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(73)	Innehaver	Anta Swiss AG, Bundesstrasse 7, 6304 Zug, Sveits
(72)	Oppfinner	STREBEL, Matthias, Jöchlerweg 7, 6340 Baar, Sveits
(74)	Fullmektig	TANDBERG INNOVATION AS, Postboks 1570 Vika, 0118 OSLO, Norge

(54) Benevnelse **WASTE DISPOSAL CONTAINER WITH PRESSING DEVICE**

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WASTE DISPOSAL CONTAINER WITH PRESSING DEVICE

TECHNICAL FIELD

5 The present invention relates to a waste-disposal container with a pressing device for pressing waste inside of the waste-disposal container according to the preamble of claim 1, and to a method for operating a waste-disposal container with a pressing device according to claim 12.

10 PRIOR ART

Cleanliness in public spaces is a central objective of cities and communities. The provision of waste-disposal containers for disposing the waste of pedestrians contributes significantly to achieving this objective. However, it must here be ensured that the waste-
15 disposal containers have the required capacity. Since waste-disposal containers of arbitrary capacity cannot easily be set up at many locations, the containers must be emptied at highly frequented locations, sometimes often, so as to prevent public spaces from becoming polluted.

20 Reducing the number of manual emptying operations performed by service personnel here represents an undisputed option for optimizing the upkeep of waste-disposal containers for both frequented and remote locations. One optimization option involves pressing the waste inside of the waste-disposal container, making it possible to increase the effective volumetric capacity of the waste-disposal container, and to significantly
25 reduce the number of required emptying operations.

WO2006/073224 describes a waste-disposal container according to the preamble of claim 1, with an automatically opening and closing door, comprising an outer housing with upper and lower doors for opening and closing upper and lower inner parts, an inner
30 housing held in the lower, inner part of the outer housing, a detection unit that detects an approaching object, a drive unit for the upper door, which opens and closes the upper door in response to a signal input from the detection unit, and a control unit, which controls the drive of the drive unit for the upper door in response to the signal input from

the detection unit. An optional pressing unit for compacting the waste in the inner housing is described, which has a pair of pivoting members, a lifting member, crossed fingers, a drive and a motor. The crossed fingers are fastened to the lower end of the lifting member, which at the other end is hinged with the pivoting members, and thereby
5 moves up and down.

In the waste-compacting device realized by BigBelly Solar (<http://www.bigbelly.com/solutions/stations/bigbelly/>), a compacting ram in a waste-disposal container performs a linear, vertical movement in the waste compacting
10 process. The compacting ram is driven by a chain drive mechanism, wherein the required electrical energy is supplied by photovoltaic panels on the housing of the waste-compacting device. The waste is collected by a drawer device, wherein the pedestrian has to open a separate drawer with a handle, and can only then deposit the waste therein. The waste is intended to fall into the container when closing the drawer, which is then
15 to be followed by the compaction.

The chain mechanism that drives the vertical movement of the compacting ram consists of a complicated mechanical system with numerous components, which increase the production outlay for realizing the compacting device as well as the error rate. The
20 dimensioning and linear, vertical movement of the compacting ram also necessitate a relatively high installation height, and limit how the shape of the cross section of the compacting ram can be configured to the dimension of the cross section of the receptacle, since a reliable compaction of the contents inside of the container can otherwise not be guaranteed. Due to the changing position of the sun and variable location of the waste-
25 disposal container, the fixed arrangement of the photovoltaic panels on the upper side of the housing does not ensure any optimized use of the solar radiation. While accommodation by the drawer device does ultimately ensure that the hand of the pedestrian will not inadvertently get into the compacting device, it does require an additional action and additional contact by the pedestrian with the housing, so as to
30 dispose of the waste. For hygienic reasons, many users avoid any direct contact with a waste container in public spaces.

DESCRIPTION OF THE INVENTION

Therefore, the object of the invention is to create a waste-disposal container with a pressing device and a method for operating a waste-disposal container with a pressing device that avoid the mentioned disadvantages to prior art.

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These objects are achieved by the waste-disposal container with a pressing device according to the invention and the method according to the invention for operating a waste-disposal container with a pressing device as defined in claims 1 and 12. Several preferred embodiments are claimed in the dependent claims.

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The waste-disposal container with a pressing device according to the invention consists of a housing, a container, an opening in the housing, a movable securing element, a control device and a drive device operatively connected with the control device, wherein a pressing ram coupled with the drive device comprises a preferably step-form pressing plate, a long lever and a short lever. According to the invention, the pressing plate, the long lever and the short lever with bearing means on the housing and on the pressing plate form a four-bar linkage (four-bar linkage principle according to Dubbel, Taschenbuch für den Maschinenbau, Springer (1995), 18th edition, pp. 152 ff). The pressing ram can be moved between an initial position and a maximum pressing position.

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The securing element can be moved between a position that releases the opening of the housing and a position that closes the opening of the housing, and according to the invention is coupled with the control device and/or drive device. Coupling the securing element with the control device and/or drive device ensures that the securing element is in a position that closes the opening of the housing during the pressing movement. The securing element can preferably be locked in the position that closes the opening.

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The housing can be a frame with a cladding in which the container, control device, drive device, and pressing ram can be located. The housing can also be a massive and load-bearing structure, in which the container, control device, drive device and pressing ram can be located.

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Two mounting points can be arranged on the housing and two mounting points on the pressing plate, wherein the long lever and short lever each connect a mounting point of

the pressing plate with a mounting point on the housing. The mounting points on the housing can lie closer together than the mounting points on the pressing plate, which in conjunction with the varying length of the levers leads to a complex pivoting movement of the pressing plate. The advantage to the complex pivoting movement is that, as
5 opposed to a linear pressing movement, a larger path for the pressing plate (i.e., the entire pressing plate or at least portions thereof) is enabled at a constant stroke of the drive device. The complex pivoting movement increases the volume in the container that moves the pressing plate during the pressing movement, and also allows the waste inside of the container to be brought into areas where less or hardly any deposited waste
10 accumulates by itself. By comparison to a linear movement, a larger space is covered with the complex pivoting movement given the same dimensions of the pressing surface, so that the pressing surface can be smaller than the cross section of the container. For an elevated stability, additional levers arranged parallel to the mentioned levers can be attached, but these do not alter the degree of freedom of the pressing movement.

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The securing element as embodied in a flap can preferably be locked in a position that closes the opening of the housing. The securing element can be in the position that closes the opening of the housing while exposed to a spring force, and could be opened against the force by one or several springs.

20

The securing element ensures that the opening of the housing remains closed during the pressing process, thereby precluding any danger of injury arising from introducing the hands or arms of pedestrians and through contact with the pressing ram. The system with the opening in the housing and securing element allows the pedestrian to dispose of the
25 waste in the waste-disposal container without making any physical contact with the waste-disposal container.

In a preferred embodiment, the control device and/or drive device are electrically connected with an independent voltage supply. The securing element can also be
30 electrically connected with the independent voltage supply. In a preferred embodiment, the independent voltage supply consists of photovoltaic elements and at least one storage element, for example a battery. In this embodiment, the photovoltaic elements are secured to an inclined surface of an upper housing part on the upper side of the housing,

wherein the upper housing part comprising the inclined surface of the upper housing part can be rotated around a longitudinal axis of the housing on the upper side of the upper housing part. The advantage to being able to rotate the upper housing part and inclined surface is that the photovoltaic elements can be optimally aligned relative to the sun
5 depending on location, thereby yielding the most efficient voltage supply possible. By contrast, the disposal opening can also be optimally aligned independently of the photovoltaic elements, for example toward a walkway or public place, thereby ensuring a maximum user friendliness. The upper housing part can be opened, so that maintenance work on components inside of the waste-disposal container with a pressing device can
10 be performed. For example, this allows maintenance personnel to easily change out a storage element arranged in the upper housing part.

The waste-disposal container with a pressing device can consist of a display device secured to the exterior side of the housing, which preferably involves an LED display,
15 wherein the display device can be electrically connected with the independent voltage supply. As a consequence, the display device can be used to visually acquire various information about the status of the waste-disposal container from outside, for example by service personnel.

20 In another preferred embodiment, the control device consists of a filling level monitoring device, which measures the filling level of the container. The filling level monitoring device can comprise an ultrasound measuring device. The control device can further consist of a charge status monitoring device, which measures the charging status of the storage element. The control device can also comprise a pressing pressure measuring
25 device and/or a stroke length measuring device.

The stroke length measuring device can measure the stroke length of the drive device. The stroke length measuring device together with the pressing pressure measuring device can preferably form a filling level monitoring device, and be used to determine
30 the filling level of the pressed waste in an especially easy manner. The display device can be electrically connected with the charge status monitoring device and/or filling level monitoring device.

