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(54) **Waste compacting unit**

Abfallverdichtungseinheit

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(73) Proprietor: **ATOP S.p.A.**
50021 Barberino Val d'Elsa (Firenze) (IT)

(72) Inventors:
• **Santandrea, Marco**
50021 Barberino Val D'elsa (FI) (IT)
• **Lombardi, Massimo**
55020 San Donato In Poggio (FI) (IT)

(74) Representative: **Celestino, Marco**
ABM Agenzia Brevetti & Marchi,
Viale Giovanni Pisano, 31
56123 Pisa (IT)

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- **PATENT ABSTRACTS OF JAPAN vol. 009, no. 121 (M-382), 25 May 1985 (1985-05-25) & JP 60 006298 A (KAZUTOSHI OGASAWARA), 12 January 1985 (1985-01-12)**
- **PATENT ABSTRACTS OF JAPAN vol. 1998, no. 14, 31 December 1998 (1998-12-31) & JP 10 235498 A (KAMACHIYOU SEIKO KK), 8 September 1998 (1998-09-08)**

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DescriptionField of the invention

[0001] The present invention relates to a waste compacting unit of many kinds, such as plastic, metal, glass containers, capable of shrinking the waste before their disposal and their collection by a public disposal centre, and of assisting a separate waste collection.

Description of the prior art

[0002] As well known, machines exist for solid waste treatment, such as plastic, metal, glass bottles or containers, capable of compacting the waste before disposal and collection by a public disposal centre so that the waste has a minimum encumbrance.

[0003] A waste compacting machine is described in WO2004106046. It provides a compacting step of the waste arranged within plastic bags, and at the same time it can compact containers of glass, plastics and metal. The compression of the waste arranged in a bin is carried out by a pantograph, which moves a piston and is operated by a carriage and by a cam. The piston enters the bin and compacts the waste in it present, sliding in a previously arranged shell, for preventing the waste containing plastic bags to be damaged.

[0004] Another type of waste compacting machine, described in EP1074486, provides a frame having three apertures for introducing the waste. In the machine means are provided for compacting plastic waste and metal waste, associated respectively to a first and a second aperture. Means for crushing glass waste is provided adjacent to a compacting means and are associated to the third aperture. At least one open bin is provided, arranged below a compacting and crushing means, where the crushed waste and the compacted waste are respectively collected. A compacting means comprise a movable support frame on which two compacting plates are mounted that can slide with respect to each other within a couple of cylinders with axes parallel to each other. In particular, the first cylinder is suitable for receiving plastic waste and the second cylinder is suitable for receiving metal waste.

[0005] However, the compacting means used in the machines above described, and normally in prior art machines, cannot compact the waste effectively. In particular, if pantograph compacting means are used, the mechanism can jam due to an asymmetrical action, thus requiring a stop of the machine to clear the jammed parts. Furthermore, such machines are structurally complex, bulky and expensive and are not suitable for a household use.

[0006] A further technical problem of the apparatus of prior art is that they can treat single species of waste. In other words, most of the known waste treating apparatus are capable to process a single kind of waste, without assisting completely a separate waste collection, i.e. their

sorted collection in different containers.

[0007] The document DE-C-10130006 discloses a waste compacting unit in accordance with the preamble of claim 1.

Summary of the invention

[0008] It is therefore a feature of the invention to provide a waste compacting unit that allows a reduction of the volume of the material treated and is effective with respect to the devices of prior art.

[0009] It is another feature of the invention to provide a waste treating apparatus that is structurally easy and cheap with respect to apparatus of prior art.

[0010] It is another feature of the invention to provide a waste treating apparatus for processing also organic waste, further assisting a separate waste collection.

[0011] These and other features are accomplished with one exemplary waste compacting unit, according to appended claim 1.

[0012] In an advantageous exemplary embodiment, said compacting means divide said compacting chamber into two parts in each of which said waste to compact can be put.

[0013] In particular, the waste compacting means provides a compacting plate mounted on a carriage reciprocating along said working direction.

[0014] In particular, the piercing means comprise a plurality of piercing elements suitable for cutting the waste during a compacting step operated by a compacting means, to assist the exit of air. This way an effective compacting action is obtained.

[0015] In particular, the piercing elements can be connected to side walls of a compacting chamber.

[0016] Alternatively, the piercing elements can be integrated to a compacting step plate.

[0017] The motor driven means can provide a bi-directional motor operatively connected to the carriage through transmission means.

[0018] In particular, the motor driven means are associated to a control circuit suitable for repeating for a predetermined number of times the last portion of a compacting stroke.

[0019] This way, the waste is compacted by a compacting means according to a reciprocation towards/away from the resiliently yieldable wall for several times, for example three. This avoids a possible resilient memory recovery of the material also in case of particularly resistant material. The repetition of several compacting actions allows a better expulsion of any air trapped in, as well as air recalled by the resilient memory after a first compacting action. Furthermore, between a compacting step and a repetition thereof the waste changes slightly the position with respect to the piercing means, and the latter would pierce the material again in slightly different points, in order to further assist the compacting step.

[0020] Preferably, the transmission means provides a

worm screw suitable for causing the rotation of a plurality of pulleys associated to transmission belts. When the shaft of the motor rotates in one direction, it causes the rotation in one sense of the pulleys that belong to a same kinematical chain, and then the motion of the carriage in that sense, whereas when the speed of the shaft of the motor is inverted the carriage proceeds in the opposite direction.

[0021] In an exemplary embodiment of the invention the base is divided into two portions that can move independently between a supporting position and a releasing position.

[0022] Advantageously, a compacting chamber has means for extracting the compacted waste by the piercing elements.

[0023] During a compacting step of the waste material the interposition plate translates towards the side walls by the force exerted on it by the material being compacted, thus loading the resilient means and uncovering progressively the piercing elements. At the end of a compacting step of the material, the resilient means cause the interposition plate to move away from the side wall back to the starting position and at the same time withdrawing gradually the part of the piercing elements that protrudes from the interposition plate. This way, the extraction is obtained from the piercing elements of the material already compacted, that can freely fall down in the waste collecting bin.

[0024] In particular, each of said two portions of the base has engaging/releasing means suitable for keeping the relative portion in the supporting position or for allowing the arrangement in the releasing position.

[0025] Advantageously, the compacting unit as above described may be integrated to an organic waste grinding unit within a piece of furniture for kitchen units. This way it is possible to carry out a separate waste collection that according to the kind of waste is sent to either unit for being processed.

[0026] In a possible exemplary embodiment of the invention, the piece of furniture for kitchen units can comprise in addition to the compacting unit also an organic waste grinding unit comprising:

- an inlet for introducing the waste to treat;
- a grinding chamber provided with grinding means for the waste coming from said inlet;
- an outlet for liquid residues percolating from said waste through said chamber;
- a waste collecting container, for collecting the waste that has been ground in said chamber;
- flow sorting means, suitable for causing selectively the liquid residues of said waste to pass towards said outlet or also a solid part, and wherein the grinding means may comprise at least one knife rotating about an axis suitable for cooperating with a stationary knife connected to the wall of the grinding chamber, in order to grind the waste coming from said inlet.

[0027] In an exemplary embodiment of the invention, the or each knife is mounted on the boundary of a drum capable of rotating about its own longitudinal axis.

[0028] According to another aspect of the invention a modular element for kitchen units comprises a compacting unit, said modular element comprising a piece of furniture having a height, depth and width of standard size for kitchen units.

[0029] In a possible exemplary embodiment particularly suitable for separate waste collection, an organic waste grinding unit is provided associated to said compacting unit and integrated in said piece of furniture.

Brief description of the drawings

[0030] The invention will now shown with the following description of an exemplary embodiment thereof, exemplifying but not limitative, with reference to the attached drawings wherein:

- figure 1 shows diagrammatically a cross sectional view of a possible exemplary embodiment of a waste compacting unit, according to the invention,
- figures 2 and 3 show diagrammatically a cross sectional view of a compacting chamber of the compacting unit of figure 1 in two different operative steps,
- figure 4 shows diagrammatically a top plan view of the compacting unit of figure 1,
- figures 5 and 6 show diagrammatically an elevational side view of the drive and the kinematical chain that operate a compacting means for the unit of figure 1;
- figures 7 and 8 show diagrammatically a partially cross sectioned elevational front view of two different configurations of the base of a compacting chamber of the unit of figure 1;
- figures from 9A to the 9E show diagrammatically a full compacting cycle executed by the compacting unit of figure 1 for highlighting detail features thereof;
- figures 10A and 10B show an elevational front view of an element for kitchen units according to the invention, integrating the compacting unit of figure 1 and a grinding unit;
- figures 11 and 12 show, respectively in a elevational front view and a perspective view, the compacting unit of figure 1 integrated within a piece of furniture for kitchen units;
- figure 13 shows diagrammatically a position-time diagram (x, t) for the compacting means of the compacting unit of figure 1 during a possible waste compacting step.

Description of a preferred exemplary embodiment

[0031] With reference to figure 1, a waste compacting unit 1, according to the invention, provides a compacting chamber 3 in which the waste 30 to dispose of is put, such as bottles and containers of various type of glass, plastics or metal, for reducing its volume and assisting

its following disposal in public collecting centres. In particular, the waste is put into chamber 3 through a first inlet 103a or a second inlet 103b, shown in a top plan view of figure 4, according to the kind of the material to treat in order to assist a separate waste collection.

