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(54) **PNEUMATIC REFUSE COLLECTION APPARATUS**

PNEUMATISCHE MÜLLSAMMELVORRICHTUNG

APPAREIL PNEUMATIQUE DE COLLECTE DES DÉCHETS

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Description

Field of the Art

[0001] The present invention relates generally to a pneumatic refuse collection apparatus, and more particularly to a pneumatic collection apparatus which is capable of selectively collecting two different fractions and is constituted by three easily transportable modules having a compact design.

Background of the Invention

[0002] A large amount of refuse is generated in some places, such as large buildings that are usually related to public access in general, for example hospitals, shopping centers, etc., and it would therefore be suitable to install pneumatic refuse collection apparatus in such places. Nevertheless, a drawback that these places have in general is that they have a small and limited space for installing the pneumatic refuse collection apparatus.

[0003] An objective of the present invention is to provide a pneumatic refuse collection apparatus that can be divided into different compact, modular units which can be easily transported and coupled to one another, does not require a specific infrastructure for installation, and provides easy access to its mechanisms and to the control devices thereof.

[0004] Patent document US 3889830 A discloses a pneumatic refuse collection apparatus comprising a container, a fan-based suction device, and a compacting ram-based compactor device that are installed in a single structure on the chassis of a truck. The container has only one compartment with a refuse inlet and an air outlet, the suction device is arranged such that it draws out air from inside the compartment through the air outlet and thereby generates a negative pressure which suctions the refuse inside the compartment through the refuse inlet, and the compactor device is arranged such that it compacts the refuse inside the compartment.

[0005] Patent document DE 4400007 C1 describes a pneumatic refuse collection apparatus comprising a container and a suction device including a fan installed on the chassis of a truck. The container is provided with three compartments, each of which has a combined refuse and air inlet. The suction device suctions the refuse through an inlet duct and injects the refuse, together with the suction air, selectively into one of the compartments by means of a mobile transfer duct and through the corresponding combined refuse and air inlet. By means of a rotational movement about a vertical section, the outlet of the mobile transfer duct can be arranged to selectively face any one of the three combined refuse and air inlets of the three compartments.

[0006] Patent document WO 2015092122 A1 discloses a pneumatic refuse collection apparatus 2-in accordance with the preamble of claim 1, comprising a container comprising a compartment having a refuse inlet, an air

outlet and a compacting inlet, a compactor device comprising an air inlet, a compacting outlet, and a compacting ram which is moved by an actuator between a retracted position, in which the compacting ram is inside the compactor device, and an extended position, in which the compacting ram projects outwardly from the compactor coupling face through the compacting outlet, and a suction device comprising a fan arranged inside an enclosure having an air inlet and an air outlet, the suction device being arranged for drawing out air from inside the container through the air outlet of the container thereby generating a negative pressure which suctions the refuse inside the container through the refuse inlet thereof.

[0007] In the pneumatic refuse collection apparatus described in WO 2015092122 A1, the container has a container coupling face where the air outlet and the compacting inlet are located, and the compactor device has a compactor coupling face where the air inlet and the compacting outlet are located. The container coupling face of the container and the compactor coupling face of the compactor fit together for attaching the container to the compactor in an operative position in which the air outlet and the compacting inlet of the container are aligned and coupled with the air inlet and the compacting outlet of the compactor device, respectively, and the compacting ram is received in the extended position in the compartment of the container through the compacting outlet and the compacting inlet for compacting the refuse inside the container.

[0008] Patent document JP S5312946 1A discloses a refuse container having a compartment with a refuse inlet and a compactor device having a refuse chamber with a refuse hopper inlet and a refuse outlet and a compacting ram which is moved inside the compactor device by an actuator between a retracted position, in which the compacting ram is away from the refuse outlet, and an extended position, in which the compacting ram is adjacent the refuse outlet. The container has a container coupling face provided with a door where the refuse inlet is located and the compactor device has a compactor coupling face where the refuse outlet is located. In an operative position, the container coupling face of the container is joined to the compactor coupling face of the compactor device and the refuse inlet is aligned and coupled with the refuse outlet.

Description of the Invention

[0009] The present invention contributes to achieving the foregoing and other objectives by providing a pneumatic refuse collection apparatus in accordance with claim 1, comprising a container having a refuse inlet and an air outlet, a suction device drawing out air from inside the container through the air outlet, thereby generating a negative pressure which suctions the refuse inside the container through the refuse inlet, and a compactor device compacting the refuse inside the container.

[0010] The container is integrated in a container mod-

ule comprising a compartment having a refuse inlet, an air outlet and a compacting inlet. The container module has on one of its sides a container coupling face, and at least the air outlet and the compacting inlet are located on a container coupling face.

[0011] The compactor device is integrated in a compactor-duct carrier module comprising an air inlet, an air outlet, an air duct communicating the air inlet with the air outlet, and a compacting ram which is moved by an actuator between a retracted position, in which the compacting ram is inside the compactor-duct carrier module, and an extended position, in which the compacting ram projects outwardly from the compactor-duct carrier module through the compacting outlet. Optionally, the compactor-duct carrier module has installed therein a hydraulic unit, and the actuator moving the compacting ram is likewise a hydraulic cylinder operated by this hydraulic unit.

[0012] The compactor-duct carrier module has on one of its sides a first compactor coupling face and on another opposite side a second compactor coupling face. The air inlet and the compacting outlet are located on the first compactor coupling face and the air outlet is located on the second compactor coupling face.

[0013] The suction device is integrated in a suction module comprising a fan arranged inside an enclosure having an air inlet and an air outlet. The suction module has a suction coupling face in which the air inlet is located. The air inlet of the suction module can be coupled to the air outlet of the compactor-duct carrier module. Optionally, the suction module comprises a cabin having an access door. The cabin houses the suction device and an electrical control panel. The fan is preferably a centrifugal fan having a blade impeller rotating about a horizontal axis, and the air inlet of the enclosure is aligned with the horizontal axis of rotation of the blade impeller, whereas the air outlet is in a position tangent to the blade impeller. An electric motor rotating the blade impeller of the fan is installed in the suction module.

[0014] The container coupling face of the container module and the first compactor coupling face of the compactor-duct carrier module have elements that fit together and anchoring devices which, when activated, attach the container module and the compactor-duct carrier module to one another in an operative position, in which the air outlet and the compacting inlet of the container module are aligned and coupled with the air inlet and the compacting outlet of the compactor-duct carrier module, respectively. The compacting ram is therefore received in the extended position in the compartment of the container through the compacting outlet of the compactor-duct carrier module and the compacting inlet of the container module.

[0015] The compactor-duct carrier module and the suction module are preferably provided for being supported on the ground and kept in a fixed position by friction. Optionally, the compactor-duct carrier module and/or the suction module comprise legs provided with

fixing elements which allow fixing the compactor-duct carrier module and/or the suction module to the ground in the mentioned fixed position.

[0016] The container module is preferably provided with rolling elements for rolling on the ground, and optionally these rolling elements have surfaces that are coupled to alignment rails fixed to the ground in positions adjacent to the compactor-duct carrier module. Therefore, when the container module is moved closer to the compactor-duct carrier module by rolling it on the ground, the alignment rails align the container module with the compactor-duct carrier module and secure the coupling thereof to one another in the operative position.

[0017] The anchoring devices comprise protruding elements fixed in the container module and retractable hooks installed in the compactor-duct carrier module. The retractable hooks hook onto the protruding elements of the container module and are retracted by respective actuators for pressing the container coupling face of the container module against the first compactor coupling face of the compactor-duct carrier module. The actuators retracting the retractable hooks are hydraulic cylinders operated by the hydraulic unit installed in the compactor-duct carrier module, although alternatively they could be actuators based on a manually operated lever.

[0018] In one embodiment, the refuse inlet of the compartment of the container module is located on the container coupling face of the container module and the compactor-duct carrier module further comprises a refuse outlet located on the first compactor coupling face and a refuse inlet. When the container module and the compactor-duct carrier module are attached to one another in the operative position, the refuse inlet of the container module is aligned and coupled with the refuse outlet of the compactor-duct carrier module.

[0019] The container module preferably comprises a door that can be moved between an open position, in which the door provides access to the compartment of the container, and a closed position, in which the door closes the compartment and provides the container coupling face. The refuse inlet, the air outlet and the compacting inlet are formed in the door.

[0020] In another embodiment suitable for the collection of two different refuse fractions, the container module comprises a second compartment having a second refuse inlet, a second air outlet and a second compacting inlet, wherein at least the second air outlet and the second compacting inlet are located on the container coupling face.

[0021] In this embodiment, the compactor-duct carrier module comprises a second air inlet and a second compacting outlet located on the first compactor coupling face, a second air duct communicating the second air inlet with the air outlet by means of a collector to which there is also connected the first air duct, and a second compacting ram which is moved by a second actuator between a retracted position, in which the second compacting ram is inside the compactor-duct carrier module,

and an extended position, in which the second compacting ram projects outwardly from the first compactor coupling face through the second compacting outlet. The actuators moving the first and second compacting rams can act simultaneously with or independently of one another, and in a particular embodiment, the actuators are hydraulic cylinders operated by the hydraulic unit installed in the compactor-duct carrier module.

[0022] In this embodiment, when the container module and the compactor-duct carrier module are attached to one another in the operative position, the first and second air outlets and the first and second compacting inlets of the container module are aligned and coupled with the first and second air inlets and the first and second compacting outlets of the compactor-duct carrier module, respectively, and the first and second compacting rams in the extended position are received in the first and second compartments of the container through the first and second compacting outlets of the compactor-duct carrier module and the first and second compacting inlets of the container module.

[0023] Preferably, the first air duct of the compactor-duct carrier module has a first shutter that can be moved between an open position and a closed position, and the second air duct of the compactor-duct carrier module has a second shutter that can be moved between an open position and a closed position. The first and second shutters are moved by respective actuators, such as, for example, hydraulic cylinders operated by the hydraulic unit installed in the compactor-duct carrier module, although alternatively the actuators moving the first and second shutters could be manually operated actuators.

[0024] The first and second refuse inlets of the first and second compartments of the container module are also preferably located on the container coupling face. The compactor-duct carrier module further comprises first and second refuse outlets located on the first compactor coupling face, a refuse inlet, a refuse duct having a first end connected to the refuse inlet, and a distributor device communicating a second end of the refuse duct selectively with either the first or second refuse outlets, so the distributor device allows selecting two different refuse fractions and storing them separately in the two compartments of the container module.

[0025] The first and second refuse inlets of the container module are aligned and coupled with the first and second refuse outlets of the compactor-duct carrier module when the container module and the compactor-duct carrier module are attached to one another in the operative position.

[0026] In a particular embodiment of the distributor device, the first and second ends of the refuse duct are misaligned with respect to one another, the first end of the refuse duct is connected to the refuse inlet by a rotary joint and the distributor device comprises a rocker arm fixed to the second end of the refuse duct and an actuator causing the rocker arm and the refuse duct to pivot about a shaft between first and second positions, in which the

second end of the refuse duct is facing and in communication with the first and second refuse outlets, respectively. The actuator causing the rocker arm to pivot is preferably a hydraulic cylinder operated by the hydraulic unit installed in the compactor-duct carrier module, although alternatively it could be a manually operated actuator.

[0027] Optionally, the container module comprises first and second doors that can be moved between respective open positions, in which the first and second doors provide access to the first and second compartments of the container, respectively, and respective closed positions, in which the first and second doors close the first and second compartments, respectively. The first and second doors together provide the container coupling face when they are in the closed position, and the first and second refuse inlets, the first and second air outlets and the first and second compacting inlets are formed in the first and second doors, respectively.

[0028] In one embodiment, the refuse inlet of the compactor-duct carrier module is located on the second compactor coupling face, and the suction module comprises a refuse duct having a refuse outlet located on the suction coupling face and a refuse inlet. The refuse outlet can be connected to the refuse inlet located on the second compactor coupling face of the compactor-duct carrier module.

[0029] In an alternative embodiment suitable for the collection of only one refuse phase, there is formed in the compactor-duct carrier module a refuse chamber demarcated between the compacting ram, when it is in the retracted position, and the compacting outlet, and the refuse duct opens directly into this refuse chamber instead of being connected to a refuse outlet. The compacting outlet therefore constitutes a refuse and compacting outlet through which the compacting ram transfers the refuse into the compartment of the container module and compacts said refuse in the compartment.

[0030] Accordingly, the refuse inlet and the compacting inlet of the container module are combined constituting a refuse and compacting inlet located on the container coupling face of the container module, such that the refuse and compacting inlet of the container module is aligned and coupled with the refuse and compacting outlet of the compactor-duct carrier module when the container module and the compactor-duct carrier module are attached to one another in the operative position.

[0031] In another alternative embodiment suitable for the collection of two refuse phases, there are formed in the compactor-duct carrier module first and second refuse chambers demarcated between the first and second compacting rams, when they are in the retracted positions, and the first and second compacting outlets, and the distributor device communicates the refuse duct selectively with either the first or second additional refuse ducts opening directly into the first and second refuse chambers, respectively. The first and second refuse outlets and the first and second compacting outlets are

therefore combined forming first and second refuse and compacting outlets.

[0032] Accordingly, the first and second refuse inlets and the first and second compacting inlets of the first and second compartments of the container module are combined constituting respective first and second refuse and compacting inlets located on the container coupling face. These first and second refuse and compacting inlets are aligned and coupled with the first and second refuse and compacting outlets of the compactor-duct carrier module when the container module and the compactor-duct carrier module are attached to one another in the operative position.

[0033] Optionally, in the compactor-duct carrier module, the distributor device can be installed in an inclined position such that the distributed refuse outlets of the device are inclined towards the first compacting coupling face for the purpose of reducing a bend that the first and second additional refuse ducts must have in order to open into refuse inlets located in an upper part of the first and second refuse chambers.

Brief Description of the Drawings

[0034] The foregoing and other features and advantages will be better understood based on the following detailed description of several merely illustrative and non-limiting embodiments in reference to the attached drawings, in which:

Figure 1 is a perspective view of a pneumatic refuse collection apparatus according to a first embodiment of the present invention useful for the collection of only one refuse fraction;

Figure 2 is a perspective view of a container module that is part of the pneumatic collection apparatus of Figure 1, showing a container coupling face thereof; Figure 3 is a front view of the container module of Figure 2 showing a door providing the container coupling face thereof in a closed position;

Figure 4 is a cross-section view taken along plane IV-IV of Figure 3;

Figure 5 is a front view of the container module with the door open;

Figures 6 and 7 are perspective views of a compactor-duct carrier module that is part of the pneumatic collection apparatus of Figure 1, showing opposing second and first compacting coupling faces thereof, respectively;

Figure 8 is a front view of the compactor-duct carrier module of Figures 6 and 7 showing the first compacting coupling face thereof;

Figure 9 is a cross-section view taken along plane IX-IX of Figure 8;

Figure 10 is a perspective view of a suction module that is part of the pneumatic collection apparatus of Figure 1, showing a side thereof with a door open;

Figure 11 is a perspective view of the suction module

of Figure 10, showing a suction coupling face opposite the side where the door is located;

Figure 12 is a front view of the suction module with the door open;

Figure 13 is a cross-section view taken along plane XIII-XIII of Figure 12;

Figure 14 is a perspective view of a pneumatic refuse collection apparatus according to a second embodiment of the present invention useful for the collection of two different refuse fractions;

Figure 15 is a perspective view of a container module that is part of the pneumatic collection apparatus of Figure 14, showing a container coupling face thereof;

Figure 16 is a front view of the container module showing doors providing the container coupling face thereof in a closed position;

Figure 17 is a cross-section view taken along plane XVII-XVII of Figure 16;

Figure 18 is a cross-section view taken along plane XVIII-XVIII of Figure 16;

Figure 19 is a front view of the container module with the doors open;

Figures 20 and 21 are perspective views of a compactor-duct carrier module that is part of the pneumatic collection apparatus of Figure 14, showing opposing second and first compacting coupling faces thereof, respectively, and with a distributor device lacking its upper cover;

Figure 22 is a side view of the compactor-duct carrier module of Figures 20 and 21;

Figure 23 is a cross-section view taken along plane XXIII-XXIII of Figure 22;

Figure 24 is a cross-section view taken along plane XXIV-XXIV of Figure 22;

Figures 25 and 26 are top views of the compactor-duct carrier module with the distributor device in two alternative positions, respectively;

Figure 27 is a perspective view of a suction module that is part of the pneumatic collection apparatus of Figure 14, showing a side thereof with a door open;

Figure 28 is a perspective view of the suction module of Figure 27, showing a suction coupling face opposite the side where the door is located;

Figure 29 is a front view of the suction module with the door open;

Figure 30 is a cross-section view taken along plane XXX-XXX of Figure 29;

Figure 31 is a perspective view of a pneumatic refuse collection apparatus according to a third embodiment of the present invention useful for the collection of two different refuse fractions;

Figure 32 is a perspective view of a compactor-duct carrier module that is part of the pneumatic collection apparatus of Figure 31, showing a first compacting coupling face thereof, and with a distributor device lacking its upper cover; and

Figure 33 is a perspective view of a container module that is part of the pneumatic collection apparatus of

Figure 31, showing doors providing a container coupling face in a closed position.

Detailed Description of an Embodiment

[0035] First, in reference to Figures 1 to 13, reference number 100 (Figure 1) generally designates a pneumatic refuse collection apparatus according to a first embodiment of the present invention provided for the collection of one refuse fraction, comprising a container module 4, a compactor-duct carrier module 5 and a suction module 6 operatively attached and coupled to one another.

[0036] The container module 4 (best shown in Figures 2 to 5) integrates a container 1 comprising only one compartment 7a with a door 40a articulated with respect to a jamb of the door frame of the container 1 by vertical hinges. The door 40a can be moved between an open position (Figure 5), in which the door 40a provides access to the compartment 7a of the container 1, and a closed position (Figures 2, 3 and 4), in which the door 40a closes the compartment 7a. There are formed in the door 40a a refuse inlet 8a in an upper central position, a pair of air outlets 9a on both sides of the refuse inlet 8a, and a compacting inlet 10a in a lower position.

[0037] The door 40a can be locked in the closed position by means of a lock 43. When it is in the closed position, the door 40a provides a container coupling face 4a on which the refuse inlet 8a, the air outlets 9a and the compacting inlet 10a, which are in communication with the only compartment 7a, are arranged.

[0038] The provision of two air outlets 9a in communication with the only compartment 7a is optional and has the purpose of providing a more uniform airflow in and out of the container 1 and allowing a central position for the refuse inlet 8a. However, in an alternative embodiment (not shown), only one air outlet 9a with equivalent functionality is formed in the door 40a.

[0039] The container module 4 has on its outer surface protruding elements 29 that are formed in the illustrated example by jambs of the door frame, and is provided with rolling elements 34 provided for rolling on the ground. The protruding elements 29 are part of anchoring devices for connecting the container module 4 and the compactor-duct carrier module 5. The container module 4 is configured for being handled and transported by a truck or another vehicle.

[0040] The compactor-duct carrier module 5 (better shown in Figures 6 to 9) has opposing first and second compactor coupling faces 5a, 5b. A pair of air inlets 11a, a refuse outlet 14a and a compacting outlet 38a are located on the first compactor coupling face 5a. An air outlet 12 is located on the second compactor coupling face 5b. A pair of air ducts 13a communicates the air inlets 11a with the air outlet 12 through a collector 13c. A refuse duct 16 has a first end provided with a refuse inlet 15 provided with connecting elements (not shown) for connection thereof to a refuse delivery duct (not shown) and a second end connected to the refuse outlet 14a.

[0041] In the previously mentioned alternative embodiment (not shown) in which the container module 4 includes only one air outlet 9a, the compactor-duct carrier module 5 has only one air inlet 11a on its first compactor coupling face 5a, and only one air duct 13a communicates the only air inlet 11a with the air outlet 12 located on the second compactor coupling face 5b.

