisely this snap-fit connection is then configured.

[0055] In an embodiment the locking element 17 comprises an actuating bracket 45. The same is projecting at the top end in the radial direction relative to the coupling axis A from the second basic body 40. It is oriented to be freely cantilevering. This actuating bracket 45 may be directly gripped by an operator so that thus the rotation movement of the locking element 17 is initiated. This actuating bracket 45 is configured as a single piece with the second basic body 40.

[0056] In Fig. 8 in a perspective view the embodiment of the locking element 17 according to Fig. 7 is shown. In Fig. 9 a lateral view of this locking element 17 is shown where the at least one snap-fit element 42 is configured. This is here designed as springy tongue. Extending directly therefrom, the at least one centering element 44 is shown. The same has a top edge 46 .

[0057] In an embodiment according to Fig. 7 and 8 the locking element 17 comprises at least one sap-fit element

42 and at least one centering element 44. These snap fit element 42 and centering element 44 are preferably integrated in the second basic body 40 of the locking element 17. The snap-fit element 42 can be snap-fitted with the snap-fit element receptacle 41a being arranged at the locking receptacle 18. The centering element 44 can be mechanically coupled to a counter centering element by a bayonet-like connection. Said counter centering element can be integrated in an inner side of a wall 41 of a pot-like locking receptacle 18. The counter centering element can be the locking structure 26 (Fig. 15, 16).

[0058] In Fig. 10 this locking element 17 is represented viewed from the top.

[0059] In Fig. 11 a view from the top of a sub-portion of the guiding rail 14 is represented. The first hole 19 is shown here. A sector 47, which, as this is also shown in Fig. 7, is recessed, serves as an engagement recess for the actuating bracket 45. An azimuthal movement about the coupling axis A is facilitated for this actuating bracket 45 in this sector 47, which is configured as clearance. For this purpose, however, it is envisaged that a first stop 48 is configured, against which the actuating bracket 45 stops, when the locked end position is achieved. This may also be symbolically characterized by a first symbol 49. Moreover, a second stop 50 is configured, against which the actuating bracket 45 stops, when in the course of the rotation about the coupling axis A it has achieved the unlocked end position of the locking element 17. This, too, may be indicated by a second symbol 51. The maximum movement path of the actuating bracket 45 is therefore limited and predetermined by these stops 48 and 50.

[0060] In Fig. 12 in a perspective view a sub-portion of the inner liner 3 as well as the still unmounted guiding rail 14 is shown. The locking receptacle 18 is here shown already in the end position. Here, too, a corresponding blind hole depression 21 may be configured in the bottom wall 9. In this embodiment this cup-shaped locking receptacle 18 is arranged completely sunk in this blind hole depression 21. The locking receptacle 18 here, too, may be correspondingly fastened to a holder 25, in particular screwed thereto, as this has already been explained as to Fig. 3. The locking element 17 is here already arranged in the first hole 19. In a subsequent mounting then the guiding rail 14 coming from the top is placed upon the bottom wall 9. Therein the locking element 17 is axially introduced into the locking receptacle 18. If the corresponding state placed on the top is achieved, by the already explained rotation movement of the locking element 17 about the coupling axis A by the predetermined maximum rotation angle the locked end position is achieved. Thus, also the mounted end state of the guiding rail 14 is achieved. Here it may be discerned that then the actuating bracket 45 in the sector 47 has stopped against the first stop 48. This is shown in Fig. 13.

[0061] In Fig. 14 an enlarged sub-portion of the view of the guiding rail 14 and the locking element 17 of Fig. 12 is shown.

[0062] The top edge 46 comprises an inclined section 46a and a horizontal section 46b. The inclined section 46a contacts a complementary inclined first section 26a of the locking structure 26 when the locking element 17 is rotated around the axis A. By this the locking element 17 is moved towards the locking receptacle 18 in axial direction.

[0063] Further the locking structure 26 comprises a horizontal second section 26b, on which horizontal section 46b slides along when the locking element 17 is further rotated around the axis A.

[0064] In Fig. 14 an embodiment is shown in which the sector 47 comprises an additional deepening 52. In said additional deepening 52 the actuating bracket 45 is brought in when the locking element 17 reaches its locked end position. By this an additional securing if said locked state is achieved.

[0065] In Fig. 15 and Fig. 16 an embodiment of a pot-like locking receptacle 18 is shown.

[0066] In Fig. 17 in a perspective view a further embodiment is shown. In this embodiment the guiding rail 14 is not fastened to the bottom wall 9, but on the vertical second side wall 6, which here is exemplarily shown. The fast-locking device 16 may here be configured according to the embodiment, as it was explained with regard to Figs. 2 to 6 or as it was for example explained according to Figs. 7 to 13. In particular, here an embodiment is provided, as it was explained as to Figs. 7 to 13.

List of Reference Signs

[0067]

1	household cooling appliance
1a	storage good container
2	housing
3	inner liner
4	receiving space
5	first side wall
6	second side wall
7	first rear wall
8	ceiling wall
9	bottom wall
10	clearance
11	door
12	corpus
13	guiding system
14	guiding rail
15	vertical side wall
16	fast-locking device
17	locking element
18	locking receptacle
19	first hole
20	bottom leg
21	blind hole depression
22	first basic body
23	bar

24 second hole
25 holder
26 locking structure
26a first section
26b second section
27 end
28 locking blade
29 wall
30 second rear wall
31 lid
32 engagement portion
33 cap
34 bottom side
35 counter-locking structure
36 hook
37 disk-like element
38 top side
39 inner side
40 second basic body
41 third side wall
41a snap-fit element receptacle
42 snap-fit element
43 fourth side wall
44 centering element
45 actuating bracket
46 top edge
46a inclined section
46b horizontal section
47 sector
48 first stop
49 first symbol
50 second stop
51 second symbol
52 additional deepening

A coupling axis
x width direction
y height direction
z depth direction

Claims

1. Household cooling appliance (1) comprising a receiving space (4) for food, wherein the receiving space (4) is bounded with walls (5, 6, 7, 8, 9) of the household cooling appliance (1), wherein on an surface (5a) of a wall (5, 6, 7, 8) at least one guiding rail (14) is arranged, which is separable thereto, wherein the guiding rail (14) is fastened by a releasable mechanical connection (15), wherein the connection (15) is a fast-locking device (16), which comprises at least one locking element (17) and at least one locking receptacle (18), which is separate thereto and in which the locking element (17) is received, and by a rotating of the locking element (17) relative to the locking receptacle (18) about a coupling axis (A) by a predetermined maximum rotation angle smaller than 360° a locking end position of the locking element (17) is predetermined.

2. Household cooling appliance (1) according to claim 1, wherein the maximum rotation angle amounts to between larger than or equal to 45° and smaller than 360°, in particular between 60° and 180°.

3. Household cooling appliance (1) according to claim 1 or 2, wherein the fast-locking device (16) comprises a bayonet-like connection.

4. Household cooling appliance (1) according to any one of the preceding claims, wherein the fast-locking device (16) comprises a snap-fit connection.

5. Household cooling appliance (1) according to any one of the preceding claims, wherein the locking receptacle (18) comprises an integrated locking structure (26), which is directly coupled with the locking element (17).

6. Household cooling appliance (1) according to claim 5, wherein the locking receptacle (18) is configured to be pin-like and is a component, which is separate to the guiding rail (14).

7. Household cooling appliance (1) according to claim 5 or 6, wherein the locking structure (26) is configured on a basic carrier (22) of the locking receptacle (18) and comprises at least one locking blade (28) radially projecting from the basic carrier (22), in particular at an end (27) facing the receiving space (4), wherein the locking blade (28) is configured to extend only in part circumferentially around a longitudinal axis (A) of the basic carrier (22).

