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(54) Waste container with cushioning device

(57) A waste container includes a container body (10), a cover (20), and a cushioning device (30;40;50; 60). The container body includes a connecting seat (14) on an upper end thereof. The cover is pivotally mounted to the container body and movable between an open position and a closed position. The cover includes a pivotal seat (21) for pivotal connection with the connecting seat of the container body. The cushioning device is mounted between the connecting seat (14) of the container body and the pivotal seat (21) of the cover for cushioning downward movement of the cover (20).

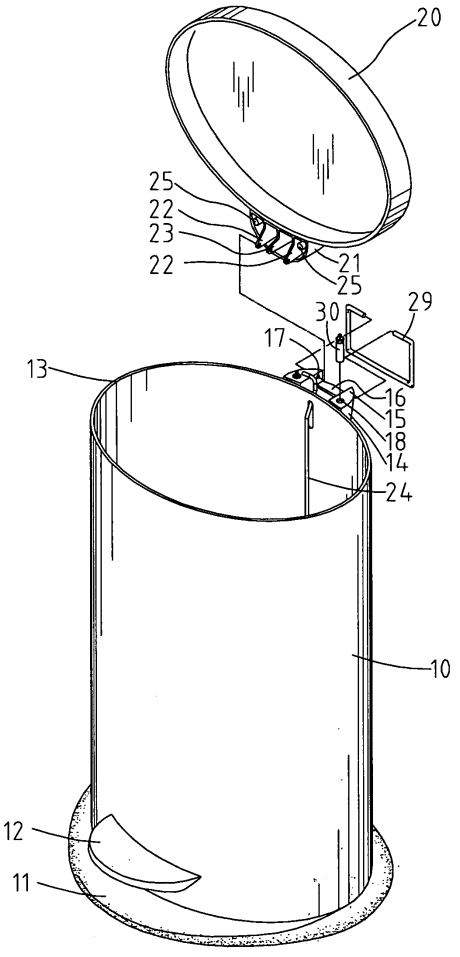

Fig.1

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Description

Field of the Invention

[0001] The present invention relates to a waste container. In particular, the present invention relates to a waste container with a buffering device for buffering downward movement of a cover of the waste container.

Background of the Invention

[0002] A conventional waste container with a buffering device for slowing downward movement of a cover is disclosed in, e.g., Taiwan Utility Model Publication No. 576427. The waste container comprises a container body, a base on which the container body is mounted, an upper ring mounted to an upper end of the container body, and a pair of covers pivotally mounted to the upper ring for covering the open upper end of the container body. Two lift bars are connected between a pedal and the covers such that the covers are pivoted to an open position revealing the upper open end of the container body when the pedal is stepped on and that the covers fall down back to their initial position covering the open upper end of the container body when the pedal is released.

[0003] A buffering device is provided for slowing down the downward movement of the covers. The cushioning device comprises a fixed seat mounted on the base; a restraining member; a push member that is securely mounted to the restraining member and the fixed seat and that has a gear; a toothed member that has an end extending through a groove in the base and that is pivotally extended through by a pivotal rod mounted to the pedal; and two elastic elements each having a first end attached to an associated lift bar and a second end attached to a retaining portion on the base.

[0004] When the pedal is stepped on, the elastic members must be overcome in addition to the weights of the covers for moving the lift bars upward for pushing the covers away from the open upper end of the container, which requires a considerable stepping force. When the pedal is released, the lift bars are rapidly moved downward by the weights of the covers and the returning forces of the elastic members. The relatively large downward forces are transmitted to the gear and the toothed section of the toothed member that are meshed with each other. After a period of time, the meshing engagement between the gear and the toothed member deteriorates and thus fails to provide the required cushioning effect. As a result, noise occurs when the covers fall onto the upper end of the container body.

[0005] Further, there are too many parts for the cushioning device, leading to troublesome and costly manufacturing and assembling procedures. Further, in a case that one or more parts of the cushioning device is damaged, the whole waste container has to be detached for repair. And it is not uncommon that the waste container is discarded instead of the troublesome repair.

Summary of the Invention

[0006] An objective of the present invention is to provide a waste container with a cushioning device that allows easy repair.

[0007] Another objective of the present invention is to provide a waste container with a cushioning device that prolongs the life of the waste container.

[0008] A further objective of the present invention is to provide a waste container with a cushioning device that allows easy manufacturing and assembling procedures at a low cost.

[0009] A waste container in accordance with the present invention comprises a container body, a cover, and a buffering device. The container body includes a connecting seat on an upper end thereof. The cover is pivotally mounted to the container body and movable between an open position and a closed position. The cover includes a pivotal seat for pivotal connection with the connecting seat of the container body. The buffering device is mounted between the connecting seat of the container body and the pivotal seat of the cover for buffering downward movement of the cover.

[0010] In an embodiment of the invention, the connecting seat includes a groove in a top face thereof. A hole is defined in two lateral walls delimiting the groove. The pivotal seat of the cover includes two pivotal sections for respective pivotal connection with the holes. A U-shaped ring has two ends extending through the pivotal sections into the holes.

[0011] Preferably, the connecting seat includes a receptacle in a top face thereof for receiving the buffering device.

[0012] In an alternative embodiment, the pivotal seat includes a receptacle in a face thereof for receiving the buffering device.

[0013] Preferably, the pivotal seat of the cover includes an abutting section for pressing against the buffering device into the receptacle when the cover is in the closed position. The abutting section may be a column, a rib, or a planar face.

[0014] In an embodiment of the invention, the buffering device includes a housing removably mounted in the receptacle, a valve body mounted in the housing and movable along a longitudinal direction of the housing, a tappet having a first end fixed to the valve body and a second end extending beyond the housing, and an elastic element for biasing the second end of the tappet out of the housing.

[0015] The valve body and the tappet are moved in a first direction in which the second end of the tappet moves out of the housing while the cover is moving from the closed position to the open position.

[0016] The second end of the tappet is pressed against by one of the cover and the connecting seat of the container body to move the tappet and the valve body in a

second direction opposite to the first direction and to compress the elastic element while the cover is moving from the open position to the closed position.

[0017] Preferably, the valve body divides an interior of the housing into an upper chamber and a lower chamber. The valve body further includes an annular groove in an outer periphery thereof and a central chamber that is in communication with the lower chamber. The annular groove is in communication with the upper compartment. Further, the annular groove is in communication with the central chamber via a radial hole that is defined in a bottom wall delimiting the annular groove. Preferably, the housing contains viscous fluid contained in the housing. Preferably, a retarding ring is mounted in the annular groove for limiting flow of the viscous fluid through the radial hole. Preferably, the elastic element is attached between an end wall of the housing and the valve body. Preferably, a padding member is mounted on the second end of the tappet. Preferably, the housing includes a closed end and an open end. And an end cap and an O-ring are provided for sealing the open end of the housing.

[0018] In another embodiment of the invention, the buffering device includes a housing removably mounted in the receptacle, a tubular tappet mounted in the housing and movable along a longitudinal direction of the housing, a valve body fixed in the housing and located in the tappet, and an elastic element attached between the valve body and the tappet for biasing the tappet out of the housing.

[0019] The tappet is moved out of the housing while the cover is moving from the closed position to the open position. The tappet is pressed against by one of the cover and the connecting seat of the container body to move the tappet into the housing and to compress the elastic element while the cover is moving from the open position to the closed position.

[0020] Preferably, the tubular tappet contains viscous fluid and includes two sealed ends. Preferably, a fixed rod has a first end fixed to the housing and a second end extending through one of the sealed ends of the tubular tappet and fixed to the valve body. Preferably, the valve body and the housing have a gap therebetween. Preferably, an end cap is provided for sealing the one of the sealed ends of the tubular tappet. Preferably, a padding member is mounted on the end cap. Preferably, a padding member is mounted on an end of the tappet to be pressed against.

[0021] In a further embodiment of the invention, the buffering device includes a housing removably mounted in the receptacle, a tappet mounted in the housing and movable along a longitudinal direction of the housing, an elastic element attached between the housing and the tappet for biasing the tappet out of the housing.

[0022] The tappet is moved out of the housing while the cover is moving from the closed position to the open position. The tappet is pressed against by one of the cover and the connecting seat of the container body to move the tappet into the housing and to compress the elastic element while the cover is moving from the open position to the closed position.

[0023] Preferably, the housing includes an open end through which the tappet extends and a closed end having a vent, allowing air in the housing to exit the housing via the vent when the cover is moving from the open position to the closed position.

[0024] Preferably, the tappet includes a padding member attached to an end thereof that is extendible out of the housing. Preferably, the elastic element is attached between an end wall of the housing and a lower end of the tappet.

[0025] In still another embodiment of the invention, the buffering device includes a gear rotatably mounted to one of the connecting seat and the pivotal seat, and a rack provided on the other of the connecting seat and the pivotal seat and meshed with the gear.

[0026] Preferably, the gear contains an oily bearing. Preferably, the rack is arcuate. Preferably, the cover further includes a reinforcing wall formed between the arcuate rack and the pivotal seat.

[0027] Preferably, the container body further includes a pedal and a lift bar that is operatively connected between the pedal and the cover such that the cover is moved from the closed position to the open position when the pedal is stepped on.

[0028] Preferably, a base is mounted to a bottom of the container body.

[0029] Other objectives, advantages, and novel features of the invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings.

Brief Description of the Drawings

[0030]

Fig. 1 is a perspective view, partly exploded, of a first embodiment of a waste container in accordance with the present invention.

Fig. 2 is an exploded perspective view of a cushioning device of the waste container in Fig. 1.

Fig. 3 is a sectional view of the waste container in Fig. 1.

Fig. 4 is an enlarged view of a circled portion in Fig. 3.

Fig. 5 is a view similar to Fig. 3, wherein a pedal is stepped on.

Fig. 6 is an enlarged view of a circled portion in Fig. 5.

Fig. 7 is a view similar to Fig. 5, wherein the pedal is released.

Fig. 8 is an enlarged view of a circled portion in Fig. 7.

Fig. 9 is a partial exploded perspective view illustrating a second embodiment of the waste container in accordance with the present invention.

Fig. 10 is a partial exploded perspective view illustrating a third embodiment of the waste container in accordance with the present invention.

Fig. 11 is a partial exploded perspective view illus-

trating a fourth embodiment of the waste container in accordance with the present invention.

Fig. 12 is an exploded perspective view illustrating a cushioning device of a fifth embodiment of the waste container in accordance with the present invention.

Fig. 13 is an enlarged sectional view of a portion of the fifth embodiment of the waste container in accordance with the present invention, wherein the cover is open.

Fig. 14 is a sectional view similar to Fig. 13, wherein the cover is closed.

Fig. 15 is an exploded perspective view illustrating a cushioning device of a sixth embodiment of the waste container in accordance with the present invention.

Fig. 16 is an enlarged sectional view of a portion of the sixth embodiment of the waste container in accordance with the present invention, wherein the cover is open.

Fig. 17 is a view similar to Fig. 15a, wherein the cover is closed.

Fig. 18 is a partial exploded perspective view illustrating a seventh embodiment of the waste container in accordance with the present invention.

Fig. 19 is an enlarged sectional view of a portion of the seventh embodiment of the waste container in accordance with the present invention, wherein the cover is open.

Fig. 20 is a view similar to Fig. 19, illustrating downward movement of the cover.

Fig. 21 is a view similar to Fig. 20, wherein the cover is closed.

Detailed Description of the Preferred Embodiments

[0031] Referring to Figs. 1 and 2, a first embodiment of a waste container in accordance with the present invention comprises a container body 10, a cover 20, and a buffering device 30 mounted between the container body 10 and the cover 20 for buffering downward movement of the cover 20.

[0032] A base 11 may be mounted to a bottom of the container body 10. Further, a pedal 12 is mounted to a lower end of the container body 10 and spaced from the bottom of the container body 10. An opening 13 is defined in an upper end of the container body 10. Formed on an outer periphery of the upper end of the container body 10 is a connecting seat 14 that has a platform 15 on a top face thereof, with a central groove 16 being defined in the platform 15. A hole 17 is defined in each of two lateral walls delimiting the central groove 16. Further, a receptacle 18 is defined in each of two ends of the platform 15. As can be seen from Fig. 1, the receptacles 18 are located on two sides of the central groove 16 respectively.

[0033] The cover 20 is pivotally mounted to the connecting seat 14 and movable between an open position revealing the opening 13 of the container body 10 and a closed position covering the opening 13. The cover 20 includes a pivotal seat 21 with two pivotal sections 22 for pivotal connection with the holes 17 of the connecting seat 14, allowing pivotal movement of the cover 20 relative to the connecting seat 14. In the illustrated embodiment, the pivotal sections 22 of the cover 20 are pivotally connected to the connecting seat 14 by a substantially U-shaped member 29 having two distal ends respectively extending through the pivotal sections 22 of the cover 20 into the holes 17 of the connecting seat 14. It is appreciated that other pivotal connection arrangements may be used for pivotally connecting the cover 20 to the container body 10.

[0034] The connecting seat 21 further includes an actuating section 23 that is connected to a lift bar 24, which, in turn, is connected to the pedal 12. By such an arrangement, when the pedal 12 is stepped on, the cover 20 is pivoted upward to the open position. Further, two abutting sections 25 are respectively provided on two sides of a bottom end of the pivotal seat 21. Each abutting section 25 is aligned with an associated receptacle 18 of the connecting seat 14 of the container body 10. In this embodiment, each abutting section 25 is in the form of a column or cylinder.

[0035] The buffering device 30 is mounted between the connecting seat 14 of the container body 10 and the pivotal seat 21 of the cover 20 for buffering downward movement of the cover 20 when the cover 20 moves downward from the open position to the closed position.

