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(54) **AUTOMATIC VENDING MACHINE OF EDIBLE PRODUCTS AND/OR DURABLE GOODS**

(57) An automatic vending machine (1) of edible products and/or durable goods which comprises a substantially box-shaped support frame (2) presenting an inner collection room (3), a display store (4) contained in the support frame (2) and formed by a plurality of supporting shelves (5) parallel each other, arranged at different heights along a vertical direction (Y) and suitable to receive the products and/or goods to be supplied to a user, an at least partly transparent front shutter (6), revolvingly coupled to the support frame (2) to allow an operator to move it in opening/closing the support frame (2), a movable bulkhead (7) coupled to the front shutter (6) and cooperating with actuation means adapted to move it between a release position, in which the movable bulkhead (7) closes an access mouth (8) of the collection room (3), and a re-enter position in which the movable bulkhead (7) opens the access mouth (8) for picking up and/or returning the products and/or goods, dispensing means (9) cooperating with the display store (4) to direct the products and/or goods selected by the user to the collection room (3) and/or to bring back to the display store (4) the products and/or goods returned by the user, and anti-shoplifting means (10), arranged in the collection room (3) and facing the access mouth (8) of the latter, in such a way as to prevent the user from accessing the display store (4) when the movable bulkhead (7) takes the re-enter position and the products and/or goods are in supply and/or return phase. In particular, the anti-shoplifting means (10) comprise a movable laminar damper (11) contained in the support frame (2) which is coupled to and operatively connected with moving means (12) which alternately move it between a rest position, defined when the movable bulkhead (7) takes the release position, in which the laminar damper (11) is arranged ac-

cording to a plane parallel to the supporting shelves (5), and an operating position, defined immediately before the movable bulkhead (7) takes the re-enter position, in which the laminar damper (11) is arranged at least partly according to a plane orthogonal to the plane defined by the supporting shelves (5) and obstructs access to the display magazine (4) through said access mouth (8) when the movable bulkhead (7) takes the re-enter position.

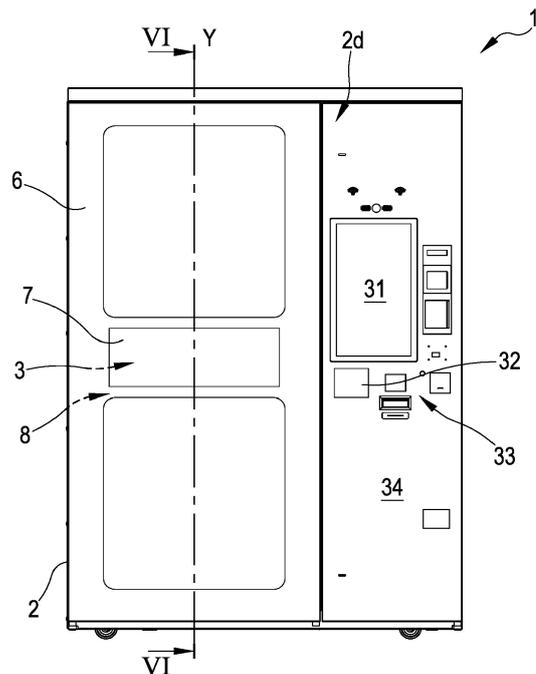


FIG.4

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Description

[0001] The present invention relates to an automatic distributor (or vending machine) of edible products (or foodstuffs) and/or of goods (or objects or items), even durable ones.

[0002] Notoriously, the automatic distributors for the rental and final sale of durable goods, even the most delicate and fragile ones, such as books, videotapes, CDs, DVDs, smartphones, tablets and the like, and/or the definitive sale of edible products (or foodstuffs), such as sweet and savory snacks, sweets, sandwiches, ice creams, frozen foods, beverages of various kinds or the sale of products such as cigarettes, alcohol, tickets or coupons for instant lotteries, printer cartridges, watches, PC accessories, cameras, clothing and even more, are automatic distribution machines (commonly known as "vending machines") increasingly widespread on the market which supply products at the user's direct request, subject to payment.

[0003] Usually, these machines are installed in workplaces and communities (for example hospitals, airports, shopping malls, companies), but their use is increasingly becoming widespread even in places open to the public such as railway or underground stations, distributors of fuel, urban centers, indoor parking areas, cruise ships or other proper dedicated places.

[0004] Specifically, the current automatic machines for distributing products of any type are available in numerous versions and sizes, suitable for satisfying the customer's various needs.

[0005] From a constructive point of view, it can be assumed that, as a general rule, a vending machine of traditional type comprises a display store, arranged in several housing lanes, located at various height levels or horizontal supporting shelves and contained inside of a substantially box-shaped support frame (or casing) which, moreover, aesthetically characterizes the machine itself.

[0006] The horizontal supporting shelves are parallelly and often, although not always, equally spaced apart each other along a vertical direction, so that the products to be dispensed, considering their dimensions and their conformation, are more evenly distributed in the display store inside the box-shaped support frame and occupy the inner volume of the latter as more efficiently as possible.

[0007] Furthermore, at each of the shelves, the housing lanes of the products to be dispensed are arranged side-by-side and parallel each other.

[0008] The products to be dispensed are placed inside a plurality of support seats defined in each of the housing lanes according to conformations able to house a wide range of products or goods that differ each other in shape, size and packaging.

[0009] If the products are intended for final delivery, such as for example the edible goods identified above, the traditional vending machines are provided with a

mainly transparent front shutter, rotatably coupled through rotation means with the box-shaped support frame into which the display store is contained: the transparency (obtained through the installation of a shatter-proof glass plate) of such a front shutter allows the end user to view the products available to make his own choice. Each housing lane, if not even, in certain constructive solutions, each individual support seat defined in the display store of these automatic distributors is also marked by an alphanumeric code that the user types on a special control panel, applied externally to the support frame, to make the desired choice, after having paid the relative amount by inserting coins, banknotes or other in a special slot made in the front shutter.

[0010] At the time of the selection made by the user, the products aligned in the housing lanes are moved towards the front shutter, for a prefixed stretch, through transport or dispensing means (constituted for instance by a plurality of rotating spirals of conventional type), in such a way that the first product of the selected lane is conveyed, remaining supported, or released by gravity in an inner collection room defined in the support frame, in positions dependent on the construction choices and/or on the operational and application requirements.

[0011] The end user accesses the collection room as a result of a manual or automatic movement of a movable bulkhead (or safety window), which belongs to the front shutter itself or below it, depending on the embodiments, and which, normally or in the release position, closes the access mouth of the collection room itself.

[0012] During the collection phase of the selected good, the movable bulkhead also prevents fraudulent removal of the products from the display store, being operatively associated with anti-shoplifting means which inhibit any wish of a ill-intentioned end user to illegitimately appropriate, without paying, one or more of the products or goods contained in the horizontal shelves of the display and containment store.

[0013] If, instead, the products are intended for sale but above all for rental, such as durable goods, a typical vending machine of the known art also includes a keyboard and a screen, or a touch-screen, coupled with the front shutter or support frame in such a way as to be available to the user who uses them for the choice of the products.

[0014] In this case, the products and/or goods are made available to the user, generally by lateral or frontal translation, at an outlet mouth through which the previously rented product is returned after its temporary use, always as a result of the payment of a given amount or the insertion of a prepaid card from which the amount due is automatically deducted.

[0015] Even this second type of vending machine comprises transport and dispensing means, for example a pincer associated with a carriage slidable along at least two axes or a kind of lift sliding along at least three axes, which, following the command given on the keyboard by of the end user, withdraw the chosen product or the good

(edible or durable) from the display store and convey it, performing a lateral and/or vertical translation movement, to the outlet mouth if the user is renting or purchasing the product or good, or in the opposite direction (from the collection room to the display store) if the user is returning the rented product or good.