8. Household cooling appliance (1) according to any one of the preceding claims 5 to 7, wherein the basic carrier (22) comprises a second hole (24), into which a separate locking element is introduced, by which the locking receptacle (18), which is completely arranged in the receiving space (4), is fastened to a holder (25) arranged external to the receiving space (4).

9. Household cooling appliance (1) according to claim 8, wherein the locking receptacle (18) is arranged at least in part in a blind hole depression (21) in a wall (5, 6, 7, 8, 9).

10. Household cooling appliance (1) according to any one of the preceding claims, wherein the locking element (17) is configured as closure-like cap comprising a plate-like lid (31), on the bottom side (34) of which a counter-locking structure (35) is integrated.

11. Household cooling appliance (1) according to claim

10, wherein the counter-locking structure (35) comprises at least one hook (36), which is coupled directly with the locking receptacle (18) for adjusting the locked end position.

12. Household cooling appliance (1) according to claim 7 and according to claim 11, wherein in the locked end position the hook (36) grips behind the locking blade (28) so that an axial position securing is configured.

13. Household cooling appliance (1) according to any one of the preceding claims 1 to 5, wherein the locking receptacle (18) is configured to be cup-shaped.

14. Household cooling appliance (1) according to any one of the preceding claims, wherein the locking receptacle (18) comprises a third side wall (41), in which a snap-fit element receptacle (41a) is configured.

15. Household cooling appliance (1) according to any one of the preceding claims 1 to 9, wherein the locking element (17) comprises an, in particular cylinder-like, second basic body (40), and comprises an actuating bracket (45) radially projecting from the second basic body (40) for rotating the locking element (17) about the longitudinal axis (A).

16. Household cooling appliance (1) according to claim 15, wherein the guiding rail (14) comprises a first stop (48), against which the actuating bracket (45) stops in the locked end position, and comprises a second stop (50), against which the actuating bracket (45) stops in the unlocked end position.

17. Household cooling appliance (1) according to any one of the preceding claims, wherein on an outer side of an, in particular cylinder-like, second basic body (40) of the locking element (17) a springy snap-fit element (42) is configured, in particular integrated.

18. Household cooling appliance (1) according to any one of the preceding claims, wherein the guiding rail (14) comprises a first hole (19), through which the locking element (17) extends for direct coupling with the locking receptacle (18), in particular the locking element (17) is completely sunk in the first hole (19).