[0036] In the illustrated embodiment, the buffering device 30 comprises two sets of components respectively mounted in the receptacles 18 of the connecting seat 14. Each set includes a housing 31, an elastic element 32, a valve body 33, an end cap 34, and a tappet 35, best shown in Fig. 2.

[0037] Detailed structural arrangement and operation of the buffering device 30 will be described with respect to a set of the components and the associated elements. However, it is noted that only one set of components and associated elements are sufficient to provide the required buffering effect.

[0038] Referring to Figs. 2 through 4, the tubular housing 31 is removably mounted in the receptacle 18 and includes an open end through which viscous liquid is filled into the housing 31. The valve body 33 is mounted in the lower compartment 31 b and separates the housing 31 into an upper compartment 31 a and a lower compartment 31b, and the elastic element 32 is mounted in the housing 31 and located between the valve body 33 and an end wall of the housing 31, allowing the valve body 33 to move in the housing 31 along a longitudinal direction of the housing 31. As illustrated in Figs. 3 and 6, the valve body 33 includes an annular groove 332 in an outer periphery thereof and a central chamber 333 that is in communication with the lower compartment 31b of the housing 31 that is filled with the viscous fluid. The annular groove 332 is in communication with the upper compart-

ment 31a of the housing 31. Further, the annular groove 332 is in communication with the central chamber 333 via a radial hole 331 in a bottom wall delimiting the annular groove 332.

[0039] The end cap 34 is mounted to the open end of the housing 31. An O-ring 37 is retained in the end cap 34 by a sealing member 36. The upper end of the housing 31 is thus sealed. The tappet 35 has a lower end fixed to the valve body 33 and an upper end extending out of the end cap 34, with a soft cap 38 (padding member) being attached to the upper end of the tappet 35.

[0040] When the cover 20 is in the closed position shown in Figs. 3 and 4, the abutting section 25 of the pivotal seat 21 of the cover 20 presses against the upper end of the tappet 35. The weight of the cover 20 overcomes the elastic element 32. Thus, the cover 20 lies on top of the body 10 and covers the opening 13 of the container body 10.

[0041] Referring to Figs. 5 and 6, when the pedal 12 is stepped on, the lift bar 24 is moved upward and thus pivots the cover 20 upward to the open position. The tappet 35 is no longer pressed downward, and the elastic element 32 pushes the valve body 33 upward. As indicated by the arrows in Fig. 6, the viscous fluid in the upper compartment 31a above the valve body 33 slowly flows downward via the annular groove 332, the radial hole 331, and the central chamber 333 of the valve body 33 into the lower compartment 31b of the housing 31, creating a resistance to the longitudinal movement of the valve body 33 in the housing 31. As a result, the tappet 35 slowly moves upward. The cover 20 is rapidly moved upward without any resistance.

[0042] Referring to Figs. 7 and 8, when the pedal 12 is released, the cover 20 pivots downward relative to the body 10 under the action of gravity. Each tappet 35 is moved downward under the impact from the associated abutting section 25 of the pivotal seat 21 of the cover 20. The valve body 33 moves downward together with the tappet 35. As indicated by the arrows in Fig. 8, the viscous fluid in the lower compartment 31b of the housing 31 flows through the central chamber 333, the radial hole 331, and the annular groove 332 of the valve body 33 into the upper compartment 31a of the housing 31, creating a resistance to the downward movements of the tappet 35. Thus, the downward movement of the cover is slowed down, providing the required buffering effect.

[0043] A retarding ring 39 may be mounted in annular groove 332 to limit flow of the viscous fluid through the radial hole 331, which further slows down the movement of the valve body 33 in the housing 31.

[0044] The structural arrangement allows simple replacement of the buffering device 30 when malfunctions, as the buffering device 30 can be easily removed from the receptacle 18. The life of the waste container is thus prolonged.

[0045] Fig. 9 illustrates a second embodiment of the invention, wherein the abutting sections 26 of the pivotal seat 21 of the cover 20 are in the form of ribs.

[0046] Fig. 10 illustrates a third embodiment of the invention, wherein the abutting sections 27 of the pivotal seat 21 of the cover 20 are different from those in the previous embodiments. In this embodiment, the pivotal seat 21 includes a planar face that acts as the abutting sections 27.

[0047] Fig. 11 illustrates a third embodiment of the invention, wherein the buffering device 30 is provided on the cover 20. In particular, two receptacles 28 are defined in the pivotal seat 21 of the cover 20 for receiving the buffering device 30. Further, an abutting section 19 is provided on each of two sides of the platform 15 of the connecting seat 14 of the container body 10. A buffering effect is thus provided in a manner similar to the first embodiment.

[0048] Fig. 12 illustrates a fifth embodiment of the invention, wherein the buffering device 40 includes two sets of components each comprising a tappet 41, an elastic element 42, a valve body 43, an end cap 44, a fixed rod 45, and a housing 46 removably mounted in the receptacle 18. Detailed structural arrangement and operation of the buffering device 40 will be described with respect to a set of the components and the associated elements. However, it is noted that only one set of components and associated elements are sufficient to provide the required buffering effect.

[0049] Referring to Figs. 12 and 13, the tappet 41 is substantially tubular and includes a first end and an open second end, with a hole 47 being defined in the first end for receiving a steel ball 48 that seals the first end. Viscous fluid is contained in the tappet 41. A padding member 411 is mounted on the first end of the tappet 41. The elastic element 42 is received in the tappet 41 and includes a first end abutting against the steel ball 48 and a second end abutting against the valve body 43 that is fixed in the tappet 41. The end cap 44 is mounted to seal the open second end of the tappet 41. A padding member 49 is mounted on the end cap 44. An end of the fixed rod 45 is fixed on an end wall of the housing 46, with the other end of the fixed rod 45 extending through the end cap 44 and the padding member 49 into the valve body 43. In other words, the valve body 43 is fixed on the other end of the fixed rod 45. The tappet 41 is slidably mounted in the housing 46. A C-clip (not labeled) may be provided to prevent the tappet 41 from disengaging from the housing 46.

[0050] When the cover 20 is in its closed position, the weight of the cover 20 compresses the elastic element 42 and retains the tappet 41 in the housing 46. Referring to Fig. 13, when the cover 20 pivots upward as a result of stepping on the pedal 12, the tappet 41 is moved upward under the returning force of the elastic element 42, and the viscous fluid in a lower compartment 41b of the tappet 41 below the valve body 43 flows through a gap between the tappet 41 and the valve body 43 into an upper compartment 41a of the tappet 41 above the valve body 43, as indicated by the arrows in Fig. 13. The padding member 49 is made of a soft material for absorbing

impact to the end cap 44 during upward movement of the tappet 41.

[0051] Referring to Fig. 14, when the cover 20 pivots downward, the abutting section 25 presses against the tappet 41 of the buffering device 40 and thus moves the tappet 41 downward. As indicated by the arrows in Fig. 14, the viscous fluid in the upper compartment 41a of the tappet 41 above the valve body 43 flows through the gap between the tappet 41 and the valve body 43 into the lower compartment 41b of the tappet 41 below the valve body 43, providing a resistance to the downward movement of the valve tappet 41. Thus, the cover 20 moves downward slowly. Generation of noise upon closing of the cover 20 onto the container body 10 is avoided.

[0052] The structural arrangement allows simple replacement of the buffering device 40 when malfunctions, as the buffering device 40 can be easily removed. The life of the waste container is thus prolonged.

[0053] Figs. 15 and 16 illustrate a sixth embodiment of the invention, wherein the buffering device 50 includes two sets of components each comprising a housing 51, an elastic element 52, and a tappet 53. Detailed structural arrangement and operation of the buffering device 50 will be described with respect to a set of the components and the associated elements. However, it is noted that only one set of components and associated elements are sufficient to provide the required buffering effect.

[0054] The housing 51 is substantially cylindrical and removably mounted in the receptacle 18. The housing 51 includes a first end and an open second end. A vent 54 is defined in the first end of the housing 51 to allow passage of a small amount of air. The elastic element 52 is mounted in the housing 51. Further, the tappet 53 includes a positioning block 55 at an end thereof, with an end of the elastic element 52 abutting against the positioning block 55, and with the other end of the elastic element 52 abutting against an end wall of the housing 51. The tappet 53 is hollow and mounted in the housing 51 and movable along a longitudinal direction of the housing 51. A padding member 56 is mounted to the other end of the tappet 53 that is movable out of the housing 51. The padding member 56 provides a soft contact with the abutting section 25 of the cover 20.

[0055] When the cover 20 is in its closed position, the weight of the cover 20 compresses the elastic element 52 and retains the tappet 53 in the housing 51.

[0056] Referring to Fig. 16, when the cover 20 pivots upward as a result of stepping on the pedal 12, the tappet 53 is moved upward under the returning force of the elastic element 52. Ambient air is sucked into the housing 51 via the vent 54, as indicated by the arrows.

[0057] Referring to Fig. 17, when the cover 20 pivots downward as a result of release of the pedal 12, the abutting section 25 abuts against the upper end of the tappet 53 and thus moves the tappet 53 downward into the housing 51 while compressing the elastic element 52, and air in the housing 51 exits the housing 51 via the vent 54 to provide a buffering effect for slowing down movement of the tappet 53, as indicated by the arrows. This embodiment also provides a buffering effect for the cover 20 to prevent generation of noise upon closing of the cover 20. A C-clip 57 may be mounted to the housing 51 to prevent the tappet 53 from disengaging from the housing 51. The C-clip 57 may be formed by bending a wire.

[0058] It is appreciated that the structures of Figs. 12 through 17 can be applied to the third embodiment in which the buffering device is provided on the cover 20. In other words, the buffering devices 40 and 50 in Figs. 12 through 17 can be mounted to the cover 20.

[0059] Figs. 18 and 19 illustrate a seventh embodiment of the invention, wherein the buffering device 60 includes two sets of components each comprising a gear 61 and an arcuate rack 62. Detailed structural arrangement and operation of the buffering device 60 will be described with respect to a set of the components and the associated elements. However, it is noted that only one set of components and associated elements are sufficient to provide the required buffering effect.

[0060] The gear 61 is rotatably mounted on the connecting seat 14 of the container body 10. The gear 61 meshes with the arcuate rack 62 and contains an oily bearing (not shown) for lubrication purposes. As illustrated in Figs. 18 and 19, the arcuate rack 62 extends downward from the pivotal seat 21 of the cover 20. Further, a reinforcing wall 63 may be formed between the arcuate rack 62 and the pivotal seat 21. In this embodiment, the arcuate rack 62 extends from the abutting section 26.

[0061] Referring to Figs. 20 and 21, when the cover 20 pivots downward, the arcuate rack 62 causes rotation of the gear 61, thereby slowing down the downward movement of the cover 20 and avoiding generation of noise upon closing of the cover 20.

[0062] Although specific embodiments have been illustrated and described, numerous modifications and variations are still possible without departing from the essence of the invention. The scope of the invention is limited by the accompanying claims.

Claims

1. A waste container comprising:

a container body (10) including a connecting seat (14) on an upper end thereof;
a cover (20) pivotally mounted to the container body and movable between an open position and a closed position, the cover including a pivotal seat (21) for pivotal connection with the connecting seat (14) of the container body; and
a buffering device (30; 40; 50; 60) mounted between the connecting seat (14) of the container body and the pivotal seat (21) of the cover for buffering downward movement of the cover (20).

2. The waste container as claimed in claim 1, wherein:

the connecting seat (14) includes a groove (16) in a top face thereof;
a hole (17) is defined in two lateral walls delimiting the groove (16); and
the pivotal seat (21) of the cover (20) includes two pivotal sections (22) for respective pivotal connection with the holes (17).

3. The waste container as claimed in claim 2, wherein the waste container includes a U-shaped ring having two ends extending through the pivotal sections (22) into the holes (17).

4. The waste container as claimed in claim 1, wherein the connecting seat (14) includes a receptacle (18) in a top face thereof for receiving the buffering device (30; 40; 50).

5. The waste container as claimed in claim 1, wherein the pivotal seat (21) includes a receptacle (28) in a face thereof for receiving the buffering device (30; 40; 50).

6. The waste container as claimed in claim 4, wherein the pivotal seat (21) of the cover (2) includes an abutting section (25; 26; 27) for pressing against the buffering device (30) into the receptacle (18) when the cover (2) is in the closed position.

7. The waste container as claimed in claim 6, wherein the abutting section includes a column (25).

8. The waste container as claimed in claim 6, wherein the abutting section includes a rib (26).

9. The waste container as claimed in claim 6, wherein the abutting section includes a planar face (27).

10. The waste container as claimed in claim 4 or 5, wherein:

the buffering device (30) includes a housing (31) removably mounted in the receptacle (18), a valve body (33) mounted in the housing and movable along a longitudinal direction of the housing, a tappet (35) having a first end fixed to the valve body (33) and a second end extending beyond the housing (31), and an elastic element (32) having an end attached to the valve body (33) for biasing the tappet (35) out of the housing;
wherein the valve body (33) and the tappet (35) are moved in a first direction in which the second end of the tappet (35) moves out the housing while the cover (20) is moving from the closed position to the open position; and
wherein the second end of the tappet (35) is pressed against by one of the cover (20) and the connecting seat (14) of the container body (10) to move the tappet (35) and the valve body (33) in a second direction opposite to the first direction and to compress the elastic element (32) while the cover (20) is moving from the open position to the closed position.