[0016] In the sector of automatic distribution of edible and/or durable goods, the sale and/or rental machines for the purpose provided, currently available on the market - an example of which is presented in the prior art document published with WO2017/187467 - thus adapt to any customer requirement (understood as the purchaser of the machines themselves), essentially allowing the effective, safe, reliable and hygienic sale of any type of item even in outdoor locations.

[0017] However, even the most modern, recent and advanced vending machines of the prior art (of which figures 1, 2 and 3 show a typical executive solution) just briefly described suffer from some recognized drawbacks.

[0018] The main drawback of the present state of the art herein considered derives from the fact that, at the inner collection room, the anti-shoplifting means installed in known automatic vending machines are fixed, applied in a non-modifiable position, (usually and generally they comprise a metal laminar closing plate, provided with side edges fixed to the inner wall of the box-shaped support frame T or to the structure of the display store).

[0019] As shown especially in figures 2 and 3, this inevitably entails that in the part behind the fixed closing plate (indicated with A and whose height reaches even 20 cm), the display store M does not in any way provide support shelves for the containment of products or goods to be dispensed, with a consequent net loss (or waste) of useful space that would otherwise be exploitable for the display of products or goods intended for the public.

[0020] Basically, the automatic vending machines of the prior art, due to the constructive conception of the anti-shoplifting means of which they are provided, do not fully or in any case optimally exploit the space available inside the box-shaped support frame and intendable for the display store for making available to the public edible products and/or durable goods that can be purchased and/or rented.

[0021] The further drawback suffered by the known vending machines, direct consequence of what has just been pointed out, is that their potential display capacity, given by the inner volume of the box-shaped support frame, is not optimal or exploited to the maximum.

[0022] For its part, the anti-shoplifting means (such as a bulkhead numbered with 11) of the vending machine highlighted by the known document WO2017/187467 are, actually and more precisely, coupled with the dispensing or transport means (such as the movable carriage) of the products and/or goods and slide between an open position and a closed position to allow, respectively, to place the selected items in an automatic positioning system (numbered with 10 in that document),

passing them through an opening (numbered with 12 in WO2017/187467) made in such a positioning system, and to deliver to the user the selected items, after closing the opening 12 itself.

5 **[0023]** In WO2017/187467, the anti-shoplifting means, negatively and disadvantageously, slide only along a vertical direction so that, whatever is their position with respect to the opening which allows the introduction of the selected products and/or goods to be dispensed into the automatic positioning system and/or, in some cases, their return, obstruct or make more difficult and inconvenient for the end user the view of a part of these products and/or goods still in the store.

10 **[0024]** Moreover, the constructive design and installation of the anti-shoplifting means shown in the prior art document WO2017/187467, is rather complex.

15 **[0025]** Starting, therefore, from the awareness of the aforementioned drawbacks of the present state of the art considered herein, the present invention aims to effectively overcome these drawbacks.

20 **[0026]** In particular, primary purpose of the invention is to provide an automatic distributor (or automatic vending machine) of edible products (or foodstuffs) and/or durable goods (or objects or items) which includes a horizontal supporting shelf also at the inner collection room to which the access mouth from which the user picks up or returns the chosen product or good faces.

25 **[0027]** In other words, main purpose of the invention is to provide an automatic distributor of edible products and/or durable goods which has a load or exposure capacity of edible products and/or durable goods higher than that one of automatic distributors, the inner volume of the box-shaped support frame which distinguishes it and which, together with the front shutter, is the only component with which the user can physically enter into contact being equal.

30 **[0028]** Within the scope of this purpose, it is therefore task of the present invention to devise an automatic distributor of edible products and/or durable goods which contains a number of edible products and/or durable goods greater than that one of the equivalent automatic distributors of the prior art, always the inner volume of the box-shaped support frame belonging to the automatic distributor being equal.

35 **[0029]** In the cognitive sphere of the aforesaid main purpose, it is also task of the present invention itself to indicate an automatic distributor of edible products and/or durable goods which is capable of satisfying a number of users greater than the known automatic distributors, still the inner volume of the box-shaped support frame being equal and at the net of interventions to restore the display store performed by the operator responsible for managing the automatic distributor.

40 **[0030]** It is a further purpose of the invention to provide an automatic distributor of edible products and/or durable goods that, unlike what is permitted by the automatic distributors of the prior art, can contain and distribute to the public items even profoundly different each other by use

requirements, and in particular items of traditional, if not daily, consumption (such as sweet and savory snacks, soft drinks, chocolates and candies in bags) together with items prohibited by law to persons of minor age (such as alcoholic beverages, cigarettes, condoms and so on).

[0031] It is a last but not least purpose of the present invention to make concrete an automatic distributor of edible products and/or durable goods that achieves the purposes and effectively carries out the consequent tasks mentioned above without that this entailing an excessive complication of its constructive conception. Said purposes are achieved by means of an automatic distributor (or automatic vending machine) of edible products and/or durable goods (or objects or items) as per claim 1 attached, as hereinafter referred for the sake of brevity.

[0032] Further technical features of detail of the automatic distributor of edible products and/or durable goods of the present invention are contained in the corresponding dependent claims.

[0033] The above claims, hereinafter specifically and concretely defined, are intended as an integral part of the present description.

[0034] Advantageously, the automatic distributor (or automatic vending machine) of edible products and/or durable goods, object of the present invention, allows to recover, with respect to known distributors comparable to it and of equal volume, a significant part of the space available inside the box-shaped support frame and effectively and appropriately appoint it to the display of products and/or goods: in practice, the automatic distributor of the invention increases by about 20% with respect to the current state of the equivalent technique the space available for the display of products and/or goods which can be dispensed to the public.

[0035] This is due to the fact that in the automatic vending machine of the invention, the anti-shoplifting means are not of the fixed type but include at least one movable laminar damper (inventive heart of the present description) contained in the support frame which it is properly coupled with, and operatively connected with moving means which alternately move it between a rest position, defined when the movable bulkhead (or safety window) takes the release position, in which the laminar damper is arranged according to a plane parallel to the supporting shelves, and an operating position, defined at least when the movable bulkhead takes the re-enter position, in which the laminar damper is arranged according to a plane orthogonal to the plane defined by the supporting shelves and obstructs access to the display store through the collection room and the open access mouth faced to it.

[0036] Equally advantageously, the automatic distributor of the invention allows to expose and, therefore, deliver to the end users a quantity of edible products and/or durable goods greater than that one associated with the vending machines of the known type, the inner volume of the box-shaped support frame in which the display store is contained being equal: in practice, the automatic

distributor of the invention can house, in its own display store, more than 1,200-1,400 products generally distributed on a total of nine horizontal supporting shelves.

[0037] Likewise advantageously, the vending machine of the present invention allows to satisfy a number of users greater than the equivalent vending machines of the prior art, always the inner volume of the box-shaped support frame in which the display store is contained being equal.

[0038] In a preferred and advantageous manner, moreover, contrary to what is allowed by the vending machine shown in WO2017/187467, the automatic distributor of the invention can contain and distribute to the public, at the same time, articles even with intended use and users' type profoundly different each other: for instance, the display store of the automatic distributor of the invention is able to simultaneously house classic edible products, such as sweet and savory snacks, beverages, sweets, as well as goods or items prohibited by law to persons of minor age, such as alcoholic beverages, cigarettes, condoms.

[0039] This advantage is reached when the laminar damper remains in the operating position even when the movable bulkhead takes the release position (in which the movable bulkhead itself, in this preferred embodiment necessarily driven by actuation means of automatic type, closes the access mouth of the collection room defined in the box-shaped support frame) and is automatically positioned by the moving means in the rest position as soon as the user inserts into a specific slot in the support frame a personal identity document - in the shape of a card or badge - which certifies its age of majority (established in Italy, as known at 18 years): all this before the user makes his choice, having available also goods intended to adults, and before the automatic actuation means, following the selection made by the user, place the movable bulkhead in the re-enter position.