The display device can use the electrical connection to display information about the filling level or charge status of the storage element, for example by flashing and/or changing the color of the display.

5 In a preferred embodiment, the drive device has a drive cylinder, wherein the drive cylinder with the first end engages on the pressing plate, preferably between the bearing means of the pressing plate or on one of the bearing means of the pressing plate or on the long lever, and with the second end engages on the housing, preferably centrally on a holder. The drive cylinder can be an electric cylinder driven by an electric motor.

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The embodiment of the drive device as a drive cylinder reduces the error rate by comparison to the example of pressure pad drives or shearing mechanisms. The drive cylinder and the pressing ram designed as a four-bar linkage are compact, and together take up little space, so that the waste-disposal container with a pressing device can be realized with a small size. Precisely the ability to rotate the inclined surface of the upper part of the housing makes it possible to reduce the effectively usable space in the housing between the pressing ram and the upper side of the housing, so that the compactness of the driving mechanism and pressing ram offers an advantage in configuring the waste-disposal container with a pressing device.

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The drive device can consist of driving mechanisms, such as pneumatic drives, spindle drives, several drive cylinders or other electromotor drives.

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In an embodiment, the pressing ram consists of a step-form pressing plate, wherein the step shape is configured in such a way that the pressing plate in the initial position is downwardly stepped proceeding from the opening in the housing, which in one embodiment is a front-side opening, to the middle of the waste-disposal container. The step-form embodiment of the pressing plate allows the opening in the housing, which in one embodiment is the front-side opening, to remain open in the initial position of the pressing ram, guaranteeing an unimpeded receiving of waste. In addition, the step-form embodiment of the pressing plate makes it possible to enlarge the space in the housing between the pressing ram and the inclined surface on the upper side of the housing in the initial position of the pressing ram, for example which simplifies the positioning of

the storage element in the mentioned space.

In a preferred embodiment, the housing has a circular cross section perpendicular to the longitudinal axis. The cross section of the housing can be polygonal. The cross section
5 of the container can be adjusted to the cross section of the housing. The container can have a circular cross section perpendicular to the longitudinal axis of the housing, wherein at least two partial sections of the edge can be straight. As viewed from the top, the corresponding pressing plate can likewise have a circular shape with at least two straight partial sections of the edge.

10 In a preferred embodiment, the waste-disposal container with a pressing device has a fire extinguishing device with a fire extinguishing agent inside of the housing, wherein the fire extinguishing device preferably comprises a triggering means and a fire extinguishing capsule with the fire extinguishing agent.

15 The waste-disposal container with a pressing device can comprise a communication device, with which wireless data transmission can be effected, wherein the communication device can be electrically connected with the independent voltage supply.

20 In another preferred embodiment, the securing element, which is preferably a flap, in the position that releases the opening of the housing together with the pressing plate forms a sloping surface designed as a sloping cover, which is located opposite a preferably front-side opening in the housing, wherein the sloping surface can have an inclination relative to the longitudinal axis of the housing, and can be a functional surface, for
25 example which can have gradations.

In an embodiment, the securing element, preferably a shield, is arranged at least partially below the opening in the position that releases the openings, wherein preferably the upper edge of the securing element abuts against the lower edge of the opening.

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In an embodiment, the securing element is mechanically connected with a pivoting device. The pivoting device makes it possible to pivot the securing element. The securing element can be pivotable between the position that releases the opening and the position

that closes the opening, wherein the pivoting device can be electrically connected with the control device. The advantage to this is that the pivoting movement of the securing element can be electrically controlled. The pivoting device can comprise a motor, which can drive the pivoting movement of the securing element.

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The pivoting device or securing element can comprise means to prevent blockages of the securing element. For example, the motor of the pivoting device can comprise a load-limiting device, which given a maximum load on the securing element can interrupt the movement, for example the pivoting movement. The load-limiting device can trigger a reversal of the movement. For example, as the securing element moves from the position that releases the opening to the position that closes the opening, the load-limiting device can interrupt the movement of the securing element, and move the securing element back into the position that releases the opening. The advantage to this is that objects, for example those which partially stick in the opening and block the movement of the securing element, can fall into the opening or out of the opening by releasing the opening. This makes it possible to reduce the risk of a blockage of the opening and the operation of the waste-disposal container.

The control device and storage element and parts of the drive device can be arranged in the space between the pressing ram and inclined surface on the upper side of the housing.

The arrangement of the control device, storage element and parts of the drive device in the space inside the housing between the pressing ram and inclined surface on the upper side of the housing and the compactness of the pressing ram and drive device enable the realization of waste-disposal containers with a pressing device having a small size. A small size and compactness of the waste-disposal container with a pressing device can be advantageous as regards security against vandalism, since the small size and compactness permits the production of especially robust waste-disposal containers.

In the method according to the invention for pressing waste with a waste-disposal container with a pressing device, the securing element is brought into a position that closes the opening of the housing, and preferably locked in the position that closes the opening during the pressing operation, the drive device is actuated by the control device,

wherein the drive device is only released when the securing element is in the position that closes the opening of the housing. In the method according to the invention, the pressing ram is moved into the pressing position corresponding to the maximum pressing pressure measured by the pressing pressure measuring device, wherein the movement of
5 the pressing ram is driven by the drive device, and the drive device is controlled by the control device. Finally, in the method according to the invention, the pressing ram is moved back into the initial position, and the securing element is moved back into the position that releases the opening of the housing.

10 During the pressing operation, the securing element can be locked in the position that closes the opening of the housing, for example while exposed to a spring force.

In another embodiment of the method, the pressing operation is triggered after the filling level of the container has been measured by the filling level monitoring device as of a
15 specific threshold value for the filling level of the container. The charge status of the storage element is preferably also measured, and the pressing operation is triggered as of a specific charge status.

In a preferred embodiment of the method, the threshold for the filling level that triggers
20 the pressing operation is incrementally increased in a stepwise manner with the number of pressing operations. The advantage to this is that, given a low filling level after a specific number of pressing operations, additional pressing operations are discontinued, so that energy can be economized. In addition, it is ensured that the waste is pressed at a still low number of executed pressing operations and a low filling level.

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In an embodiment of the method, the direction of movement of the securing element from the position that closes/releases the opening is reversed into the position that releases/closes the opening when the movement is blocked.

30 The display device can display the filling level of the container and/or the charge status of the storage element by flashing and/or changing the color of the display.

The communication device can transmit data, for example about the filling level and/or

charge status, to a site remote from the location of the waste-disposal container, for example wirelessly.

The communication device can comprise an insertable SIM card, wherein the data about
5 GSM are transmitted to a site remote from the location of the waste-disposal container.

In the event of a fire, the fire extinguishing agent of the fire extinguishing device can be dispensed into the container, wherein a triggering means can trigger the dispensing of the fire extinguishing agent into the fire [extinguishing] capsule.

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The control device can trigger a pressing operation in predetermined intervals, for example every 15 minutes. The control device can limit the maximum number of pressing operations to a number, e.g., to 20, per day.

15 BRIEF DESCRIPTION OF THE FIGURES

Embodiments of the invention will be explained in greater detail based on the following figures and accompanying descriptions. Shown on:

20 Fig. 1a is a perspective view of an embodiment of a waste-disposal container with a pressing device comprising a housing with a front-side opening, a rotatable upper housing part, wherein the upper housing part turned by a specific angle is denoted by dashed lines;

25 Fig. 1b is a front view of the waste-disposal container according to Fig. 1a;

Fig. 2a is a section of an embodiment of a waste-disposal container with a pressing device according to Fig. 1b along line A-A, comprising a pressing ram in the initial position and a flap in the position that releases the front-side opening of the housing;

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Fig. 2b is a section of the waste-disposal container according to Fig. 2a with a closed flap and with the pressing ram in a position between the initial position and maximum pressing position;

Fig. 2c is a section of the waste-disposal container according to Fig. 2a and 2b with a closed flap and with the pressing ram in the maximum pressing position;

- 5 Fig. 3a is a top view of a section of a waste-disposal container according to Fig. 1b along B-B with the pressing ram in the initial position;

Fig. 3b is a top view of a waste-disposal container according to Fig. 3a with the pressing ram in the maximum pressing position;

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Fig. 4a is a perspective view of an embodiment of a pressing ram in the initial position and a drive cylinder with central holder on the housing, wherein the remaining parts of the waste-disposal container have been omitted;

- 15 Fig. 4b is a perspective view of the embodiment of a pressing ram according to Fig. 4a in the same perspective with the pressing ram in the maximum pressing position;

Fig. 5a is a side view of the embodiment of a pressing ram and a drive cylinder with central holder on the housing according to Fig. 4a with the pressing ram in the initial position, wherein the housing is denoted by dashed lines;

20

Fig. 5b is a side view of the embodiment according to Fig. 5a with the pressing ram in the maximum pressing position;

- 25 Fig. 6a is a longitudinal section through the upper area of another embodiment of a waste container with a securing element in the form of a shield in an upper position that closes the disposal opening; and

Fig. 6b is the view according to Fig. 6a, wherein the shield is now shown in a lower position that releases the disposal opening.