11. The waste container as claimed in claim 10, wherein:

the valve body (33) divides an interior of the housing (31) into an upper chamber (31a) and a lower chamber (31b);
the valve body (33) further includes an annular groove (332) in an outer periphery thereof and a central chamber (333) that is in communication with the lower chamber (31b);
the annular groove (332) is in communication with the upper compartment (31a); and
the annular groove (332) is in communication with the central chamber (333) via a radial hole (331) that is defined in a bottom wall delimiting the annular groove (332).

12. The waste container as claimed in claim 11, further comprising viscous fluid contained in the housing (31).

13. The waste container as claimed in claim 12, further comprising a retarding ring (39) mounted in the annular groove (332) for limiting flow of the viscous fluid through the radial hole (331).

14. The waste container as claimed in claim 10, wherein the elastic element (32) is attached between an end wall of the housing (31) and the valve body (33).

15. The waste container as claimed in claim 10, further comprising a padding member (38) mounted on the second end of the tappet (35).

16. The waste container as claimed in claim 12, wherein the housing (31) includes a closed end and an open end, further comprising an end cap (36) and an O-ring (37) for sealing the open end of the housing (31).

17. The waste container as claimed in claim 4 or 5, wherein:

the buffering device (40) includes a housing (46) removably mounted in the receptacle (18), a tubular tappet (41) mounted in the housing (46) and movable along a longitudinal direction of the housing, a valve body (43) fixed in the housing (46) and located in the tappet (41), and an elastic element (42) attached between the valve body (43) and the tappet (41) for biasing the tappet

(41) out of the housing (46);
wherein the tappet (41) is moved out of the housing (46) while the cover (20) is moving from the closed position to the open position; and
wherein the tappet (41) is pressed against by one of the cover (20) and the connecting seat (14) of the container body (10) to move the tappet (41) into the housing (46) and to compress the elastic element (42) while the cover (20) is moving from the open position to the closed position.

18. The waste container as claimed in claim 17, wherein the tubular tappet (41) contains viscous fluid and includes two sealed ends.

19. The waste container as claimed in claim 18, wherein the buffering device (40) further includes a fixed rod (45) having a first end fixed to the housing (46) and a second end extending through one of the sealed ends of the tubular tappet (41) and fixed to the valve body (43).

20. The waste container as claimed in claim 17, wherein the valve body (43) and the housing (46) have a gap therebetween.

21. The waste container as claimed in claim 19, wherein the buffering device (40) further includes an end cap (44) for sealing the one of the sealed ends of the tubular tappet (41).

22. The waste container as claimed in claim 21, wherein the buffering device (40) further including a padding member (49) mounted on the end cap (44).

23. The waste container as claimed in claim 17, wherein the tappet (41) further includes a padding member (411) mounted on an end thereof to be pressed against.

24. The waste container as claimed in claim 4 or 5, wherein the
the buffering device (50) includes a housing (51) removably mounted in the receptacle (18), a tappet (53) mounted in the housing (51) and movable along a longitudinal direction of the housing, an elastic element (42) attached between the housing (51) and the tappet (53) for biasing the tappet (53) out of the housing (51);
wherein the tappet (53) is moved out of the housing (51) while the cover (20) is moving from the closed position to the open position; and
wherein the tappet (53) is pressed against by one of the cover (20) and the connecting seat (14) of the container body (10) to move the tappet (51) into the housing (51) and to compress the elastic element (52) while the cover (20) is moving from the open position to the closed position.

25. The waste container as claimed in claim 24, wherein the housing (51) includes an open end through which the tappet (53) extends and a closed end having a vent (54), allowing air in the housing to exit the housing via the vent when the cover is moving from the open position to the closed position.

26. The waste container as claimed in claim 24, wherein the tappet (53) includes a padding member (56) attached to an end thereof that is extendible out of the housing.

27. The waste container as claimed in claim 24, wherein the elastic element (52) is attached between an end wall of the housing (53) and a lower end of the tappet (53).

28. The waste container as claimed in claim 1, wherein the buffering device (60) includes:

a gear (61) rotatably mounted to one of the connecting seat (14) and the pivotal seat (21), and
a rack (62) provided on the other of the connecting seat (14) and the pivotal seat (24),
wherein the arcuate rack (62) meshes with the gear (61).

29. The waste container as claimed in claim 28, wherein the gear (61) is mounted on the connecting seat (14) and the rack (62) is provided on the pivotal seat (21).

30. The waste container as claimed in claim 28, wherein the gear (61) contains an oily bearing.

31. The waste container as claimed in claim 28, wherein the rack (62) is arcuate.

32. The waste container as claimed in claim 28, wherein the cover (20) further includes a reinforcing wall (63) formed between the arcuate rack (62) and the pivotal seat (24).

33. The waste container as claimed in claim 1, wherein the container body (10) further includes a pedal (12) and a lift bar (24) that is operatively connected between the pedal (12) and the cover (20) such that the cover (20) is moved from the closed position to the open position when the pedal (12) is stepped on.

34. The waste container as claimed in claim 1, further comprising a base (11) mounted to a bottom of the container body (10).

Amended claims in accordance with Rule 86(2) EPC.

1. A waste container comprising:

a container body (10) including a connecting seat (14) on an upper end thereof;
a cover (20) pivotally mounted to the container body and movable between an open position and a closed position, the cover including a pivotal seat (21) for pivotal connection with the connecting seat (14) of the container body; and
a cushioning device (30; 40) mounted between the connecting seat (14) of the container body and the pivotal seat (21) of the cover for buffering downward movement of the cover (20);
wherein the connecting seat or the pivotal seat includes a receptacle (18) in a top face thereof for receiving the cushioning device (30; 40); and
wherein the cushioning device comprises:

a housing (31) removably mounted in the receptacle (18),
a valve body (33, 43) mounted in the housing,
a tappet (35, 41) movable along a longitudinal direction of the housing, having its one end extending beyond the housing (31), and an elastic element (32, 42) having an end attached to the valve body (33, 43) for biasing the tappet (35, 41) out of the housing;
wherein the tappet (35, 41) is moved in a first direction in which the one end of the tappet (35, 41) moves out the housing while the cover (20) is moving from the closed position to the open position; and
wherein the one end of the tappet (35, 41) is pressed against by one of the cover (20) and the connecting seat (14) of the container body (10) to move the tappet (35, 41) and in a second direction opposite to the first direction and to compress the elastic element (32, 42) while the cover (20) is moving from the open position to the closed position;
characterized by the valve body (33) being mounted in the housing such that it separates the housing into an upper compartment (31a, 41a) and a lower compartment (31b, 41b).

2. The waste container as claimed in claim 1, wherein:

the connecting seat (14) includes a groove (16) in a top face thereof;
a hole (17) is defined in two lateral walls delimiting the groove (16); and
the pivotal seat (21) of the cover (20) includes two pivotal sections (22) for respective pivotal connection with the holes (17).

3. The waste container as claimed in claim 2, wherein the waste container includes a U-shaped ring having two ends extending through the pivotal sections (22) into the holes (17).

4. The waste container as claimed in claim 1, wherein the pivotal seat (21) of the cover (2) includes an abutting section (25; 26; 27) for pressing against the buffering device (30) into the receptacle (18) when the cover (2) is in the closed position.

5. The waste container as claimed in claim 4, wherein the abutting section includes a column (25).

6. The waste container as claimed in claim 4, wherein the abutting section includes a rib (26).

7. The waste container as claimed in claim 4, wherein the abutting section includes a planar face (27).

8. The waste container as claimed in claim 1, wherein:

the valve body (33) is movable along a longitudinal direction of the housing, and the tappet (35) has its other end attached to the valve body (33).

9. The waste container as claimed in claim 8, wherein:

the valve body (33) further includes an annular groove (332) in an outer periphery thereof and a central chamber (333) that is in communication with the lower chamber (31b);
the annular groove (332) is in communication with the upper compartment (31a); and
the annular groove (332) is in communication with the central chamber (333) via a radial hole (331) that is defined in a bottom wall delimiting the annular groove (332).

10. The waste container as claimed in claim 9, further comprising viscous fluid contained in the housing (31).

11. The waste container as claimed in claim 10, further comprising a retarding ring (39) mounted in the annular groove (332) for limiting flow of the viscous fluid through the radial hole (331).

12. The waste container as claimed in claim 8, wherein the elastic element (32) is attached between an end wall of the housing (31) and the valve body (33).

13. The waste container as claimed in claim 8, further comprising a padding member (38) mounted on the second end of the tappet (35).

14. The waste container as claimed in claim 10, wherein the housing (31) includes a closed end and an open end, further comprising an end cap (36) and an O-ring (37) for sealing the open end of the housing (31).

15. The waste container as claimed in claim 1, wherein:

the tappet (41) is tubular and the valve body (43) is fixed to the housing (46) and is located within the tappet (41), and the elastic element (42) is attached between the valve body (43) and the tappet (41).

16. The waste container as claimed in claim 15, wherein the tubular tappet (41) contains viscous fluid and includes two sealed ends.

17. The waste container as claimed in claim 16, wherein valve body (43) is fixed to the housing (46) via a fixed rod (45) having a first end fixed to the housing (46) and a second end extending through one of the sealed ends of the tubular tappet (41) and fixed to the valve body (43).

18. The waste container as claimed in claim 15, wherein the valve body (43) and the housing (46) have a gap therebetween.

19. The waste container as claimed in claim 17, wherein the cushioning device (40) further includes an end cap (44) for sealing the one of the sealed ends of the tubular tappet (41).

20. The waste container as claimed in claim 19, wherein the cushioning device (40) further includes a padding member (49) mounted on the end cap (44).

21. The waste container as claimed in claim 15, wherein the tubular tappet (41) further includes a padding member (411) mounted on an end thereof to be pressed against.

22. A waste container comprising:

a container body (10) including a connecting seat (14) on an upper end thereof;
a cover (20) pivotally mounted to the container body and movable between an open position and a closed position, the cover including a pivotal seat (21) for pivotal connection with the connecting seat (14) of the container body; and
a cushioning device (50) mounted between the connecting seat (14) of the container body and the pivotal seat (21) of the cover for buffering downward movement of the cover (20);
wherein the connecting seat or the pivotal seat includes a receptacle (18) in a top face thereof for receiving the cushioning device (50); and
wherein the cushioning device (50) comprises:

a housing (51) removably mounted in the receptacle (18),
a tappet (53) mounted in the housing (51) and movable along a longitudinal direction of the housing,
an elastic element (42) attached between the housing (51) and the tappet (53) for biasing the tappet (53) out of the housing (51);
wherein the tappet (53) is moved out of the housing (51) while the cover (20) is moving from the closed position to the open position;
wherein the tappet (53) is pressed against by one of the cover (20) and the connecting seat (14) of the container body (10) to move the tappet (51) into the housing (51) and to compress the elastic element (52) while the cover (20) is moving from the open position to the closed position, and
characterized in that the housing (51) includes an open end through which the tappet (53) extends and a closed end having a vent (54), allowing air in the housing to exit the housing via the vent when the cover is moving from the open position to the closed position.

23. The waste container as claimed in claim 22, wherein the tappet (53) includes a padding member (56) attached to an end thereof that is extendible out of the housing.

24. The waste container as claimed in claim 22, wherein the elastic element (52) is attached between an end wall of the housing (53) and a lower end of the tappet (53).

25. The waste container as claimed in claim 1, wherein the container body (10) further includes a pedal (12) and a lift bar (24) that is operatively connected between the pedal (12) and the cover (20) such that the cover (20) is moved from the closed position to the open position when the pedal (12) is stepped on.

26. The waste container as claimed in claim 1, further comprising a base (11) mounted to a bottom of the container body (10).