[0040] In summary, therefore, in the embodiment of the invention which can be deduced from the previous paragraph, the personal identity card of the user, when introduced into the appropriate slot in order to check the user's age through reading means electronically connected with a central processing and control unit managing the operation of the entire vending machine, acts indirectly as auxiliary actuator of the moving means which position the laminar damper in the rest position, in such a way that also the horizontal supporting shelf of the display store previously hidden by it outside is visible and available to the adult user who, immediately afterwards, is free to make his choice having at his disposal the entire range of products, goods or items positioned by the operator in the display store. Also advantageously, moreover, the height position of the movable laminar damper, as said heart of the inventive technical concept of the automatic distributor of the invention, is adjustable at will during installation phase according to the dimensions of the products or goods which are housed in the housing lanes of the horizontal supporting shelf that it must hide

and protect, considering however the space constraints imposed by the support frame.

[0041] It follows that, unlike what is shown in the prior document WO2017/187467, the movable laminar damper, starting from the horizontal rest position, takes the operating position being moved by the moving means, generally towards the bottom, by a length sufficient to hide the products or goods displayed on the horizontal supporting shelf (generally below) it must protect, making it inaccessible to the user from the access mouth and the inner collection room: such a vertical length of which the laminar damper is moved, thus, depends on the height of the products or goods placed in the supporting shelf to be hidden to the user when the movable bulkhead is raised and/or can be raised to open the access mouth of the collection room.

[0042] Said purposes and advantages will become more apparent from the description that follows, relating to a preferred embodiment of the automatic distributor (or automatic vending machine) of edible products and/or durable goods (or objects or items) of the invention, given by way of indicative and illustrative, but not limiting, title with reference to the attached drawings in which:

- figure 1 is a front view of a known vending machine;
- figure 2 is the view of figure 1 according to the section plane II-II;
- figure 3 is a simplified front view of the vending machine of figure 1;
- figure 4 is the front view of an automatic distributor of the invention;
- figure 5 shows a simplified front view of the vending machine of figure 4;
- figure 6 is the view of figure 4 according to the section plane VI-VI;
- figure 6a is an enlargement of a construction detail of figure 6;
- figure 7 is an axonometric view of a constructive assembly of figure 5;
- figure 8 is a top plan view of figure 7;
- figure 9 is a bottom plan view of figure 7.

[0043] The automatic distributor of durable goods and/or edible products of the invention, particularly suitable for the sale of delicate products or products that must be dispensed in a horizontal position, is illustrated in figures 4, 5 and 6, where it is globally numbered with 1.

[0044] As it can be observed, this automatic distributor 1 comprises:

- a substantially box-shaped support frame 2 adapted to rest on a reference surface, such as the flooring of any structural element accessible to the public, and having an inner collection room 3;
- a display store 4 contained in the support frame 2 and formed by a plurality of supporting shelves 5 parallel each other, arranged at heights different each other along a vertical direction Y and suitable

to receive also durable goods and/or edible products to be delivered to the end user;

- an at least partly transparent front shutter 6 suitable to allow the end user to view the even durable goods and/or edible products to make his own choice: this front shutter 6 is rotatably coupled with the support frame 2 (through rotation means such as one or more hinges mutually aligned vertically along the central edge 2d of the support frame 2) to allow an operator to move it in opening/closing of the support frame 2 itself and thus to intervene inside the display store 4 to perform maintenance, repair, restoration operations of the products in the housing lanes 30 and so on;
- a movable bulkhead 7 coupled to the front shutter 6 and cooperating with actuation means, unshown in the attached figures, suitable to move it between a release (or lowered) position, in which the movable bulkhead 7 closes an access opening 8 of the inner collection room 3, and a re-enter (or raised or lifted) position in which the movable bulkhead 7 opens the access mouth 8 for picking up and/or returning the products or goods by said user, especially the withdrawal of (even) durable goods and/or edible products finally purchased, used or consumed and/or the return of durable goods temporarily rent;
- dispensing means, as a whole numbered with 9, cooperating with the display store 4 to direct the products and/or goods selected by the user to the access mouth 8 and/or to bring back to the horizontal supporting shelves 5 of the display store 4 the products returned by the user through the access mouth 8 and the inner collection room 3;
- anti-shoplifting means, as a whole indicated by 10, arranged in the collection room 3 and facing the access mouth 8 of the collection room 3 itself, so as to prevent the user from accessing the display store 4 when the movable bulkhead 7 takes the re-enter position and the products and goods are in supply and/or return phase.

[0045] The automatic vending machine 1 of the invention is convenient and practical to use both for the customer/purchaser and the end user: indeed, it does not oblige the end user who buys the product and/or good to bend himself down to pick it up, but it is delivered at man's height, at about 85-90 cm from the reference surface. To this extent, as it can be seen in figure 4, in the automatic distributor 1 of the invention, the inner collection room 3, advantageously with respect to other "vending machines" available on the market, is arranged in the center of the partly transparent front shutter 6 (or display case) and, preferably, also the movable bulkhead 7 is totally transparent.

[0046] This constructive solution facilitates the withdrawal and return operation by the user of the product and/or good chosen and delivered, thanks to the opening, in this case automatic, of the motorized movable bulk-

head 7 and to the position of the inner collection room 3 at about 85-90 cm from the reference surface, also designed considering the needs of disabled or with mobility difficulties people.

[0047] The vending machine 1 of the present invention is an apparatus equipped with the most fully-developed and advanced technologies, such as for example a touch-screen LCD display 31, dispensing means 9 of the transport type, as it will be better highlighted later on, front/rear loading of products and/or goods by the operator, displays for electronic prices 32, various payment systems 33 (even the most innovative ones).

[0048] The vending machine 1 of the invention also comprises, according to technological solutions yet currently available in the known machinery of the sector involved, a self-diagnosis system before each dispensing, suitable for checking the operating status of each housing lane 30 of the products and/or goods to be supplied to end users.

[0049] All the movements of the movable components of the automatic distributor 1 of the invention are preferably managed by a central processing and control unit, not shown in the enclosed drawing tables, contained inside the box-shaped support frame 2 where it is, if necessary, accessible to the operator only through the opening of a side door, for the sake of simplicity not visible in the following figures. In accordance with the innovative and salient feature of the invention, the anti-shoplifting means 10 include a movable laminar damper 11 contained in the support frame 2 to which it is stably coupled and operatively connected with moving means, better visible in figures 7-9 where they are overall indicated with 12, which move it alternately between a rest position, defined when the movable bulkhead 7 takes the release position, in which the laminar damper 11 is arranged according to a plane parallel to the supporting shelves 5, and an operating position, defined at least immediately before the movable bulkhead 7 takes the re-enter position, in which the laminar damper 11 is arranged according to a plane orthogonal to the plane defined by the supporting shelves 5 and obstructs access to the display store 4 through the access mouth 8 and the collection room 3, preventing any desire for fraudulent removal of products by an ill-intentioned user when the movable bulkhead 7 takes the re-enter position.

[0050] The presence of the movable laminar damper 11, therefore, represents a deterrent to the illegal action of a user who wants to fraudulently withdraw, without paying the relative amount, the products and/or goods from one or more of the horizontal supporting shelves 5 of the display store 4, discouraging or at least complicating deeply the bad intentions thereof.

[0051] In particular, the movable laminar damper 11 describes, preferably, a substantially and essentially semi-rectangular trajectory in its passage from the rest position to the operating position, such that the shorter linear portion of such a trajectory is vertical and the longer linear portion is horizontal: in this case, moreover, the

vertical section is underlying the horizontal section, so that the movable laminar damper 11 descends at least partly downwards in its movement from the rest position to the operating position, as shown in the enlarged detail of figure 6a.

[0052] Figures 6 and 7 and again the enlarged detail of figure 6a show that, in a preferred but non-binding manner, the movable laminar damper 11 is integrally arranged according to a horizontal plane when it takes the rest position and at least partly in a vertical plane when it takes the operating position (better shown always in figure 6a).

[0053] More precisely, the movable laminar damper 11 is arranged immediately below one of the aforementioned horizontal supporting shelves 5 of the display store 4 when it takes the rest position.

