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(54) **AUTOMATIC MACHINE FOR WEIGHING AND DISPENSING LOOSE PRODUCTS**

(57) The invention relates to a vending machine including a display cabinet of containers (2) for the products, a numerical selector (3), a coin slot (5), an information display (4) and an outlet (6). The machine is **characterised in that** the containers (2) rotate with an internally secured spring (7) in order to dispense the product. The invention includes a hopper (818) which receives the product dispensed by the container (2) and which can be moved both horizontally and vertically in order to be positioned below the container (2) housing the product that has been selected. The invention also includes a system for automatically filling the bags that receive the product supplied by the tilting of the hopper (18). Said automatic bagging system consists of a tilting, movable suction plate (33) by means of which bags (51) are removed from a container (52) and positioned opposite a stationary vertical plate (40) in order for the bag to be opened and receive the product released during the tilting of the hopper (18), said bag falling together with the product into the corresponding outlet receptacle (41).

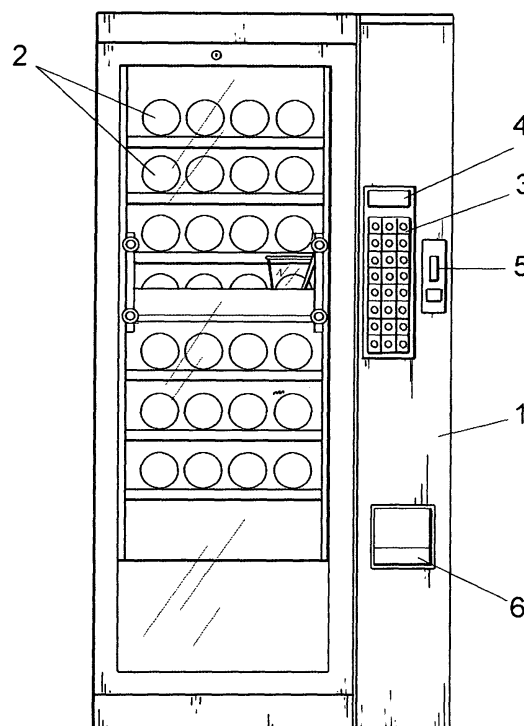


FIG. 1

Description

[0001] The present invention relates to a machine from the type of those known as vending machines, planned for dispensing loose products, preferably titbits, and, at the same time, weighing the dispensed product.

[0002] The aim of the invention is to simplify the operations made for buying titbits, with no need of buying the product and, after that, weighing it, as it happens now.

[0003] Although the machine is planned specially for its use in dispensing and weighing titbits, it is not dismissed for vending or dispensing any other small loose product, such as screws, buttons or dried fruits.

STATE OF THE ART.-

[0004] As it is known, there are many titbit shops and other loose products on which each product is housed on a container with a lateral or superior tilting trap door, through which the consumer takes the wanted product by acting over the trap door or through a ladle that takes the products directly from the container. In both cases, not only the consumer has to go to different containers for buying different products, but after that he has to go to the checkout, where the products are weighted and charged.

[0005] This method, that is the most common nowadays, means nuisances, wastes of time and some other troubles for the consumer. Also, the shop needs an employee for weighing and charging the products.

[0006] By other side, there exist vending machines that dispense loose products like the ones related, but dispensing is made into bags so the consumer does not have the chance of buying the precise wanted amount, so he has to buy the weight contained on the bag.

[0007] Anyway, vending machines including dispensing and weighing means for loose products are not known.

THE INVENTION.-

[0008] The present invention has been conceived in order to solve the problems previously shown. It is made from a common wardrobe, with a numerical selector, an information display, a coin slot, one container for each product, a display cabinet and an outlet for the product. The special feature in this invention is a special system for dispensing containers, as well as a jig with a receiving hopper for each product, combined with a scale that is part of the jig. The machine also includes an automatic bagging system for the products sold, single or united, as ordered by the costumer.

[0009] Specifically, the invention presents, as first innovation feature, the inclusion of a series of containers housing different products, made of clear-plastic cylindrical tubes, resting on different pairs of rollers. Those cylindrical tubes include an internally secured spring, that is activated from its base by an engine that works when

coins are inserted and costumer pushes the selector. There is another engine in order to activate a frontal open-and-close door on the container, so that on its closed position it prevents product's outlet, and on its opened position the product outlets when the cylindrical tube turns. Close to the outlet, there is a pair of semi-disks. One of them is fixed, and the other is revolving, so the outlet can be regulated according to the product or its quantity. There is also a fixed pivot combined with the pair of semi-disks.

[0010] Optionally, and depending on the kind of product, there may be installed on container's bottom a disruptive pendulum, in order to avoid the products being stuck on the cylindrical tube.

[0011] The second innovation feature in this invention is a positioning system for the hopper that receives the product from the containers, as well as a dispensing system from the hopper to the outlet.

[0012] The positioning system consists of a transversal and frontal guide, movable in ascending and descending direction, while it is combined through pulleys and cables with some reels located above it. Those reels are activated by an engine so that when the engine works, depending on turning direction, the guide is moved vertically up and down. Due to that movement, hopper is moved too. Hopper is not only moved ascending and descending, but it is also moved sideways by a tilting movement in order to fix exactly with the containers. There is also another sideways movement to the opposite side, in order to empty the hopper into the outlet receptacle.

[0013] Since it is evident, the hopper is movable through a rail so it can be placed, depending on customer's selection, close to the cylindrical container's outlet that contains the product selected by the customer. The hopper is emptied out by tilting it over. A weighing cell is also placed in the rail.

[0014] The third innovation feature is the bagging system. It is made by a bag container, with a cylindrical-squared shape. Bags are inside it, and it also has a curved front in order to allow a tilting movement. There is also a movable suction plate placed close to top of bag's pile, so that those bags are individually removed by suction. The movable suction plate is linked with a pipe that takes the bags from movable suction plate to a stationary vertical suction plate. The movable plate has a pinion that engages with two racks. The first one is above it, and it allows suction plate's movement of descent when it is in front of the bag's container. The other rack allows the frontal movement when suction plate is in opposite to vertical plate. In this case, a valve is activated through a crankshaft so that it allows suction, and both sheets of the bags are separated. One of the sheets is stuck on suction plate's bellows, and the other is stuck on vertical plate, so that the bag is opened. The product is placed into the bag by the hopper and, when suction ends, the bag falls by gravity with the product inside. There is a trapdoor manually-opened to remove the bag together

with the dispensed product.

[0015] Moving and tilting movements of the movable plate are made by an engine with a pinion and a rack. When it works, the plate is moved back and forward. When the pinion reaches some of the rack's stretches, plate tilts in order to absorb bags from pile and to free them when filled. The freeing action takes place when plate is in front of product container's outlet.

Plans and Drawings.-

[0016] In order to complement the description, and to reach a better understanding of the invention according to the preferential manufacturing process, some drawings are added to this document.

Figure 1.- It shows a frontal representation of the automatic machine, made according to the aim of the invention.

