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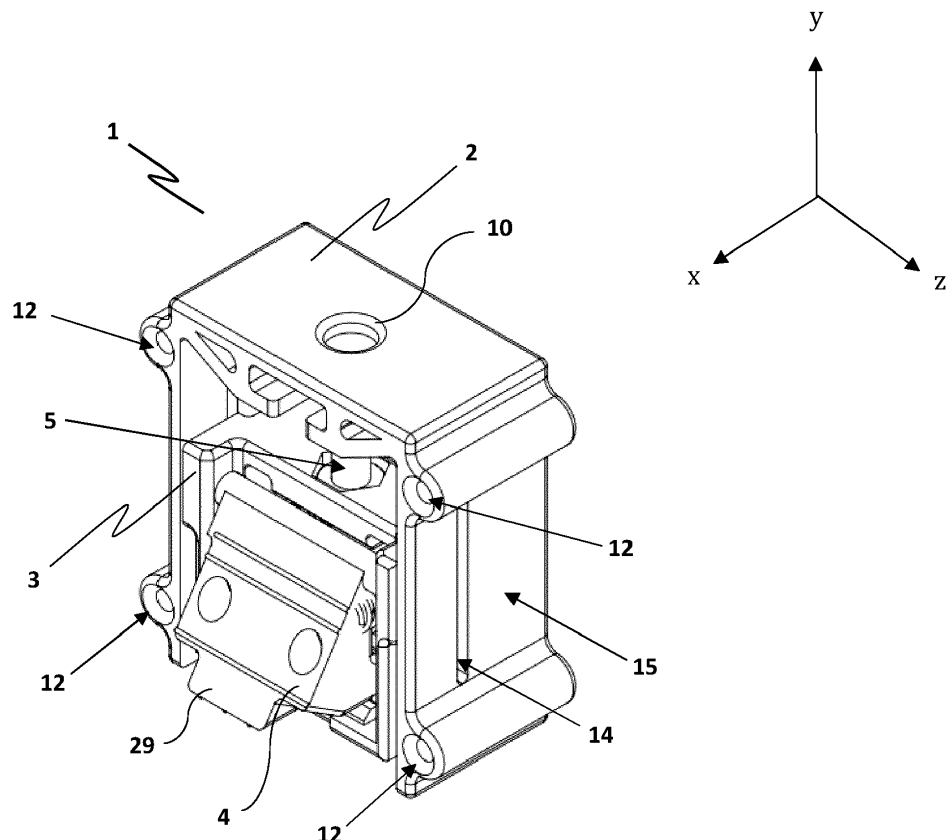
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(54) **MOUNTING APPARATUS FOR MOUNTING A HOME APPLIANCE**

(57) The present invention relates to a mounting apparatus (1) for mounting a home appliance to a stationary assembly comprising a moving mechanism (3), a latching means (4) and a bearing means (2) accommodating said

moving mechanism (3) and latching means (4). The invention is advantageous in that direction of the latching means (4) become interchangeable in vertical axis (y).

FIG. 1



Description

Technical Field

[0001] The present invention relates to a mounting apparatus for use in mounting a home appliance, particularly of a range hood. The present invention more particularly relates to a mounting apparatus designed to enable range hoods to be hanged and mounted to a desired position in a stationary assembly such as a cupboard or cabinet. The invention further relates to a novel range hood comprising the apparatus as mentioned hereinabove, method for producing the same and novel use of the apparatus for mounting home appliances in general.

Background of the Invention

[0002] It is known that range hoods are one of the most important appliances in the kitchen. In the art of cooking and ventilating, there are numerous types of cooking appliances which are designed in different sizes and shapes. Said range hoods generally contain a mechanical fan that hangs above the stove or cooktop in the kitchen and they are configured to remove airborne grease, combustion products, fumes, smoke, heat, and steam from the air by evacuation of the air and filtration.

[0003] Installation of a range hood usually requires a complex installation operation. This can be hanging the range hoods onto a cooktop or fitting the range hoods into a cupboard or a cabinet on cooktop. Furthermore, the range hoods can be mounted below a cooktop to extract undesired air from the kitchen environment downwardly. Said type of range hoods requires also an opening inside the cooktop and hinging or fitting equipment to fix said range hoods inside the cooktop. Although dimensions and structures of range hoods are standardized for mass production, dimensions and structures of cupboards or cabinets are not standardized compared to range hoods. In this case, manufacturers and installers face numerous challenges while both manufacturing and installing processes.

[0004] The problems with fitting or hanging the range hood to the cupboards or cabinets can present numerous challenges for manufacturers and installers of the range hood which makes them unpleasant. The most common difficulty which can be occurred during the installation of range hood is fitting the range hood to the particular dimensions and construction of the particular cupboard or cabinet. Due to the weight and large dimensions of the range hood, handling the range hood into engagement with the cabinet and supporting the weight of range hood can be difficult. Likewise, the range hood must also be supported while the necessary mechanical and electrical connections are being made. In order to mount the range hood safely, at least two people are generally required to mount the range hood and make the necessary mechanical and electrical connections, and supporting the range hood during the mounting process.

[0005] Another remarkable problem appears after drilling of the holes for fixing the range hood. To install the conventional range hoods in a cupboard or a cabinet, more than two holes typically become necessary. Drilling of the holes is also a problem for the walls and the installers as it takes a considerable time.

[0006] Installers of the range hoods also have a problem with limited area of the cupboards or cabinets caused by their dimensions or shapes. Installers have to assemble and dismantle the range hoods even in poorly accessible areas and less mounting equipment.

[0007] Apparatuses and methods for mounting a range hood in a cupboard or inside a cooktop in order to hide range hoods into cupboards or cabinets or save place in the kitchen are generally known in the art. CN206036557 U for instance, discloses a mounting bracket of wall-hanging household electrical appliances.

[0008] EP 0490074 A1 is also related to a fitted fume-extraction hood for mounting in a bottom opening of a piece of furniture, such as a hanging cupboard or the like, with a housing which is surrounded at least in sections by a frame-like attachment, the housing is equipped with sprung locking noses projecting outwards at a distance from the rear side of the attachment, which noses are, on insertion of the housing into the bottom opening, forced back by its edges and, after they emerge on the upper edge of the bottom opening, are able to pivot out in a sprung manner and lock the housing on the upper edge of the bottom opening in a self-locking manner.

[0009] CN106322465 A discloses a suspension device of a range hood and a range hood. The suspension device of the range hood includes a bracket, which is fixed on a wall under a use state of the suspension device, and at least one hook, which is used for hanging the body of the range hood. Specifically, the suspension device also includes at least one fastener, and the bracket comprises at least one corresponding bearing wall. Under the use state, the hook is fixed to the bearing wall through the fastener, and the height of the hook along the gravity direction is adjustable through the fastener. According to the invention, the height of the range hood body can be adjusted within a certain range, and the phenomenon of skew body installation can be corrected.

[0010] In another document, US 2014352151 A1 discloses a method for installing a ventilation hood to an underside of a wall cabinet including providing a ventilation hood having a housing, a removable utility structure with an aligning mechanism and at least one hanger stud. The removable utility structure is placed proximate to the wall cabinet in at least one measuring position, wherein the aligning mechanism of the removable utility structure locates anchorage points of the ventilation hood. Hanger studs are secured in the anchorage points. The removable utility structure is secured to the housing in a structural position at least partially covering an electrical system of the ventilation hood. The housing is placed on the hanger studs to secure the ventilation hood proximate to the wall cabinet. Electrical power is connected to the elec-

trical system while the housing is secured on the hanger studs. The housing of the ventilation hood is then secured to the wall cabinet.

[0011] WO 2016/187467 A1 discloses a mounting bracket mountable to the underside of the cabinet prior to the range hood and configured to engage and support the range hood as the range hood is secured to the cabinet. The mounting bracket having a support feature engageable to the range hood to hold the range hood proximate to the cabinet while fasteners are sunk to secure the range hood to the cabinet. The mounting brackets are pre-positioned on the cabinet such that range hood is aligned with the cabinet when the range hood is supported by the support feature. The smaller mounting brackets can be more easily mounted in the proper position on the cabinet then the larger range hood speeding the installation process and reducing errors.

