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(54) VENDING MACHINE OF PRODUCTS

VERKAUFSAUTOMAT FÜR PRODUKTE

DISTRIBUTEUR DE PRODUITS

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Description

[0001] The invention has for an object a vending machine of products. In particular, the present invention finds application in the distribution of frozen products. Typically, but not necessarily, the present invention finds application in the distribution of food products in public places.

[0002] As is known, there are different models of vending machines. Machines of such kind, generally comprise a bearing structure which defines an inner compartment which contain the products destined for sale. A transparent portion is afforded on the front wall of the structure, through which transparent portion the internal of the compartment is visible. The products are arranged within a storage that is composed of a plurality of shelves, whereon the products intended for sale are placed.

[0003] All machines are provided with a door which allows access to the compartment for the purposes of filling the storage with the products. In machines of this type, the user selects the product by pressing a corresponding button that is located, by way of example, at the side of the transparent portion. Alternatively, the product is selected via a corresponding numerical code typed in by way of a keyboard suitably arranged at the side of the transparent portion.

[0004] Vending machines are further provided with suitable moving means for moving the selected products from the storage to a collecting compartment where the same can be picked up.

[0005] In the vending machines intended for the sale of small sized products of a substantially parallelepiped or cylindrical shape, the moving means consists, by way of example, of spirals, the turns of which accommodate the products themselves. Here, the products are expelled and deposited by fall into the collecting compartment.

[0006] In the machines intended for the sale of frozen products, the latter are accommodated each on a respective shelf of the storage.

[0007] The moving means comprises a pusher that expels the selected product from the storage.

[0008] An example of a pusher in the known vending machines, comprises a hydraulic or pneumatic actuator, disposed at a rear area of the storage in order to push the selected product in the opposite direction.

[0009] The known vending machines further comprise control and power supply means generating activation signals, as well as the required electrical power. The control and power supply means comprises common electric wires.

[0010] Disadvantageously, the vending machines of the known type exhibit remarkable internal dimensions also due to the required size and encumbrance of the pushers.

[0011] In addition to making it more difficult to maintain unchanged the required temperature for the storage of frozen food products, the remarkable internal dimensions of such machines determine a corresponding increase

in external dimension thereof.

[0012] A further disadvantage of the known vending machines consists of the damage that the control and power supply means suffer as a result of prolonged exposure to low temperatures that may reach -18°C . In fact, the metal contained in the standard electrical wire hardens as a result of the low temperatures and is easily subject to breakage as a result of the movement of the moving means. Moreover, low temperatures are harmful to common insulating materials.

[0013] An example of prior art vending machine is disclosed in publication EP2061011. Such vending machine substantially solves the above drawbacks, but it can be perfected in relation to the replenishing operations. In this context, the technical task of the present invention is to provide a vending machine which is free of the aforementioned drawbacks. In particular, it is an object of the invention to provide a vending machine that is remarkably impactful on the energy-saving efficiency.

[0014] Still, it is object of the present invention to provide a vending machine that has reduced internal and external dimensions.

[0015] In addition, it is an object of the present invention to provide a vending machine which maintains high reliability characteristics over time.

[0016] In accordance with the present invention, the technical task and the aims described are attained by a vending machine of products comprising the technical characteristics as set forth in one or more of the appended claims.

[0017] Further characteristics and advantages of the present invention will become more apparent from the indicative, and therefore non-limiting description of a preferred but non-exclusive embodiment of a vending machine, as illustrated in the appended figures wherein:

- Figure 1 shows a front view of a vending machine of products in accordance with the present invention;
- Figure 2 shows a side view, at least partially in section, of the vending machines of products of Figure 1;
- Figure 3 shows a side view of a first detail of the vending machine of products of Figure 1;
- Figure 4 shows a perspective view of a portion of the vending machine of Figure 1 comprising the detail of figure 3;
- Figure 5 shows a perspective view of a further detail of the machine of Figure 1.

[0018] With reference to the cited figures, by 1 it was indicated a vending machine in its entirety according to the present invention.

[0019] The vending machine 1 comprises a bearing structure 2 which defines an inner compartment 3, wherein a storage 4 is housed for storing the products 5 intended for sale.

[0020] The bearing structure 2 is usually of a parallelepiped shape and has a front wall 6 which is provided, preferably, but not necessarily, of a transparent portion

or window 7. The latter provides visual access within the inner compartment 3 to allow direct observation of the selected products.

[0021] The inner compartment 3 is cooled via appropriate refrigeration means (not shown in the figures) and is suitably insulated in order to be thermally isolated from the outside environment.

[0022] The bearing structure 2 is further provided with an openable door that allows access to the inner compartment 3 for the supply of the products intended for sale. Preferably, but not exclusively, such a door coincides with the front wall 6 of the bearing structure 2.

[0023] The storage 4 comprises at least a shelving 8 having a plurality of shelves 9 vertically aligned, on each of which a corresponding product 5 is lying.

[0024] In the embodiment herein described, the storage 4 comprises two shelves 8 arranged alongside one to another.

[0025] The vending machine 1 further comprises a collecting compartment 10, also obtained inside of the bearing structure 2, from which collecting compartment 10 a selected product 5a being placed therein can be picked up.

[0026] A communication opening 11 separates the inner compartment 3 from the collecting compartment 10. The communication opening 11 can be closed by a suitable door 12. In particular, the communication opening 11 is preferably but not necessarily formed at the same height of the collecting compartment 10.

[0027] This door 12 is placed between the inner compartment 3 and the collecting compartment 10 and is movable between an open configuration to allow the transit of the selected product 5a from the inner compartment 3 to the collecting compartment 10, and a closed configuration for maintaining the inner compartment 3 isolated from the collecting compartment 10 and accordingly from the external environment.

[0028] Also the door 12 is insulated to prevent heat loss.

[0029] Suitable moving means 13 pick up the selected product 5a from the storage 4 and transfer the same into the collecting compartment 10.

[0030] More in detail, the moving means 13 comprises at least one pusher 14, which is movable along a substantially vertical direction so that it can be positioned relative to the selected product 5a (Figure 3), as better detailed hereinafter. In this way, the pusher 14 can extract the selected product 5a from the storage 4.

[0031] In the described embodiment, the vending machine 1 comprises two pushers 14, each associated with a corresponding shelving 8 of the storage 4.

[0032] The pushers 14 are positioned in a rear area of the inner compartment 3. In other words, the pushers 14 are located behind the storage 4 with respect to the window 7.

[0033] In addition, the moving means 13 comprises a lifting table 15 movable along a substantially vertical direction in order to receive the selected product 5a which

was expelled from the storage 4 by the pusher 14 (Figure 5).