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DETAILED DESCRIPTION OF THE EMBODIMENTS

The present invention in conjunction with the attached figures describes embodiments of the invention, and is intended to contribute to a better understanding of the invention. The designations for the embodiments of the invention illustrated on the figures that were used in the detailed description are not intended to limit the invention. The figures are schematically depicted.

Fig. 1a shows a perspective view of an embodiment of a waste-disposal container 100 with a pressing device, comprising a housing 1, a front-side opening 11, a control device (not shown on the figures), a rotatable upper housing part 14 with an inclined surface 12 and photovoltaic elements 61 on the inclined surface 12. According to the embodiment depicted, the upper housing part 14 can be rotated around the longitudinal axis 13 in the directions denoted by the arrow P. Dashed lines denote a configuration of the upper housing part 14 after a rotation around the longitudinal axis 13 by a specific angle. The rotatability of the upper housing part 14 with the inclined surface 12 and the photovoltaic elements 61 makes it possible to align the photovoltaic elements 61 independently of the front-side opening 11, so that the photovoltaic elements 61 can be optimally aligned toward the sun, and the front-side opening 11 can be optimally aligned toward the pedestrian, independently of the alignment of the photovoltaic elements 61. In the embodiment shown, the housing 1 has a circular cross section. For example, ashtrays 17 can be secured behind additional front-side openings 16. In the embodiment shown, a front part of the housing 1 comprising the front-side opening 11 and additional front-side opening 16 is designed as a front gate 18, which can be opened to empty the waste M in the container 2 (not visible on figure 1), or to perform maintenance work. Situated above the opening 11 in the embodiment shown is an LED display 71, with which information about the status of the waste-disposal container 100 can be optically scanned. The upper housing part 14 can preferably be opened to perform maintenance work.

Figure 1b shows a front view of the waste-disposal container 100 with a pressing device according to figure 1a.

Figures 2a-c show three sections of an embodiment of a waste-disposal container 100

with a pressing device along A-A on figure 1b, wherein the three sections differ in terms of the different positions of the pressing ram 5 and a securing element in the form of a flap 111'.

5 Figure 2a shows the pressing ram 5 in the initial position 54, wherein the pressing ram 5 comprises a pressing plate 51, a long lever 52 and a short lever 53. In the embodiment shown, the pressing plate 51, long lever 52 and short lever 53 together with the bearing means 191 and 191' form a four-bar linkage on a bearing block 19 fastened to the housing 1 and the bearing means 56 and 56' on the pressing plate 51. According to the
10 embodiment shown, the relative positions of the bearing means 191 and 191' are nearly horizontal to each other. The bearing means 191 and 191' are not operatively connected with the housing 1 directly, but via the bearing block 19. In the embodiment shown, the drive device 4 comprises a drive cylinder 41, wherein the drive cylinder 41 engages on the pressing plate 51 with the first end 411 and centrally on a yoke-shaped mount 15
15 above on the housing 1 with the second end 412. According to figure 2a, the flap 111' is in a position that releases the front-side opening 11. In the embodiment shown, the pressing plate 51 in the initial position 54 of the pressing ram 5 and the flap 111' in the position that releases the opening 11 form a functional inclined cover lying opposite the front-side opening 11, so that waste M can be thrown into the container 2 unimpeded
20 through the opening 11. In the embodiment shown, the pressing plate 51 is downwardly stepped proceeding from the front-side opening 11 to the middle of the waste-disposal container, thereby enabling the unimpeded collection of waste M through the front-side opening 11 in the initial position 54 of the pressing ram 5.

25 Figure 2b shows the pressing ram 5 in a position between the initial position and the maximum pressing position during the pressing movement, which is driven by the drive cylinder 41, wherein the flap 111' is in a position that closes the front-side opening 11. The flap 111' is preferably locked in the position that closes the front-side opening 11, so that no access into the interior of the housing 1 is possible during the pressing
30 movement, and the risk of injury is minimized.

In a preferred embodiment, the flap 111' can be exposed to a spring force, so that the flap in the closed position must be opened against the force exerted by one or more

springs by a flap drive. As a result, the flap 111' is preferably moved into the position that closes the opening 11 by the spring force given a failure of the flap drive.

Figure 2c shows the pressing ram 5 in the maximum pressing position 55, wherein the stroke length of the drive cylinder 41 is at the maximum value. In the example shown, the volume of the waste M is distinctly reduced in the maximum pressing position 55 of the pressing ram 5 by comparison to the initial position 54 of the pressing ram. In a preferred embodiment, a pressing pressure measuring device 33 measures the pressing pressure. In a preferred embodiment, the position corresponding to a maximum pressing pressure can be measured in conjunction with a stroke length measuring device 34. In order to prevent damage to the pressing device, the pressing movement of the pressing ram 5 can be interrupted upon reaching the maximum pressing pressure, even if the maximum pressing position 55 has not yet been reached.

Figure 3a shows a top view of a section of the waste-disposal container 100 with a pressing device according to figure 1b along B-B, wherein the pressing ram 5 is in the initial position 54. For improved clarity, the flap 111' is not shown on figure 3a. In the embodiment shown, the container 2 has a circular cross section with two opposing, straight partial sections of the edge, arranged laterally to the front-side opening 11. Viewed from the top, the pressing plate 51 according to the embodiment shown on figure 3a also has a circular cross section with two opposing, straight partial sections of the edge, preferably arranged parallel to the straight partial sections of the edge of the container 2. In the embodiment shown, two long levers 52 and 52' are arranged parallel to each other. The levers 52 and 52' each comprise two lever blades in the embodiment shown, so as to increase the stability of the levers 52 and 52'. Likewise, two short levers 53 and 53' are arranged parallel to each other in the shown embodiment. The levers 53 and 53' also each comprise two lever blades in the embodiment shown. Several parallel arranged long levers 52 and short levers 53 can ensure an elevated stability of the pressing ram 5, without altering the degree of freedom for the pressing movement. In the embodiment shown, the bearing means 56 and 56' on the pressing plate 51 are designed with axes 57 and 57'. The bearing means 191 and 191' are correspondingly designed with axes 192 and 192' according to the embodiment shown. Additional reinforcing structures 58, for example additional ribs, can ensure an elevated stability of

the pressing plate 51.

Figure 3b shows a top view according to figure 3a with the pressing ram in the maximum pressing position 55. As evident from figures 3a and b, the pressing surface of the pressing plate 51 is smaller than the depth of the container 2 in the embodiment shown, wherein a region of the container 2 opposite the front-side opening 11 under the short levers 53 according to figure 3a is not covered by the pressing plate 5 in the initial position 54 of the pressing ram 5, and a region of the container 2 by the front-side opening 11 according to figure 3b is not covered by the pressing plate 51 in the maximum pressing position 55 of the pressing ram 5. The pressing plate 51 has roughly the same width laterally as the container 2. However, the complex pivoting movement between the initial position 54 of the pressing ram 5 and the maximum pressing position 55 of the pressing ram 5 covers nearly the entire depth of the container 2 during the pressing movement.

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Fig. 4a shows a perspective view of a preferred embodiment of a pressing ram 5 in the initial position 54, comprising a pressing plate 51, two long levers 52 and 52' arranged parallel to each other, two short levers 53 and 53' arranged parallel to each other and a drive cylinder 41 with a yoke-shaped holder 15 on the housing 1. According to the embodiment shown, the pressing plate 51 is stepped, and in the initial position 54 of the pressing ram 5 forms a functional inclined cover.

20

Fig. 4b shows the pressing ram 5 according to figure 4a from the same perspective as on figure 4a, wherein the pressing ram 5 is now in the maximum pressing position 55. The bearing means 56 and 56' on the pressing plate 51 and the bearing means 191 and 191' are designed with axes 57, 57', 192 and 192' in the embodiment shown. Additional reinforcing structures 58, for example additional ribs, can provide for an elevated stability. In the embodiment shown, the two long levers 52 and 52' and the two short levers 53 and 53' each comprise two lever blades, but this does not alter the degree of freedom for pressing movement.

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Figure 5a shows a side view of a preferred embodiment of a pressing ram 5 and a drive cylinder 41 with a central, yoke-shaped holder 15 on the housing 1 according to figure

4a, with the pressing ram 5 in the initial position 54. The housing 1 and upper housing part 14 are denoted by dashed lines. The front-side opening 11 is shown open. The storage element 62 is located inside of the upper housing part 14. Additional components of the waste-disposal container 100 can be placed in the space under the yoke-shaped bearing means 15, for example parts of the drive device 4. A fire extinguishing device can be located by the bearing block 19, and in the event of a fire can dispense a fire extinguishing agent into the waste-disposal container 100. Figure 5b shows a side view of the pressing ram 5 according to figure 5a, with the pressing ram 5 in the maximum pressing position 55.