[0042] The compactor-duct carrier module 5 further comprises a compactor device 2 including a compacting ram 18a. An actuator, such as, for example, a hydraulic cylinder 30a operated by a hydraulic unit 32, moves the compacting ram 18a between a retracted position (shown by means of solid lines in Figure 9), in which the compacting ram 18a is inside the compactor-duct carrier module 5 without projecting from the compacting outlet 38a, and an extended position (shown by means of dashed lines in Figure 9), in which the compacting ram 18a projects outwardly from the first compactor coupling face 5a through the compacting outlet 38a.

[0043] Retractable hooks 28 connected to hydraulic cylinders 42 which are operated by the hydraulic unit 32 are installed on both sides of the compactor-duct carrier module 5. Activation of the hydraulic cylinders 42 retracts the retractable hooks 28, which are part of the anchoring devices and which cooperate with the protruding elements 29 of the container module 4.

[0044] In the illustrated example, the hydraulic unit 32 is installed in a structure of the compactor-duct carrier module 5. In an alternative embodiment, the compactor-duct carrier module 5 has a hydraulic connection for being connected to an external hydraulic unit.

[0045] The compactor-duct carrier module 5 comprises legs 35 provided with fixing elements, such as, for example, holes, for fixing the compactor-duct carrier module 5 to the ground by means of screws or bolts.

[0046] The suction module 6 (better shown in Figures 10 to 13) comprises a cabin 52 provided with an access door 37 on one side and a suction coupling face 6a on another opposing side. A suction device 3 and an electrical control panel 36 are housed in the cabin 52. The suction device 3 comprises a fan having a blade impeller 19 arranged inside an enclosure 20 provided with an air inlet 21 located on the suction coupling face 6a and an air outlet 22 located in an upper position. The blade impeller 19 rotates about a horizontal axis being driven by an electric motor 33 installed in the cabin 52, the air inlet 21 of the enclosure 20 is aligned with the horizontal axis of rotation of the blade impeller 19 and the air outlet 22 is located in a position tangent to the blade impeller 19.

[0047] The container module 4, the compactor-duct carrier module 5 and the suction module 6 form compact units sized for being transported individually by normal means of transport and for being operatively installed in relatively small places, such as basements of large buildings, such as, for example, hospitals, shopping centers, etc.

[0048] When the modules are operatively installed (Figure 1), the compactor-duct carrier module 5 is fixed

to the ground by means of the fixing elements provided in its legs 35. The suction module 6 is placed on the ground with its suction coupling face 6a facing the second compacting coupling face 5b of the compactor-duct carrier module 5. In this position, the air inlet 21 of the suction module 6 is aligned with the air outlet 12 of the compactor-duct carrier module 5 and coupled to the air outlet 12 by means of a flange 49. The air outlet 22 of the suction module 6 is coupled to an air discharge duct (not shown) by means of a flange 44.

[0049] The container module 4 is moved closer to the compactor-duct carrier module 5 by rolling it on the ground to an operative position, in which the container coupling face 4a of the container module 4 is facing the first compactor coupling face 5a of the compactor-duct carrier module 5. The refuse inlet 8a, the air outlets 9a and the compacting inlet 10a of the container module 4 are positioned such that, in the operative position, they are aligned and coupled with the refuse outlet 14a, the air inlets 11a and the compacting outlet 38a compactor-duct carrier module 5, respectively.

[0050] Alignment rails 41 (Figure 1) are preferably fixed on the ground in positions adjacent to the first compactor coupling face 5a of the compactor-duct carrier module 5. The rolling elements 34 of the container module 4 have surfaces that are coupled to the alignment rails 41 for directing the container module 4 towards the compactor-duct carrier module 5 in the operative position.

[0051] The refuse outlet 14a, the air inlets 11a and the compacting outlet 38a of the compactor-duct carrier module 5 are provided with respective perimetral protrusions that respectively enter the refuse inlet 8a, the air outlets 9a and the compacting inlet 10a of the container module 4 in the operative position, constituting elements that fit together. The air inlets 11a and the refuse outlet 14a of the compactor-duct carrier module 5 have perimetral fins 46, 47 that are supported against the door 40a of the container module 4 compressing respective elastic joints in the operative position. The first compactor coupling face 5a of the compactor-duct carrier module 5 has a support surface 45 which is supported against the door 40a of the container module 4 in the operative position.

[0052] In the operative position, the retractable hooks 28 of the compactor-duct carrier module 5 hook onto the protruding elements 29 of the container module 4 and are retracted by the hydraulic cylinders 42 for pressing the container coupling face 4a of the container module 4 against the first compactor coupling face 5a of the compactor-duct carrier module 5 and for keeping both modules coupled to one another in the operative position. Additional anchoring elements, such as manually operated levers 53 that can be snapped closed, are arranged for securing the perimetral fins 46 of the air inlets 11a of the compactor-duct carrier module 5 against the door 40a of the container module 4.

[0053] When the container module 4, the compactor-duct carrier module 5 and the suction module 6 are operatively attached and coupled to one another to form

the pneumatic refuse collection apparatus 100, the suction device 3 of the suction module 6 draws out air from inside the compartment 7a of the container 1 of the container module 1 through the air outlets 11a, thereby generating a negative pressure which suctions the refuse inside the compartment 7a of the container 1 through the refuse inlet 8a. When moved to the extended position, the compacting ram 18a of the compactor device 2 of the compactor-duct carrier module 5 enters the compartment 7a of the container 1 of the container module 4 through the compacting inlet 10a and compacts the refuse inside the container 1.

[0054] Now in reference to Figures 14 to 30, reference number 200 (Figure 14) generally designates a pneumatic refuse collection apparatus according to a second embodiment of the present invention provided for the collection of two different refuse fractions, comprising a container module 4, a compactor-duct carrier module 5 and a suction module 6 operatively attached and coupled to one another.

[0055] In this second embodiment, the container module 4, the compactor-duct carrier module 5 and the suction module 6 are similar to those described above in relation to the first embodiment except in the following aspects.

[0056] In the pneumatic refuse collection apparatus 200 of this second embodiment, the container module 4 comprises a partition 48 dividing the container 1 into first and second compartments 7a, 7b provided with respective first and second doors 40a, 40b in which respective first and second refuse inlets 8a, 8b, first and second air outlets 9a, 9b and first and second compacting inlets 10a, 10b are formed. The first and second doors 40a, 40b are articulated with respect to opposite jambs of the door frame of the container 1 by vertical hinges and can be moved between open positions (Figure 19) and closed positions (Figures 15, 16 and 18).

[0057] When they are in the closed positions, the first and second doors 40a, 40b together provide a container coupling face 4a, such that the first and second refuse inlets 8a, 8b, the first and second air outlets 9a, 9b and the first and second compacting inlets 10a, 10b are located on the container coupling face 4a.

[0058] Accordingly, the compactor-duct carrier module 5 comprises first and second air inlets 11a, 11b, first and second refuse outlets 14a, 14b, and first and second compacting outlets 38a, 38b located on the first compactor coupling face 5a, in addition to the air outlet 12 located on the second compactor coupling face 5a. First and second air ducts 13a, 13b communicate the first and second air inlets 11a, 11b with the air outlet 12 by means of a collector 13c.

[0059] The first air duct 13a of the compactor-duct carrier module 5 has a first shutter 23a that can be moved between an open position and a closed position, and the second air duct 13b of the compactor-duct carrier module 5 has a second shutter 23b that can be moved between an open position and a closed position. The first and sec-

and shutters 23a, 23b are moved by respective hydraulic cylinders 29a, 29b, although alternatively they could be manually operated.

[0060] The compactor-duct carrier module 5 further comprises a refuse inlet 15 located on the first compactor coupling face 5a and a refuse duct 16 having a first end connected to the refuse inlet 15 and a second end connected to a distributor device 17 communicating the second end of the refuse duct 16 selectively with either the first or second refuse outlets 14a, 14b. The distributor device 17 acts for selecting two different refuse fractions.

[0061] The first and second ends of the refuse duct 16 are misaligned with respect to one another although they are preferably parallel. The first end of the refuse duct 16 is connected to the refuse inlet 15 by a rotary joint and the distributor device 17 comprises a rocker arm 27 fixed to the second end of the refuse duct 16. An actuator, such as, for example, a hydraulic cylinder 31, causes the rocker arm 27 and the refuse duct 16 to pivot about a shaft 27a between first and second positions, in which the second end of the refuse duct 16 is facing and in communication with the first and second refuse outlets 14a, 14b, respectively (Figures 25 and 26).

[0062] The compactor device 2 comprises first and second compacting rams 18a, 18b which are independently moved by respective first and second hydraulic cylinders 30a, 30b between a retracted position (shown by means of solid lines in Figure 24), in which the first and second compacting rams 18a, 18b are inside the compactor-duct carrier module 5, and an extended position (shown by means of dashed lines in Figure 24), in which the first and second compacting rams 18a, 18b project outwardly from the first compactor coupling face 5a through the corresponding first and second compacting outlets 38a, 38b.

[0063] Therefore, when the container module 4 and the compactor-duct carrier module 5 are attached to one another in the operative position, the first and second refuse inlets 8a, 8b, the first and second air outlets 9a, 9b and the first and second compacting inlets 10a, 10b of the container module 4 are aligned and coupled with the first and second refuse outlets 14a, 14b, the first and second air inlets 11a, 11b and the first and second compacting outlets 38a, 38b of the compactor-duct carrier module 5, respectively, and when they are in the extended position, the first and second compacting rams 18a, 18b are received in the first and second compartments 7a, 7b of the container 1 through the first and second compacting outlets 38b and the first and second compacting inlets 10a, 10b.

[0064] The refuse inlet 15 of the compactor-duct carrier module 5, which is located on the second compactor coupling face 5b,

[0065] The suction module 6 comprises, in addition to the elements already described in relation to the first embodiment, a refuse duct 24 having a refuse outlet 25 located on the suction coupling face 6a and a refuse inlet 26 located above the access door 37. The refuse duct

24 goes through the cabin 52 above the enclosure 20 of the fan.

[0066] When the suction module 6 and the compactor-duct carrier module 5 are attached to one another in the operative position, the refuse outlet 25 of the suction module 6 is connected to the refuse inlet 15 of the compactor-duct carrier module 5 by means of a flange 50. The refuse inlet 26 of the suction module 6 can be connected to a refuse delivery duct (not shown) by means of a flange 51.

[0067] The hydraulic cylinders 30a, 30b which move the first and second compacting rams 18a, 18b, the hydraulic cylinders 29a, 29b which move the first and second shutters 23a, 23b and the hydraulic cylinder 31 which causes the rocker arm 27 to pivot are operated by a hydraulic unit 32 installed in the compactor-duct carrier module 5 or by an external hydraulic unit.

[0068] Now in reference to Figures 31 to 33, reference number 300 (Figure 31) generally designates a pneumatic refuse collection apparatus according to a third embodiment of the present invention provided for the collection of two different refuse fractions, and comprising a container module 4, a compactor-duct carrier module 5 and a suction module 6 operatively attached and coupled to one another.

[0069] In this third embodiment, the suction module 6 is identical to that described above in relation to the second embodiment, whereas the container module 4 and the compactor-duct carrier module 5 only differ from what have been described in relation to the second embodiment as regards the features described below.

[0070] The compactor device 2 of the compactor-duct carrier module 5 comprises first and second refuse chambers 54a, 54b which are comprised between the first and second compacting rams 18a, 18b, when they are in the retracted position, and the first and second compacting outlets 38a, 38b, and first and second additional refuse ducts 55a, 55b communicating outlets of the distributor device 17 with inlets of the first and second refuse chambers 54a, 54b located in an upper part thereof.

[0071] As a result, the distributor device 17 communicates the refuse duct 16 selectively with either the first or second additional refuse ducts 55a, 55b for distributing the refuse to either the first or second refuse chambers 54a, 54b, respectively. In the compactor-duct carrier module 5 of this third embodiment, the first and second refuse outlets 14a, 14b are combined with the first and second compacting outlets 38a, 38b constituting first and second refuse and compacting outlets 14a, 38a; 14b, 38b.

[0072] In the container module 4, the first and second compartments 7a, 7b have the respective first and second refuse inlets 8a, 8b and first and second compacting inlets 10a, 10b combined with one another constituting respective first and second refuse and compacting inlets 8a, 10a; 8b, 10b located on the container coupling face 4a. These first and second refuse and compacting inlets 8a, 10a; 8b, 10b are aligned and coupled with the first

and second refuse and compacting outlets 14a, 38a; 14b, 38b of the compactor-duct carrier module 5 when the container module 4 and the compactor-duct carrier module 5 are attached to one another in the operative position.

[0073] Similarly to that described above in relation to the second embodiment, the container module 4 of the third embodiment comprises first and second doors 40a, 40b that can be moved between respective open and closed positions, and these first and second doors 40a, 40b, when they are in the closed positions, together provide the container coupling face 4a. The first and second refuse and compacting inlets 8a, 10a; 8b, 10b and the first and second air outlets 9a, 9b are formed in the first and second doors 40a, 40b, respectively.

[0074] In an alternative embodiment (not shown) useful for the collection of only one refuse fraction, the compactor device has a refuse chamber and the refuse duct introduces the refuse directly in the refuse chamber, such that the refuse outlet and the compacting outlet of the compactor-duct carrier module are combined into a single refuse and compacting outlet, and the refuse inlet and the compacting inlet of the container module are combined into a single refuse and compacting inlet which is aligned and coupled with the refuse and compacting outlet of the compactor-duct carrier module when both modules are coupled in the operative position.

Claims

1. A pneumatic refuse collection apparatus comprising:

a container (1) integrated in a container module (4) comprising a compartment (7a) having a container refuse inlet (8a), a container air outlet (9a) and a compacting inlet (10a), wherein at least said container air outlet (9a) and said compacting inlet (10a) are located on a container coupling face (4a);

a compactor device (2) comprising a compacting outlet (38a) located on a first compactor coupling face (5a), and a compacting ram (18a) which is moved by an actuator between a retracted position, in which the compacting ram (18a) is inside the compactor-duct carrier module (5), and an extended position, in which the compacting ram (18a) projects outwardly from said first compactor coupling face (5a) through said compacting outlet (38a);

a suction device (3) comprising a fan arranged inside an enclosure (20) having a suction air inlet (21) and a suction air outlet (22), the suction device (3) being configured for drawing out air from inside the container (1) through said container air outlet (9a) of the container module (4) thereby generating a negative pressure which suctions the refuse inside the container (1)

through said container refuse inlet (8a) of the container module (4);

wherein said container coupling face (4a) of the container module (4) and said first compactor coupling face (5a) of the compactor-duct carrier module (5) have elements that fit together and anchoring devices which, when activated, attach the container module (4) and the compactor-duct carrier module (5) to one another in an operative position, in which the compacting inlet (10a) of the container module (4) is aligned and coupled with the compacting outlet (38a) of the compactor-duct carrier module (5), and the compacting ram (18a) is received in the extended position in the compartment (7a) of the container (1) through the compacting outlet (38a) and the compacting inlet (10a) for compacting the refuse inside the container (1),

characterized in that:

the compactor device (2) is integrated in a compactor-duct carrier module (5) further comprising a compactor-duct carrier air inlet (11a) located on the first compactor coupling face (5a), a compactor-duct carrier air outlet (12) located on a second compactor coupling face (5b) opposite and parallel to the first compactor coupling face (5a), and an air duct (13a) communicating said compactor-duct carrier air inlet (11a) with said compactor-duct carrier air outlet (12), and the suction device (3) is integrated in a suction module (6) having a suction coupling face (6a) where said suction air inlet (21) is located, wherein the suction coupling face (6a) of the suction module (6) is facing the second compacting coupling face (5b) of the compactor-duct carrier module (5) and the suction air inlet (21) of the suction module (6) is aligned with the compactor-duct carrier air outlet (12) of the compactor-duct carrier module (5) and coupled to the compactor-duct carrier air outlet (12) by means of a flange (49).

2. The pneumatic refuse collection apparatus according to claim 1, wherein said container refuse inlet (8a) of the container module (4) is located on the container coupling face (4a) of the container module (4), the compactor-duct carrier module (5) further comprises a compactor-duct carrier refuse outlet (14a) located on the first compactor coupling face (5a), a compactor-duct carrier refuse inlet (15), and a refuse duct (16) having a first end connected to said compactor-duct carrier refuse inlet (15) and another end connected to said compactor-duct carrier refuse outlet (14a), and the container refuse inlet (8a) of the container module (4) is aligned and coupled

with said compactor-duct carrier refuse outlet (14a) of the compactor-duct carrier module (5) when the container module (4) and the compactor-duct carrier module (5) are attached to one another in the operative position.

3. The pneumatic refuse collection apparatus according to claim 2, wherein the container module (4) comprises a door (40a) that can be moved between an open position, in which said door (40a) provides access to the compartment (7a) of the container (1), and a closed position, in which the door (40a) closes the compartment (7a) and provides the container coupling face (4a), and wherein the container refuse inlet (8a), the container air outlet (9a) and the compacting inlet (10a) are formed in said door (40a).
4. The pneumatic refuse collection apparatus according to claim 1, wherein the compactor-duct carrier module (5) further comprises a refuse chamber (54a) comprised between the compacting ram (18a) in the retracted position and the compacting outlet (38a), and a refuse duct (16) having a first end connected to a compactor-duct carrier refuse inlet (15) and another end connected to said refuse chamber (54a), the compacting outlet (38a) constituting a refuse and compacting outlet (14a, 38a), and said container refuse inlet (8a) of the container module (4) is combined with the compacting inlet (10a) constituting the refuse and compacting inlet (8a, 10a) located on the container coupling face (4a) of the container module (4), wherein said refuse and compacting inlet (8a, 10a) is aligned and coupled with the refuse and compacting outlet (14a, 38a) of the compactor-duct carrier module (5) when the container module (4) and the compactor-duct carrier module (5) are attached to one another in the operative position.
5. The pneumatic refuse collection apparatus according to claim 4, wherein the container module (4) comprises a door (40a) that can be moved between an open position, in which said door (40a) provides access to the compartment (7a) of the container (1), and a closed position, in which the door (40a) closes the compartment (7a) and provides the container coupling face (4a), and wherein the refuse and compacting inlet (8a, 10a) and the container air outlet (9a) are formed in said door (40a).
6. The pneumatic refuse collection apparatus according to claim 1, wherein:

the container module (4) comprises a second compartment (7b) having a second container refuse inlet (8b), a second container air outlet (9b) and a second compacting inlet (10b), wherein at least said second container air outlet (9b) and said second compacting inlet (10b) are

located on the container coupling face (4a); the compactor-duct carrier module (5) comprises a second compactor-duct carrier air inlet (11b) and a second compacting outlet (38b) located on the first compactor coupling face (5a), a second air duct (13b) communicating said second compactor-duct carrier air inlet (11b) with said compactor-duct carrier air outlet (12) by means of a collector (13c), and a second compacting ram (18b) which is moved by a second actuator between a retracted position, in which the second compacting ram (18b) is inside the compactor-duct carrier module (5), and an extended position, in which the second compacting ram (18b) projects outwardly from said first compactor coupling face (5a) through said second compacting outlet (38b); and when the container module (4) and the compactor-duct carrier module (5) are attached to one another in said operative position, the second container air outlet (9b) and the second compacting inlet (10b) of the container module (4) are aligned and coupled with the second compactor-duct carrier air inlet (11b) and the second compacting outlet (38b) of the compactor-duct carrier module (5), respectively, and the second compacting ram (18b) is received in the extended position in the second compartment (7b) of the container (1) through the second compacting outlet (38b) and the second compacting inlet (10b).