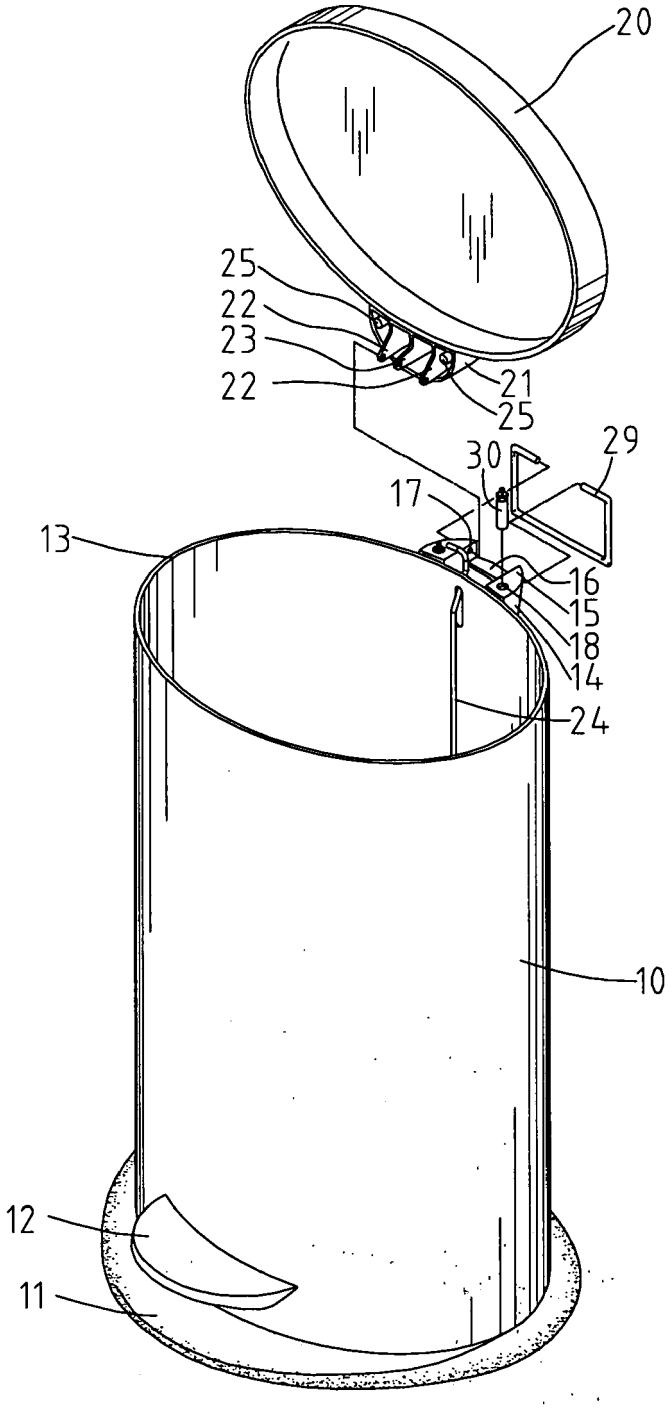

Fig.1

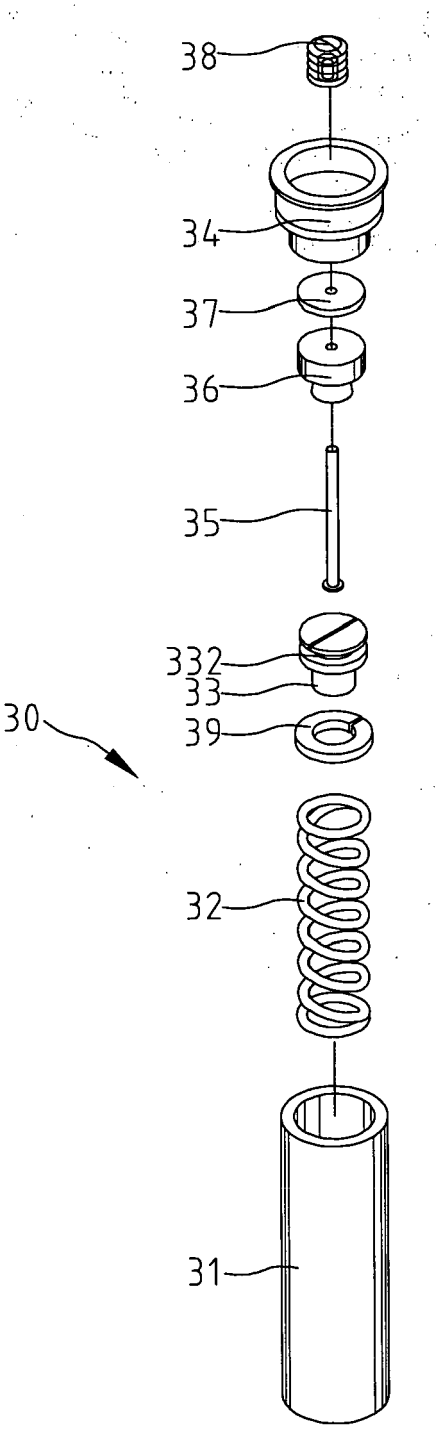

Fig.2

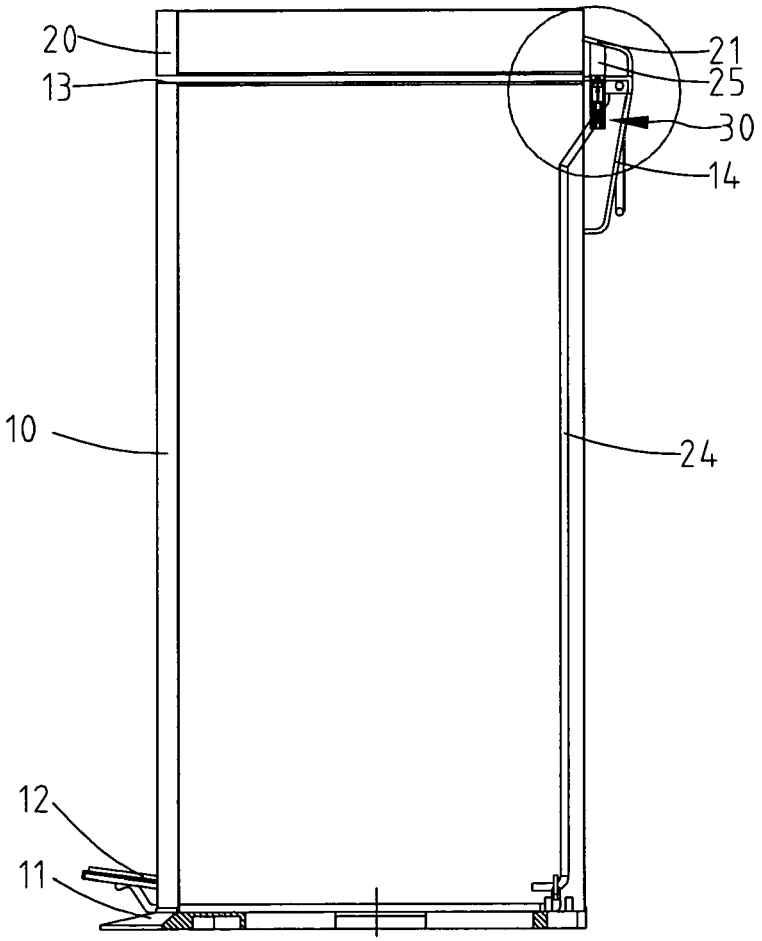

Fig.3

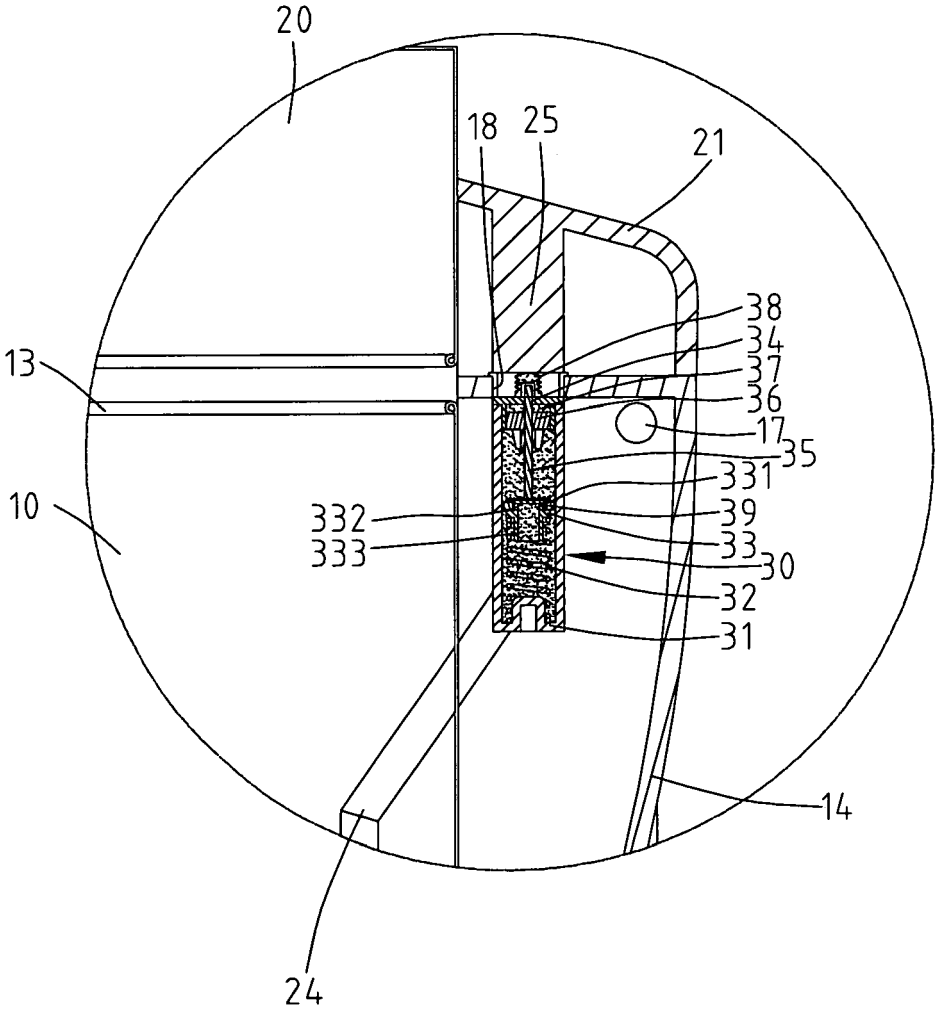

Fig.4

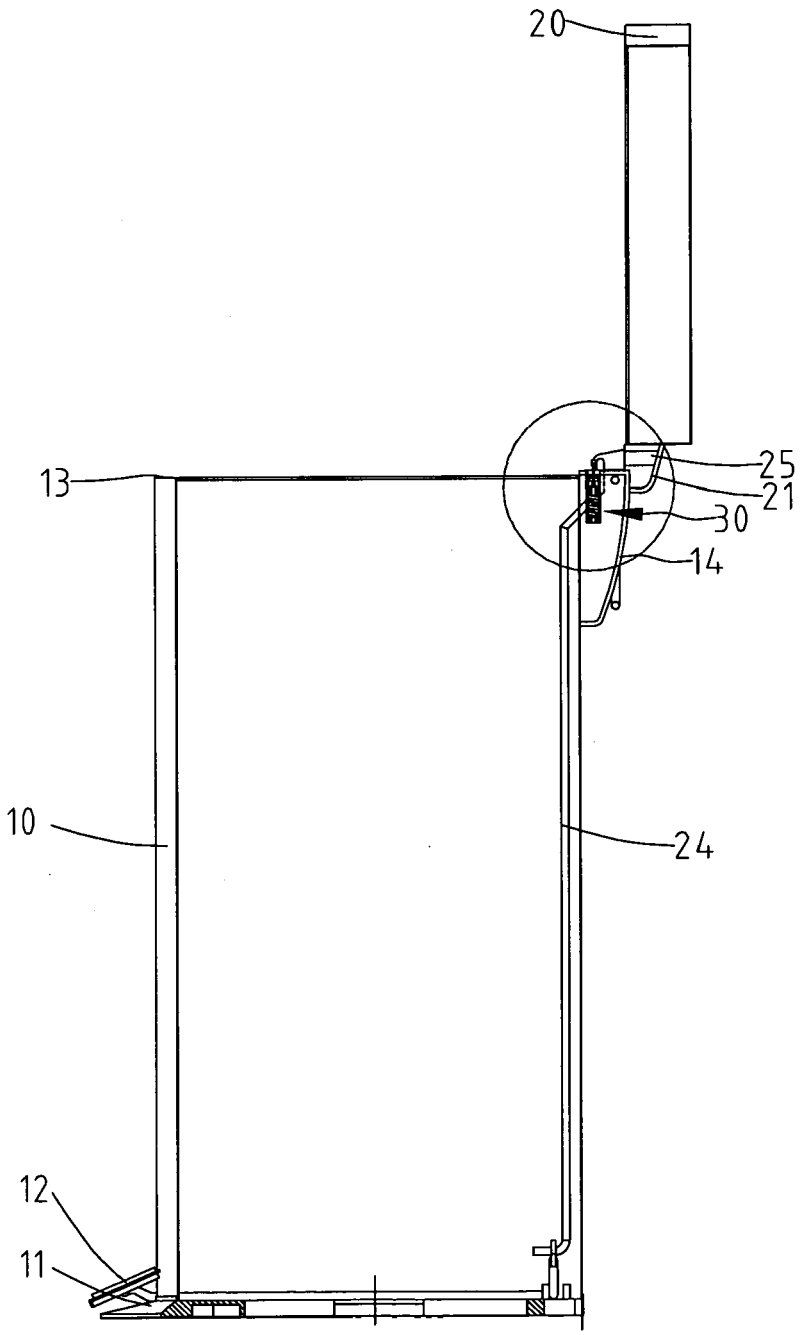

Fig.5