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Figures 6a and 6b show a longitudinal section of another embodiment of the waste-disposal container according to the invention. The upper region of a waste-disposal container is shown, in which the securing element is designed as a shield 111". As shown on figure 6b, the shield 111" in a lower position releases the opening 11 for throwing away the waste. The upper edge of the shield 111" is designed so as to circumferentially protrude, and in this position abuts against the lower edge of the disposal opening 11, so that it serves as a disposal lip for the waste. This ensures that the waste thrown in reliably gets into the receptacle. If necessary, the interior side of the shield 111" can here serve as a slide, since it is essentially smooth in design and free of disruptive structures.

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The disposal of waste is also not impeded by the pivoting device 9 with which the shield 111" is mechanically connected, since the points of attack for the pivoting device on the shield 111" are arranged on the side.

25 On figure 6a, the shield 111", which can be pivoted from a lower into an upper position by means of the pivoting device 9, closes the disposal opening 11 in the upper position mentioned last. The pivoting device 9 is connected with the control device via a preferably electrical connection, which is not shown on the figure, and is driven by a motor, which is also not shown on the figure. The connection with the control device ensures that the pressing process is only triggered if the disposal opening 11 has been completely closed by the shield 111". Since the pivoting device and its drive are arranged to the side and above the disposal opening 11, the disposal of waste is not impeded in any way. In the lower, releasing position, the shield 111" even acts as a slide to support

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the path for the waste into the container 2.

Patentkrav

1. Avfallsbeholder (100) med pressanordning for pressing av avfall (M),
5 omfattende et hus (1), en beholder (2) som befinner seg i huset (1), en åpning (11) i huset (1) for innkasting av avfallet (M) i beholderen (2), et bevegelig sikringselement (111', 111"), som kan beveges mellom en posisjon som blottlegger åpningen (11) og en posisjon som stenger åpningen (11) og som fortrinnsvis kan sperres i posisjonen som stenger åpningen (11), en styringsanordning, en drivanordning (4) som er
10 operativt forbundet med styringsanordningen, og et presstempel (5) som er koblet til drivanordningen (4) og som, for å presse avfallet (M) inne i beholderen (2), er bevegelig mellom en innledende posisjon (54) og en posisjon (55) med maksimalt press, karakterisert ved at presstempelet (5), som er koblet til drivanordningen (4), omfatter en fortrinnsvis trinnformet pressplate (51), en lang hevarm (52) og en kort
15 hevarm (53), hvor pressplaten (51), den lange hevarmen (52) og den korte hevarmen (53), sammen med lagerinnregninger (191) på huset (1) og lagerinnregninger (56) på pressplaten (51), danner en fireleddet forbindelse; og ved at sikringselementet (111', 111") er koblet til styringsanordningen og/eller drivanordningen (4).
- 20 2. Avfallsbeholder (100) med pressanordning ifølge krav 1, karakterisert ved at styringsanordningen og/eller drivanordningen (4) er elektrisk forbundet med en uavhengig spenningsforsyning.
3. Avfallsbeholder (100) med pressanordning ifølge krav 2, karakterisert ved
25 at den uavhengige spenningsforsyningen omfatter fotovoltaiske elementer (61) og minst ett lagringselement (62), hvor de fotovoltaiske elementene (61) er anbrakt på en skrå overflate (12) til en husoverdel (14) på oversiden av husoverdelen (14), hvor fortrinnsvis husoverdelen (14) omfattende den skrå overflaten (12) til husoverdelen (14) på oversiden av husoverdelen (14) er dreibar om en lengdeakse (13) til huset (1).
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4. Avfallsbeholder (100) med pressanordning ifølge krav 3, karakterisert ved at styringsanordningen og lagringselementet (62) og deler av drivanordningen (4) er

anordnet i rommet mellom presstempelet (5) og den skrå overflaten (12).

5. Avfallsbeholder (100) med pressanordning ifølge ett av de foregående krav, karakterisert ved at styringsanordningen omfatter en fyllingsnivåkontrollanordning og/eller en presstrykkmåleanordning (33) og/eller en slaglengdemåleanordning (34).
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6. Avfallsbeholder (100) med pressanordning ifølge ett av de foregående krav, karakterisert ved at drivanordningen (4) omfatter en drivsylinder (41), fortrinnsvis en elektrisk sylinder drevet av en elektromotor, hvor drivsylinderen (41) med den første enden (411) griper inn i pressplaten (51), fortrinnsvis mellom lagerinnretningene (56) til pressplaten (51), eller i én av lagerinnretningene (56) til pressplaten (51) eller i den lange hevarmen (52), og med den andre enden (412) griper inn i huset (1) ved toppen, fortrinnsvis sentralt på en holder (15).
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7. Avfallsbeholder (100) med pressanordning ifølge ett av de foregående krav, karakterisert ved at huset (1) har et sirkulært tverrsnitt vinkelrett på lengdeaksen (13).
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8. Avfallsbeholder (100) med pressanordning ifølge ett av de foregående krav, omfattende, inne i huset (1), en brannslukkingsanordning med et brannslukkingsmiddel, hvor brannslukkingsanordningen fortrinnsvis omfatter en utløser og en brannslukkingskapsel med brannslukkingsmiddelet.
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9. Avfallsbeholder (100) med pressanordning ifølge ett av de foregående krav, karakterisert ved at i posisjonen som blottlegger åpningen (11), sikringselementet (111'), fortrinnsvis en klaff (111'), danner, sammen med pressplaten (51), et skrått lokk motstående, den fortrinnsvis frontale, åpningen (11).
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10. Avfallsbeholder (100) med pressanordning ifølge ett av kravene 1 til 8, karakterisert ved at i posisjonen som blottlegger åpningen (11), sikringselementet (111"), fortrinnsvis et skjold (111"), er anordnet i det minste delvis nedenfor åpningen (11), hvor fortrinnsvis den øvre randen til sikringselementet (111") ligger an mot den
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nedre randen til åpningen (11).

11. Avfallsbeholder (100) med pressanordning ifølge krav 10, karakterisert ved at sikringselementet (111") er mekanisk forbundet med en svingeanordning (9) og sikringselementet (111") er svingbart mellom posisjonen som blottlegger åpningen (11) og posisjonen som stenger åpningen (11), hvor svingeanordningen (9) er elektrisk forbundet med styringsanordningen.

12. Fremgangsmåte for pressing av avfall med en avfallsbeholder (100) med pressanordning ifølge ett av de foregående krav, karakterisert ved at sikringselementet (111', 111") bringes til en posisjon som stenger åpningen (11) og fortrinnsvis sperres i posisjonen som stenger åpningen (11) under presseoperasjonen; ved at drivanordningen (4) aktiveres gjennom styringsanordningen, hvor drivanordningen (4) frigjøres når sikringselementet (111', 111") er i posisjonen som stenger åpningen (11); ved at presstempelet (5) beveges til pressposisjonen som svarer til det maksimale presstrykket målt av presstrykkmåleanordningen (33), hvor bevegelsen til presstempelet (5) drives gjennom drivanordningen (4), hvor drivanordningen (4) styres gjennom styringsanordningen; ved at presstempelet (5) beveges tilbake til den innledende posisjonen (54); og ved at sikringselementet (111', 111") beveges tilbake til posisjonen som blottlegger åpningen.

13. Fremgangsmåte ifølge krav 12, karakterisert ved at presseoperasjonen, etter en måling av fyllingsnivået til beholderen (2) gjennom fyllingsnivåkontrollanordningen, utløses av en bestemt terskelverdi for fyllingsnivået til beholderen (2), hvor fortrinnsvis også lastenivået til lagringselementet (62) måles og presseoperasjonen utløses av et bestemt lastenivå.

14. Fremgangsmåte ifølge krav 13, karakterisert ved at terskelverdien for fyllingsnivået som utløser presseoperasjonen økes trinnvis med antallet presseoperasjoner.

15. Fremgangsmåte ifølge ett av kravene 12 til 14, karakterisert ved at bevegelsesretningen til sikringselementet (111', 111") fra posisjonen som stenger/blottlegger åpningen (11) til posisjonen som blottlegger/stenger åpningen (11) reverseres ved en blokkering av bevegelsen.

