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(54) **Refrigerator with bottom drawer having basket lift device**

Kühlschrank mit Bodenschublade und Korbhebevorrichtung

Réfrigérateur avec tiroir de fond ayant un élévateur de panier

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Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention relates to a refrigerator of the so-called 'drawer' type having a basket lift device and more particularly, to a basket lift device capable of lifting a basket received at a lower portion of a main body of such a refrigerator, to thereby enhance users' convenience.

2. Description of the Background Art

[0002] Figure 1 is a perspective view of a refrigerator and Figure 2 is a sectional view of a lower portion of the refrigerator showing how a basket is received in a main body of the refrigerator in accordance with the conventional art.

[0003] A typical bottom drawer-type refrigerator includes a main body 102 having an opened front side and a receiving space, an upper cooling chamber 106 disposed at an upper portion of the main body 102, having a pair of upper ('French' style side-by-side) doors 104 respectively opening swingably at both sides, for keeping food items stored therein cold, and a lower cooling chamber 112 (e.g. a freezer compartment) disposed at a lower portion of the main body 102, separated by a barrier wall 108 from the upper cooling chamber 106 and having a drawer door 110 opening slidably outwardly.

[0004] A mechanical chamber 116, which includes a compressor 114 and other components for generating cooling air supplied to the upper cooling chamber 106 and the lower cooling chamber 112, is provided at a rear portion of the main body 102.

[0005] A basket 120 for receiving food items therein is slidably disposed in the lower cooling chamber 112, and the drawer door 110 is fixed at the front side of the basket 120 like a drawer front panel. Accordingly, when the drawer door 110 is pulled out, the basket 120 is thereby opened, and when the drawer door 110 is pushed in, the basket 120 is thereby closed. A guide rail 124 is respectively installed between each of the outer sides of the basket 120 and inner sides of the lower cooling chamber 112 to guide the basket 120 to be slid the inward/outward directions.

[0006] One or more of drawers 126 for keeping food items therein may be provided above the basket 120 so as to be slidably opened.

[0007] In such conventional bottom drawer-type refrigerator, when a food item kept in the lower cooling chamber 112 needs to be taken out or a food item needs to be put into the lower cooling chamber 112, the drawer door 110 is pulled outwardly so that the basket 120 can be slidably moved and opened. After the food item stored in the basket 120 is taken out or the food item is put into the basket 120, the drawer door 110 is pushed inwardly so that the basket 120 can be slidably closed. Another bottom drawer type refrigerator is known from US 20040100168.

[0008] However, the conventional bottom drawer-type refrigerator has a problem in that, because the installation position of the basket is too low, a user must lower his/her posture, that is, for example, the user must bend his/her back or crouch down in order to put in or take out the food items, causing users' inconvenience.

SUMMARY OF THE INVENTION

[0009] Therefore, an object of the present invention is to provide a bottom drawer type refrigerator having a basket lift device capable of enhancing users' convenience by lifting a position of the basket in such a manner that when a basket disposed at a lower portion of a main body of the refrigerator is drawn out, it is lifted upwardly.

[0010] To achieve these and other advantages and in accordance with the purpose of the present invention, as embodied and broadly described herein, there is provided a bottom drawer type refrigerator including: a main body having upper and lower cooling chambers respectively disposed at upper and lower portions of the main body; a base frame disposed to be movable inwardly/outwardly at the lower cooling chamber and having a drawer door at a front side thereof; a lift frame disposed atop the base frame, on which a basket is placed; a gas spring mounted vertically at an upper surface of the base frame and connected with the lift frame to generate force for lifting the lift frame; and a pair of lift rails mounted at a rear side of the drawer door and guiding the lift frame to be moved up and down.

[0011] The gas spring includes a cylinder charged with high pressure gas, fixed at the base frame and disposed vertically; and an operation rod inserted into the cylinder and movable up and down linearly, the operation rod being urged upwardly by the pressure of the gas charged inside the cylinder, and fixed at the lift frame.

[0012] A locking unit is installed between the lift rail and a guide protrusion, and locks the lift frame to maintain a maximum lifted position and a maximum lowered position. The locking unit includes an upper stopping groove formed at an upper side of the lift rail; a lower stopping groove formed at a lower side of the lift rail; a locking member inserted to be linearly moved into the guide protrusion and locked one of the upper stopping groove and the lower stopping groove; and a spring inserted into an insertion groove and gives an elastic force to allow the locking member to maintain the state of being caught by the stopping groove.

[0013] The foregoing and other objects, features, aspects and advantages of the present invention will become more apparent from the following detailed description of the present invention when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] The accompanying drawings, which are included to provide a further understanding of the invention and are incorporated in and constitute a part of this specification, illustrate embodiments of the invention and together with the description serve to explain the principles of the invention.

[0015] In the drawings:

Figure 1 is a frontal perspective view of a bottom drawer type refrigerator in accordance with the conventional art;

Figure 2 is a cross-sectional view of a lower portion of the bottom drawer type refrigerator in accordance with the conventional art;

Figure 3 is a frontal perspective view of a bottom drawer type refrigerator in accordance with a first embodiment of the present invention with a basket thereof shown in an opened condition;

Figure 4 is a elevation side view showing a basket lift device of the refrigerator in accordance with the first embodiment of the present invention;

Figure 5 is a rear perspective view of the basket lift device of the refrigerator in accordance with the first embodiment of the present invention;

Figure 6 is a top plan view of the basket lift device of the refrigerator in accordance with the first embodiment of the present invention;

Figure 7 is an enlarged view of a portion 'A' in Figure 6;

Figure 8 is a sectional view taken along line VIII-VIII in Figure 7;

Figure 9 is an enlarged view of a portion 'B' in Figure 6;

Figure 10 is a side elevation view showing an operation state of the basket lift device of the refrigerator in accordance with the first embodiment of the present invention;

Figure 11 is a top plan view of the basket lift device of the refrigerator in accordance with a second embodiment of the present invention;

Figure 12 is an enlarged view of a portion 'C' in Figure 11;

Figure 13 is a top plan view of the basket lift device of the refrigerator in accordance with a third embodiment of the present invention; and

Figure 14 is an enlarged view of a portion 'D' in Figure 13.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0016] A bottom drawer type refrigerator having a basket lift device in accordance with the present invention will now be described with reference to the accompanying drawings.

[0017] There can be several embodiments of the refrigerator having a basket lift device, of which the most preferred ones will be described.

[0018] Figure 3 is a frontal perspective view of a bottom drawer refrigerator, with a basket thereof shown in an opened state in accordance with the first embodiment of the present invention, and Figure 4 is a side elevation view showing a basket lift device of the refrigerator in accordance with the first embodiment of the present invention.

[0019] The refrigerator implementing the basket lift device of the present invention includes a main body 10 having a receiving space, an upper cooling chamber 14 disposed at an upper portion of the main body 10 and having a pair of upper (e.g. 'French') swinging doors 12 open at both sides, a lower cooling chamber 18 separated by a barrier wall 16 from the upper cooling chamber 14 and disposed at a lower portion of the main body 10, a basket 20 disposed to be slidable in inward/outward directions at the lower cooling chamber 18 for keeping food items therein, and a lift unit for lifting the basket 20 upwardly when the basket 20 is drawn out.

[0020] The upper cooling chamber 14 is preferably used as a refrigerating chamber for keeping refrigerated food items and the lower cooling chamber 18 is preferably used as a freezing chamber for keeping frozen food items.

[0021] A drawer door 22 is disposed at a front side of the lower cooling chamber 18 and pushes in or draws out the basket 20 while being moved in inwardly/outwardly of the main body 10. A plurality of drawers 24 are optionally disposed at an upper portion of the lower cooling chamber 18, to keep food items, e.g. ice cubes, therein and can be drawn in or out.

[0022] The drawer door 22 includes a handle 26 at its front side and a base frame 30 mounted at its inner side, on which the basket 20 is mounted. A pair of guide rails 32 are installed between the lower cooling chamber 18 and the base frame 30 to slidably guide the base frame 30 inwardly/outwardly of the main body 10.

[0023] Each guide rail 32 includes a fixed rail 32a fixed at the bottom surface of the lower cooling chamber 18, a middle rail 32b slidably connected with the fixed rail 32a, and a moving rail 32c slidably connected with the middle rail 32b and fixed at the lower surface of the base frame 30.

[0024] Figure 5 is a rear perspective view of the basket lift device of the refrigerator in accordance with the first embodiment of the present invention, and Figure 6 is a top plan view of the basket lift device of the refrigerator in accordance with the first embodiment of the present invention.

[0025] The lift unit includes a lift frame 36 disposed above the base frame 30, on which the basket 20 is placed, a gas spring 38 installed at the base frame 30 and generating force for lifting the lift frame 36, and a pair of lift rails 40 for guiding the lift frame 36 to be moved linearly up and down.

[0026] The gas spring 38 includes a cylinder 42

charged with high pressure gas, fixed at the base frame 30 and disposed vertically; and an operation rod 44 inserted to be movable up and down in the cylinder 42 and linearly moved by the pressure of the gas charged in the cylinder 42, an upper end of the operation rod 44 being fixed at the lift frame 36.

[0027] A vertical riser portion 46 is formed extending at a right angle upwardly at the front side of the lift frame 36, and a connection portion 48 is formed at an upper end of the vertical riser portion 46. An upper end of the operating rod 44 of the gas spring 38 is connected with the connection portion 48.

[0028] The gas spring 38, in which high pressure gas is charged in the hermetic cylinder 42, generates pressing force on the inner end of the operating rod 44 by the pressure of the gas. The gas spring 38 is small, light and smoothly operated, so the lift frame 36 can be smoothly lifted.