7. The pneumatic refuse collection apparatus according to claim 6, wherein the first air duct (13a) of the compactor-duct carrier module (5) has a first shutter (23a) that can be moved between an open position and a closed position, and the second air duct (13b) of the compactor-duct carrier module (5) has a second shutter (23b) that can be moved between an open position and a closed position, and wherein said first and second shutters (23a, 23b) are moved by respective actuators.
8. The pneumatic refuse collection apparatus according to claim 6 or 7, wherein the compactor-duct carrier module (5) further comprises first and second compactor-duct carrier refuse outlets (14a, 14b) located on the first compactor coupling face (5a), a refuse inlet (15), a refuse duct (16) having a first end connected to said compactor-duct carrier refuse inlet (15), and a distributor device (17) communicating a second end of said refuse duct (16) selectively with either the first or second compactor-duct carrier refuse outlets (14a, 14b), where said first and second container refuse inlets (8a, 8b) of the first and second compartments (7a, 7b) of the container module (4) are located on the container coupling face (4a) and are aligned and coupled with said first and second

compactor-duct carrier refuse outlets (14a, 14b) of the compactor-duct carrier module (5) when the container module (4) and the compactor-duct carrier module (5) are attached to one another in the operative position.

9. The pneumatic refuse collection apparatus according to claim 8, wherein the container module (4) comprises first and second doors (40a, 40b) that can be moved between respective open positions, in which said first and second doors (40a, 40b) provide access to the first and second compartments (7a, 7b) of the container (1), respectively, and respective closed positions, in which the first and second doors (40a, 40b) close the first and second compartments (7a, 7b), respectively, and together provide the container coupling face (4a), and wherein the first and second container refuse inlets (8a, 8b), the first and second container air outlets (9a, 9b) and the first and second compacting inlets (10a, 10b) are formed in said first and second doors (40a, 40b).

10. The pneumatic refuse collection apparatus according to claim 4 or 5, wherein the compactor-duct carrier module (5) further comprises first and second refuse chambers (54a, 54b) comprised between the first and second compacting rams (18a, 18b) in the retracted position and the first and second compacting outlets (38a, 38b), a compactor-duct carrier refuse inlet (15), a refuse duct (16) having a first end connected to said compactor-duct carrier refuse inlet (15), and a distributor device (17) communicating a second end of said refuse duct (16) selectively with either the first or second additional refuse ducts (55a, 55b) communicated with said first and second refuse chambers (54a, 54b), respectively, where the first and second compacting outlets (38a, 38b) constitute first and second refuse and compacting outlets (14a, 38a; 14b, 28b), and where said first and second container refuse inlets (8a, 8b) and said first and second compacting inlets (10a, 10b) of the first and second compartments (7a, 7b) of the container module (4) are combined constituting respective first and second refuse and compacting inlets (8a, 10a; 8b, 10b) located on the container coupling face (4a), where said first and second refuse and compacting inlets (8a, 10a; 8b, 10b) are aligned and coupled with said first and second refuse and compacting outlets (14a, 38a; 14b, 38b) of the compactor-duct carrier module (5) when the container module (4) and the compactor-duct carrier module (5) are attached to one another in the operative position.

11. The pneumatic refuse collection apparatus according to claim 10, wherein the container module (4) comprises first and second doors (40a, 40b) that can be moved between respective open positions, in which said first and second doors (40a, 40b) provide

access to the first and second compartments (7a, 7b) of the container (1), respectively, and respective closed positions, in which the first and second doors (40a, 40b) close the first and second compartments (7a, 7b), respectively, and together provide the container coupling face (4a), and wherein the first and second refuse and compacting inlets (8a, 10a; 8b, 10b) and the first and second container air outlets (9a, 9b) are formed in said first and second doors (40a, 40b).

12. The pneumatic refuse collection apparatus according to claim 8 or 10, wherein the compactor-duct carrier refuse inlet (15) of the compactor-duct carrier module (5) is located on the second compactor coupling face (5b) and the suction module (6) comprises a refuse duct (24) having a refuse outlet (25) located on said suction coupling face (6a) and a refuse inlet (26), and said refuse outlet (25) being able to be connected to the compactor-duct carrier refuse inlet (15) of the compactor-duct carrier module (5).

13. The pneumatic refuse collection apparatus according to claim 8, wherein said first and second ends of the refuse duct (16) are misaligned with respect to one another, the first end of the refuse duct (16) is connected to the compactor-duct carrier refuse inlet (15) by a rotary joint and said distributor device (17) comprises a rocker arm (27) fixed to the second end of the refuse duct (16) and an actuator causing said rocker arm (27) and the refuse duct (16) to pivot about a shaft (27a) between first and second positions, in which the second end of the refuse duct (16) is facing and in communication with the first and second compactor-duct carrier refuse outlets (14a, 14b), respectively, and wherein said actuator causing the rocker arm (27) to pivot is a hydraulic cylinder (31) operated by a hydraulic unit (32) installed in the compactor-duct carrier module (5).

14. The pneumatic refuse collection apparatus according to any one of claims 1, 4, 6 and 10, wherein said anchoring devices comprise protruding elements (29) fixed in the container module (4) and retractable hooks (28) installed in the compactor-duct carrier module (5), wherein said retractable hooks (28) hook onto said protruding elements (29) of the container module (4) and are retracted by respective actuators for pressing the container coupling face (4a) of the container module (4) against the first compactor coupling face (5a) of the compactor-duct carrier module (5) and wherein said actuators retracting the retractable hooks (28) are hydraulic cylinders (42) operated by a hydraulic unit (32) installed in the compactor-duct carrier module (5).

15. The pneumatic refuse collection apparatus according to claim 1 or 6 wherein said actuator moving the

compacting ram (18a, 18b) is a hydraulic cylinder (30a, 30b) operated by a hydraulic unit (32) installed in the compactor-duct carrier module (5).

Patentansprüche

1. Pneumatische Müllsammelvorrichtung umfassend:

einen Behälter (1), welcher in ein Behältermodul (4) integriert ist, umfassend eine Abteilung (7a), welche einen Behältermülleingang (8a), einen Behälterluftausgang (9a) und einen Verdichtungseingang (10a) aufweist, wobei sich mindestens der genannte Behälterluftausgang (9a) und der genannte Verdichtungseingang (10a) auf einer Behälterkopplungsfläche (4a) befinden;

eine Verdichtereinrichtung (2) umfassend einen Verdichtungs Ausgang (38a), welcher sich auf einer ersten Verdichterkopplungsfläche (5a) befindet, und einen Verdichtungsstempel (18a), welcher von einem Stellglied zwischen einer eingefahrenen Stellung, in welcher der Verdichtungsstempel (18a) innerhalb des Verdichterleitungsträgermoduls (5) liegt, und einer ausgefahrenen Stellung, in welcher der Verdichtungsstempel (18a) von der genannten ersten Verdichterkopplungsfläche (5a) durch den genannten Verdichtungs Ausgang (38a) nach außen herausragt, bewegt wird;

eine Saugeinrichtung (3) umfassend ein Gebläse, welches innerhalb eines Gehäuses (20) angeordnet ist, welches einen Sauglufteingang (21) und einen Saugluftausgang (22) aufweist, wobei die Saugeinrichtung (3) dazu ausgebildet ist, Luft aus dem Inneren des Behälters (1) durch den genannten Behälterluftausgang (9a) des Behältermoduls (4) herauszunehmen, wodurch ein Unterdruck erzeugt wird, welcher den Müll innerhalb des Behälters (1) durch den genannten Behältermülleingang (8a) des Behältermoduls (4) saugt;

wobei die genannte Behälterkopplungsfläche (4a) des Behältermoduls (4) und die genannte erste Verdichterkopplungsfläche (5a) des Verdichterleitungsträgermoduls (5) Elemente aufweisen, welche zusammenpassen, und Verankerungseinrichtungen aufweisen, welche, wenn sie aktiviert werden, das Behältermodul (4) und das Verdichterleitungsträgermodul (5) in einer Betriebsstellung aneinander befestigen, in welcher der Verdichtungseingang (10a) des Behältermoduls (4) mit dem Verdichtungs Ausgang (38a) des Verdichterleitungsträgermoduls (5) ausgerichtet und gekoppelt ist, und der Verdichtungsstempel (18a) in der ausgefahrenen Stellung in der Abteilung (7a) des Behälters (1)

durch den Verdichtungs Ausgang (38a) und den Verdichtungseingang (10a) zur Verdichtung des Mülls innerhalb des Behälters (1) aufgenommen wird,

dadurch gekennzeichnet, dass:

die Verdichtereinrichtung (2) in ein Verdichterleitungsträgermodul (5) integriert ist, zusätzlich umfassend eine Verdichterleitungsträgerlufteingang (11a), welcher sich auf der ersten Verdichterkopplungsfläche (5a) befindet, einen Verdichterleitungsträgerluftausgang (12), welcher sich auf einer zweiten, zur ersten Verdichterkopplungsfläche (5a) gegenüberliegenden und parallelen Verdichterkopplungsfläche (5b) befindet, und eine Luftleitung (13a), welche den genannten Verdichterleitungsträgerlufteingang (11a) mit dem genannten Verdichterleitungsträgerluftausgang (12) verbindet, und

die Saugeinrichtung (3) in ein Saugmodul (6) integriert ist, welches eine Saugkopplungsfläche (6a) aufweist, in welcher sich der genannte Sauglufteingang (21) befindet, wobei die Saugkopplungsfläche (6a) des Saugmoduls (6) der zweiten Verdichtungskopplungsfläche (5b) des Verdichterleitungsträgermoduls (5) zugewandt ist und der Sauglufteingang (21) des Saugmoduls (6) mit dem Verdichterleitungsträgerluftausgang (12) des Verdichterleitungsträgermoduls (5) ausgerichtet ist und mit dem Verdichterleitungsträgerluftausgang (12) mittels eines Flansches (49) gekoppelt ist.

2. Pneumatische Müllsammelvorrichtung nach Anspruch 1, wobei sich der genannte Behältermülleingang (8a) des Behältermoduls (4) auf der Behälterkopplungsfläche (4a) des Behältermoduls (4) befindet, das Verdichterleitungsträgermodul (5) zusätzlich umfassend einen Verdichterleitungsträgermüllausgang (14a), welcher sich auf der ersten Verdichterkopplungsfläche (5a) befindet, einen Verdichterleitungsträgermülleingang (15) und eine Müllleitung (16), welche ein erstes Ende, welches mit dem genannten Verdichterleitungsträgermülleingang (15) verbunden ist, und ein anderes Ende, welches mit dem genannten Verdichterleitungsträgermüllausgang (14a) verbunden ist, aufweist, und der Behältermülleingang (8a) des Behältermoduls (4) mit dem genannten Verdichterleitungsträgermüllausgang (14a) des Verdichterleitungsträgermoduls (5) ausgerichtet und gekoppelt ist, wenn das Behältermodul (4) und das Verdichterleitungsträgermodul (5) in der Betriebsstellung aneinander befestigt sind.

3. Pneumatische Müllsammelvorrichtung nach An-

spruch 2, wobei das Behältermodul (4) eine Tür (40a) umfasst, welche zwischen einer offenen Stellung, in welcher die genannte Tür (40a) Zugang zur Abteilung (7a) des Behälters (1) bereitstellt, und einer geschlossenen Stellung, in welcher die Tür (40a) die Abteilung (7a) schließt und die Behälterkopplungsfläche (4a) bereitstellt, bewegt werden kann, und wobei der Behältermülleingang (8a), der Behälterluftausgang (9a) und der Verdichtungseingang (10a) in der genannten Tür (40a) gebildet sind.

4. Pneumatische Müllsammelvorrichtung nach Anspruch 1, das Verdichterleitungsträgermodul (5) zusätzlich umfassend eine Müllkammer (54a), welche zwischen dem Verdichtungsstempel (18a) in der eingefahrenen Stellung und dem Verdichtungs Ausgang (38a) eingeschlossen ist, und eine Müllleitung (16), welche ein erstes Ende, welches mit einem Verdichterleitungsträgermülleingang (15) verbunden ist, und ein anderes Ende, welches mit der genannten Müllkammer (54a) verbunden ist, aufweist, wobei der Verdichtungs Ausgang (38a) einen Müll- und Verdichtungs Ausgang (14a, 38a) bildet, und der genannte Behältermülleingang (8a) des Behältermoduls (4) mit dem Verdichtungseingang (10a) kombiniert ist, unter Bildung des Müll- und Verdichtungs Eingangs (8a, 10a), welcher sich auf der Behälterkopplungsfläche (4a) des Behältermoduls (4) befindet, wobei der genannte Müll- und Verdichtungseingang (8a, 10a) mit dem Müll- und Verdichtungs Ausgang (14a, 38a) des Verdichterleitungsträgermoduls (5) ausgerichtet und gekoppelt ist, wenn das Behältermodul (4) und das Verdichterleitungsträgermodul (5) in der Betriebsstellung aneinander befestigt sind.

5. Pneumatische Müllsammelvorrichtung nach Anspruch 4, wobei das Behältermodul (4) eine Tür (40a) umfasst, welche zwischen einer offenen Stellung, in welcher die genannte Tür (40a) Zugang zur Abteilung (7a) des Behälters (1) bereitstellt, und einer geschlossenen Stellung, in welcher die Tür (40a) die Abteilung (7a) schließt und die Behälterkopplungsfläche (4a) bereitstellt, bewegt werden kann, und wobei der Müll- und Verdichtungseingang (8a, 10a) und der Behälterluftausgang (9a) in der genannten Tür (40a) gebildet sind.

6. Pneumatische Müllsammelvorrichtung nach Anspruch 1, wobei:

das Behältermodul (4) eine zweite Abteilung (7b) umfasst, welche einen zweiten Behältermülleingang (8b), einen zweiten Behälterluftausgang (9b) und einen zweiten Verdichtungs Eingang (10b) aufweist, wobei sich mindestens der genannte Behälterluftausgang (9b) und der genannte Verdichtungseingang (10b) auf der Behälterkopplungsfläche (4a) befinden;

das Verdichterleitungsträgermodul (5) umfassend einen zweiten Verdichterleitungsträgerlufteingang (11b) und einen zweiten Verdichtungs Ausgang (38b), welche sich auf der ersten Verdichterkopplungsfläche (5a) befinden, eine zweite Luftleitung (13b), welche den genannten zweiten Verdichterleitungsträgerlufteingang (11b) mit dem genannten Verdichterleitungsträgerluftausgang (12) mittels eines Sammlers (13c) verbindet, und einen zweiten Verdichtungsstempel (18b), welcher von einem zweiten Stellglied zwischen einer eingefahrenen Stellung, in welcher der zweite Verdichtungsstempel (18b) innerhalb des Verdichterleitungsträgermoduls (5) liegt, und einer ausgefahrenen Stellung, in welcher der zweite Verdichtungsstempel (18b) von der genannten ersten Verdichterkopplungsfläche (5a) durch den genannten zweiten Verdichtungs Ausgang (38b) nach außen herausragt, bewegt wird; und wenn das Behältermodul (4) und das Verdichterleitungsträgermodul (5) in der genannten Betriebsstellung aneinander befestigt sind, der zweite Behälterluftausgang (9b) und der zweite Verdichtungseingang (10b) des Behältermoduls (4) jeweils mit dem zweiten Verdichterleitungsträgerlufteingang (11b) und dem zweiten Verdichtungs Ausgang (38b) des Verdichterleitungsträgermoduls (5) ausgerichtet und gekoppelt sind, und der zweite Verdichtungsstempel (18b) in der ausgefahrenen Stellung in der zweiten Abteilung (7b) des Behälters (1) durch den zweiten Verdichtungs Ausgang (38b) und den zweiten Verdichtungseingang (10b) aufgenommen wird.

7. Pneumatische Müllsammelvorrichtung nach Anspruch 6, wobei die erste Luftleitung (13a) des Verdichterleitungsträgermoduls (5) eine erste Blende (23a) aufweist, welche zwischen einer offenen Stellung und einer geschlossenen Stellung bewegt werden kann, und die zweite Luftleitung (13b) des Verdichterleitungsträgermoduls (5) eine zweite Blende (23b) aufweist, welche zwischen einer offenen Stellung und einer geschlossenen Stellung bewegt werden kann, und wobei die erste und die zweite Blende (23a, 23b) von jeweiligen Stellgliedern bewegt werden.

8. Pneumatische Müllsammelvorrichtung nach Anspruch 6 oder 7, das Verdichterleitungsträgermodul (5) zusätzlich umfassend erste und zweite Verdichterleitungsträgermüllausgänge (14a, 14b), welche sich auf der ersten Verdichterkopplungsfläche (5a) befinden, einen Mülleingang (15), eine Müllleitung (16), welche ein erstes Ende aufweist, welches mit dem genannten Verdichterleitungsträgermülleingang (15) verbunden ist, und eine Verteilereinrichtung

- tung (17), welche ein zweites Ende der genannten Müllleitung (16) selektiv mit entweder dem ersten oder dem zweiten Verdichterleitungsträgermüllausgang (14a, 14b) verbindet, wobei sich der genannte erste und der genannte zweite Behältermülleingang (8a, 8b) der ersten und der zweiten Abteilung (7a, 7b) des Behältermoduls (4) auf der Behälterkopplungsfläche (4a) befinden und mit dem genannten ersten und dem genannten zweiten Verdichterleitungsträgermüllausgang (14a, 14b) des Verdichterleitungsträgermoduls (5) ausgerichtet und gekoppelt sind, wenn das Behältermodul (4) und das Verdichterleitungsträgermodul (5) in der Betriebsstellung aneinander befestigt sind.
9. Pneumatische Müllsammelvorrichtung nach Anspruch 8, wobei das Behältermodul (4) erste und zweite Türen (40a, 40b) umfasst, welche zwischen jeweiligen offenen Stellungen, in welchen die genannten ersten und zweiten Türen (40a, 40b) Zugang jeweils zur ersten und zweiten Abteilung (7a, 7b) des Behälters (1) bereitstellen, und jeweiligen geschlossenen Stellungen, in welchen die ersten und zweiten Türen (40a, 40b) jeweils die erste und die zweite Abteilung (7a, 7b) schließen und zusammen die Behälterkopplungsfläche (4a) bereitstellen, bewegt werden können, und wobei der erste und der zweite Behältermülleingang (8a, 8b), der erste und der zweite Behälterluftausgang (9a, 9b) und der erste und der zweite Verdichtungseingang (10a, 10b) in den genannten ersten und zweiten Türen (40a, 40b) gebildet sind.
10. Pneumatische Müllsammelvorrichtung nach Anspruch 4 oder 5, das Verdichterleitungsträgermodul (5) zusätzlich umfassend erste und zweite Müllkammern (54a, 54b), welche zwischen dem ersten und dem zweiten Verdichtungsstempel (18a, 18b) in der eingefahrenen Stellung und dem ersten und dem zweiten Verdichtungsstempel (18a, 18b) eingeschlossen sind, einen Verdichterleitungsträgermülleingang (15), eine Müllleitung (16), welche ein erstes Ende aufweist, welches mit dem genannten Verdichterleitungsträgermülleingang (15) verbunden ist, und eine Verteilereinrichtung (17), welche ein zweites Ende der genannten Müllleitung (16) selektiv jeweils mit entweder der ersten oder der zweiten zusätzlichen Müllleitung (55a, 55b) verbindet, welche mit der genannten ersten und der genannten zweiten Müllkammer (54a, 54b) verbunden sind, wobei der erste und der zweite Verdichtungsstempel (18a, 18b) erste und zweite Müll- und Verdichtungs- ausgänge (14a, 38a; 14b, 38b) bilden, und wobei der genannte erste und der genannte zweite Behältermülleingang (8a, 8b) und der genannte erste und der genannte zweite Verdichtungseingang (10a, 10b) der ersten und der zweiten Abteilung (7a, 7b) des Behältermoduls (4) unter Bildung jeweiliger ersten und zweiten Müll- und Verdichtungseingänge (8a, 10a; 8b, 10b), welche sich auf der Behälterkopplungsfläche (4a) befinden, kombiniert werden, wobei der genannte erste und der genannte zweite Müll- und Verdichtungseingang (8a, 10a; 8b, 10b) mit dem genannten ersten und dem genannten zweiten Müll- und Verdichtungs- ausgang (14a, 38a; 14b, 38b) des Verdichterleitungsträgermoduls (5) ausgerichtet und gekoppelt sind, wenn das Behältermodul (4) und das Verdichterleitungsträgermodul (5) in der Betriebsstellung aneinander befestigt sind.
11. Pneumatische Müllsammelvorrichtung nach Anspruch 10, wobei das Behältermodul (4) erste und zweite Türen (40a, 40b) umfasst, welche zwischen jeweiligen offenen Stellungen bewegt werden können, in welchen die genannten ersten und zweiten Türen (40a, 40b) Zugang jeweils zur ersten und zur zweiten Abteilung (7a, 7b) des Behälters (1) bereitstellen, und jeweiligen geschlossenen Stellungen, in welchen die ersten und zweiten Türen (40a, 40b) jeweils die erste und die zweite Abteilung (7a, 7b) schließen und zusammen die Behälterkopplungsfläche (4a) bereitstellen, und wobei der erste und der zweite Müll- und Verdichtungseingang (8a, 10a; 8b, 10b) und der erste und der zweite Behälterluftausgang (9a, 9b) in den genannten ersten und zweiten Türen (40a, 40b) gebildet sind.
12. Pneumatische Müllsammelvorrichtung nach Anspruch 8 oder 10, wobei sich der Verdichterleitungsträgermülleingang (15) des Verdichterleitungsträgermoduls (5) auf der zweiten Verdichterkopplungsfläche (5b) befindet und das Saugmodul (6) eine Müllleitung (24) umfasst, welche einen Müllausgang (25), welcher sich auf der genannten Saugkopplungsfläche (6a) befindet, und einen Mülleingang (26) aufweist, und wobei der genannte Müllausgang (25) in der Lage ist, mit dem Verdichterleitungsträgermülleingang (15) des Verdichterleitungsträgermoduls (5) verbunden zu werden.
13. Pneumatische Müllsammelvorrichtung nach Anspruch 8, wobei der genannte erste und der genannte zweite Ende der Müllleitung (16) in Bezug aufeinander nicht ausgerichtet sind, wobei das erste Ende der Müllleitung (16) mit dem Verdichterleitungsträgermülleingang (15) mittels eines Drehgelenks verbunden ist und die genannte Verteilereinrichtung (17) umfassend einen Kipphebel (27), welcher am zweiten Ende der Müllleitung (16) fixiert ist, und ein Stellglied, welches das Verschwenken des genannten Kipphebels (27) und der Müllleitung (16) um eine Welle (27a) zwischen ersten und zweiten Stellungen verursacht, in welchen das zweite Ende der Müllleitung (16) jeweils dem ersten und dem zweiten Verdichterleitungsträgermüllausgang (14a, 14b) zugewandt ist und damit verbunden ist, und wobei das

genannte Stellglied, welches das Verschwenken des Kipphebels (27) verursacht, ein Hydraulikzylinder (31) ist, welcher von einer Hydraulikeinheit (32) betrieben wird, welche im Verdichterleitungsträgermodul (5) installiert ist.