[0032] In a compacting chamber 3 a compacting plate 2 is mounted sliding along a working direction 100 by means of a carriage 20. Compacting plate 2 divides compacting chamber 3 into two parts 3a and 3b that are accessible when the machine is turned off for disposing the waste of, through the respective inlets 103a and 103b. Below each part 3a or 3b of chamber 3 a respective waste collecting bin 35a and 35b is arranged, suitable for receiving the compacted waste.

[0033] To compact both the waste put into first part 3a and in second part 3b of chamber 3, plate 2 can act along the above described working direction 100 both in one direction 101 and in an opposite direction 102 (figure 4). This is allowed according to the invention by the transmission mechanism of carriage 20 and then of compacting plate 2. As shown in detail in figures 5 and 6 the mechanism of transmission of the movement provides a bidirectional motor 50 that operates a worm screw 55. According to the speed of rotating shaft 51 of motor 50, worm screw 55 moves in one direction (figure 5), or in the opposite direction (figure 6), causing the pulley 11 that engages with it to rotate in the corresponding direction. A belt 15 connects pulley 11 to a plurality of other pulleys 12, 13 and 14 that transmit the movement to carriage 20 by rotating shaft 23.

[0034] To assist the compacting step of the waste, in chamber 3 piercing elements 5 are provided connected to side walls 6. When the waste is at side walls 6, piercing elements 5 pierce its surface obtaining a corresponding number of holes 31, that assist the exit of air contained inside during a compacting step (figure 3). This way, the waste is compacted easily and at the same time an explosion of the container is avoided, owing to the air trapped by a stopper 32, avoiding to damage the machine.

[0035] The motor 50 can be associated to a control circuit, not shown in the figures, suitable for repeating for a predetermined number of times the last portion of the stroke of compacting plate 2 during a waste compacting step. In figure 13 a qualitative diagram is given of the position (x) of plate 2 versus time (t), under this repetition procedure of the compacting step. More in detail, starting from a starting position x_0 , at time t_0 , plate 2 approaches side wall 6 of chamber 3, and compacts a first time the waste, as shown graphically by coordinates (x_1, t_1) . Then plate 2 withdraws and reaches position x_2 , at time t_2 . At this point, the conveying direction of plate 2 is again reversed, and at time t_3 it is again at position x_1 , compacting again the waste. The above steps are repeated a predetermined number of times, for example three, in order to avoid the possible resilient memory recovery of the waste, thus eliminating trapped air or air recalled by the resilient memory recovery after the first compacting step.

[0036] To avoid that the waste can pass in containers 35a or 35b before the completion of the compacting step the base of chamber 3 is associated to means that cause its opening/closing in synchronism with the compacting step. This is obtained by operating the opening/closing mechanism directly by carriage 20, as shown in particular in figures 7 and 8.

[0037] In figures 7 and 8, the base of compacting chamber 3 is provided divided into two portions 4a and 4b which can be operated independently. In particular, during a compacting step of waste 30 put in part 3a of chamber 3, the portion 4a of base is in a supporting position to prevent an access to bin 35a (figure 7). At the end of the compacting step, the portion 4a of the base rotates about a hinge 14a and reaches a releasing position in order to cause the waste 30 already compacted to reach bin 35a (figure 8).

[0038] As diagrammatically shown in figures from 9A to 9E, in compacting chamber 3 an interposition plate 7 is provided capable of translating, biased by resilient means 8, towards/away from side walls 6, which are equipped with piercing elements 5. More in detail, during a compacting step of the waste (figure 9C), interposition plate 7 of compacting chamber 3b translates progressively towards side walls 6, owing to the force exerted by the waste 30 being compacted, thus loading resilient means 8. At the end of a compacting step, resilient means 8 cause the interposition plate 7 to move away from the relative side wall 6 in a withdrawn position (figure 9D). This way, the extraction is obtained from piercing elements 5 of the already compacted waste 30 that can then fall down in the waste collecting bin (figure 9E).

[0039] Always as diagrammatically shown in figures from 9A to 9E if the base of compacting chamber 3 provides two separate portions 4a and 4b, these comprise independent engaging/releasing means 40-41. In particular, the engaging/releasing means provides a protruding side 40 integral to the relative base portion suitable for engaging/releasing in/from a groove 41 executed in the interposition plate 7 of compacting chamber 3. When the interposition plate 7 translates towards the relative side wall 6, the protruding side 40 leaves groove 41 and allows base to move to the releasing position.

[0040] This way, pieces of waste 30 can be put in the two portions 3a and 3b before starting the machine. During a working cycle, while the piece of waste arranged in portion 3b of the compacting chamber is processed, the piece of waste 30' arranged in portion 3a is supported by base 4a, awaiting to be compacted in turn.

[0041] According to the invention, furthermore, the compacting unit 1 above described can be integrated within a piece of furniture for kitchen units 150 having a size (depth and width) for example of 30*60, 45*60 cm, etc. (figure 11). In this case, compacting unit 1 may be coupled, within a piece of furniture for kitchen units 200, sized as a standard module, to an organic waste grinding unit 10 (figures 10A, 10B and 12). This way, a household appliance 200 is obtained capable to process both or-

ganic waste, by grinding unit 10, and inorganic waste by compacting unit 1. It is thus possible to carry out a separate waste collection and then an effective and environmentally acceptable operation.

[0042] Normally, organic waste has a liquid fraction and a solid fraction. Therefore, for reducing the volume of the waste to send to public collection centres and at the same time to avoid conditions favourable to multiplication of bacteria, in the first step of the organic waste treatment process a relevant portion of the waste liquid fraction is separated from the solid fraction. This step is made through waste sorting means 120, 121 and 130. In particular, the waste sorting means 120, 121 and 130 comprise a sieve 121 movable between a first position, where it allows the percolation of only the waste liquid fraction, and a second position, where it allows the passage also of the waste solid fraction. The sieve 121 is operatively connected by a rod 120 to a control valve 130, arranged downstream of a grinding chamber 110, in order to synchronize its movements. The second step of the organic waste treatment provides the arrangement of sieve 121 in the second position, in order to cause the solid fraction of the processed waste to reach grinding chamber 110 where a fine grinding is made by knives 115, which are arranged on the boundary of a rotating drum 111 and cooperate with a stationary knife 116 connected to the wall of chamber 110, in order to provide a substantially "comb-shaped" structure.

Claims

1. Waste compacting unit (1) comprising:

- at least one inlet (103a,103b) for introducing a waste (30) to treat;
- a compacting chamber (3);
- waste compacting means (2) acting in said compacting chamber (3), said waste compacting means (2) being mounted on a carriage (20);
- a resiliently yieldable wall comprising an interposition plate (7) arranged in said compacting chamber (3), said waste compacting means (2) arranged to compact said waste (30) against the resiliently yieldable wall comprising said interposition plate (7);
- motor driven means (22,50) arranged to cause the waste compacting means (2) and the carriage (20) to move along a working direction (100);
- piercing means (5) provided in said compacting chamber (3) and arranged to cooperate with said compacting means (2) to cause a volume reduction of said waste (30), said piercing means (5) comprising a plurality of piercing elements arranged to pierce said waste (30) during a compacting step operated by said waste compacting means (2);

- means for extracting the compacted waste from said piercing elements (5), the means for extracting being provided in said compacting chamber (3);

- at least one compacted waste collecting bin (35a,35b) arranged below said compacting chamber (3), said compacting chamber (3) having a base comprising at least one portion (4a,4b) movable between a supporting position, where the base (4a,4b) is closed and prevents an access towards said waste collecting bin (35a,35b), and a releasing position, where the base (4a,4b) is opened and allows an access towards said waste collecting bin (35a,35b);

- said means for extracting comprises the interposition plate (7) positioned between a side wall (6) and a respective portion of said compacting chamber (3), said interposition plate (7) being provided with apertures arranged to be crossed by said piercing elements (5) and being capable of translating, biased by resilient means, towards/away from the side walls (6) for respectively uncovering/covering said piercing elements (5);

said waste compacting unit being **characterized in that** each portion of said base (4a,4b) has engaging/releasing means arranged to keep each portion of said base (4a,4b) in the supporting position or in the releasing position respectively, said engaging/releasing means comprising at least one protruding side wall (40) integral to said base (4a,4b) suitable for engaging/releasing in/from a groove (41) made in said interposition plate (7); **and in that** the movement of said base (4a,4b) between said supporting position and said releasing position is directly operated by said carriage (20).