Figure 2.- It shows a cross - section side view of one of the cylindrical tubes that constitute a container, resting on the lower rollers.

Figure 3.- It shows a frontal view of the cylinders represented on the previous figure, as well as the lower rollers that support each container.

Figure 4.- It shows a general perspective of the rollers, specifically four couples to support four containers, with the planned elements for activating each cylinder.

Figure 5.- It shows a frontal detail of the displacement system for the hopper that receives the products from the different containers. On the outlet can be seen the rack's stretch on which the pinion engages and tilts the hopper. Also has been drawn, in the stretch previously referred, the position of the hopper when it is starting the unloading.

Figure 6.- It shows a lateral view of the hopper with the mechanisms that allow the tilting movement, the pinion, the rail with the weighing cell and their assembly over the hook. This figure also shows the tilting movement of the hopper when it is being positioned close to the container's outlet.

Figure 7.- It shows a schematic view of the automatic bagging system, where all its elements can be seen.

Figure 8.- It shows a floor plan of the bag container, as well as the movable suction plate with its bellows. Those bellows extract the bags one by one. It can also be seen the internally secured pinion that moves the suction plate.

Figures 9 to 13.- They shows different moments of

the automatic bagging system when it is working.

PREFERENTIAL MANUFACTURING PROCESS FOR THE INVENTION.

[0017] As seen in the previous figures, this automatic machine for weighing and dispensing loose products is a vending machine constituted by a rectangular wardrobe (1) with a display cabinet of containers (2), containers for the products, a numerical selector (3), an information display (4), a coin slot (5) and an outlet (6) for the dispensed product.

[0018] From this features, it has been foreseen that containers must be made, on each case, by a cylindrical tube as shown on figure 2, on which interior is an internally secured spring so that containers (2) are supported by couples of rolling rollers, assisted by a frame (9). There is also an engine (10) in order to activate container's turn (2). This engine (10) has an activating element (11) coupled on a notch (12) made on the base (13) of each cylinder (2). Close to each cylinder's outlet there has been foreseen a regulator that allows or prevents product's exit depending on its thickness. That regulator consists of two semi-disks (14 & 14'). The first one is fixed and the other turns partially for closing the outlet according to product's thickness. A pivot (15) has been also foreseen.

[0019] Each cylinder or container (2) turns independently according to customer's choice. Cylinder's (2) outlet has a gate (16) activated by an engine (17) that closes it when the product is dispensed.

[0020] Products leave cylinders (2) by a tilting hopper (18) that slides on a rail (19) over a straight guide (20), as clearly seen in figure number 4, so that on guide's end where hopper (18) has to empty there is a rack (21) which function will be explained later.

[0021] Over the rail (19) there is a weighing cell (22) that weighs product contained on the hopper (18); the hopper has a hinge (23) that allows its movement until it fits container's outlet (2) in order to receive dispensed product without leaks. The movement is provided by an engine (24) that, through a crankshaft, pushes the hopper's bottom (18), moving it, as explained before.

[0022] At the end of the crankshaft (25) there is a pinion (26) that engages with the rack (21) when hopper (18) is close to that part of the rack (21). There is also a hinge (27) that allows the hopper (18) to be moved into its unloading position when it reaches the end of the rack (21) because, as it has been told before, the hopper (18), according to the product chosen by the numerical selector (3), will turn and move until it is positioned close to container's (2) outlet of the chosen product for gathering it. After that, hopper is moved towards the rack's end (21), and there it is moved again by the gear made between the pinion (26) and the rack (21) in order to empty product previously received from the hopper (18).

[0023] Hopper's vertical displacements, it is to say, in ascending and descending sense, are made through lat-

eral cables (28) that are connected with pulleys (29) united with the guide (20) through which hopper (18) is moved, and reels (30) above it, so that those pulleys (29) slide through round guides (31) situated vertically in both wardrobe's sides (1). That movement is in ascending and descending sense on the guide (20) and, therefore, in the same sense that hopper's movement. That movement is activated by an engine (32) that activates reel's axle (30) on which cables (28) are coiled.

[0024] In recounted to automatic bagging system, represented on figures 8 & 9, it is constituted by a suction plate (33) with bellows (34) that tilts around a pint of joint (36) with regard to the joint with a flexible tube (37), that is part of the suction system, connected through a pipe (38) with suction engine (39), including an axis of joint (36) and an internally secured pinion (40), which function will be explained later.

[0025] From the connection between flexible tube (37) and pipe (38), another pipe (38') is established. It ends on a stationary vertical plate (57) situated above the outlet receptacle (41) where outlet (6) is situated. In that receptacle, a tilting door (42) with counterweight (43) has been planned.

[0026] Stationary vertical plate (57) is activated by a valve associated with an arm (45).

[0027] This system also includes a guide (46) that, combined with a rack (47), directs suction plate's (33) movements. It is made by an engine (48) with a pinion (49) that engages with rack (47). There are also different stretches on the rack: on its end (50) and another one (50') above it and movable to opposite end.

OPERATION WAY

[0028] When money is inserted through coin slot (5), customer pushes a button in the numerical selector (3) according to wanted product. Each button in numerical selector matches with a different container (2), so that customer will push the button in the numerical selector (3) until wanted amount is obtained. It is necessary to bear in mind that, when selector (3) is pushed, the hopper (18) that receives the selected product will be moved until fixing with container's outlet. Dispensing is made through container's (2) turn, that dispends the product slowly until customer stops pushing numerical selector (3) or available money runs out.

[0029] Obviously, costumer is able to select different products with the same amount of money by pushing different buttons in the selector (3) so that the hopper (18) will receive those products, keeping in mind that, after each different selection, customer is informed by information display (4) about the amount selected in grams and the remaining money.

[0030] When there is no money left, received product on the hopper (18) falls to outlet receptacle (41), where previously a bag (51) has been situated. Hopper is emptied by its tilting movement when it moves to rack's (21) area that engages with the pinion (26), generating that

tilting movement around the hinge (27).

[0031] Under movable suction plate (33) it is situated a container (52) for bags (51), that have to be suctioned by that plate (33). That container (52) has a rectangular curved shape on its frontal part (52'), fixing with suction plate's (33) brim. There are also serrated strips (53) combined with small springs (54) in order to avoid bags sticking between themselves.

[0032] Container (52) also has a back wall (55) with a buffer (56) for bag (51) pilling up. That wall (55) is able to tilt in order to let its projection towards out so that bags (51) are loaded inside container (52), piled for their individual extraction.

[0033] According to suction system previously described, automatic bagging system is as detailed:

Beginning from the position drawn in figure number 9, when machine starts working, suction engine (39) is activated, and an order is given to movable suction plate (33) so that it moves backward and tilts down. Then, bellows (34) absorb first bag (51) of the pile contained on container (52). Bellows (34) adapt themselves according to bags remaining on the container. Bags are extracted from their frontal part, as shown on figure number 9.

[0034] Simultaneously, pinion (40) from aspiration plate engages with rack (50') and produces a tilting movement on movable plate (33) until it stands in half-vertical position, as shown on figure number 10. That set advances, due to the engage between pinion and rack (47), to the opposite side, as shown on figure number 10.

