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(54) **Automatic vending machine provided with products selection means from window**

(57) An automatic vending machine comprises a bearing structure (2) defining an inner space (3) and additionally having a front wall (4) provided with a transparent portion (5); the machine further comprises a magazine (6) to carry a predetermined number of products (7) and slidably movable between a first forward position and a second retracted position, and a picking-up space (11) to receive the selected item (7a); the outer surface (5a) of the transparent portion (5) is a touch screen (13) for selection of a desired item (7a).

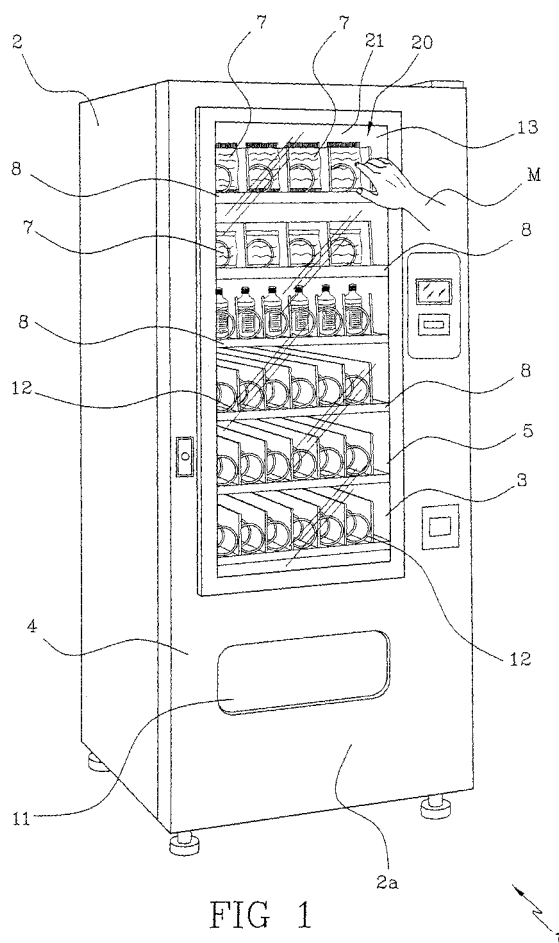


FIG 1

Description

[0001] The present invention relates to an automatic vending machine. Typically, but not necessarily, the present invention applies to dispensing of foodstuffs in public places.

[0002] It is known that there are different models of vending machines. Generally, the machines of this type comprise a bearing structure defining an inner space within which the products or items for sale are contained. Formed on the front wall of the structure is a transparent portion enabling visual access to the inner space. The products for sale are disposed in a magazine made up of a plurality of shelves on which the products themselves are aligned in parallel rows.

[0003] In accordance with the European patent application No. 05425672 in the name of the same Applicant, there would be on the market vending machines in which the magazine is slidably movable along suitable guides between a first advanced or forward position and a second retracted position. In the first position the exposed products are placed close to the transparent portion of the machine's front wall. In this manner, these products are more visible. In the second retracted position, the magazine is spaced apart from said transparent portion. Thus a gap is created between the magazine and the front wall for release of the product.

[0004] The vending machines are also provided with suitable item-handling members which consist of helical coils between the turns of which the items themselves are disposed. Due to the rotation imposed to said helical coils, the selected item is urged towards said gap so that it falls into a picking-up space placed at the lower end of the gap. The consumer can therefore take away the selected item.

[0005] All vending machines are provided with a door enabling access to the picking-up space and allowing the magazine to be filled with the products.

[0006] In machines of this type, the user selects the product by pressing a corresponding key placed laterally of the transparent portion, for example. Sometimes the choice can also take place by keystroking a digital code relative to the desired item by means of a keyboard suitably set alongside the transparent portion.

[0007] Disadvantageously, in vending machines of the above described type selection of the item always takes place in an indirect manner. In fact, the desired item is first watched and selected and then one or more keys corresponding to said item are pressed. These keys are disposed far from the different items, which means that the consumer must look away from said items for carrying out his/her selection. In this way it is possible for the user to press the wrong key or type a different code, thus selecting an unwanted item.