[0034] For this purpose, the lifting table 15 is aligned to the shelf 9 corresponding to the selected product 5a so that the latter, pushed by the pusher 14, slides on the lifting table 15. Subsequently, the lifting table 15 transfers the selected product 5a in the vicinity of the collecting compartment 10.

[0035] More in detail, the lifting table 15 is rigidly associated to the pusher 14 so as to be moved simultaneously with the latter.

[0036] With particular reference to the pushers 14, the latter comprise a respective chain 16 having a first free end 16a, which is movable along a direction parallel to the shelves 9 of the storage 4, and a second free end 16b, movable along a substantially vertical direction.

[0037] The first free end 16a of the chain 16 is intended to come into contact with the selected product 5a in order to push the latter from an inner position to an outer position to the storage 4.

[0038] In greater detail, the chain 16 comprises a first portion 17a lying substantially horizontal, and a second portion 17b lying loosely under the action of its own weight.

[0039] This first portion 17a comprises the aforementioned first free end 16a, whilst the second portion 17b comprises the aforementioned second free end 16b.

[0040] The chain 16 comprises a plurality of meshes 18, each engaged to the other in a known manner. An essential characteristic of the above mentioned chain 16 is to be flexible on one side only, in the depicted example of embodiment, the one facing downwards. The flexibility on the part of the side facing upwards, is prevented mechanically by fasteners that do not allow the relative rotation of the meshes.

[0041] In the illustrated embodiment, a stiffening block 19 is associated with each mesh 18.

[0042] The stiffening blocks 19 allow the chain 16 to bend to one side only, so that the concavity thereof is facing only a zone opposite to the one wherein the stiffening blocks 19 are lying.

[0043] Each pusher 14 further comprises a movable support body 20 that is associated with the lifting table 15. In detail, on the support body 20 there is located a guide 21, which assists and promotes sliding of the chain 16. In particular, the guide 21 promotes and assists sliding of the first portion 17a of the chain 16.

[0044] Each support body 20 is associated with a respective actuating member 22 of the chain 16.

[0045] The actuating member 22 comprises a toothed wheel 23, rotatably mounted on the support body 20, which meshes with the chain 16 for moving the latter, and a motor 24 connected to the toothed wheel 23 and associated to the support body 20.

[0046] Each pusher 14 further comprises a respective fixed panel 25, with a substantially vertical orientation to the first free end 16a of the chain 16. This panel is interposed between the first free end 16a of the chain 16 and

the selected product 5a.

[0047] With reference to the operation of the pusher 14, when a selected product 5a must be expelled, the motor 24 sets in rotation the toothed wheel 23. The toothed wheel 23 drives the chain 16, such as to cause the first free end 16a to advance, which first free end 16a, after having come into contact with the selected product 5a, pushes the latter onto the lifting table 15.

[0048] The lifting table 15 comprises two separate flat portions 26 placed alongside one to another. The flat portions 26 are coplanar so as to define a single supporting plane 27 for the selected product 5a which was expelled from the storage 4.

[0049] The lifting table 15 further comprises a transfer member 28 having the function to translate the selected product along a major extension direction of the lifting table 15 itself. In particular, the transfer member 28 is required for bringing the selected product 5a closer to the collecting compartment 10.

[0050] The transfer member 28 comprises a conveyor belt 29 arranged parallel to the direction of development of the lifting table 15 and a lug 30 secured to the conveyor belt 29 and capable of coming into contact with the selected product 5a so as to move the latter.

[0051] In the embodiment described, the transfer member 28 is disposed between the separate flat portions 26 of the lifting table 15, such that the lug 30 is protruding, thereby intercepting the selected product 5a which is resting on the supporting plane 27 of the lifting table 15.

[0052] As already mentioned above, each pusher 14 is rigidly associated with the lifting table 15 such that the pushers 14 can move solidly and simultaneously.

[0053] For this purpose, the moving means 13 comprises a straight guide 31, substantially vertical, and a carriage 32 being slidable along the straight guide 31.

[0054] With reference to the embodiment described herein, the straight guide 31 comprises a pair of vertical and parallel bars 33 and is placed between the two shelving 8 of the storage 4. The carriage 32 is associated with each pusher 14. The carriage 32 is further associated with the lifting table 15. More in detail, the moving means 13 also comprises an arm 34 arranged transversely to the straight guide 31 and connected to the support body 20 of each pusher 14. The arm 34 exhibit an "L"-shaped cross-section. The moving means 13 further comprises a motor 35 to put in motion the carriage 32. More in detail, the motor 35 is connected to the carriage 32 by a pair of toothed belts 36 set in rotation by the motor 35 and secured to the carriage 32. Thus, the actuation of the motor 35 determines the upward and downward movement of the carriage 32 and with it, that of the pushers 14 and of the lifting table 15.

[0055] With reference to the operation of the moving means 13, when a selected product 5a must be transferred from the storage 4 to the collecting compartment 10, the motor 35 of the moving means 13 is actuated in order to allow the pusher 14 to reach the shelf whereon

the selected product 5a is placed. At that stage, the motor 24 of the pusher 14 is actuated relative to which the selected product 5a is located. The toothed wheel 23 drives the chain 16 such that the first free end 16a comes closer to the selected product 5a, intercepts it and finally push it onto the lifting table 15.

[0056] At this point, the carriage 32 is lowered to allow the lifting table 15 to reach the opening 11 which puts in communication the inner compartment 3 with the collecting compartment 10.

[0057] The transfer member 28 is then activated for moving the selected product 5a towards the communication opening 11. The door 12 is opened and the selected product 5a transferred from the inner compartment 3 to the collecting compartment 10. The door 12 is then closed right after again in order that the thermal insulation of the inner compartment 3 is reset.

[0058] By way of example, the selection means 37 comprises a selection button (not shown), which is placed on the front wall 6 in proximity of each product 5.

[0059] In the embodiment described, the selection means 37 comprises an alphanumeric keyboard 38.

[0060] The distributing machine 1 further comprises a control unit for acquiring at least a first signal indicative of the selected product 5a from the selection means 37, and sending to the moving means 13 at least one second signal indicative of the position of the selected product 5a in the storage 4. This second signal is conveyed by a suitable power supply and control device (not shown in the figures), associated with the moving means 13. Such a power supply and control device feeds the second signal to the moving means 13, in order to activate the motor 35 of the moving means 13 and the motor 24 of the suitable pusher 14 for transferring the selected product 5a into the collecting compartment 10.