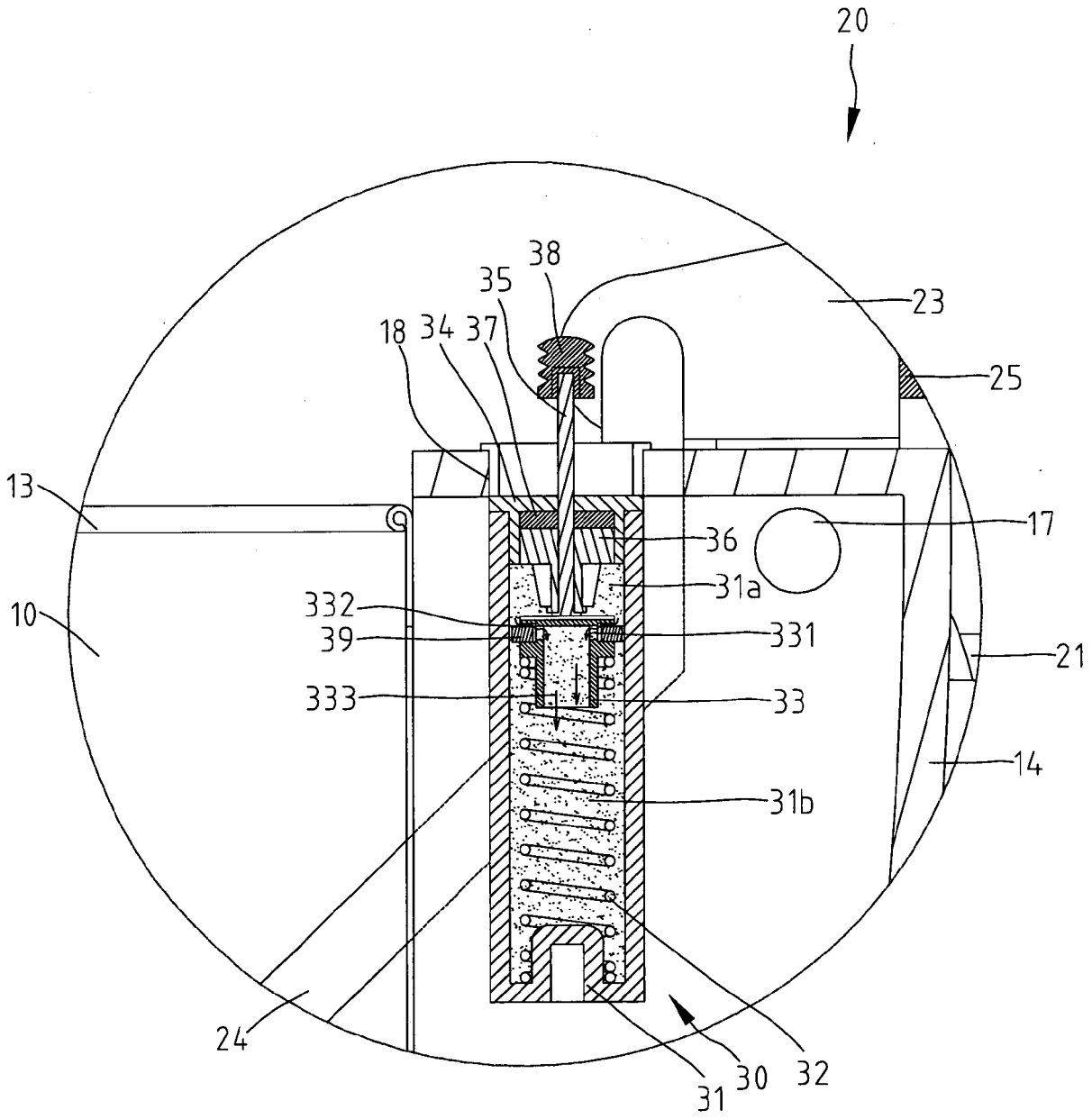
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Fig.6

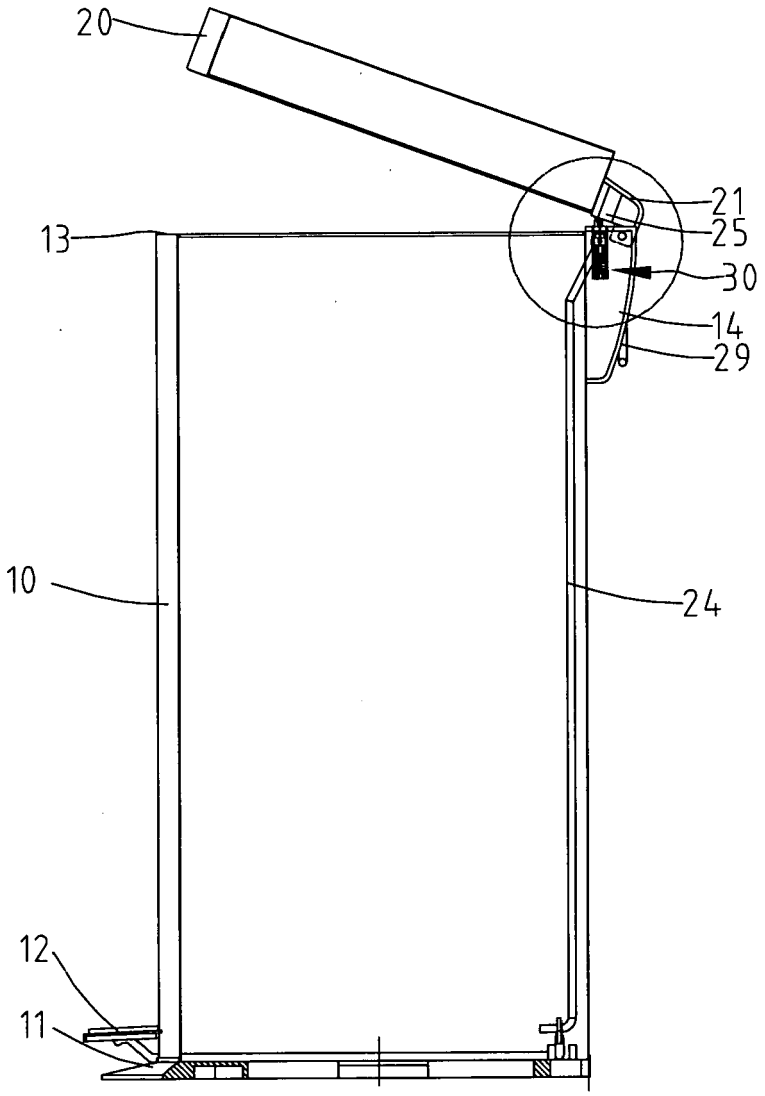

Fig.7

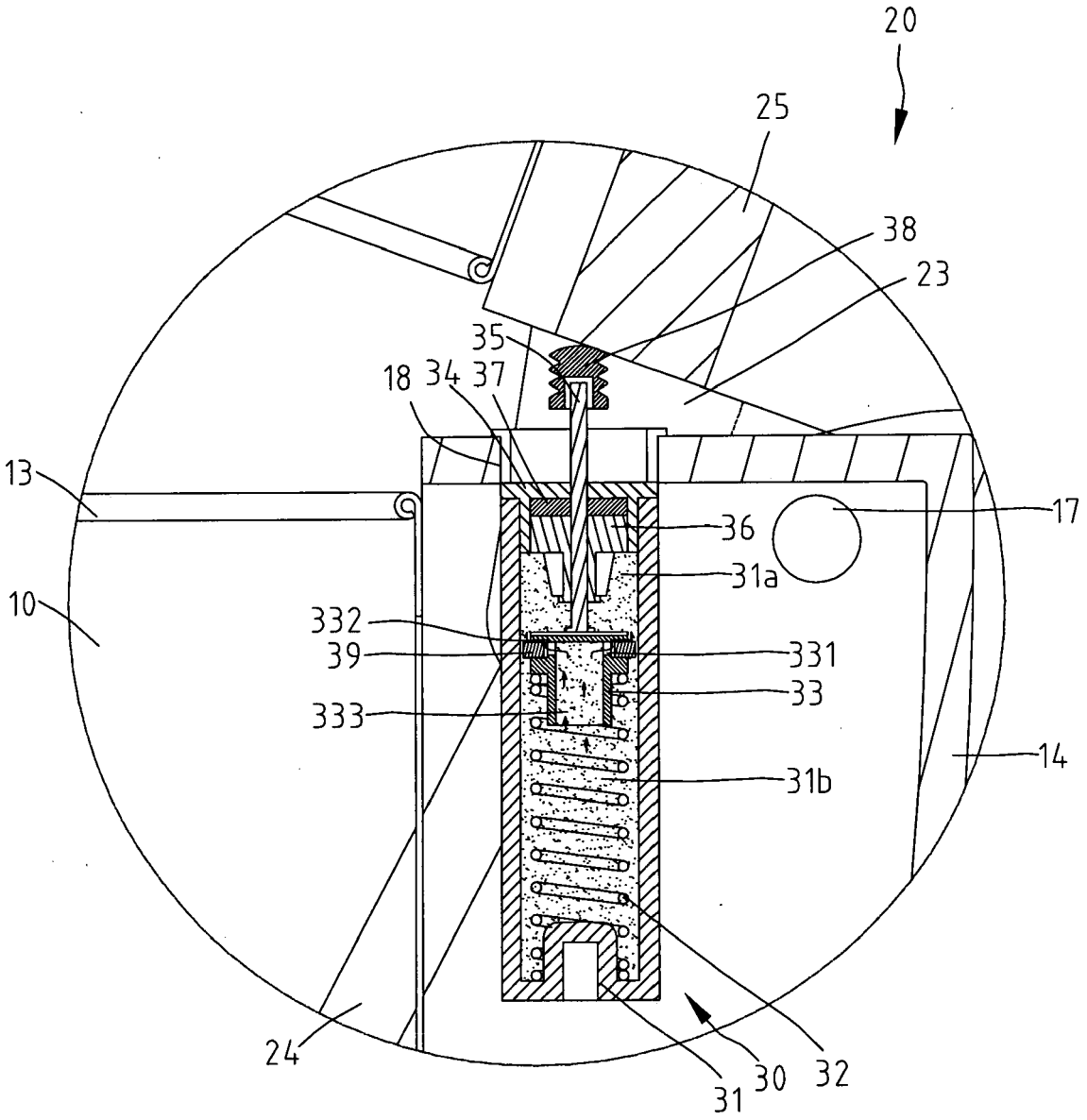
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Fig.8

