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(54) **Dispensing machine of popped corns**

(57) This machine comprises a shell (1) fitted with a front door (2); inside the shell is housed a control micro-processor (6), a number of bins (3) to storage corn with different additives, a number of independent feeders (4) linking the bins with a volumetric dispenser (5) and a heating device (9) to which the corn arriving from the dispenser (5) accedes to be converted into popcorn; on the door's inner side there is a duct (10) through which the formed popcorn fall into a collecting box (11) accessible from the machine outside, and a dispenser (12) of paper cups making delivery of one cup (13) through a slot (2c) defined on the door (2) every time a client inserts the price set into the coin slot (7) and selects the kind of popcorn desired by pressing a keyboard keys (8)

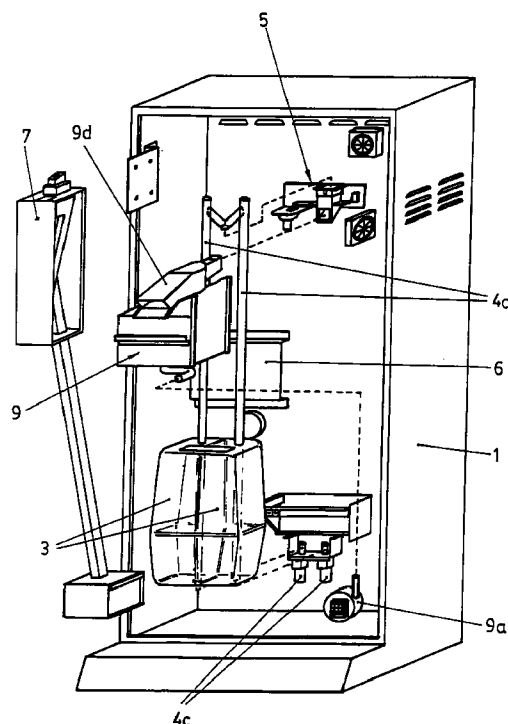


FIG. 3

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Description

SUBJECT MATTER OF THE INVENTION

[0001] This present invention refers, as shown in its title, to a popcorn dispensing machine, of the so-called pay-in-advance type, including a series of elements to allow preparing a given volume of popcorn in the moment it is required, altering said volume according with the amount inserted by the client in the machine's coin slot.

BACKGROUND OF THE INVENTION

[0002] Popcorn dispensing machines are presently known that work automatically and comprise only one corn storage hopper and a product dispenser which is controlled by a coin slot in such a way that when a given amount is inserted in the coin slot, the dispenser allows passing a given volume of corn from the hopper onto a lower receiving bin where corn is popped to form popcorn by means of a hot air stream from a heating device, the popcorn issuing the machine through a dispensing opening due to the expansion they undergo when taking form and to the push of the hot air stream coming from inside the shell.

[0003] The corn storage hopper in these machines is placed upon the heated receptacle and is fitted, in its lower opening, with the above-mentioned dispenser; this dispenser is generally composed of a turning windlass having several radial compartments where corn is collected at the rate they coincide with the hopper opening; this dispenser is closed in its inside by means of a cover having an opening with a section similar to that of a windlass radial compartment, the corn held in every compartment falling into the heated receptacle when the compartment coincides with the opening in the lower cover during the windlass turning motion.

[0004] The windlass turning amplitude is automatically set according with the money amount being inserted in the coin slot; the dispenser being thus able to deliver to the heated compartment the corn held in one or more of its radial compartments.

[0005] In order that user may collect the popcorn dispensed by the machine it is required that close to it should lie a stack of a number of discardable containers or paper cones, which poses several problems such as pilferage of the paper cones due to which user will have no container available to collect the popcorn delivered by the machine, as well as sanitary problems in case said paper cones or containers are unduly handled.

INVENTION DESCRIPTION

[0006] This invention machine has been projected to automatically dispense several kinds of popcorn, to which end it will suffice with introducing in a coin slot a money amount that may be variable and then select in a

keyboard the preferred kind of popcorn.

[0007] The machine in question has a shell fitted with a front door having its relevant locking means; inside the shell there is an electric control circuit, several bins containing raw products from which the different kinds of popcorn are obtained, independent driving feeders which make such container bins relate with a volumetric doser, a pay-in-advance coin slot, a heating device to make popcorn and a dispenser of folded paper cups.

[0008] According with this invention, the control circuit comprises a microprocessor that drives the various devices included in the machine, in order to supply a folded paper cup and a predetermined volume of popcorn, after the customer has inserted the relevant amount of money in the coin slot and has selected the kind of popcorn desired by pressing a keyboard.

[0009] The various bins disposition allows the machine to prepare and dispense popcorn having several flavours when said bins are loaded with the relevant raw products.

[0010] These bins place themselves below the heated receptacle, and the feeders related therewith take charge of raising the product to be prepared from the relevant bin onto the volumetric doser.

[0011] Every feeder comprises a duct linking the relevant bin with the volumetric doser, a worm screw housed inside the duct and a motor device to apply a turning motion to the worm screw thus provoking an ascending move to the product inside the duct.

[0012] Feeder motors are driven in a selective manner by the microprocessor whenever an amount of money is inserted in the coin slot and relevant product is selected by pressing the keyboard relevant keys; product feeding is stopped when the microprocessor receives a signal from a photoelectric cell set in the doser; this signal takes place when the cell detects the existence of a given volume of product inside the doser.