[0012] Therefore, there has been a continuous need in prior art to provide an apparatus and a method suitable for installation of range hoods in a cupboard or a cabinet onto a cooktop or inside a position inside the cooktop which would minimize costs of the mounting equipment, persons needed for installation and difficulties during the installation of said range hoods. Said apparatus and method presents a simplified and efficient mounting apparatus with cost efficient equipment and provides self-mounting option to the installers with less effort. In addition, said apparatus also provides a two way mounting direction which ensures that the range hoods can be easily assembled and disassembled even with poorly accessible area and less mounting equipment. These objectives are currently achieved with a mounting apparatus according to claim 1.

Brief Description of the Invention

[0013] The present invention relates to a mounting apparatus (1) for mounting range hoods to a stationary assembly such as cupboards or cooktops comprising;

- a moving mechanism (3) which moves along a vertical axis (y) up and down comprising a first hole (16a) on one lateral side of the mechanism (3) and a second hole (16b) on another lateral side opposite to the first hole (16a), said first and second holes (16a, 16b) being arranged such that a longitudinal connection means (5) protrudes at least one of said holes (16a, 16b),
- a latching means (4) which is engaged on said moving mechanism (3), and
- a bearing means (2) accommodating said moving mechanism (3) and latching means (4), the bearing means (2) comprising an opening (10) through which said connection means (5) is introduced and engaged with the first and second holes (16a, 16b) of the moving mechanism (3) for adjusting its position in vertical axis (y) wherein;
said moving mechanism (3) is configured to fit into

said bearing means (2) in different directions (a, b) in a manner such that when the moving mechanism (3) is mounted into the bearing means (2), either the first hole (16a) or second hole (16b) can be brought into close proximity with the opening (10) of the bearing means (2), and thereby direction of the latching means (4) become interchangeable in vertical axis (y).

[0014] In preferred embodiments, the mounting apparatus (1) mentioned above further comprises at least a fixing hole (12) on the body of the bearing means (2), at least a holding slot (13) for accommodating at least a portion of the connection means (5) inside of the bearing means (2), a guiding projection (11) located on the body of said bearing means (2) in order to guide said moving mechanism (3) in vertical direction (y) along said bearing means (2).

[0015] Preferably, the mounting apparatus (1) comprises at least a spring (6) so that latching means (4) can be loaded with a spring tension.

[0016] The moving mechanism (3) according to the present invention can comprise a guiding channel (17) which is configured to engage with the guiding projection (11) of the bearing means (2) to move along the guiding projection (11) in the vertical direction (y) and at least a hole (18) located on the side walls (23) of said mechanism (3) which provides rotational movement for the latching means (4), at least a stopper (19) and a stopper edge (20) corresponding to the latching means (4) to delimit its movement, at least an extension (21) which is configured to hold the spring(s) (6). Accordingly, the latching means (4) may comprise projections (24) which are configured to fit into the holes (18) on the side walls (23) of the moving mechanism (3), lugs (25) and a tongue (29) corresponding to the stopper (19) and stopper edge (20) on the moving mechanism (3), respectively which are configured to limit movement of the latching means (4), a carrying surface (26) to provide an angle and coming into contact with a portion of the range hood in order to carry it, and at least a spring holder (28) which is configured to hold an end portion of the spring(s) (6).

[0017] The connection means (5) in the context of the present invention is a longitudinal piece and can be a bolt, screw or the like which can be accompanied with a nut (7).

[0018] The mounting apparatus (1) according to present invention is preferably made of metal or plastics partly or entirely.

[0019] In another aspect, the present invention relates to a range hood comprising the mounting apparatus (1) as mentioned above.

[0020] In another further aspect, the present invention relates to a method for mounting a range hood by means of using a mounting apparatus (1) as described above.

[0021] The present invention is further related to the use of a mounting apparatus (1) as mentioned above in a home appliance in particular in a range hood.

Brief Description of the Figures

[0022] The preferred embodiments of the present invention are illustrated via non-limiting drawings wherein;

Figure 1 is a perspective view of a mounting apparatus for mounting a range hood according to the present invention.

Figure 2 is a top view of the mounting apparatus for mounting a range hood according to the present invention.

Figure 3 is a front view of the mounting apparatus for mounting a range hood according to the present invention.

Figure 4 is a side view of the mounting apparatus for mounting a range hood according to the present invention.

Figure 5 is an exploded perspective view of the mounting apparatus for mounting a range hood showing the elements of said apparatus according to the present invention.

Figure 6 is a perspective view of a bearing means of the mounting apparatus according to preferred embodiments of the present invention.

Figure 7 shows a front and a rear view of the bearing means of the mounting apparatus according to preferred embodiments of the present invention.

Figure 8 is a perspective view of a moving mechanism of the mounting apparatus according to preferred embodiments of the present invention.

Figure 9 shows a front and a rear view of the moving mechanism of the mounting apparatus according to preferred embodiments of the present invention.

Figure 10 is a perspective view of a latching means of the mounting apparatus according to preferred embodiments of the present invention.

Figure 11 shows a front and a rear view of the latching means of the mounting apparatus according to preferred embodiments of the present invention.

Figure 12 is front and perspective views of the mounting apparatus according to preferred embodiments of the present invention showing direction of assembly of the moving mechanism into the bearing means in an operating position.

Figure 13 is another front and perspective view of the mounting apparatus according to preferred em-

bodiments of the present invention showing direction of assembly of the moving mechanism into the bearing means in another operating position.

Figure 14 is a planar view of the mounting apparatus according to preferred embodiments of the present invention showing the relation of the mounting apparatus which is mounted on a range hood with a cupboard or a projection of cupboard.

Figure 15 is a detailed planar view of the mounting apparatus according to preferred embodiments of the present invention as shown in Figure 14.

Figure 16 is a planar view of the mounting apparatus according to preferred embodiments of the present invention showing the relation of the mounting apparatus which is integrated into a range hood with a cupboard or a projection of cupboard.

Figure 17 is a detailed planar view of the mounting apparatus according to preferred embodiments of the present invention as shown in Figure 16.

Detailed Description of the Invention

[0023] The present invention provides a mounting apparatus (1) for use in mounting of range hoods to a stationary assembly such as a cupboard or a cooktop. The mounting apparatus (1) of the present invention can be also mounted on a range hood or integrated into a range hood to be fixed to a position in the kitchens.

[0024] The mounting apparatus (1) of the present invention is generally shown in Figures 1 to 5. Components of the mounting apparatus (1) of the present invention are shown in detail in Figures 6 to 11. Also, the operation direction of the mounting apparatus (1) is shown Figures 12 and 13. Lastly, the relation of the mounting apparatus (1) according to preferred embodiments of the present invention with a range hood and a cupboard or a projection of cupboard is shown in Figures 14 to 17.

[0025] Referring to Fig. 1 which shows a perspective view of the invention, the mounting apparatus (1) comprises basically a moving mechanism (3), a latching means (4) which is provided on said moving mechanism (3) and a bearing means (2) which accommodates said moving mechanism (3) and latching means (4). Figure 5 also shows an exploded perspective view of the mounting apparatus (1) of the present invention. Preferably, said apparatus (1) also comprises a spring (6) provided to allow the latching means (4) to be moved, a connection means (5) such as a screw for adjusting the position of the moving mechanism (3) in said bearing means (2) and optionally nuts (7) for preventing said connection means (5) or the moving mechanism (3) to be moved. Said spring (6) is designed to push the latching means (4) in horizontal direction (x) such that latching means (4) remain tensioned outwardly as shown in Fig. 4.

[0026] In Figure 6, a perspective view of the bearing means (2) of the present invention is shown. Preferably, said means (2) is formed in a rectangular shape and has an inner volume (8) in its body for inserting the moving mechanism (3) into said inner volume (8) of the bearing means (2). Furthermore, said means (2) can preferably comprise an opening (10) to fix and adjust the moving mechanism (3) by way of using a longitudinal connection means (5). Additionally, said means (2) can comprise a guiding projection (11) located on its body to guide said moving mechanism (3) in vertical direction (y) along the bearing means (2).

[0027] Figure 7 shows a front and a rear view of the bearing means (2) of the mounting apparatus (1) according to preferred embodiments of the present invention. In said preferred embodiments, the bearing means (2) of the present invention can comprise a fixing hole (12) which is configured to fix it to a range hood or a wall. Preferably, said means (2) can comprise four fixing holes (12) to fix a range hood in each of its corners in order to distribute the load in a homogeneous way. Moreover, the bearing means (2) of the invention can also comprise a holding slot (13) which is configured to hold the connection means (5) at least in part for preventing the connection means (5) to become loose. Said slot (13) is located on an upper part of the bearing means (2). In another aspect, said means (2) of the present invention is provided with at least one channel (14) in a vertical direction (y) in order to provide further guidance for the moving mechanism (3). Said channel (14) is preferably located on the rear side of the bearing means (2) and also on the side walls (15) thereof.