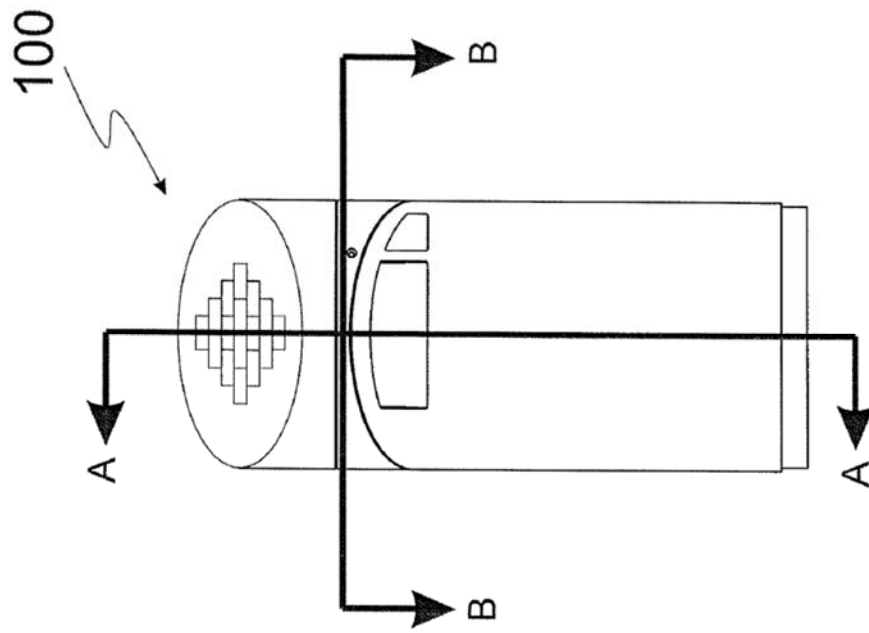


Fig.1b

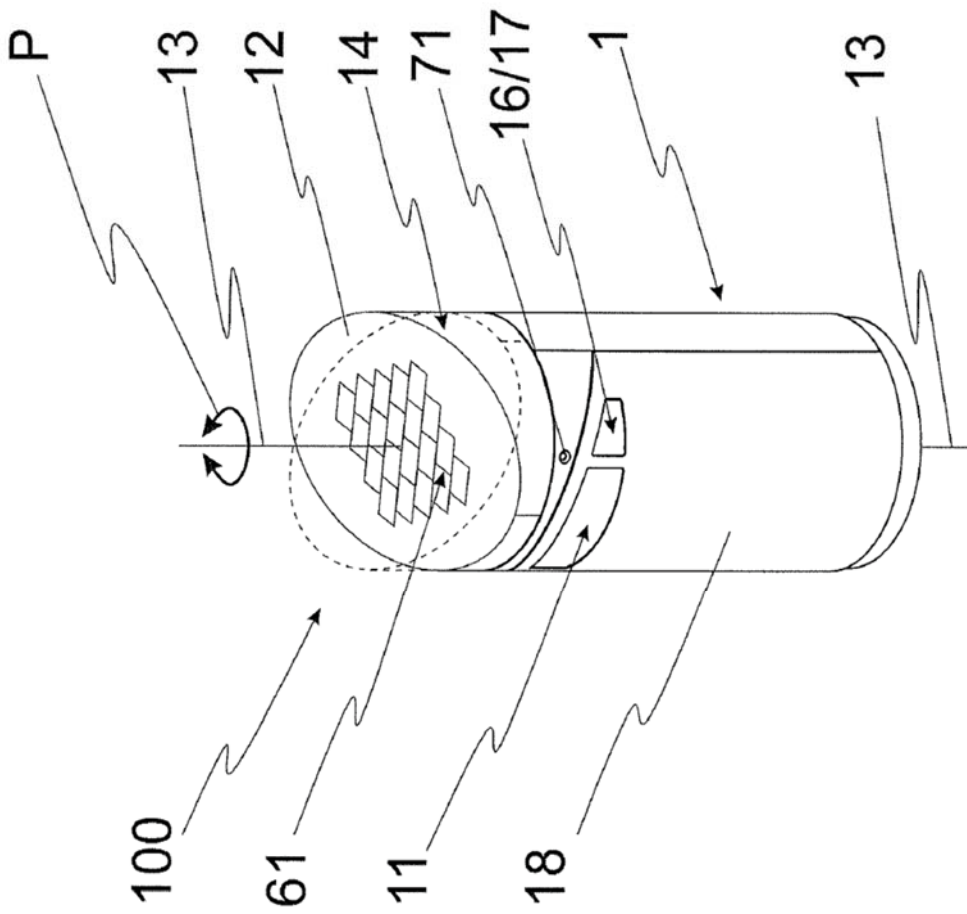


Fig.1a

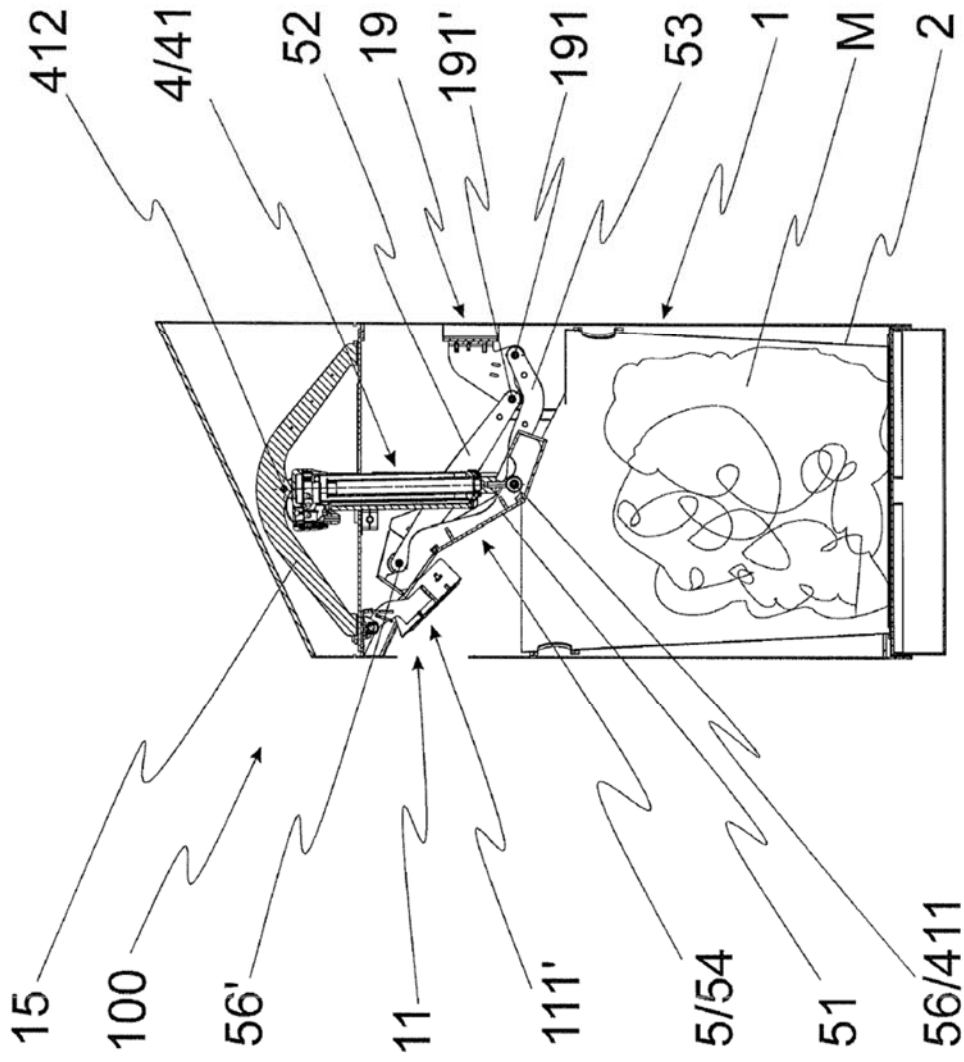


Fig. 2a