2. Compacting unit, according to claim 1, wherein said waste compacting means (2) divide said compacting chamber into two parts (3a,3b), in each of which said waste (30) to compact can be put.
3. Compacting unit, according to claim 1, wherein said waste compacting means (2) provides a compacting plate mounted on said carriage (20) reciprocating along said working direction (100).
4. Compacting unit, according to claim 1, wherein said piercing elements are selected from the group comprised of:
 - elements connected to support walls (6) laterally arranged in said compacting chamber (3) ;
 - elements connected to said compacting plate (2) .
5. Compacting unit, according to claim 1, wherein said

- motor driven means provides a bi-directional motor (50) operatively connected to said carriage (20) by transmission means, said transmission means providing, in particular, a worm screw (55) suitable for causing the rotation of a plurality of pulleys (11,12,13,14) mutually connected by a transmission belt (15). 5
6. Compacting unit, according to claim 1, wherein said base (4a,4b) is divided in two portions (4a,4b) that can move independently between said supporting position and said releasing position. 10
7. Compacting unit, according to claim 1, wherein said motor driven means are associated to a control circuit suitable for repeating for a predetermined number of times the last portion of a compacting step of said compacting means. 15
8. Element for kitchen units **characterised in that** it comprises a compacting unit according to the previous claims and/or an organic waste grinding unit. 20
9. Element for kitchen units, according to claim 8, wherein said grinding unit comprises: 25
- an inlet for introducing the waste to treat;
 - a grinding chamber provided with grinding means for the waste coming from said inlet;
 - an outlet for liquid residues percolating from said waste through said chamber; 30
 - a waste collecting container, for collecting the waste that has been ground in said chamber;
 - flow sorting means, suitable for causing selectively the liquid residues of said waste to pass towards said outlet or also a solid part; said element for kitchen units **characterised in that** said grinding means comprises at least one knife rotating about an axis suitable for cooperating with a stationary knife connected to the wall of the grinding chamber, in order to grind the waste coming from said inlet. 35 40
10. Element for kitchen units, according to claim 9, wherein said or each knife is mounted on the boundary of a drum capable of rotating about its own longitudinal axis. 45
11. Element for kitchen units according to claim 9 **characterised in that** it is a modular element comprising a piece of furniture having a height, depth and width of standard size for kitchen units. 50

Patentansprüche 55

1. Abfallverdichtungseinheit (1), umfassend:

- mindestens einen Einlass (103a, 103b) zum Einführen eines zu behandelnden Abfalls (30);
- eine Verdichtungskammer (3);
- Abfallverdichtungsmittel (2), die in besagter Verdichtungskammer (3) wirken, wobei besagtes Abfallverdichtungsmittel auf einer Beförderungsvorrichtung (20) montiert ist;
- eine elastisch verformbare Wand, umfassend eine Zwischenpositionsplatte (7), die in besagter Verdichtungskammer (3) angeordnet ist, wobei besagtes Abfallverdichtungsmittel (2) so angeordnet ist, dass es besagten Abfall (30) gegen die elastisch verformbare Wand, die eine Zwischenpositionsplatte (7) umfasst, verdichten kann;
- Motorgetriebenes Mittel (22,59), derart angeordnet, dass es eine Bewegung des Abfallverdichtungsmittels (2) und der Beförderungsvorrichtung (20) entlang einer Arbeitsrichtung (100) verursacht;
- Stechmittel (5), das in besagter Verdichtungskammer (3) bereitgestellt ist und derart angeordnet ist, dass es mit besagtem Verdichtungsmittel (2) zusammenwirkt, so dass eine Volumenreduktion des besagten Abfalls (30) erreicht wird, wobei besagtes Stechmittel (5) eine Vielzahl Stechelemente umfasst, die derart angeordnet sind, dass sie besagten Abfall (30) während eines Verdichtungsschrittes, der durch gesagtes Abfallverdichtungsmittel (2) durchgeführt wird, stechen können;
- Mittel zur Entfernung des verdichteten Abfalls von besagten Stechelementen (5), wobei das Mittel zur Entfernung in besagter Verdichtungskammer (3) bereitgestellt ist;
- mindestens einen Abfallsammelbehälter zur Sammlung verdichteten Abfalls (35a,35b), der unter besagter Verdichtungskammer (3) angeordnet ist, wobei besagte Verdichtungskammer (3) eine Basis (4a,4b) umfasst, die mindestens einen Abschnitt umfasst, der bewegbar ist zwischen einer Stützposition, wo die Basis (4a,4b) geschlossen ist und einen Zugang zu besagtem Abfallsammelbehälter (35a,35b) verhindert, und einer Löseposition, wo die Basis (4a,4b) offen ist einen Zugang zu besagtem Abfallsammelbehälter (35a,35b) zulässt;
- wobei besagtes Mittel zur Entfernung die Zwischenpositionsplatte (7), die zwischen einer Seitenwand (6) und einem entsprechenden Abschnitt besagter Verdichtungskammer (3) positioniert ist, umfasst, wobei besagte Zwischenpositionsplatte (7) mit Öffnungen zur Durchquerung durch besagte Stechelemente (5) versehen ist, und, vorgespannt durch elastische Mittel, zur Verschiebung zu/gegen die Seitenwände (6) angepasst ist um besagte Stechelemente (5) auf- resp. zu-

- zudecken;
 besagte Abfallverdichtungseinheit **dadurch gekennzeichnet, dass**
 jeder Abschnitt der besagten Basis (4a,4b) Andock-/Lösemittel umfasst, die derart angeordnet sind, um jeden Abschnitt besagter Basis (4a,4b) in der Stützposition beziehungsweise in der Löseposition zu halten, wobei besagte Andock-/Lösemittel mindestens eine vorstehende, integral zur Basis (4a,4b) ausgebildete Seitenwand (40) umfassen,
 die dazu geeignet ist, in eine/aus einer Kerbe (41), die in besagter Zwischenpositionsplatte (7) eingebracht ist, anzudocken/zu lösen; und dass die Bewegung besagter Basis (4a,4b) zwischen besagter Stützposition und besagter Löseposition direkt durch besagtes Beförderungsmittel durchgeführt wird.
2. Verdichtungseinheit nach Anspruch 1, wobei besagtes Abfallverdichtungsmittel (2) besagte Verdichtungskammer in zwei Abschnitte (3a,3b) aufteilt, in beide besagter Abfall (30) zum Verdichten eingebracht werden kann.
3. Verdichtungseinheit nach Anspruch 1, wobei besagtes Abfallverdichtungsmittel eine Verdichtungsplatte bereitstellt, die auf besagter Beförderungsvorrichtung (20) montiert ist und entlang besagter Arbeitsrichtung (100) hin- und her bewegt.
4. Verdichtungseinheit nach Anspruch 1, wobei besagte Stechelemente aus der Gruppe ausgewählt sind, die umfasst:
- Elemente, die verbunden sind mit Stützwänden (6), die lateral in besagter Verdichtungskammer (3) angeordnet sind;
 - Elemente die mit besagter Verdichtungsplatte (2) verbunden sind.
5. Verdichtungseinheit nach Anspruch 1, wobei besagtes motorgetriebenes Mittel einen bi-direktionalen Motor (50) bereitstellt, der durch ein Übertragungsmittel operativ mit besagter Beförderungsvorrichtung (20) verbunden ist, wobei das Übertragungsmittel insbesondere eine Schnecke (55) bereitstellt, die geeignet ist, die Drehung einer Vielzahl von Rollen (11, 12, 13, 14) zu bewirken, die durch einen Antriebsriemen miteinander verbunden sind.
6. Verdichtungseinheit nach Anspruch 1, wobei besagte Basis (4a, 4b) in zwei Abschnitte (4a, 4b) unterteilt ist, die sich unabhängig voneinander zwischen besagter Stützposition und besagter Löseposition bewegen können.
7. Verdichtungseinheit nach Anspruch 1, wobei die motorgetriebenen Mittel einer Steuerschaltung zugeordnet sind, die geeignet ist, den letzten Abschnitt eines Verdichtungsschritts besagter Verdichtungsmittels für eine vorbestimmte Anzahl von Malen zu wiederholen.
8. Element für Kücheneinheiten, **dadurch gekennzeichnet, dass** es eine Verdichtungseinheit nach den vorhergehenden Ansprüchen und/oder eine Mahleinheit für organischen Abfall umfasst.
9. Element für Kücheneinheiten nach Anspruch 8, wobei die Mahleinheit umfasst:
- einen Einlass zum Einführen des zu behandelnden Abfalls;
 - eine Mahlkammer, die mit einem Mahlmittel für den aus besagtem Einlass kommenden Abfall ausgestattet ist;
 - einen Auslass für flüssige Rückstände, die aus besagtem Abfall durch besagte Kammer sickern;
 - ein Abfallsammelbehältnis zum Sammeln der in besagter Kammer gemahlene Abfälle;
 - Strömungssortiermittel, das geeignet ist, um selektiv zu bewirken, dass die flüssigen Rückstände des besagten Abfalls in Richtung des Auslasses gelangen, oder auch einen festen Teil; wobei das Element für Kücheneinheiten **dadurch gekennzeichnet ist, dass** das Mahlmittel zumindest ein Messer umfasst, das sich um eine Achse dreht, die geeignet ist, mit einem stationären Messer zusammenzuwirken, das mit der Wand der Mahlkammer verbunden ist, um den aus dem Einlass kommenden Abfall zu mahlen.
10. Element für Kücheneinheiten nach Anspruch 9, wobei besagtes oder jedes Messer an der Grenze einer Trommel montiert ist, die sich um ihre eigene Längsachse drehen kann.
11. Element für Kücheneinheiten nach Anspruch 9, **dadurch gekennzeichnet, dass** es ein modulares Element ist, das ein Möbelstück mit einer Höhe, Tiefe und Breite von Standardgröße für Kücheneinheiten umfasst.