[0013] This cell may be found assembled on the doser with the possibility of moving in the vertical sense, which allows modifying the volume of product supplied in every delivery, which depends on the photoelectric cell position.

[0014] In case the photocell is set in a fixed position, the volume of product supplied for every delivery may be altered by the microprocessor, keeping the feeder working until some time after having received the photoelectric cell signal.

[0015] Doser has in its lower area a discharge chute which remains usually closed by the sliding flap. This flap is driven by a motor element controlled by the microprocessor; both these elements being mutually related by means of an eccentric and connecting rods which make the flap move longitudinally when the motor turns, placing the flap at a doser opening or closing position.

[0016] Below the doser there is a heating device which comprises in its lower part an opening through which the filtered air driven by a pump enters; inside the

heating device there is an electric resistance to heat the air draft and a cylindrical receptacle on which is positioned a cover fitted with a rear entrance for the corn supplied by the doser to enter and a front exit through which the already formed popcorn goes out.

[0017] The above-mentioned receptacle shows on its periphery a plurality of tangential intakes through which the hot air accedes to its inside; the tangential disposition of said fins provokes the circulating hot air to form inside the receptacle an ascending helicoidal draft which pushes the already formed popcorn towards the exit defined in the cover.

[0018] When the machine is in the operative mood and the door is, therefore, closed, the exit defined in the heating device cover is confronted with a vertical duct assembled on the door inside. The front wall of this duct is formed in clear material and is confronted with a clear plate inserted in a window defined in the door itself, in such a way as to allow customer to watch through the duct clear plate and wall how the popcorn required comes down to fall into a collecting box which is accessible from the outer side of the door.

[0019] Said collecting box has room enough for the customer to place inside a previously unfolded paper cup so that the popcorn being dispensed fall inside it.

[0020] As it has been said above, this machine includes inside its shell an automatic paper cup dispenser, which is accessible to the consumer; this dispenser supplies one paper cup whenever a customer requires one of the products available, which means a number of important advantages such as impeding that cups be pilfered and the undesirable rumpling thereof.

[0021] This cup dispenser comprises a box containing the folded cups, a roller set underneath the box, a motor to drive said drawing-in roller when the microprocessor is activated and a photoelectric cell to induce the motor stopping when it detects a mark close to the rear end of the paper cup drawn in by the roller.

[0022] The cup dispenser is assembled on the door inside, the latter having a slot through which the cup drawn in by the roller partially protrudes, thus allowing customer to pick it up to unfold the cup and place it in the popcorn collecting box in such a way as to make popcorn fall into it.

DESCRIPTION OF DRAWINGS

[0023] To complete the description we have been making and in order to assist to a better understanding of this invention's characteristics, we are attaching to this present specification, as an integrating part thereof, a set of drawings wherein with illustrative non limitative character has been represented what follows:

- Figure 1 shows a perspective view of the popcorn dispensing machine.
- Figure 2 shows a perspective view of the machine

with its door open.

- Figure 3 shows a perspective view of the machine body, in which a lineal exploded view has been made of the devices fitted inside it.
- Figure 4 shows a perspective view of the door, as seen from its inside, where it has been made an exploded view of the elements assembled on it.
- Figure 5 shows a perspective detail of the volumetric doser.
- Figure 6 shows a lineal exploded view of the heating device.
- Figure 7 shows a schematic view, in profile, of the cup dispenser and a part of the door facing it.

PREFERENTIAL EMBODIMENT OF THE INVENTION

[0024] As it may be seen in the above referenced figures, the machine under discussion comprises a shell (1) fitted with a front door (2) allowing access to the various devices fitted inside the machine.

[0025] Inside said shell are the bins (3) aimed to contain corn with different additives to modify its flavour, each of the bins (3) being fitted with a feeder (4) composed of a duct (4a) inside which there is a worm gear (4b) linked to a motor (4c). Turning of one of the motors (4) makes the worm gear linked to it turn and thus the corn conveyance from the relevant bin (3) towards a volumetric doser (5).

[0026] Motors (4) are driven by a microprocessor (6) to which a payment-in-advance coin slot (7) is connected as well as a keyboard (8) by keying in which the customer may select the kind of popcorn desired.

[0027] The volumetric doser (5) comprises a compartment (5a) in which the product conveyed by any one of the feeders (4) is introduced.. This compartment has in its lower part a discharge chute fitted with a closing flap (5b) which is driven by a motor (5c) through a worm gear (5d) and a number of connecting rods (5e) which force it to describe alternative motions, thus placing it in the opening or closing position.

[0028] The assembly of the photoelectric cell on the compartment (5a) is performed by means of a support (5g) which is vertically sliding, thus allowing to modify the volume of product supplied by the machine in every serve.

[0029] This modification of the product volume supplied may be performed by a microprocessor, keeping the cell at a fixed position; in this case, the microprocessor will keep the feeder motor (4c) working until a predetermined time has elapsed from the moment it receives the photoelectric cell's (5f) signal.

[0030] Underneath the doser (5) it has been fitted a heating device (9) comprising a lower opening through

which the filtered air driven by a pump (9a) may accede, an electric resistance (9b) that heats the circulating air and a cylindrical receptacle (9c) on which a cover (9d) is placed; this cover 9d is provided with a rear intake (9e) for the corn supplied by the doser to come in and a front exit (9f) through which the already formed popcorn will come out.