[0028] The moving mechanism (3) of the invention is shown in Figure 8 with a perspective view. Said mechanism (3) is preferably formed in a rectangular shape and has an opening (22) in its body which is suitable for placing the latching means (4) according to the present invention. Said mechanism (3) comprises a first hole (16a) and a second hole (16b) for inserting the longitudinal connection means (5) therethrough in vertical direction (y). The moving mechanism (3) of the present invention preferably comprises a guiding channel (17) which is configured to engage with the guiding projection (11) of the bearing means (2) to allow said mechanism (3) to move along the guiding projection (11) in the vertical direction (y). In preferred embodiments said channel (17) can have a T shaped form which offers a well-balanced movement along the guiding projection (11).

[0029] Figure 9 shows a front and a rear view of the moving mechanism (3) of the mounting apparatus (1) according to preferred embodiments of the present invention. Said mechanism (3) of the mounting apparatus (1) has at least a hole (18) located on one of side walls (23) as shown in Fig. 8. Preferably, said mechanism (3) can have two holes (18) located on each side walls (23) and said holes (18) act as a support for the latching means (4) and provide pivotal movement of the latter. The moving mechanism (3) of the present invention is

also provided with at least a stopper (19) corresponding to the latching means (4) for delimiting the movement of said means (4). In preferred embodiments, two stoppers (19) are located on the lower part of the moving mechanism (3) which are positioned on a place closer to the side walls (23). In addition, the moving mechanism (3) presents a stopper edge (20) to limit movement of the latching means (4) and facing towards a portion of said means (4) whose features will be described in detail below.

[0030] The body of the moving mechanism (3) comprises at least an extension (21) which is configured to hold a spring (6). Said extension (21) acts as a support for said spring(s) (6) between the body and the latching means (4).

[0031] In Figure 10, a latching means (4) of the mounting apparatus (1) according to the present invention is shown. Said means (4) preferably has an angled body which act as a latching element as known from the conventional door locks. In addition, said means (4) may have a recess (30) on the rear side of its body which allows the connection means (5) to be passed through the latching means (4) without blocking its movement. Upper part of said latching means (4) is formed to have projections (24) which are configured to fit into the holes (18) on the side walls (23) of the moving mechanism (3). By means of fitting said projections (24) into said holes (18), the latching means (4) of the present invention is allowed to make a rotational movement in a limited area which is however limited by the stoppers (19) and stopper edge (20) of the moving mechanism (3).

[0032] As shown in Figure 11 which shows a front and a rear view of a latching means (4) of the mounting apparatus (1) according to preferred embodiments of the present invention, said means (4) is provided with lugs (25) which are used to stop latching means (4) on a desired position to allow carrying surface (26) to have an angle for coming into contact with the corresponding surface. Carrying surface (26) of the latching means (4) can also have surface projections (27) which provides a stable abutment to the corresponding surface and also preventing range hood to be slipped over the carrying surface (26).

[0033] In preferred embodiments of the present invention, the latching means (4) of the mounting apparatus (1) can also comprise at least a spring holder (28). In this embodiment of the present invention, the latching means (4) has two spring holders (28) that correspond with extensions (21) located on the body of the moving mechanism (3). Said spring holders (28) and extensions (21) together hold a spring (6) which allows the latching means (4) of the invention to move from the body of the moving mechanism (3) in a direction out of the moving mechanism (3). In this way, the latching means (4) is forced outwardly by the normal form of the spring (6). In addition, when the latching means (4) is pushed inside the moving mechanism (3), the spring (6) becomes compressed and movement of the latching means (4) is lim-

ited by means of a tongue (29) of the latching means (4) which corresponds the stopper edge (20) on the moving mechanism (3).

[0034] Further, Figure 12 shows a front and perspective view of the mounting apparatus (1) according to preferred embodiments of the present invention showing a first assembly direction (a) of the moving mechanism (3) into the bearing means (2) whereas Figure 13 shows another front and perspective view of the mounting apparatus (1) according to preferred embodiments of the present invention showing a second assembly direction (b) of the moving mechanism (3) into the bearing means (3) for different operating positions. By means of changing the assembly direction of the moving mechanism (3) to the bearing means (2) has certain advantages such that instead of using two different models of the mounting apparatus (1), only one type mounting apparatus (1) as described above can be used interchangeably in a mounting process. This results in changing the direction of latching and therefore provides versatile usage for the mounting technician. Beside of this, said apparatus (1) would enable users or the people who intend to mount the equipment such as a range hood (31) to adjust said apparatus (1) from top or bottom depending on the restrictions in the area of mounting. The difficulties with tightening of the connection means (5) and nuts (7) of the mounting apparatus (1) due to limited space is presently solved by the two-way mounting direction enabled by the mounting apparatus (1).

[0035] In Figure 14, the relation of the mounting apparatus (1) with a range hood (31) and a cupboard (32) or a projection (33) of cupboard is shown. Accordingly, the mounting apparatus (1) is mounted on a range hood (31) by means of fixing holes (12) located on the side walls of the bearing means (2). Figure 15 also shows a detailed planar view of the mounting apparatus (1) according to the present invention as shown in Figure 14.

[0036] In Figure 16, the relation of the mounting apparatus (1) which is integrated into a range hood (31) with a cupboard (32) or a projection (33) of cupboard is shown. Figure 17 also shows a detailed view of the mounting apparatus (1) according to the present invention as shown in Figure 16.

[0037] The bearing means (2), the moving mechanism (3) and the latching means (4) of the mounting apparatus (1) according to the present invention may conveniently be produced from metals or plastics, more preferably from plastics with different techniques such as moulding or 3D printing.

[0038] In a further aspect, the present invention relates to a method for manufacturing a range hood by using of the mounting apparatus (1) hereinabove. Further aspects and embodiments of the present invention will be apparent for those skilled in the art in view of the appended claims.

Claims

1. A mounting apparatus (1) for mounting a home appliance to a stationary assembly comprising;
 - a moving mechanism (3) which moves along a vertical axis (y) up and down comprising a first hole (16a) on one lateral side of the mechanism (3) and a second hole (16b) on another lateral side opposite to the first hole (16a), said first and second holes (16a, 16b) being arranged such that a longitudinal connection means (5) protrudes at least one of said holes (16a, 16b),
 - a latching means (4) which is engaged on said moving mechanism (3), and
 - a bearing means (2) accommodating said moving mechanism (3) and latching means (4), the bearing means (2) comprising an opening (10) through which said connection means (5) is introduced and engaged with the first and second holes (16a, 16b) of the moving mechanism (3) for adjusting its position in vertical axis (y) wherein;
 said moving mechanism (3) is configured to fit into said bearing means (2) along different directions (a, b) in a manner such that when the moving mechanism (3) is mounted into the bearing means (2), either the first hole (16a) or the second hole (16b) can be brought into close proximity with the opening (10) of the bearing means (2), and thereby direction of the latching means (4) become interchangeable in vertical axis (y).
2. The mounting apparatus (1) according to claim 1 wherein the bearing means (2) further comprises at least a holding slot (13) for accommodating at least part of the connection means (5).
3. The mounting apparatus (1) according to claim 1 wherein the bearing means (2) comprises a guiding projection (11) for guiding said moving mechanism (3) in vertical direction (y).
4. The mounting apparatus (1) according to claim 1 wherein the moving mechanism (3) comprises a guiding channel (17) which is configured to engage with the guiding projection (11) of the bearing means (2).
5. The mounting apparatus (1) according to claim 1 wherein the moving mechanism (3) comprises at least a hole (18) located on one of its side walls (23) which acts as a support for the latching means (4).
6. The mounting apparatus (1) according to claim 1 wherein the moving mechanism (3) further comprises a spring (6) for tensioning the latching means (4).