[0061] It should be appreciated that the power supply and control device, in addition to transferring said second signal, also feeds to aforementioned motors 24, 35 with the electric power necessary to the activation of the same.

[0062] Advantageously, the power supply and control device comprises a flexible printed circuit. Not being provided any metal parts, in this manner the harmful effects of a prolonged exposure of the power supply and control device at very low temperatures can be obviated indeed.

[0063] The vending machine 1 further comprises an identification device 39, 40 of the products 5, which is connected to the control unit of the machine so that each product can be associated with a corresponding information relating to its position in the storage.

[0064] In the described embodiment, the identification device 39, 40 comprises a bar code reader 39. In detail, the identification device 39, 40 comprises two readers 39, each one associated to the support body 20 of a respective pusher 14.

[0065] The identification device 39, 40 further includes a proximity sensor 40 that is arranged for detecting the presence of at least one product 5 on the shelves 9.

[0066] Advantageously, each reader 39 is disposed in the vicinity of a side of the shelves 9, preferably the side of the shelves 9 toward which a bar code, applied on a side of the products 5, is pointing. For example, each reader 39 is arranged parallel to one side of the shelves 9, which side is facing the other shelves 9 column 8 of the storage 4. Essentially, the identification device provided with two readers 39, is placed within the space between the two columns 8 of the shelves 9.

[0067] The identification device 39,40 is movable vertically, so as to be aligned to each shelf 9.

[0068] The identification device 39,40 allows to considerably simplify the filling operations of the distributing machine 1.

[0069] A random disposition of the products 5 on the shelves 9 of the storage 4 is indeed possible. Thereafter, the moving means 13 move the support bodies 20 to which the readers 39 and the proximity sensors 40 are associated, so that a scan of the products 5, and relative position thereof within the storage 4, can be effected. At each shelf 9, the proximity sensor 40 detects the presence of a product 5. If a product 5 is actually present on the shelf 9, then the reader 39 performs reading of the bar code thereof, wherein the position and the identification code of the product 5 are communicated to the control unit of the storage. The position of the reader 39 parallel to a side of the shelves 9, makes the reading of the bar codes applied on the corresponding side of the products 5 substantially foolproof, and this also applies in case of inclined surfaces of the products themselves. It is sufficient that the products 5 are placed into the storage 4 and made to rest on respective shelves 9, in such a manner that the barcodes are facing the side of the shelf 9 toward which the barcode reader 39 is pointing.

[0070] In this way, despite being the products 5 distributed randomly within the storage, each product 5 may always be associated to the respective location, such that the selected product 5a is promptly identified, irrespective of its location.

[0071] The invention attains the intended purposes and achieves important advantages.

[0072] The vending machine 1 according to the present invention is remarkably impactful on the energy-saving efficiency indeed, in that the pusher 14 disclosed herein, enable to considerably reduce the inner space. This allows to reduce the volume of the inner compartment 3 thereby also reducing the energy quantity required to cool such volume and to keep constant the temperature inside the inner compartment 3, in order to ensure the correct preservation of the products 5 contained therein.

[0073] Thanks to the functional structure of the storage 4 and the collecting compartment 10, the machine can advantageously be provided with one or more heating or cooking furnaces 100, only shown schematically in Figure 1. Said one or more furnaces 100 can be placed by side of the storage 4 (for example on the right side of the machine as depicted in figure 1), i.e. by side of the shelving 8. The furnace 100 are preferably placed above the

collecting compartment 10. Each furnace 100 exhibits an access door which opens outwards the machine. Each furnace is instead isolated relative to the interior of the machine, in particular relative to the storage 4. In this manner any substantial increase in the temperature of the storage 4 is generated by the furnace 100. Owing to the presence of a plurality of furnaces 100, several products can be heated or cooked simultaneously, which considerably improves the ease of use of the machine compared to the ones currently available that, due to their complex and bulky structures, are provided with one furnace only located internally of the refrigerated area.

[0074] Advantageously, the furnaces 100 may be provided with an automatic door (not shown in detail), that is predisposed for being opened and closed only under pre-determined circumstances. In particular, the door of each furnace 100 may be provided with an opening and closing mechanism connected to the control unit of the machine. For example, the control unit sends an opening command to the opening and closing mechanism of a door only after that a product has been picked up, for example by typing the corresponding code on the alphanumeric keyboard of the machine. Once the product has been put into the furnace, the control unit sets the cooking/heating time of the product. After that the cooking/heating cycle is terminated, the control unit sends a command for opening the door so that the product can be picked up and the door of the used furnace closed again.

Claims

1. A vending machine of products comprising:

- a bearing structure (2) which defines an inner compartment (3);
- at least one storage (4) placed internally of the inner compartment (3) and comprising a plurality of shelves (9) whereon the products (5) are placed;
- a collecting compartment (10) for receiving a selected product (5a);
- moving means (13) of the selected product (5a), arranged to move the selected product (5a) from the storage (4) to the collecting compartment (10), which moving means (13) comprises at least one pusher (14) positionable relative to the selected product (5a) such that the selected product (5a) may be extracted from the storage (4);
- at least one identification device (39,40) of the products (5), which is predisposed for associating to each product a corresponding information relating to the position occupied by the latter in the storage, said identification device (39,40) comprising at least one bar code reader (39);

the barcode reader (39) is arranged in proximity of a side of the shelves (9) toward which a barcode applied to the products is pointing (5);

characterized in that:

the identification device comprises at least a proximity sensor (40) arranged for detecting the presence of a product (5) on a shelf (9).

2. A vending machine according to claim 1, comprising two columns (8) of shelves (9) placed alongside one to another, wherein the identification device comprises two bar codes readers (39), each of which is arranged parallel to a side of the shelves (9) which side is facing the other column (8) of the shelves (9).
3. A vending machine according to claim 1, wherein the pusher (14) comprises a chain (16) having a first free end (16a) thereof movable along a direction parallel to the shelves (9) in order to push the selected product (5a) from an inner position to an outer position relative to the storage (4), and a second free end (16b) movable along a substantially vertical direction, in which the chain (16) comprises a first portion (17a) substantially horizontal and a second portion (17b) lying along a substantially vertical direction.
4. A vending machine according to claim 3, **characterized in that** the chain (16) comprises a plurality of meshes (18) connected to one another and at least one stiffening block (19) associated to each mesh (18).
5. A vending machine according to claim 4, **characterized in that** the pusher (14) comprises a support body (20) movable in order to be positioned relative to the selected product (5a); said support body (20) comprising a sliding guide (21) of the chain (16) for supporting the first portion (17a) of the chain (16).
6. A machine according to any preceding claim, **characterized in that** the moving means (13) further comprises a lifting table (15) for receiving the selected product (5a) which was pushed outwards the storage (4); the lifting table (15) lifting the selected product (5a) up to being proximate to the collecting compartment (10).
7. A vending machine according to claim 6, **characterized in that** said lifting table (15) is associated to the pusher (14) in order to move simultaneously with the latter.
8. A vending machine according to claim 6 or 7, **characterized in that** said lifting table (15) comprises a transfer member (28) for translating the selected product (5a) along a major extension direction of the lifting table (15) itself in order to move the selected product (5a) into the collecting compartment (10).