[0031] Said receptacle (9c) has on its periphery a number of tangential intakes (9g) through which the heated air accedes to its inside; the tangential positioning of said intakes (9g) enables forming inside the receptacle (9c) a helicoidal hot air stream having an ascending direction, which enables the popcorn move towards the cover (9d) exit.

[0032] On the door inside is assembled a vertical duct (10) which, when the door (2) is closed, faces the heating device exit (9f). The duct (10) front wall (10a) is clear and is faced to the clear plate (2a) inserted in the door (2) itself.

[0033] The wall (10a) and the plate (2a), both clear, allow a customer to watch how the already formed popcorn falls down onto a collecting box (11), which is accessible from the outside through an opening (2b) defined on the door (2).

[0034] On the door inside is assembled an automatic paper cups (13) dispenser (12).

[0035] Such dispenser (12) comprises a box (12a) in which the folded paper cups (13) are stacked; underneath said box (12a) is placed a roller (12b) linked to a motor (12c) which drives it with a turning motion controlled by the microprocessor (6), and a photoelectric cell (12d) which stops the motor (12c) when the former detects a mark printed close to the cup's (13) rear end.

[0036] In order to avoid that the drawing-in roller (12b) may slip on the paper cup (13) placed in the box (12a) lowermost part, it has been previewed that said roller (12b) will incorporate on its outer surface some protrusions (12e) made in highly flexible material, latex for instance, which will guarantee that the paper cup (13) will be driven on when the roller (12b) turns.

[0037] The door (2) shows, facing the box (12a) lowermost end, a slot (2c) through which a cup (13) driven in by the roller (12b) protrudes, thus allowing a customer to pick it up, unfold it and introduce it in the box (11) to collect the popcorn dispensed by the machine.

[0038] It is not deemed necessary to make this discussion any longer for any expert in this art to understand the scope of this invention and the advantages that should be obtained from it.

[0039] The terms in which this specification has been drafted should be taken in their amplest non imitative sense.

[0040] Materials, shape, size and disposition of the various elements are susceptible of being changed, providing this does not imply any alteration of the essential characteristics of this present invention, as claimed hereinafter.

Claims

1. Popcorn dispensing machine of the kind incorporating a payment-in-advance coin slot, corn dispensing means, heating means to provoke corn grain transformation into popcorn; characterized by the fact that it comprises a shell (1) fitted with a front door (2) wherein are housed a control electric circuit, several bins (3) to contain different types of corn or of corn with different additives, a number of independent feeders (4) linking the relevant bins (3) with a volumetric doser (5), an automatic folded paper cups (13) dispenser (12), the payment-in-advance coin slot (7) and the relevant heater device (9) to make ready the popcorn to be dispensed.
2. A machine, according with above claim, characterized by the fact that the control circuit includes a microprocessor (6) to which are connected a number of keys (8) for the selection of the popcorn kind desired and the payment-in-advance coin slot (7), the devices fitted in the machine being activated by said microprocessor in a selective manner, depending on the kind of popcorn chosen and the amount of money introduced in said coin slot (7).
3. A machine, according with previous claims, characterized by the fact that every feeder (4) comprises a duct (4a) linking the relevant bin (3) with the volumetric doser (5), a worm gear (4b) housed inside said duct (4a) and a motor element (4c) driving the worm gear with a rotational motion when it is activated by the microprocessor (6).
4. A machine, according with previous claims, characterized by the fact that the volumetric doser (5) comprises a compartment (5a) having in its lower part a discharge chute provided with a closing flap (5b) and laterally a photoelectric cell (5f) that is connected to the microprocessor (6) to emit a signal when the product contained in said compartment (5a) reaches a predetermined level.
5. A machine, according with previous claims, characterized by the fact that the flap (5b) driving means are composed of a motor (5c) linked with the former through an eccentric (5d) and a number of connecting rods (5e) that place it in either an opening or closing position.
6. A machine, according with previous claims, characterized by the fact that the photoelectric cell (5f) is assembled on a support (5g) fitted with the possibility of sliding vertically over the compartment (5a).
7. A machine, according with previous claims, characterized by the fact that the heating device (9) comprises a lower opening through which the filtered air

drawn by a pump (9a) enters, an electric resistance (9b) to heat the circulating air and a cylindrical receptacle (9c) on which a cover (9d) is placed.

8. A machine, according with previous claims, characterized by the fact that the cover (9d) is fitted with a rear intake (9e) through which the corn supplied by the doser enters the receptacle (9c) and a rear exit through which the already formed popcorn emerges. 5
10
9. A machine, according with previous claims, characterized by the fact that the receptacle (9c) bears in its periphery a plurality of tangential intakes (9g) through which the heated air accedes to its inside. 15
10. A machine, according with previous claims, characterized by the fact that on the door inside is fixed a vertical duct (10) the front wall (10a) of which has been made in clear material and faces a clear plate (2a) inserted in the door (2) itself, thus allowing to watch the duct inside from outside the machine. 20
11. A machine, according with previous claims, characterized by the fact that the vertical duct (10) faces the heating device exit (9f) when the door is set in the closing position. 25
12. A machine, according with previous claims, characterized by the fact that on the door inside is fixed a collecting box (11) facing an opening (2b) defined in the door itself allowing to accede to it from the machine front side. 30
13. A machine, according with previous claims, characterized by the fact that the box (11) is placed underneath the conduct (10), the popcorn to be dispensed falling inside it. 35
14. A machine, according with previous claims, characterized by the fact that the automatic dispenser (12) comprises a box (12a) wherein the folded paper cups (13) are stacked, a roller (12b) connected to a motor (12c) driven by a microprocessor and a photoelectric cell (12d) that provokes the motor (12c) deactivation when it detects a mark printed close to the cups (13) rear end. 40
45
15. A machine, according with previous claims, characterized by the fact that the roller (12b) is placed under the box and it provokes, when turning, the conveyance of the cup (13) being in the former's lower area. 50
16. A machine, according with previous claims, characterized by the fact that the roller (12b) has on its periphery a number of protrusions (12e) made in flexible material. 55