14. Pneumatische Müllsammelvorrichtung nach einem der Ansprüche 1, 4, 6 und 10, wobei die genannten Verankerungseinrichtungen herausragende Elemente (29), welche im Behältermodul (4) fixiert sind, und einfahrbare Haken (28), welche im Verdichterleitungsträgermodul (5) installiert sind, umfassen, wobei die genannten einfahrbaren Haken (28) an den genannten herausragenden Elemente (29) des Behältermoduls (4) haken und von jeweiligen Stellgliedern eingefahren werden, um die Behälterkopplungsfläche (4a) des Behältermoduls (4) gegen die erste Verdichterkopplungsfläche (5a) des Verdichterleitungsträgermoduls (5) zu drücken und wobei die genannten Stellglieder, welche die einfahrbaren Haken (28) einfahren, Hydraulikzylinder (42) sind, welche von einer Hydraulikeinheit (32) betrieben werden, welche im Verdichterleitungsträgermodul (5) installiert ist.
15. Pneumatische Müllsammelvorrichtung nach Anspruch 1 oder 6, wobei das genannte Stellglied, welches den Verdichtungsstempel (18a, 18b) bewegt, ein Hydraulikzylinder (30a, 30b) ist, welcher von einer Hydraulikeinheit (32) betrieben wird, welche im Verdichterleitungsträgermodul (5) installiert ist.

Revendications

1. Un appareil de collecte d'ordures pneumatique comportant :

un conteneur (1) intégré dans un module conteneur (4) comportant un compartiment (7a) ayant une entrée (8a) d'ordures du conteneur, une sortie (9a) d'air du conteneur et une entrée de compactage (10a) où au moins cette sortie (9a) d'air du conteneur et cette entrée (10a) de compactage sont situées sur une face (4a) d'accouplement du conteneur ;

un dispositif de compactage (2) comportant une sortie (38a) de compactage située sur une première face (5a) d'accouplement du compacteur et un vérin de compactage (18a) qui est déplacé par un dispositif de commande entre une position repliée, dans laquelle la vérin de compactage (18a) est à l'intérieur du module (5) transporteur de compacteur-conduite, et une position déployée, dans laquelle le vérin de compactage (18a) est projeté vers l'extérieur de cette première face (5a) d'accouplement du compacteur à travers cette sortie (38a) de compactage ;

un dispositif d'aspiration (3) comportant un ventilateur aménagé à l'intérieur d'un boîtier (20) ayant une entrée (21) d'air d'aspiration et une sortie (22) d'air d'aspiration, le dispositif d'aspiration (3) étant configuré pour faire sortir l'air de l'intérieur du conteneur (1) à travers cette sortie (9a) d'air du conteneur du module conteneur (4) en générant ainsi une pression négative qui aspire les ordures à l'intérieur du conteneur (1) à travers cette entrée (8a) d'ordures du conteneur du module conteneur (4) ;

où cette face (4a) d'accouplement du conteneur du module conteneur (4) et cette première face (5a) d'accouplement du compacteur du module (5) transporteur de compacteur-conduite possèdent des éléments qui s'emboîtent et des dispositifs d'ancrage qui, lorsqu'ils sont activés, fixent le module conteneur (4) et le module (5) transporteur de compacteur-conduite l'un à l'autre dans une position de fonctionnement, dans laquelle l'entrée (10a) de compactage du module conteneur (4) est alignée et couplée avec la sortie (38a) de compactage du module (5) transporteur de compacteur-conduite et le vérin de compactage (18a) est reçu dans une position déployée dans le compartiment (7a) du conteneur (1) à travers la sortie (38a) de compactage et l'entrée (10a) de compactage pour compacter les ordures à l'intérieur du conteneur (1),

caractérisé en ce que :

le dispositif compacteur (2) est intégré dans un module (5) transporteur de compacteur-conduite comportant par ailleurs une entrée (11a) d'air du transporteur de compacteur-conduite située sur la première face (5a) d'accouplement du compacteur, une sortie (12) d'air du transporteur de compacteur-conduite située sur une deuxième face (5b) d'accouplement de compacteur opposée et parallèle à la première face (5a) d'accouplement du compacteur et une conduite d'air (13a) communiquant cette entrée d'air du transporteur de compacteur-conduite (11a) avec cette sortie (12) d'air du transporteur de compacteur-conduite ;

et le dispositif d'aspiration (3) est intégré dans un module d'aspiration (6) ayant une face (6a) d'accouplement d'aspiration où cette entrée (21) d'air d'aspiration est située, où la face (6a) d'accouplement d'aspiration (6a) du module d'aspiration (6) fait face à la deuxième face (5b) d'accouplement de compactage du module (5) transporteur de compacteur-conduite et l'entrée (21) d'air d'aspiration du module (6) d'aspiration est alignée avec la sortie (12) d'air du

- transporteur de compacteur-conduite du module (5) transporteur de compacteur-conduite et couplée à la sortie (12) d'air du transporteur de compacteur-conduite au moyen d'une bride (49).
2. L'appareil de collecte d'ordures pneumatique conformément à la revendication 1, où cette entrée (8a) d'ordures du conteneur du module conteneur (4) est située sur la face (4a) d'accouplement du conteneur du module conteneur (4), le module (5) transporteur de compacteur-conduite par ailleurs comporte une sortie (14a) d'ordures du transporteur de compacteur-conduite située sur la première face (5a) d'accouplement du compacteur, une entrée (15) d'ordures du transporteur de compacteur-conduite et une conduite à ordures (16) ayant une première extrémité connectée à cette entrée (15) d'ordures du transporteur de compacteur-conduite et une autre extrémité connectée à cette sortie (14a) d'ordures du transporteur de compacteur-conduite, et l'entrée (8a) d'ordures du conteneur du module conteneur (4) est alignée et couplée à cette sortie (14a) d'ordures du transporteur de compacteur-conduite du module (5) transporteur de compacteur-conduite lorsque le module conteneur (4) et le module (5) transporteur de compacteur-conduite sont reliés l'un à l'autre dans la position de fonctionnement.
3. L'appareil de collecte d'ordures pneumatique conformément à la revendication 2, où le module conteneur (4) comporte une porte (40a) qui peut être déplacée entre une position ouverte, dans laquelle cette porte (40a) donne l'accès au compartiment (7a) du conteneur (1) et une position fermée, dans laquelle la porte (40a) ferme le compartiment (7a) et offre la face (4a) d'accouplement du conteneur, et où l'entrée (8a) d'ordures du conteneur, la sortie (9a) d'air du conteneur et l'entrée (10a) de compactage sont formées dans cette porte (40a).
4. L'appareil de collecte d'ordures pneumatique conformément à la revendication 1, où le module (5) transporteur de compacteur-conduite par ailleurs comporte une chambre à ordures (54a) comprise entre le vérin de compactage (18a) dans la position repliée et la sortie (38a) de compactage et une conduite (16) à ordures ayant une première extrémité connectée à une entrée (15) d'ordures du transporteur de compacteur-conduite et une autre extrémité connectée à cette chambre à ordures (54a), la sortie (38a) de compactage constituant une sortie (14a, 38a) d'ordures et de compactage et cette entrée (8a) d'ordures du conteneur du module conteneur (4) est combinée avec l'entrée (10a) de compactage constituant l'entrée (8a, 10a) d'ordures et de compactage située sur la face (4a) d'accouplement du conteneur du module conteneur (4), où cette entrée (8a, 10a) d'ordures et de compactage est alignée et couplée avec la sortie (14a, 38a) d'ordures et de compactage du module (5) transporteur de compacteur-conduite lorsque le module conteneur (4) et le module (5) transporteur de compacteur-conduite sont fixés l'un à l'autre dans la position de fonctionnement.
5. L'appareil de collecte d'ordures pneumatique conformément à la revendication 4, où le module conteneur (4) comporte une porte (40a) qui peut être déplacée entre une position ouverte, dans laquelle cette porte (40a) donne l'accès au compartiment (7a) du conteneur (1) et une position fermée, dans laquelle la porte (40a) ferme le compartiment (7a) et offre la face (4a) d'accouplement du conteneur et où l'entrée (8a, 10a) d'ordures et de compactage et la sortie (9a) d'air du conteneur sont formées dans cette porte (40a).
6. L'appareil de collecte d'ordures pneumatique conformément à la revendication 1, où :
- le module conteneur (4) comporte un deuxième compartiment (7b) ayant une deuxième entrée (8b) d'ordures du conteneur, une deuxième sortie (9b) d'air du conteneur et une deuxième entrée (10b) de compactage, où au moins cette deuxième sortie (9b) d'air du conteneur et cette deuxième entrée (10b) de compactage sont situées sur la face (4a) d'accouplement du conteneur ;
- le module (5) transporteur de compacteur-conduite comporte une deuxième entrée (11b) d'air du transporteur de compacteur-conduite et une deuxième sortie (38b) de compactage située sur la première face (5a) d'accouplement du compacteur, une deuxième conduite (13b) d'air communicant cette deuxième entrée (11b) d'air du transporteur de compacteur-conduite avec cette sortie (12) d'air du transporteur de compacteur-conduite au moyen d'un collecteur (13c) et un deuxième vérin de compactage (18b) qui est déplacé par un deuxième dispositif de commande entre une position repliée, dans laquelle le deuxième vérin (18b) de compactage se trouve à l'intérieur du module (5) transporteur de compacteur-conduite et une position déployée, dans laquelle le deuxième vérin (18b) de compactage se projette vers l'extérieur de cette première face (5a) du compacteur à travers cette deuxième sortie (38b) de compactage ; et
- lorsque le module conteneur (4) et le module (5) transporteur de compacteur-conduite sont fixés l'un à l'autre dans cette position de fonctionnement, la deuxième sortie (9b) d'air du conteneur et la deuxième entrée (10b) de compactage du module conteneur (4) sont alignées et couplées

- avec la deuxième entrée (11b) d'air du transporteur de compacteur-conduite et la deuxième sortie (38b) de compactage du module (5) transporteur de compacteur-conduite, respectivement et le deuxième vérin (18b) de compactage est reçu dans la position déployée, dans le deuxième compartiment (7b) du conteneur (1) à travers la deuxième sortie (38b) de compactage et la deuxième entrée (10b) de compactage.
7. L'appareil de collecte d'ordures pneumatique conformément à la revendication 6, où la première conduite d'air (13a) du module (5) transporteur de compacteur-conduite possède un premier obturateur (23a) qui peuvent être déplacé entre une position ouverte et une position fermée et la deuxième conduite d'air (13b) du module (5) transporteur de compacteur-conduite possède un deuxième obturateur (23b) qui peut être déplacé entre une position ouverte et une position fermée et où ces premier et deuxième obturateurs (23a, 23b) sont déplacés par des dispositifs de commande respectifs.
8. L'appareil de collecte d'ordures pneumatique conformément à la revendication 6 ou 7, où le module (5) transporteur de compacteur-conduite par ailleurs comporte des première et deuxième sorties (14a, 14b) d'ordures du transporteur de compacteur-conduite situées sur la première face (5a) d'accouplement du compacteur, une entrée (15) d'ordures, une conduite (16) à ordures ayant une première extrémité connectée à cette entrée (15) d'ordures du transporteur de compacteur-conduite et un dispositif distributeur (17) communiquant une deuxième extrémité de cette conduite à ordures (16) sélectivement avec cette première ou deuxième sorties (14a, 14b) d'ordures du transporteur de compacteur-conduite, où ces première et deuxième entrées (8a, 8b) d'ordures du conteneur des premier et deuxième compartiments (7a, 7b) du module conteneur (4) sont situées sur la face d'accouplement (4a) du conteneur et sont alignées et couplées avec ces première et deuxième ouvertures (14a, 14b) d'ordures du transporteur de compacteur-conduite du module (5) transporteur de compacteur-conduite lorsque le module conteneur (4) et le module (5) transporteur de compacteur-conduite sont reliés l'un à l'autre dans la position de fonctionnement.
9. L'appareil de collecte d'ordures pneumatique conformément à la revendication 8, où le module conteneur (4) comporte des première et deuxième portes (40a, 40b) qui peuvent être déplacées entre des positions ouvertes respectives, où ces première et deuxième portes (40a, 40b) donnent l'accès aux premier et deuxième compartiments (7a, 7b) du conteneur (1), respectivement, et des positions fermées respectives, où les première et deuxième portes (40a, 40b) ferment les premier et deuxième compartiments (7a, 7b), respectivement, et ensemble, offrent la face (4a) d'accouplement du conteneur et où, les première et deuxième entrées (8a, 8b) d'ordures du conteneur, les première et deuxième sorties (9a, 9b) d'air du conteneur et les première et deuxième entrées (10a, 10b) de compactage sont formées dans ces première et deuxième portes (40a, 40b).
10. L'appareil de collecte d'ordures pneumatique conformément à la revendication 4 ou 5, où le module (5) transporteur de compacteur-conduite par ailleurs comporte des première et deuxième chambres (54a, 54b) à ordures comprises entre les premier et deuxième vérins (18a, 18b) de compactage dans la position repliée et les première et deuxième sorties (38a, 38b) de compactage, une entrée (15) d'ordures du transporteur de compacteur-conduite, une conduite (16) à ordures ayant une première extrémité connectée à cette entrée (15) d'ordures du transporteur de compacteur-conduite et un dispositif distributeur (17) communiquant une deuxième extrémité de cette conduite (16) à ordures sélectivement avec soit la première soit la deuxième conduite (55a, 55b) à ordures complémentaire, communiquées avec cette première et deuxième chambres (54a, 54b) à ordures, respectivement, où les première et deuxième sorties de compactage (38a, 38b) constituent des première et deuxième sorties (14a, 38a, 14b, 28b) d'ordures et de compactage et où ces première et deuxième entrées (8a, 8b) d'ordures du conteneur et ces première et deuxième entrées (10a, 10b) de compactage des premier et deuxième compartiments (7a, 7b) du module conteneur (4) sont combinés en constituant des respectives première et deuxième entrées (8a, 10a ; 8b, 10b) d'ordures et de compactage situées sur la face (4a) d'accouplement du conteneur où ces première et deuxième entrées (8a, 10a ; 8b, 10b) d'ordures et de compactage sont alignées et couplées avec ces première et deuxième sorties (14a, 38a ; 14b, 38b) d'ordures et de compactage du module (5) transporteur de compacteur-conduite lorsque le module conteneur (4) et le module (5) transporteur de compacteur-conduite sont fixés l'un à l'autre dans la position de fonctionnement.
11. L'appareil de collecte d'ordures pneumatique conformément à la revendication 10, où le module conteneur (4) comporte des première et deuxième portes (40a, 40b) qui peuvent être déplacées entre des positions ouvertes respectives, où ces première et deuxième portes (40a, 40b) donne l'accès aux premier et deuxième compartiments (7a, 7b) du conteneur (1), respectivement, et les positions fermées respectives où les première et deuxième portes

- (40a, 40b) ferment les premier et deuxième compartiments (7a, 7b), respectivement, et ensemble offrent la face d'accouplement (4a) du conteneur et où les première et deuxième entrées (8a, 10a; 8b, 10b) d'ordures et de compactage et les première et deuxième sorties (9a, 9b) d'air du conteneur sont formées dans ces première et deuxième portes (40a, 40b).
12. L'appareil de collecte d'ordures pneumatique conformément à la revendication 8 ou 10, où l'entrée (15) d'ordures du transporteur de compacteur-conduite (15) du module (5) transporteur de compacteur-conduite est située sur la deuxième face (5b) d'accouplement du compacteur et le module (6) d'aspiration comporte une conduite à ordures (24) ayant une sortie (25) d'ordures située sur cette face (6a) d'accouplement d'aspiration et une entrée (26) d'ordures et cette sortie (25) d'ordures qui peuvent être connectée à l'entrée (15) d'ordures du transporteur de compacteur-conduite du module (5) transporteur de compacteur-conduite.
13. L'appareil de collecte d'ordures pneumatique conformément à la revendication 8, où ces première et deuxième extrémités de la conduite (16) à ordures sont mal alignées l'une par rapport à l'autre, la première extrémité de la conduite (16) à ordures est connectée à l'entrée (15) d'ordures du transporteur de compacteur-conduite par un joint rotatoire et ce dispositif (17) distributeur comporte un culbuteur (27) fixé à la deuxième extrémité de la conduite (16) à ordures et un dispositif de commande faisant que ce culbuteur (27) et la conduite (16) à ordures pivotent sur un arbre (27a) entre des première et deuxième positions, où la deuxième extrémité de la conduite (16) à ordures fait face et est en communication avec les première et deuxième sorties (14a, 14b) d'ordures du transporteur de compacteur-conduite, respectivement, et où ce dispositif de commande faisant pivoter le culbuteur (27) est un cylindre hydraulique (31) entraîné par une unité hydraulique (32) installée dans le module (5) transporteur de compacteur-conduite.
14. L'appareil de collecte d'ordures pneumatique conformément à une quelconque des revendications 1, 4, 6 et 10, où ces dispositifs d'ancrages comportent des éléments saillants (29) fixés sur le module conteneur (4) et des crochets (28) escamotables installés dans le module (5) transporteur de compacteur-conduite, où ces crochets escamotables (28) s'accrochent sur ces éléments saillants (29) du module conteneur (4) et sont escamotés par des dispositifs de commande respectifs pour presser la face (4a) d'accouplement du conteneur du module conteneur (4) contre la première face (5a) d'accouplement du compacteur du module (5) transporteur de compacteur-conduite et où ces dispositifs de commande escamotant les crochets escamotables (28) sont des cylindres hydrauliques (42) entraînés par une unité hydraulique (32) installée dans le module (5) transporteur de compacteur-conduite.
15. L'appareil de collecte d'ordures pneumatique conformément à la revendication 1 ou 6 où ce dispositif de commande déplaçant le vérin compacteur (18a, 18b) est un cylindre hydraulique (30a, 30b) entraîné par une unité hydraulique (32) installée dans le module (5) transporteur de compacteur-conduite.