[0054] This allows, advantageously, to the anti-shoplifting means 10, in particular to the mobile laminar damper 11, of the vending machine 1 of the present invention to not in any way obstruct the end user the view of the products and/or goods stored in the display store 4, facilitating the relative possible choice, when the movable bulkhead 7 is in the release position where it closes the access mouth 8 of the inner collection room 3.

[0055] In addition, as it can be seen more clearly from figure 7, the movable laminar damper 11 extends substantially over the entire width L and the entire depth P of the display store 4, substantially on the exact pattern of what occurs for each of the horizontal supporting shelves 5.

[0056] Preferably and appropriately, the movable laminar damper 11 is coupled with the box-shaped support frame 2 through guiding means, generally indicated with 13, which favour its controlled and regular sliding during the passage from the rest position to the operating position and vice versa.

[0057] More in detail, the guiding means 13 are arranged on two inner side walls 2a, 2b facing and opposite each other of the support frame 2 itself, separated posteriorly by the bottom wall 2e and frontally by the front shutter 6 as well as by a fixed longitudinal column 34, placed side-by-side the rotatable front shutter 6 and belonging to the support frame 2 and in which the interface commands available to the user (as well as to the operator) previously and synthetically cited are applied. In a preferred but not exclusive manner, the guiding means 13 comprise in the specific case:

- a pair of horizontal shaped section bars 14, 15 opposite each other, arranged by fastening means, not indicated for simplicity, one for each of the inner side walls 2a, 2b of the support frame 2, in which the side edges 11b, 11c opposite each other of the movable laminar damper 11 are inserted when it takes the rest position;
- a pair of mutually opposite vertical shaped section bars 16, 17, arranged by fastening means, not indicated for simplicity, one for each of the inner side

walls 2a, 2b of the support frame 2, in which the side edges 11b, 11c opposite each other of the laminar damper 11 are at least partly inserted when it takes the operating position.

[0058] In practice, the side edges 11b, 11c of the laminar damper 11 engage in the respective vertical shaped sections bars 16, 17 for a length that preferably depends on the height of the edible products and/or durable goods contained in the housing lanes 30 of the horizontal supporting shelf 5 which must be hidden outside and protected when the movable bulkhead 7 takes the re-enter position and the products and/or goods are in dispensing and/or returning phase.

[0059] Each of the horizontal shaped section bars 14, 15 or vertical section bars 16, 17 presents in cross section a substantially C-shaped opened profile, whose opening faces the inner volume of the support frame 2 and towards each of the side edges 11b, 11 c of the laminar damper 11.

[0060] In accordance with what has been previously described with respect to the trajectory described by the laminar damper 11 in its passage from the rest position to the operating position, it should be noted that, by way of preferred but not binding, the horizontal section bars 14, 15 are arranged at a vertical height, calculated starting from an internal base wall 2c of the support frame 2, higher than a vertical height at which the upper end 16a, 17a of the vertical section bars 16, 17 is located.

[0061] As far as the moving means 12 are concerned, preferably but not necessarily they are arranged beneath the laminar damper 11.

[0062] More specifically and preferentially, the moving means 12 comprise:

- two mechanical transmission assemblies, each of which is indicated as a whole with 18, coupled with the lower surface 11 a of the laminar damper 11;
- motorization means, generally indicated with 19, keyed to at least one of the members of the mechanical transmission assemblies 18.

[0063] In particular, figures 8 and 9 show that, in the specific case, the motorization means 19 comprise a pair of electric motors 20, 21, each of which keyed to a first mechanical transmission member 22, 23 (such as a toothed wheel) through which the relative electric motor 20, 21 is connected with a respective second mechanical transmission member 24, 25 (such as a chain) coupled with the lower surface 11a of the laminar damper 11 and cooperating with a third transmission member 26, 27 opposed and aligned with the first transmission member 22, 23 (such as a toothed wheel again) along a horizontal direction Z orthogonal to the vertical direction Y and coinciding with the depth development direction P of the laminar damper 11.

[0064] More specifically, the first mechanical transmission member 22, 23 is arranged near the rear edge 11d

of the laminar damper 11 while the third mechanical transmission member 26, 27 is arranged at the front edge 11 of the laminar damper 11.

[0065] Substantially, therefore, in this optional embodiments of the invention, the first mechanical transmission member 22, the second mechanical transmission member 24 and the third mechanical transmission member 26 form a mechanical transmission assembly 18 which defines a horizontal direction Z parallelly spaced apart from the horizontal direction defined by another mechanical transmission assembly 18 formed by the first mechanical transmission member 23, the second mechanical transmission member 25 and the third mechanical transmission member 27.

[0066] The provision of two mechanical transmission assemblies 18 on the lower surface 11a of the laminar damper 11 advantageously allows to get a support and a balanced movement of the latter.

[0067] However, this does not exclude that in further embodiments of the automatic distributor of the invention, not shown in the attached tables, the moving means comprise a number of mechanical transmission assemblies different from two, this number being able to vary according to the construction choices starting from one. In other embodiments of the invention, not illustrated, also the motorization means could include a number of electric motors different from two, the number of electric motors being able to vary according to requirements starting from one and independently of the number of mechanical transmission units installed (it should be thought about the possibility of moving a pair of mechanical transmission units by means of a single electric motor by providing transmission means).

[0068] According to the preferred embodiment described herein of the invention, the display magazine 4 comprises, as shown in figures 5 and 6, also an additional supporting shelf 51 suitable for receiving edible products and/or durable goods to be made available to the user, arranged at the inner collection room 3 and, when the movable bulkhead 7 takes the aforesaid re-enter position, inaccessible to the user due to the interposition of the movable damper 11 between it and the access mouth 8.

[0069] The presence of the additional supporting shelf 51 is the direct and advantageous consequence of the installation, in the automatic distributor 1 of the invention, of anti-shoplifting means 10 of the movable type, such as the laminar damper 11, and determines the possibility of positioning in the display store 4 a number of edible products and/or goods to be dispensed greater than the known art, while ensuring adequate safety conditions against incorrect actions by users who intend to fraudulently remove products and/or goods from the automatic distributor 1. More in detail, the additional supporting shelf 51 is stably and removably coupled with the two inner side walls 2a, 2b facing and opposite each other of the support frame 2 through fastening means, generally numbered with 28 and of the type per se known to the

man skilled in the art, being appropriately equal to those ones with which the supporting shelves 5 are fixed to the inner side walls 2a, 2b themselves. With particular reference to the dispensing means 9, they comprise, at pure preferred title, a lift 29 of a known type, sliding vertically and horizontally on three axes, with respect to the support frame 2 and to the display store 4 from which it receives the edible products and/or durable goods that can be consumed or used by the end user to convey them to the inner collection room 3, or to which it delivers the products and/or durable goods that the user himself returns, after having rent them hopefully without damaging them, placing them in the inner collection room 3.

[0070] The lift 29 is made sliding by motorization means, overall numbered with 35, contained in the box-shaped support frame 2 and, by means of the loading surface 36 defined by it receiving a tray (not shown) housed in the display store 4 that supports the edible product and/or durable good selected, makes it directly available to the user at the inner collection room 3 and relative access mouth 8. Under the operative profile, the automatic distributor 1 of the present invention has a general operation substantially equivalent to that one of the vending machines of the prior art, with the only notable and relevant exception represented by the movable laminar damper 11 which, according to what has already been previously described, represents the innovative technical core of the invention itself: under the action exerted on it by the moving means 12, the laminar damper 11 takes the rest position and the operating position according to the position of the movable bulkhead 7.

[0071] In particular, the moving means 12 initially position the movable laminar damper 11 in the rest position, when the movable bulkhead 7 stably takes the release position, so that the user can also view and have available the edible products and/or durable goods of the additional supporting shelf 51.