[0008] A further disadvantage is sometimes connected with the fact that the consumer may not be able to correctly evaluate the amount of the desired item, as said item is only reproduced in a photo and not visible.

[0009] Also present on the market are vending machines equipped with touch screens disposed laterally of the transparent portion. Since these touch screens perform the same function as traditional keys, this solution has the same problems as above described.

[0010] Accordingly, the present invention aims at solving the drawbacks listed above.

[0011] It is a first aim of the present invention to make available a vending machine that is capable of reducing the users' errors in selecting the products.

[0012] It is a secondary aim to propose a vending machine that is adapted to allow the consumer to carry out a more careful evaluation of the quality of the desired products.

[0013] More generally, it is a further aim of the present invention to provide a vending machine operation of which is simple, more direct and immediate.

[0014] The foregoing and further aims that will become more apparent during the following description are substantially achieved by an automatic vending machine provided with product selection means from window in accordance with the present invention.

[0015] Further features and advantages will be best understood from a detailed description of a preferred but not exclusive embodiment of the invention in accordance with the appended claims. This description will be set out hereinafter with reference to the accompanying drawings, in which:

- Fig. 1 is a diagrammatic perspective view of an automatic vending machine in accordance with the present invention;
- Fig. 2 shows the machine seen in Fig. 1 in a first operating configuration;
- Fig. 3 shows the machine seen in Fig. 1 in a second operating configuration; and
- Fig. 4 shows a detail of a possible alternative embodiment of the machine seen in Fig. 1.

[0016] With reference to the drawings, an automatic vending machine provided with product selection means from window has been generally identified with reference numeral 1.

[0017] The machine 1 comprises a bearing structure 2 defining an inner space 3

[0018] The bearing structure 2 is generally in the form of a parallelepiped and has a front wall 4 which is provided with a transparent portion or window 5. This window 5 ensures visual access to the inside of space 3 to enable direct observation of the selectable products.

[0019] The bearing structure 2 is also provided with an opening door allowing access to the inner space 3 to supply the machines with the products intended for sale. Preferably, but not exclusively, this door is coincident with the front wall 4 of the bearing structure 2.

[0020] A magazine 6 is present in said inner space 3, which magazine is suitable for carrying a predetermined number of products 7. In particular, the products 7 are

disposed in different compartments into which said magazine 6 is divided depending on their nature.

[0021] The magazine 6 has the form of a parallelepiped and comprises a plurality of shelves 8 that are divided into rows of products.

[0022] The particular feature of the invention concerns the particular system for selection of the desired item.

[0023] The general idea is based on the fact that the machine comprises means 20 to enable selection of the product lying behind a predetermined region 5a of the transparent portion 5 (window) due to the user's hand moving close to or in contact with said predetermined region 5a. In other words, the vending machine being the object of the invention enables a simple and intuitive selection of the product by merely moving close to and/or touching a predetermined transparent region 5a that is placed between the consumer and the desired product exactly and directly visible behind the transparent region.

[0024] That is to say, the consumer observes the transparent window 5 and in particular the real products to be eaten displayed behind said window. After doing his/her choice, the consumer moves close to the transparent region 5a of the window 5 (region 5a interposed between himself/herself and the product) and obtains the direct selection of the product at the back by proximity or by contact.

[0025] The means 20 enabling selection of the product will generally comprise at least one sensor 21 capable of detecting proximity to the predetermined region 5a or contact with said region by the user to select the product at the back.

[0026] Alternatively or in combination, two different solutions can be adopted for obtaining the above described function.

[0027] In a first solution, sensor 21 is associated and preferably connected with the predetermined region 5a of the transparent portion 5, or even directly incorporated therein. In other words, sensor 21 will consist of the transparent portion 5 itself as the latter will be made up of a touch screen 13 divided into different predetermined regions 5a.

[0028] Said touch screen 13 is generally known by itself and can consist of a sensitive and transparent surface associated with the transparent portion 5, as shown in Figs. 1 and 4. This sensitive surface can be obtained by means of resistive or capacitive technology.