7. The mounting apparatus (1) according to claim 6 wherein the moving mechanism (3) comprises at least an extension (21) for holding the spring (6).
8. The mounting apparatus (1) according to claim 5 wherein the latching means (4) comprises projections (24) configured to fit into the holes (18) on the side walls (23) of the moving mechanism (3). 5
9. The mounting apparatus (1) according to claim 1 wherein the latching means (4) comprises lugs (25) and a tongue (29) corresponding to a stopper (19) and a stopper edge (20) on the moving mechanism (3), respectively, which are configured to limit movement of the latching means (4). 10 15
10. The mounting apparatus (1) according to claim 6 wherein the latching means (4) comprises at least one spring holder (28) which is configured to hold the spring (6). 20
11. The mounting apparatus (1) according to claim 1 wherein the connection means (5) is a longitudinal piece including a bolt or screw optionally accompanied with a nut (7). 25
12. The mounting apparatus (1) according to claim 1 wherein said apparatus (1) is made of metal or plastics. 30
13. A range hood comprising the mounting apparatus (1) according to any of the preceding claims.
14. A method for manufacturing a range hood comprising incorporating the mounting apparatus (1) according to any of the preceding claims to the range hood assembly. 35
15. Use of a mounting apparatus (1) according to any of the preceding claims in mounting a home appliance to a stationary assembly. 40

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FIG. 1

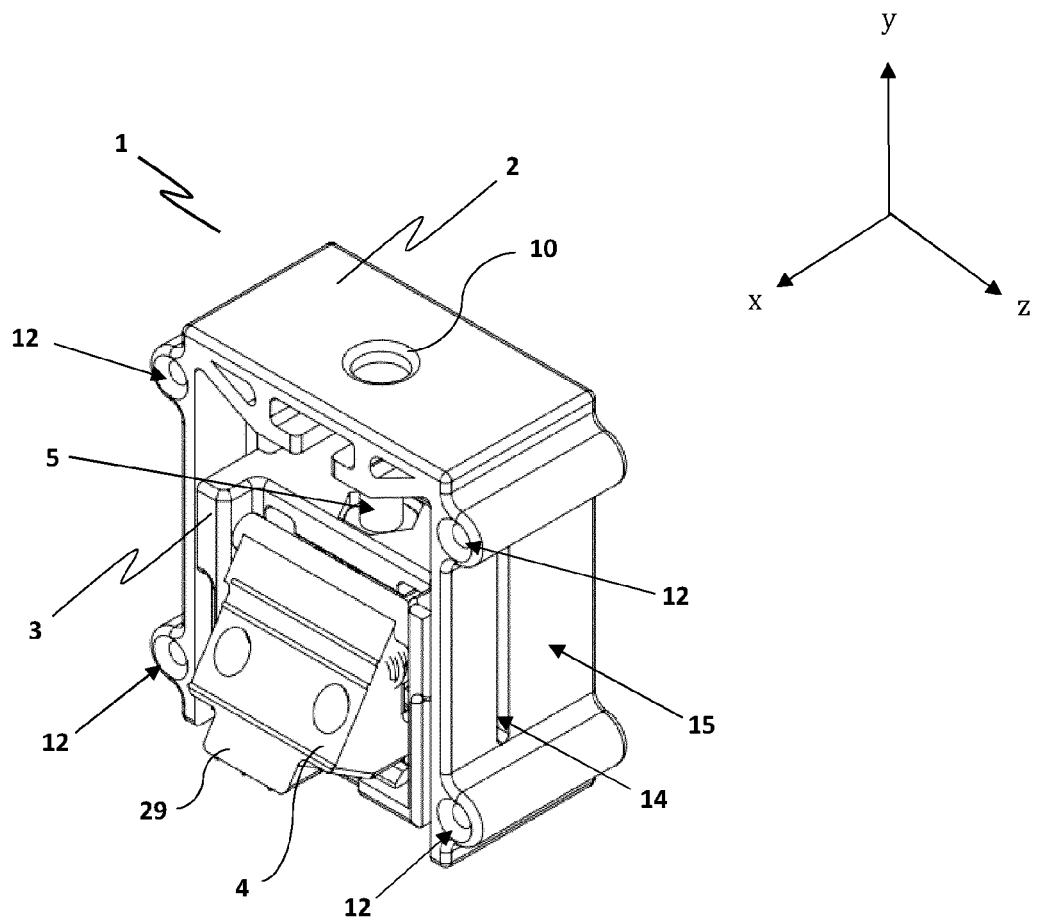


FIG. 2

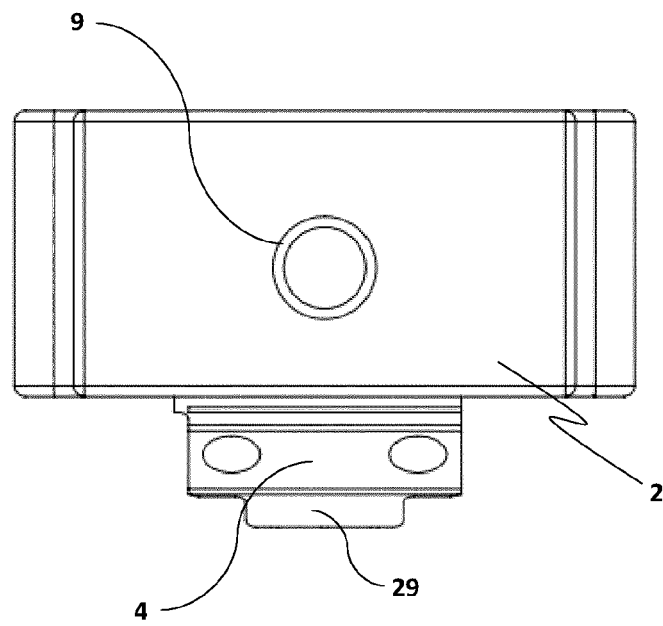


FIG. 3

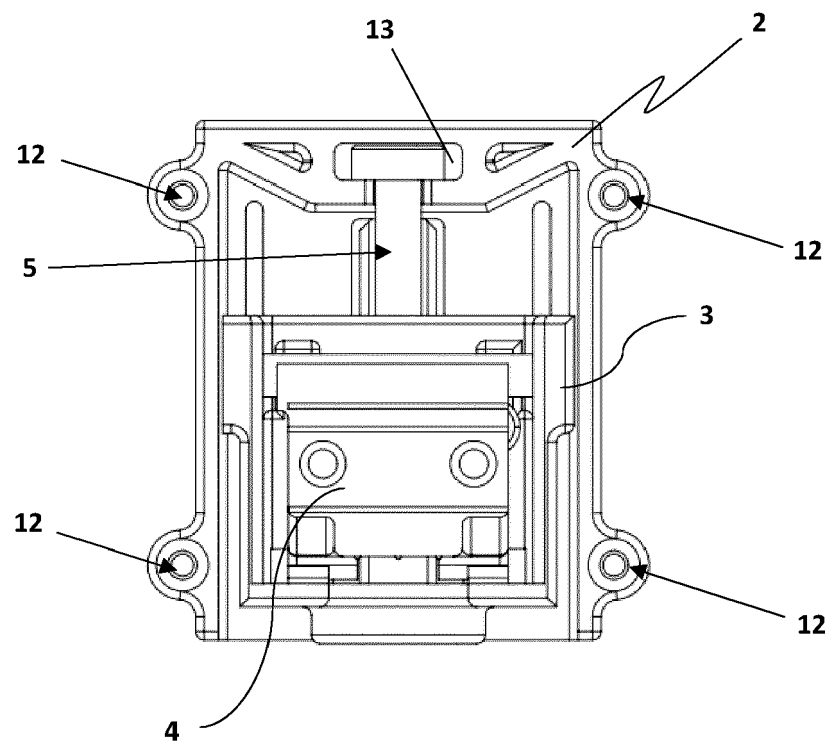
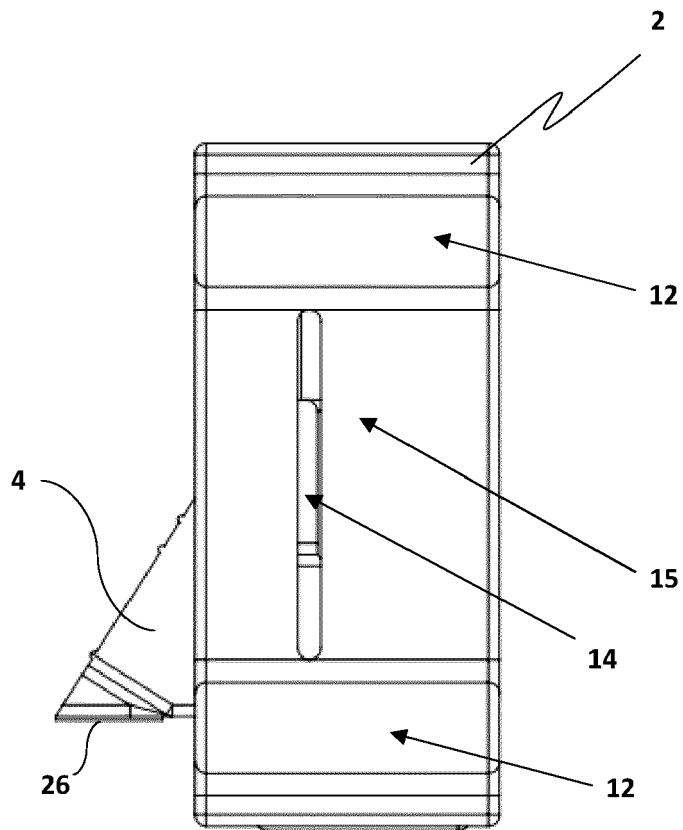