Revendications

1. Unité de compactage (1) de déchet comprenant :
- au moins une entrée (103a, 103b) permettant l'introduction d'un déchet (30) à traiter ;
 - une chambre de compactage (3) ;
 - un moyen de compactage (2) de déchet agissant dans ladite chambre de compactage (3),

ledit moyen de compactage (2) de déchet étant monté sur un chariot (20) ;

- une paroi pouvant se déformer élastiquement comprenant une plaque d'interposition (7) agencée dans ladite chambre de compactage (3), ledit moyen de compactage (2) de déchet agencé pour compacter ledit déchet (30) contre la paroi déformable élastiquement comprenant ladite plaque d'interposition (7) ;

- des moyens entraînés par moteur (22, 50) agencés pour amener le moyen de compactage (2) de déchet et le chariot (20) à se déplacer le long d'une direction de travail (100) ;

- un moyen de perçage (5) disposé dans ladite chambre de compactage (3) et agencé pour coopérer avec ledit moyen de compactage (2) afin de provoquer une réduction de volume dudit déchet (30), ledit moyen de perçage (5) comprenant une pluralité d'éléments de perçage agencés pour percer ledit déchet (30) durant une étape de compactage mise en oeuvre par ledit moyen de compactage (2) de déchet ;

- un moyen permettant l'extraction du déchet compacté desdits éléments de perçage (5), le moyen permettant l'extraction étant disposé dans ladite chambre de compactage (3) ;

- au moins un bac de collecte de déchet compacté (35a, 35b) disposé sous ladite chambre de compactage (3), ladite chambre de compactage (3) possédant une base (4a, 4b) comprenant au moins une partie mobile entre une position de support, où la base (4a, 4b) est fermée et empêche un accès vers ledit bac de collecte de déchet (35a, 35b), et une position de libération, où la base (4a, 4b) est ouverte et permet un accès vers ledit bac de collecte de déchet (35a, 35b) ;

- ledit moyen permettant l'extraction comprenant la plaque d'interposition (7) positionnée entre une paroi latérale (6) et une partie respective de ladite chambre de compactage (3), ladite plaque d'interposition (7) étant dotée d'ouvertures agencées pour être traversées par lesdits éléments de perçage (5) et étant capable de translation, sollicités par des moyens élastiques, allant vers/s'éloignant des parois latérales (6) pour découvrir/recouvrir respectivement lesdits éléments de perçage (5) ; ladite unité de compactage de déchet étant **caractérisée en ce que** chaque partie de ladite base (4a, 4b) comporte des moyens de mise en prise/de libération agencés pour maintenir chaque partie de ladite base (4a, 4b) dans la position de support ou dans la position de libération, respectivement, lesdits moyens de mise en prise/de libération comprenant au moins une paroi latérale saillante (40) faisant partie intégrante de ladite base (4a, 4b) adaptée pour venir en prise avec/se li-

bérer d'une rainure (41) ménagée dans ladite plaque d'interposition (7) ; et **en ce que** le mouvement de ladite base (4a, 4b) entre ladite position de support et ladite position de libération est directement actionné par ledit chariot (20).

2. Unité de compactage selon la revendication 1, ledit moyen de compactage (2) de déchet divisant ladite chambre de compactage en deux parties (3a, 3b), dans chacune desquelles peut être placé ledit déchet (30) à compacter.

3. Unité de compactage selon la revendication 1, ledit moyen de compactage (2) de déchet fournissant une plaque de compactage montée sur ledit chariot (20) en mouvement de va-et-vient le long de ladite direction de travail (100).

4. Unité de compactage selon la revendication 1, lesdits éléments de perçage étant choisis dans le groupe composé :

- des éléments raccordés aux parois de support (6) agencées latéralement dans ladite chambre de compactage (3) ;
- des éléments raccordés à ladite plaque de compactage (2).

5. Unité de compactage selon la revendication 1, ledit moyen entraîné par moteur fournissant un moteur bidirectionnel (50) raccordé de manière fonctionnelle audit chariot (20) par un moyen de transmission, ledit moyen de transmission disposant, en particulier, d'une vis sans fin (55) adaptée pour entraîner la rotation d'une pluralité de poulies (11, 12, 13, 14) raccordées mutuellement par une courroie de transmission (15).

6. Unité de compactage selon la revendication 1, ladite base (4a, 4b) étant divisée en deux parties (4a, 4b) qui peuvent se déplacer indépendamment entre ladite position de support et ladite position de libération.

7. Unité de compactage selon la revendication 1, ledit moyen entraîné par moteur étant associé à un circuit de commande adapté pour répéter, un nombre prédéfini de fois, la dernière partie d'une étape de compactage dudit moyen de compactage.

8. Élément destiné aux unités de cuisine **caractérisé en ce qu'il** comprend une unité de compactage selon les revendications précédentes et/ou une unité de broyage de déchet organique.

9. Élément destiné aux unités de cuisines, selon la revendication 8, ladite unité de broyage comprenant :

- une entrée permettant l'introduction du déchet à traiter;
 - une chambre de broyage dotée de moyens de broyage pour le déchet provenant de ladite entrée; 5
 - une sortie permettant la percolation de résidus liquides depuis ledit déchet à travers ladite chambre;
 - un récipient de collecte de déchet destiné à collecter le déchet qui a été broyé dans ladite chambre; 10
 - des moyens de tri en flux, adaptés pour faire passer de manière sélective les résidus liquides dudit déchet vers ladite sortie ou également une partie solide, ledit élément destiné aux unités de cuisines étant **caractérisé en ce que** ledit moyen de broyage comprend au moins un couteau en rotation autour d'un axe adapté pour coopérer avec un couteau fixe raccordé à la paroi de la chambre de broyage, afin de broyer le déchet provenant de ladite entrée. 15 20
10. Élément destiné aux unités de cuisine selon la revendication 9, ledit ou chaque couteau étant monté sur le contour d'un tambour capable de tourner autour de son propre axe longitudinal. 25
11. Élément destiné aux unités de cuisine selon la revendication 9, **caractérisé en ce que** ledit élément est un élément modulaire comprenant un meuble possédant une hauteur, une profondeur et une largeur de taille standard pour les unités de cuisine. 30

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Fig. 1

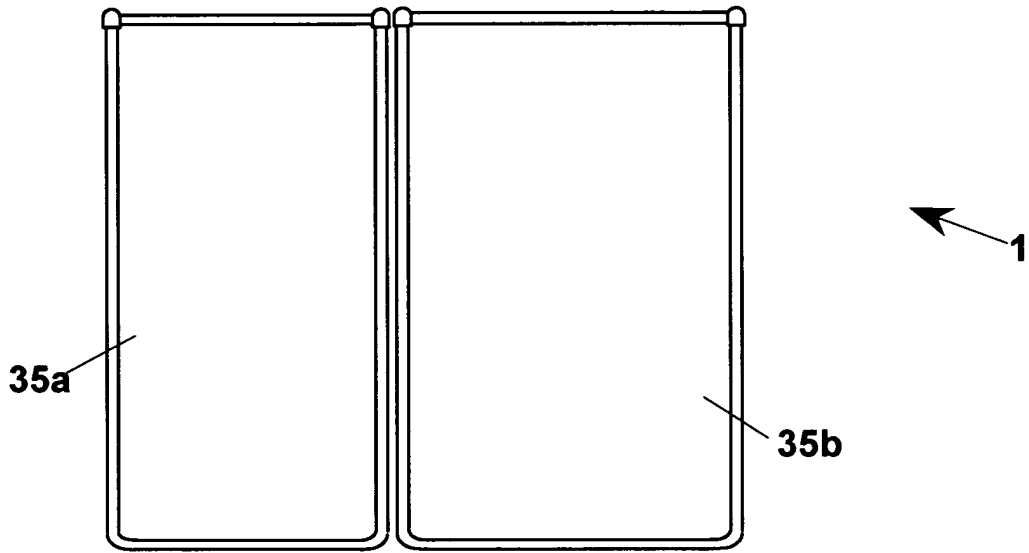
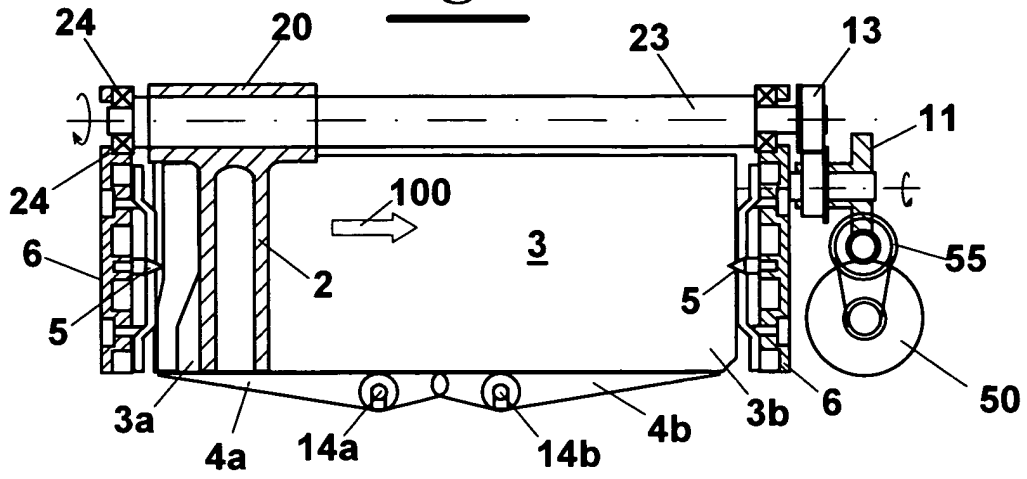