[0029] The gas pressure of the gas spring 38 is so high as to lift the basket 20 to a maximum lifted position when a maximum load is kept in the basket 20. The gas pressure of the gas spring can be variably implemented according to an application field. For example, the gas spring 38 can have such a pressure that can lift the basket 20 to a middle position.

[0030] The lift rails 40 are provided as pairs and are vertically mounted at a rear surface of the drawer door 22, each having a rail groove 50 formed in a longitudinal direction thereof. A pair of guide protrusions 52 are formed at the vertical riser portion 46 of the lift frame 36, which protrusions 52 are inserted in and moved along the respective rail grooves 50.

[0031] Upper stoppers 54 and lower stoppers 56 for preventing release of the guide protrusion 52s are mounted at upper ends and lower ends of the lift rails 40.

[0032] A locking unit is installed between at least one of the lift rails 40 and the corresponding guide protrusion 52 in order to lock a position of the lift frame 36 where the lift frame 36 is lowered to the bottom position, or in order to lock the position of the lift frame 36 where the lift frame 36 is lowered to the bottom position and also lock a position of the lift frame 36 where the lift frame 36 is lifted to the maximum lifted position.

[0033] As shown in Figures 7 and 8, the locking unit includes upper stopping detents 60 formed at an upper portion of at least one of the lift rails 40, lower stopping detents 62 formed at a lower portion of the lift rail 40, a pair of locking pins 66 movable linearly in insertion recesses 64 formed at both sides of the guide protrusion 52 and catchable in corresponding ones of the upper stopping detents 60 and the lower stopping detents 62, and springs 68 respectively inserted in the insertion recesses 64 and providing elastic outward urging force so that the locking members 66 can be caught in the stopping detents 60 and 62.

[0034] The upper stopping detents 60 are formed in both sides of the rail groove 50 of the lift rail 40 corresponding to where the guide protrusions 52 are positioned when the lift frame is lifted to the maximum lifted position, and the lower stopping detents 60 are formed in both sides of the rail groove 50 of the lift rail 40 corresponding to where the guide protrusions 52 are positioned when the lift frame 36 is lowered down to the bottom position.

[0035] When the locking pins 66 are caught in the lower stopping detents 62, the locking unit thereby prevents the lift frame 36 from being lifted by virtue of the pressure of the gas spring 38. When a user pulls up the lift frame 36 with a certain force, the locking pins 66 are released by escaping from the lower stopping detents 62 and the lift frame 36 is able to be freely lifted by virtue of the gas spring 38. When the lift frame 36 is lifted to the maximum listed position, the locking pins 66 are caught in the upper stopping detents 60, preventing the lift frame 36 from being lowered.

[0036] The locking unit can be provided without the upper stopping detents 60 so that the locking member 66 is caught only in the lower stopping detents 62, preventing the lift frame 36 from being moved upwardly, and when the lift frame 36 is placed at the maximum lifted position, the guide protrusions 52 are caught by the stoppers 54, maintaining the lift frame at the maximum lifted position.

[0037] With reference to Figure 9, a pair of guide rails 70 are mounted extending in a vertical direction and guide the lift frame 36 to be moved up and down, and guide protrusions 72 are formed at both sides of the lift frame 70 and respectively inserted in the corresponding guide grooves 74 formed in the guide rails 70 and moved along the guide grooves 74.

[0038] The operation of the basket lift device of the present invention will now be described.

[0039] Figure 10 shows an operation state of the basket lift device of the refrigerator in accordance with the first embodiment of the present invention.

[0040] When the user wants to take a food item out of the basket 20, he/she pulls out the drawer door 22 to draw the basket 20 out of the lower cooling chamber 18. Then, locking between the lift frame 36 and the lift rail 40 is released and the lift frame 36 rises freely. Namely, as the locking members 66 installed at the guide protrusions 52 of the lift frame 36 are released from the lower stopping detents 62 formed in the lift rail 40, the lift frame 36 is unlocked.

[0041] At this time, the lift frame 36 is lifted by virtue of the pressure of the gas spring 38. Namely, the operation rod 44 is moved upward by the pressure of the high pressure gas charged in the cylinder 42 of the gas spring 38 and the lift frame 36 connected with the operation rod 44 is thereby lifted up.

[0042] When the lift frame 36 is lifted up to the maximum lifted position, the locking members 66 of the lift frame 36 are caught in the stopping detents 60 formed in the lift rail, locking the lift frame 36 to be maintained in the lifted state.

[0043] In this state, the user can put in or take out a

food item and then press the lift frame 36 downwardly. Then, the locking members 66 are released from the upper stopping recesses 60 to free the lift frame 36. When the lift frame 36 is moved down to the bottom, the locking members 66 are caught in the lower stopping detents 62, preventing the lift frame 36 from being lifted up.

[0044] Figure 11 is a top plan view of the basket lift device of the refrigerator in accordance with a second embodiment of the present invention, and Figure 12 is an enlarged view of a portion 'C' in Figure 11.

[0045] The basket lift device in accordance with the second embodiment has the same structure as the basket lift device of the first embodiment of the present invention, except for the locking unit for locking the lift frame 36.

[0046] In the second embodiment of the present invention, the locking unit includes buttons 76 mounted at both upper and lower portions of the drawer door 22, an operation rod 78 connected with each button 76 and rotatably disposed inside the drawer door 22 so as to be rotated when the button 76 is pressed, a spring 82 mounted at one side of each operation rod 78 and providing an urging elastic force to the operation rod 78, and a locking detent 80 formed in the guide protrusion 52, in which an end of each the operation rod 78 can be caught.

[0047] When the lift frame 36 is placed at the lowest position, the operation rod 78 mounted at a lower side of the drawer door 22 is inserted into the locking detent 80 in the guide protrusion 52, preventing the lift frame 36 from being lifted up.

[0048] In this state, when the user presses the button 76, the operation rod 78 is rotated, overcoming the elastic force of the spring 82, and released from the locking detent 80 in the guide protrusion 52, allowing the lift frame 36 to be freely lifted up by virtue of the pressure of the gas spring 38.

[0049] When the lift frame 36 reaches the maximum lifted position, the operation rod 78 mounted at the upper side of the drawer door 22 is caught in the locking detent 80 in the guide protrusion 52, maintaining the lift frame 36 at the lifted position.

[0050] And when the button 76 mounted at the upper side of the drawer door 22 is pressed, the operation rod 78 is released from the locking detent 80, freeing the lift frame 36. Then, the user can push down the lift frame 36.

[0051] Figure 13 is a top plan view of the basket lift device of the refrigerator in accordance with a third embodiment of the present invention, and Figure 14 is an enlarged view of a portion 'D' inFigure 13.

[0052] A basket lift device in accordance with the third embodiment of the present invention has the same structure except for the locking unit for locking the lift frame.

[0053] In the third embodiment of the present invention, the locking unit includes an actuator 86 mounted at a lower portion of the drawer door 22 or at both the upper and lower portions of the drawer door 22, an operation rod 88 connected with the actuator 86 and linearly moved according to driving of the actuator 86, and a locking detent 90 formed in the side of the guide protrusion 52 of the lift frame 36, in which the operation rod 52 can be insertedly caught.

[0054] The actuator 86 is preferably formed as a solenoid type for linearly and reciprocally moving the operation rod when power is applied thereto.

[0055] A through hole 92 is formed at one side of the lift rail 40 into which the guide protrusion 52 is inserted, allowing the operation rod 88 to pass therethrough.

[0056] As for the locking unit of the third embodiment of the present invention, when the user operates the actuator 86 by manipulating a switch or the like, the operation rod 88 is retracted and released from the locking detent 90, unlocking the lift frame 36. And when DC power of opposite polarity is applied to the actuator 86, the operation rod 88 is moved forward to be inserted into the locking detent 90, locking the lift frame 36.

[0057] As so far described, the basket lift device disposed at the lower side of the refrigerator in the present invention has the following advantages.

[0058] That is, for example, when the basket is drawn out, it can be lifted up to allow the user to take a food item out of the basket without having to bend his/her back, enhancing users' convenience.

[0059] As the present invention may be embodied in several forms without departing from the essential characteristics thereof, it should also be understood that the above-described embodiments are not limited by any of the details of the foregoing description, unless otherwise specified, but rather should be construed as defined in the appended claims.

Claims

1. A bottom drawer type refrigerator comprising:

a main body (10) having upper and lower cooling chambers (14,18) respectively disposed at upper and lower portions of the main body (10);
a drawer base frame (30) movable inwardly and outwardly at the lower cooling chamber (18) and having a drawer door (22) at a front side thereof for closing the lower cooling chamber (18); **characterised in that**
a lift frame (36) disposed at an upper surface of the drawer base frame (30), on which lift frame (36) a basket may be placed;
a gas spring (38) mounted so as to operate in a vertical direction at an upper surface of the drawer base frame (30) and connected with the lift frame (36) to generate force for lifting the lift frame; and
lift rails (40) mounted at a rear side of the drawer door (22) and guiding the lift frame to be moved up and down.

2. The refrigerator of claim 1, wherein the gas spring

comprises:

a cylinder (42) charged with high pressure gas, fixed at the base frame (30) and disposed vertically; and
an operation rod (44) inserted into the cylinder and movable up and down linearly, the operation rod being urged upwardly by the pressure of the high pressure gas charged inside the cylinder (42), and being fixed at the lift frame.