[0029] According to alternative solutions, on the contrary, the touch screen is obtained by application of sensors around the transparent portion 5. Said sensors can be of the optical, infrared or sound wave type. In other words, the consumer has direct visual access to the products 7 intended for sale and can select the desired one by merely moving his/her hand close to the window (transparent portion 5) and/or touching it at the position of the desired item. In this way the consumer can directly see the true product he/she is buying and not an image or fictitious representation thereof.

[0030] The touch screen 13 is functionally divided into

regions 5a, each of which relates to a specific row of products lying behind said region.

[0031] In an alternative embodiment (Fig. 4), formed on the touch screen 13 are reference marks 14 defining precise regions 15 relating to each product and within which a contact (proximity) action must be exerted for selection of a product. In particular, in the example herein described, the reference marks 14 consist of horizontal and vertical lines confining regions 15 of rectangular shape.

[0032] Alternatively, respective individual windows ("individual portholes") can be present, each being associated with a specific row of products lying behind without however departing from the inventive idea of the present invention.

[0033] As a second alternative solution for the means enabling selection of the product, one sensor 21 (or more sensors) may be provided to be associated, and preferably connected, with a compartment carrying the respective products (see Figs. 2 and 3); sensor 21 will detect proximity to, by a user, or contact with said predetermined region 5a of the transparent portion 5 behind which the desired product is.

[0034] In other words, the sensor instead of being incorporated into or associated with the transparent window 5, will be spaced apart therefrom and associated with the compartment carrying the products. In this way, corresponding to the sensor itself will always be the products of the compartment with which said sensor is connected, irrespective of the window regions to which the user comes close.

[0035] Obviously, the presence of a plurality of sensors 21 each co-operating with the respective region 5a will be provided, to enable selection of the item lying behind said respective region 5a.

[0036] In a particular embodiment of the above described machine not intended however in a limiting sense, the magazine 6 is slidably movable within the inner space 3 between a first forward position and a second retracted position. In particular, the first forward position (Fig. 2) refers to said magazine 6 when it is close to the transparent portion 5. In this way, also the products 7 contained in the magazine 6 are in the vicinity of the transparent portion 5.

[0037] The second retracted position (Fig. 3) is taken by the magazine 6 when it is far from the transparent portion 5. In this manner a gap 9 is created between the magazine 6 and the transparent portion 5.

[0038] In the embodiment herein described each shelf 8 of the magazine 6 is slidably movable, irrespective of the other shelves, along suitable linear slide guides 10. In an alternative embodiment the whole magazine 6 may be provided to be rigidly slidable along similar linear slide guides 10.

[0039] In particular, when a consumer selects a desired item 7a, he/she only touches a region of the transparent portion 5 provided with said sensor/sensors. The touched region is exactly in front of the desired item 7a.

[0040] A control unit (not shown) acts on the magazine 6 moving it from the first forward position to the second retracted position so as to create the gap 9 within which the selected item 7a is dropped. When the selected item 7a reaches the picking-up space 11, the control unit acts on the magazine 6 again bringing it back to the first forward position.

[0041] While in the described example reference is made to machines in which the magazine 6 is movable between said operating positions, obviously also a solution in which the magazine 6 is fixed, as in traditional vending machines, is possible, and it too falls within the scope of the present invention.

[0042] The machine 1 further comprises a picking-up space 11 receiving the item 7a selected by the consumer and from where the item itself can be taken away. This picking-up space 11 can be placed in the lower part 2a of the bearing structure 2 close to said front wall 4 in a machine like that shown in the figure.

[0043] The selected item 7a is moved by suitable handling members 12. In this example these handling members 12 consist of spiral coils, the longitudinal axis "X" of which lies along each row of each mentioned shelf 8. The spiral coils are operated by suitable motors not shown when the magazine 6 is in the second retracted position. The spiral coil relating to the row of the selected item, through rotation, pushes the latter into the gap 9, so that the item falls into the picking-up space 11 where it can be taken away by the consumer.