17. A machine, according with previous claims, characterized by the fact that the door (2) has, in coincidence with the box (12a) lower end a slot (2c) through which the cup (13) conveyed by roller (12b) protrudes.

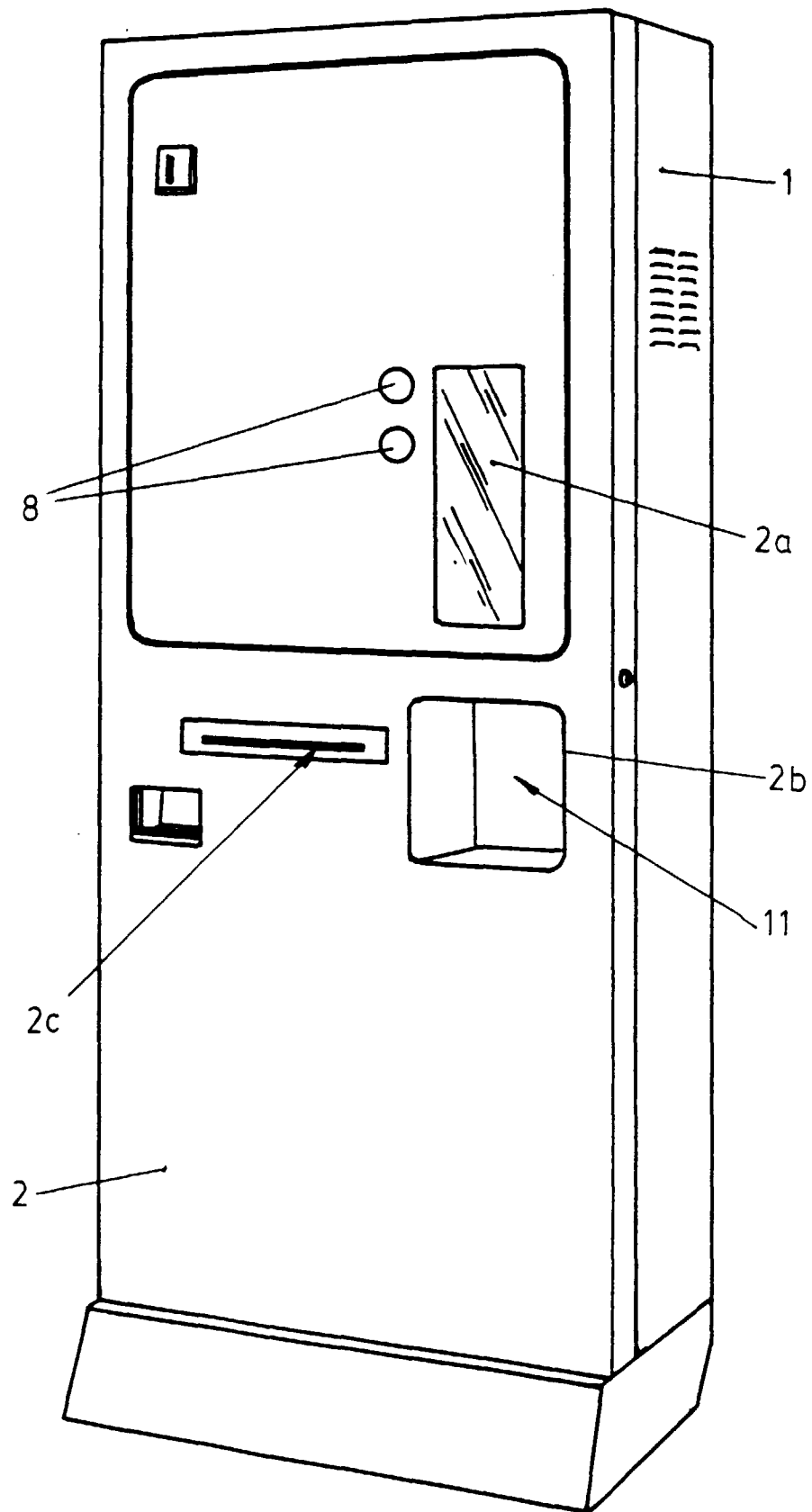


Fig. 1

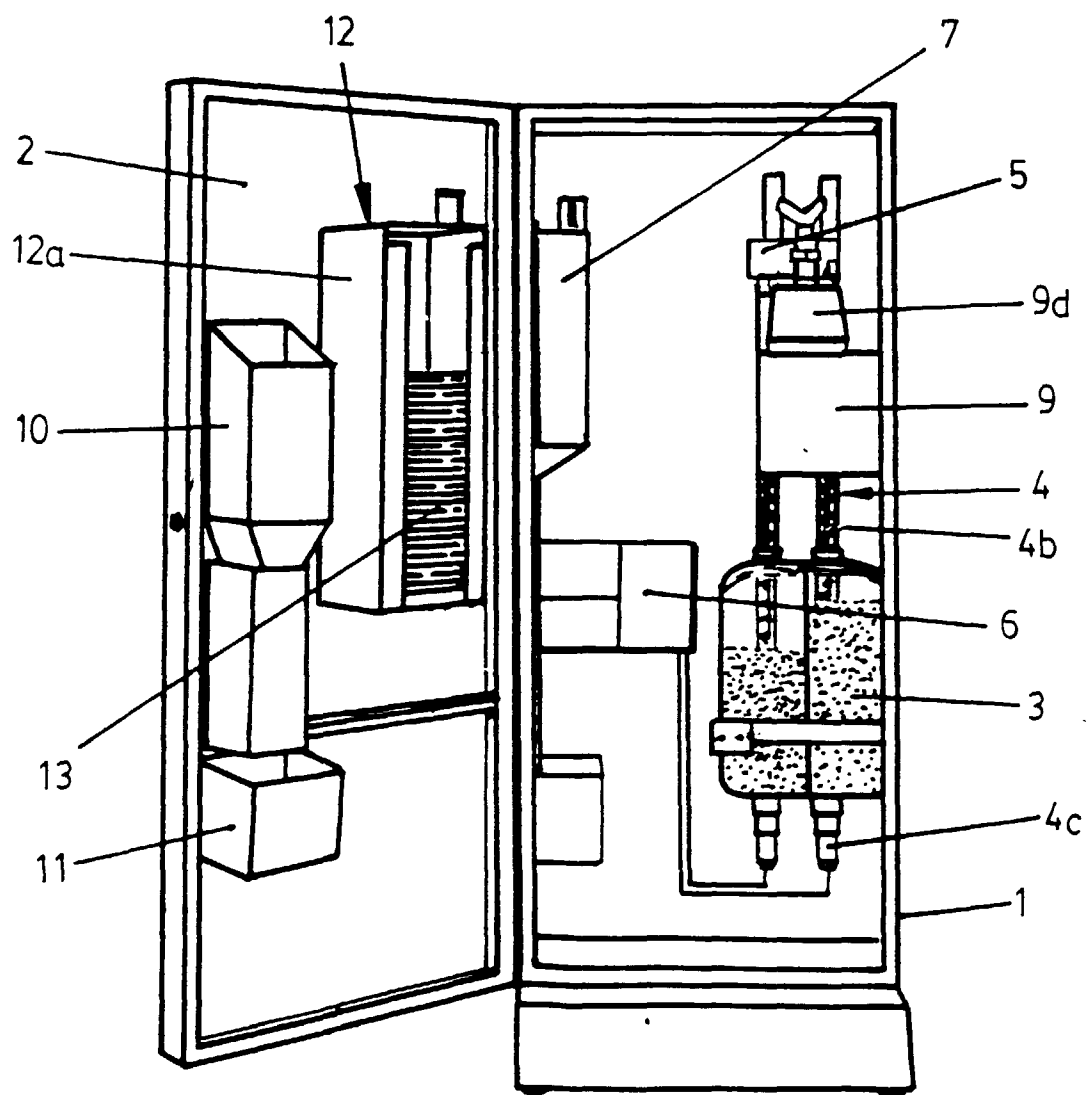