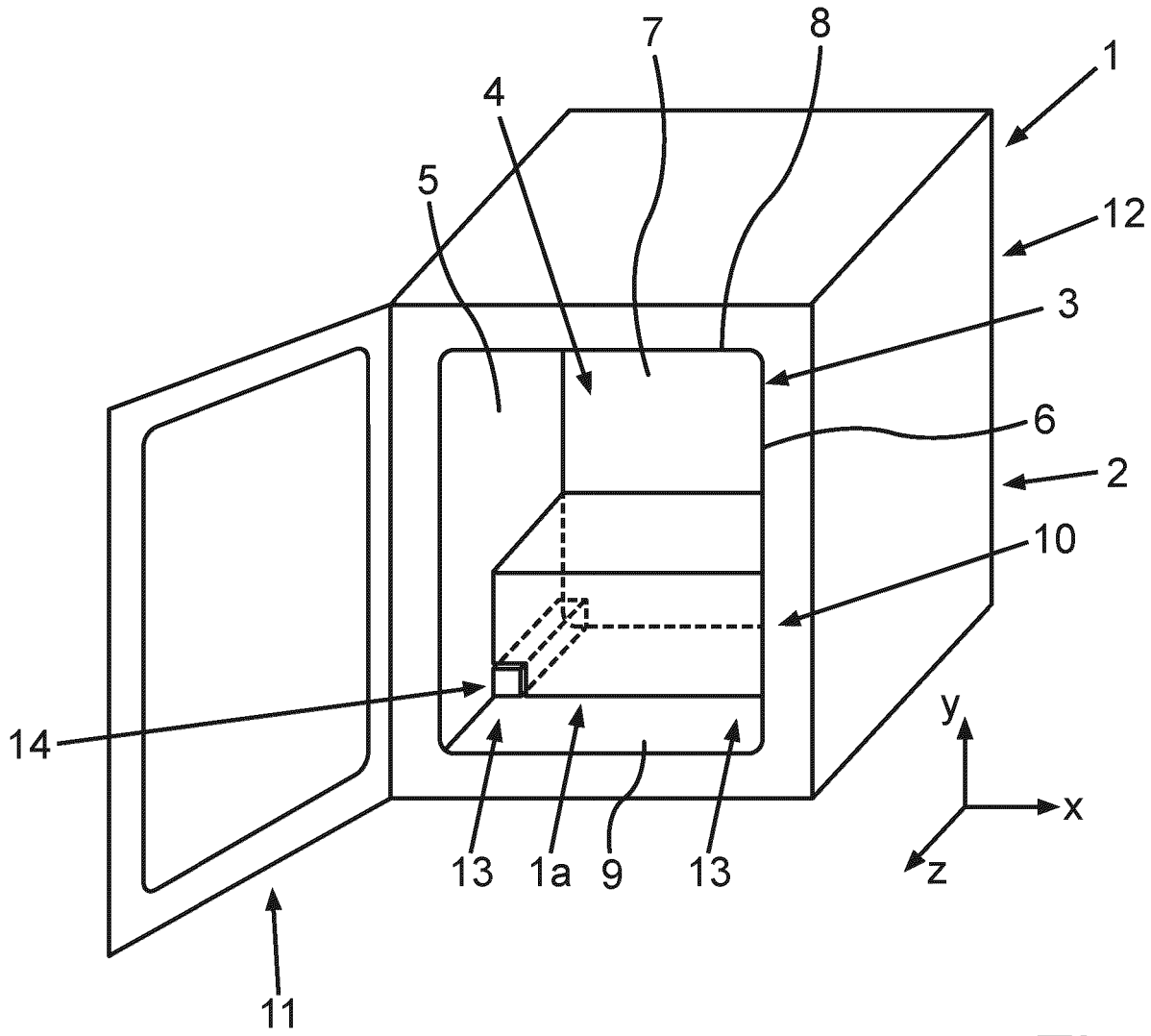


Fig.1

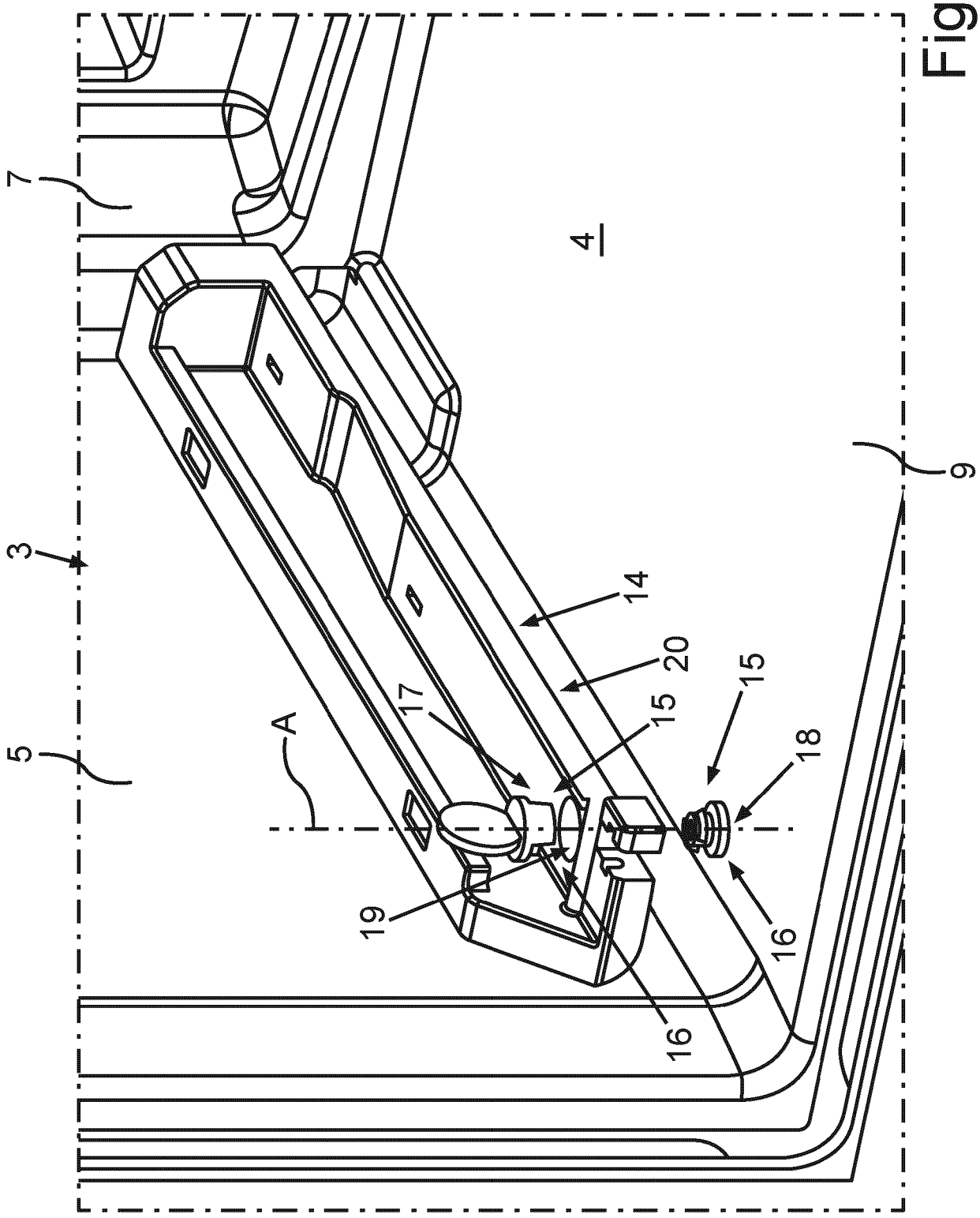
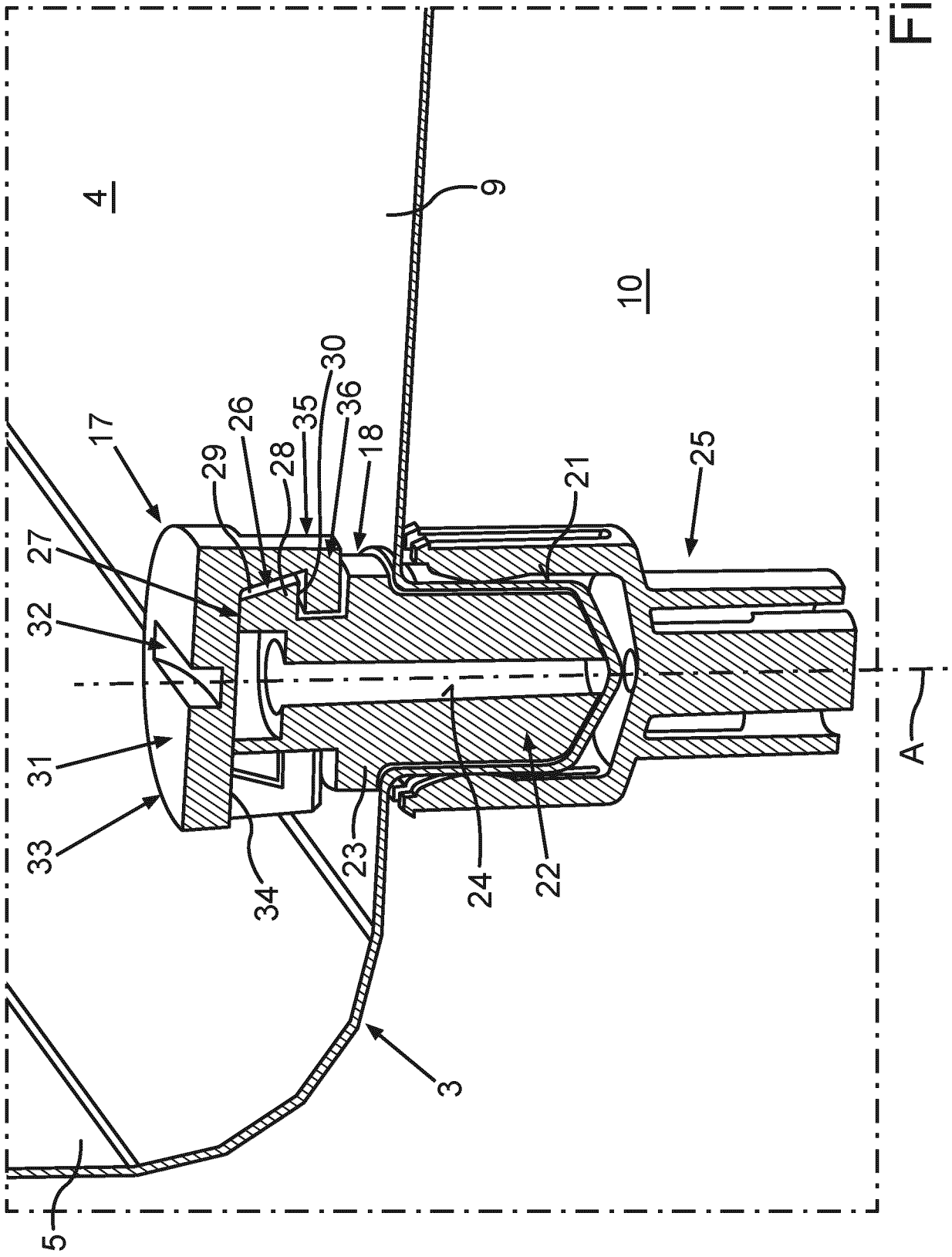