3. The refrigerator of claim 1, wherein the lift rails are disposed vertically at a rear surface of the drawer door (22), a rail groove (50) is formed in a longitudinal direction of each lift rail, and respective guide protrusions (52) are provided at a front portion of the lift frame and inserted in and movable along the corresponding rail grooves (50).

4. The refrigerator of claim 3, wherein upper and lower stoppers (54,56) for preventing the guide protrusions (52) from being released from the rail grooves (50) are installed at upper and lower ends of the lift rails.

5. The refrigerator of claim 3, further comprising:

a locking unit installed between at least one of the lift rails (40) and the corresponding guide protrusion (52) and locking the lift frame (36) in order to maintain the lift frame at a bottommost lowered position and also maintain the lift frame (36) at a maximum lifted position.

6. The refrigerator of claim 4, wherein the locking unit comprises:

an upper stopping detent (60) formed in an upper portion of the lift rail (40);
a lower stopping detent (62) formed in a lower portion of the lift rail (40);
a locking pins (66) linearly movable in the respective insertion recesses at each side of the guide protrusion (52) and lockable in either one of the upper and lower stopping detents; and
a spring (68) urging each of the locking pins outwardly for being caught in the stopping detents.

7. The refrigerator of claim 6, wherein upper stopping detents (60) are formed in both sides of the rail groove (50) of the lift rail (40) where the guide protrusion is positioned when the lift frame is lifted to its maximum lifted position, and lower stopping detents (60) are formed in both sides of the rail groove (50) of the lift rail (40) where the guide protrusion (52) is positioned when the lift frame is lowered down to its bottommost position.

8. The refrigerator of claim 1. wherein guide rails for guiding vertical movement of the lift frame (36) are vertically mounted at both respective sides of the base frame (30), and guide protrusions (52) are formed at both respective sides of the lift frame (36) and inserted in and movable along the corresponding guide rails.

9. The refrigerator of claim 1, further comprising:

a locking unit mounted at the door (22) and locking the lift frame (36) to be maintained at its bottommost lowered position and also to be maintained at its maximum lifted position.

10. The refrigerator of claim 9, wherein the locking unit comprises:

push buttons (76) mounted respectively at upper and lower portions of the drawer door (22);
an operation rod (78) connected with each push button (76) and rotatably disposed inside the drawer door so as to be rotated when the corresponding push button (76) is pressed; and
a locking detent (80) formed in the lift frame, in which the operation rods are able to be caught.

11. The refrigerator of claim 10, wherein the locking unit further includes a spring (82) mounted at one side of each operation rod (78) and urging the operation rods to be caught in the locking groove.

12. The refrigerator of claim 10, wherein the locking detent (80) is formed at a front surface of the guide protrusion (52) formed at the lift frame.

13. The refrigerator of claim 9, wherein the locking unit comprises:

an actuator (86) fixed at a rear surface of the drawer door (22);
an operation rod (88) mounted at the actuator (86) and linearly and reciprocally moved according to an operation of the actuator; and
a locking detent (90) formed in one side of the lift frame, into which the operation rod is insertable.

14. The refrigerator of claim 13, wherein the actuator (86) is formed as a solenoid for linearly and reciprocally moving the operation rod (88) when power is applied thereto.

15. The refrigerator of claim 13, wherein the locking detent (90) is formed in the side of the guide protrusion (52) formed at the lift frame.

Patentansprüche

1. Kühlschrank mit unterem Schubfach, umfassend:

einen Hauptkörper (10) mit oberer und unterer Kühlkammer (14, 18), die jeweils in oberen und unteren Abschnitten des Hauptkörpers (10) angeordnet sind;
ein Schubfachgrundgestell (30), das an der unteren Kühlkammer (18) nach innen und nach außen verschiebbar ist und eine Schubfachtür (22) an einer Vorderseite davon zum Schließen der unteren Kühlkammer (18) aufweist;
dadurch gekennzeichnet, dass
ein Hebegestell (36), das an einer oberen Fläche des Schubfachgrundgestells (30) angeordnet ist, wobei auf dem Hebegestell (36) ein Korb angeordnet sein kann;
eine Gasfeder (38) derart angebracht ist, dass sie in einer vertikalen Richtung an einer oberen Fläche des Schubfachgrundgestells (30) betrieben ist und mit dem Hebegestell (36) zum Erzeugen einer Kraft zum Heben des Hebegestells verbunden ist; und
Hebeschienen (40) an einer rückwärtigen Fläche der Schubfachtür (22) angebracht sind und das Hebegestell zur Verschiebung nach oben und unten führen.

2. Kühlschrank nach Anspruch 1, wobei die Gasfeder Folgendes umfasst:

einen Zylinder (42), der mit Hochdruckgas geladen, an dem Grundgestell (30) befestigt und vertikal angeordnet ist; und
eine Betriebsstange (44), die in den Zylinder eingeführt und linear nach oben und unten verschiebbar ist, wobei die Betriebsstange durch den Druck des Hochdruckgases, das in dem Zylinder (42) geladen ist, nach oben gedrängt ist und an dem Hebegestell befestigt ist.

3. Kühlschrank nach Anspruch 1, wobei die Hebeschienen vertikal an einer rückwärtigen Fläche der Schubfachtür (22) angeordnet sind, eine Schienennut (50) in einer Längsrichtung von jeder Hebeschiene ausgebildet ist und jeweilige Führungsvorsprünge (52) an einem vorderen Abschnitt des Hebegestells vorgesehen und in die entsprechenden Schienennute (50) eingeführt und daran entlang verschiebbar sind.

4. Kühlschrank nach Anspruch 3, wobei obere und untere Anhaltevorrichtungen (54, 56) zum Verhindern, dass sich die Führungsvorsprünge (52) aus den Schienennuten (50) lösen, an oberen und unteren Enden der Hebeschienen eingerichtet sind.

5. Kühlschrank nach Anspruch 3, ferner umfassend:

eine Sperreinheit, die zwischen zumindest einer der Hebeschienen (40) und dem entsprechenden Führungsvorsprung (52) eingerichtet ist und das Hebegestell (36) sperrt, um das Hebegestell in einer untersten abgesenkten Position zu erhalten und außerdem das Hebegestell (36) in einer maximal angehobenen Position zu erhalten.

6. Kühlschrank nach Anspruch 4, wobei die Sperreinheit Folgendes umfasst:

eine obere Anschlagarretierung (60), die in einem oberen Abschnitt der Hebeschiene (40) ausgebildet ist;
eine untere Anschlagarretierung (62), die in einem unteren Abschnitt der Hebeschiene (40) ausgebildet ist;
Sperrstifte (66), die in den jeweiligen Einführungsaussparungen an jeder Seite des Führungsvorsprungs (52) linear verschiebbar und in beiden der oberen und unteren Anschlagarretierungen sperrbar sind; und
eine Feder (68), die jeden der Sperrstifte nach außen zum Einrasten in die Anschlagarretierungen drängt.

7. Kühlschrank nach Anspruch 6, wobei obere Anschlagarretierungen (60) in beiden Seiten der Schienennut (50) der Hebeschiene (40), wo der Führungsvorsprung positioniert ist, wenn das Hebegestell in seine maximal angehobene Position angehoben ist, ausgebildet sind und untere Anschlagarretierungen (60) in beiden Seiten der Schienennut (50) der Hebeschiene (40), wo der Führungsvorsprung (52) positioniert ist, wenn das Hebegestell in seine unterste abgesenkte Position abgesenkt ist, ausgebildet sind.

8. Kühlschrank nach Anspruch 1, wobei Führungsschienen zum Führen der vertikalen Verschiebung des Hebegestells (36) an beiden jeweiligen Seiten des Grundgestells (30) angebracht sind und Führungsvorsprünge (52) an beiden jeweiligen Seiten des Hebegestells (36) ausgebildet und in die entsprechenden Führungsschienen eingeführt und daran entlang verschiebbar sind.

9. Kühlschrank nach Anspruch 1, ferner umfassend:

eine Sperreinheit, die an der Tür (22) angebracht ist und das Hebegestell (36) zur Erhaltung in seiner untersten abgesenkten Position und außerdem zur Erhaltung in seiner maximal angehobenen Position sperrt.

10. Kühlschrank nach Anspruch 9, wobei die Sperrein-

heit Folgendes umfasst:

Druckknöpfe (76), die jeweils an oberen und unteren Abschnitten der Schubfachtür (22) angebracht sind;
eine Betriebsstange (78), die mit jedem Druckknopf (76) verbunden und derart drehbar innerhalb der Schubfachtür angeordnet ist, dass sie gedreht ist, wenn der entsprechende Druckknopf (76) gedrückt ist; und
eine Sperrarretierung (80), die in dem Hebegestell ausgebildet ist und in der Betriebsstangen einrasten können.

11. Kühlschrank nach Anspruch 10, wobei die Sperreinheit ferner eine Feder (82) enthält, die an einer Seite jeder Betriebsstange (78) angebracht ist und die Betriebsstangen zum Einrasten in die Sperrnut drängt.

12. Kühlschrank nach Anspruch 10, wobei die Sperrarretierung (80) an einer Vorderfläche des Führungsvorsprungs (52) ausgebildet ist, der an dem Hebegestell ausgebildet ist.

13. Kühlschrank nach Anspruch 9, wobei die Sperreinheit Folgendes umfasst:

ein Stellglied (86), das an einer rückwärtigen Fläche der Schubfachtür (22) befestigt ist;
eine Betriebsstange (88), die an dem Stellglied (86) angebracht und gemäß dem Betrieb des Stellglieds linear und hin und herlaufend verschoben ist; und
eine Sperrarretierung (90), die in einer Seite des Hebegestells ausgebildet und in die Betriebsstange einführbar ist.