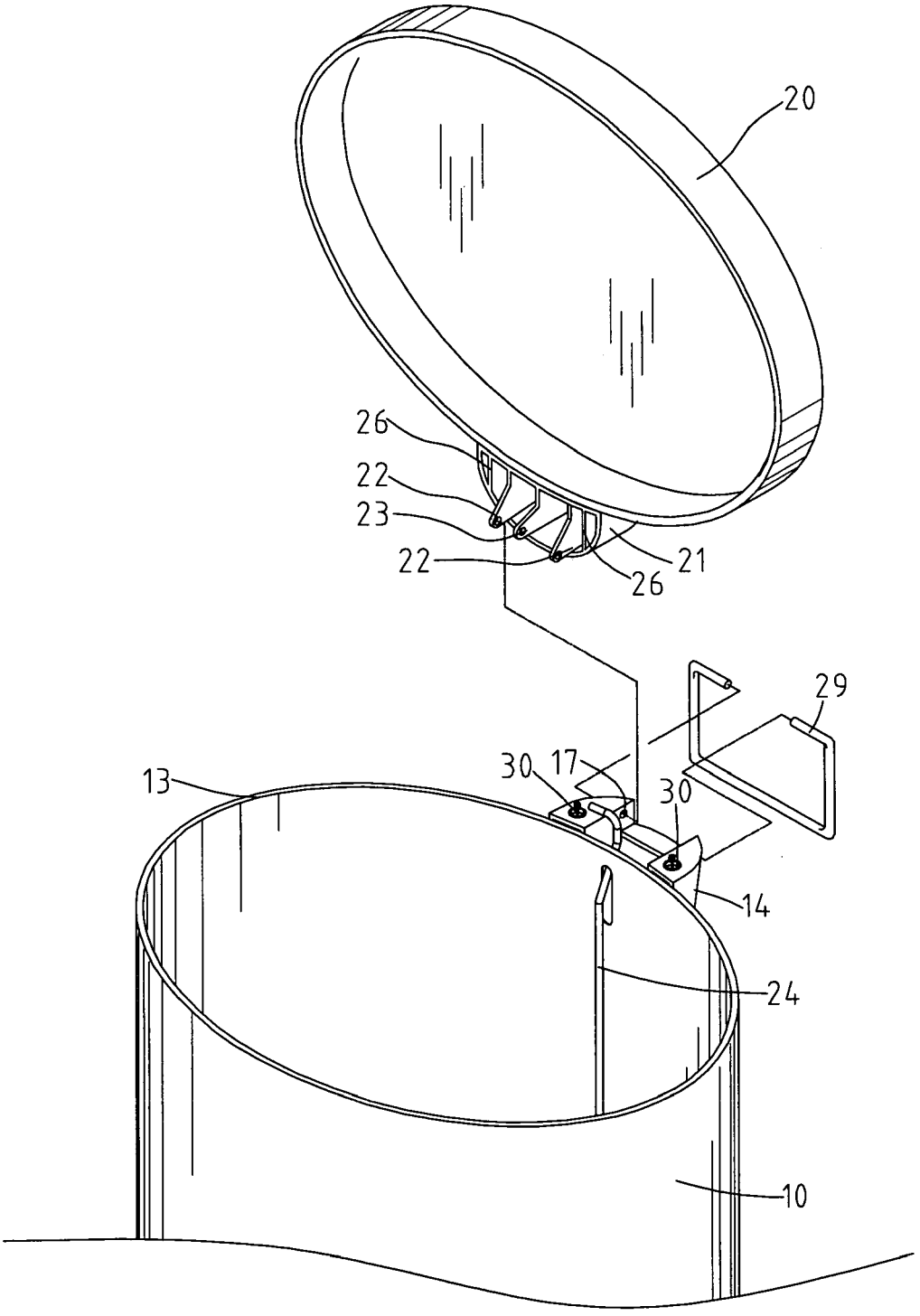

Fig.9

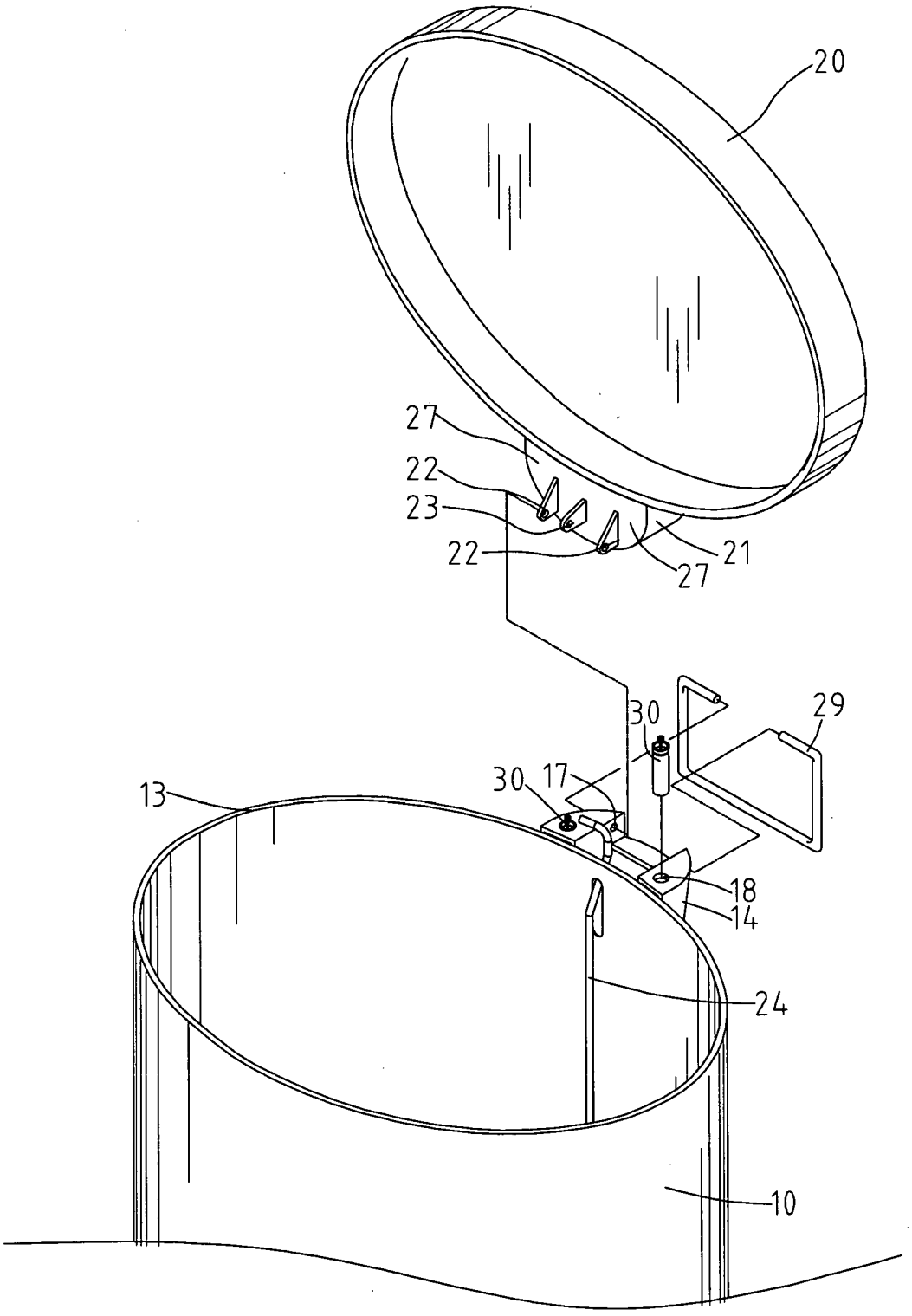

Fig.10

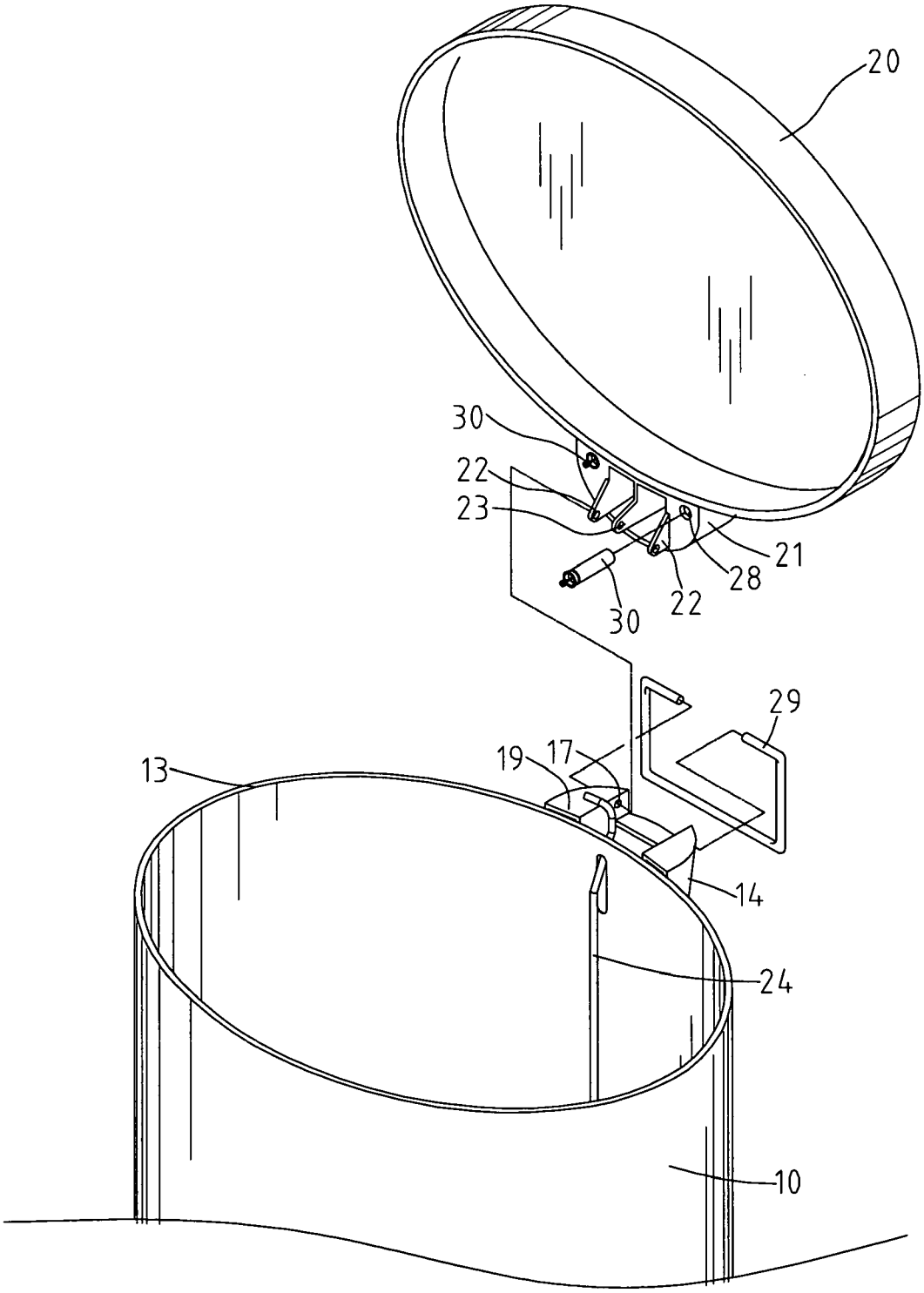

Fig.11

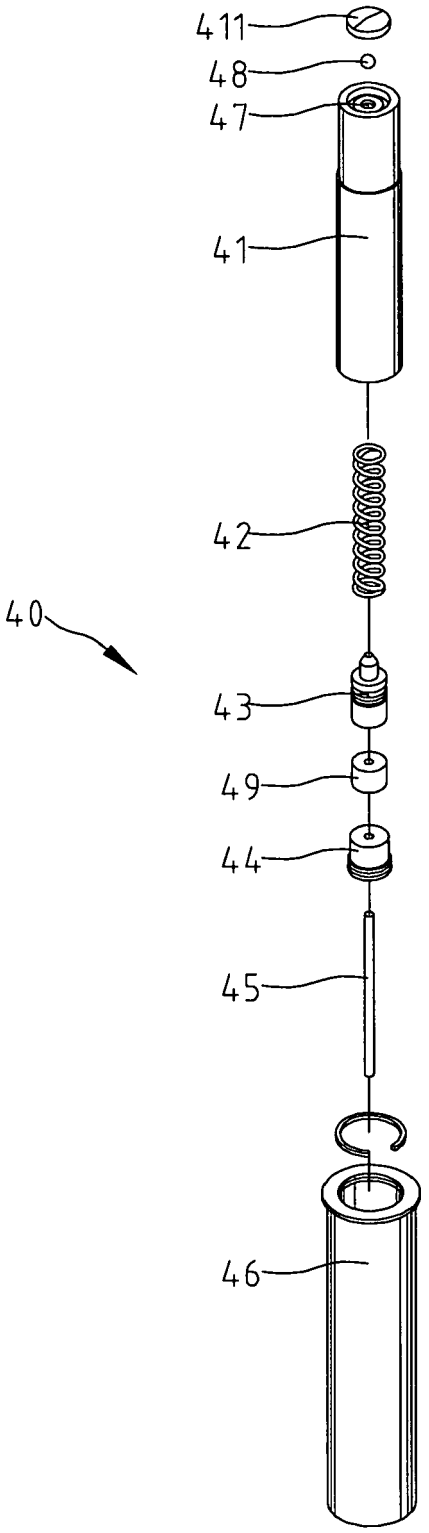

Fig.12

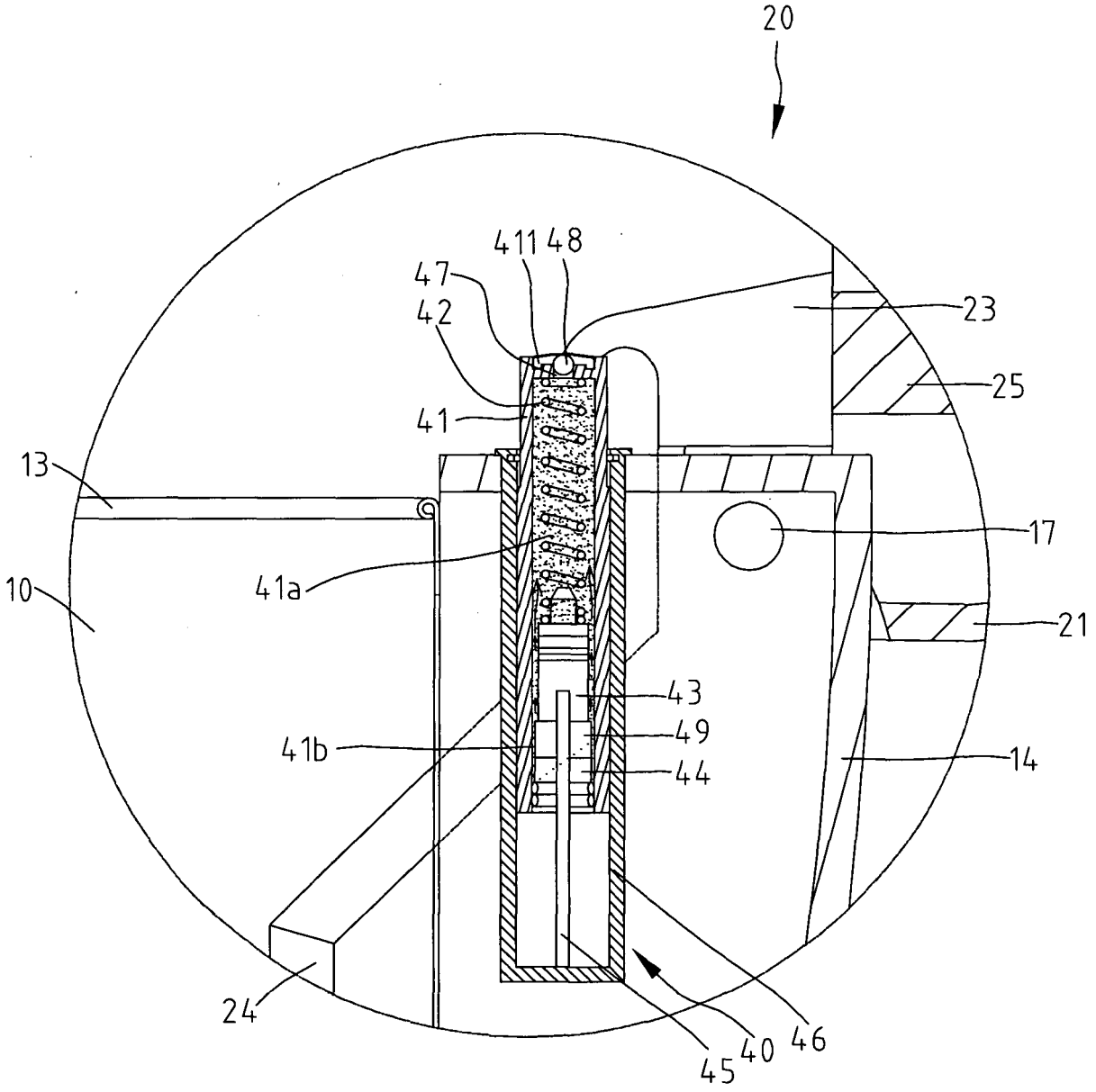

Fig.13

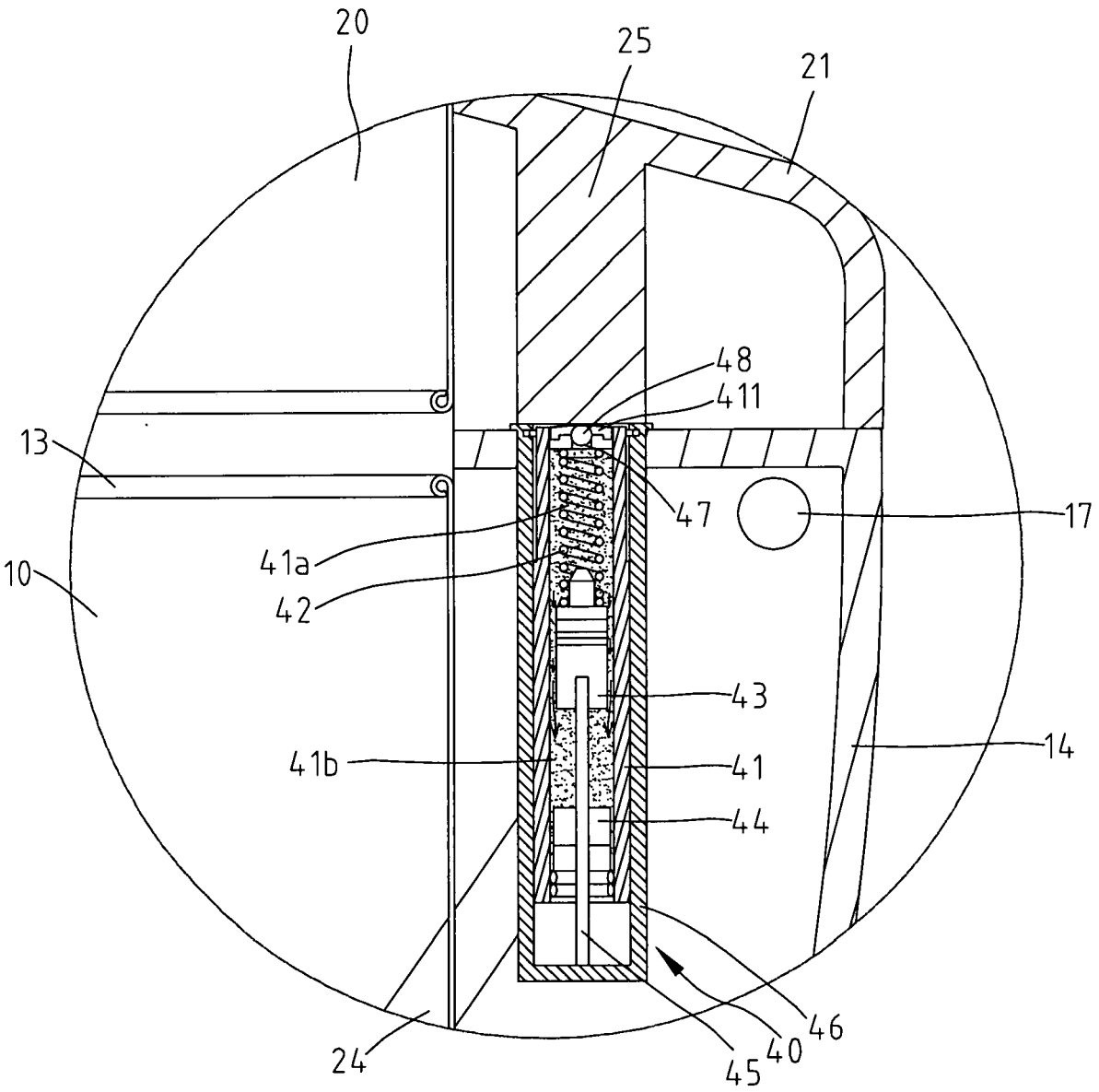

Fig.14

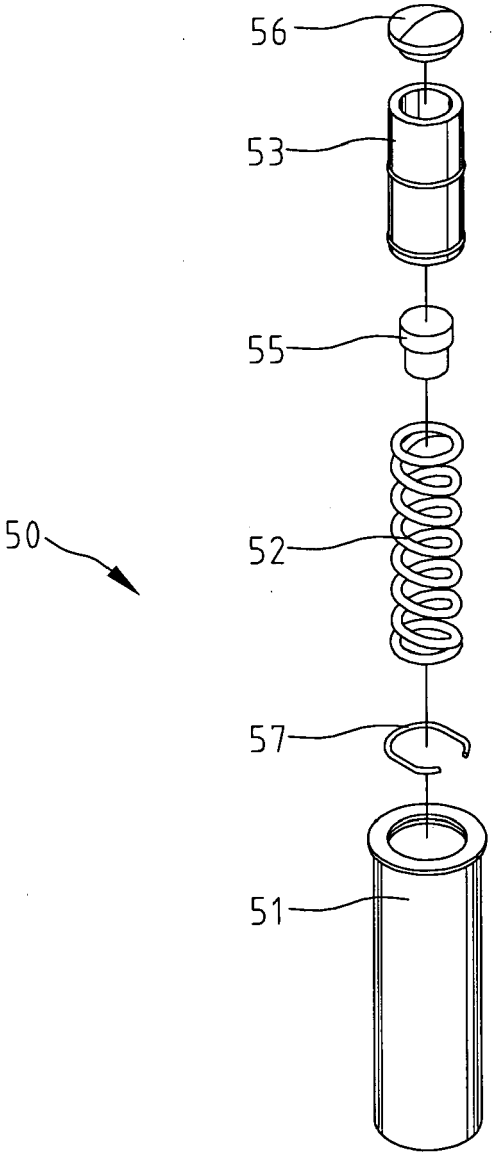

Fig.15

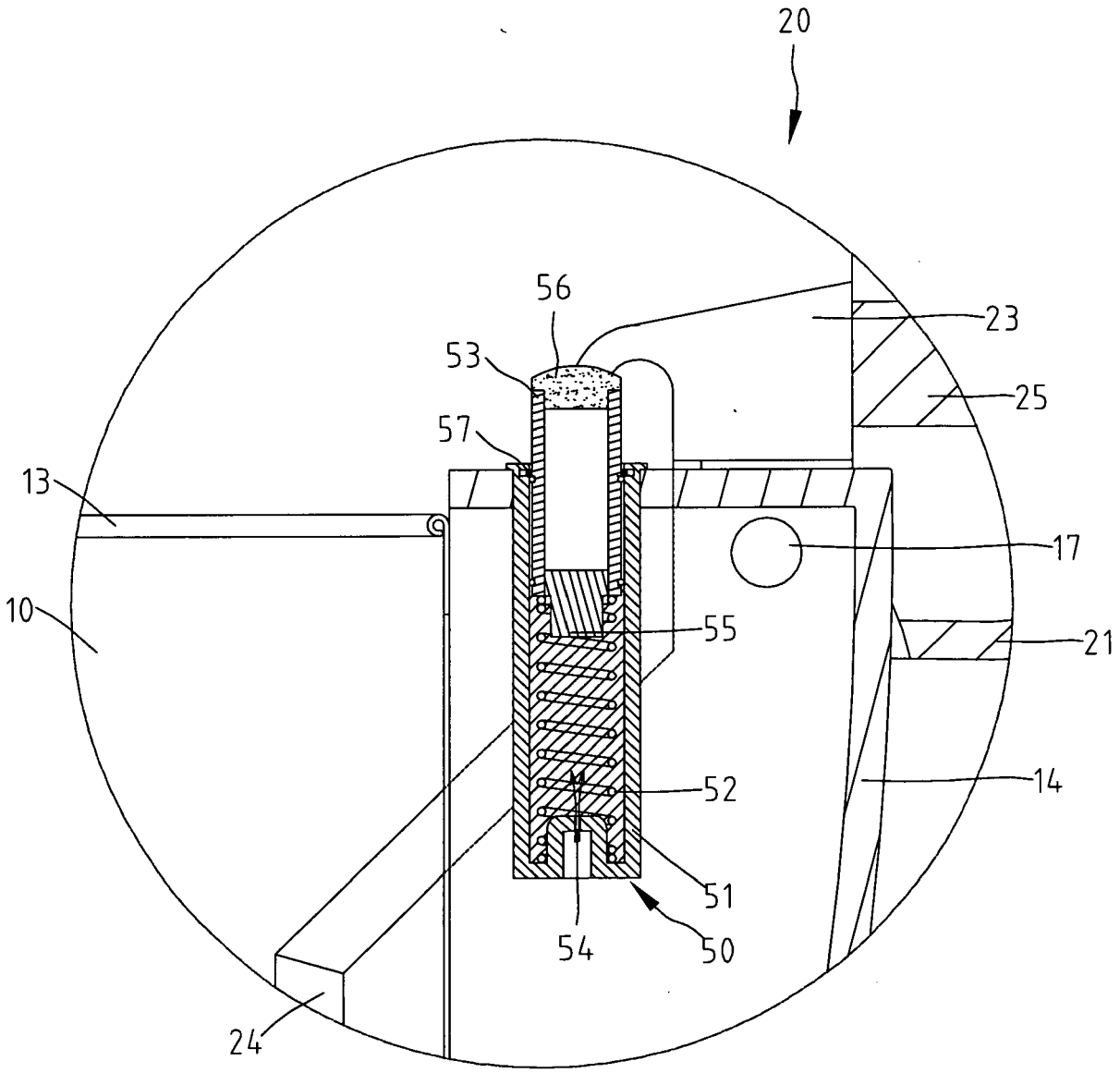

Fig.16

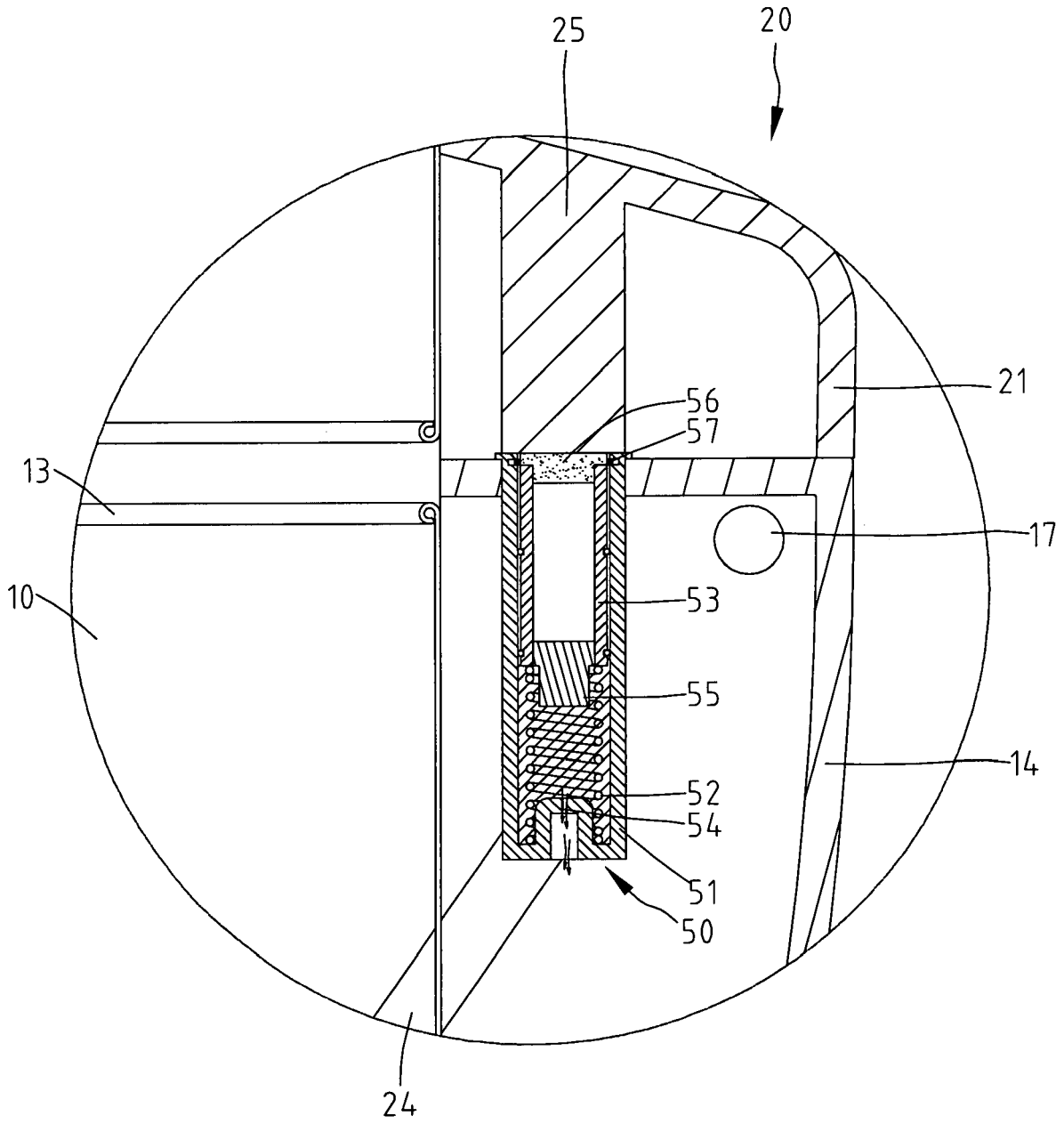

Fig.17

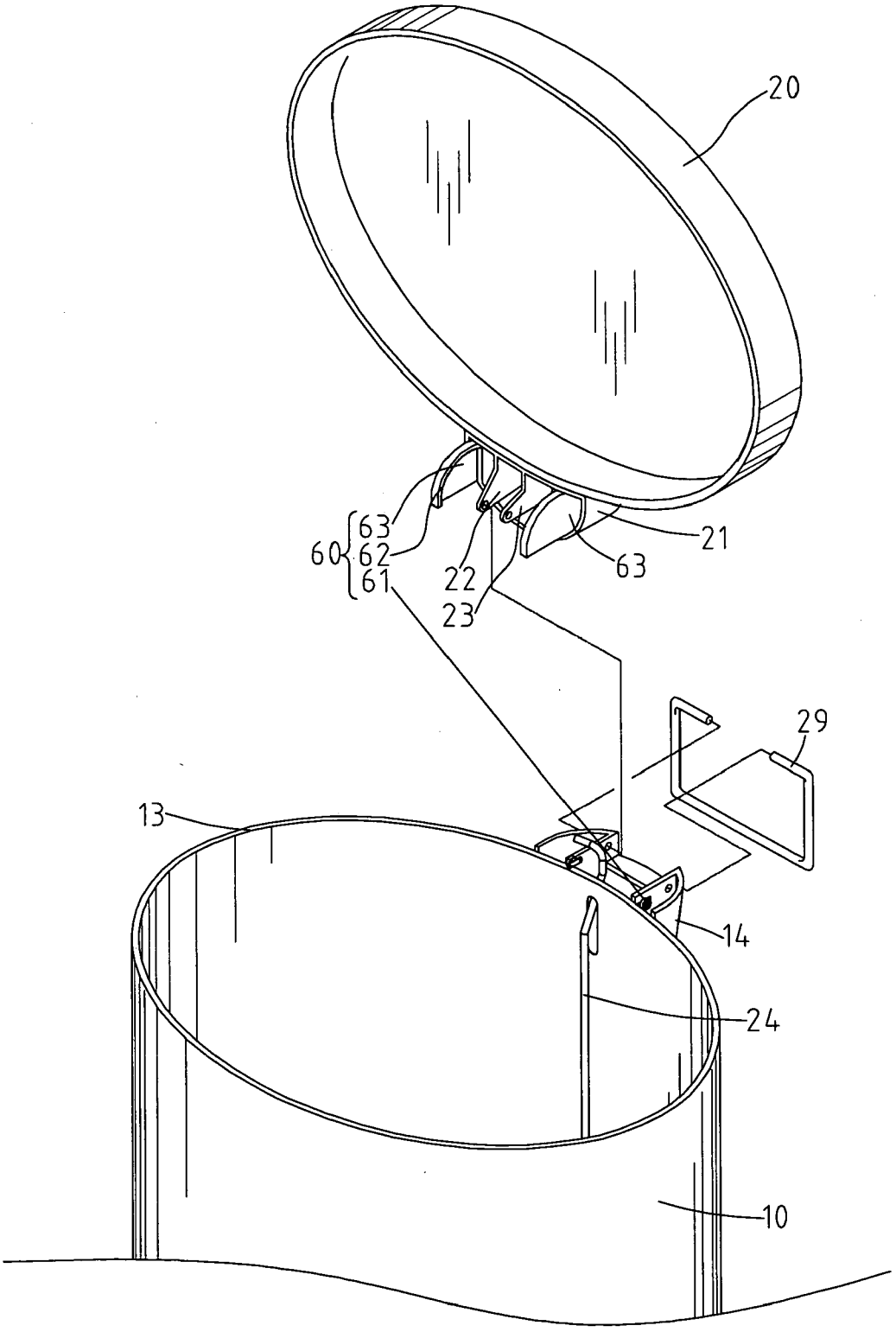

Fig.18

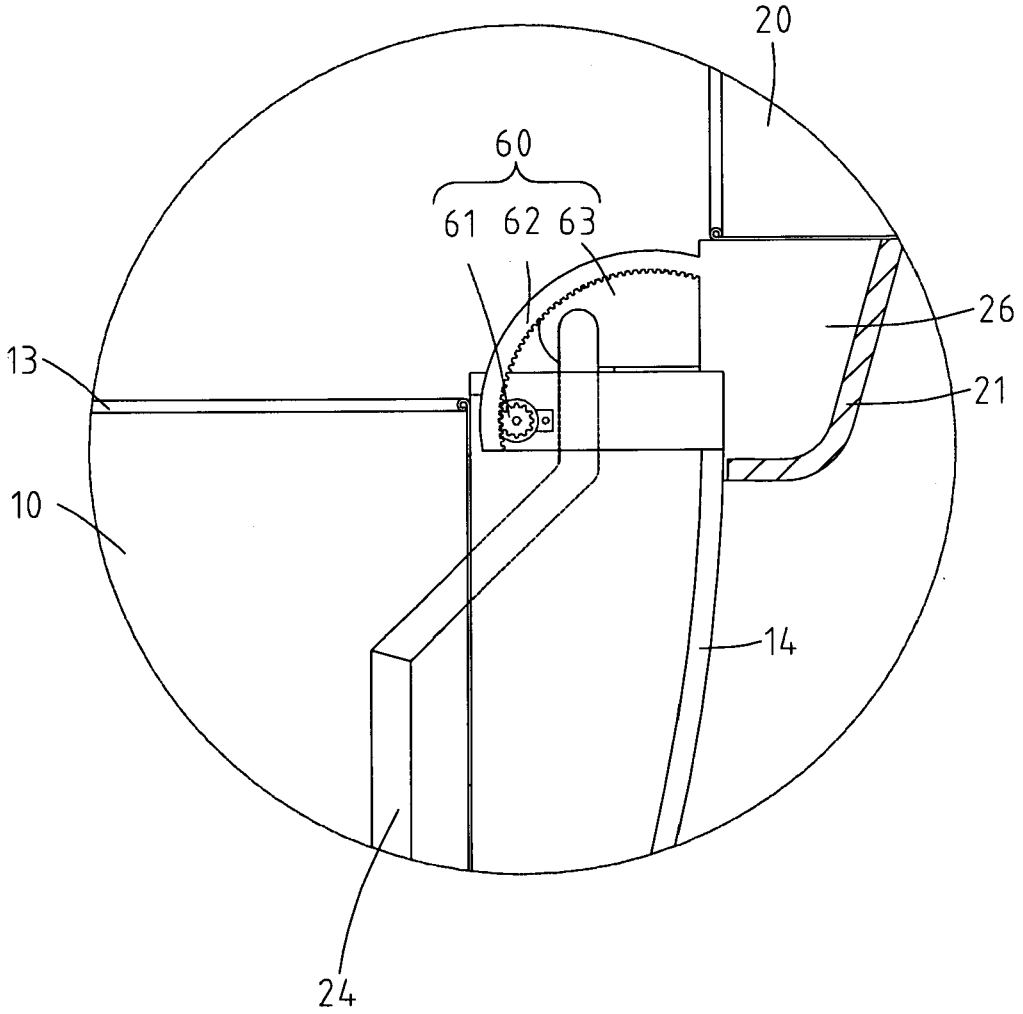

Fig.19