[0044] It is however apparent that the present invention is not limited to the embodiment shown because other handling members 12 different from the spiral coils could be provided that can move the item to a picking-up space 11 disposed laterally of the magazine for example, or at all events other systems for release of the item that are not herein described as they are of known type and are not part of the present invention.

[0045] The invention achieves important advantages.

[0046] Use of sensors 21 allows the consumer to carry out selection of the desired product 7a by directly touching a region on the front side of the transparent portion 5.

[0047] Thanks to this solution, the consumer never looks away from the product he/she wishes to buy. In this way, selection errors are greatly limited, which on the contrary is typical of machines using the traditional selection systems contemplating use of a separated key-board.

[0048] In addition, the operating condition taken by the magazine 6 in its first forward position allows errors in selecting the desired item 7a to be further reduced. In fact, since the displayed products are in close proximity to the transparent portion 5, it is possible to avoid selection errors due to perspective. In other words, if the desired item were disposed in a retracted position relative to the transparent portion 5 and therefore also relating to the touch screen 13, the user's visual direction oriented towards the desired item could intercept a region of the touch screen relating to an item placed in close proximity

to the desired one.

[0049] This type of error is greatly limited by the proposed solution, i.e. that in which the products are moved close to the transparent portion 5.

[0050] In addition, due to the constant visual contact of the consumer with the desired product, a more careful evaluation of the quality of the product itself is obtained.

[0051] Finally, the proposed solution allows selection of more products by the consumer in a quicker and safer manner.

[0052] On the whole, vending machines in accordance with the present invention are characterised by an improved intuitiveness and immediateness of use.

Claims

1. A vending machine, comprising:

- a bearing structure (2) defining an inner space (3) and having a wall (4) provided with at least one transparent portion (5),
- a magazine (6) located in the inner space (3) for holding the products (7),

characterised in that it comprises means (20) enabling selection of the product lying behind a predetermined region (5a) of said transparent portion (5) by a user moving close to or in contact with said predetermined region (5a), with his/her hand for example.

2. A vending machine as claimed in claim 1, **characterised in that** said means (20) to enable selection of the product comprises at least one sensor (21) capable of detecting proximity to the predetermined region (5a) or contact of the predetermined region (5a) by the user to select the product lying behind.

3. A vending machine as claimed in claim 2, **characterised in that** said sensor (21) is associated with the predetermined region (5a) of said transparent portion (5) and preferably connected thereto or incorporated therein, the sensor being able to detect by contact or proximity, the selection by a user of an item (7a) lying behind said region (5a).

4. A vending machine as claimed in claim 2, **characterised in that** the sensor is associated with, and preferably connected to one compartment carrying the respective products, said sensor detecting the proximity or contact by a user with said predetermined region (5a) of the transparent portion (5) behind which the desired item is.

5. A vending machine as claimed in claim 1, **characterised in that** at least one outer surface (5a) of said transparent portion (5) is a touch screen (13) adapt-

ed to be touched by a user in the vicinity of a product lying behind for identification and selection of the product itself.

6. A vending machine as claimed in claim 1, **characterised in that** said predetermined region (5a) and/or said transparent portion (5) allow direct visual access to the products (7) that can be selected. 5

7. A vending machine as claimed in claim 5, **characterised in that** said touch screen (13) consists of a sensitive and transparent flat element of said transparent portion (5). 10

8. A vending machine as claimed in anyone of the preceding claims, **characterised in that** said magazine (6) or each shelf (8) of the magazine is slidably movable between a first forward position and a second retracted position along slide guides (10). 15
20

9. A process for selling products by means of vending machines comprising a bearing structure (2) defining an inner space (3) and having a wall (4) provided with at least one transparent portion (5) and a magazine (6) holding the products (7) intended for sale and with a picking-up space (11), the process comprising the steps of: 25
 - moving close to or touching a predetermined region (5a) in front of a desired item (7a) to select the item itself; 30
 - shifting the selected item (7a) towards the picking-up space (11); and
 - taking away the selected item (7a). 35