Fig. 2

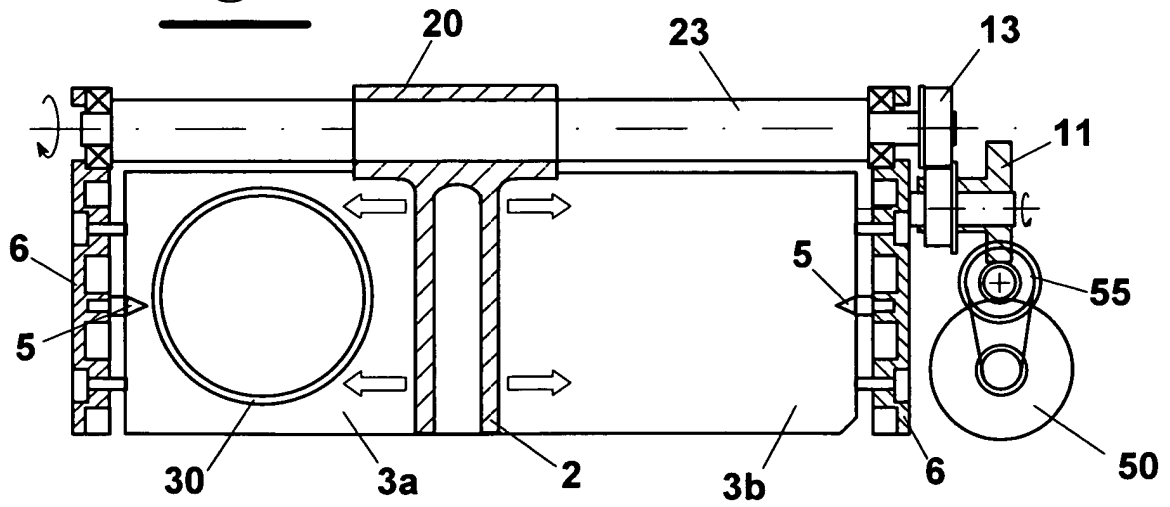


Fig. 3

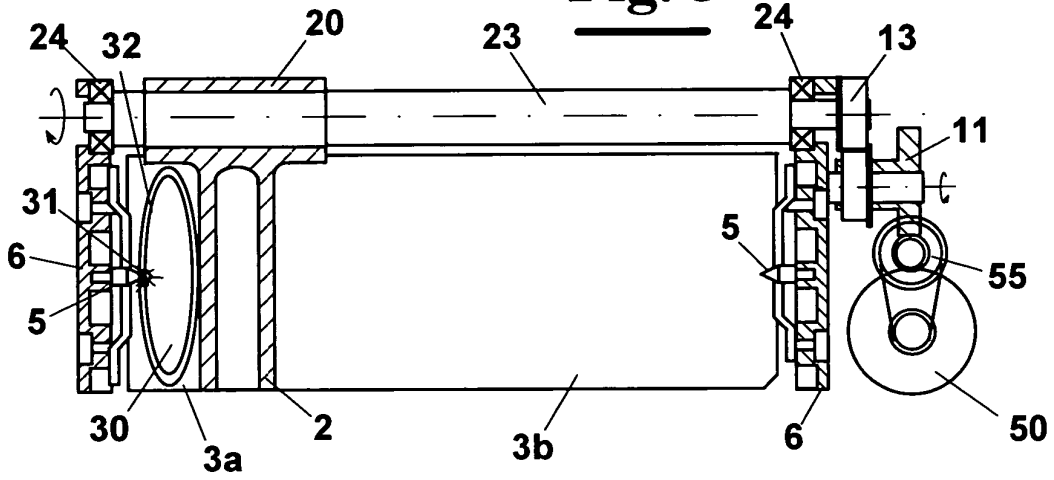


Fig. 4

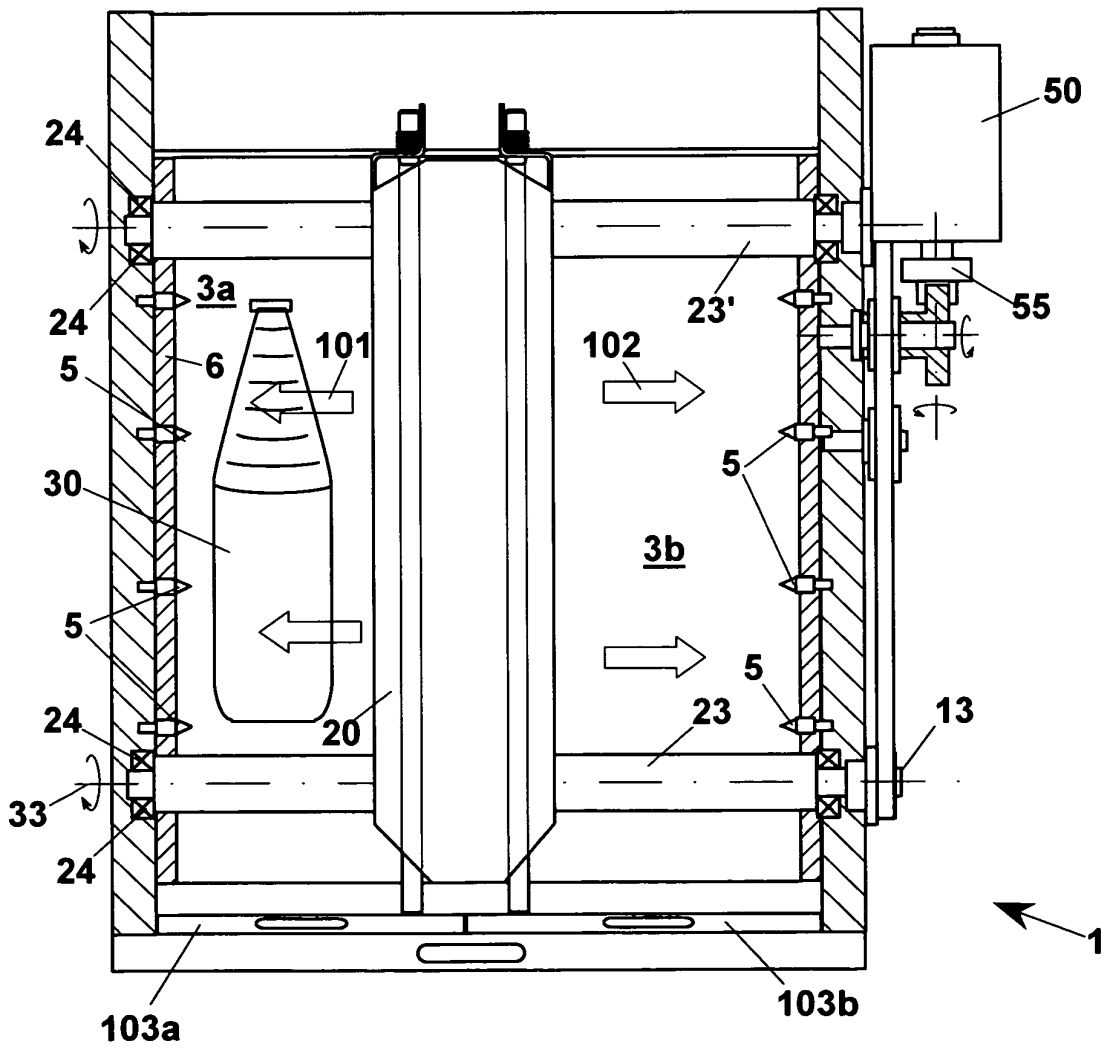


Fig. 5

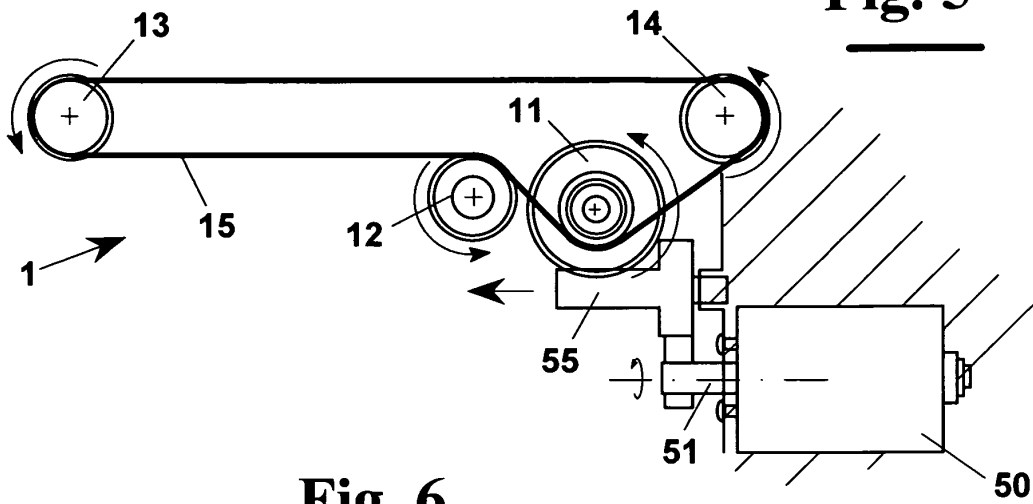


Fig. 6

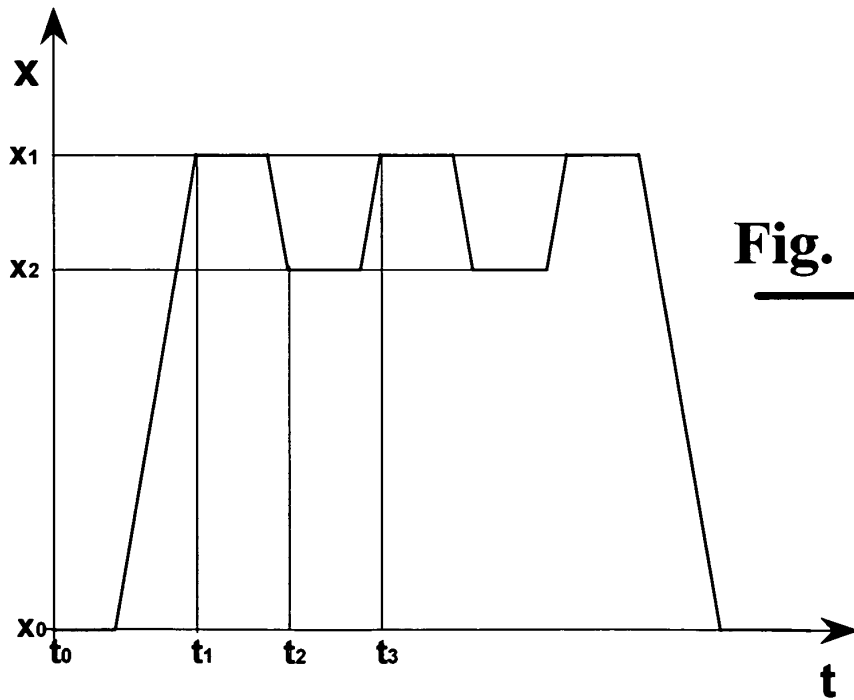