Fig.2

Fig.3



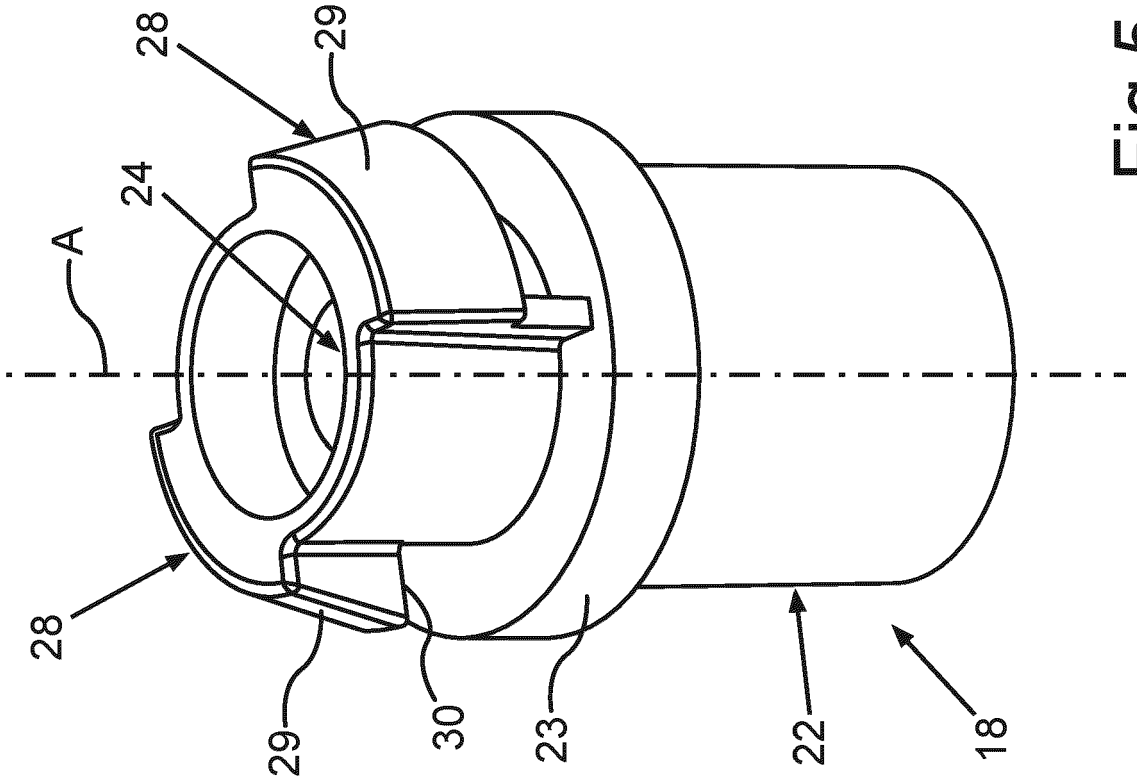


Fig.5

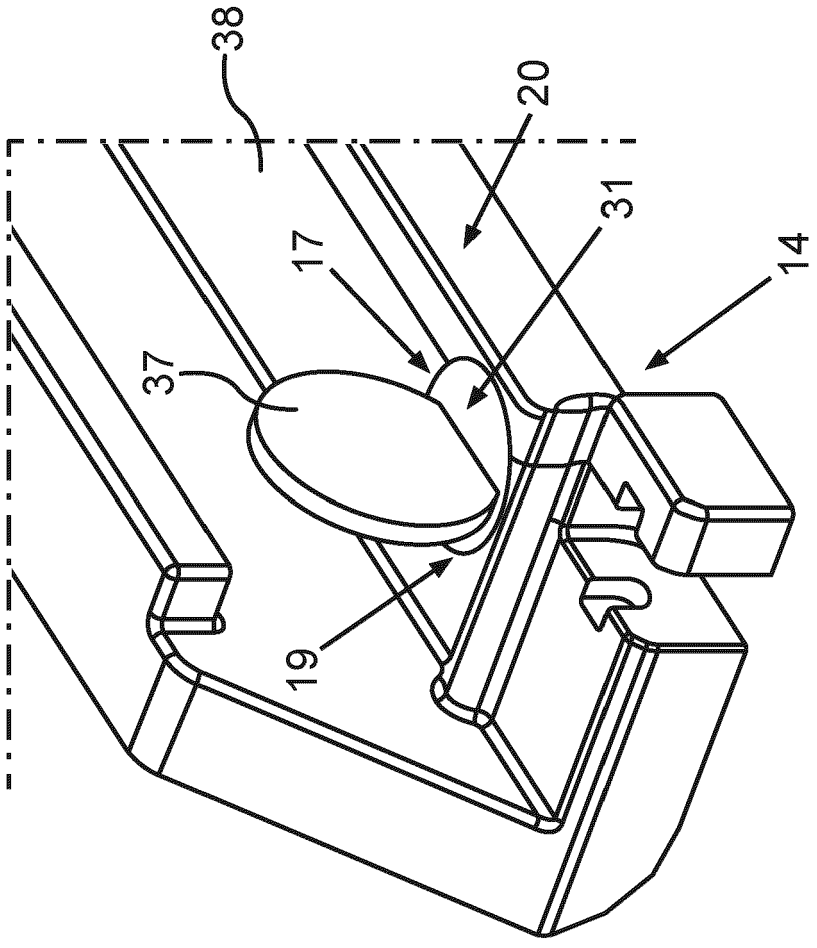


Fig.4

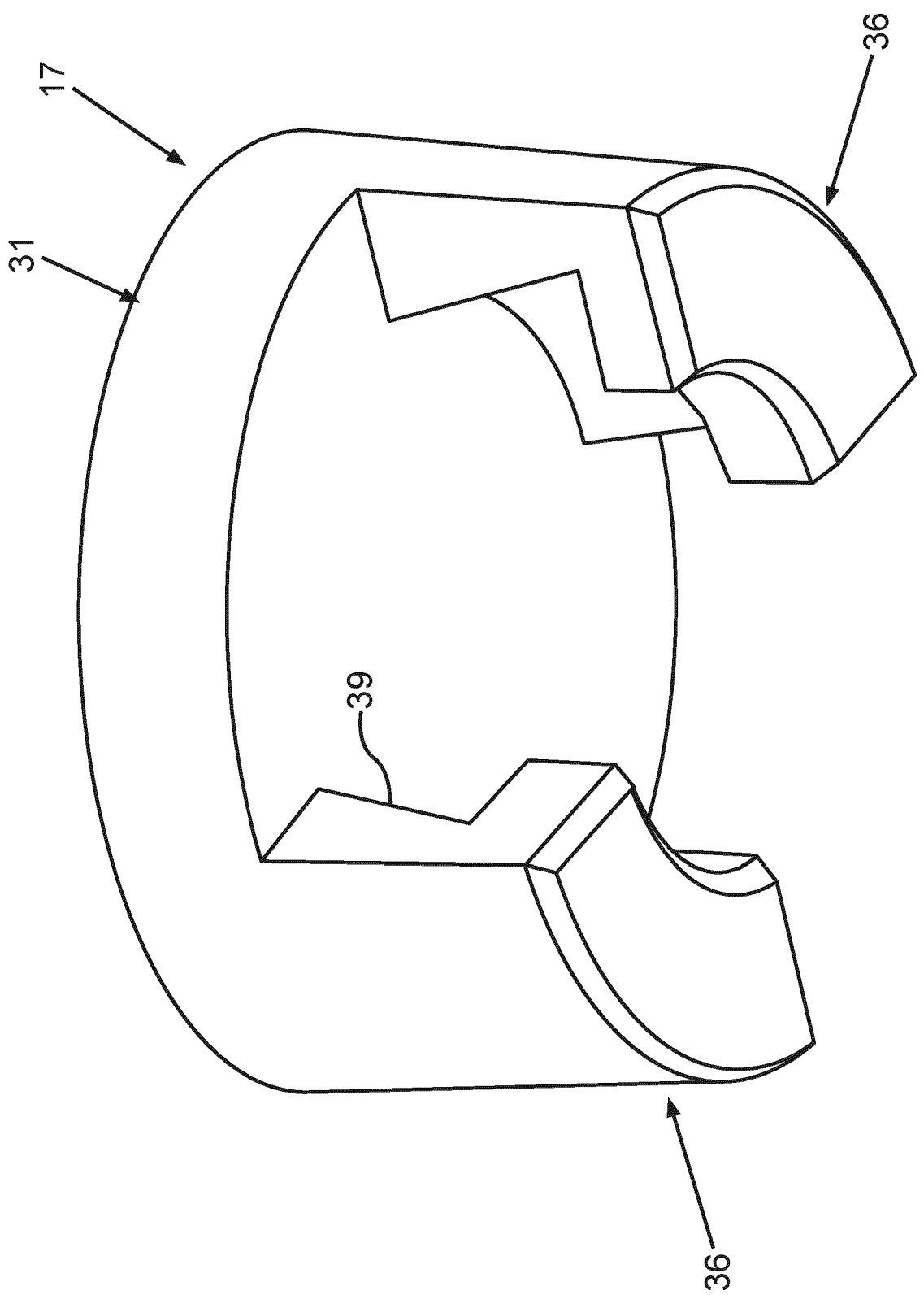


Fig.6

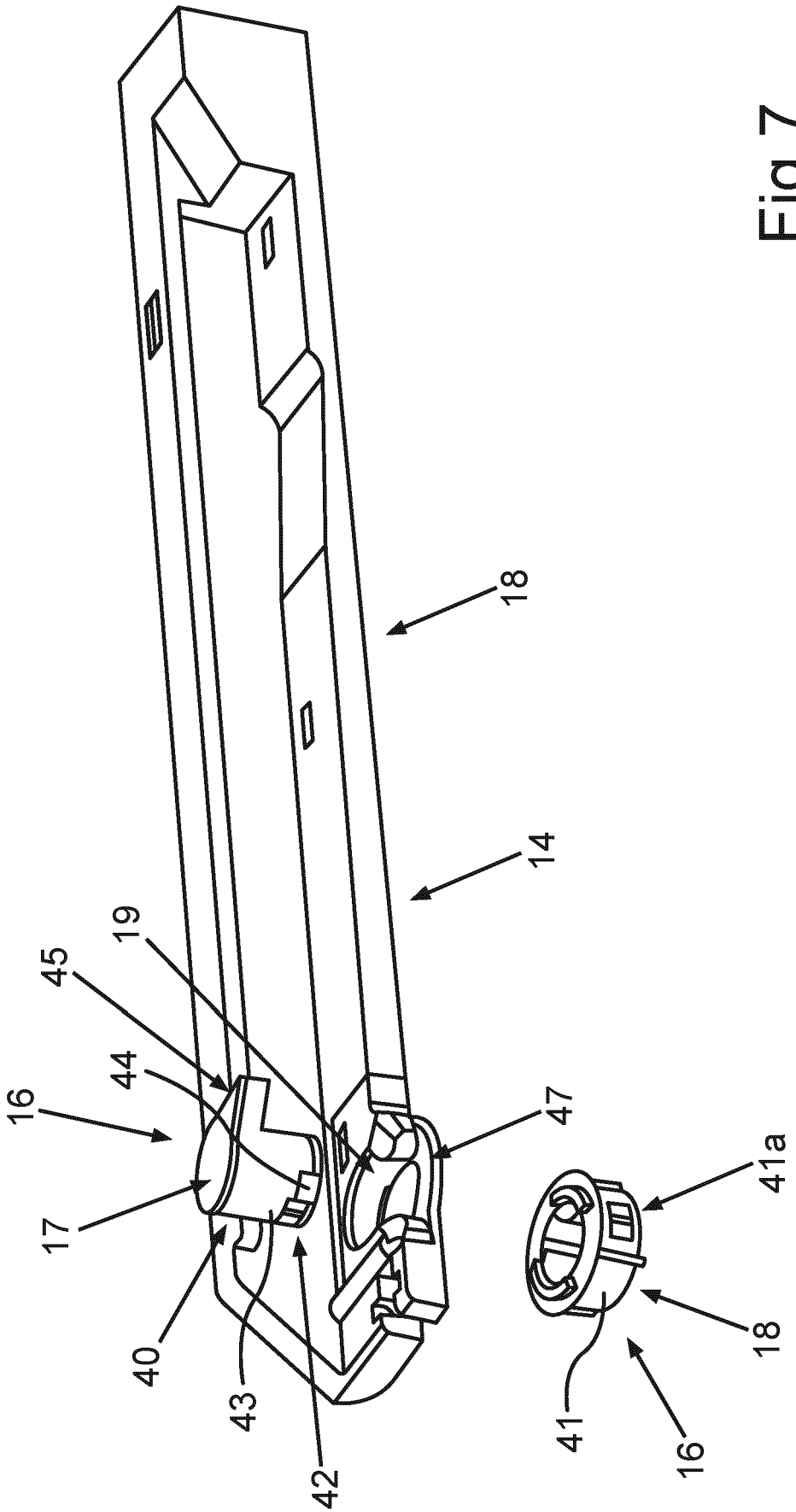


Fig.7

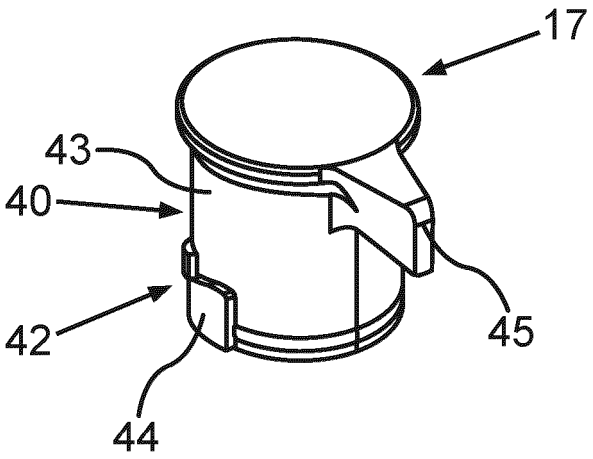


Fig.8