10. A process as claimed in claim 9, **characterised in that** it further comprises the steps of:
 - arranging the magazine (6) in a first operating position, before the selection, so as to move the products (7) close to the transparent portion (5) to increase visibility and facilitate identification of same; 40
 - shifting the magazine to a second operating position in such a manner that the products are moved away from the transparent portion (5) and a gap (9) is created between said magazine (6) and the transparent portion (5) to enable removal of the desired item (7a). 45
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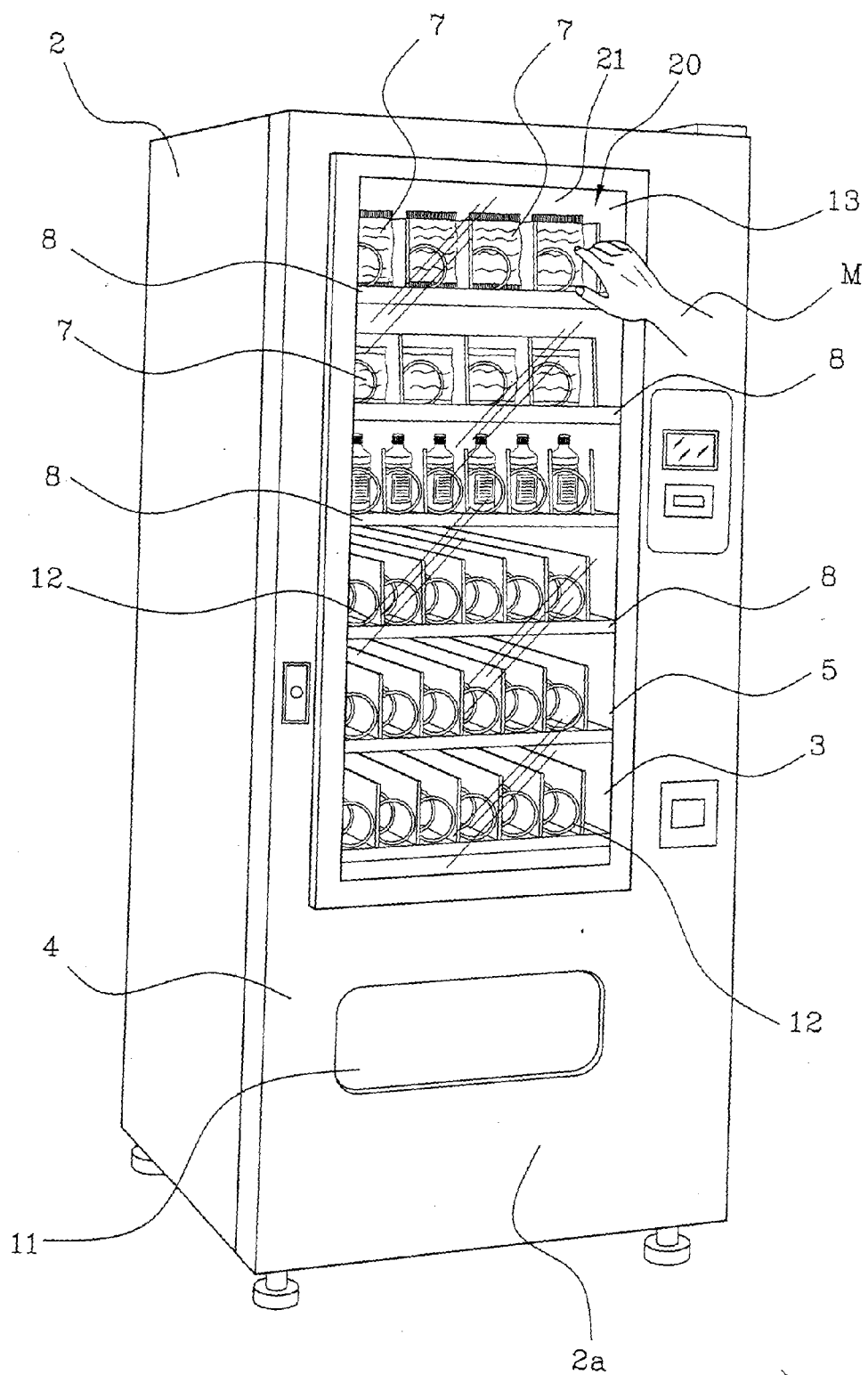