[0035] When movable suction plate (33) gets the position shown on figure number 11, its pinion (40) engages with the rack (50), producing a tilting ahead movement so that movable plate (33) is opposite to stationary suction plate (40). Simultaneously, the arm (45) starts its movement, activating the valve (44) and opening it so that plate (40) aspirates the other side of the bag (51), opening it, as shown on figure number 12.

[0036] On this moment, suction machine (39) stops working and movable suction plate (33) moves back, letting bag (51) to fall filled with its content, as shown on figure number 13, into outlet receptacle (41). Then, costumer opens the trap door (42) and takes the bag (51) with the product inside. Simultaneously, movable suction plate keeps on moving until reaching rack's area (50'); then it engages with the pinion (40), producing a tilting towards ahead and downwards movement so that it is ready to start again the bag-suction process. That is the start position as shown on figure number 9.

Claims

1. Automatic machine for weighing and dispensing loose products, specially foreseen for dispensing titbits or other loose products, such as screws, buttons,

or dried fruits, constituted by a wardrobe (1) with a display cabinet of containers (2) on its interior and, on its frontal side, a numerical selector (3), an information display (4), a coin slot (5) and an outlet (6) for the dispensed product, being **characterized** essentially this vending machine because it has dispenser containers (2) supported by couples of rollers (8) that allow those containers (2) to roll individually when they are activated by their respective engines (10) and having each one of the containers (2) an internally secured spring (7) for sweeping away the product, when container (2) rolls, downwards to the outlet, where a closing door (16) activated by an engine (17) has been foreseen, and having also a regulation system on the outlet depending on product's thickness. It also has a placing system for the hopper (18) that receives products dispensed by containers (2); that hopper (18) is movable horizontally and vertically in order to fix with container's outlet, and it is also able to tilt in both senses in order to empty out the product contained inside, being foreseen an automatic bagging system constituted by a movable suction plate (33) that tilts downwards and upwards in order to absorb bags (51) individually from a container (52) and to locate them in front of a stationary vertical suction plate (40) which is above an outlet receptacle (41) that receives the bag (51) with the product inside, once it has been dispensed by hopper (18), and all that combined with a suction engine (39) connected through a pipe (38) with a flexible tube (37) which is connected with the suction plate, as well as with another pipe (38') connected with the stationary vertical suction plate (40).

2. Automatic machine for weighing and dispensing loose products, according to the first claim, wherein containers (2) have on their back side a basis (13) with a notch (12) where an activating element (11) activated by the engine (10) is located, in order to execute container's (2) turn.
3. Automatic machine for weighing and dispensing loose products, according to claims number 1 and 2, wherein regulation system for container's (2) outlet is constituted by a pair of semi-disks, one of which is stationary and the other is movable, so that turning in one sense or the opposite means that outlet opens or closes, all combined with a fitting pivot (15) foreseen on container's (2) outlet.
4. Automatic machine for weighing and dispensing loose products, according to the first claim, wherein hopper (18) that receives products dispensed by containers (2) is assembled with a guide (20) that allows its axial movement; on guide's (20) ends have been foreseen both pulleys through which cross lateral cables (28) that move vertically and which cross also both reels (30) situated above them and which

are assembled on a common rail which is activated by an engine (32) that coils and unwinds those cables (28) and, at the same time, moves above and below the guide (20) united with the hopper (18), so that those movements, combined with hopper's (18) linear movements through guide (20), make possible hopper (18) to locate under container's (2) outlet, which product has been previously selected by pushing the numerical selector (3).

5. Automatic machine for weighing and dispensing loose products, according to claims number 1 & 4, wherein hopper (18) moves across guide (20) over a rail (19) over which is situated a weighing cell (22) for weighing the product, with a hinge (23) foreseen in one of its ends for hopper's (18) tilting movement to container's (2) outlet, and another hinge (27) on the opposite end, combined with a pinion (26) that engages with a rack (21) situated on guide's (20) end, in order to make possible hopper's (18) tilting movement that unloads the product contained on it on the outlet receptacle (41).
6. Automatic machine for weighing and dispensing loose products, according to the first claim, wherein suction plate's (33) bellows' (34) movement is made through a guide (46) combined with a rack (47) that engages with a pinion (49) activated by an engine (48), capable of engaging with a rack (50') in order to tilt towards ahead suction plate (33) and insert its bellows (34) into a container (52) that contains bags (51) so that those bags are absorbed individually, and another tilt up movement so that, on its movement through the guide (46), bag (51) is moved by suction plate (33) from container (52) to stationary vertical plate (40); so that vertical plate's (40) activation by a valve (44) makes that the other sheet of the bag (51) is absorbed, opening it and receiving product coming from the hopper (18).
7. Automatic machine for weighing and dispensing loose products, according to sixth claim, wherein valve's (44) activation is made by an arm (45) activated by suction plate (33) when pinion (49) engages with rack (50) on stationary vertical plate's (40) end.
8. Automatic machine for weighing and dispensing loose products, according to sixth claim, wherein bag (51) container (52) has a rectangular curved shape on its frontal side (52') fixing with suction plate's (33) brim. On its internal side, there are also serrated strips (53) combined with small springs (54) in order to avoid that bags (51) stick between themselves. It has also been foreseen that bag container (52) needs a tilting wall (55) in order to put bags (51) inside it, being that wall (55) able to tilt in order to allow bag's (51) introduction and pilling up them.

Amended claims under Art. 19.1 PCT

1. Automatic machine for weighing and dispensing loose products, specially foreseen for dispensing tit-bits or other loose products, such as screws, buttons, or dried fruits, constituted by a wardrobe (1) with a display cabinet of containers (2) on its interior and, on its frontal side, a numerical selector (3), an information display (4), a coin slot (5) and an outlet (6) for the dispensed product, being **characterized** this vending machine because it has cylindrical dispenser containers (2) supported by couples of rollers (8), being those containers (2) allowed to roll individually when they are activated by their respective engines (10) and having each one of them an internally secured spring (7) for sweeping away the product, when container (2) rolls to outlet, where a closing door (16) activated by an engine (17) has been foreseen, a placing system for the hopper (18) that receives product dispensed from the containers (2), which is movable horizontally and vertically to fix with container's outlet, on which the hopper (18), with faculty to move axially is assembled over a guide (20) in order to move across it over a rail (19), above which a weighing cell (22) is situated, in order to weigh the products, and an automatic bagging system constituted by a bag-suction plate (33), with a suction pad (34) on its upper end, and a stationary vertical suction plate (40) assembled above a receptacle (41) that receives bags (51) when product is dispensed, all that combined with a suction engine (39), connected through a pipe (38) with a flexible tube (37) that connects with the suction plate (33), and also with another pipe (38') that connects with the stationary vertical plate (40).

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2. Automatic machine for weighing and dispensing loose products, according to the first claim, wherein containers (2) have on their back side a basis (13) with a notch (12) where an activating element (11) activated by the engine (10) is located, in order to execute container's (2) turn.