14. Kühlschrank nach Anspruch 13, wobei das Stellglied (86) als Solenoid zum linearen und hin- und herlaufenden Verschieben der Betriebsstange (88) ausgebildet ist, wenn Leistung daran angelegt ist.

15. Kühlschrank nach Anspruch 13, wobei die Sperrarretierung (90) in der Seite des Führungsvorsprungs (52) ausgebildet ist, der an dem Hebegestell ausgebildet ist.

Revendications

1. Réfrigérateur de type à tiroir bas comprenant :

un corps principal (10) ayant des compartiments réfrigérants inférieur et supérieur (14, 18) respectivement placés sur des parties inférieure et supérieure du corps principal (10) ;
un cadre de base du tiroir (30) déplaçable vers l'intérieur et vers l'extérieur sur le compartiment réfrigérant inférieur (18) et ayant une porte de tiroir (22) sur le devant de celui-ci pour fermer le compartiment réfrigérant inférieur (18) ;

caractérisé en ce que
un cadre élévateur (36) est placé sur une surface supérieure du cadre de base du tiroir (30) sur lequel cadre élévateur (36) un panier peut être placé ;
un ressort à gaz (38) est monté de manière à fonctionner dans une direction verticale sur une surface supérieure du cadre de base du tiroir (30) et relié au cadre élévateur (36) pour générer une force pour lever le cadre élévateur ; et
des rails élévateurs (40) sont montés sur un côté arrière de la porte de tiroir (22) et guident le cadre élévateur pour qu'il monte et descende.

2. Réfrigérateur selon la revendication 1, dans lequel le ressort à gaz comprend :

un vérin (42) chargé en gaz haute pression fixé sur le cadre de base du tiroir (30) et placé verticalement ; et
une tige d'actionnement (44) insérée dans le vérin et déplaçable de haut en bas de manière linéaire, la tige d'actionnement étant poussée vers le haut par la pression du gaz haute pression chargé à l'intérieur du vérin(42) et étant fixée sur le cadre élévateur.

3. Réfrigérateur selon la revendication 1, dans lequel les rails élévateurs sont placés verticalement sur une surface arrière de la porte du tiroir (22), une rainure de rail (50) étant formée dans une direction longitudinale de chaque rail élévateur et des protubérances de guidage respectives (52) sont prévues sur la partie avant du cadre élévateur et insérées dans les rainures de rail (50) correspondantes et mobiles le long de celles-ci.

4. Réfrigérateur selon la revendication 3, dans lequel des butées inférieure et supérieure (54, 56) évitant que les protubérances de guidage (52) ne soient libérées des rainures de rail (50) sont placées sur les extrémités supérieure et inférieure des rails élévateurs.

5. Réfrigérateur selon la revendication 3, comprenant en outre :

une unité de verrouillage placée entre au moins un des rails élévateurs (40) et la protubérance de guidage (52) correspondante et verrouillant le cadre élévateur (36) afin de maintenir le cadre élévateur dans une position basse la plus abaissée et également maintenir le cadre élévateur (36) dans une position soulevée maximale.

6. Réfrigérateur selon la revendication 4, dans lequel l'unité de verrouillage comprend :

un encliquetage de butée supérieur (60) formé dans une partie supérieure du rail élévateur (40) ;
un encliquetage de butée inférieur (62) formé dans une partie inférieure du rail élévateur (40) ;
des broches de verrouillage (66) mobiles de manière linéaire dans les évidements d'insertion respectifs sur chaque côté de la protubérance de guidage (52) et verouillables dans l'un ou l'autre des encliquetages de butée supérieur et inférieur ; et
un ressort (68) poussant chacune des broches de verrouillage vers l'extérieur pour qu'elles soient prises dans les encliquetages de butée.

7. Réfrigérateur selon la revendication 6, dans lequel les encliquetages de butée supérieurs (60) sont formés dans les deux côtés de la rainure de rail (50) du rail élévateur (40) où la protubérance de guidage est placée lorsque le cadre élévateur est soulevé à sa position soulevée maximale et les encliquetages de butée supérieurs (60) sont formés dans les deux côtés de la rainure de rail (50) du rail élévateur (40) où la protubérance de guidage (52) est placée lorsque le cadre élévateur est abaissé à sa position la plus basse.

8. Réfrigérateur selon la revendication 1, dans lequel les rails de guidage pour guider le mouvement vertical du cadre élévateur (36) sont montés verticalement sur les deux côtés respectifs du cadre de base (30) et les protubérances de guidage (52) sont formées sur les deux côtés respectifs du cadre élévateur (36) et insérées dans les rails de guidage correspondants et mobiles le long de ceux-ci.

9. Réfrigérateur selon la revendication 1, comprenant en outre :

une unité de verrouillage placée sur la porte (22) et verrouillant le cadre élévateur (36) afin de le maintenir dans sa position basse la plus abaissée et également le maintenir dans sa position soulevée maximale.

10. Réfrigérateur selon la revendication 9, dans lequel l'unité de verrouillage comprend :

des boutons-poussoirs (76) montés respectivement sur les parties supérieure et inférieure de la porte du tiroir (22) ;
une tige d'actionnement (78) reliée à chaque bouton-poussoir (76) placée de manière à pouvoir tourner dans la porte du tiroir de façon à être tournée lorsque le bouton-poussoir (76) correspondant est enfoncé ; et
un encliquetage de verrouillage (80) formé dans le cadre élévateur dans lequel les tiges d'actionnement peuvent être prises.

11. Réfrigérateur selon la revendication 10, dans lequel l'unité de verrouillage comprend en outre un ressort (82) monté sur un côté de chaque tige d'actionnement (78) et poussant les tiges d'actionnement pour qu'elles soient prises dans la rainure de verrouillage.

12. Réfrigérateur selon la revendication 10, dans lequel l'encliquetage de verrouillage (80) est formé sur une face avant de la protubérance de guidage (52) formée sur le cadre élévateur.

13. Réfrigérateur selon la revendication 9, dans lequel l'unité de verrouillage comprend :

un actionneur (86) fixé sur la surface arrière de la porte de tiroir (22) ;
une tige d'actionnement (88) montée sur l'actionneur (86) et déplacée de manière linéaire et réciproque selon un fonctionnement de l'actionneur ; et
un encliquetage de verrouillage (90) formé dans un côté du cadre élévateur dans lequel la tige d'actionnement peut être insérée.

14. Réfrigérateur selon la revendication 13, dans lequel l'actionneur (86) est formé comme un solénoïde pour un déplacement linéaire et réciproque de la tige d'actionnement (88) lorsque du courant est appliqué sur celui-ci.

15. Réfrigérateur selon la revendication 13, dans lequel l'encliquetage de verrouillage (90) est formé dans le côté de la protubérance de guidage (52) formée sur le cadre élévateur.