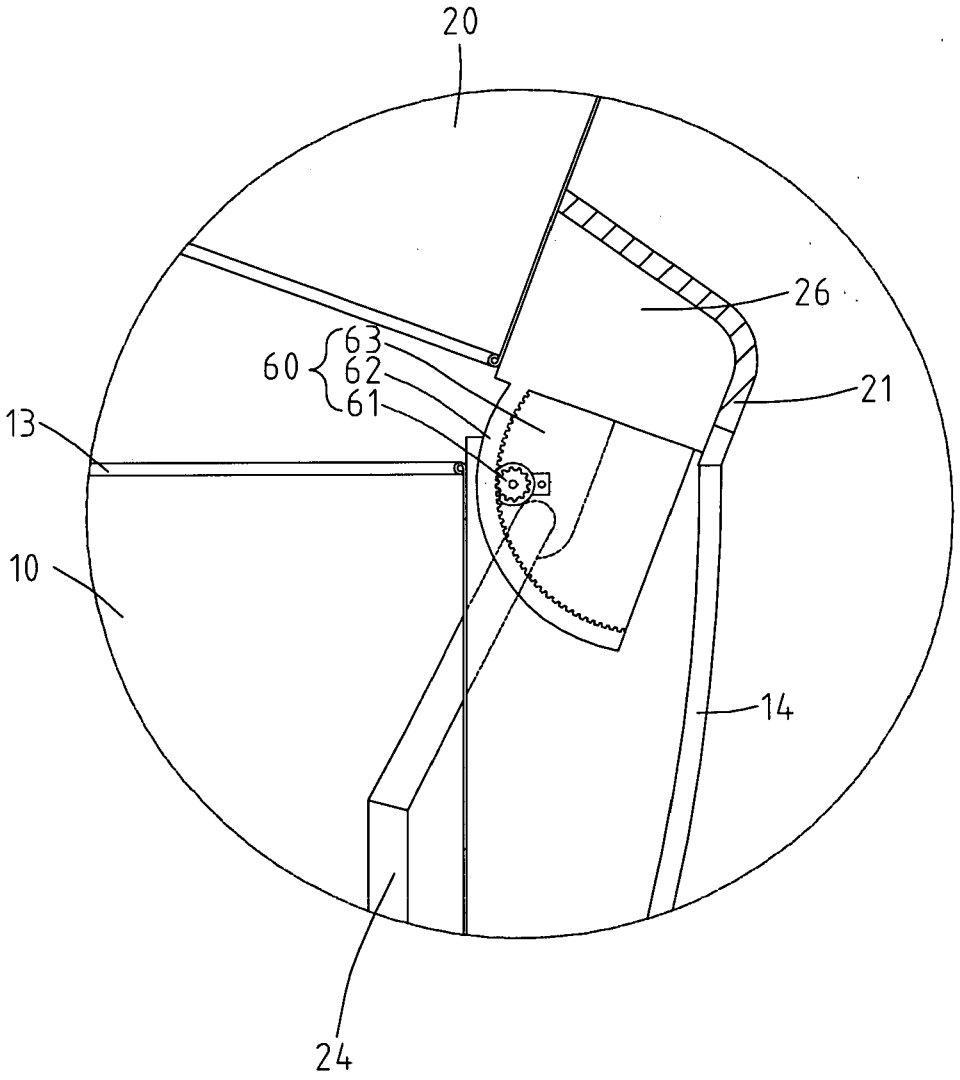

Fig.20

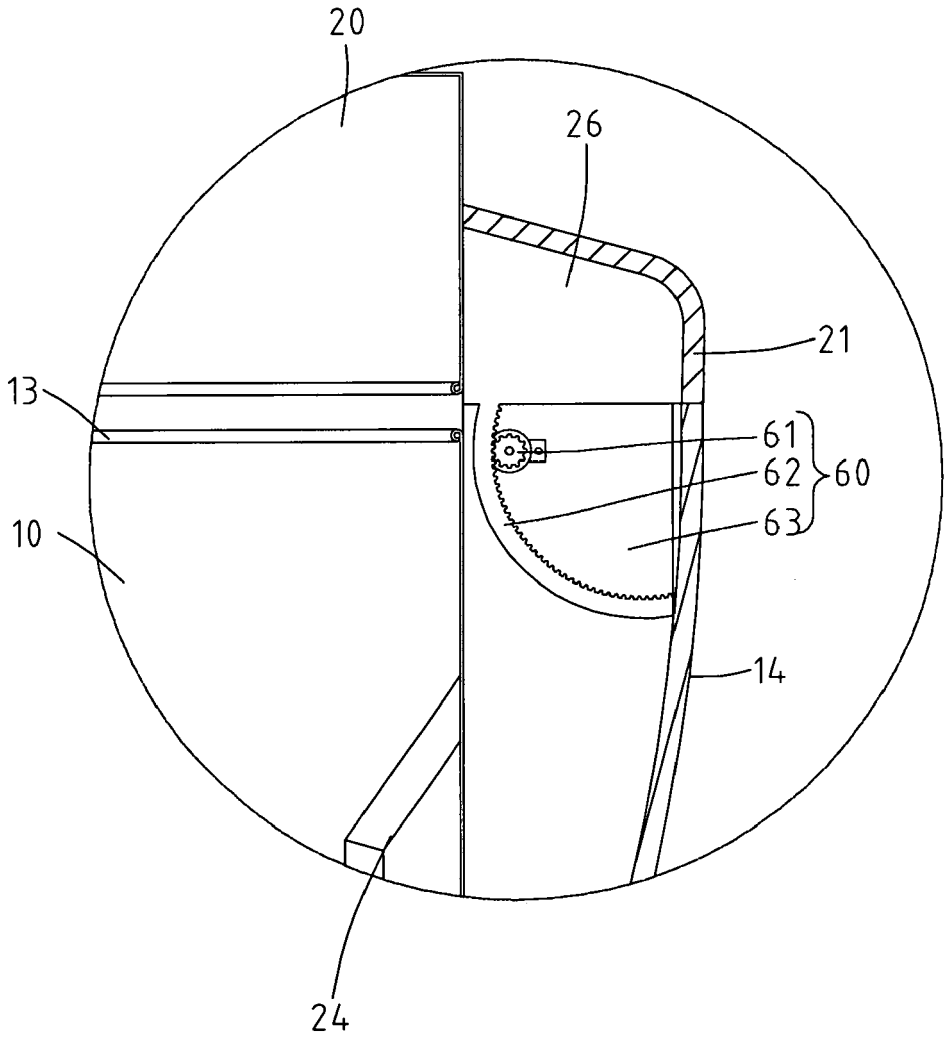

Fig.21

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 05 00 7063

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	DE 12 21 959 B (GEBR. OTTO KG BLECHWARENFABRIK UND VERZINKEREI) 28 July 1966 (1966-07-28) * column 2, line 33 - column 3, line 14; figure 1 *	1,4,6,9, 10,14, 24,27	B65F1/16
X	GB 2 372 426 A (HWAN YIH ENTERPRISE LTD) 28 August 2002 (2002-08-28) * page 4, line 7 - page 7, line 16 * * figures 1-4 *	1,2,4,5, 33,34	
A	EP 1 094 017 A (HAILO-WERK RUDOLF LOH GMBH & CO. KG) 25 April 2001 (2001-04-25) * paragraph [0022] - paragraph [0024] * * figures 4a,4b *	1,28,30, 33,34	

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

B65F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	23 August 2005	Smolders, R

CATEGORY OF CITED DOCUMENTS

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 05 00 7063

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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23-08-2005

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