FIG. 2

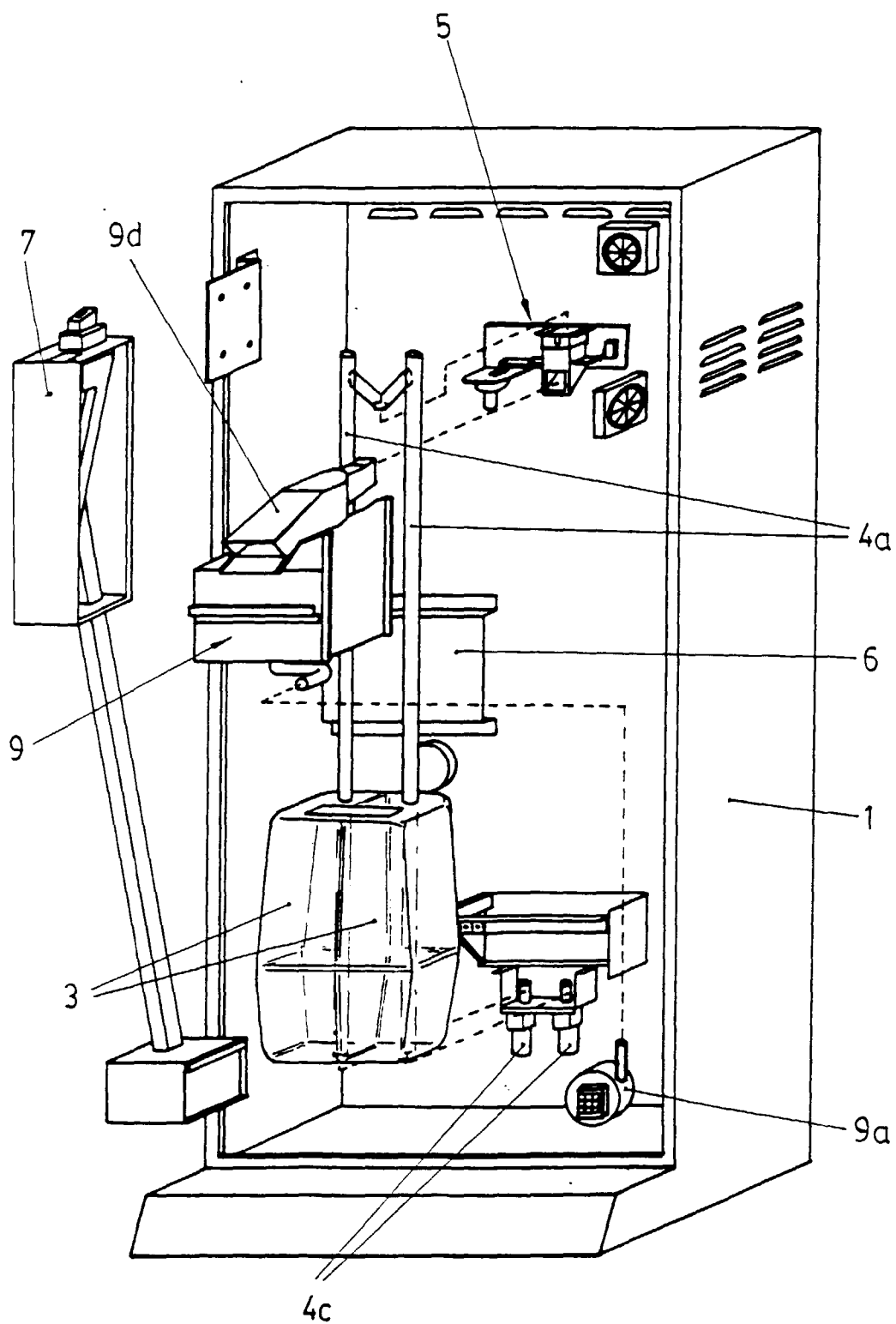


FIG. 3

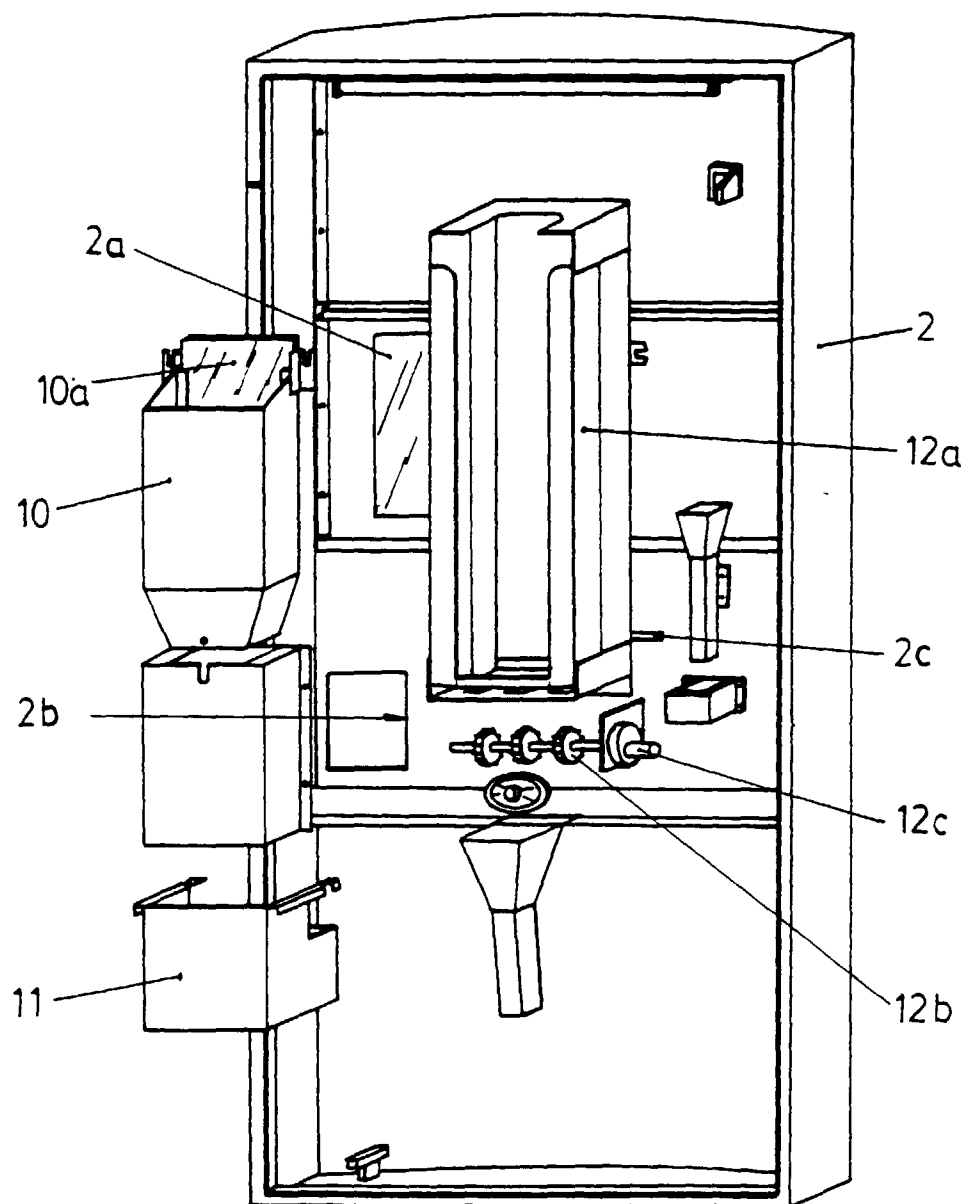


FIG. 4

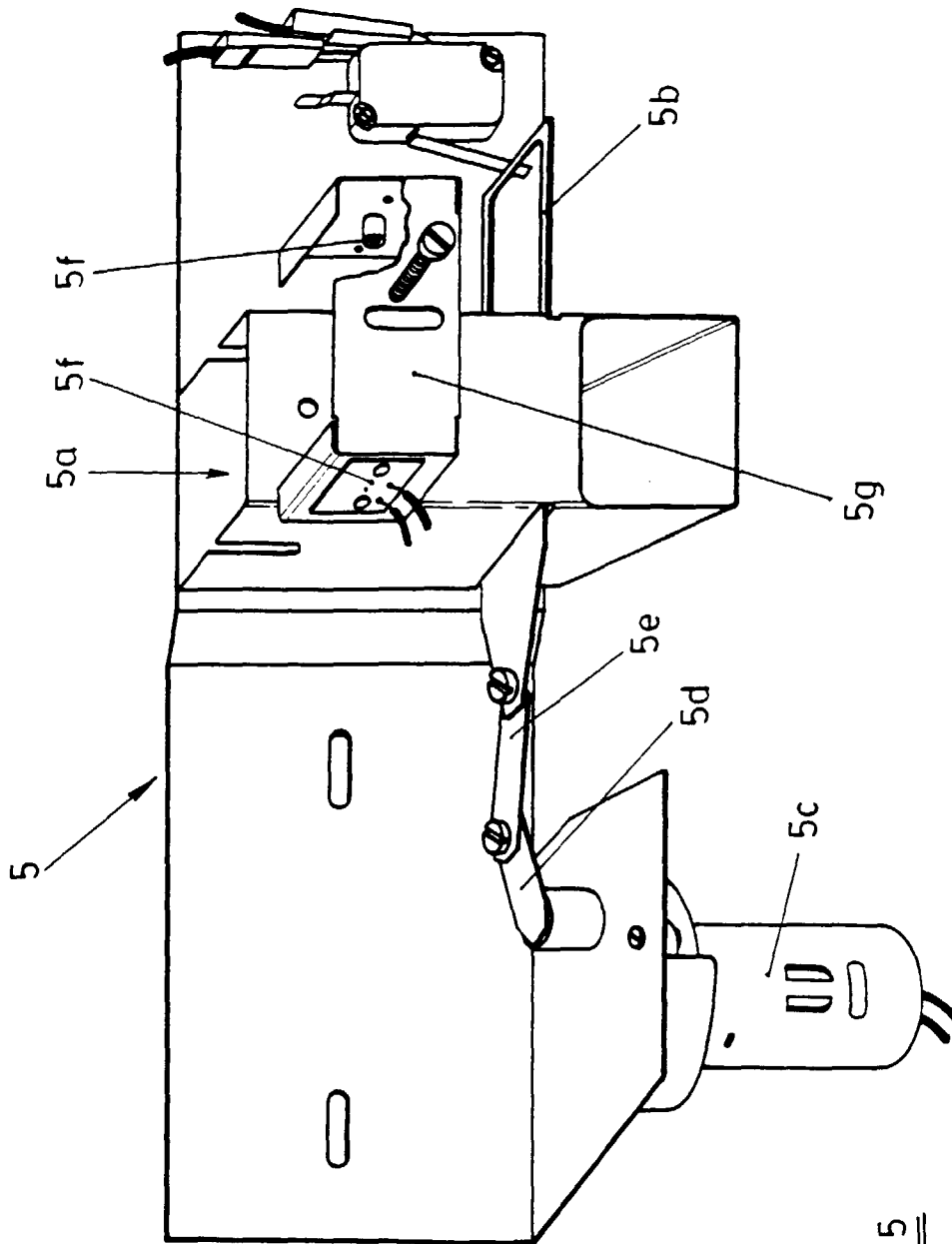


FIG. 5

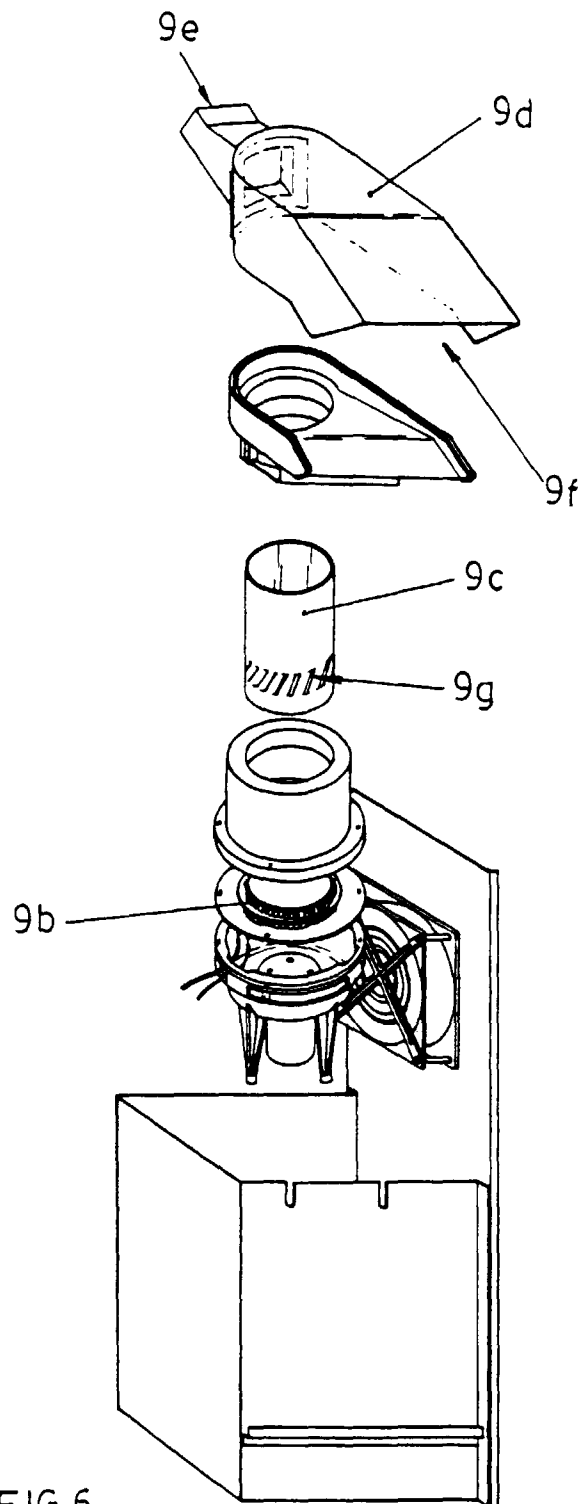


FIG.6

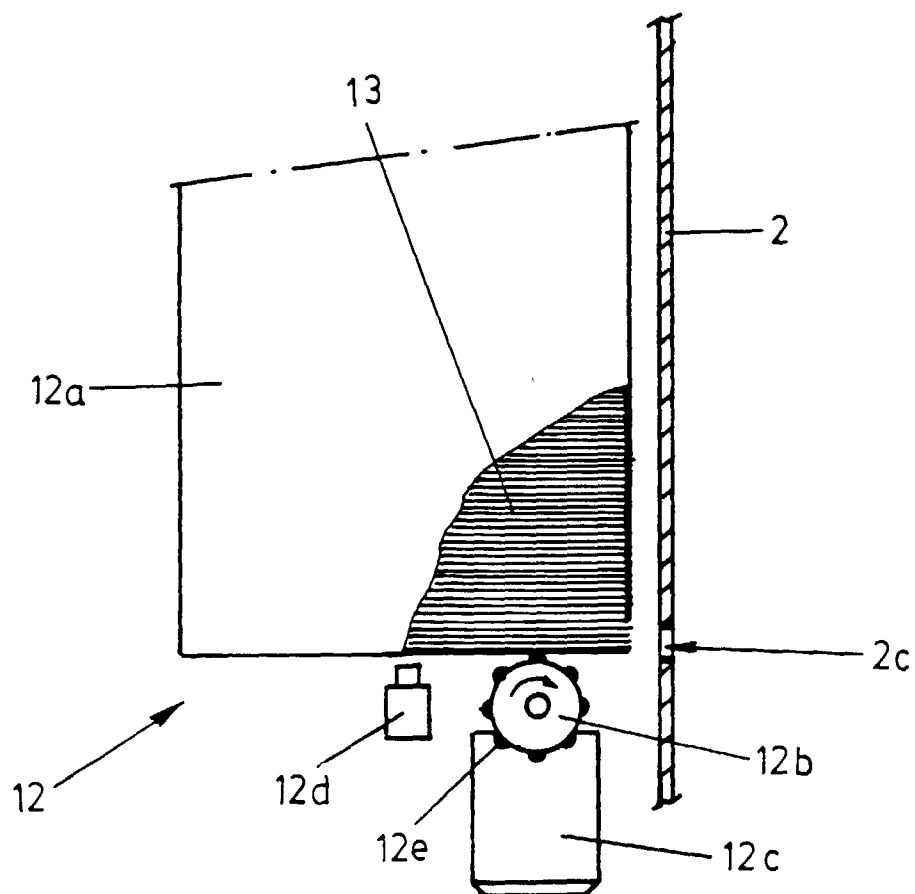


Fig. 7



European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 97 50 0146

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
Y	US 5 020 688 A (POWER PATRICK J) 4 June 1991 * the whole document *	1-3,8	G07F9/10 A23L1/18
Y	WO 97 06699 A (ROWE INTERNATIONAL INC) 27 February 1997 * the whole document *	1-3,8	
A	US 5 263 405 A (SIMON ROBERT M) 23 November 1993 * abstract; claims; figures 4,5 *	1-13	
A	DE 22 56 108 A (MASCRET ALBERT) 24 May 1973 * page 5, line 17 - page 6, line 10; figures 2-5 *	14,15	
A	US 4 171 667 A (MILLER KENNETH H ET AL) 23 October 1979 * the whole document *	1,2,4-14	
A	WO 96 29888 A (SHOW POP INTERNATIONAL INC) 3 October 1996 * abstract; figures 1-3 *	1,2	TECHNICAL FIELDS SEARCHED (Int.Cl.6) G07F A23L
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 9 February 1998	Examiner Guivol, O
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