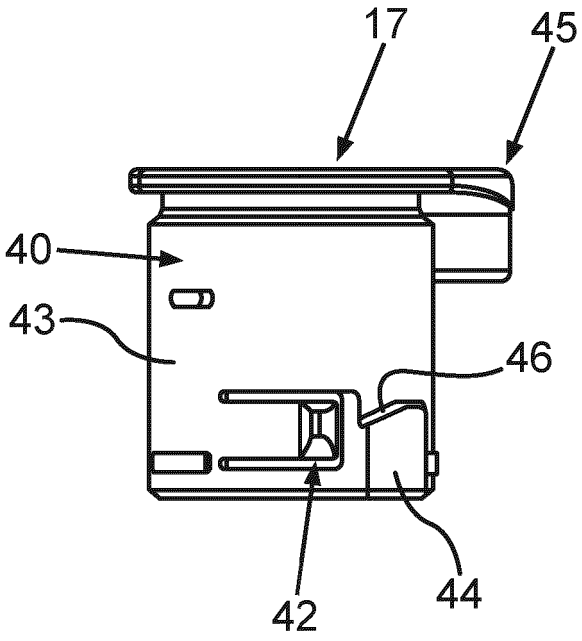


Fig.9

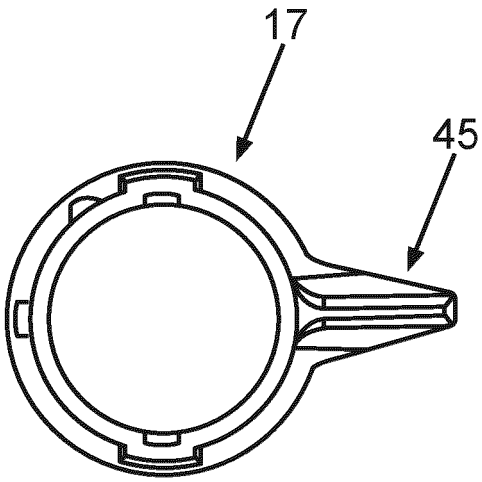


Fig.10

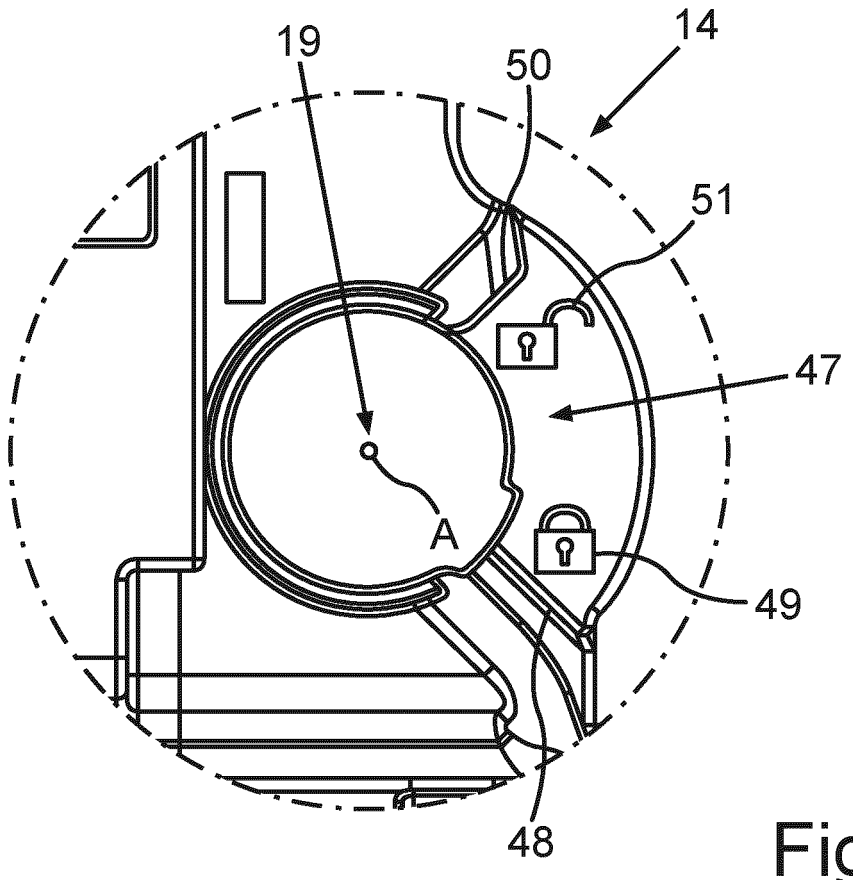


Fig.11

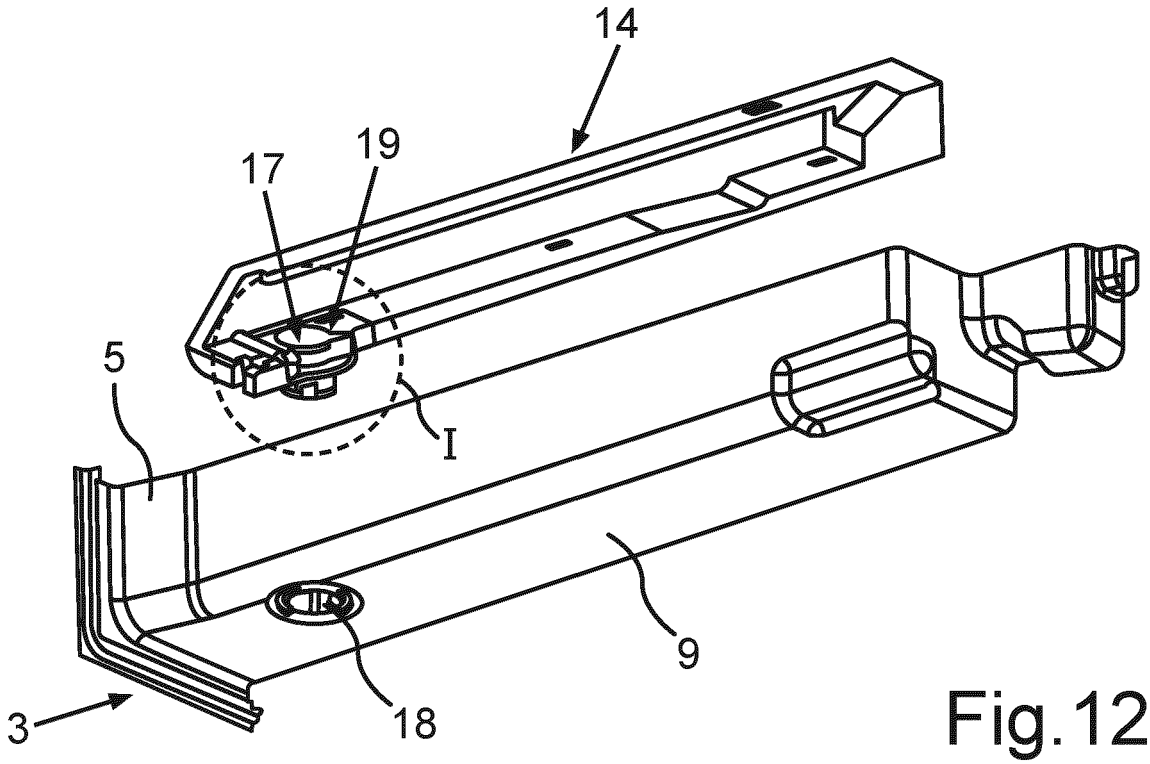


Fig.12

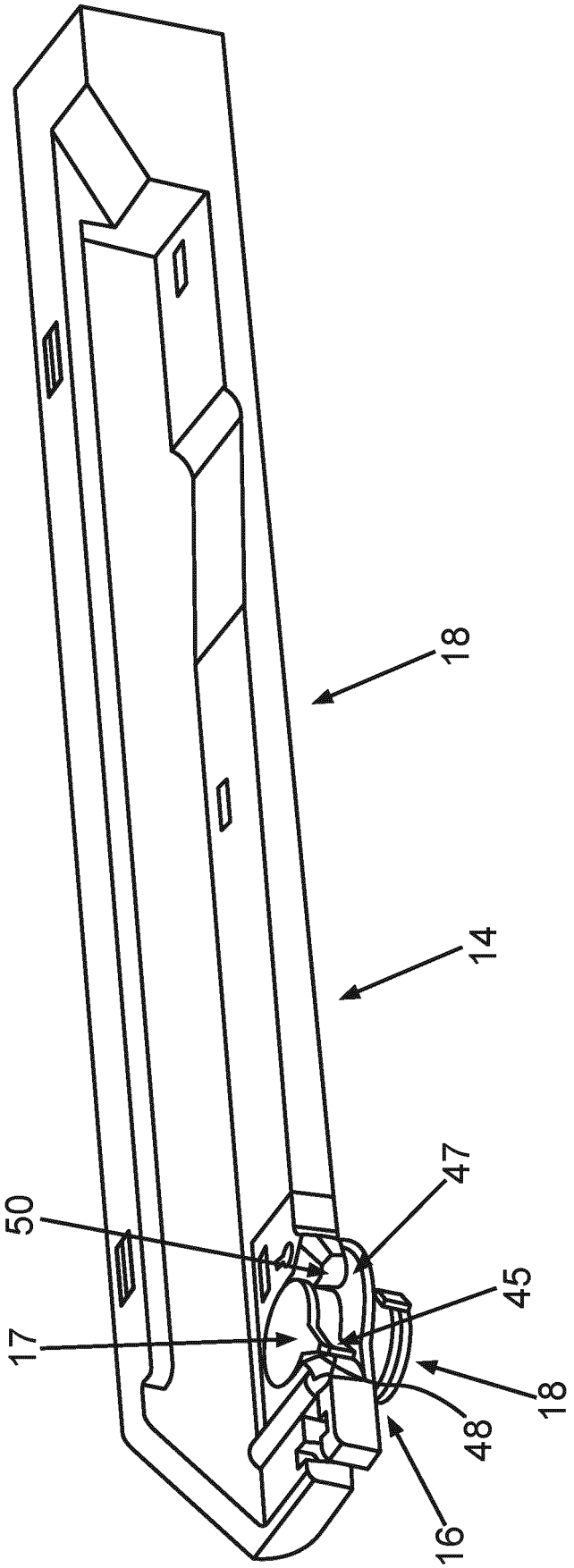


Fig.13

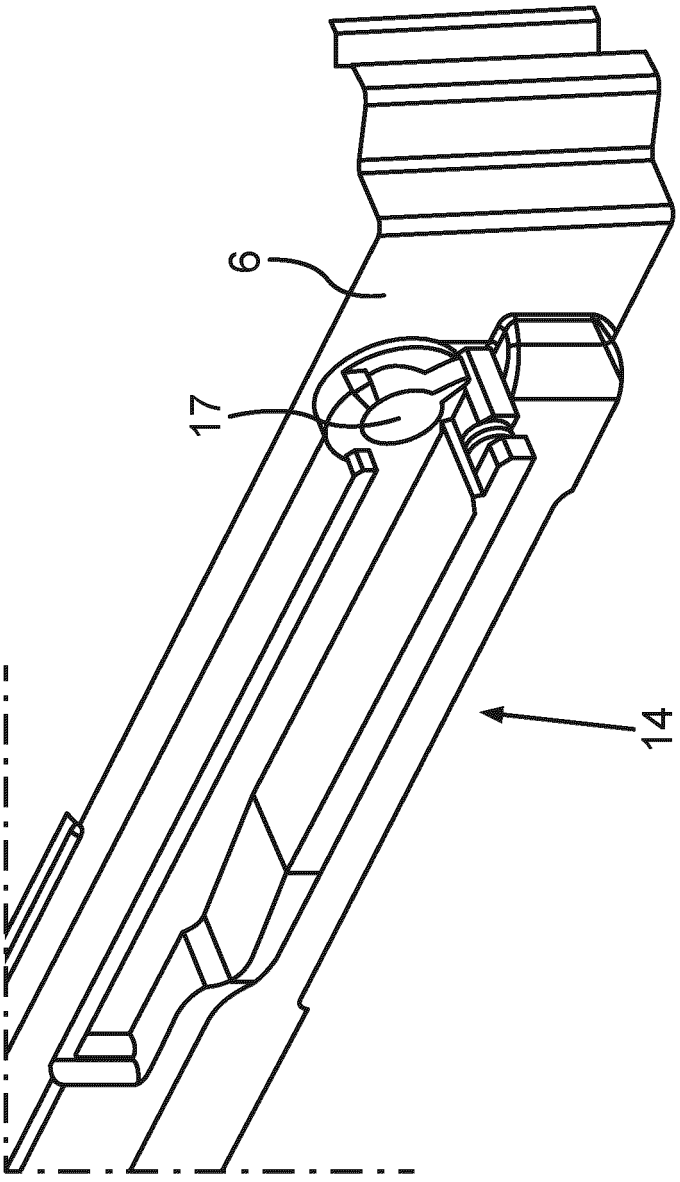


Fig.14