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3. Automatic machine for weighing and dispensing loose products, according to claims number one and two, **characterized** because rotary containers (2) have assembled close to their exit a regulation system, constituted by a pair of semi-disks (14 and 14'). One of them is fixed and the other one is manually movable around the rotation axle on which first one is fixed, so that movable-semi-disk's turning movement in one or other direction means a bigger or smaller open in container's outlet, fitting selected product's thickness, all that combined with a fixed but adjustable pivot (15). Pivot is able to be adjusted on its position inside and out, that is to say, up on its end when it's inside the tube, or down on its external end, opposite to container's outlet, in order to facilitate product's separation while they are being dispensed.

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4. Automatic machine for weighing and dispensing loose products, according to first claim, **characterized** because linear guide (20), assembled horizontally and vertically, on which hopper (18) that receives expended product from containers (2) is assembled, has both pulleys on its ends, through which cross lateral cables (28) that move vertically and which cross also both reels (30) situated above them and which are assembled on a common rail which is activated by an engine (32) that coils and unwinds those cables (28) and, at the same time, moves above and below the guide (20) united with the hopper (18), so that those movements, combined with hopper's (18) linear movements through guide (20), make possible hopper (18) to locate under container's (2) outlet, which product has been previously selected by pushing the numerical selector (3) .

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5. Automatic machine for weighing and dispensing loose products, according to fourth claim, wherein hopper (18) is able to make a tilting movement due to a hinge (23) foreseen in one of its ends for hopper's (18) tilting movement to container's (2) outlet, and another hinge (27) on the opposite end, combined with a pinion (26) that engages with a rack (21) situated on guide's (20) end, in order to make possible hopper's (18) tilting movement that unloads the product contained on it on the outlet receptacle (41).

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6. Automatic machine for weighing and dispensing loose products, according to first claim, wherein bag's suction plate (33) with suction pad (34) on its top side, has an up-and-down tilting movement, which movement is made through a guide (46) combined with a rack (47) that engages with a pinion (49) activated by an engine (48), capable of engaging with a rack (50') in order to tilt downwards suction plate (33) and insert its suction pad (34) into a container (52) that contains bags (51) so that those bags are absorbed individually, and another tilting movement upwards, so that, on its movement through the guide (46), bag (51) is moved by suction plate (33) to stationary vertical plate (40); so that vertical plate's (40) activation by a valve (44) makes that the other sheet of the bag (51) is absorbed, opening it and receiving product coming from the hopper (18) when it has tilting movement.

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7. Automatic machine for weighing and dispensing loose products, according to sixth claim, wherein valve's (44) activation is made by an arm (45) activated by suction plate (33) when pinion (49) engages with rack (50) on stationary vertical plate's (40) end.

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8. Automatic machine for weighing and dispensing

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loose products, according to sixth claim, wherein bag (51) container (52) has a rectangular curved shape on its frontal side (52') fixing with suction plate's (33) brim. On its internal side, there are also serrated strips (53) combined with small springs (54) in order to avoid that bags (51) stick between themselves. It has also been foreseen that bag container (52) needs a tilting wall (55) in order to put bags (51) inside it, being that wall (55) able to tilt in order to allow bag's (51) introduction and pilling up them. In order to rectify lack of clarity defects in the composition of claims for mentioned international application, as pointed out on the International Search Report, following modifications are included:

First claim has been simplified and specifies the three main features that define the invention: dispensing containers system, hopper positioning system, including weighing scale, and bagging system, excluding from this claim additional features which are described in other claims that depend on this one.

Therefore, in this main claim, page 17, on hopper positioning system's description has been included the mechanism that allows the weighing of the product, which was previously defined on claim number five, from 28th line, as "...on which the hopper, with faculty to move axially, is assembled over a guide in order to move across it over a rail, above which a weighing cell is situated, in order to weigh the products", and, from 33rd line, suction pad as mentioned on 6th claim is defined as "...bag-suction plate, with a suction pad on its upper end"; on the contrary, following sentences have been excluded: lines 22 to 24 "...and having also a regulation system on the outlet depending on product's thickness.", lines 28 to 31 "...that hopper is movable horizontally and vertically in order to fix with container's outlet, and it is also able to tilt in both senses in order to empty out the product contained inside", and lines 32nd to 3rd on page 18 "that tilts downwards and upwards in order to absorb bags (51) individually from a container (52)"; those sentences have been included into 3rd, 5th and 6th claims respectively. In this first claim it has also been specified container's cylindrical feature.

It has been made a new composition for **third claim**, on which "regulation system for container's outlet" is better explained than previously. It is a restricting device constituted by two semi-disks and a fitting pivot situated opposite to the gap between those semi-disks, as described on pages 3 (lines 26 to 32) and 9 (lines 25-34).

It has also been made a new composition for the beginning of 4th claim, appropriate to the new description included on first claim, from which

depends on, about the linear guide over which hopper is assembled.

5th claim depends now just on 4th one, excluding from it the device by which hopper with weighing cell moves lengthwise for receiving and weighing products, that now is part of first claim, but including on this 5th claim hopper's tilting movement, initially foreseen for first claim. Finally, on **6th claim** it has been clarified the expression "...suction plate's bellows' movement" as it has been defined that bellow on first claim as "...bag-suction plate, with a suction pad on its upper end" (page 19, 32nd line) and specifying that suction plate, besides its movement trough the guide, has a downwards-and-upwards tilting movement, as can be deduced from what has been initially put forward on, at the beginning on the same 6th claim an during the description (page 5, line 24 and following ones, page 8, line 21, page 11, line 29 and following ones, and page 13, lines 29 to 33).