FIG 1

FIG 2

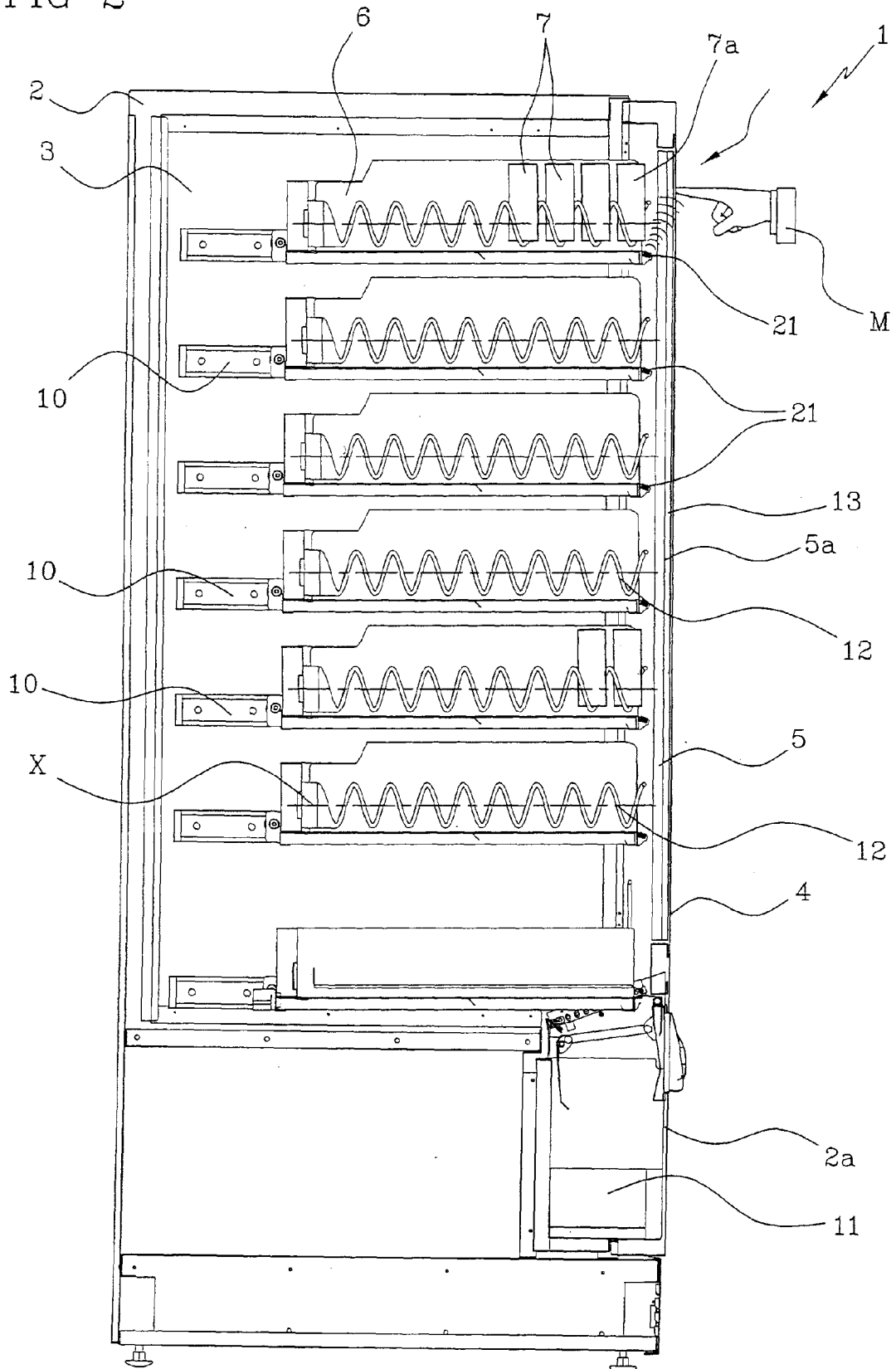