9. A vending machine according to any preceding claim, **characterized in that** said moving means (13) comprises a substantially vertical straight guide (31) and a carriage (32) sliding along said straight guide (31); said carriage (32) being associated at least to said pusher (14).

10. A vending machine according to any preceding claim, **characterized in that** said moving means (13) comprises a substantially vertical straight guide (31) and a carriage (32) sliding along said straight guide (31); said carriage (32) being associated at least to the lifting table (15).

11. A vending machine according to any preceding claim, **characterized in that** it comprises selection means (37), to allow a user to select a product, and a control unit for acquiring, by the selecting means (37), a first signal indicative of the selected product, and to send to the moving means (13) at least a second signal indicative of the position of the selected product (5a) in the storage (4).

12. A vending machine according to claim 11, **characterized in that** it comprises an identification device (39) of the products (5) in order to associate to each product (5) a corresponding information on the location of the latter within the storage.

13. A vending machine according to claim 11, **characterized in that** the identification device (39,40) of the products comprises two bar code readers (40).

14. A vending machine according to any preceding claim, comprising one or more furnaces (100) placed next to the storage (4).

Patentansprüche

1. Verkaufsautomat für Produkte, umfassend:

- eine Lagerstruktur (2), die ein Innenfach (3) definiert;
- mindestens einen Speicher (4), der innerhalb des Innenfachs (3) angeordnet ist und eine Vielzahl an Regalen (9) umfasst, auf denen die Produkte (5) aufgestellt sind;
- ein Sammelfach (10) zum Aufnehmen eines ausgewählten Produkts (5a);
- Bewegungsmittel (13) des ausgewählten Produkts (5a), die angeordnet sind, um das ausgewählte Produkt (5a) vom Speicher (4) zum Sammelfach (10) zu bewegen, wobei die Bewegungsmittel (13) mindestens einen Drücker (14) umfassen, der relativ zu dem ausgewählten Produkt (5a) positionierbar ist, so dass das ausgewählte Produkt (5a) aus dem Speicher (4) ex-

trahiert werden kann;

- mindestens eine Identifikationsvorrichtung (39,40) der Produkte (5), die eingerichtet ist, um einem jeden Produkt eine entsprechende Information in Bezug auf die Position, die dieses im Speicher einnimmt, zuzuordnen, wobei die Identifikationsvorrichtung (39,40) mindestens einen Barcodeleser (39) umfasst;

der Barcodeleser (39) ist in der Nähe einer Seite der Regale (9) angeordnet, auf die ein auf die Produkte aufgebrachter Barcode (5) zeigt;

dadurch gekennzeichnet, dass

die Identifikationsvorrichtung mindestens einen Näherungssensor (40) umfasst, der zum Erfassen des Vorhandenseins eines Produkts (5) in einem Regal (9) angeordnet ist.

2. Verkaufsautomat nach Anspruch 1, umfassend zwei Säulen (8) von Regalen (9), die nebeneinander angeordnet sind, wobei die Identifikationsvorrichtung zwei Barcodeleser (39) umfasst, von denen ein jeder parallel zu einer Seite der Regale (9) angeordnet ist, welche Seite der anderen Säule (8) der Regale (9) zugewandt ist.
3. Verkaufsautomat nach Anspruch 1, wobei der Drücker (14) eine Kette (16) aufweisend dessen erstes freies Ende (16a), das entlang einer Richtung parallel zu den Regalen (9) beweglich ist, um das ausgewählte Produkt (5a) von einer inneren Position zu einer äußeren Position relativ zu dem Speicher (4) zu drücken und ein zweites freies Ende (16b) umfasst, das entlang einer im Wesentlichen vertikalen Richtung beweglich ist, wobei die Kette (16) einen ersten Abschnitt (17a) im Wesentlichen horizontal und einen zweiten Abschnitt (17b), der entlang einer im Wesentlichen vertikalen Richtung liegt, umfasst.
4. Verkaufsautomat nach Anspruch 3, **dadurch gekennzeichnet, dass** die Kette (16) eine Vielzahl an miteinander verbundenen Maschen (18) und mindestens einen mit einer jeden Maschen (18) assoziierten Versteifungsblock (19) umfasst.
5. Verkaufsautomat nach Anspruch 4, **dadurch gekennzeichnet, dass** der Drücker (14) einen Tragkörper (20) umfasst, der beweglich ist, um relativ zu dem ausgewählten Produkt (5a) positioniert zu werden; wobei der Tragkörper (20) eine Gleitführung (21) der Kette (16) zum Tragen des ersten Abschnitts (17a) der Kette (16) umfasst.
6. Maschine nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Bewegungsmittel (13) ferner einen Hebetisch (15) zum Aufnehmen des ausgewählten Produkts (5a) umfassen, der aus dem Speicher (4) nach außen gedrückt

wurde; wobei der Hebetisch (15) das ausgewählte Produkt (5a) bis in die Nähe des Sammelfachs (10) hebt.