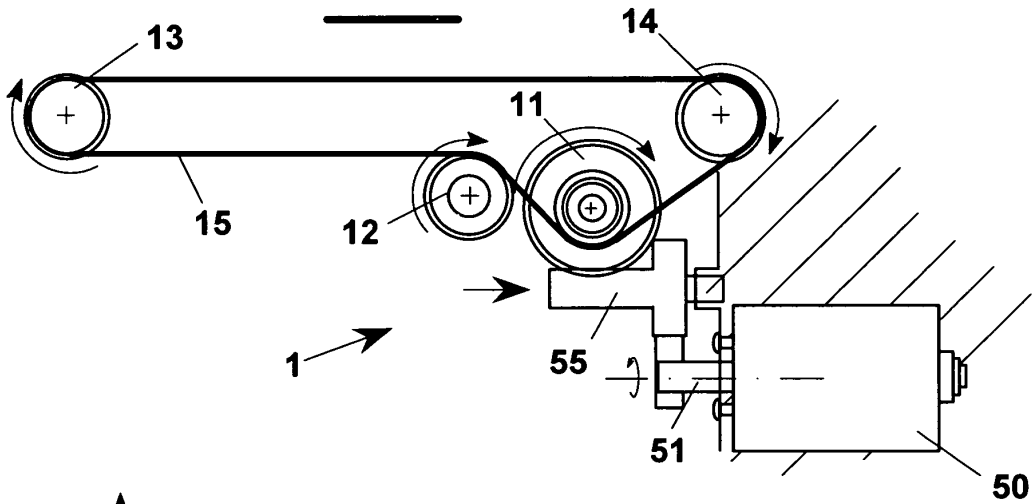


Fig. 13

Fig. 7

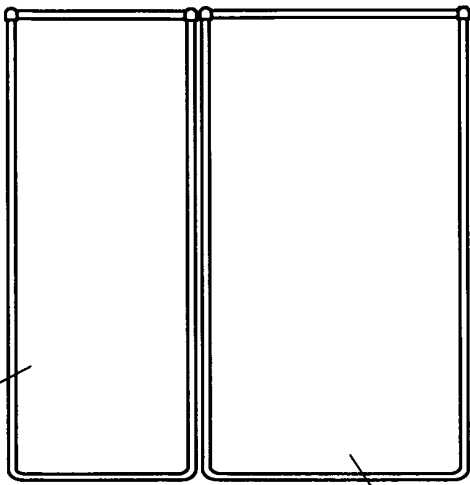
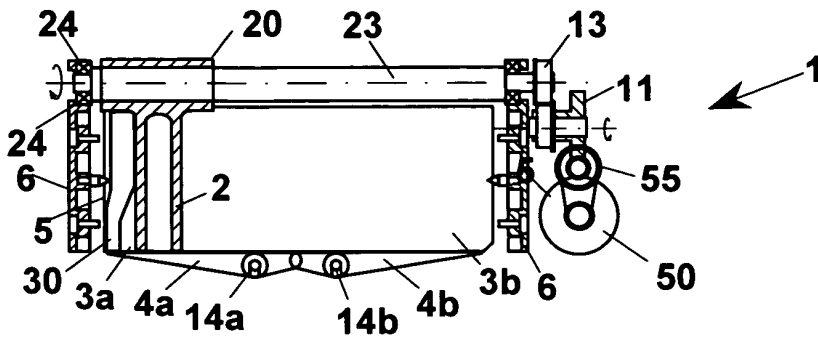


Fig. 8

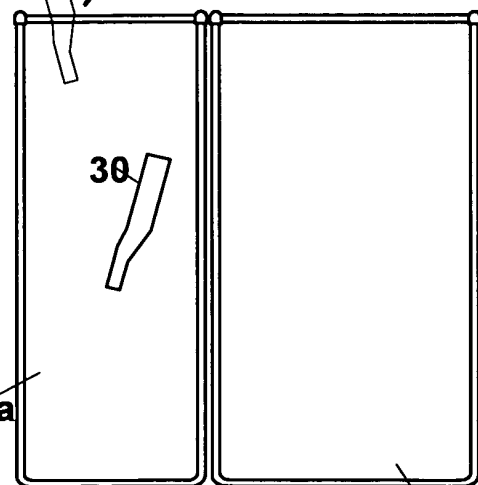
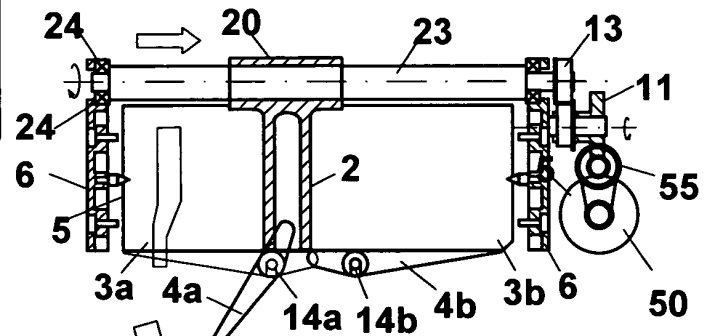