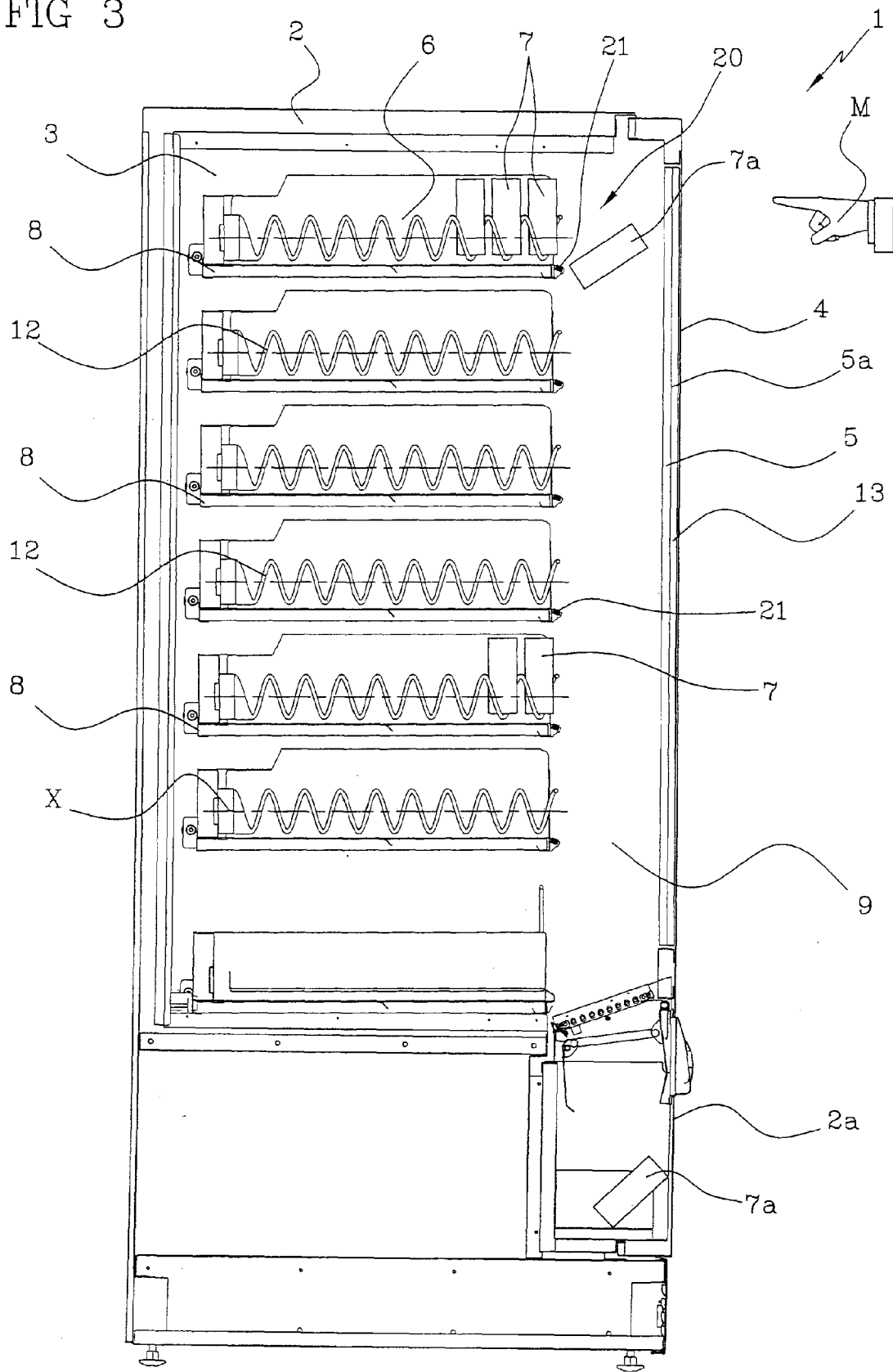