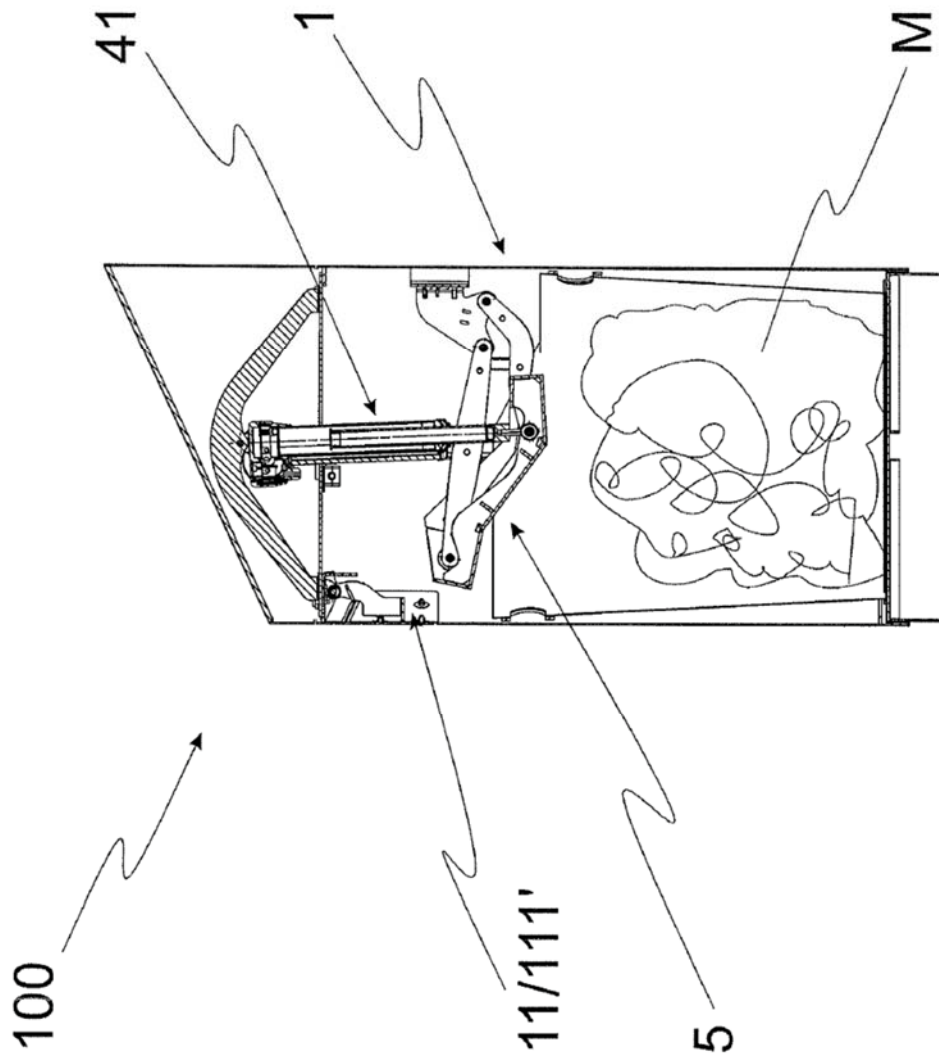


Fig. 2b

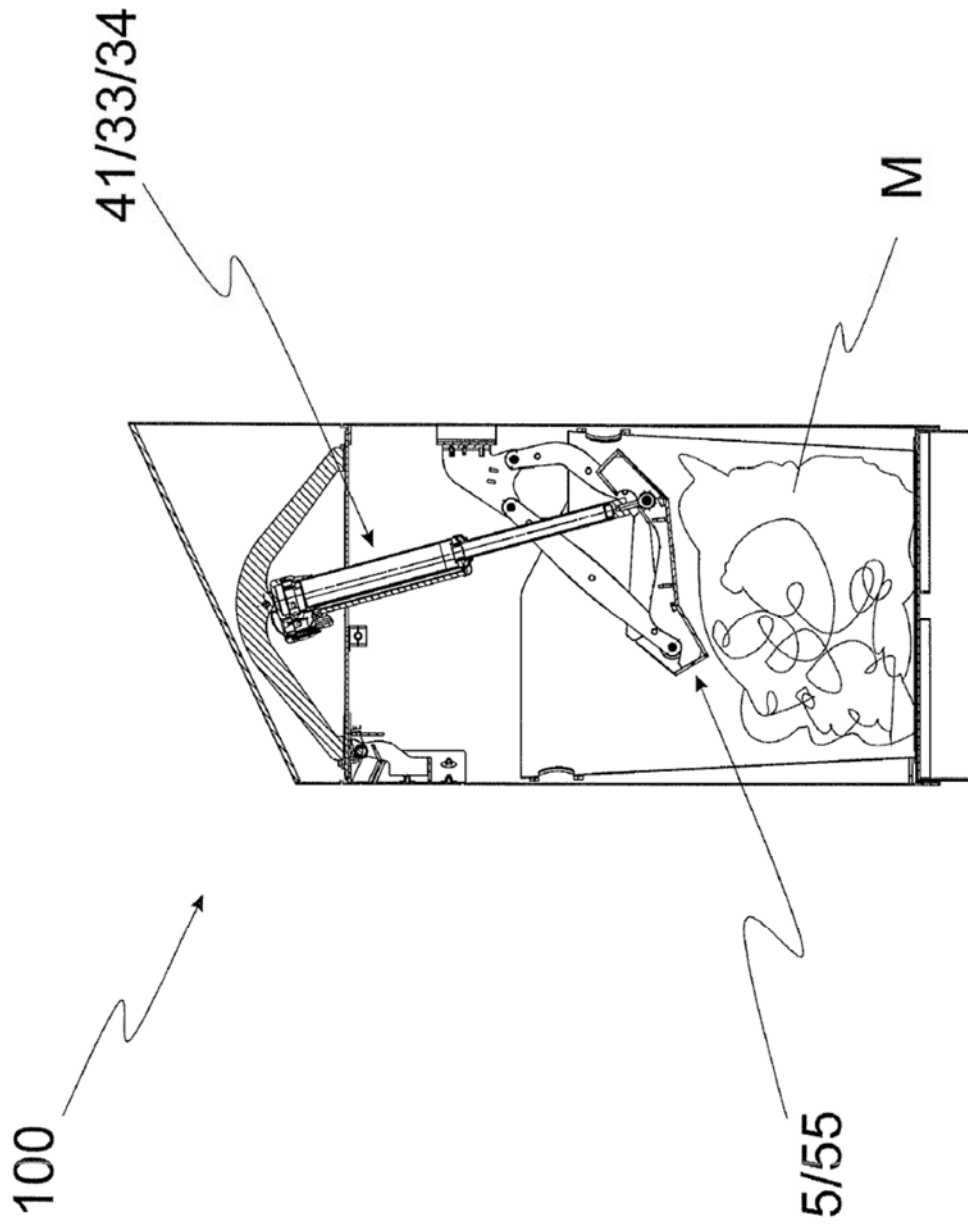


Fig. 2c

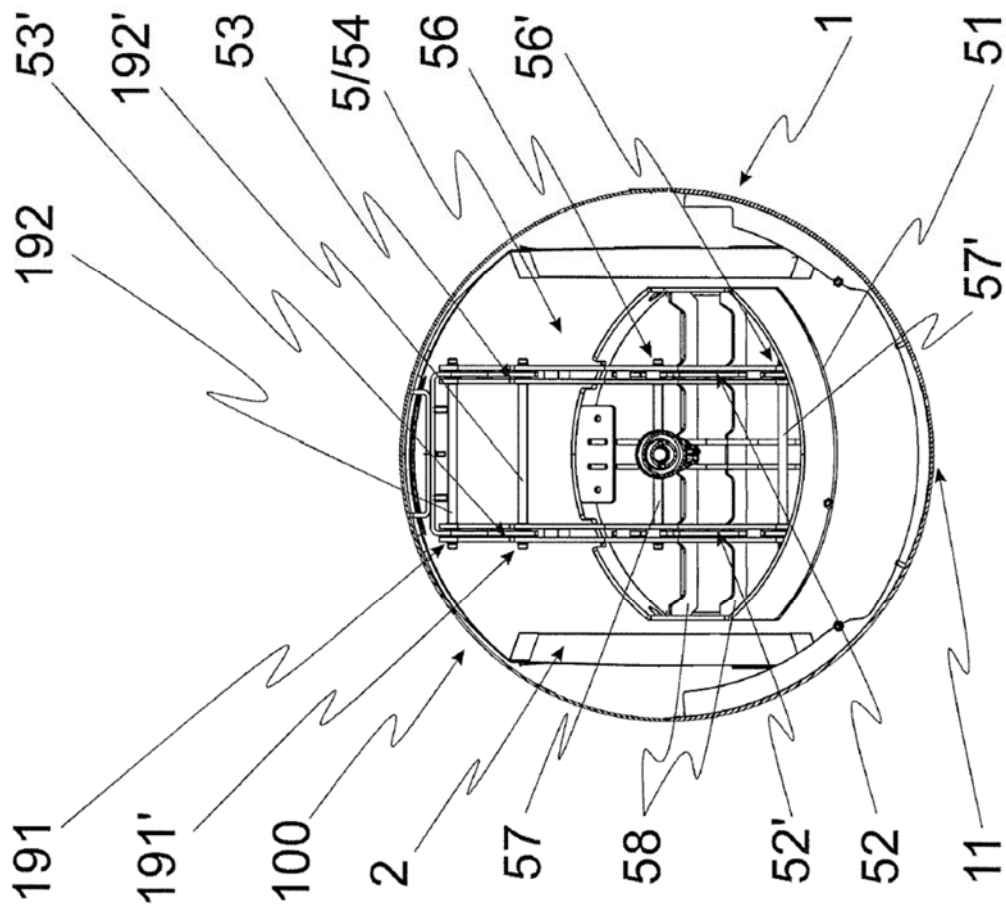


Fig. 3a

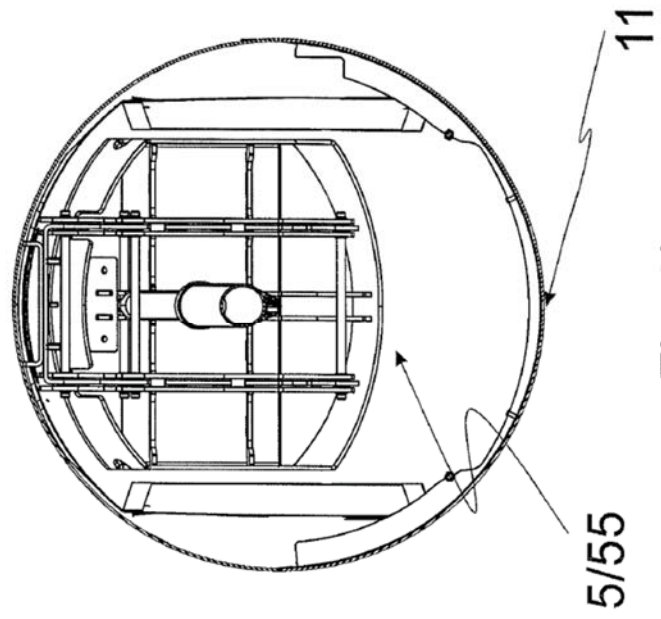