Fig. 9A

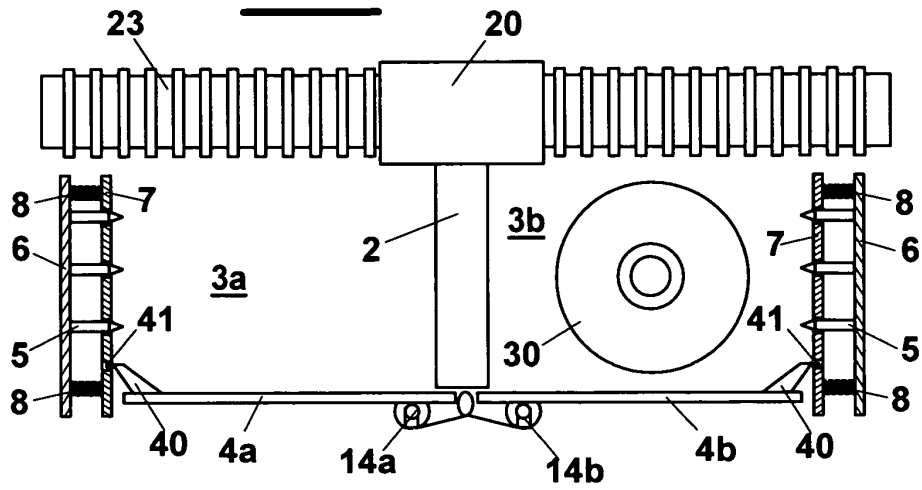


Fig. 9B

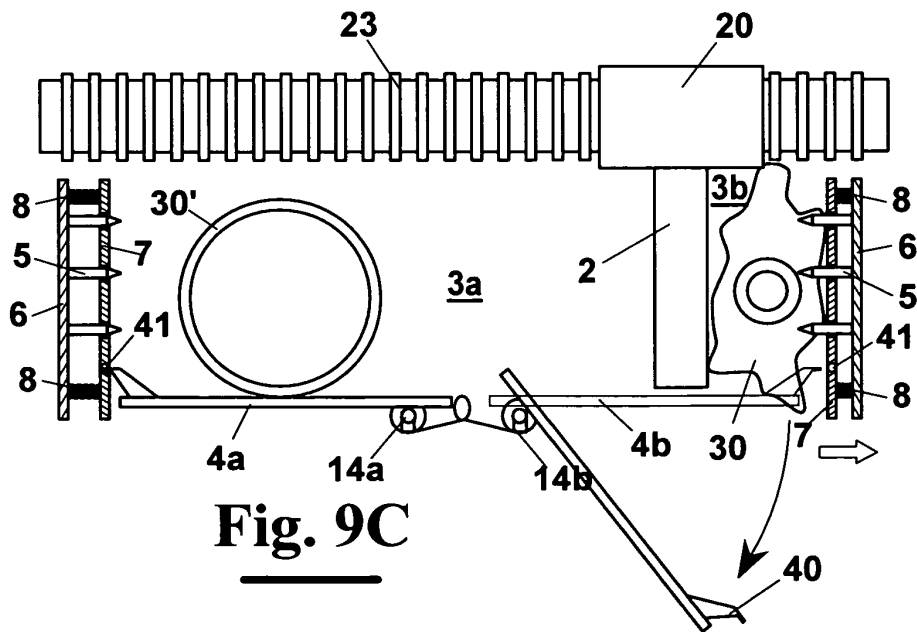
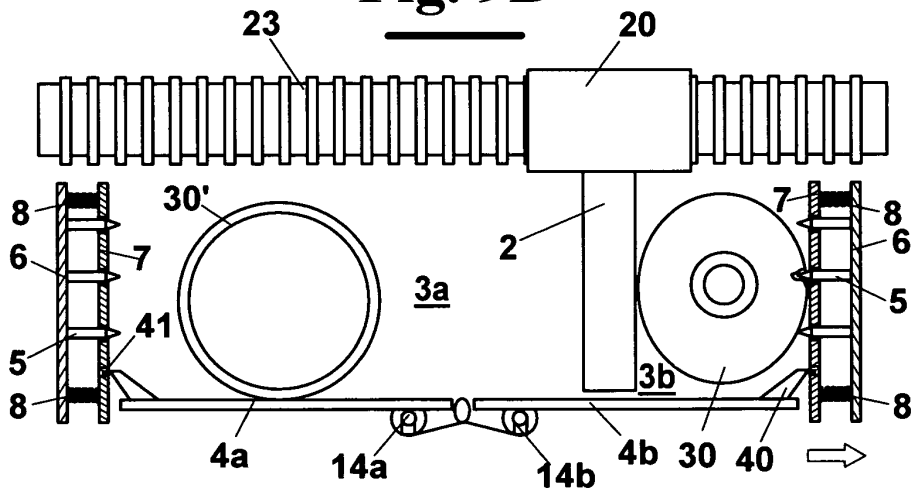


Fig. 9C

Fig. 9D

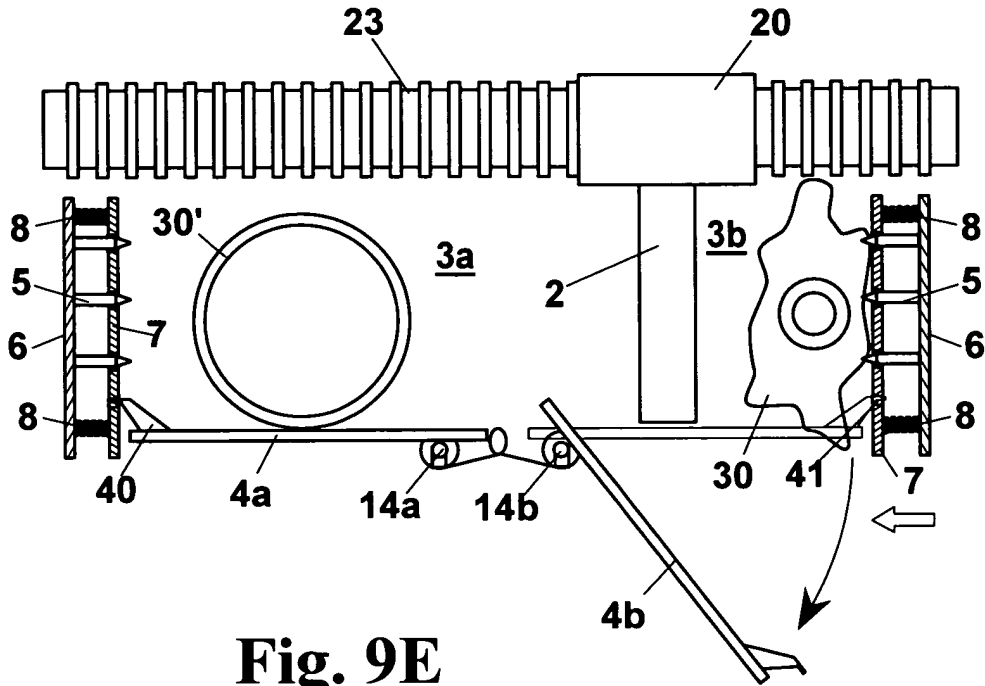
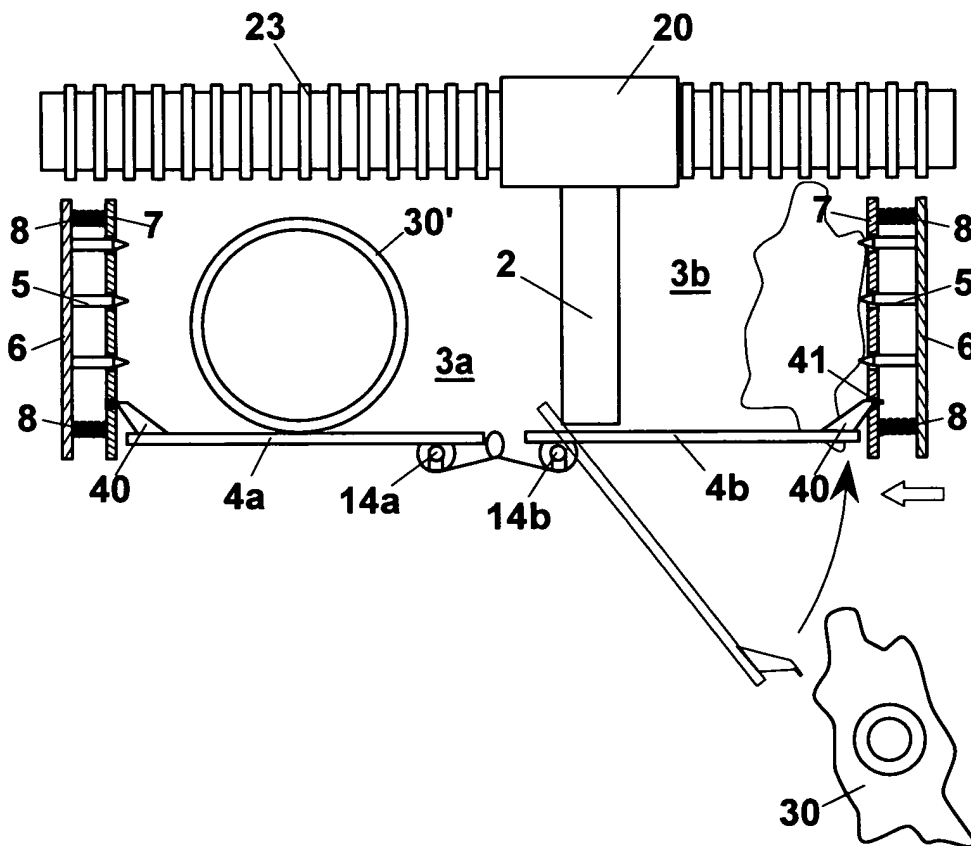