FIG 3



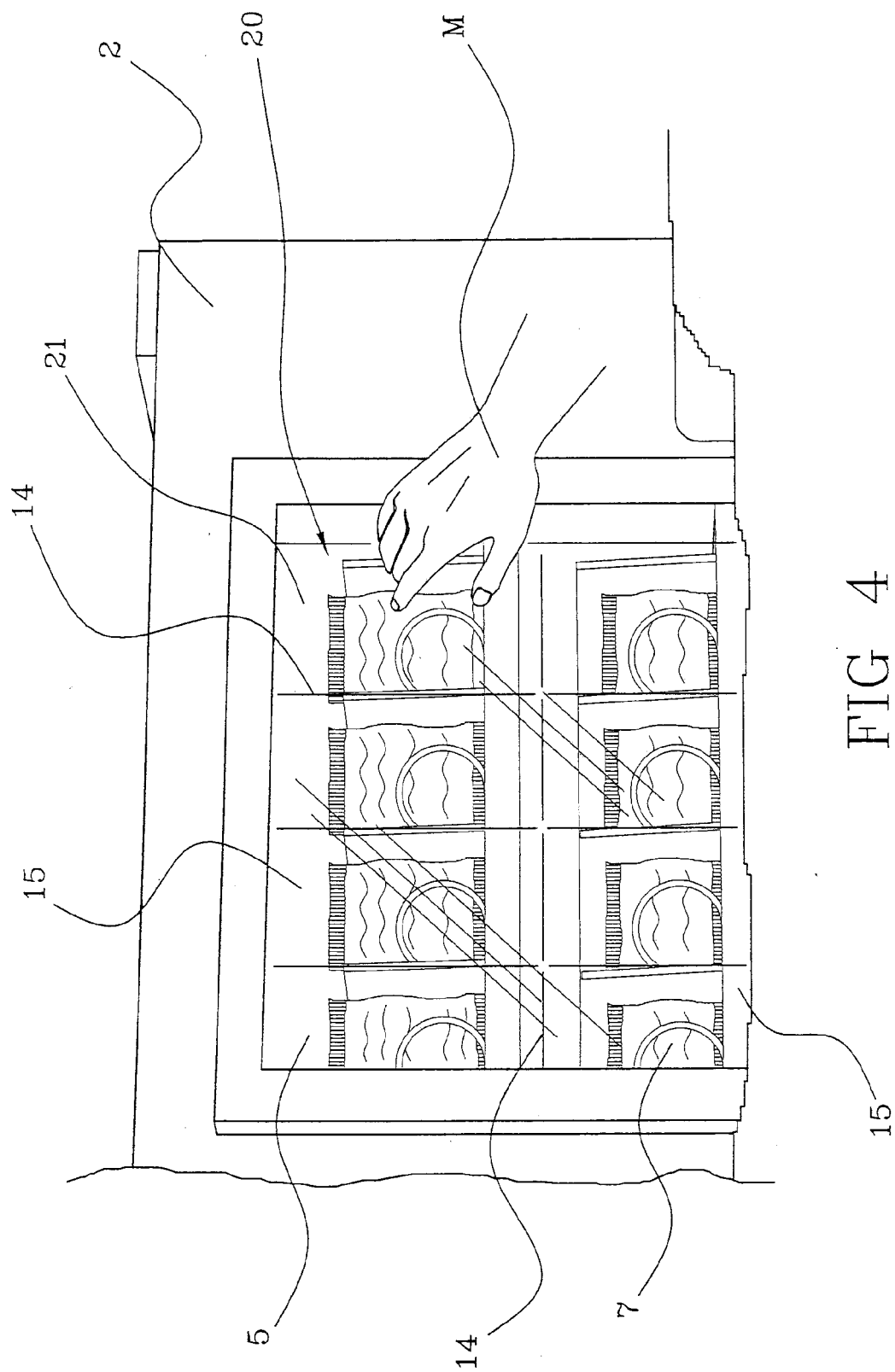


FIG 4

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 05425672 A [0003]