- 5 7. Verkaufsautomat nach Anspruch 6, **dadurch gekennzeichnet, dass** der Hebetisch (15) mit dem Drücker (14) assoziiert ist, um sich gleichzeitig mit diesem zu bewegen.
- 10 8. Verkaufsautomat nach Anspruch 6 oder 7, **dadurch gekennzeichnet, dass** der Hebetisch (15) ein Transferelement (28) zum Verschieben des ausgewählten Produkts (5a) entlang einer Hauptausdehnungsrichtung des Hebetisches (15) selbst umfasst, um das ausgewählte Produkt (5a) in das Sammelfach (10) zu bewegen.
- 15 9. Verkaufsautomat nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Bewegungsmittel (13) eine im Wesentlichen vertikale gerade Führung (31) und einen Schlitten (32) umfassen, der entlang der geraden Führung (31) gleitet; wobei der Schlitten (32) mindestens mit dem Drücker (14) assoziiert ist.
- 20 10. Verkaufsautomat nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Bewegungsmittel (13) eine im Wesentlichen vertikale gerade Führung (31) und einen Schlitten (32) umfassen, der entlang der geraden Führung (31) gleitet; wobei der Schlitten (32) mindestens mit dem Hebetisch (15) assoziiert ist.
- 25 11. Verkaufsautomat nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** er Auswahlmittel (37), um es einem Benutzer zu ermöglichen, ein Produkt auszuwählen, und eine Steuereinheit umfasst, um durch die Auswahlmittel (37) ein erstes Signal zu erfassen, das indikativ für das ausgewählte Produkt ist, und um an die Bewegungsmittel (13) mindestens ein zweites Signal zu senden, das für die Position des ausgewählten Produkts (5a) im Speicher (4) indikativ ist.
- 30 12. Verkaufsautomat nach Anspruch 11, **dadurch gekennzeichnet, dass** er eine Identifikationsvorrichtung (39) der Produkte (5) umfasst, um mit einem jeden Produkt (5) eine entsprechende Information über den Ort des letzteren innerhalb des Speichers zu assoziieren.
- 35 13. Verkaufsautomat nach Anspruch 11, **dadurch gekennzeichnet, dass** die Identifikationsvorrichtung (39,40) der Produkte zwei Barcodeleser (40) umfasst.
- 40 14. Verkaufsautomat nach einem der vorhergehenden Ansprüche, umfassend einen oder mehrere Öffnungen
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(100), die neben dem Speicher (4) angeordnet sind.

Revendications

1. Distributeur automatique de produits comprenant :

- une structure porteuse (2) définissant un compartiment intérieur (3) ;
- au moins un magasin (4) placé à l'intérieur du compartiment intérieur (3) et comprenant une pluralité d'étagères (9) sur lesquelles sont placés les produits (5) ;
- un compartiment collecteur (10) destiné à recevoir un produit sélectionné (5a) ;
- des moyens de déplacement (13) du produit sélectionné (5a), disposés pour déplacer le produit sélectionné (5a) depuis le magasin (4) vers le compartiment de collecte (10), lesdits moyens de déplacement (13) comprennent au moins un poussoir (14) pouvant être positionné par rapport au produit sélectionné (5a) de telle sorte que le produit sélectionné (5a) puisse être extrait du magasin (4) ;
- au moins un dispositif d'identification (39, 40) des produits (5), étant prédisposé pour associer à chaque produit une information correspondante relative à la position occupée par ce dernier dans le magasin, ledit dispositif d'identification (39, 40) comprenant au moins un lecteur de codes à barres (39) ;

le lecteur de codes à barres (39) est disposé à proximité d'un côté des étagères (9) vers lequel pointe un code à barres appliqué sur les produits (5) ;

caractérisé en ce que

le dispositif d'identification comprend au moins un capteur de proximité (40) disposé pour détecter la présence d'un produit (5) sur une étagère (9).

2. Distributeur automatique selon la revendication 1, comprenant deux colonnes (8) d'étagères (9) placées l'une à côté de l'autre, dans lequel le dispositif d'identification comprend deux lecteurs de codes à barres (39), chacun d'entre eux étant disposé parallèlement à un côté des étagères (9), ledit côté faisant face à l'autre colonne (8) des étagères (9).

3. Distributeur automatique selon la revendication 1, dans lequel le poussoir (14) comprend une chaîne (16) comportant une première extrémité libre (16a) de celle-ci mobile le long d'une direction parallèle aux étagères (9) afin de pousser le produit sélectionné (5a) d'une position intérieure à une position extérieure par rapport au magasin (4), et une seconde extrémité libre (16b) mobile le long d'une direction substantiellement verticale, dans lequel la chaîne (16) comprend une première partie (17a) substan-

tiellement horizontale et une seconde partie (17b) se trouvant le long d'une direction substantiellement verticale.

4. Distributeur automatique selon la revendication 3, **caractérisé en ce que** la chaîne (16) comprend une pluralité de mailles (18) reliées les unes aux autres et au moins un bloc de raidissement (19) associé à chaque maille (18).

5. Distributeur automatique selon la revendication 4, **caractérisé en ce que** le poussoir (14) comprend un corps de support (20) mobile afin d'être positionné par rapport au produit sélectionné (5a) ; ledit corps de support (20) comprenant un guide coulissant (21) de la chaîne (16) pour supporter la première partie (17a) de la chaîne (16).

6. Distributeur selon l'une quelconque des revendications précédentes, **caractérisé en ce que** les moyens de déplacement (13) comprennent de plus une table de levage (15) servant à recevoir le produit sélectionné (5a) ayant été poussé vers l'extérieur du magasin (4) ; la table de levage (15) soulevant le produit sélectionné (5a) jusqu'à être proche du compartiment de collecte (10).

7. Distributeur automatique selon la revendication 6, **caractérisé en ce que** ladite table de levage (15) est associée au poussoir (14) afin de se déplacer simultanément avec ce dernier.

8. Distributeur automatique selon la revendication 6 ou 7, **caractérisé en ce que** ladite table de levage (15) comprend un élément de transfert (28) servant à déplacer en translation le produit sélectionné (5a) le long d'une direction d'extension principale de la table élévatrice (15) elle-même afin de déplacer le produit sélectionné (5a) dans le compartiment de collecte (10).

9. Distributeur automatique selon l'une quelconque des revendications précédentes, **caractérisé en ce que** lesdits moyens de déplacement (13) comprennent un guide rectiligne (31) substantiellement vertical et un chariot (32) coulissant le long dudit guide rectiligne (31) ; ledit chariot (32) étant associé au moins au dit poussoir (14).

10. Distributeur automatique selon l'une quelconque des revendications précédentes, **caractérisé en ce que** lesdits moyens de déplacement (13) comprennent un guide rectiligne (31) substantiellement vertical et un chariot (32) coulissant le long dudit guide rectiligne (31) ; ledit chariot (32) étant associé au moins à la table de levage (15).

11. Distributeur automatique selon l'une quelconque

des revendications précédentes, **caractérisé en ce qu'il** comprend des moyens de sélection (37), pour permettre à un utilisateur de sélectionner un produit, et une unité de commande pour acquérir, par les moyens de sélection (37), un premier signal indicatif du produit sélectionné, et pour envoyer aux moyens de déplacement (13) au moins un second signal indicatif de la position du produit sélectionné (5a) dans le magasin (4).

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12. Distributeur automatique selon la revendication 11, **caractérisé en ce qu'il** comprend un dispositif d'identification (39) des produits (5) afin d'associer à chaque produit (5) une information correspondante sur l'emplacement de ce dernier dans le magasin.