FIG. 4



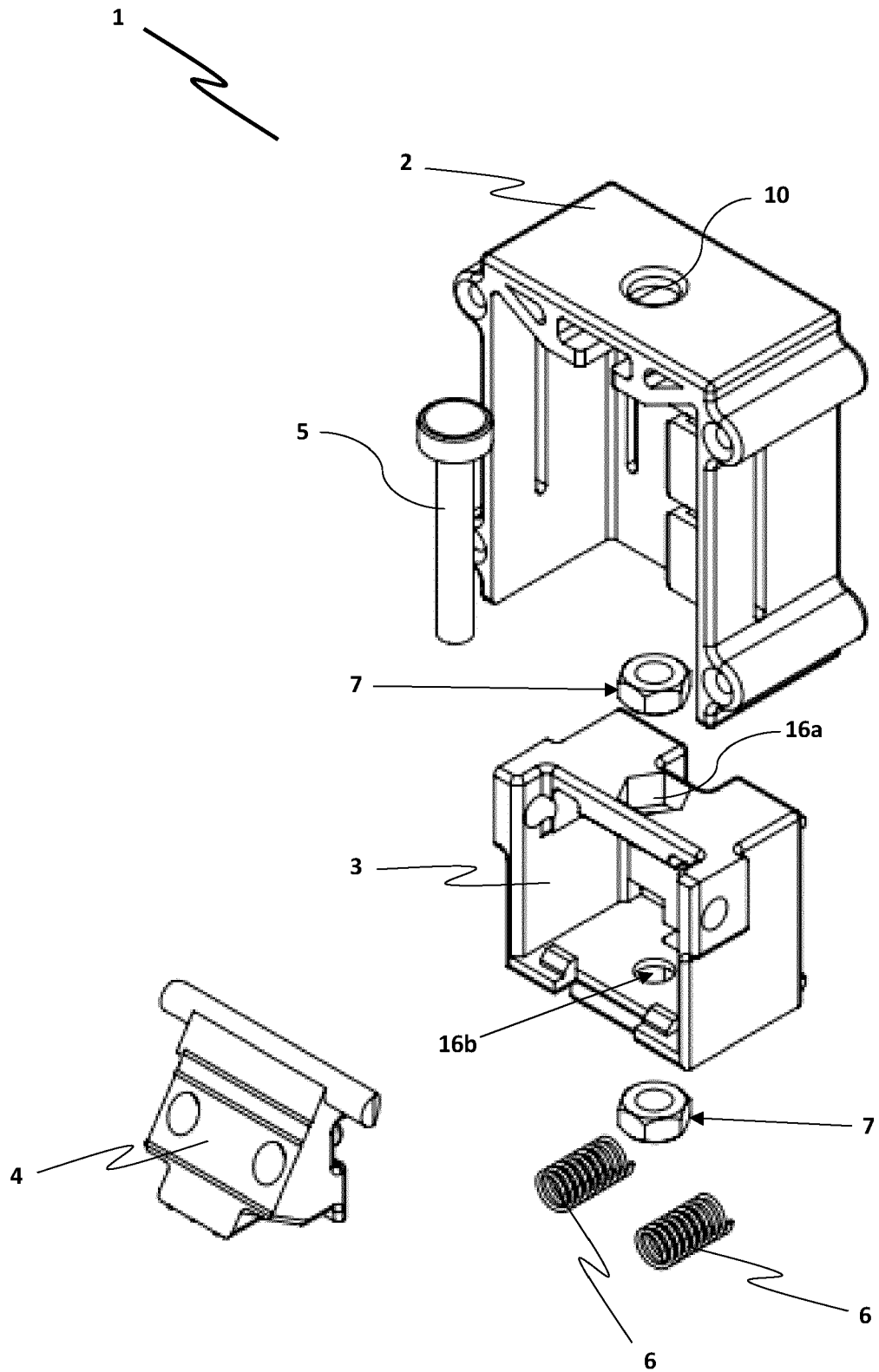


FIG. 5

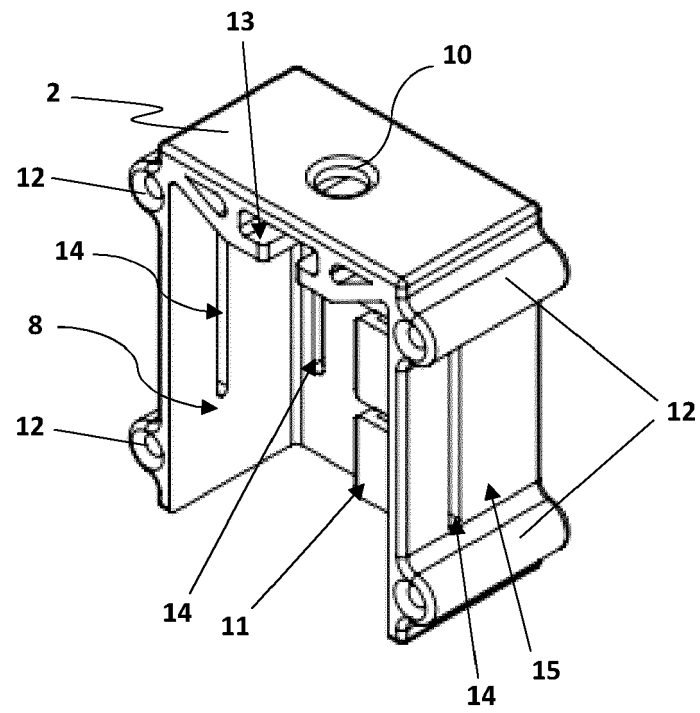


FIG. 6

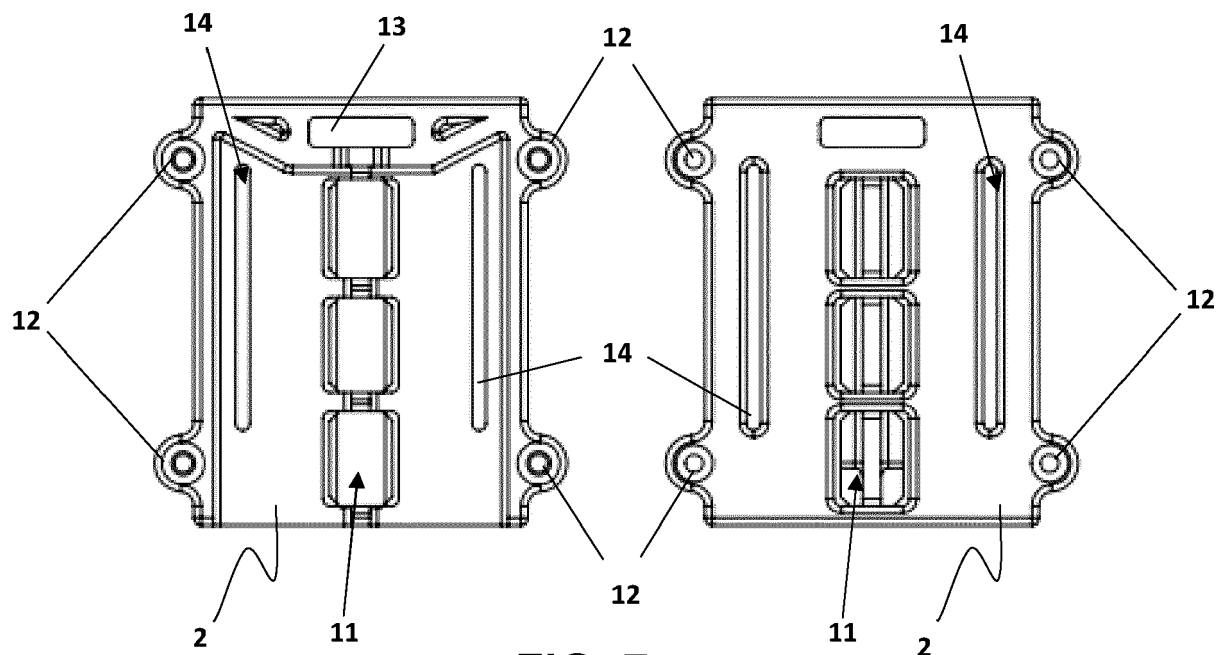


FIG. 7

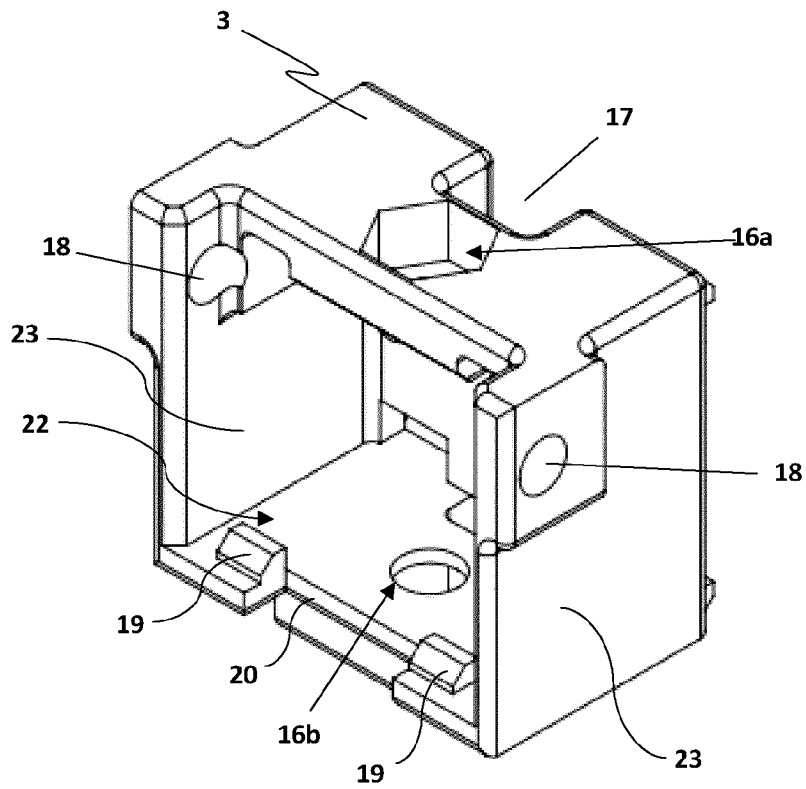