Fig. 3b

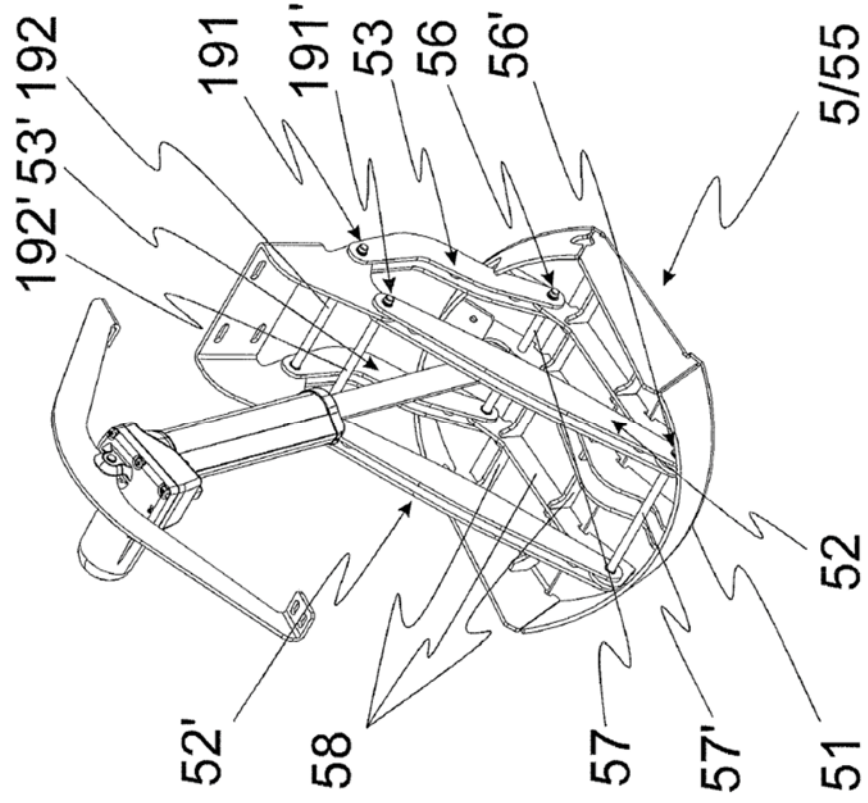


Fig. 4b

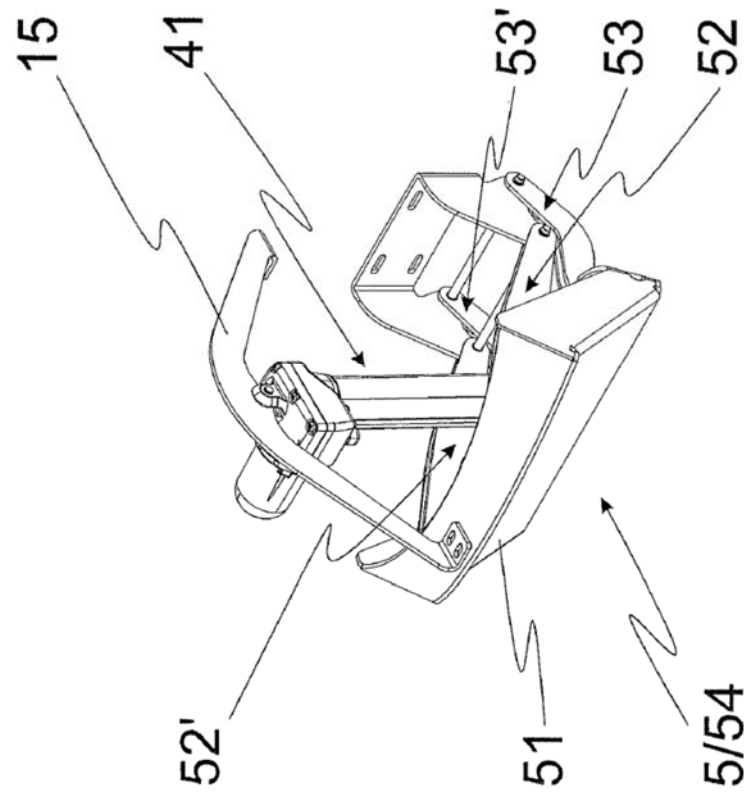


Fig. 4a

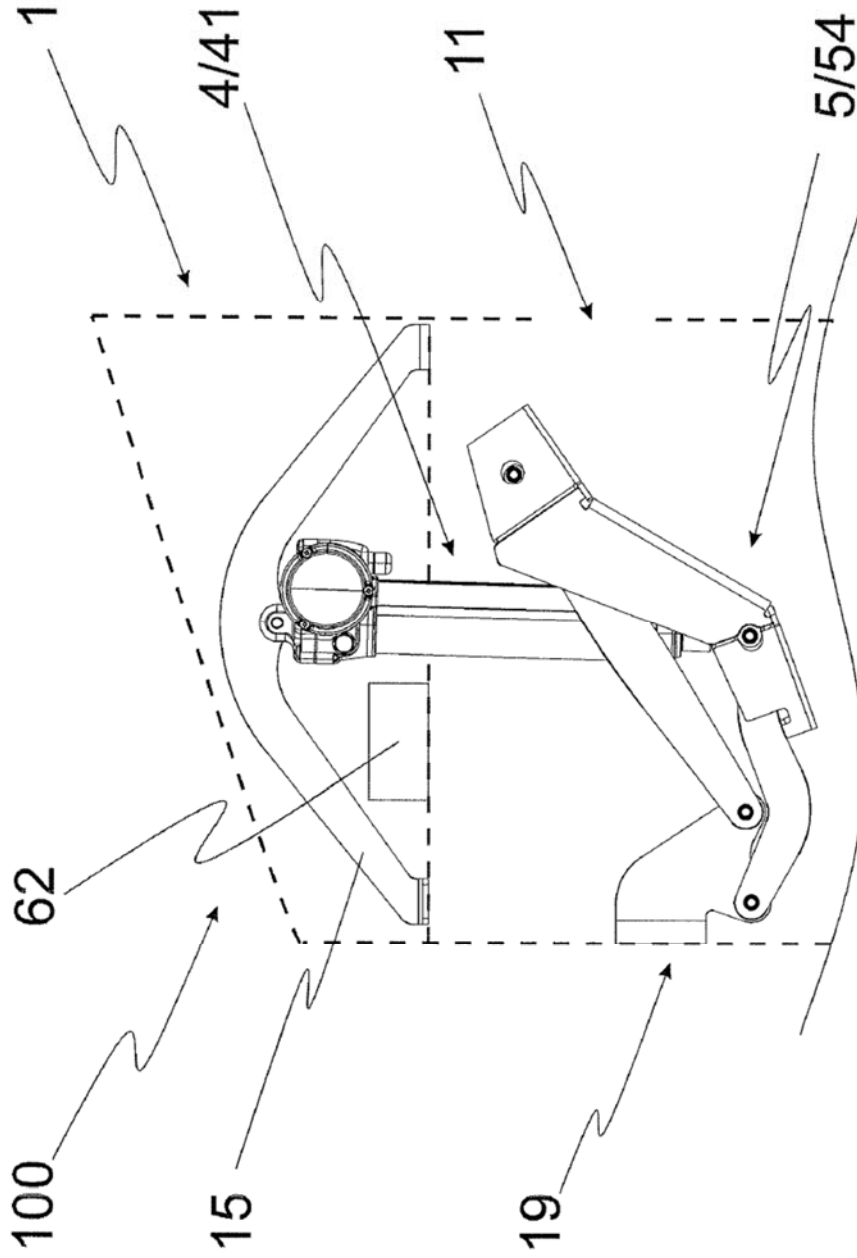