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13. Distributeur automatique selon la revendication 11, **caractérisé en ce que** le dispositif d'identification (39, 40) des produits comprend deux lecteurs de codes à barres (40).

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14. Distributeur automatique selon l'une quelconque des revendications précédentes, comprenant un ou plusieurs fours (100) placés à côté du magasin (4).

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FIG 1

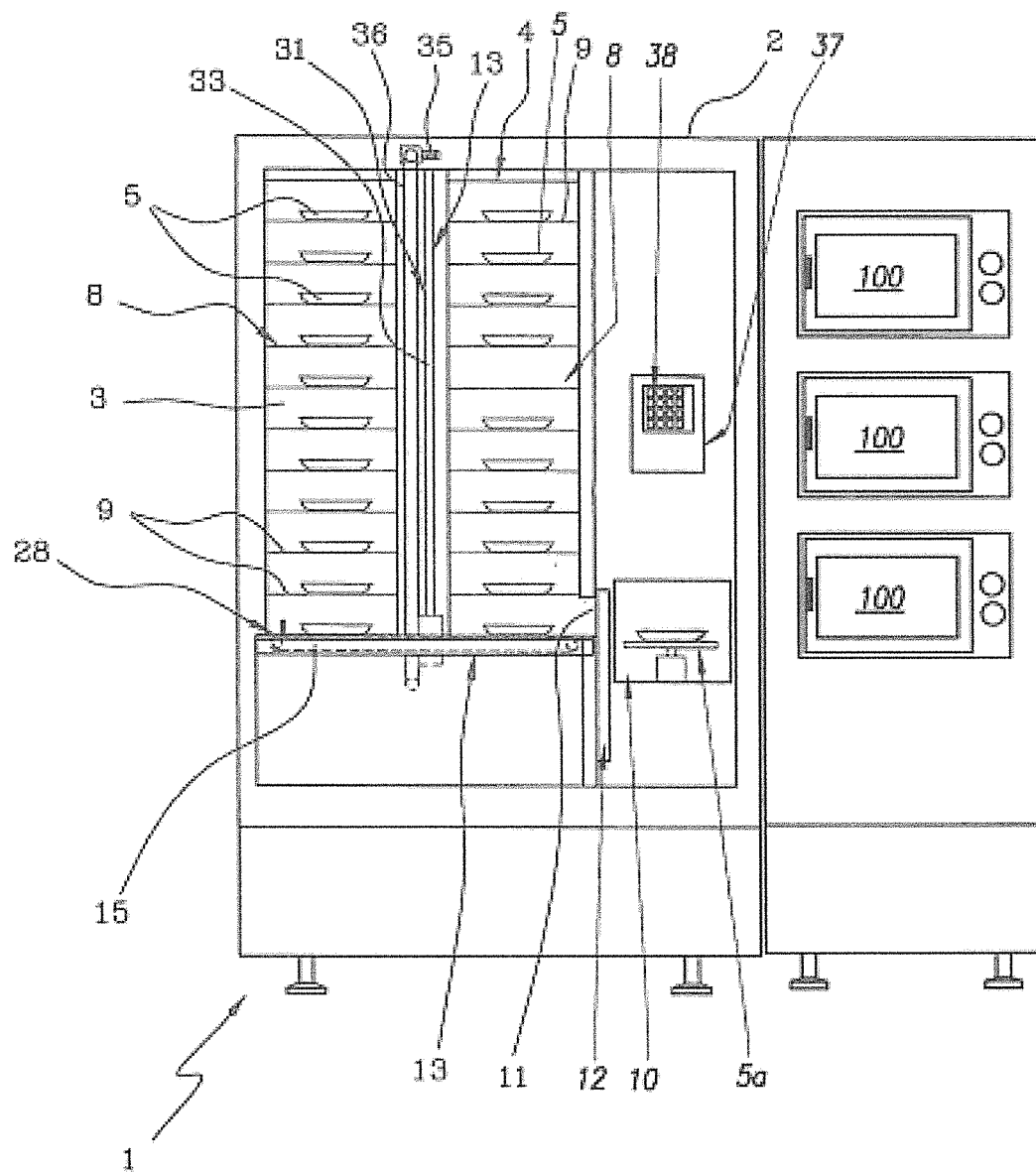


FIG 2

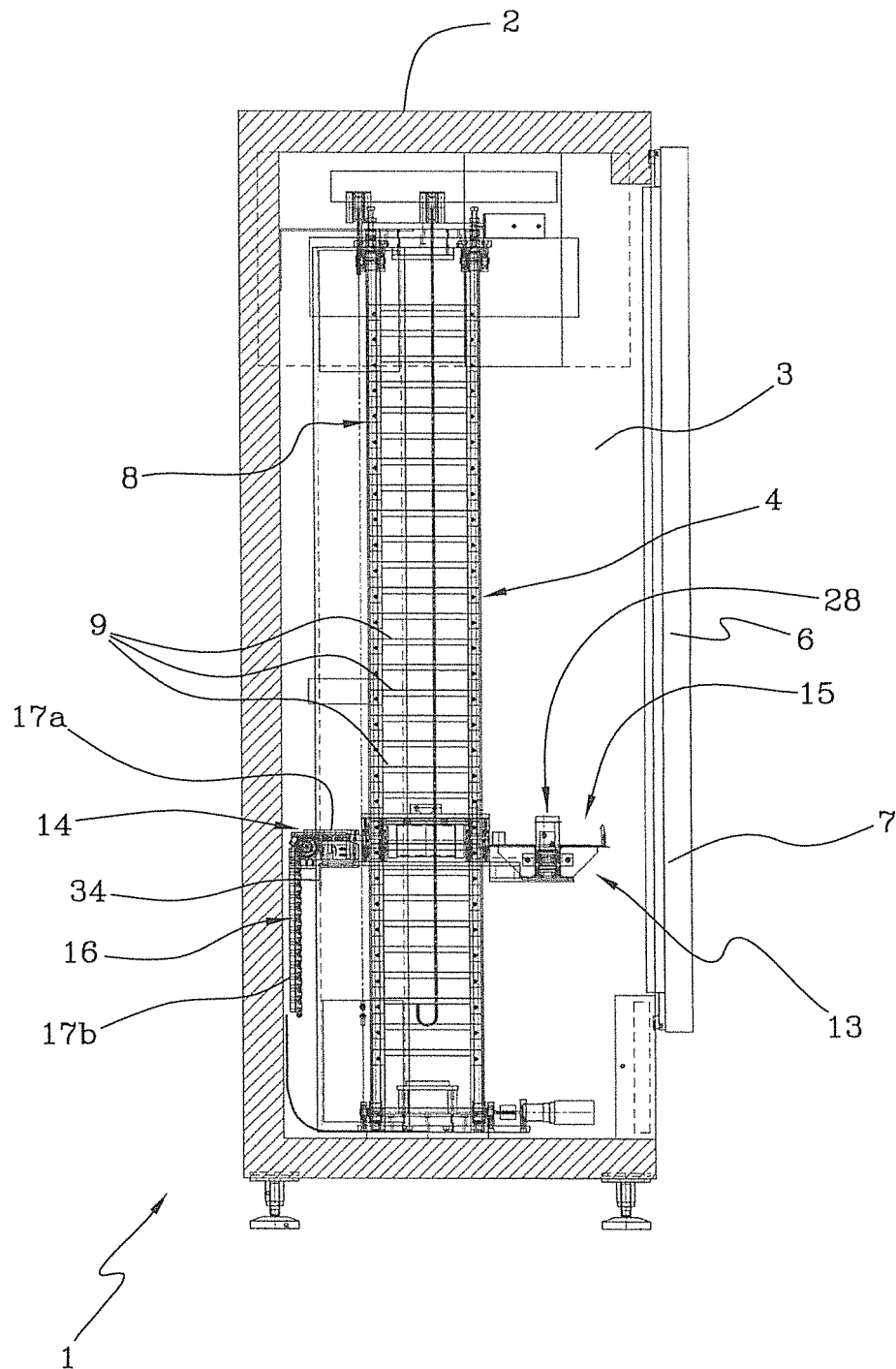
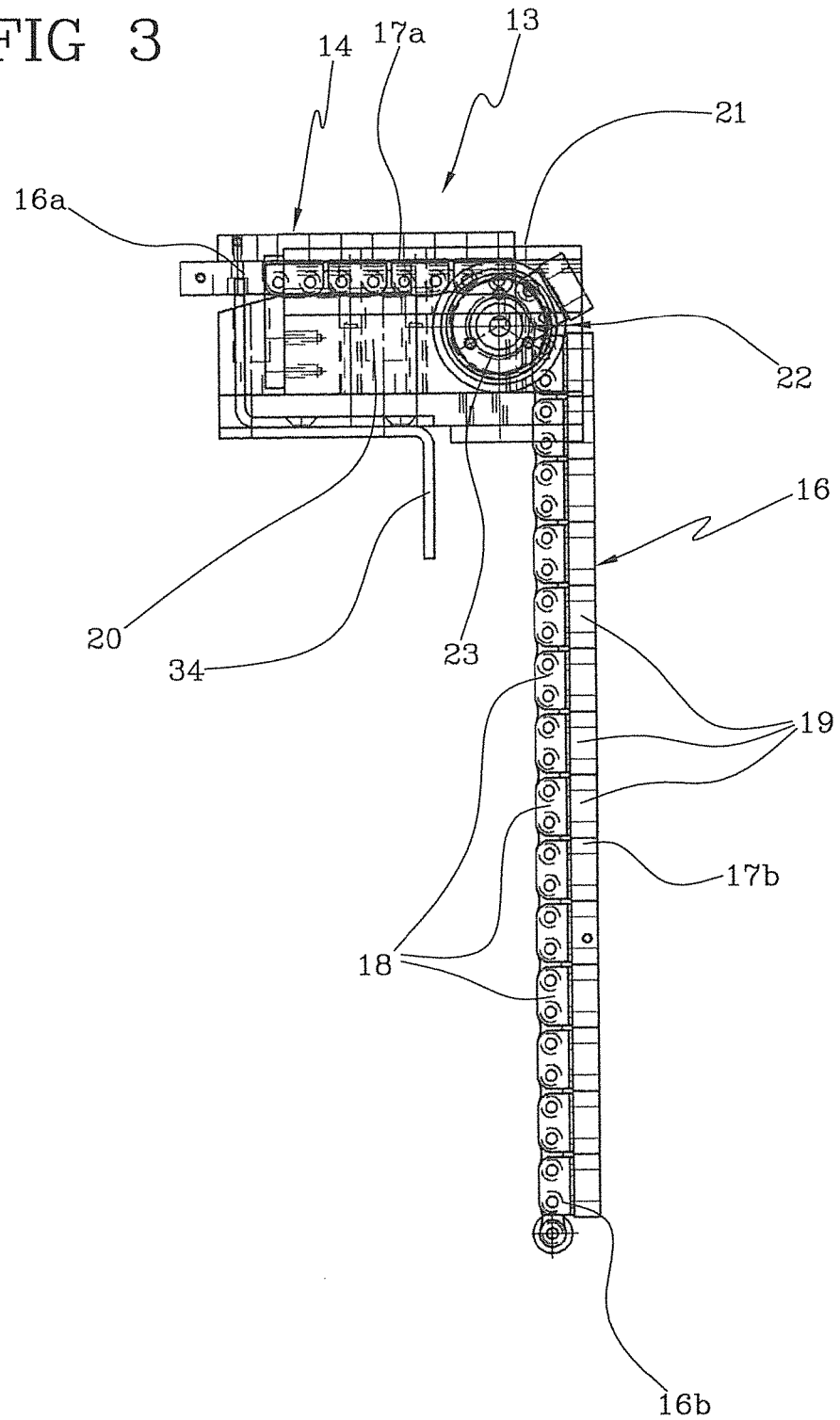