FIG. 8

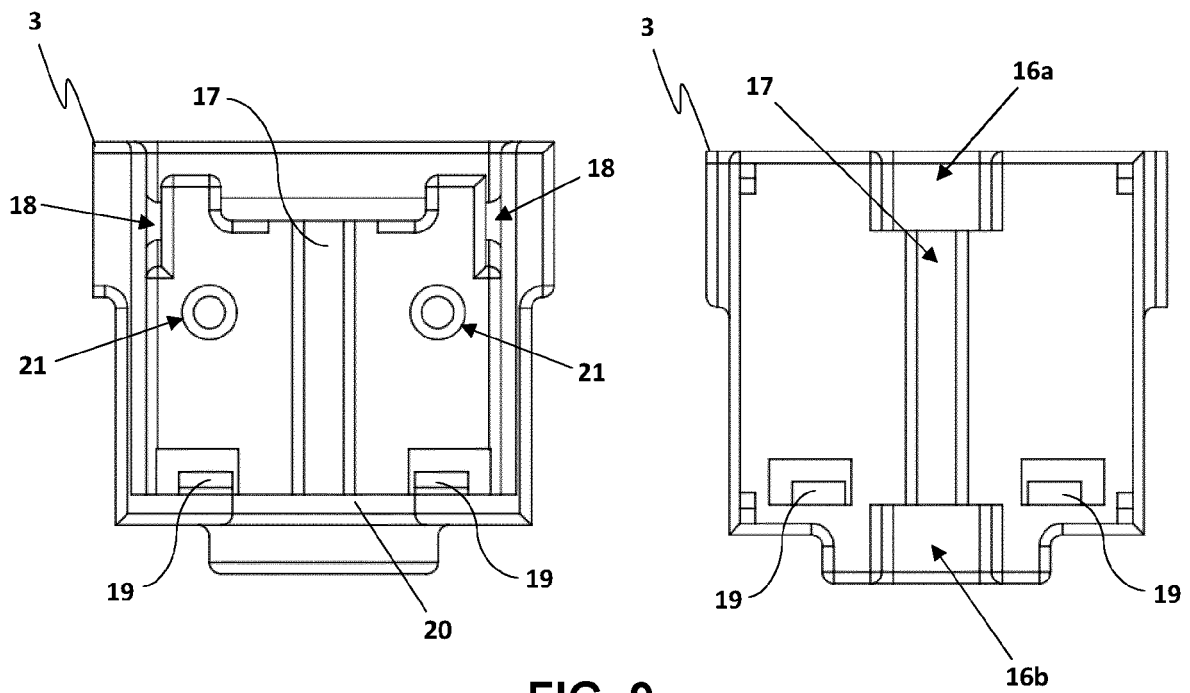


FIG. 9

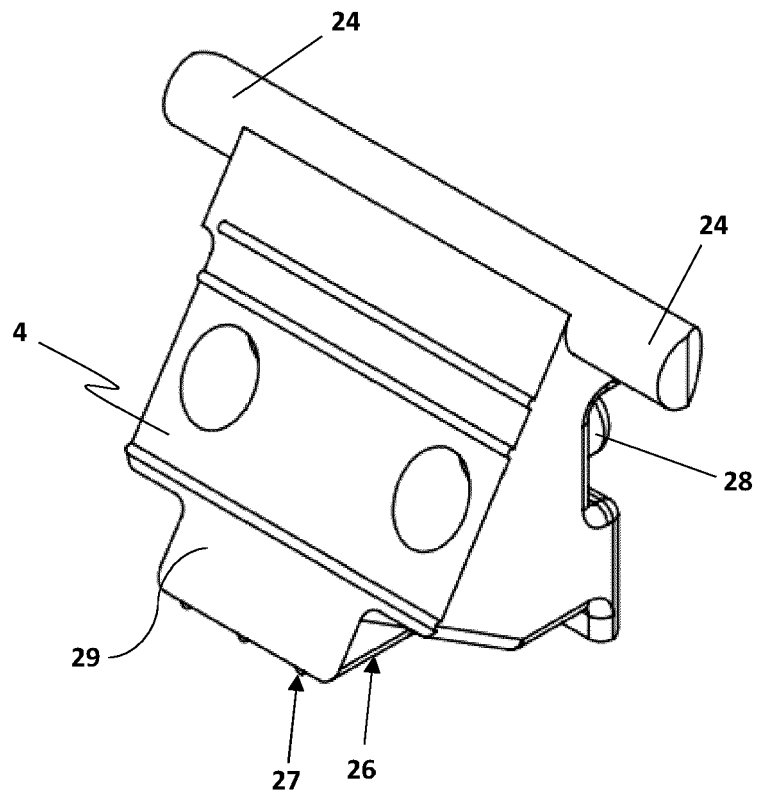


FIG. 10

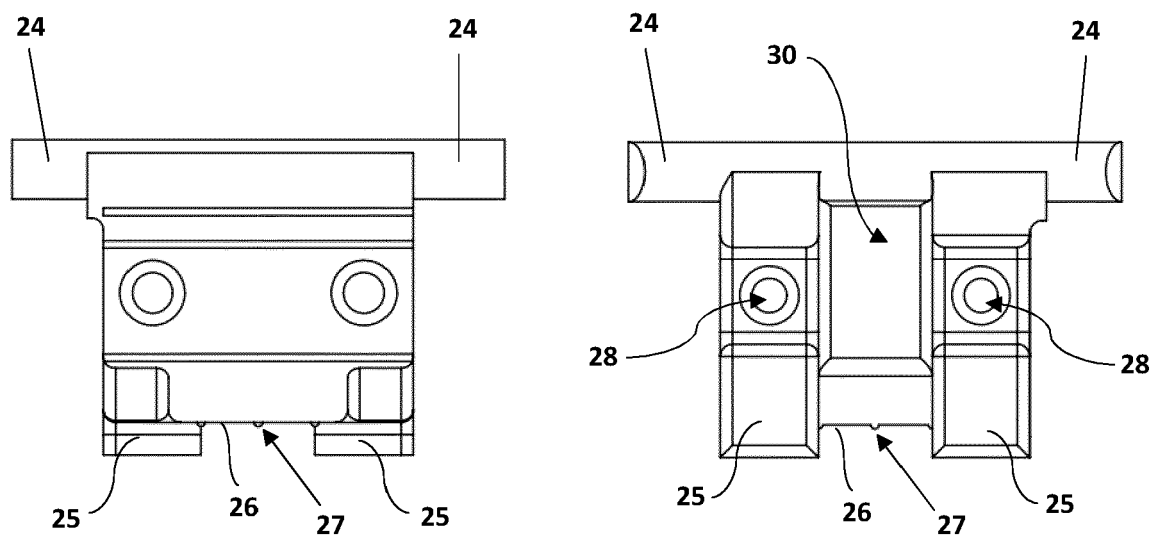


FIG. 11