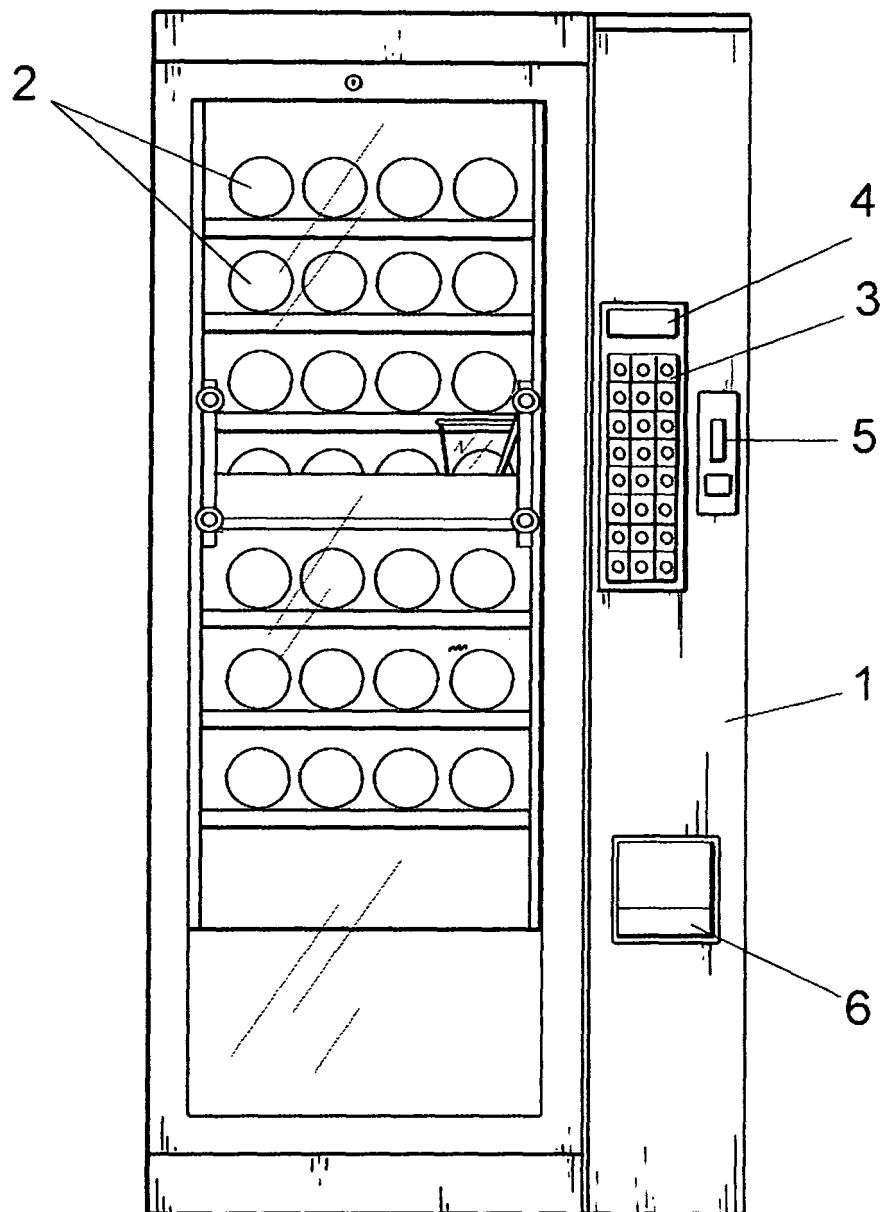
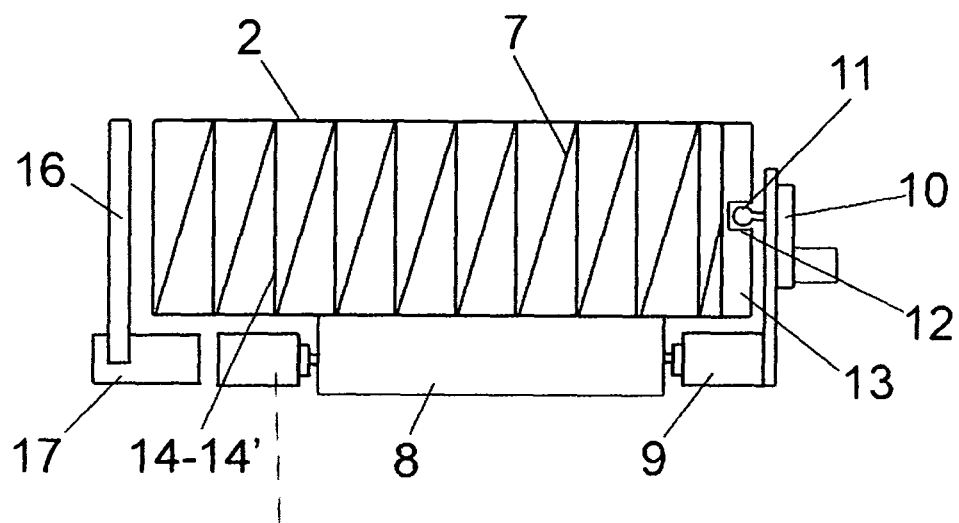