FIG. 1

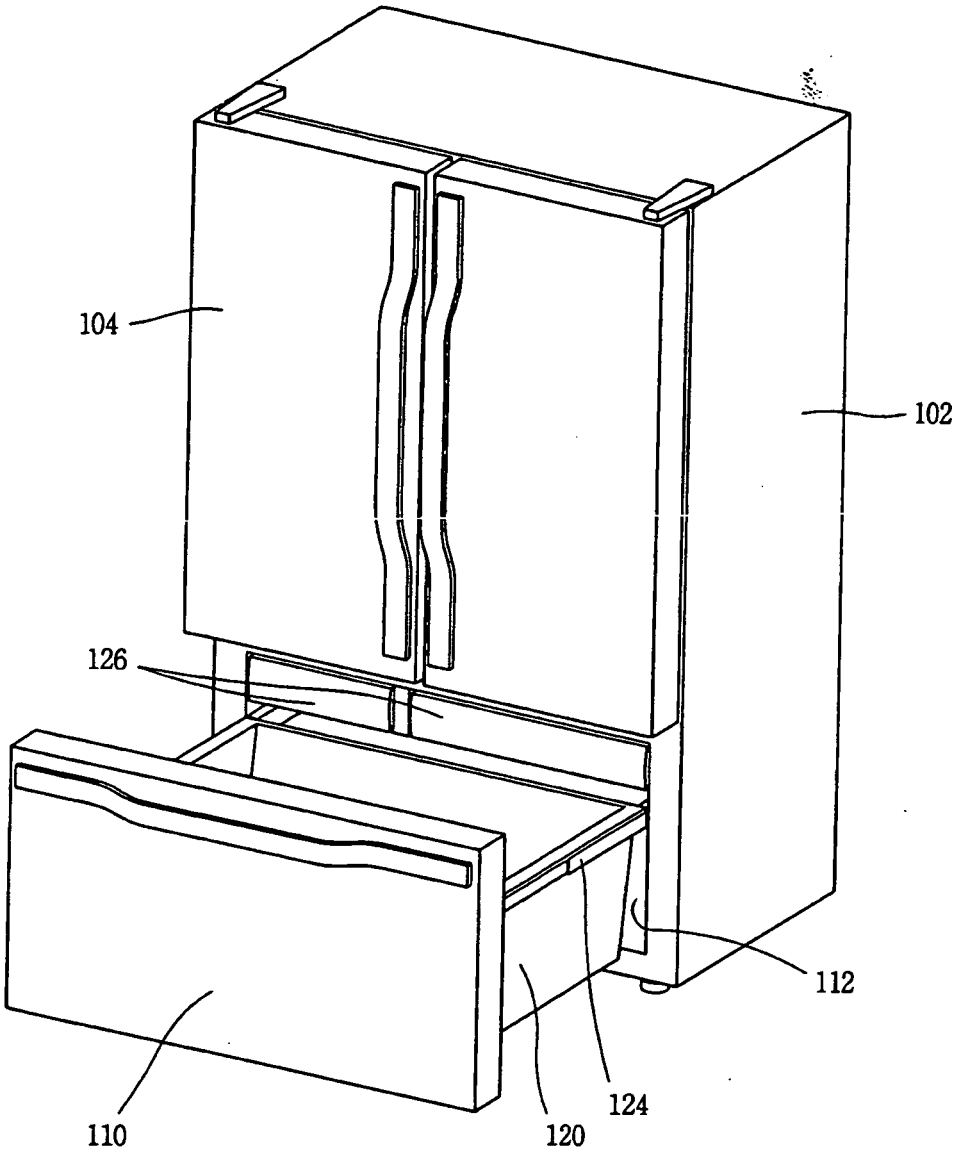


FIG. 2

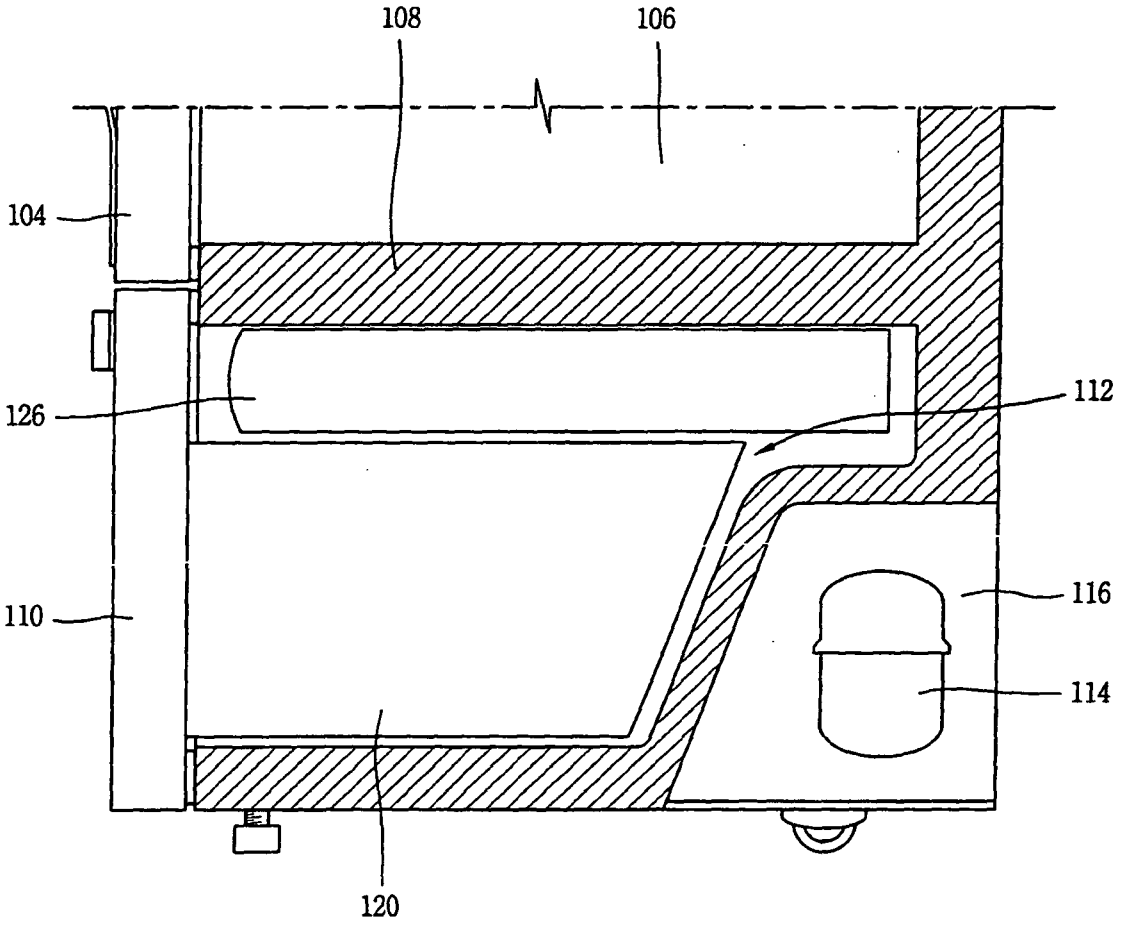


FIG. 3

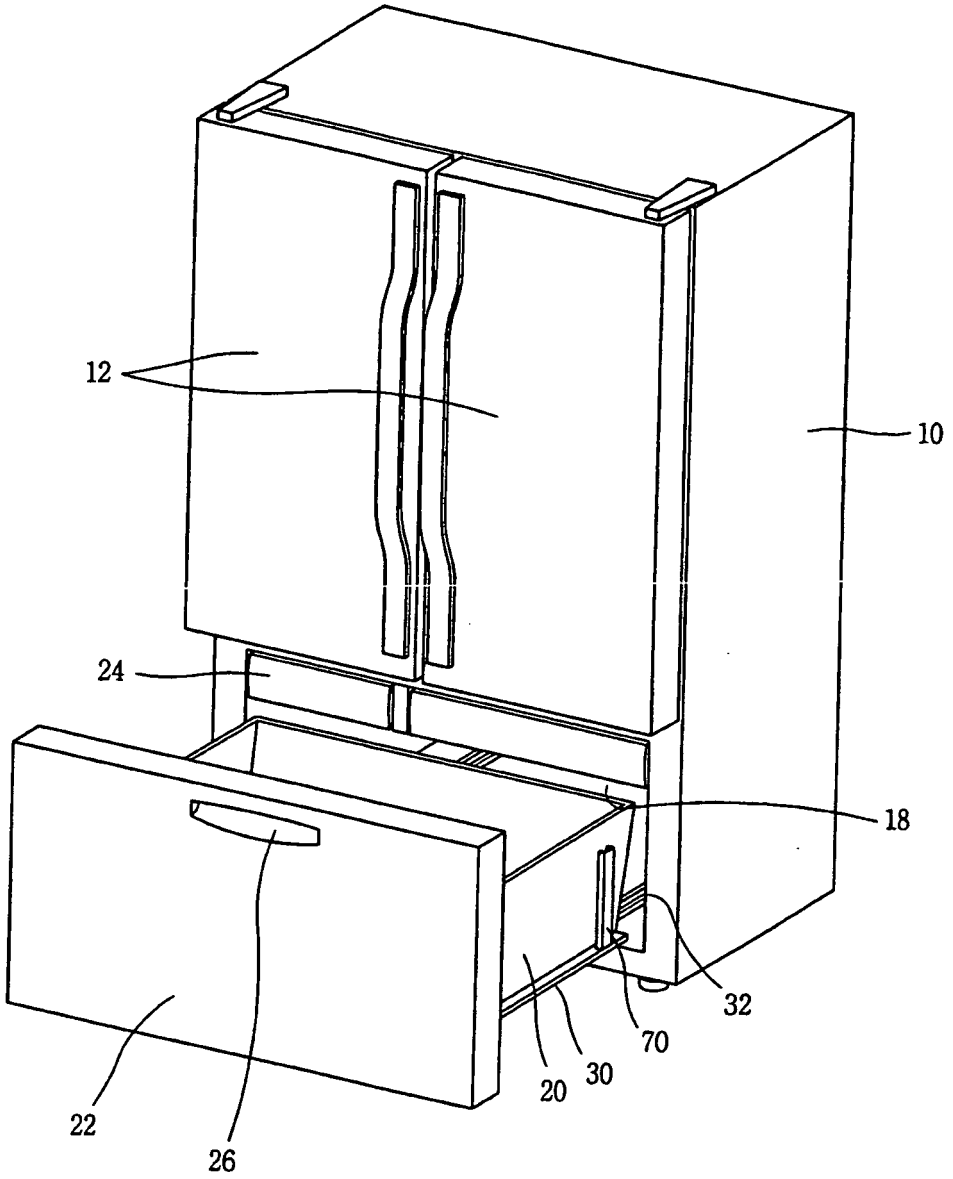


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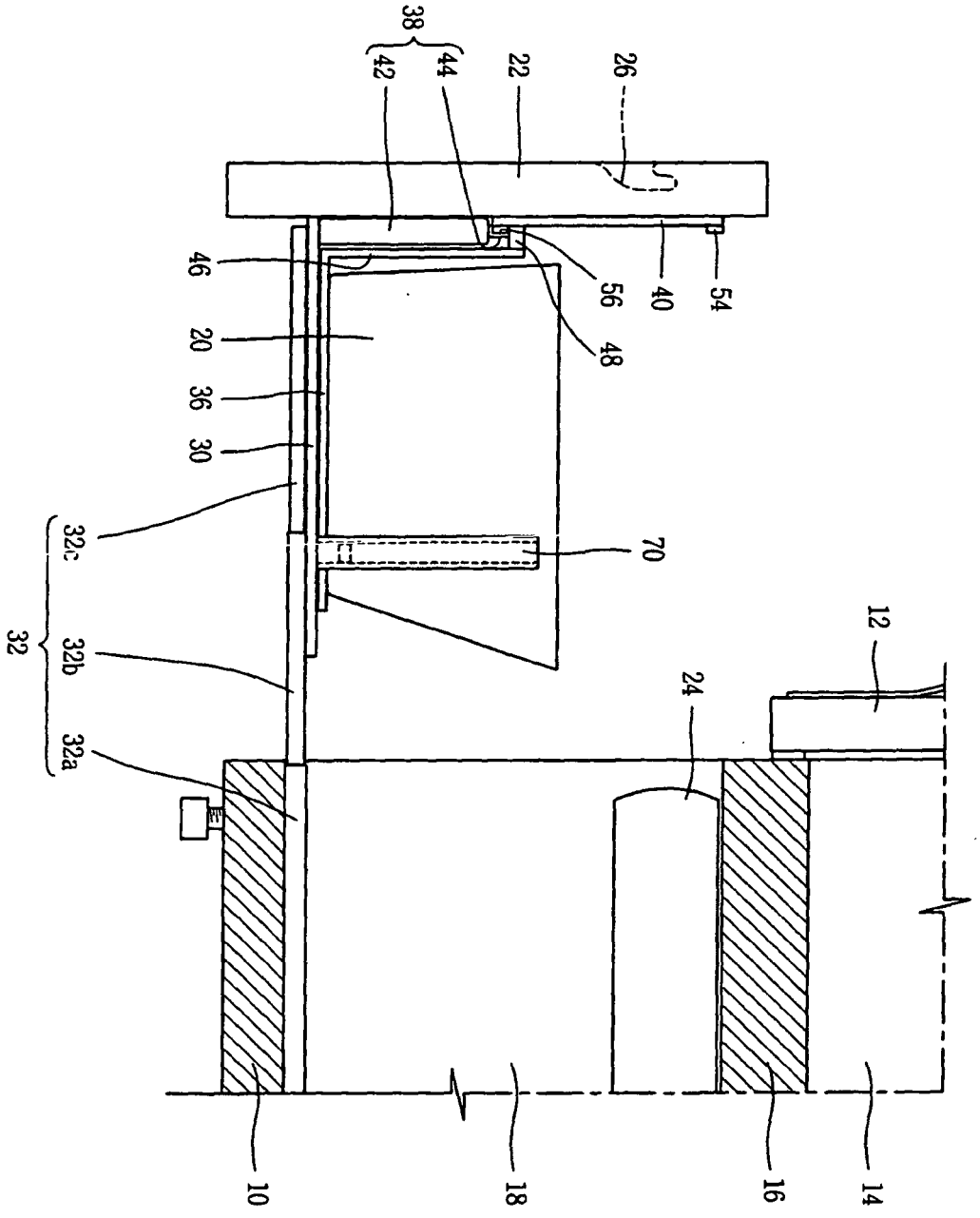