Fig. 5a

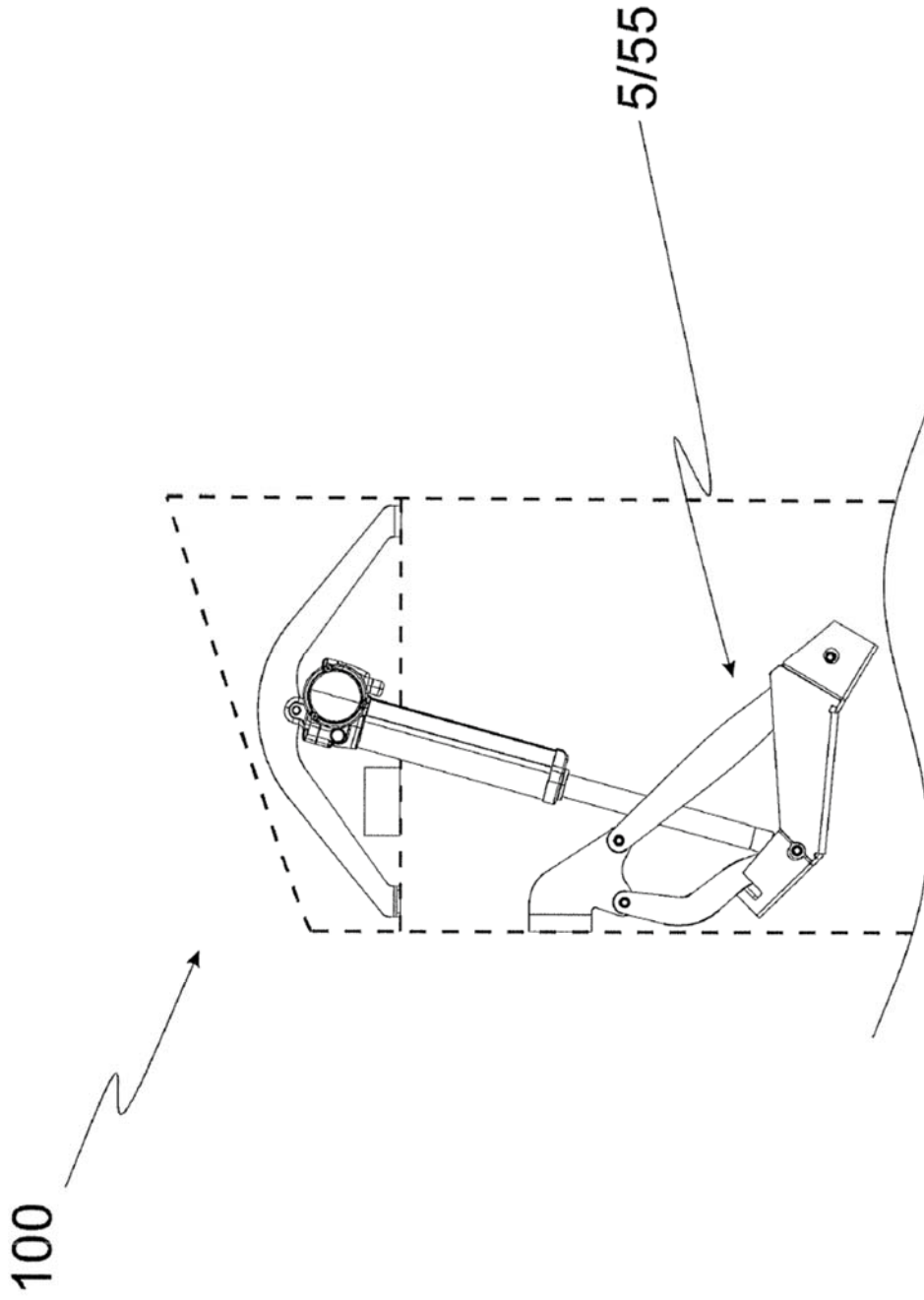


Fig. 5b

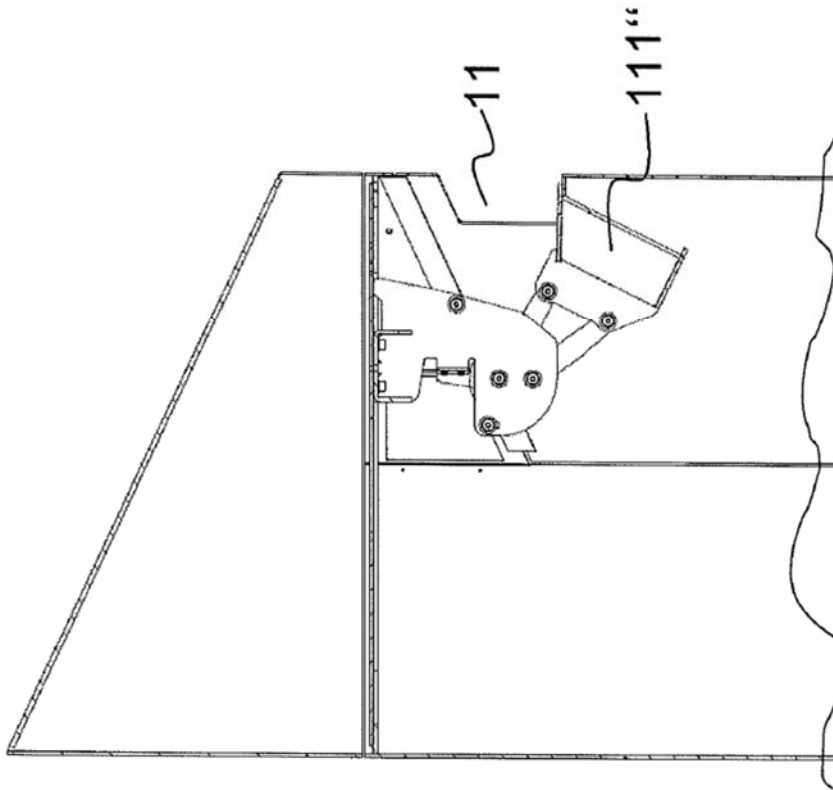


Fig. 6b

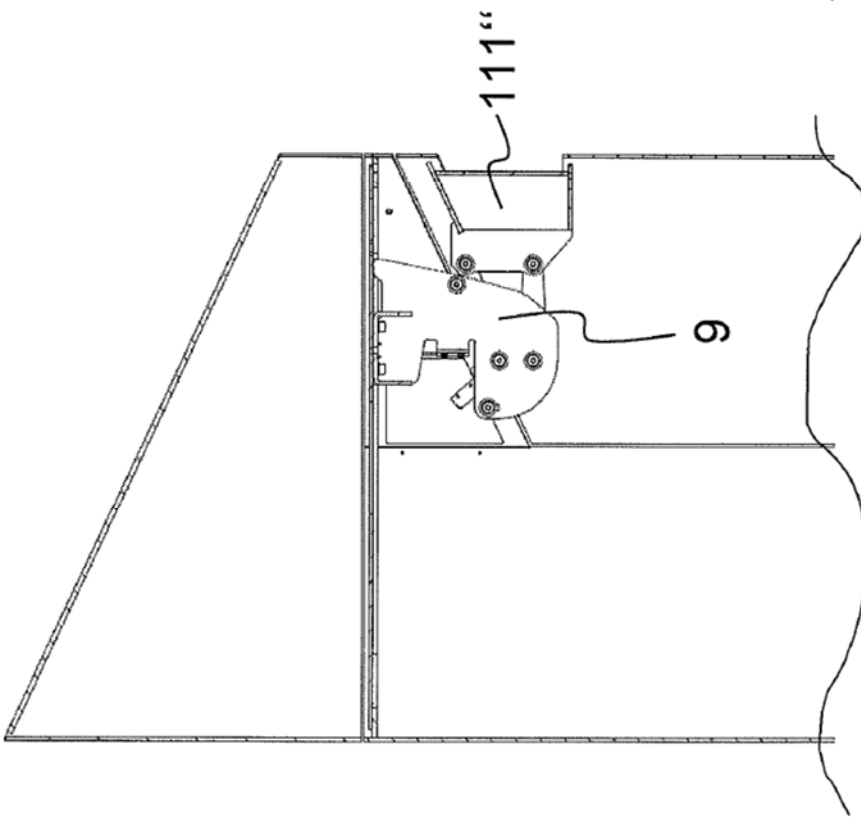


Fig. 6a