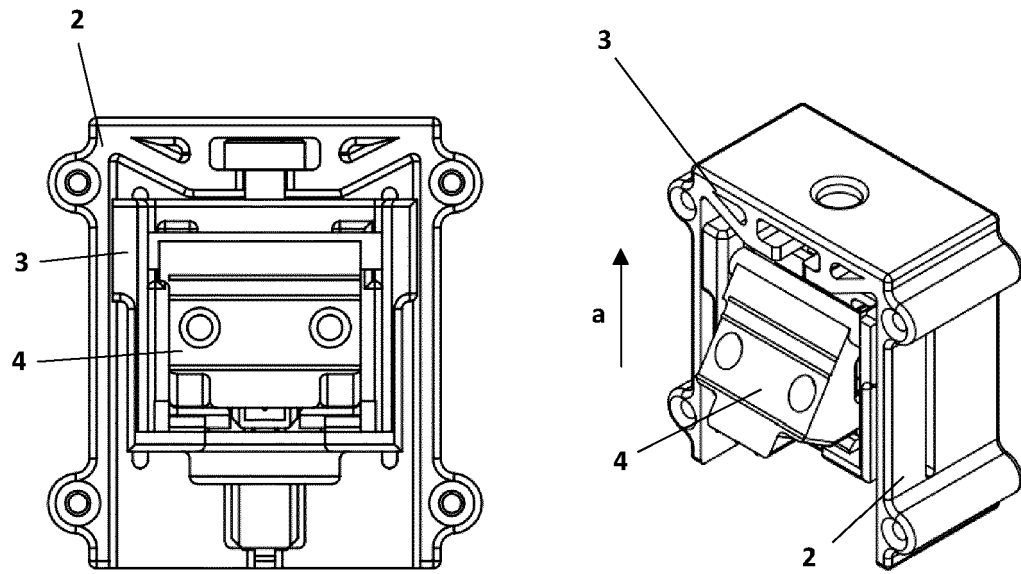


FIG. 12

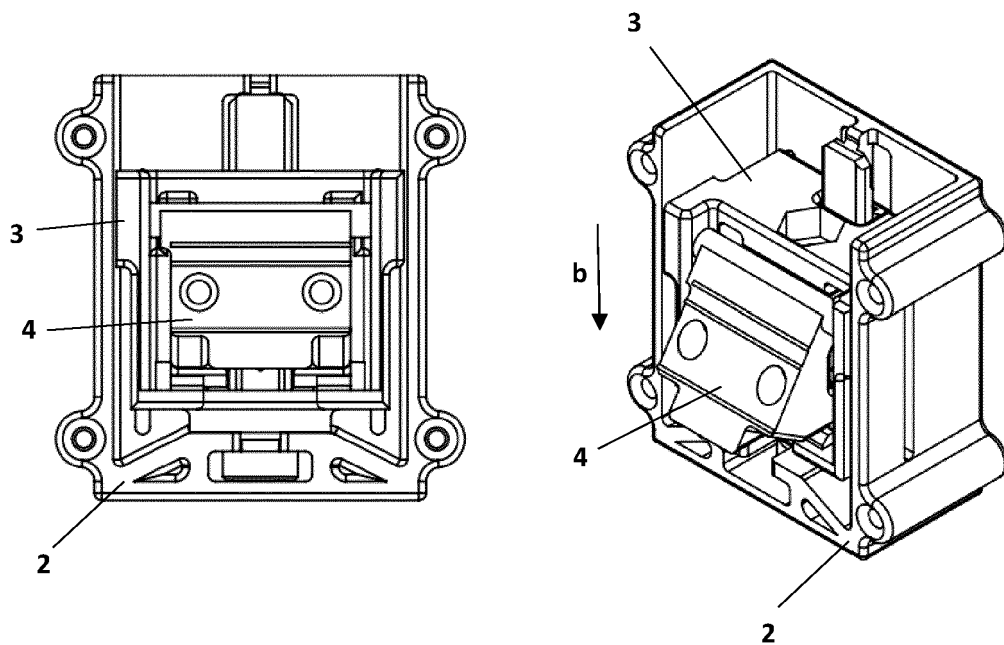


FIG. 13

FIG. 14

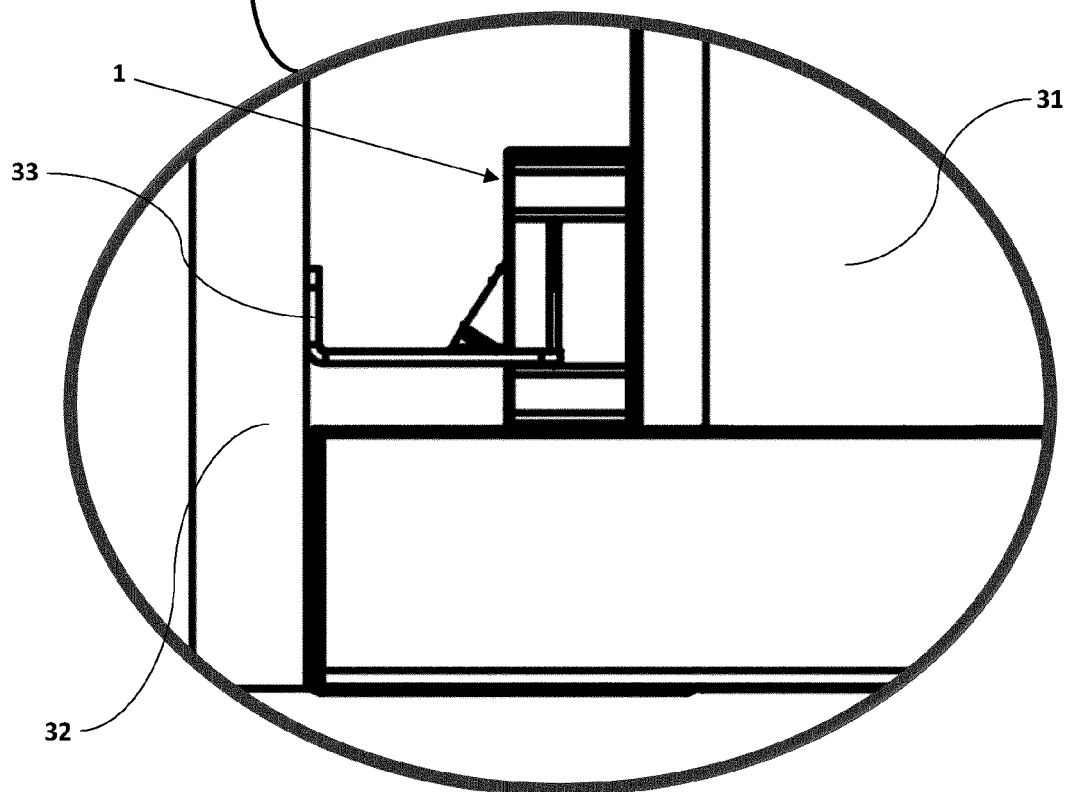
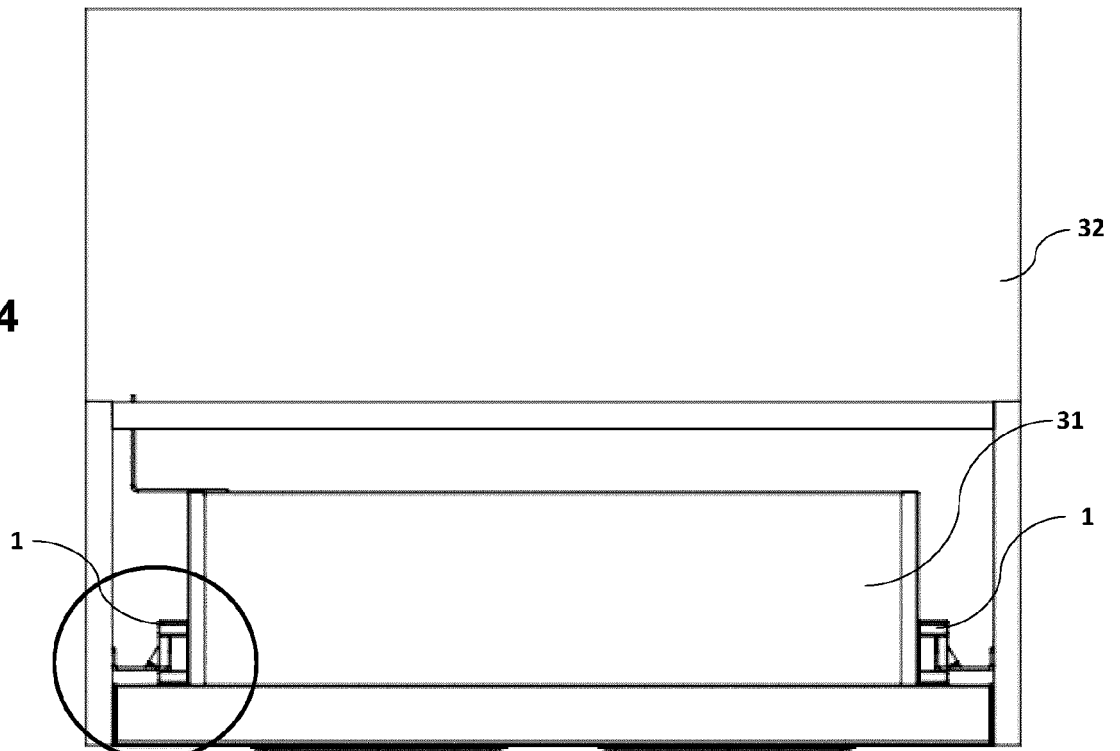