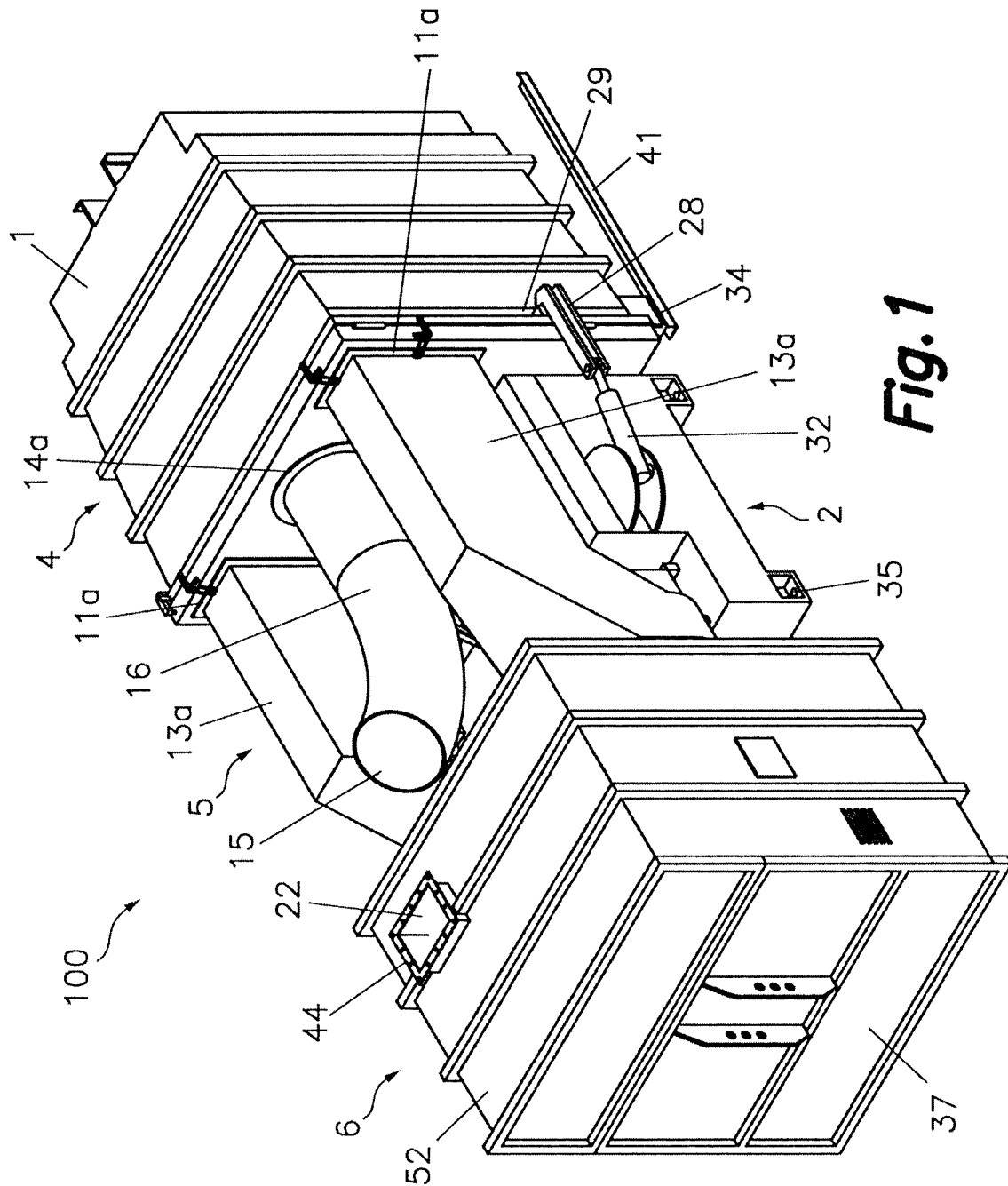
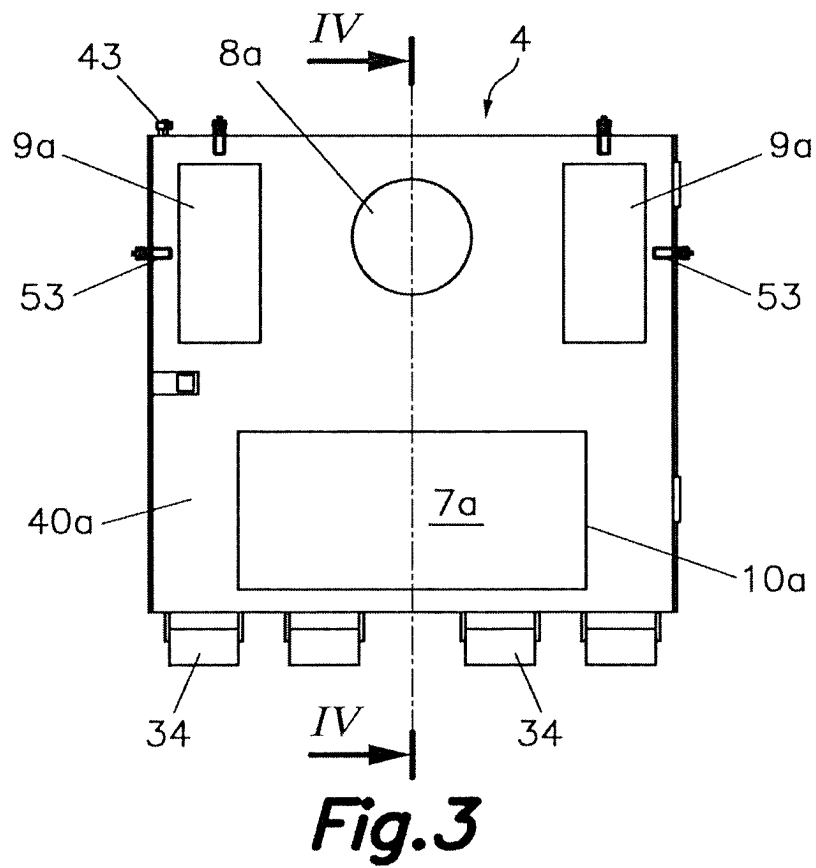
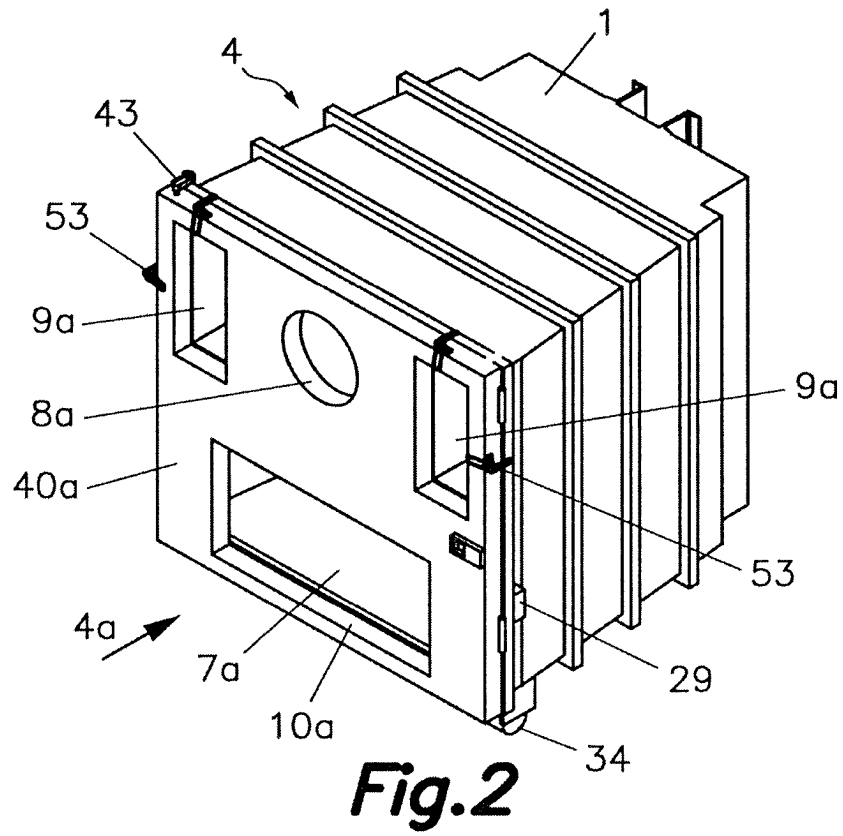


Fig. 1



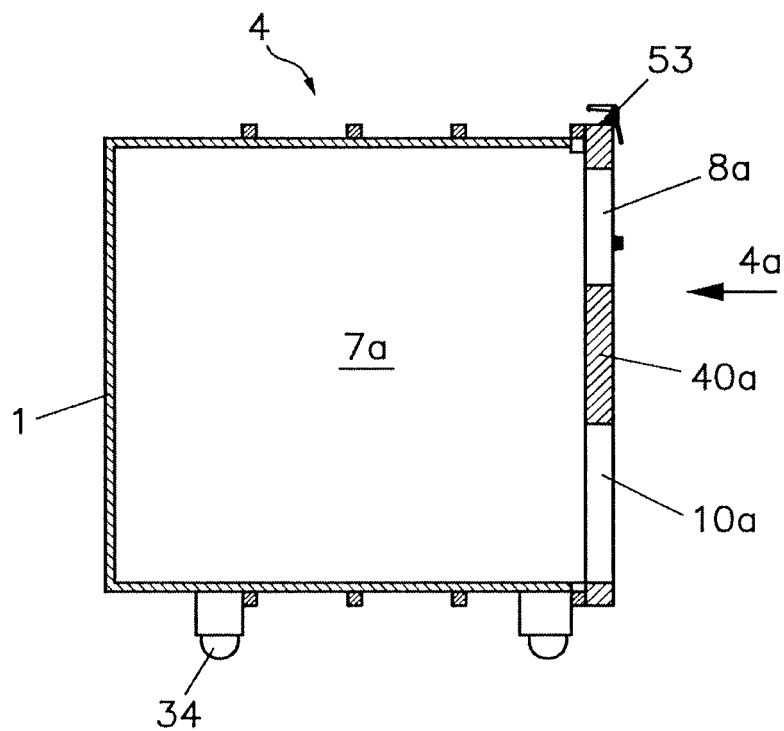


Fig. 4

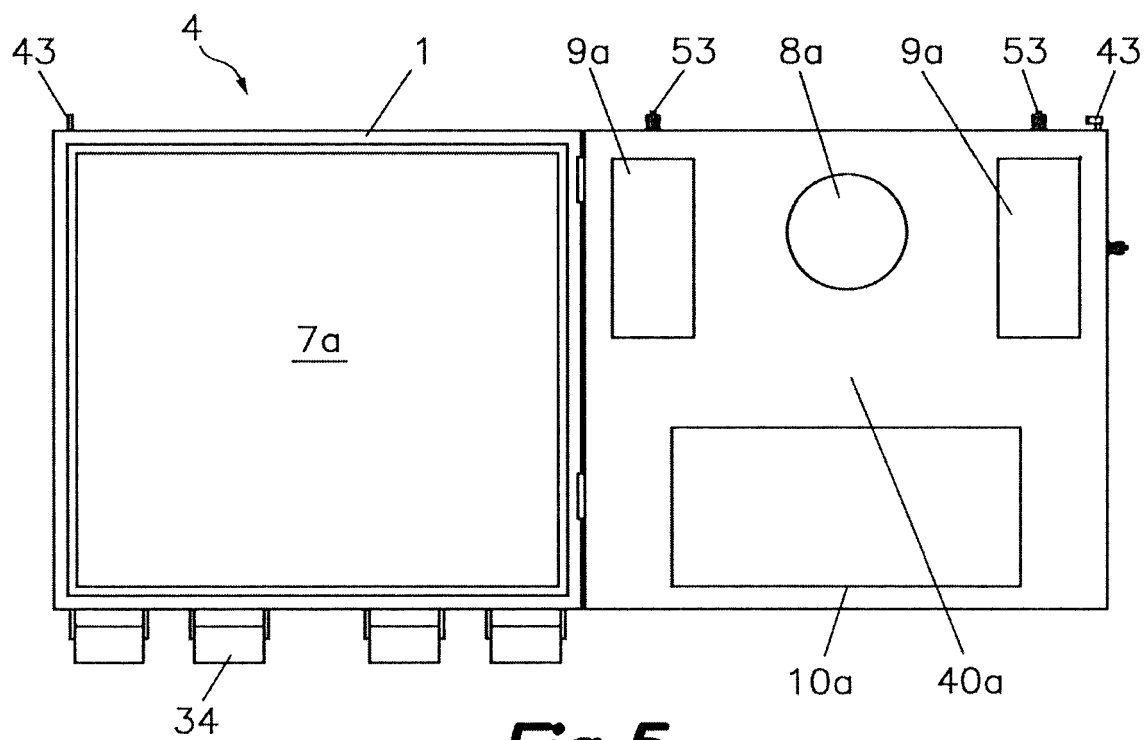
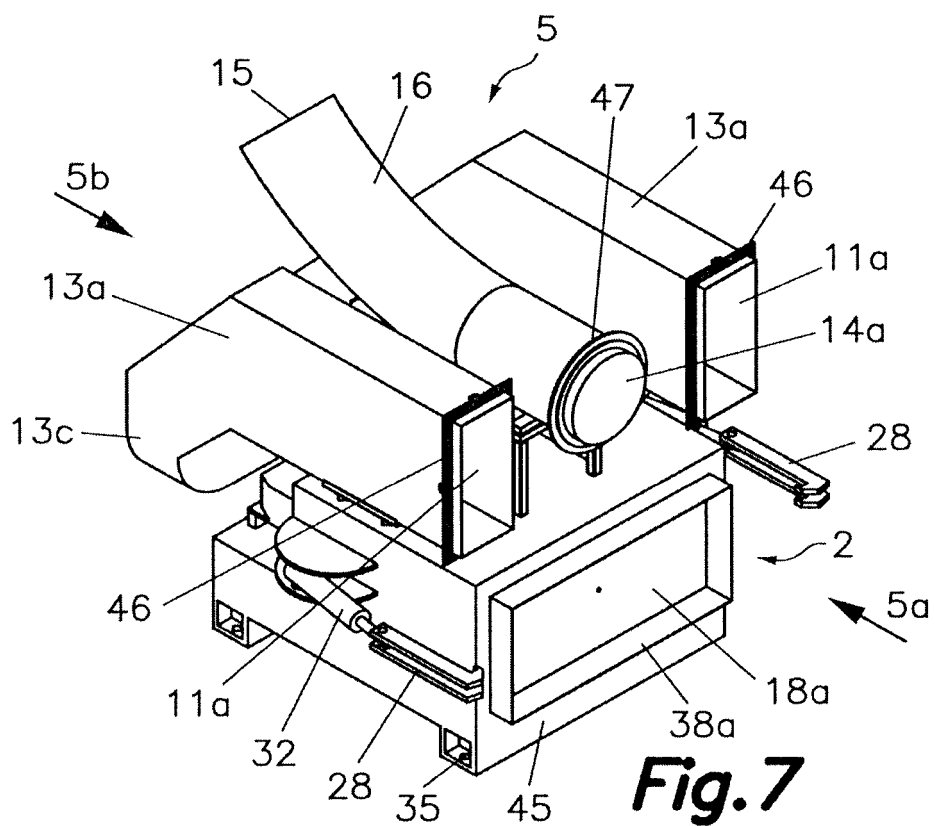
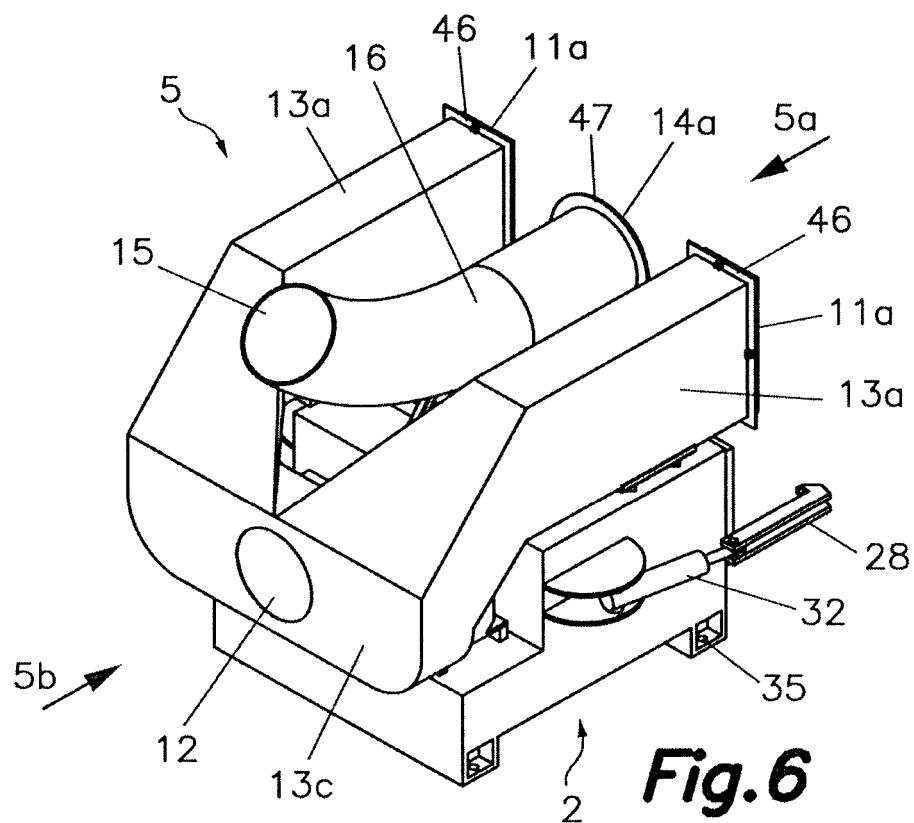