FIG 3



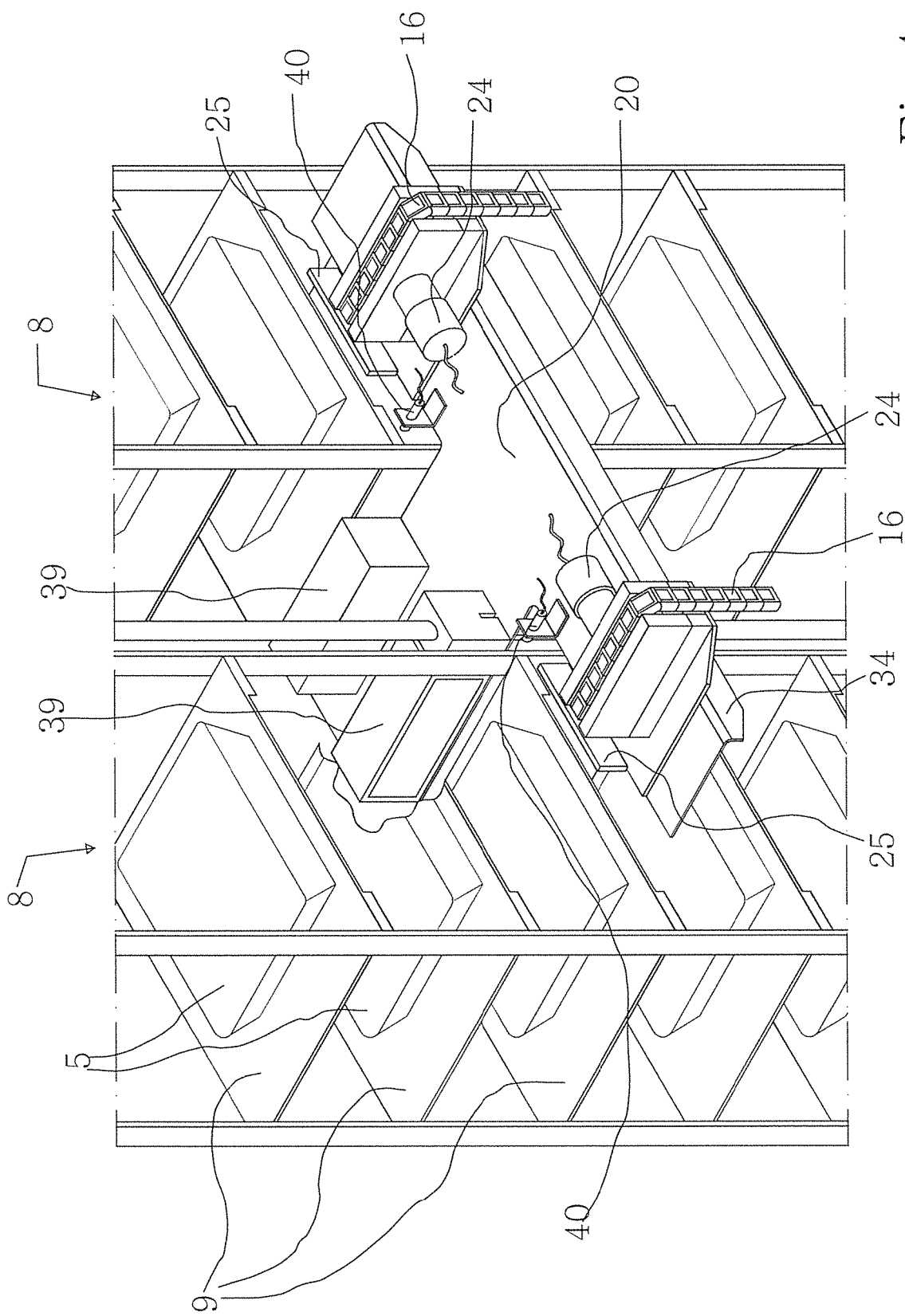
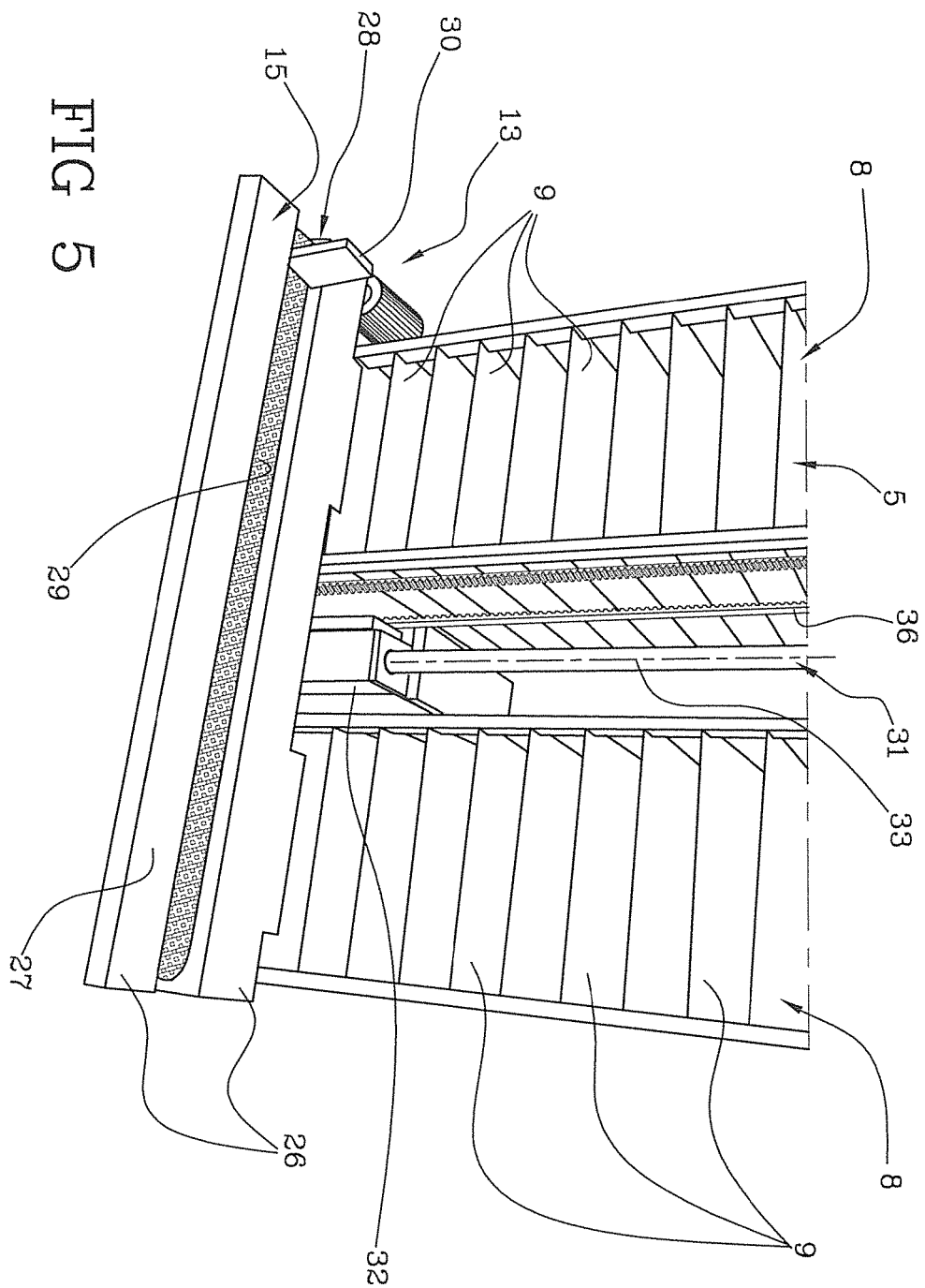


Fig.4



REFERENCES CITED IN THE DESCRIPTION

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