FIG. 1



9 FIG. 2

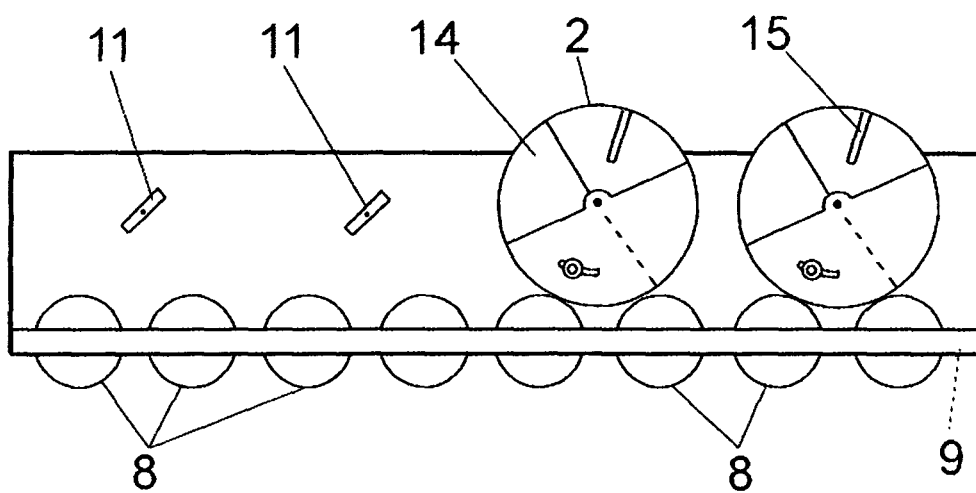
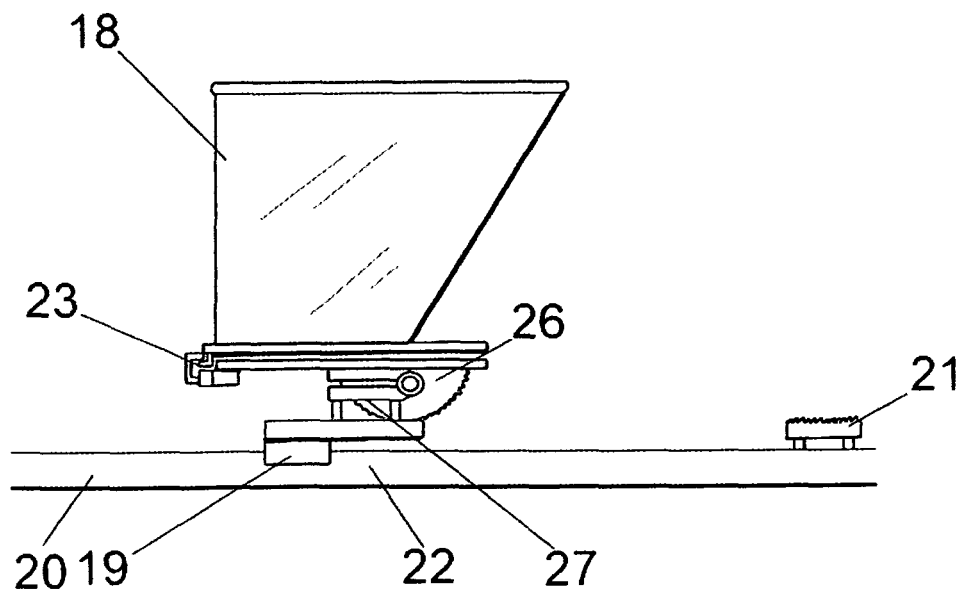
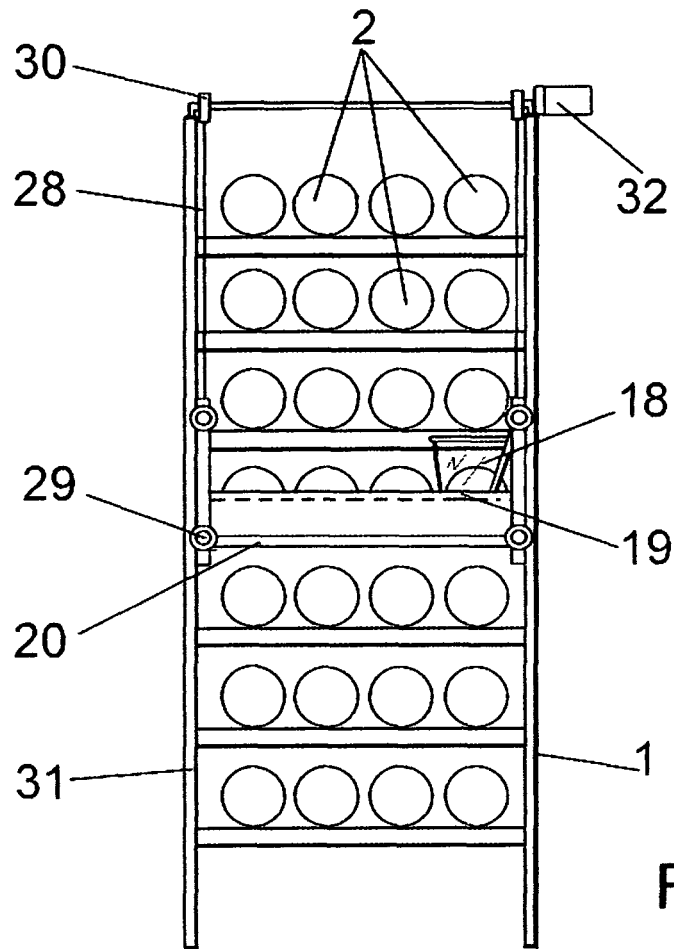
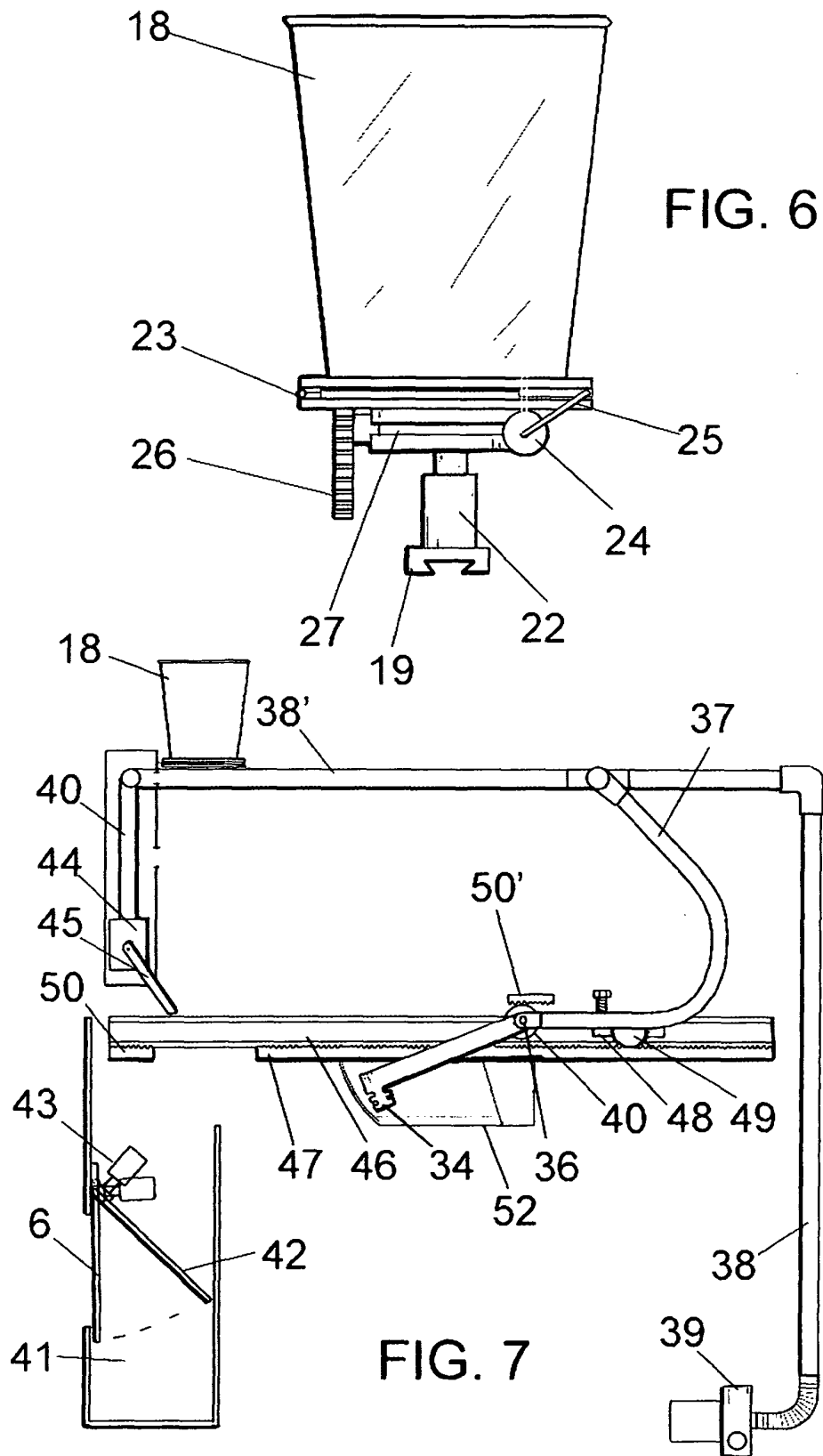