Fig. 5



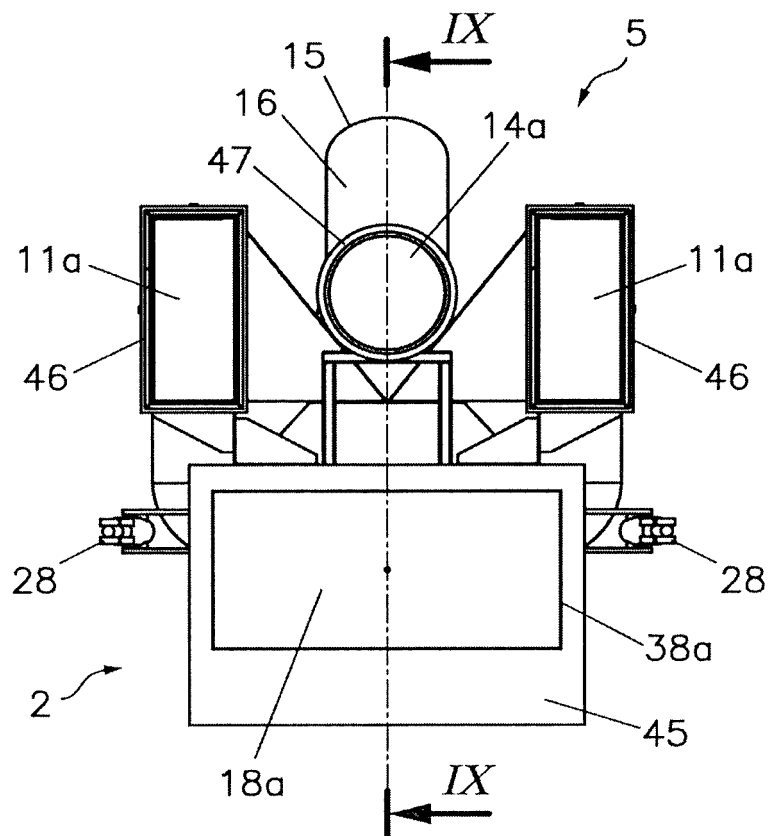


Fig. 8

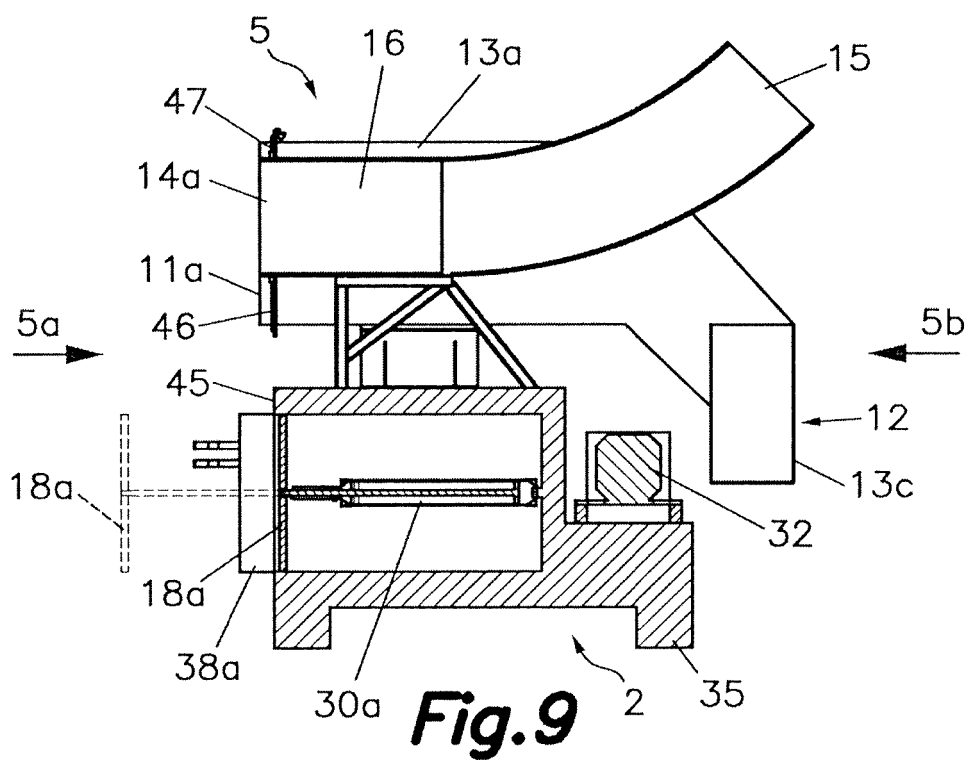


Fig. 9

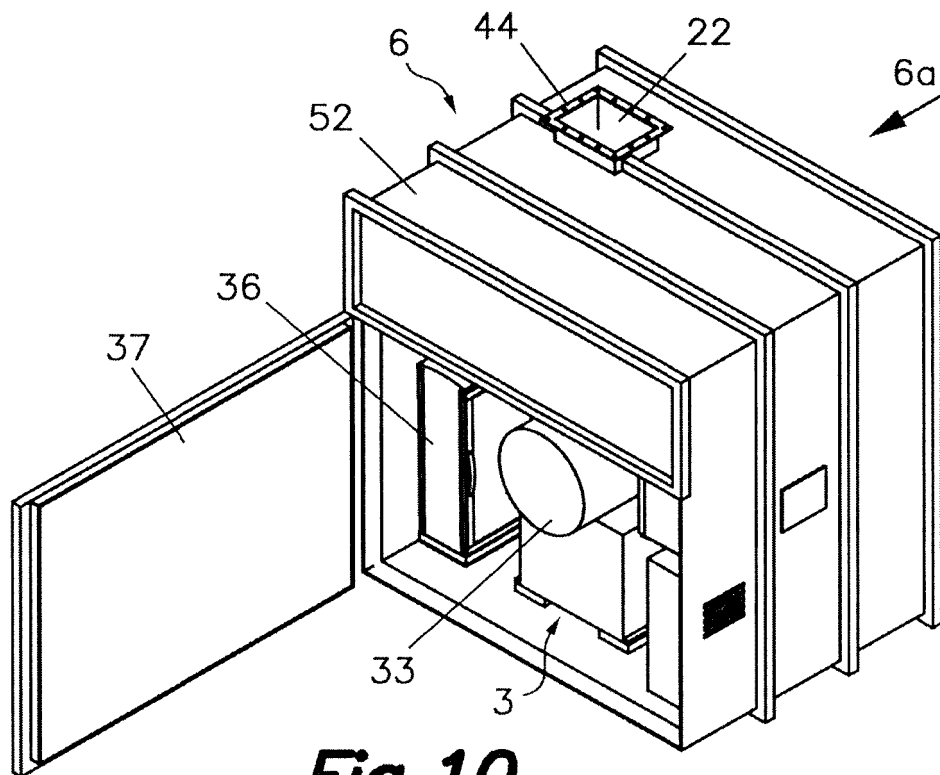


Fig. 10

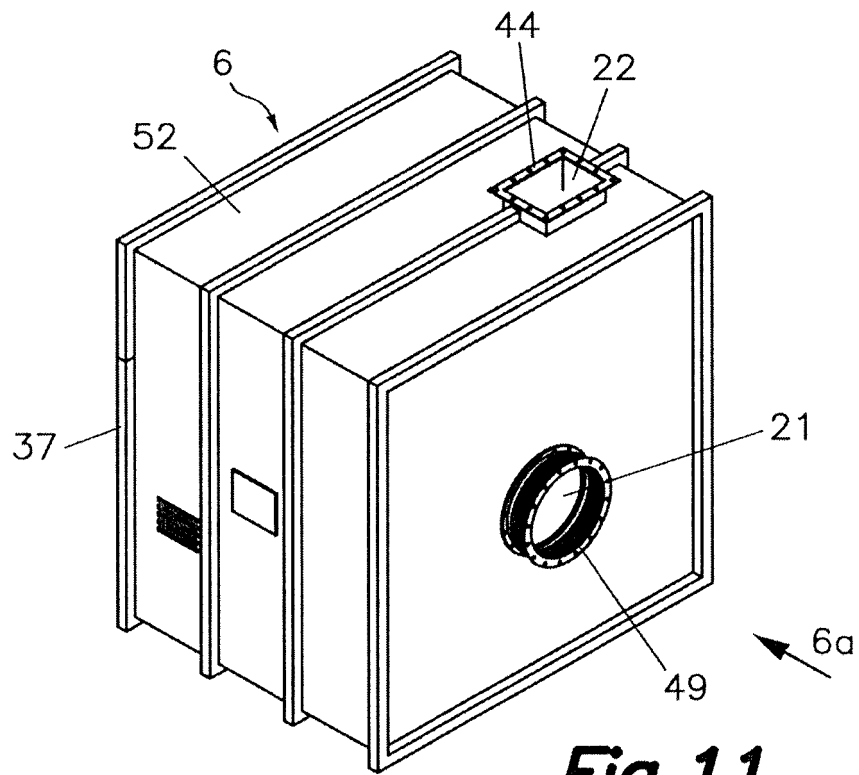


Fig. 11

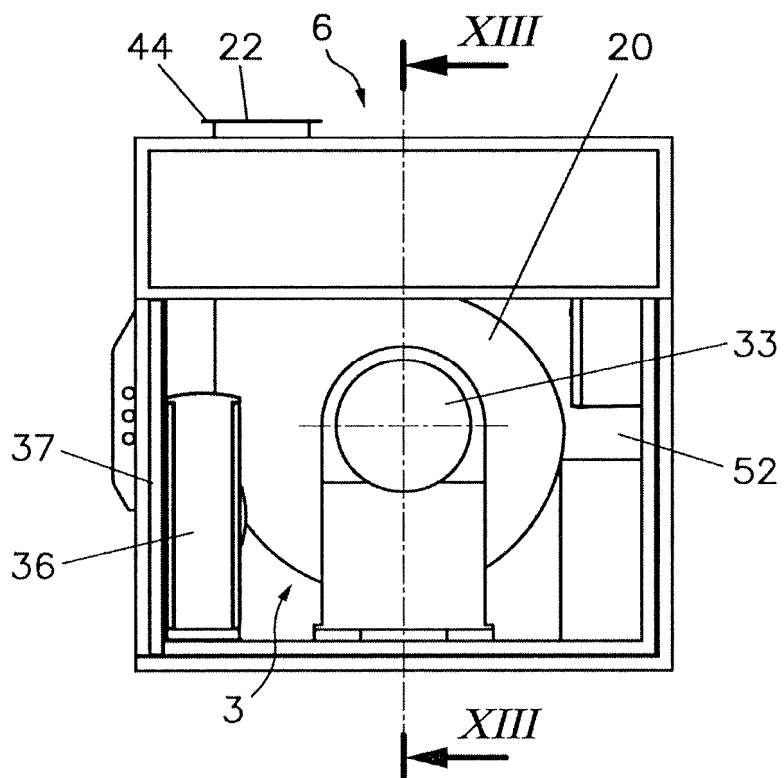


Fig. 12

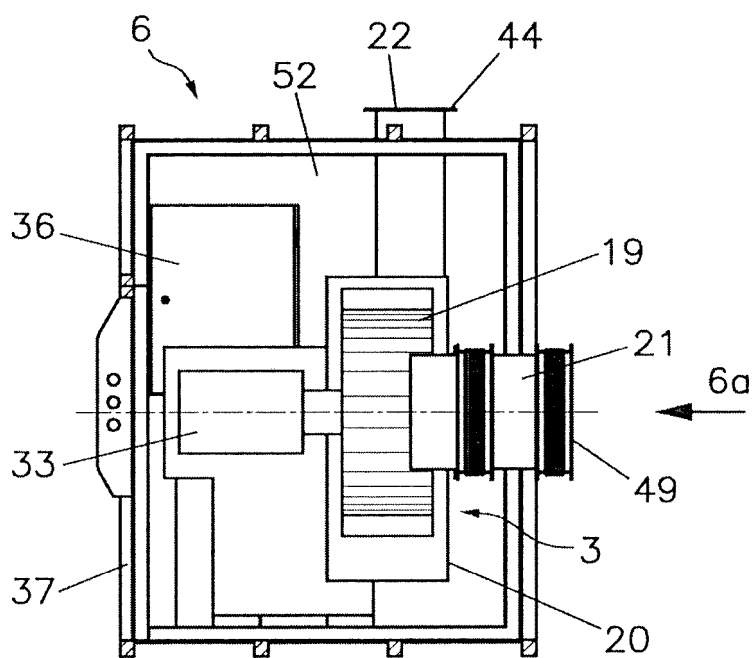


Fig. 13

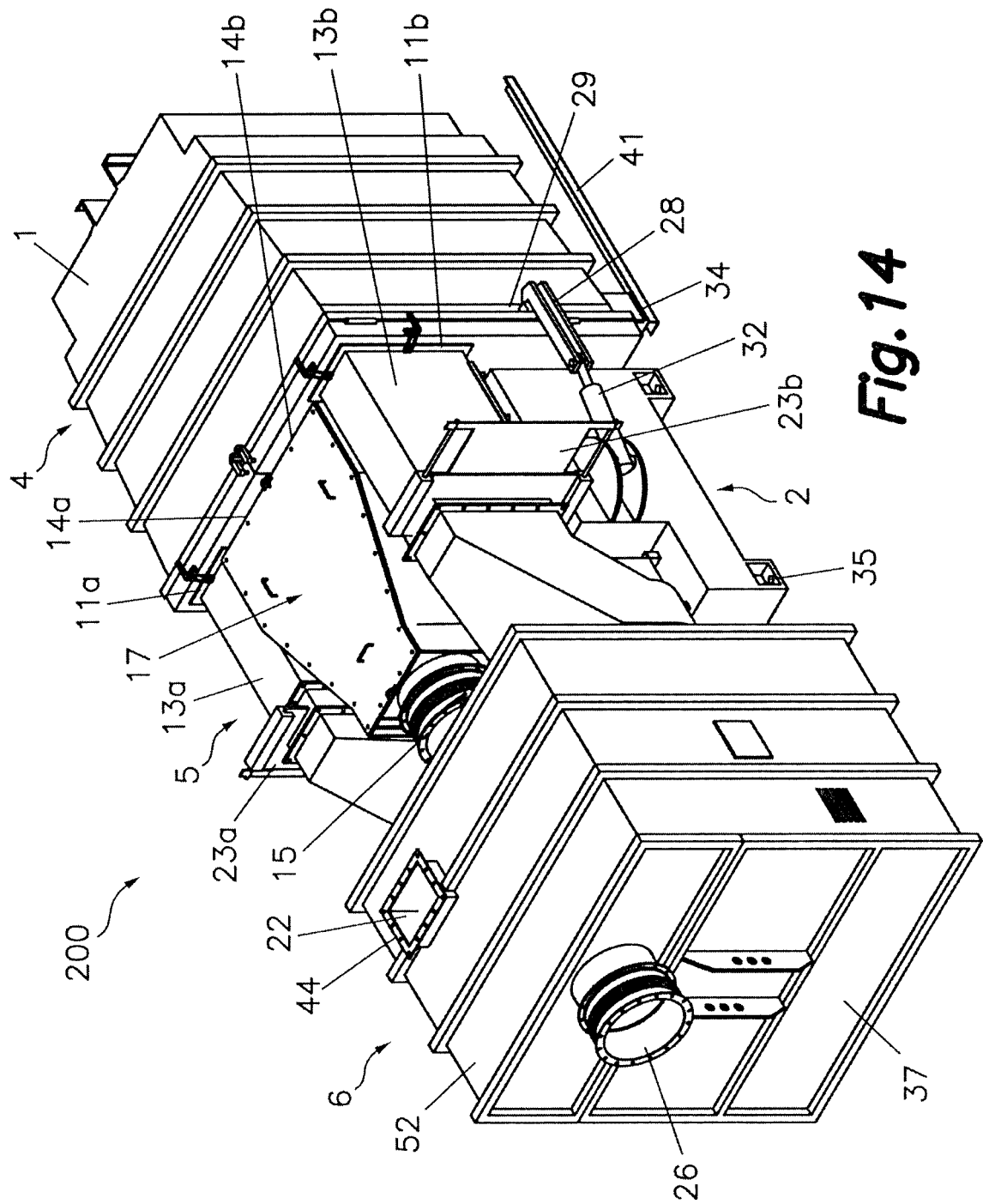