Fig. 9E



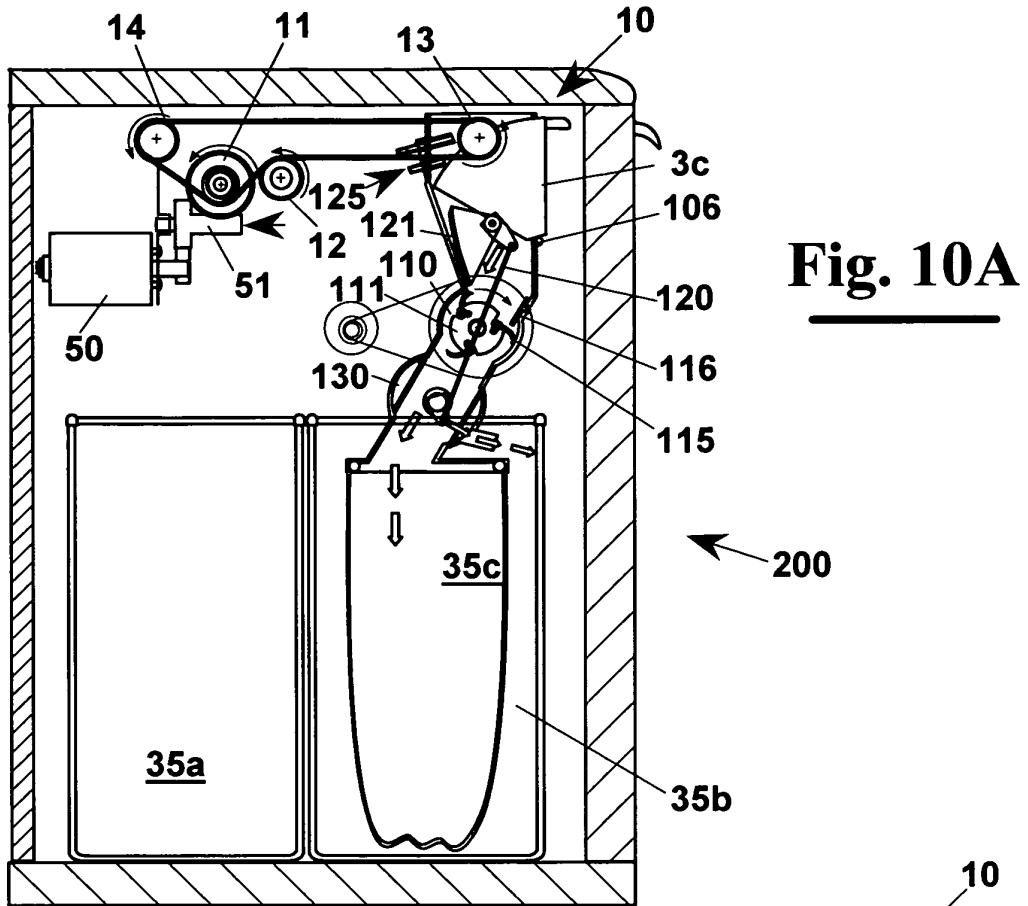
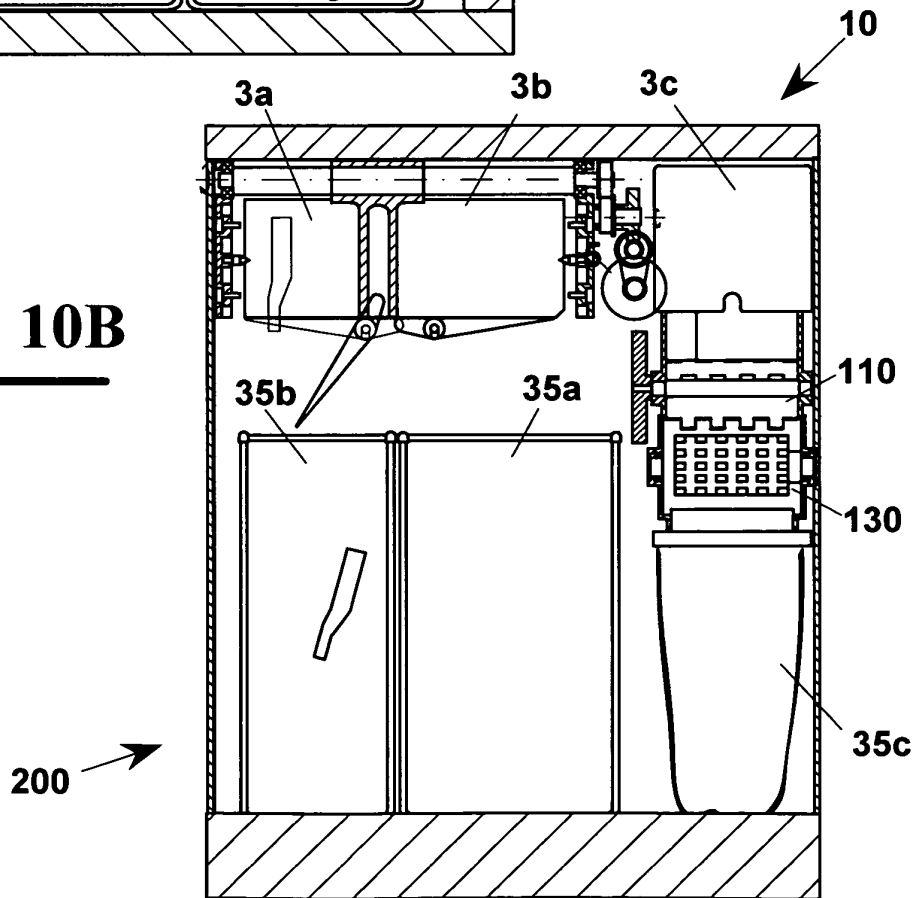


Fig. 10A

Fig. 10B



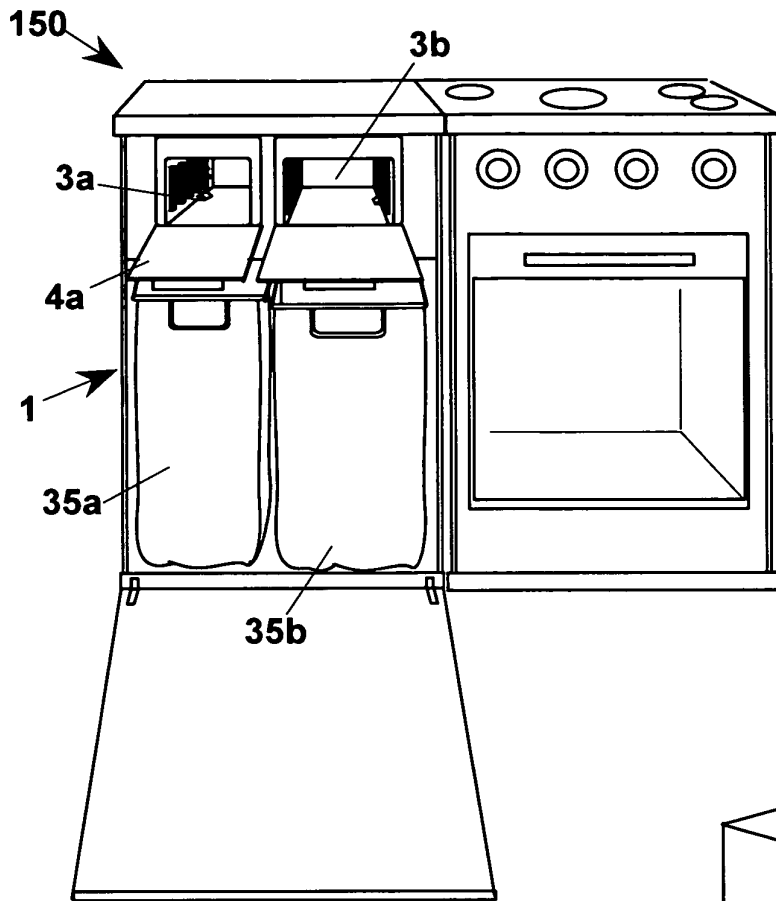


Fig. 11

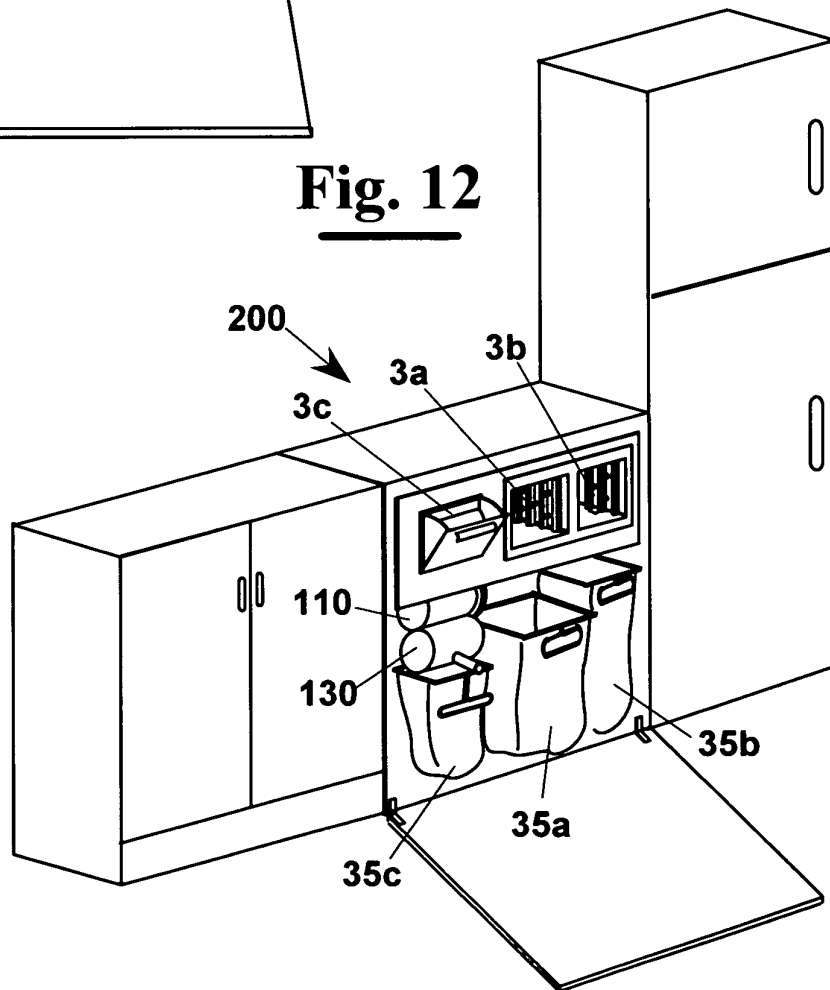


Fig. 12

REFERENCES CITED IN THE DESCRIPTION

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