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FIG. 5

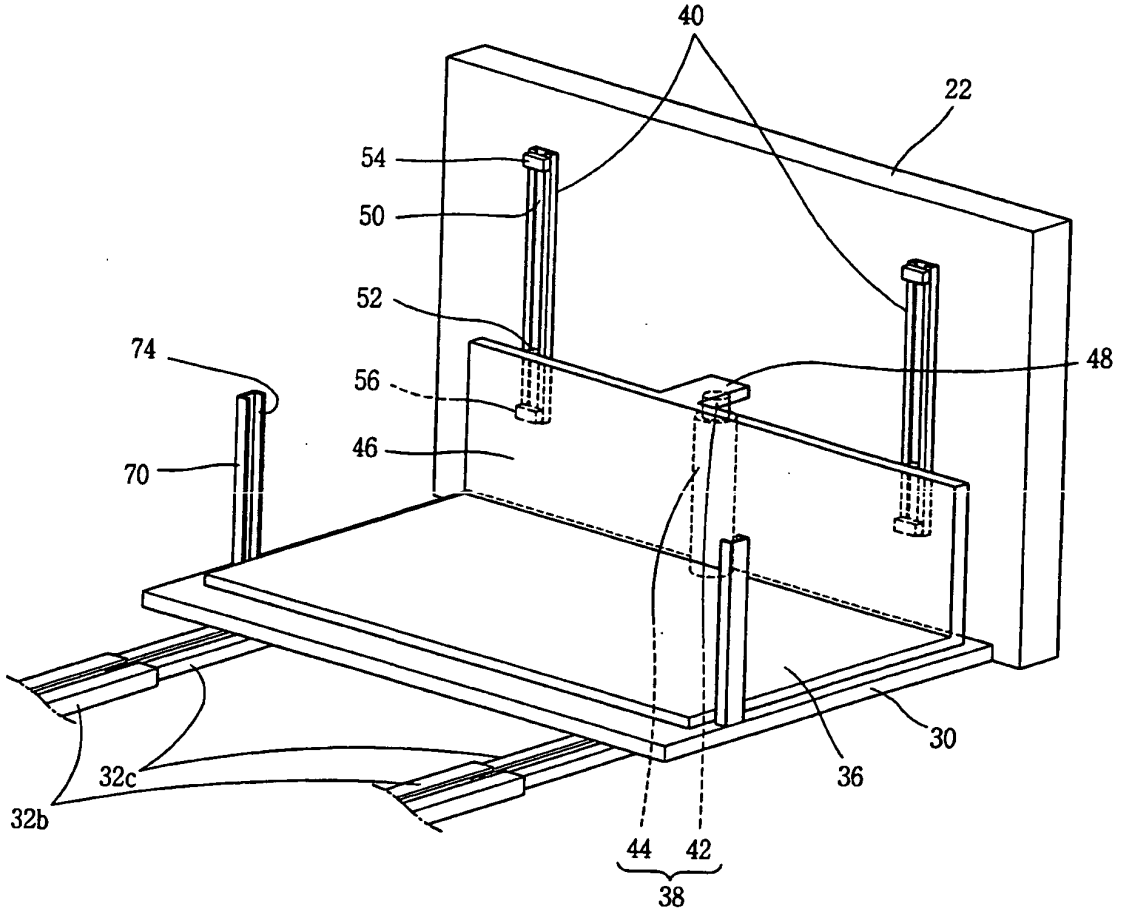


FIG. 6

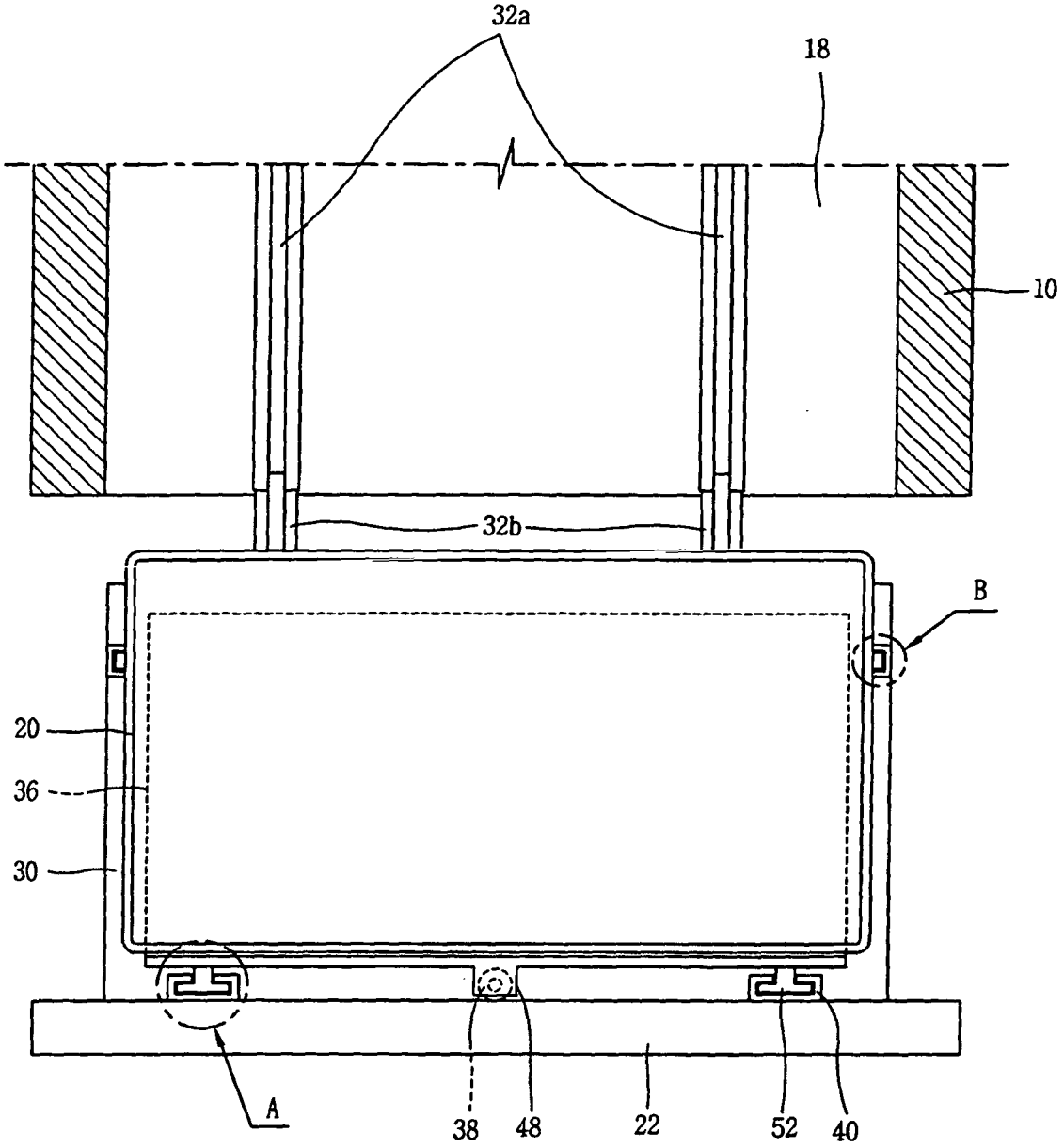


FIG. 7

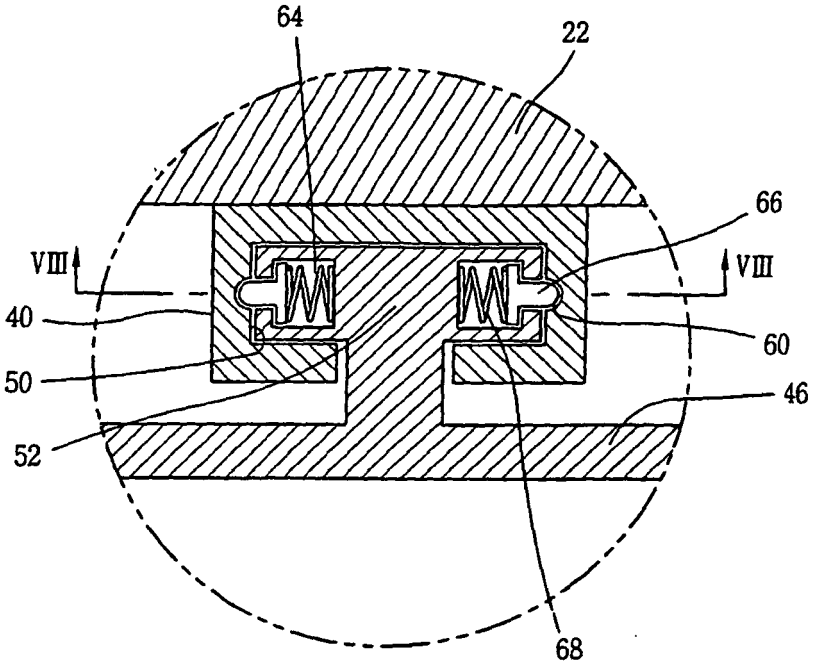


FIG. 8

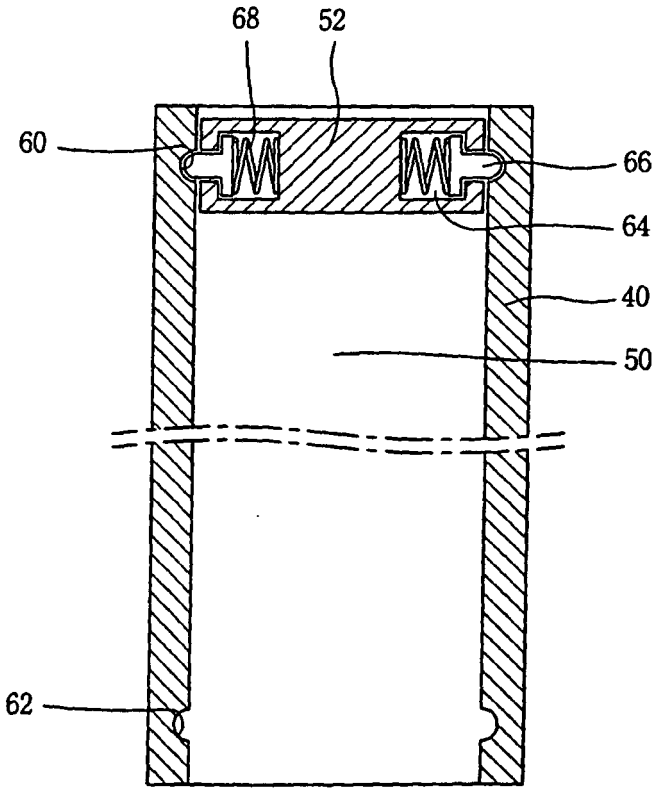