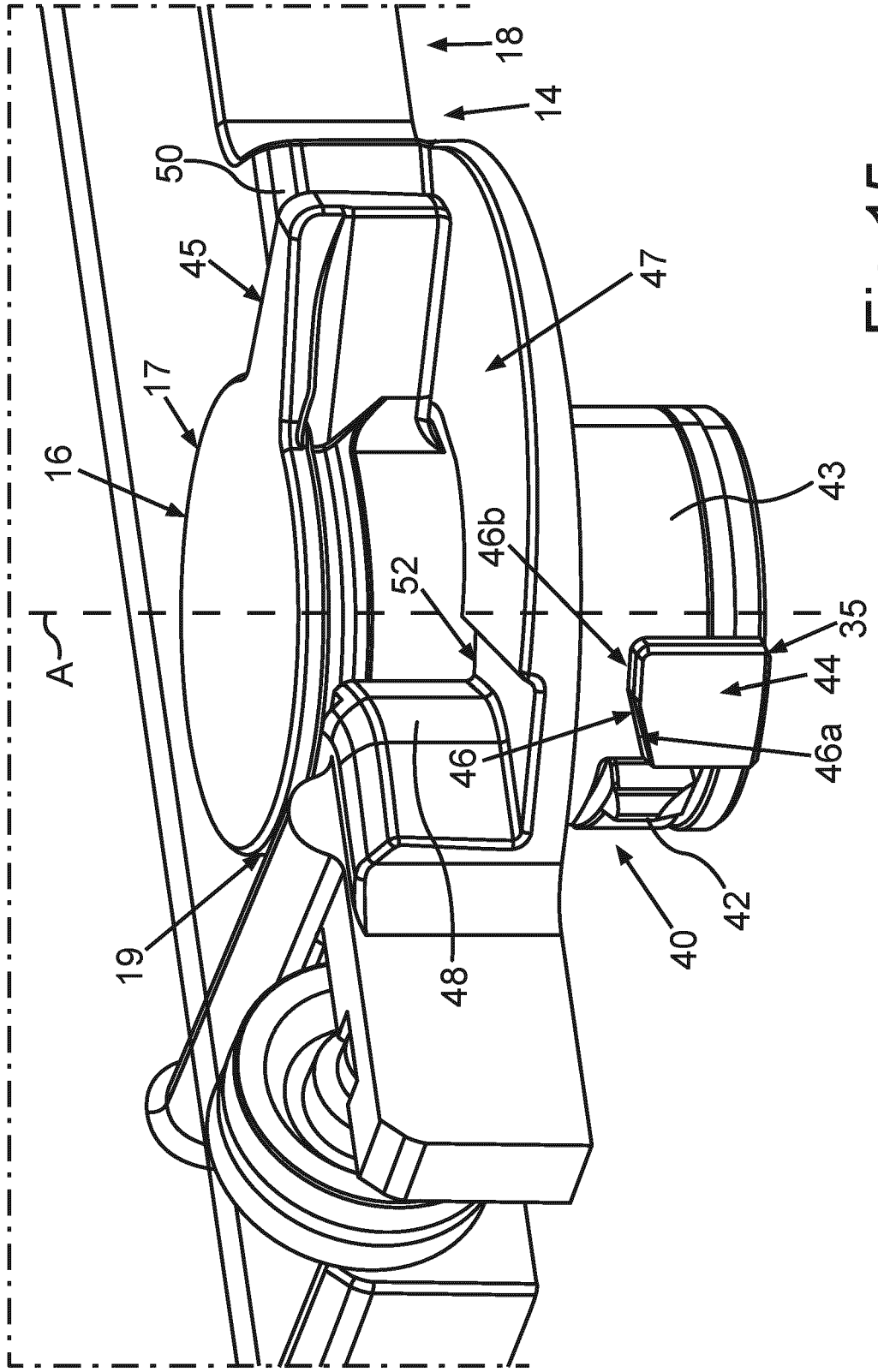


Fig.15

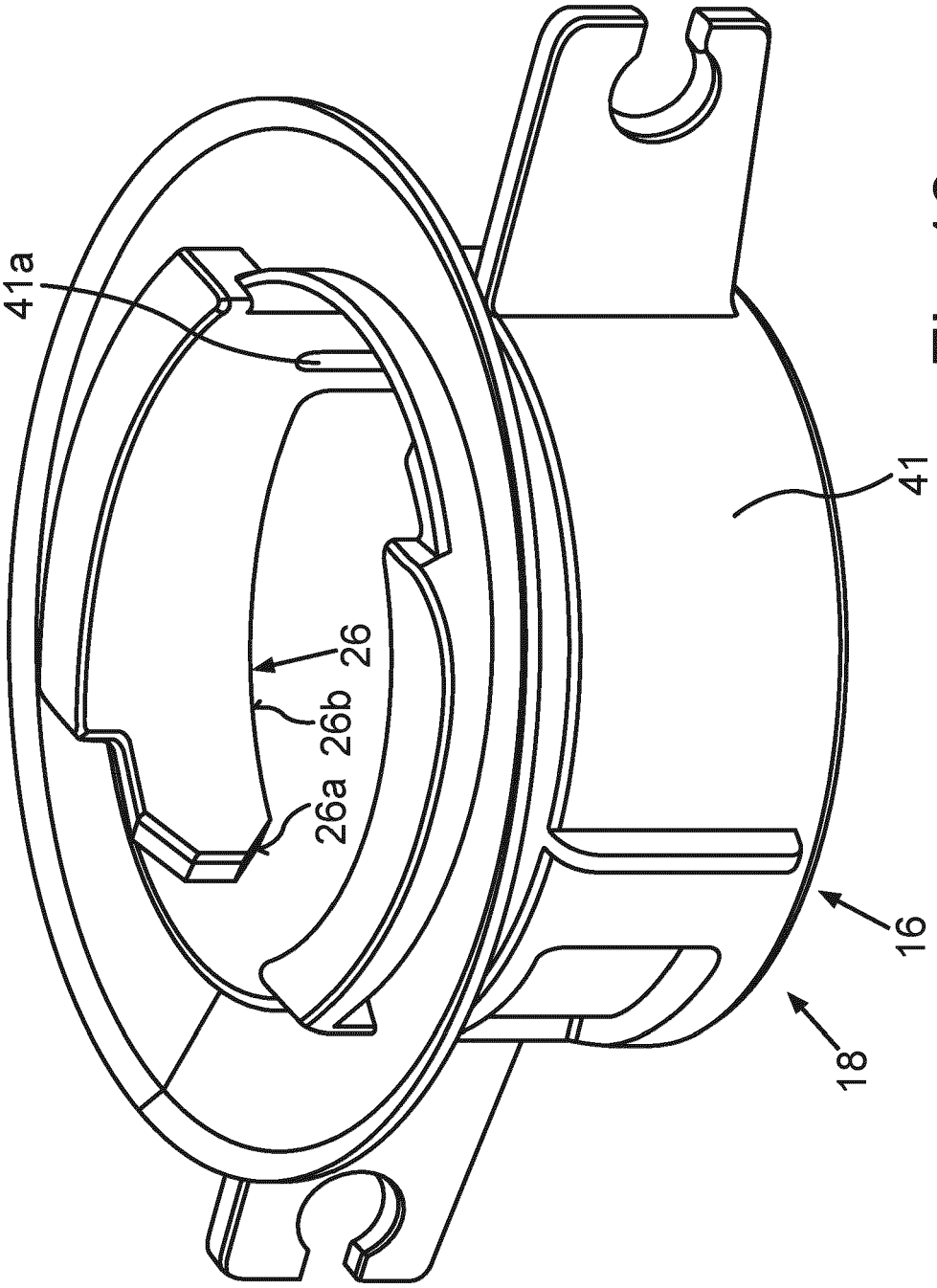


Fig.16

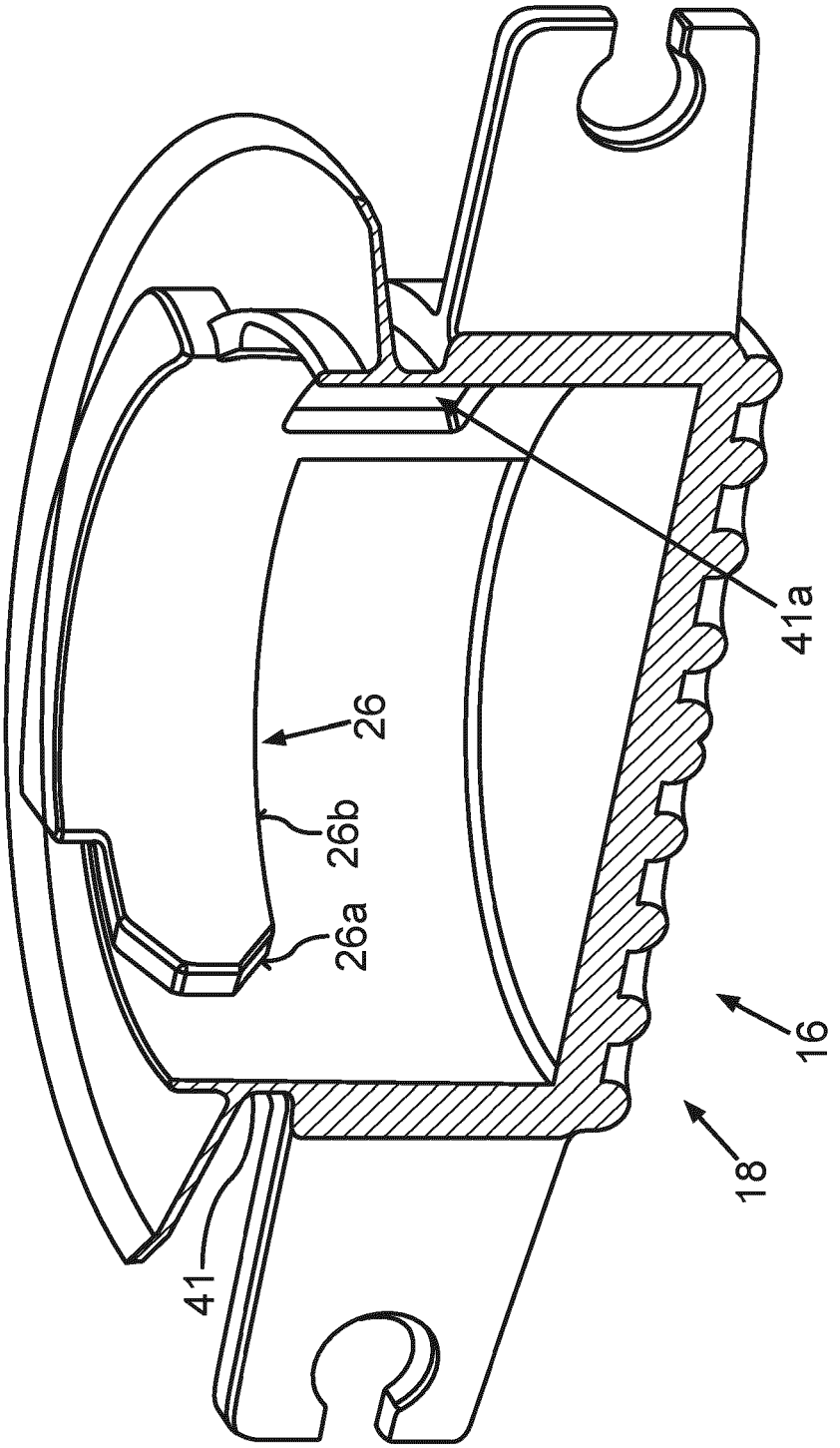


Fig.17

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EUROPEAN SEARCH REPORT

Application Number
EP 24 19 8321

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X A	DE 10 2016 224004 A1 (BSH HAUSGERAETE GMBH [DE]) 7 June 2018 (2018-06-07) * figures 2,3,7 *	1-4,10, 11,13-18 5-9,12	INV. F25D23/06 F25D25/02
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TECHNICAL FIELDS SEARCHED (IPC)

F25D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	10 January 2025	Kuljis, Bruno

CATEGORY OF CITED DOCUMENTS

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 24 19 8321

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10-01-2025

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