[0072] Once the choice has been made by the operator, the moving means 12 bring the laminar damper 11 to the operating position, defined immediately before the movable bulkhead 7 takes, in this case automatically, the re-enter position: in such a position, the laminar damper 11 is arranged at least in part according to a plane orthogonal to the plane defined by each of the supporting shelves 5 and obstructs access to the display store 4 through the access mouth 8, in particular access to the additional supporting shelf 51 behind the movable laminar damper 11. According to the description just given, it is, therefore, understood that the automatic distributor (or automatic vending machine) of durable goods (or objects or items) and/or edible products of the present invention achieves the purposes and reaches the advantages mentioned above.

[0073] In addition to providing a better delivery method than other vending machine solutions already on the market, the automatic distributor of the present invention also guarantees a process of delivery of greater efficacy and reliability, which, avoiding to manipulate and/or overturn

the selected item, allows to provide users even the most fragile and delicate products and/or goods (such as tablets, mobile phones, smartphones, glass products and even more).

5 **[0074]** Moreover and in combination with this, in the automatic distributor of the invention the anti-shoplifting means have a constructive conception and allow an installation simpler than those ones which can be found in equivalent automatic vending machines of the known type, mainly thanks to the fact of being directly coupled with a more solid and extended structure determined by the substantially box-shaped support frame.

10 **[0075]** Upon execution, changes could be made to the automatic distributor (or automatic vending machine) of durable goods and/or edible products of the invention, consisting, for example, in dispensing means different from those ones previously briefly described and illustrated in the attached tables of drawing.

15 **[0076]** In addition to this, there could be other embodiments of the automatic distributor (or automatic vending machine) of durable goods and/or edible products of the present invention, not illustrated below, in which the actuation of the movable bulkhead could be manual and constituted, therefore, by the hand of the end user. Moreover, in further embodiments of the automatic distributor (or automatic vending machine) of durable goods and/or edible products herein exclusively claimed, unaccompanied in the following by reference figures, the moving means, cooperating with the laminar damper to place it alternately between the rest position and the operating position, could be different from the previous ones described in detail and visible in the attached figures (for instance a pair of pulleys in the central slot of which a transmission belt slides due to the action of an electric motor), which doesn't affect the advantage brought by the present invention. Other embodiments of the automatic distributor (or automatic vending machine) of durable goods and/or edible products of the invention, still not shown, could provide that the display store is composed of a number of horizontal supporting shelves different from that one visible in the attached figures, since this number can vary according to the construction choices and/or application requirements starting from two.

20 **[0077]** In addition, in further embodiments of the automatic distributor of the invention, not shown in the attached drawings, the anti-shoplifting means could comprise a number of movable laminar dampers greater than one, always contained in the support frame to which they are coupled and operatively connected with the moving means which move it alternately between a rest position, defined when the movable bulkhead takes the release position, in which each laminar damper is arranged according to a plane parallel to the supporting shelves of the display store, and an operating position, defined at least immediately before the movable bulkhead takes the re-enter position, in which each laminar damper is arranged at least in part according to a plane orthogonal to the plane defined by the supporting shelves and ob-

structs access to the display store through the access mouth when the bulkhead mobile takes the re-enter position.

[0078] In such a case, the movable laminar dampers could be arranged, one according to a plane parallel to that one of the other, at the same supporting shelf of the display store and/or at supporting shelves which are distinct from each other, distributed along the vertical direction of development of this display store (for example the support shelf directly above and/or below the access mouth of the inner collection room).

[0079] Furthermore, the automatic vending machine of the invention could comprise, in alternative and optional embodiments, at least one auxiliary movable laminar damper, not properly with an anti-shoplifting function, coupled to the support frame at any supporting shelf of the display store (that is, established at will at production stage, depending on the construction choices) and suitable to take the operating position even when the movable bulkhead, operated by automatic actuation means, takes the release position in which, as seen, closes the access mouth of the collection room defined in the box-shaped support frame.

[0080] The presence of the at least one auxiliary movable laminar damper is particularly recommended and suitable when the automatic vending machine of the invention provides for the supply of products prohibited to minors and intended for adults only, since it also allows the auxiliary mobile laminar damper to be positioned automatically, through the moving means, in the rest position only when the user inserts, in a special slot made in the support frame, a personal identity document - in the shape of a card or badge - which certifies the age of majority, before the user makes his choice and before the automatic actuation means, following the selection made by the user, arrange the movable bulkhead in the return position.

[0081] It is, finally, clear that several other changes could be made to the vending machine concerned, without departing from the principle of novelty intrinsic in the inventive idea expressed herein, as it is clear that, in the practical implementation of the invention, materials, shapes and sizes of the illustrated details could be changed, as needed, and replaced with others technically equivalent.

[0082] Where the constructive features and techniques mentioned in the following claims are followed by reference numbers or signs, those reference signs have been introduced with the sole objective of increasing the intelligibility of the claims themselves and therefore they have no limiting effect on the interpretation of each element identified, by way of example only, by these reference signs.

Claims

1. Automatic vending machine (1) of edible products

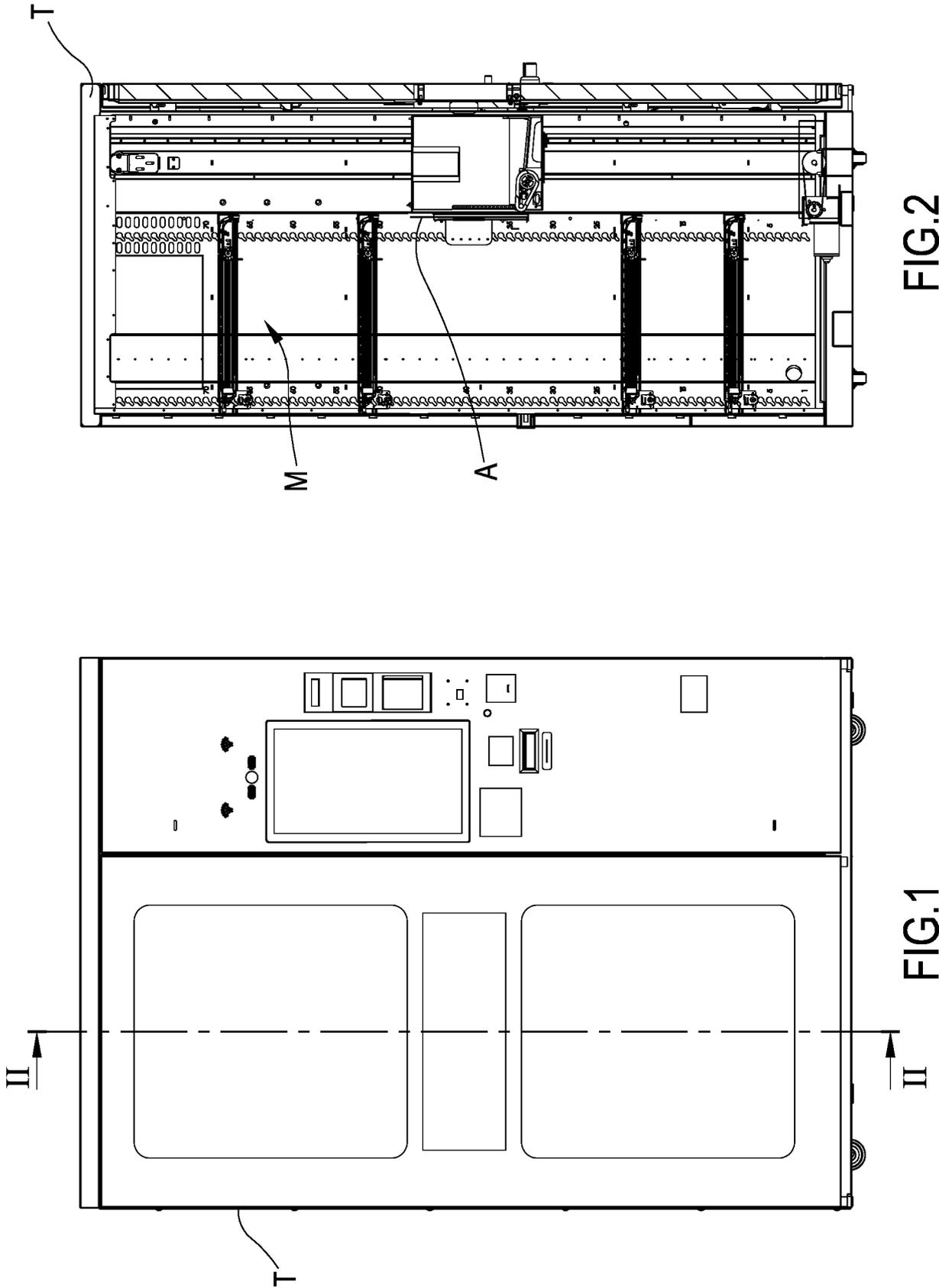
and/or durable goods which comprises:

- a substantially box-shaped support frame (2) suitable to rest on a reference surface and presenting an inner collection room (3);
- a display store (4) contained in said support frame (2) and formed by a plurality of supporting shelves (5) parallel each other, arranged at different heights along a vertical direction (Y) and suitable to receive products and/or goods to be supplied to a user;
- an at least partly transparent front shutter (6), revolvingly coupled with said support frame (2) to allow an operator to move it in opening/closing said support frame (2);
- a movable bulkhead (7) coupled with said front shutter (6) and cooperating with actuation means suitable to move it between a release position, in which said movable bulkhead (7) closes an access mouth (8) of said collection room (3), and a re-enter position in which said movable bulkhead (7) opens said access mouth (8) for picking up and/or returning said products and/or goods;
- dispensing means (9) cooperating with said display store (4) to direct said products and/or goods selected by said user to said collection room (3) and/or to bring back to said display store (4) said products and/or goods returned by said user through said access mouth (8);
- anti-shoplifting means (10), arranged in said collection room (3) and facing said access mouth (8) of said collection room (3), in such a way as to prevent said user from accessing said display store (4) when said movable bulkhead (7) takes said re-enter position and said products and/or goods are in supply and/or return phase,

characterized in that said anti-shoplifting means (10) comprise a movable laminar damper (11) contained in said support frame (2) and operatively connected with moving means (12) which alternately move it between a rest position, defined when said movable bulkhead (7) takes said release position, in which said laminar damper (11) is arranged according to a plane parallel to said supporting shelves (5), and an operating position, defined immediately before said movable bulkhead (7) takes said re-enter position, in which said laminar damper (11) is arranged at least partly according to a plane orthogonal to the plane defined by said supporting shelves (5) and obstructs access to said display magazine (4) through said access mouth (8).

2. Vending machine (1) according to claim 1), **characterized in that** said laminar damper (11) describes a substantially semi-rectangular trajectory in its pas-

- sage from said rest position to said operating position, such that the shorter linear stretch of said trajectory is vertical and the longer linear stretch is horizontal.
3. Vending machine (1) according to claim 1) or 2), **characterized in that** said laminar damper (11) is integrally arranged according to a horizontal plane when it takes said rest position and at least partly according to a vertical plane when it takes said operating position.
 4. Vending machine (1) according to any of the previous claims, **characterized in that** said laminar damper (11) is arranged immediately below one of said supporting shelves (5) of said display store (4) when it takes said rest position.
 5. Vending machine (1) according to any of the previous claims, **characterized in that** said laminar damper (11) extends substantially over the entire width (L) and the entire depth (P) of said display store (4).
 6. Vending machine (1) according to any of the previous claims, **characterized in that** said movable laminar damper (11) is coupled with said support frame (2) through guide means (13) which ease controlled and regular sliding thereof from said rest position at said operating position and vice versa.
 7. Vending machine (1) according to claim 6), **characterized in that** said guide means (13) are arranged on two inner side walls (2a, 2b) facing and opposite each other of said support frame (2).
 8. Vending machine (1) according to claim 6) or 7), **characterized in that** said guide means (13) comprise:
 - a pair of horizontal shaped section bars (14, 15), arranged one for each of said inner side walls (2a, 2b) of said support frame (2), in which the side edges (11b, 11c) opposite each other of said laminar damper (11) are inserted when it takes said rest position;
 - a pair of vertical shaped section bars (16, 17), arranged one for each of said inner side walls (2a, 2b) of said support frame (2), in which at least part of said side edges (11b, 11c) opposite each other of said laminar damper (11) are inserted when it takes said operating position.
 9. Vending machine (1) according to claim 8), **characterized in that** each of said horizontal (14, 15) or vertical (16, 17) section bars presents in cross section a profile opened towards the inner volume of said support frame (2) and towards each of said side edges (11b, 11c) of said laminar damper (11).
 10. Vending machine (1) according to claim 8) or 9), **characterized in that** said horizontal section bars (14, 15) are arranged at a vertical height from an internal base wall (2c) of said support frame (2) higher than a vertical height at which said vertical section bars (16, 17) are arranged.
 11. Vending machine (1) according to any of the previous claims, **characterized in that** said moving means (12) are arranged beneath said laminar damper (11).
 12. Vending machine (1) according to any of the previous claims, **characterized in that** said moving means (12) comprise:
 - at least one mechanical transmission assembly (18) coupled with the lower surface (11 a) of said laminar damper (11);
 - motorization means (19) keyed to at least one of the members of said mechanical transmission assembly (18).
 13. Vending machine (1) according to claim 12), **characterized in that** said motorization means (19) comprise at least one electric motor (20, 21) keyed to a first mechanical transmission member (22, 23) through which said electric motor (20, 21) is connected with a second mechanical transmission member (24, 25) coupled with said lower surface (11a) of said laminar damper (11) and cooperating with a third transmission member (26, 27) opposed and aligned with said first transmission member (22, 23) along a horizontal direction (Z) orthogonal to said vertical direction (Y) and coinciding with the depth development direction (P) of said laminar damper (11).
 14. Vending machine (1) according to any of the previous claims, **characterized in that** said display magazine (4) comprises an additional supporting shelf (51) suitable for receiving said products to be supplied to said user, arranged at said inner collection room (3) and, when said movable bulkhead (7) takes said re-enter position, inaccessible to said user due to the interposition of said movable damper (11) between said additional supporting shelf (51) and said access mouth (8).
 15. Vending machine (1) according to claim 14), **characterized in that** said additional supporting shelf (51) is stably and removably coupled with two inner side walls (2a, 2b) facing and opposite each other of said support frame (2) through fastening means (28).