FIG. 9

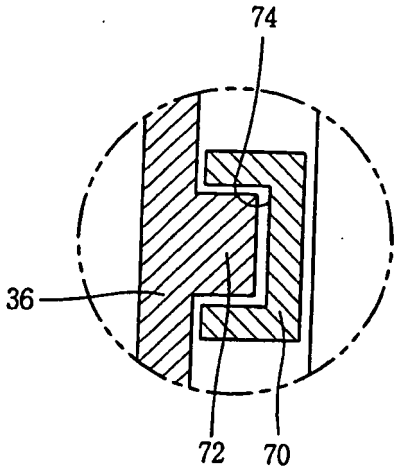


FIG. 10

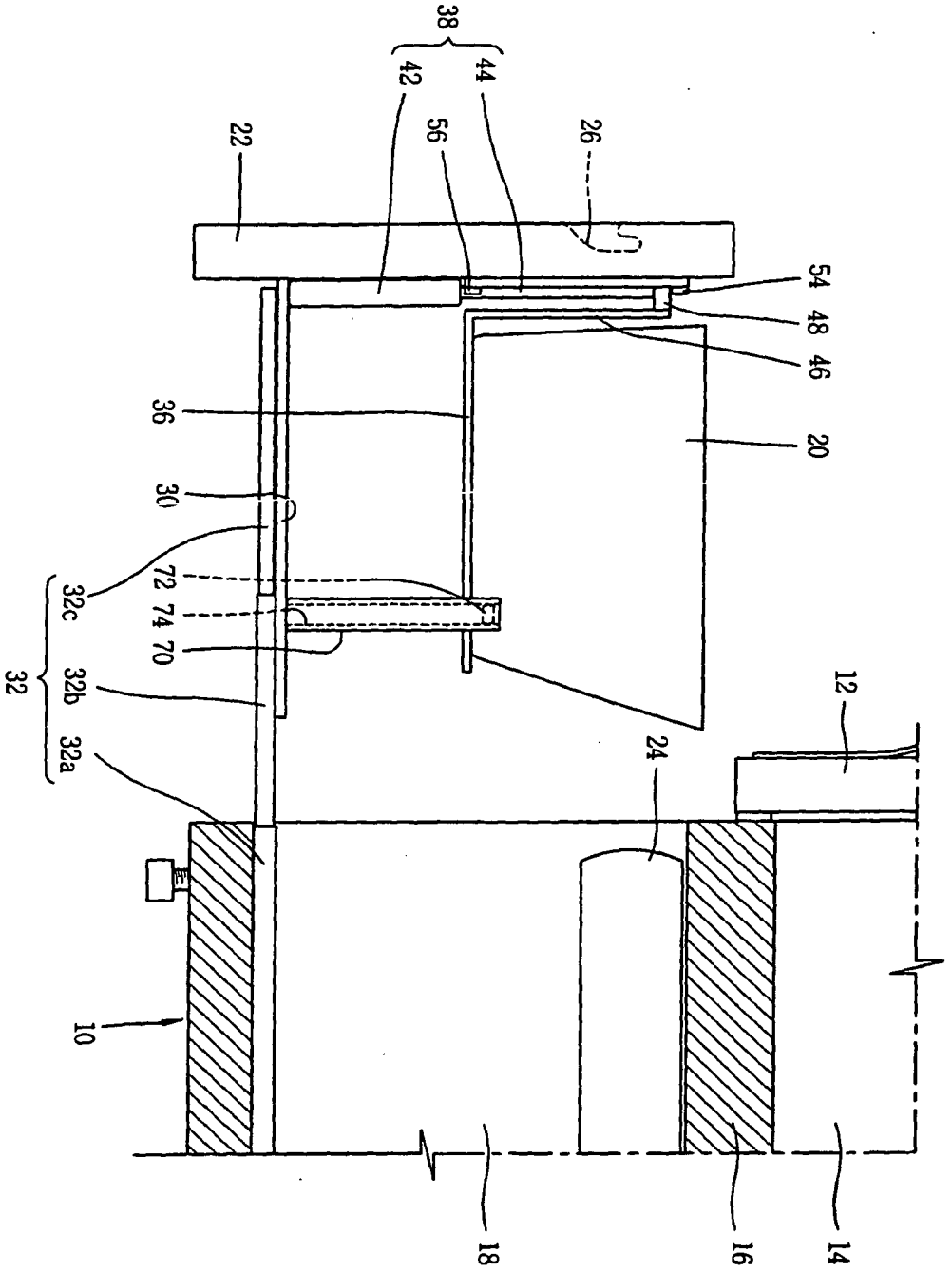

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FIG. 11

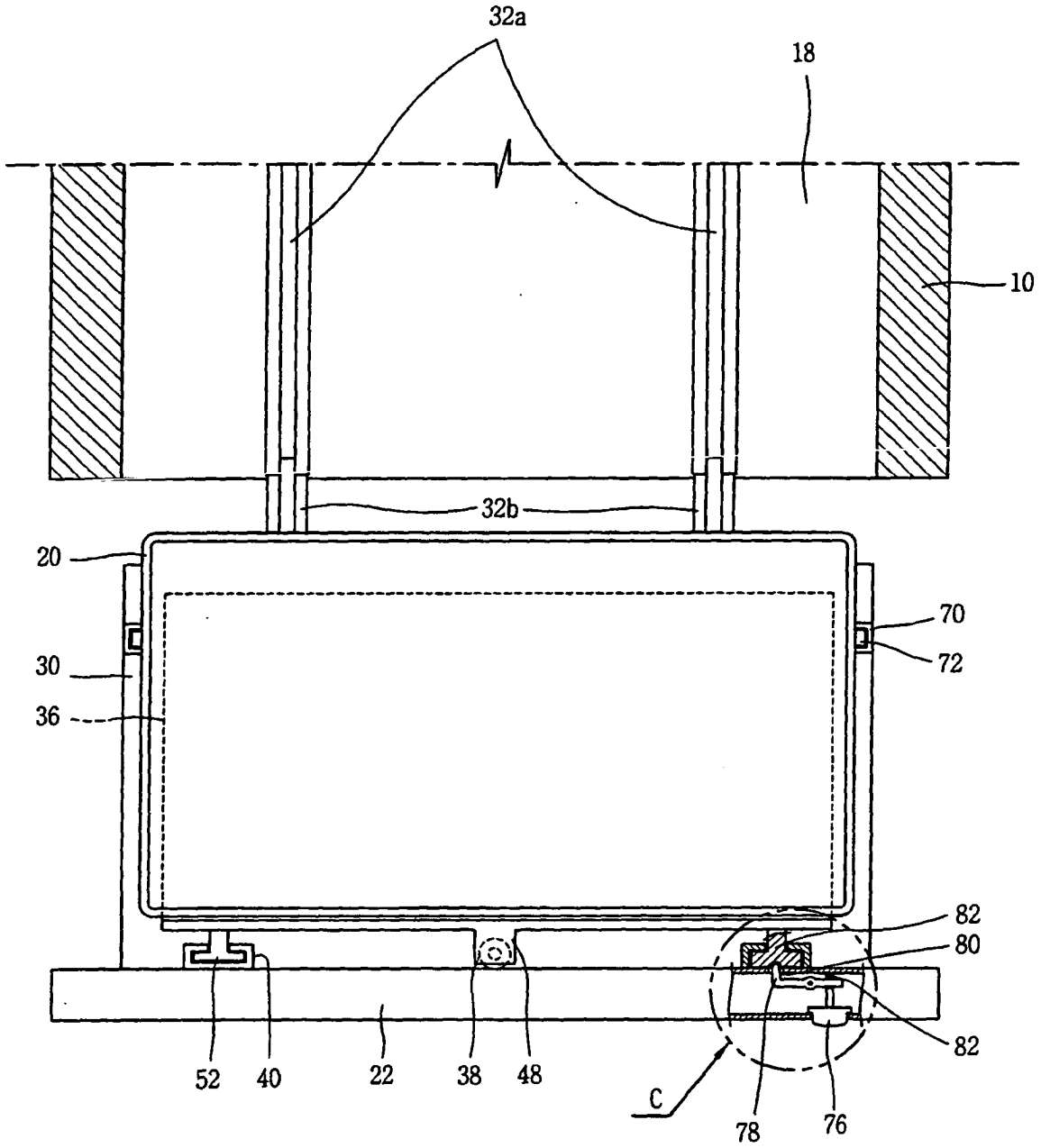


FIG. 12

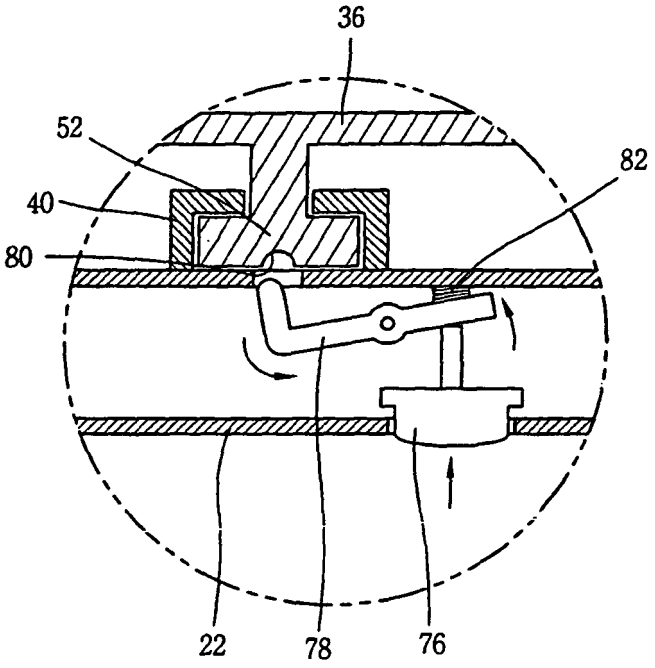