Fig. 14

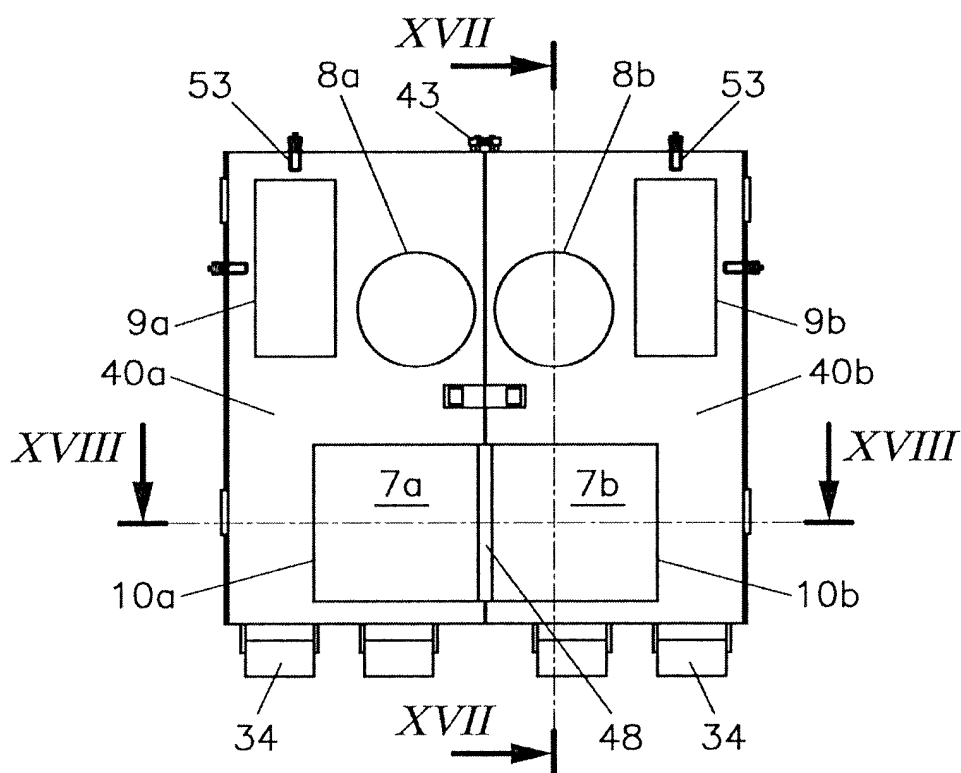
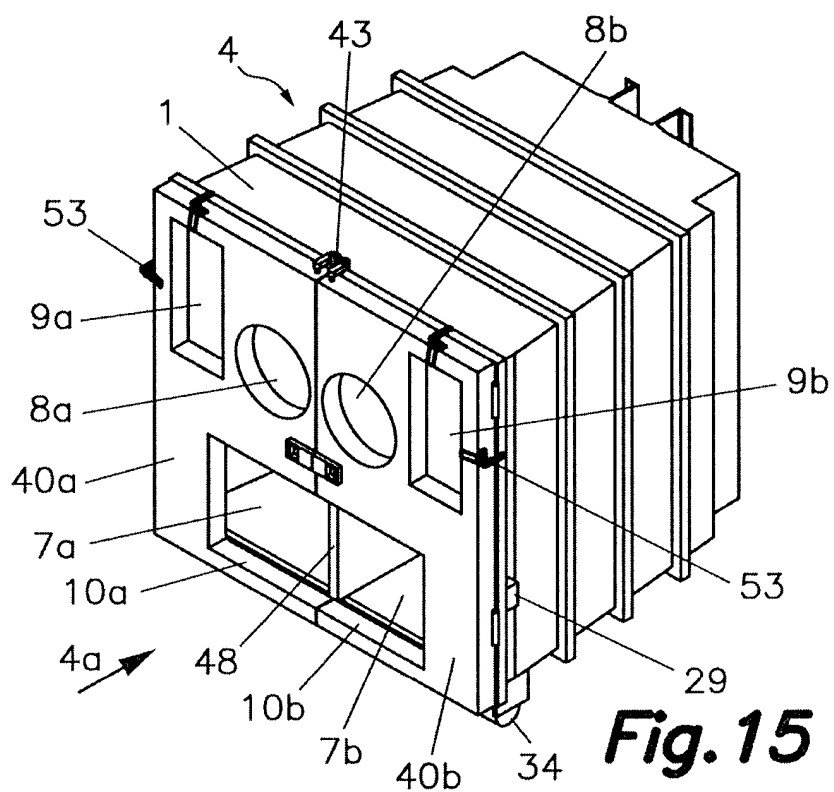
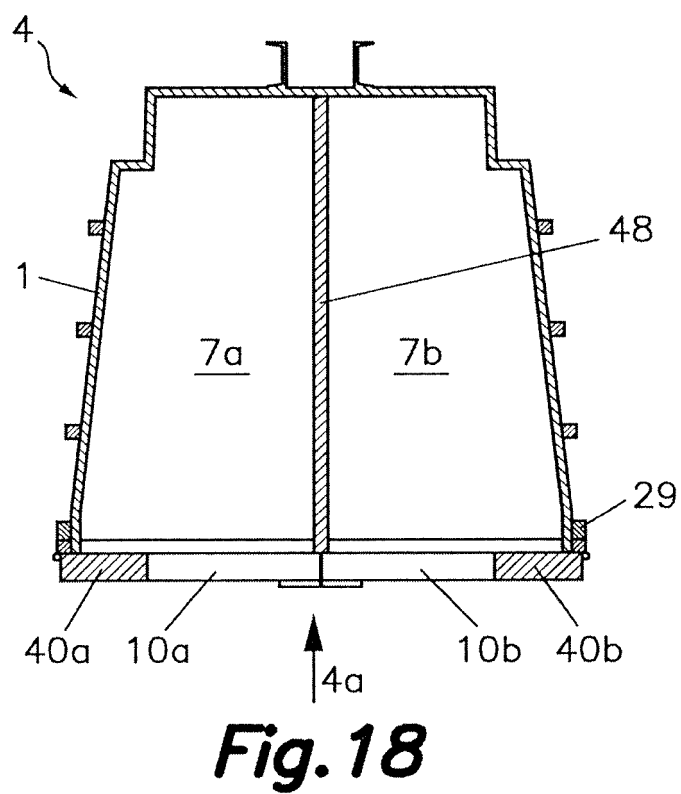
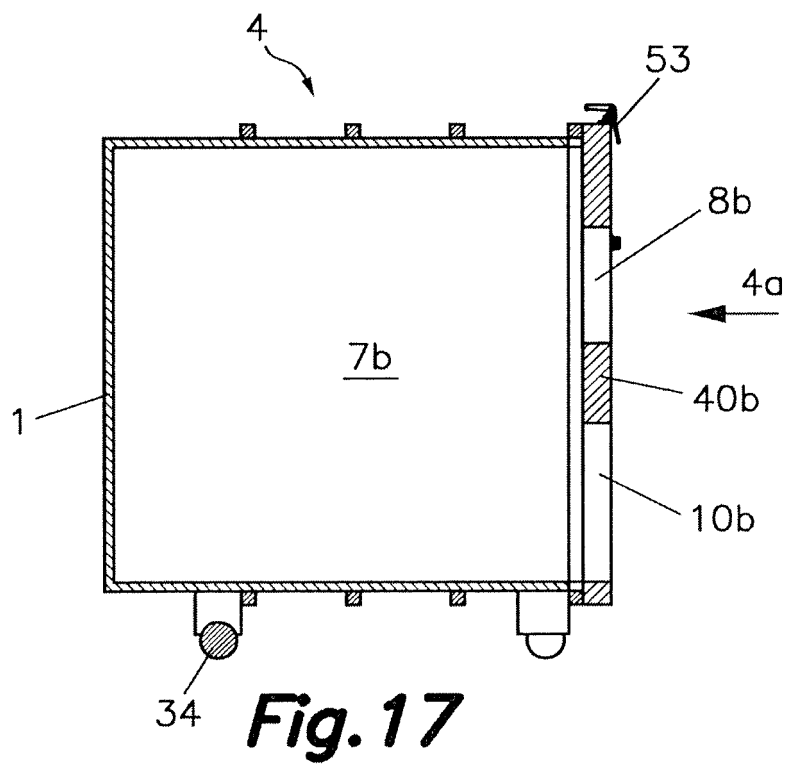
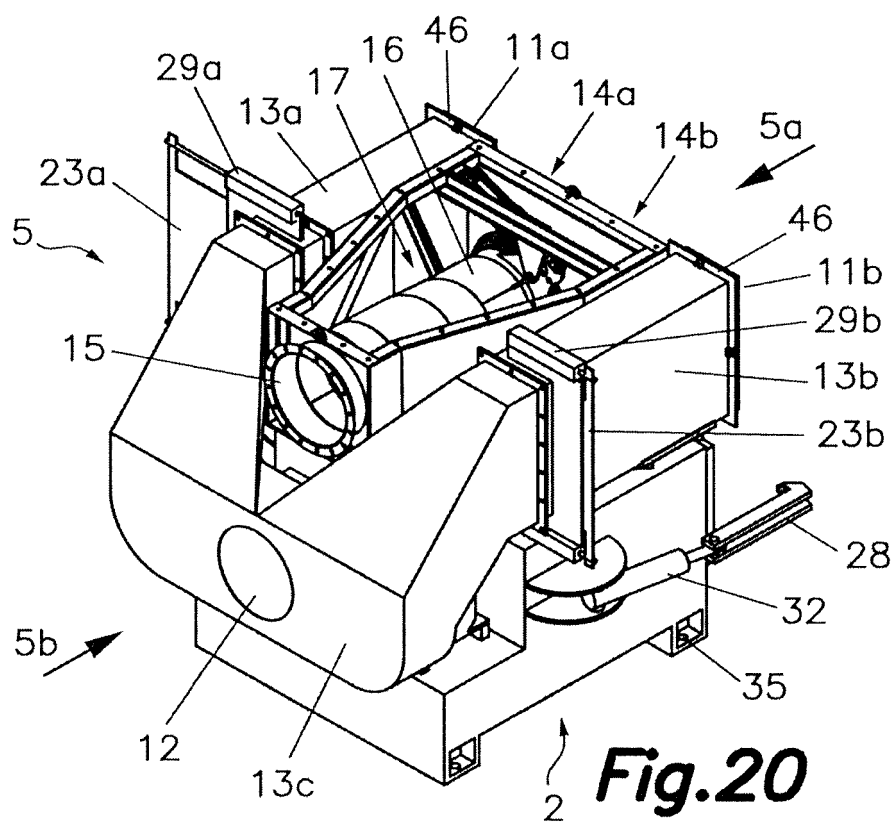
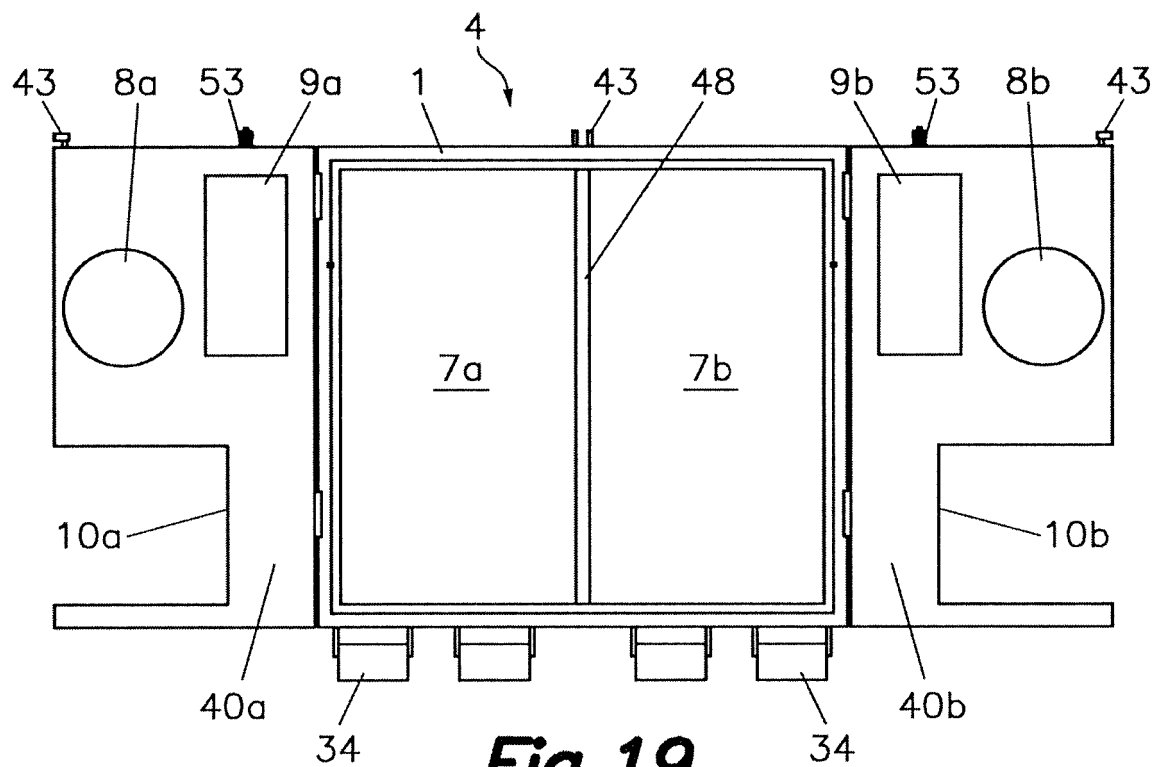
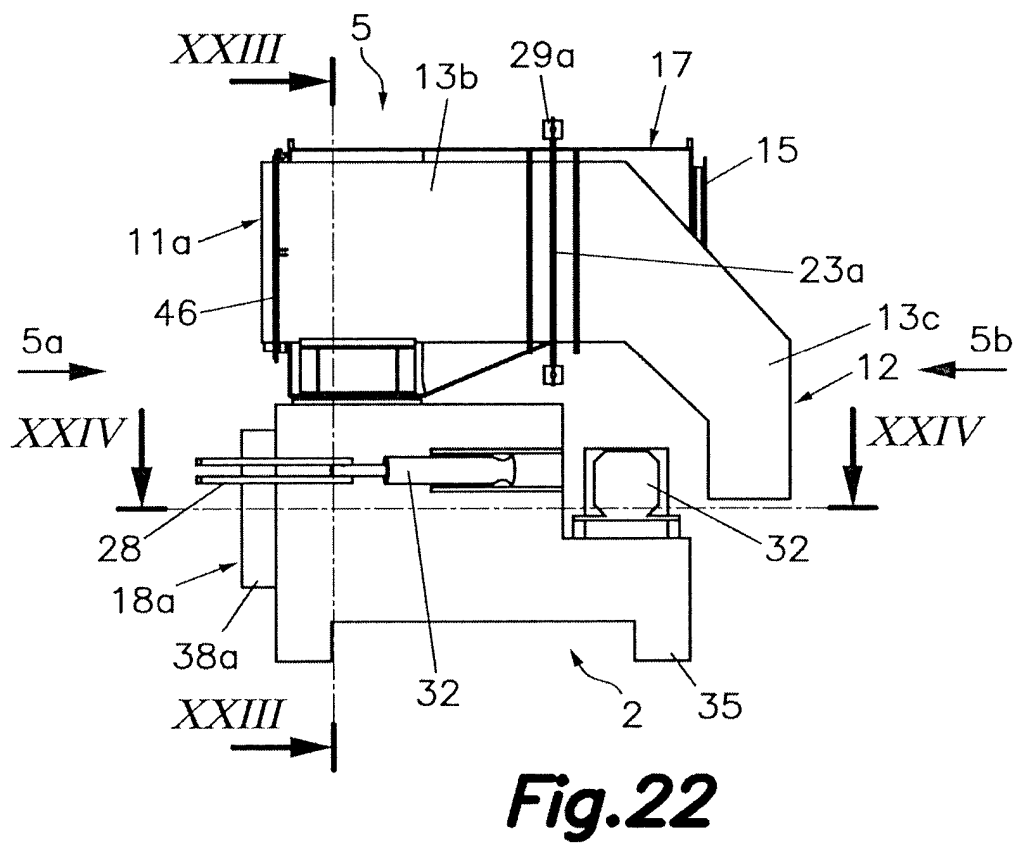
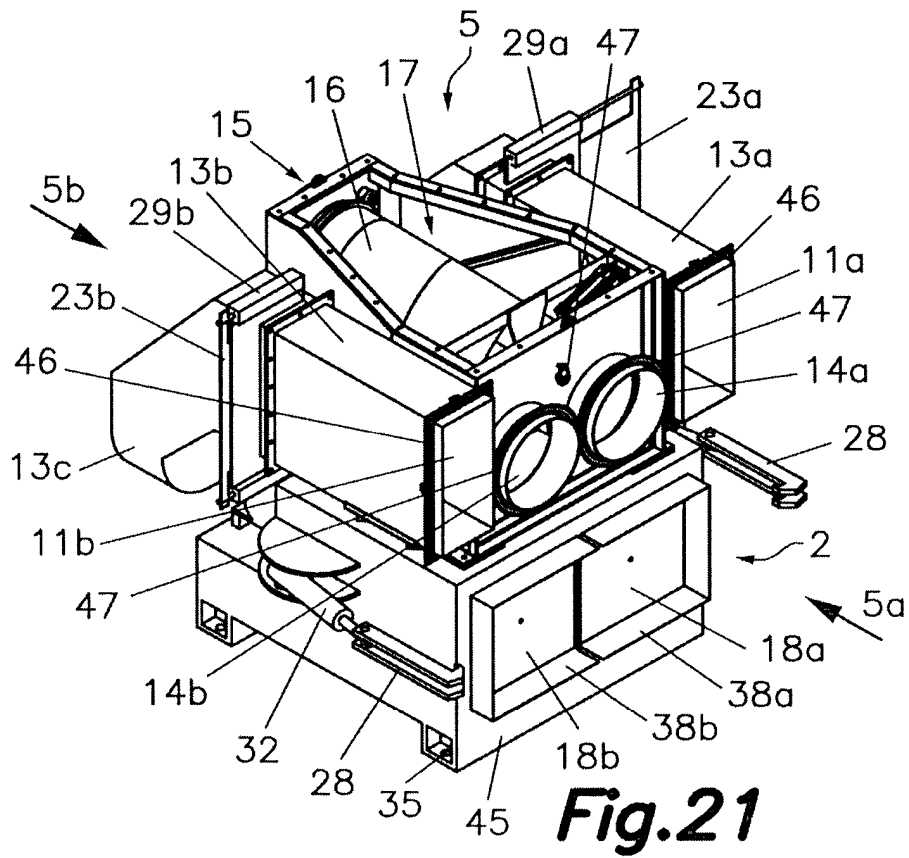