FIG. 15

FIG. 16

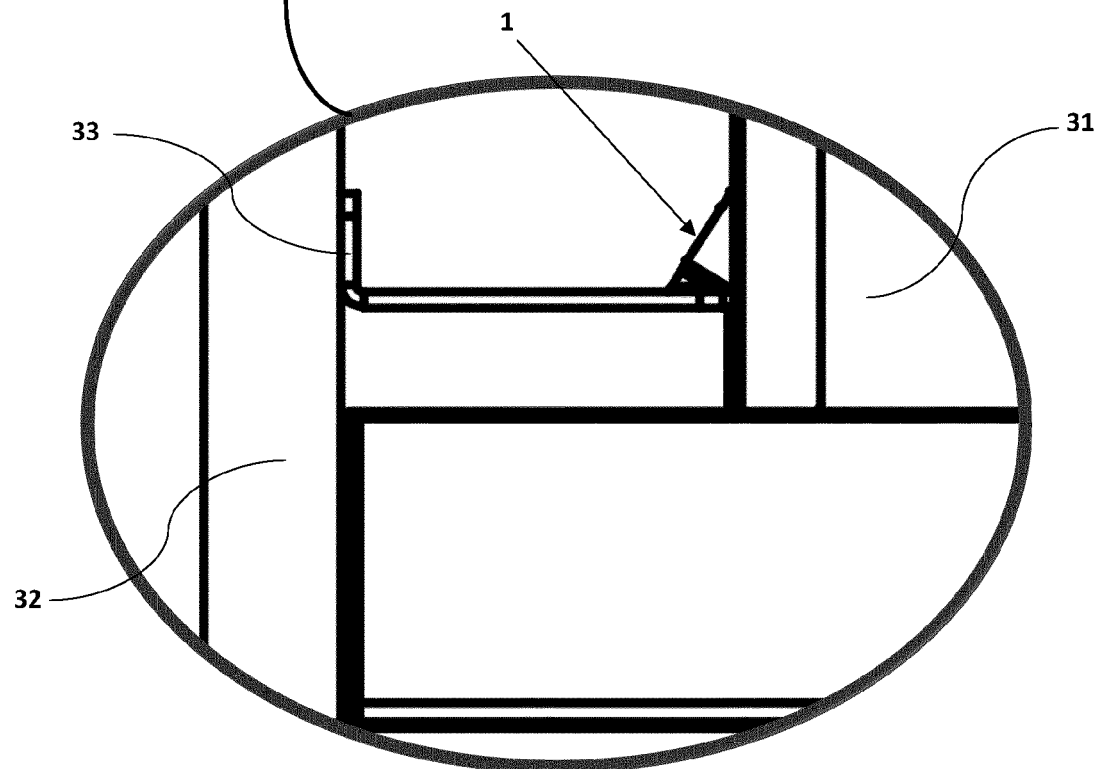
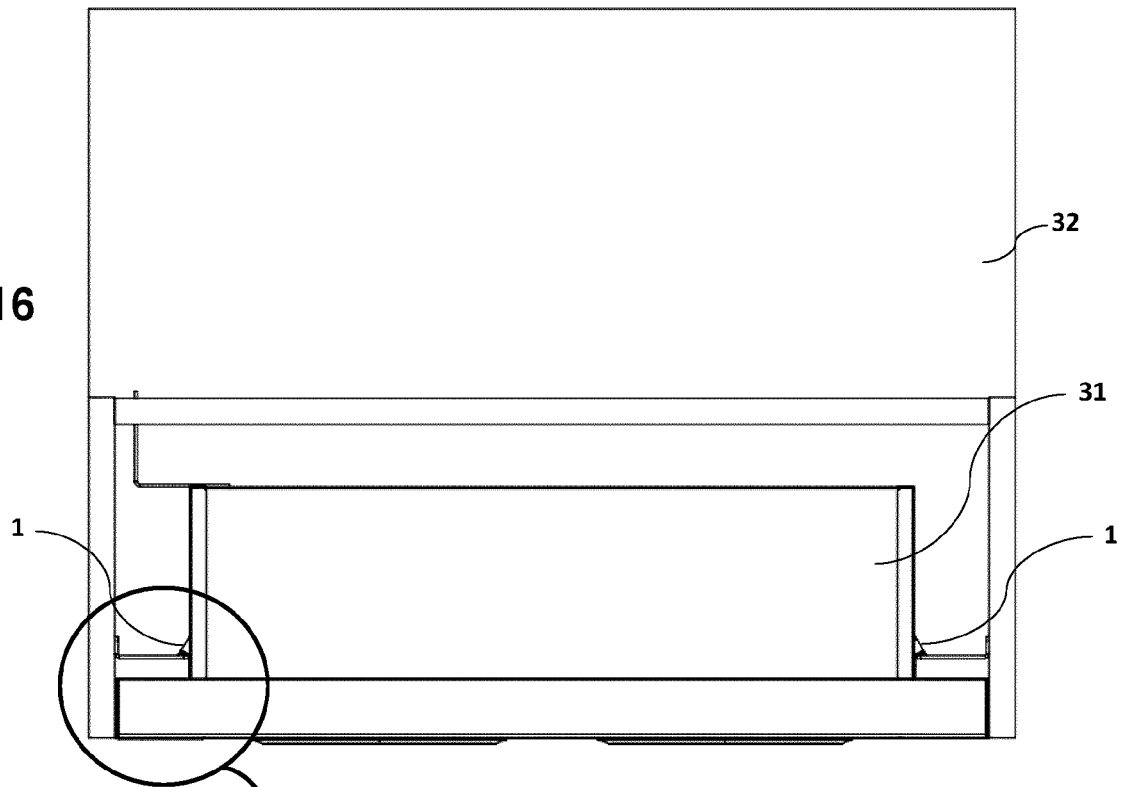


FIG. 17



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