FIG. 3





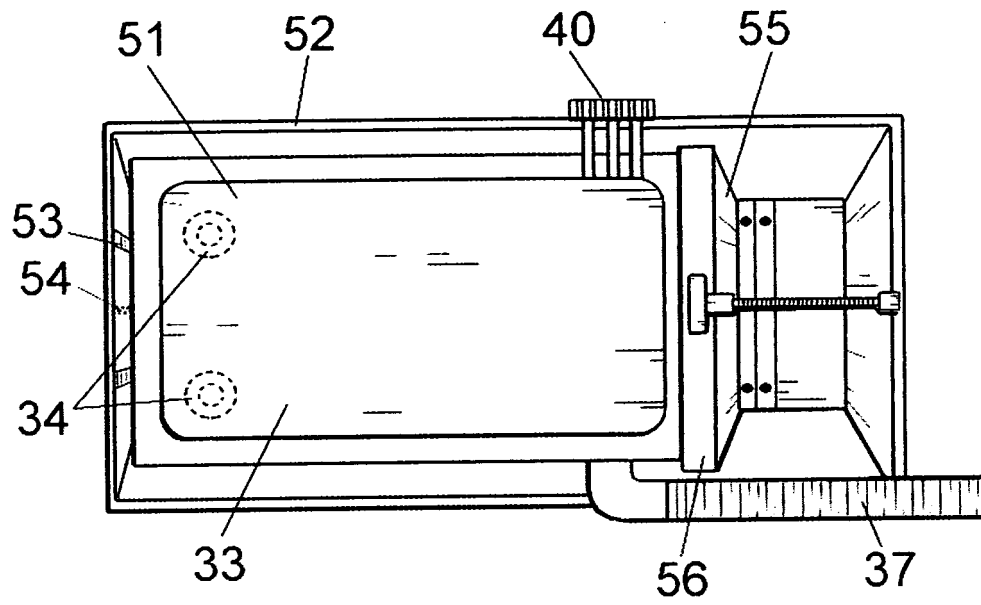


FIG. 8

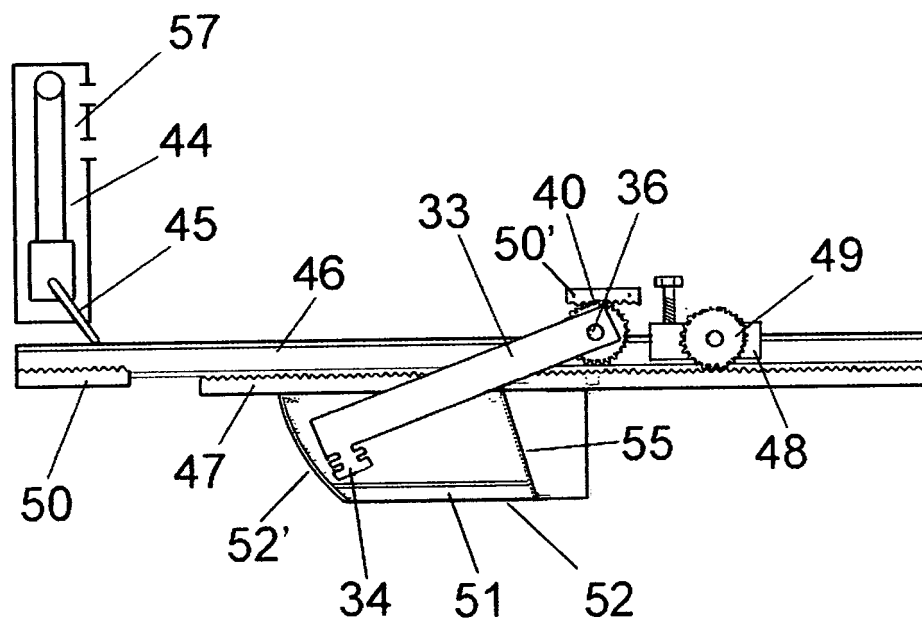


FIG. 9

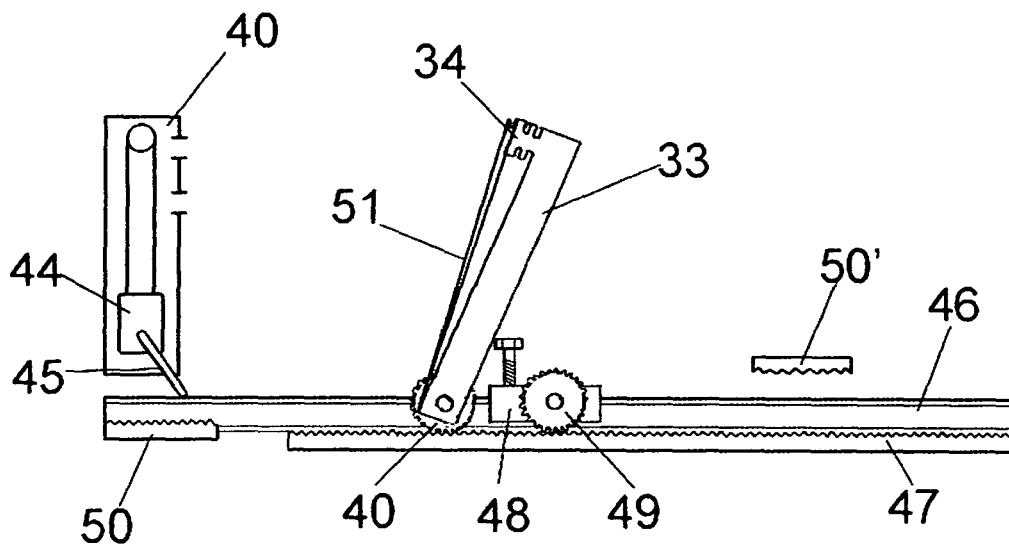


FIG. 10

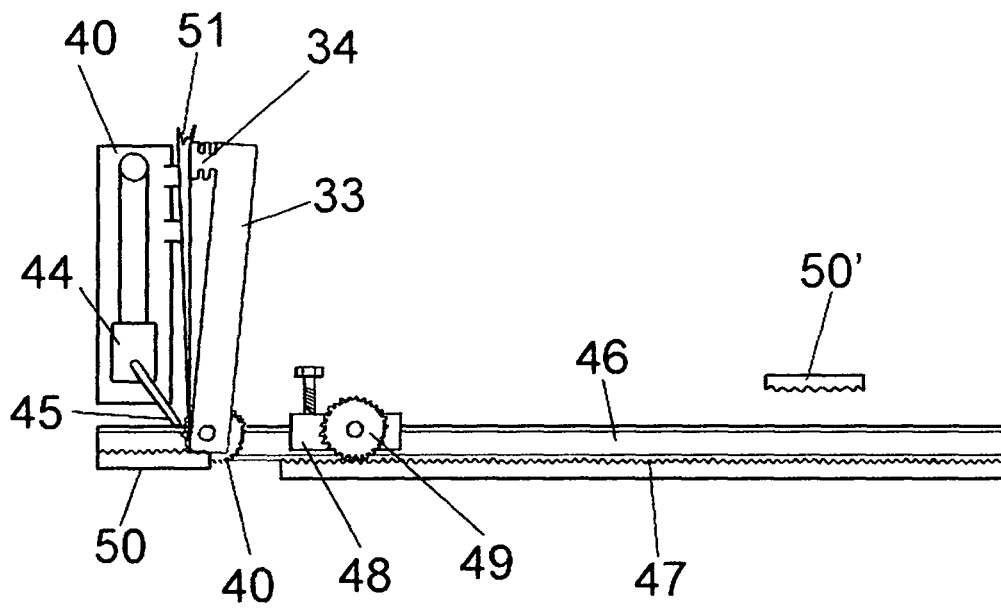


FIG. 11

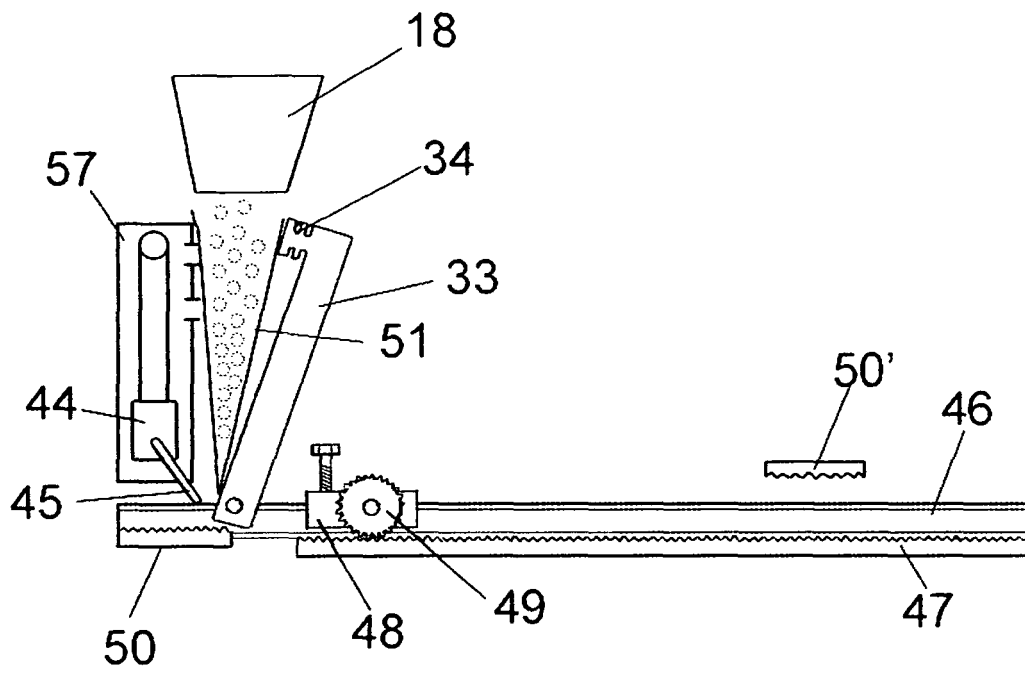


FIG. 12

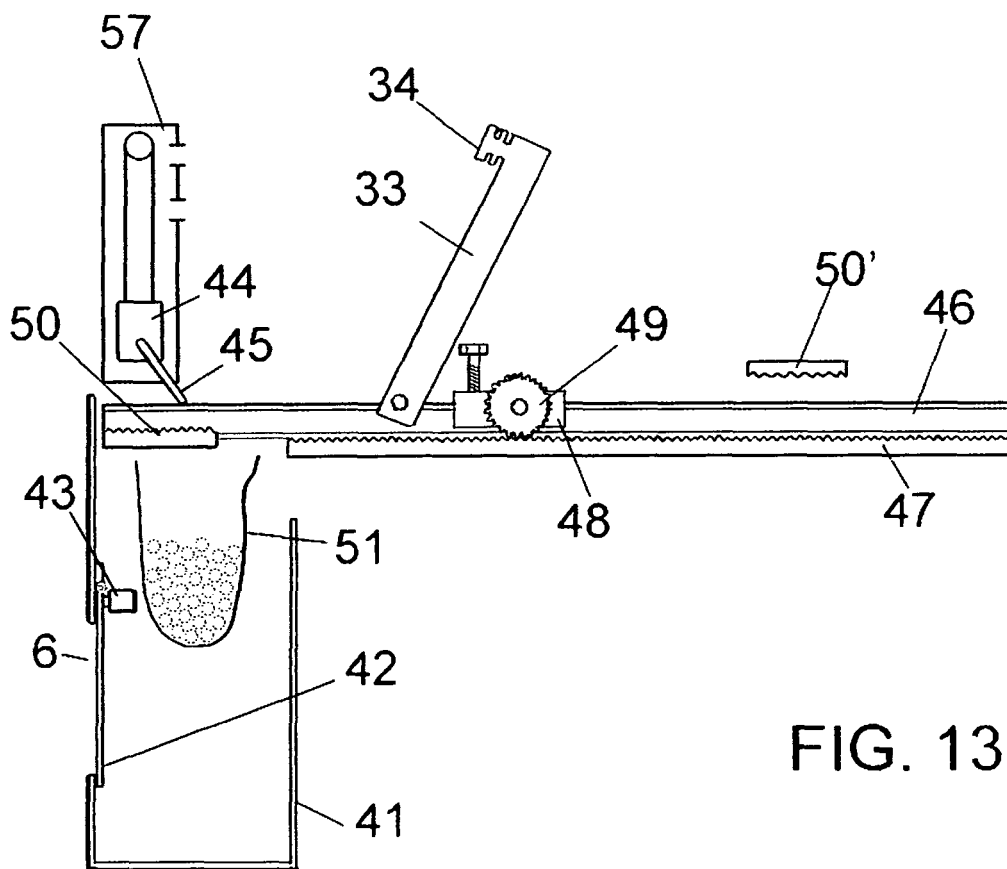


FIG. 13

INTERNATIONAL SEARCH REPORT

International application No.

PCT/ ES 2008/000764

A. CLASSIFICATION OF SUBJECT MATTER

G07F 11/52 (2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

G07F, B65D 83/04

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

INVENES, EPODOC, WPI, TEXTO COMPLETO (EP, WO, US, GB, DE, FR, AT, BE, CH)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5649641 A (CAMPOLI) 22.07.1997, column 5, lines 1-40; figures 3-5	1, 2
A	JP 2001222752 A (FUJI) 17.08.2001, figures 1,2,17,21; abstract	1, 2, 4
A	US 4258860 A (BOETTCHER) 31.03.1981, column 2, line 24 - column 3, line 17; figures 1-3.	1, 2
A	JP 7257516 A (NAGASAKI KIKI MFG CO LTD) 09.10.1995, figures 3,5-7; abstract	1, 6-8

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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"E" earlier document but published on or after the international filing date		
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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"P" document published prior to the international filing date but later than the priority date claimed	"&"	document member of the same patent family

Date of the actual completion of the international search

11.May.2009 (11.05.2009)

Date of mailing of the international search report

(14/05/2009)

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/ ES 2008/000764

Patent document cited in the search report	Publication date	Patent family member(s)	Publication date
JP 7257516 A	09.10.1995	NONE	-----
US 4258860 A	31.03.1981	EP 0019393 AB EP 19800301421 JP 56016288 A US 4312460 A US 4363422 A CA 1137936 A US 4369896 A US 4385713 A CA 1155092 A	26.11.1980 30.04.1980 17.02.1981 26.01.1982 14.12.1982 21.12.1982 25.01.1983 31.05.1983 11.10.1983
JP 2001222752 A	17.08.2001	NONE	-----
US 5649641 A	22.07.1997	US 5509573 A	23.04.1996

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