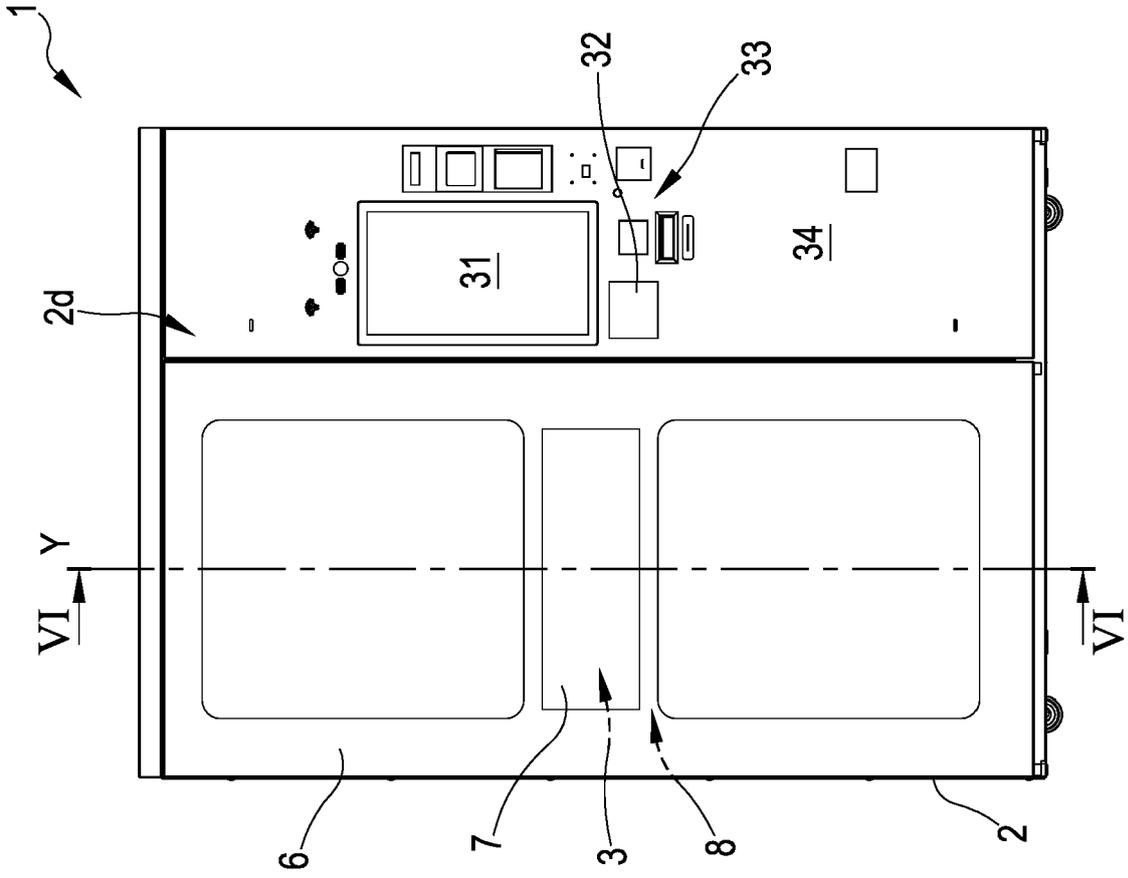


FIG. 4

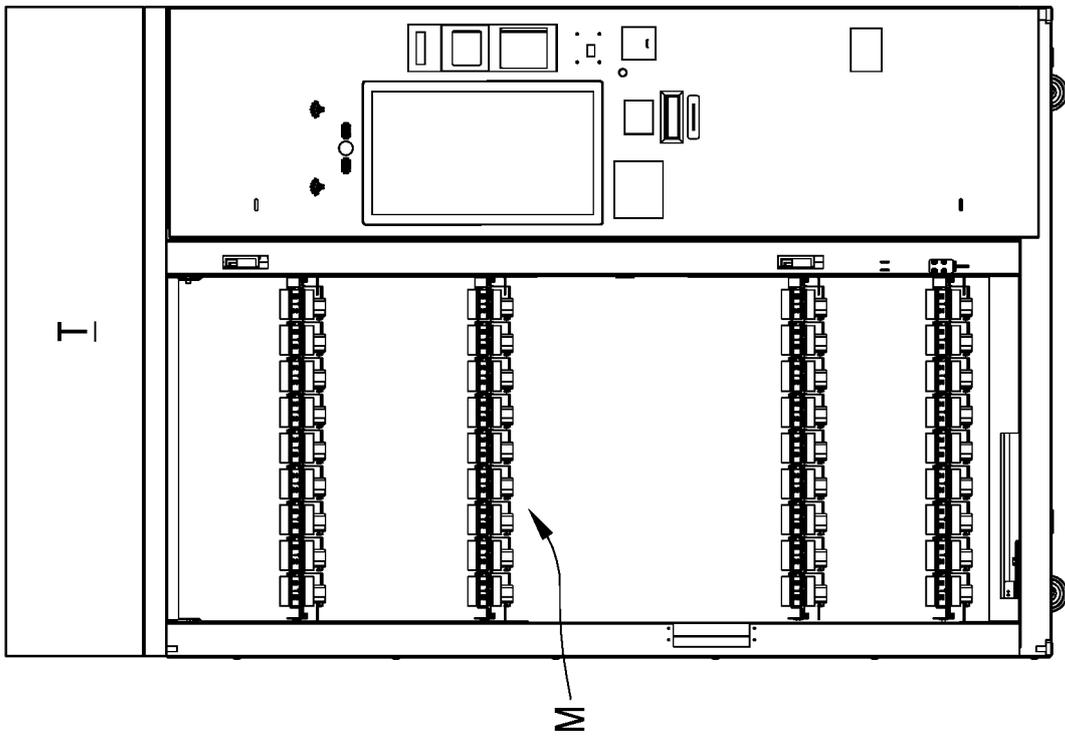


FIG. 3

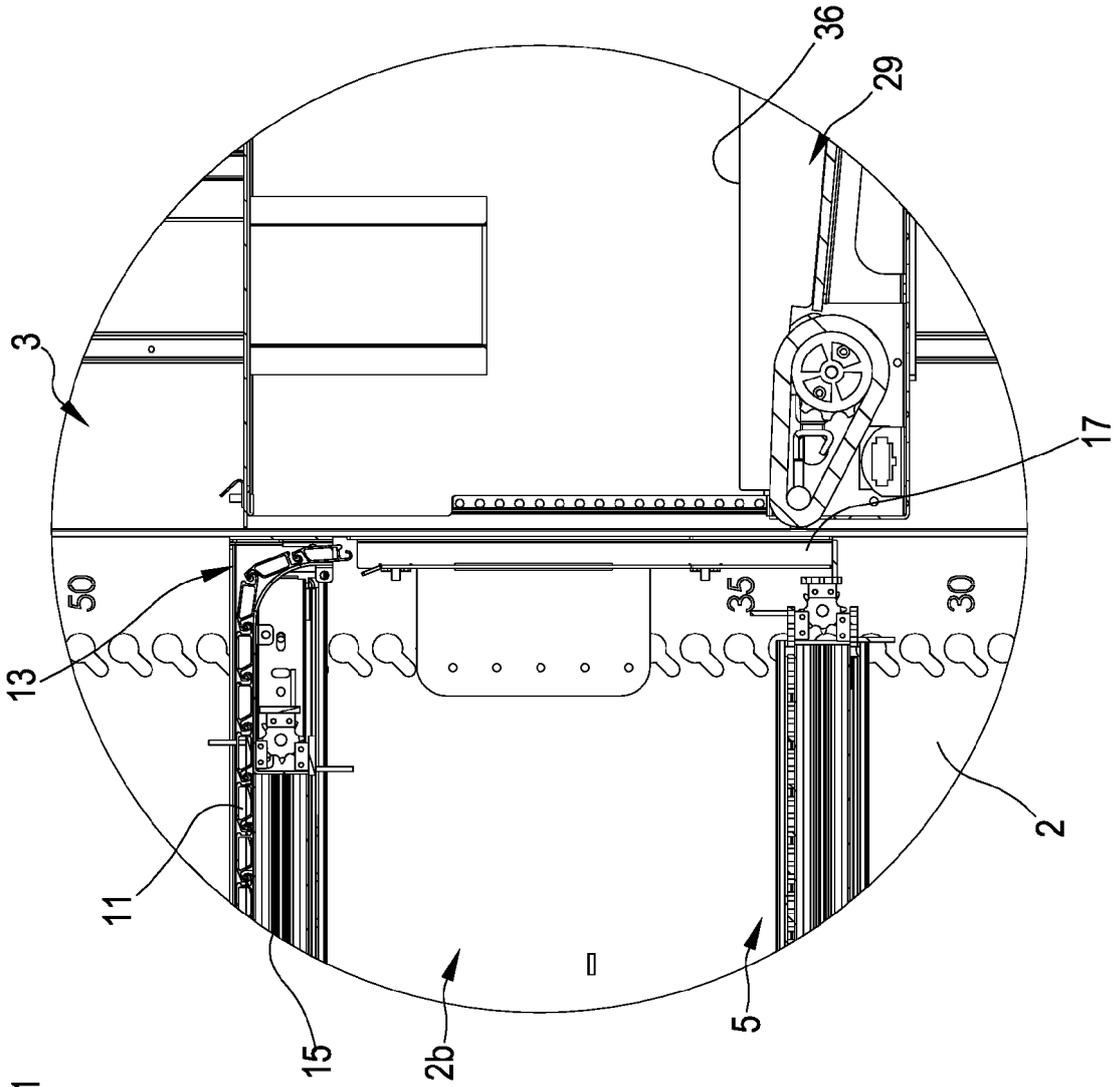


FIG.6a

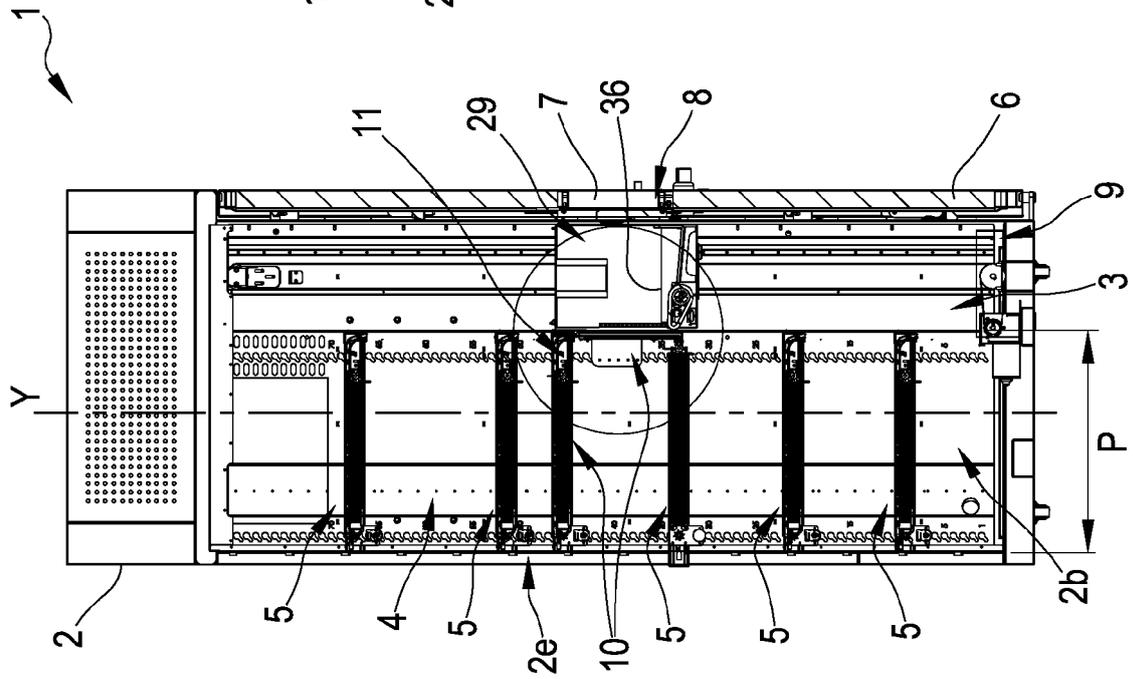


FIG.6

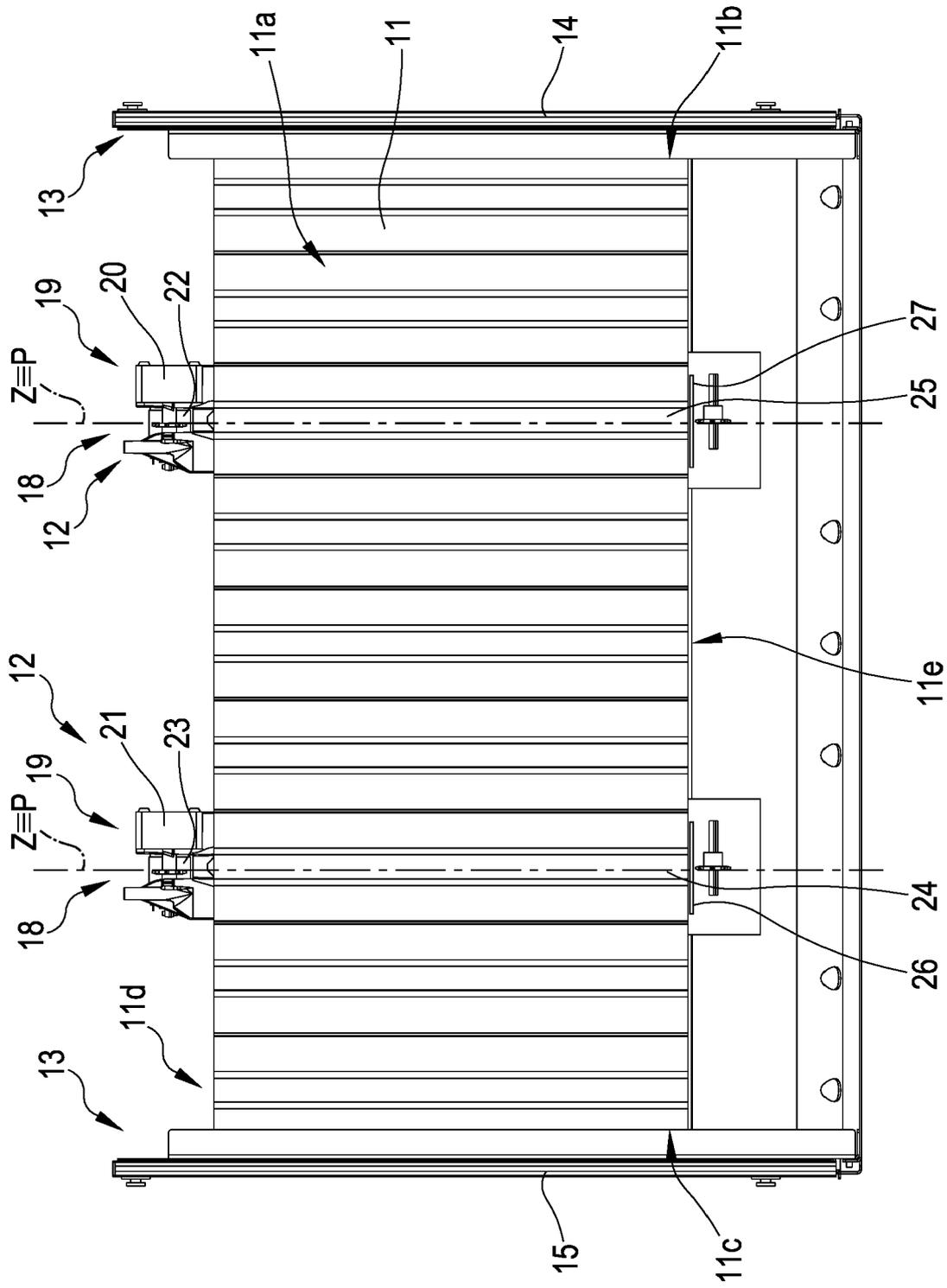


FIG.9



EUROPEAN SEARCH REPORT

Application Number
EP 19 17 0785

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 2017/187467 A1 (SANDENVENDO EUROPE S P A [IT]) 2 November 2017 (2017-11-02) * page 1, line 6 - line 7 * * page 5 - page 12 * * figures 1,2,6-10 * * claim 4 *	1-15	INV. G07F11/00 G07F11/42 G07F11/16 G07F11/26
A	----- Magex Italy: "glass bottle dispensing with Easy by Magex", 15 January 2018 (2018-01-15), page 1, XP054978953, Retrieved from the Internet: URL:https://www.youtube.com/watch?v=VifGRkDVZJc [retrieved on 2018-12-11] * starting from 0:33 * -----	1-15	
			TECHNICAL FIELDS SEARCHED (IPC)
			G07F
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		28 May 2019	Pomocka, Marek
CATEGORY OF CITED DOCUMENTS			
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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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28-05-2019

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2017187467 A1	02-11-2017	EP 3449469 A1	06-03-2019
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