FIG. 13

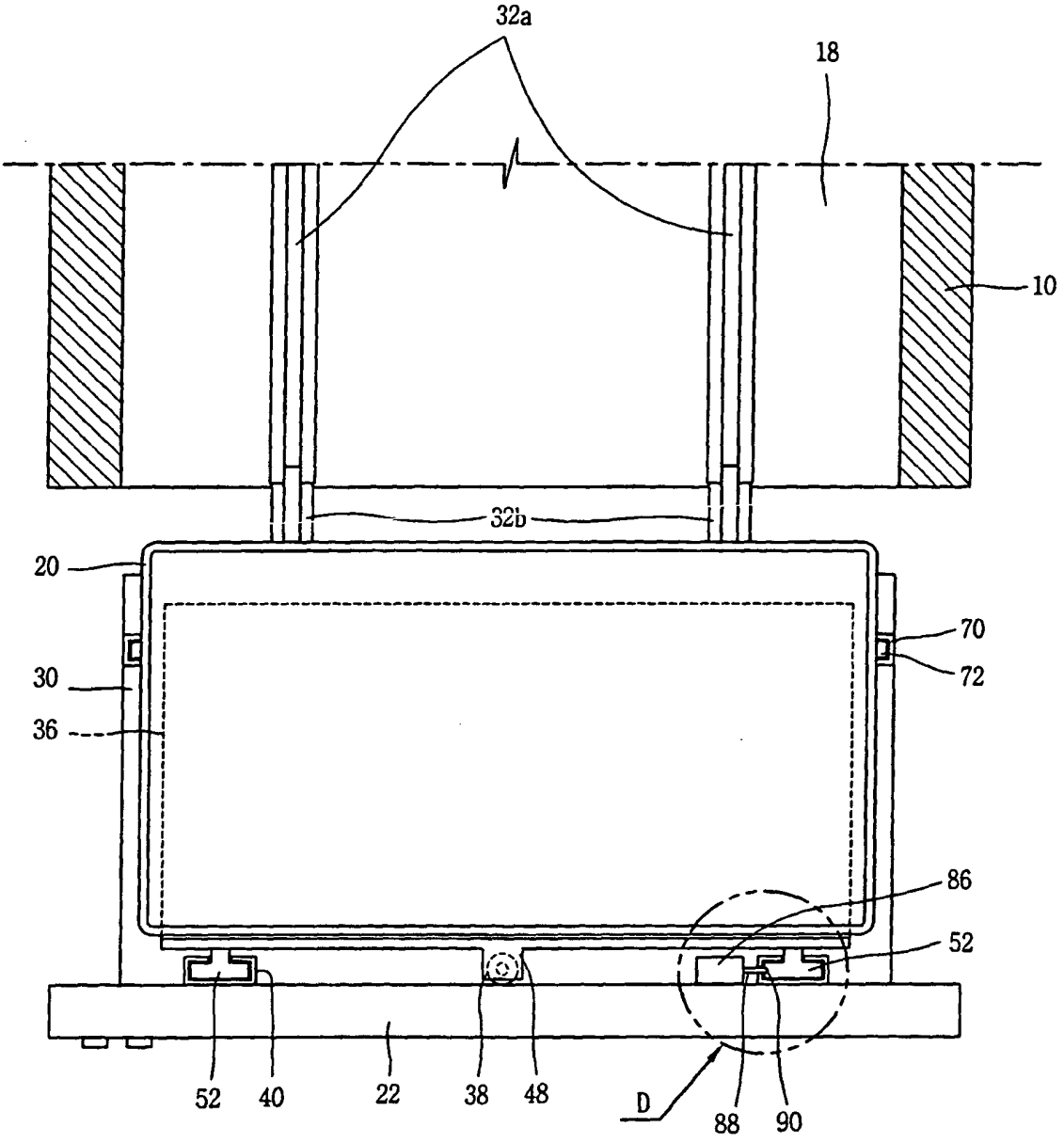
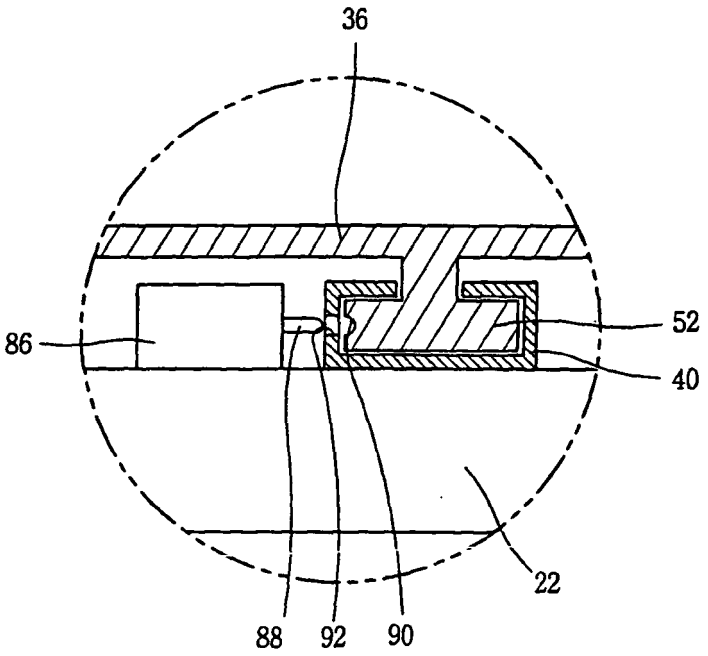


FIG. 14



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Patent documents cited in the description

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