Fig. 16







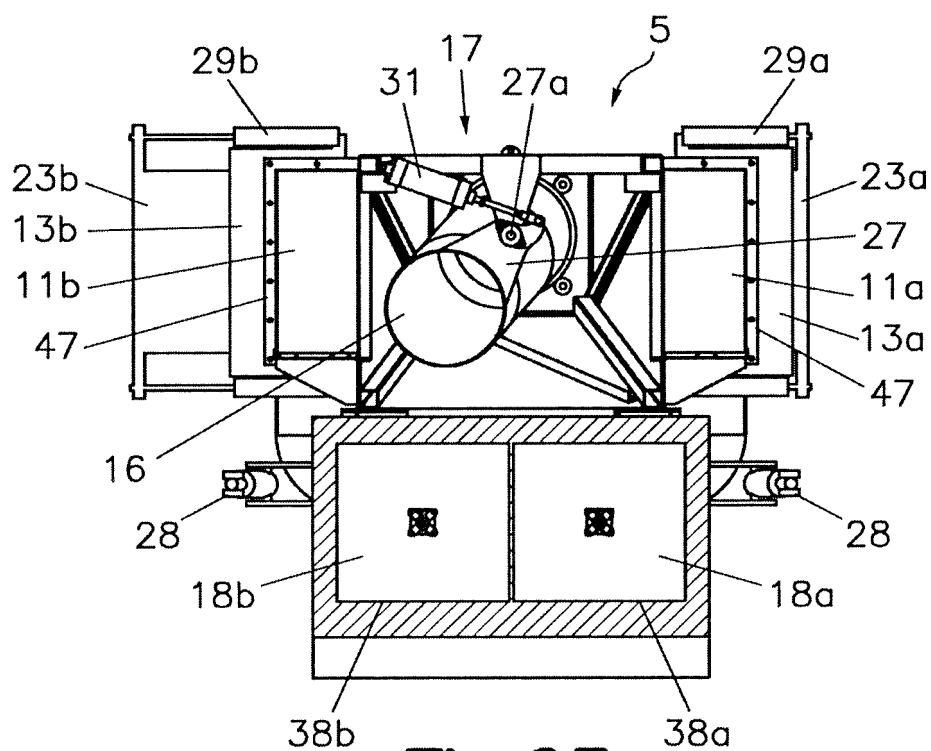


Fig.23

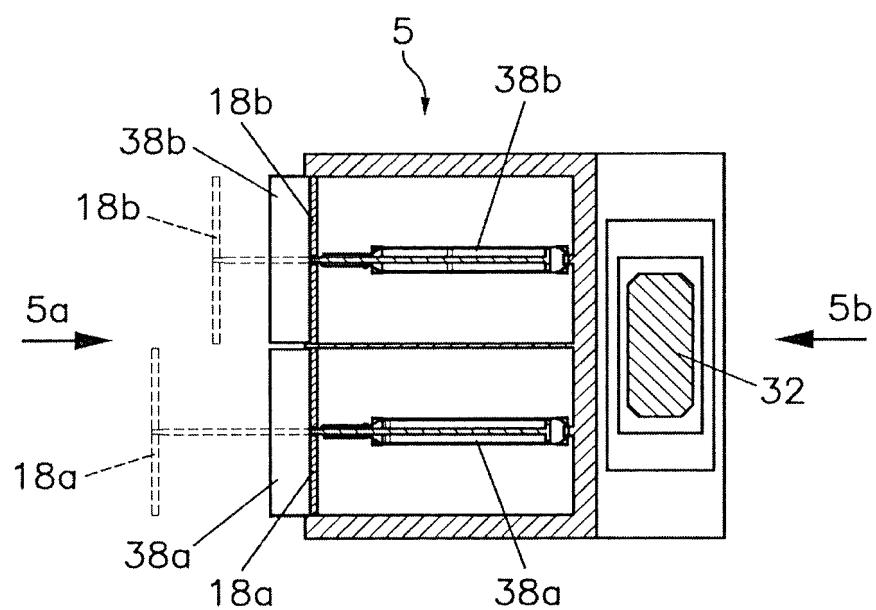


Fig.24

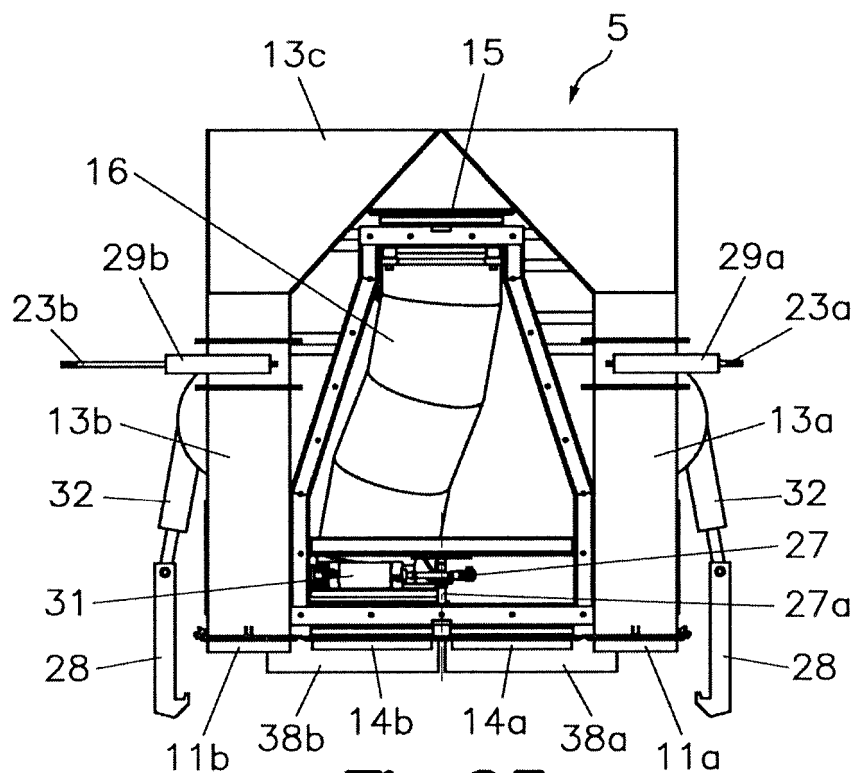


Fig. 25

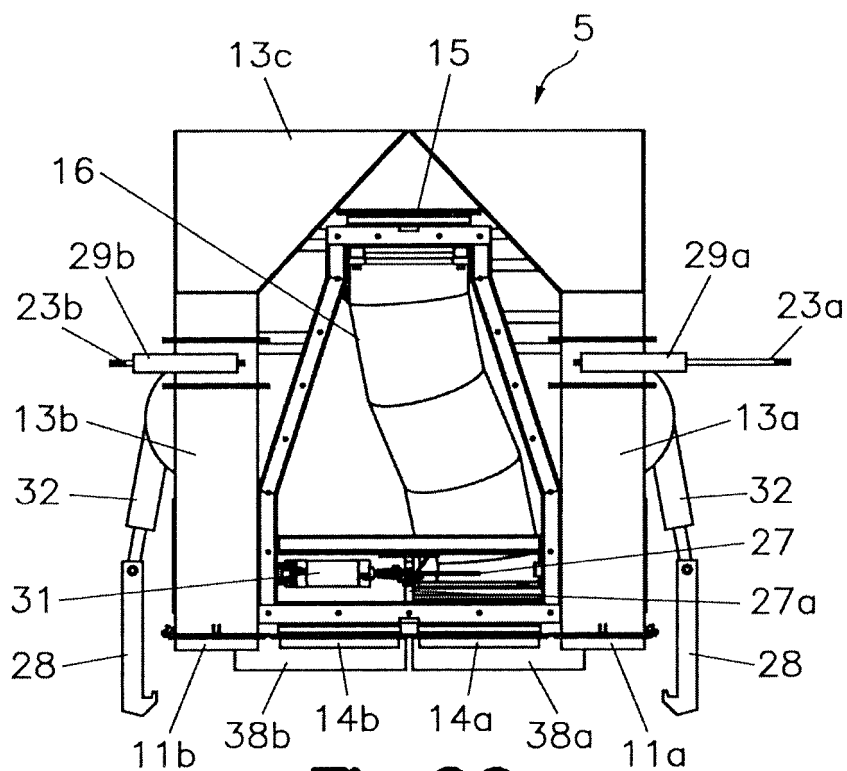


Fig. 26

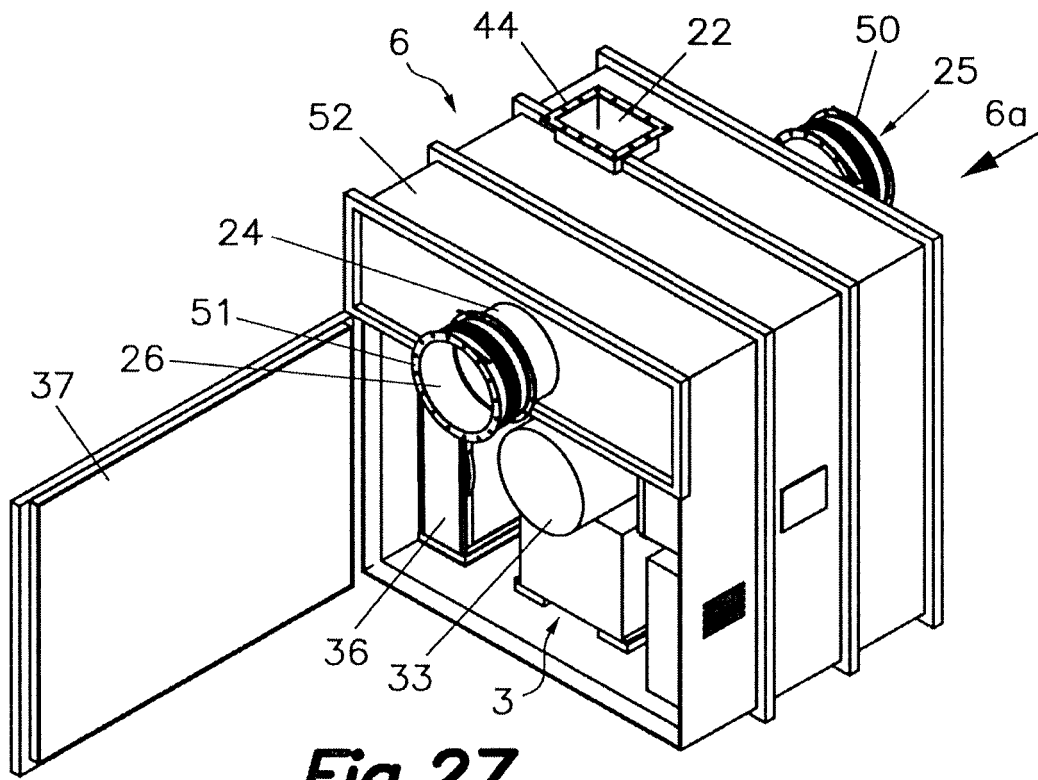


Fig.27

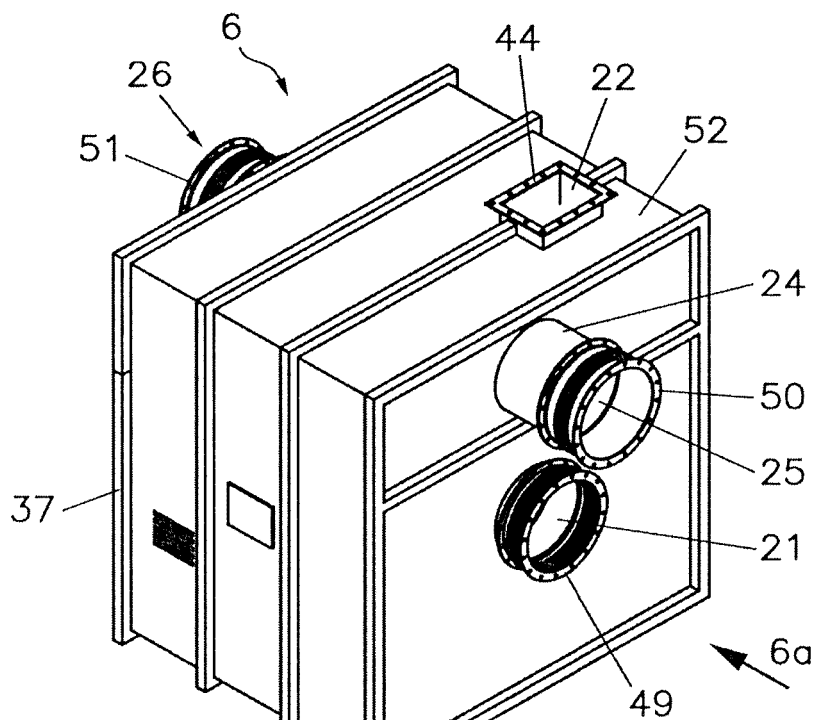


Fig.28

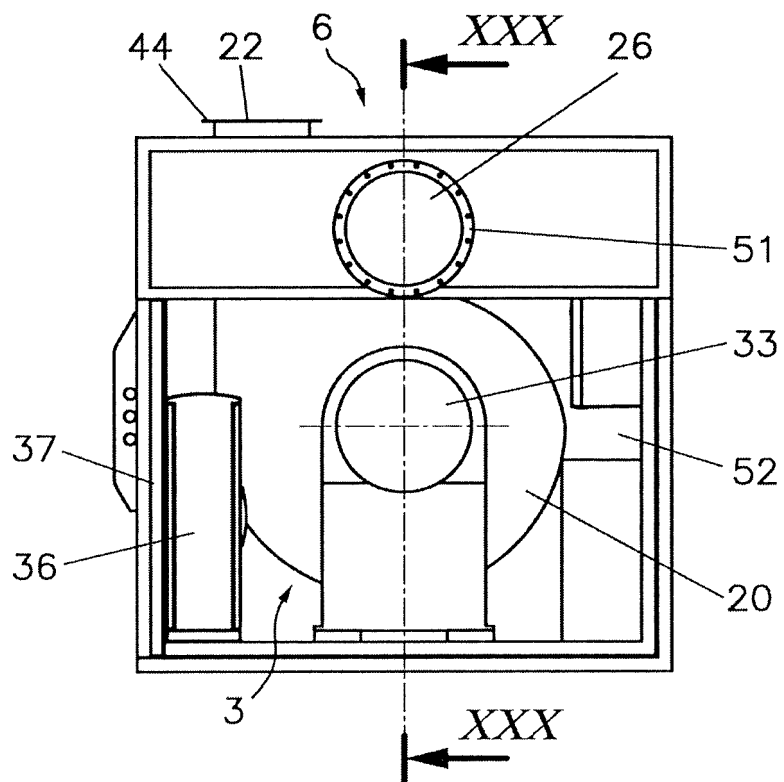


Fig. 29

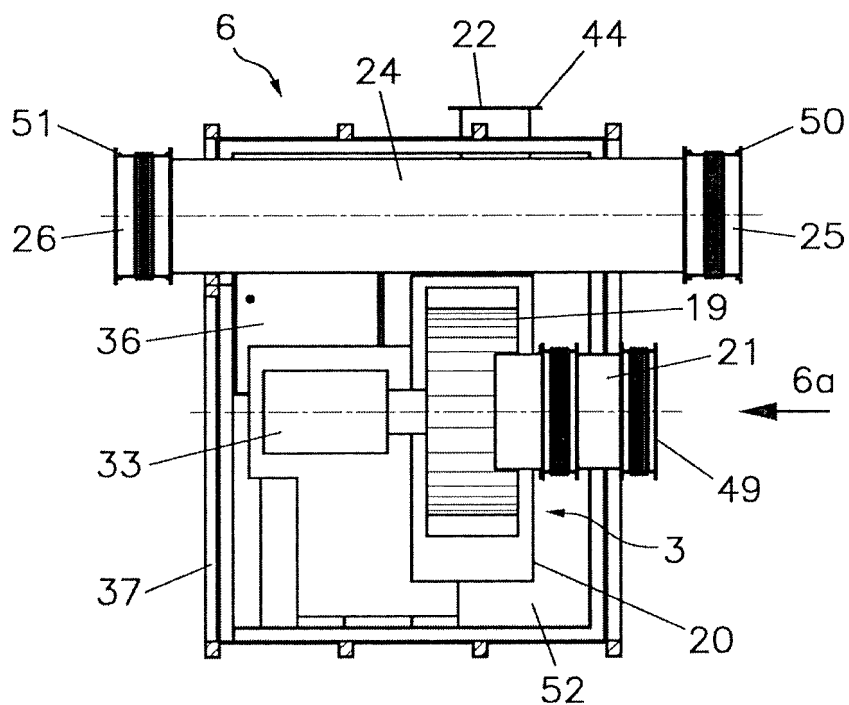


Fig. 30

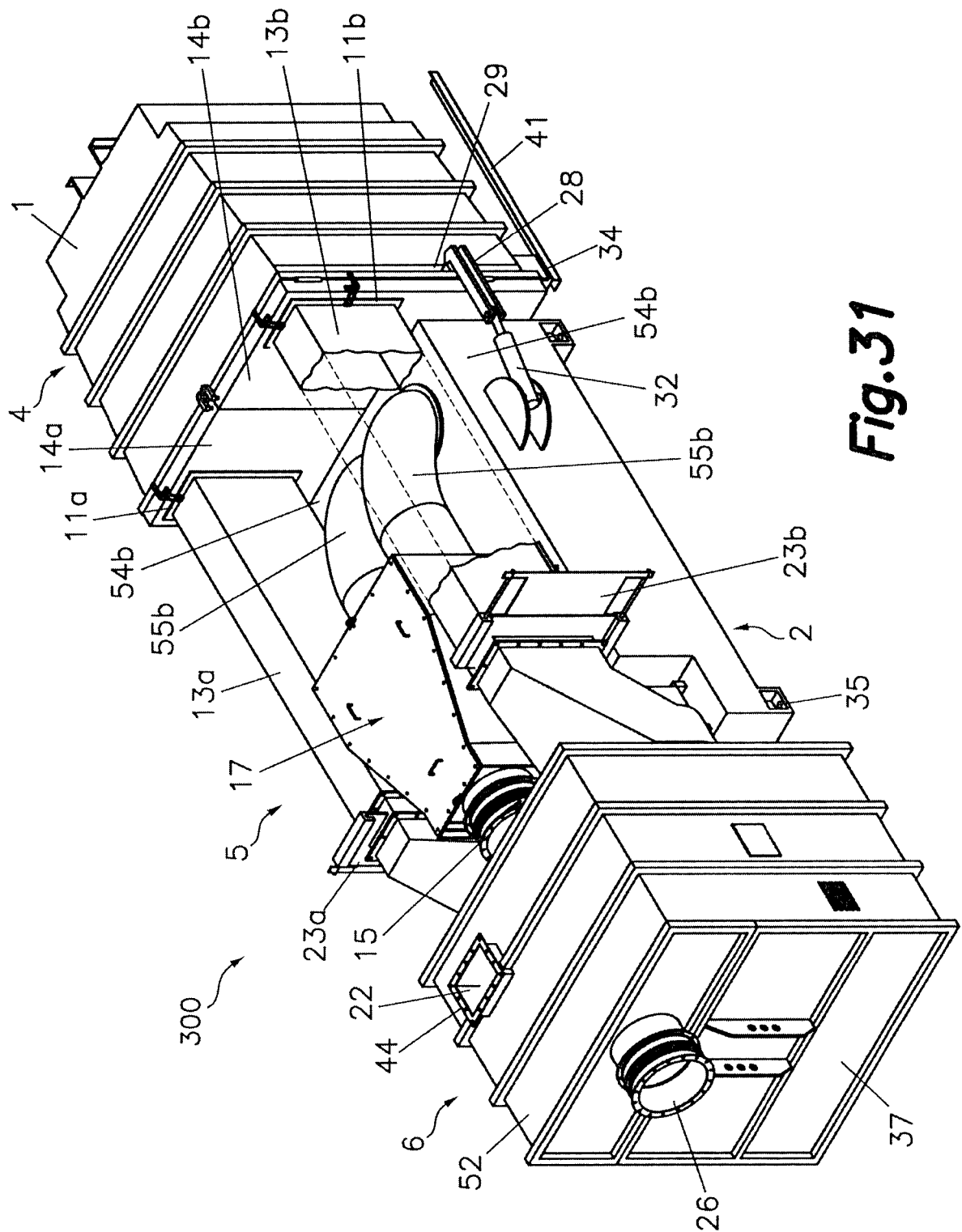
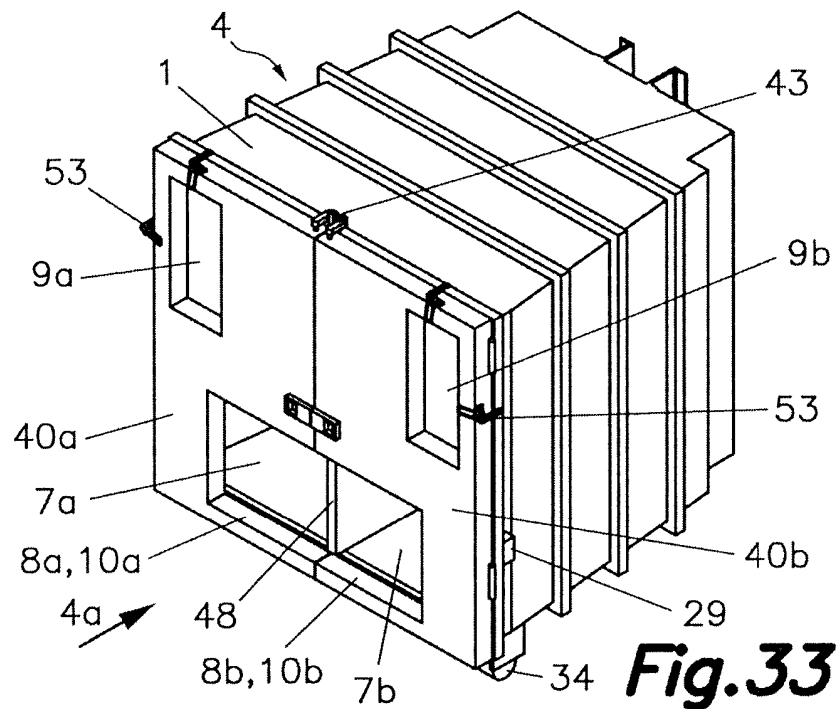
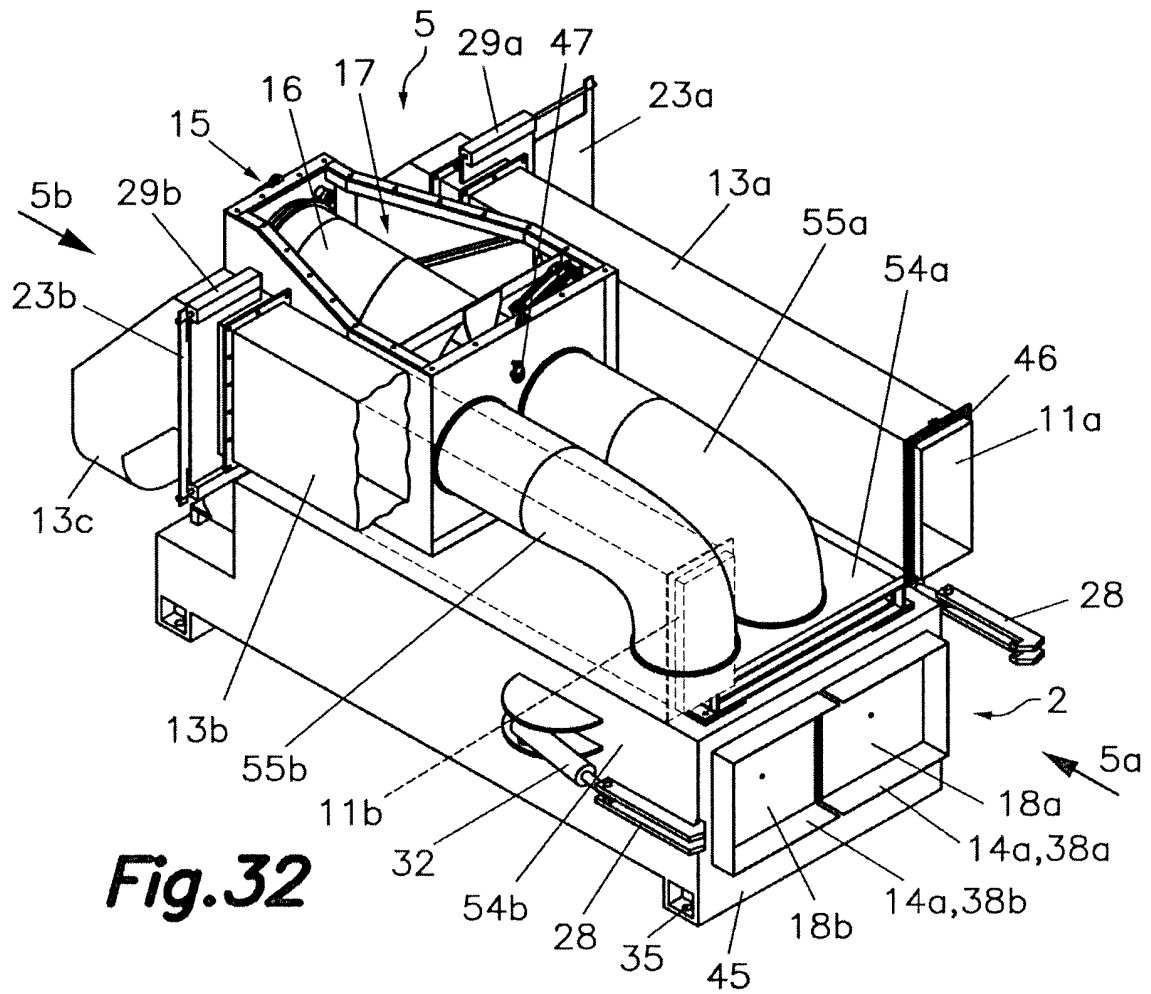


Fig. 31



REFERENCES CITED IN THE DESCRIPTION

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