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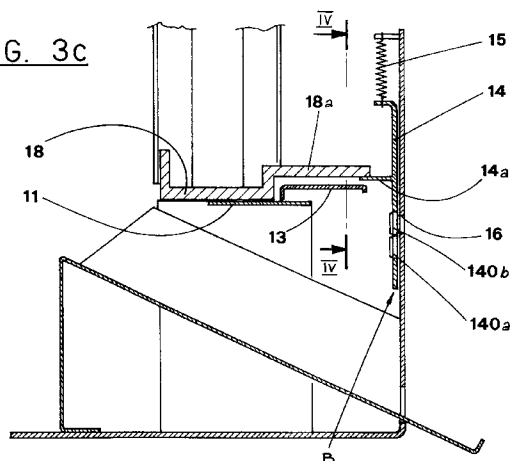
Improved apparatus for dispensing goods items.

The dispensing apparatus (100) is equipped with a coin acceptor (2) with a pusher (13) linked to the actuating push-button (6) for withdrawing a prefixed number of items (7) from the bottom (17b) of a stack (17) of these items (7), which is held inside a store compartment (10).

The items (7) withdrawn are then sent to the outside by means of a chute (30). A weight (18) resting on top of the stack (17) displaces downwards a shutter (14), that is kept raised by elastic means (15), when the stack (17) has run out of items, so as to partially cover the slot (3) wherein the coins are to be inserted to get inside the coin acceptor (2).

One or the other of two coloured sectors (140a, 140b) is made visible through a window (16) for indicating the presence or the lack of items in the dispensing apparatus (100).

FIG. 3c



The invention relates to the technical field concerned with the production of automatic dispensing apparatuses.

Particularly the invention is directed to those apparatuses which dispense goods items encased in uniform, rigid wrappings.

Substantially, these dispensing apparatuses must comply with the following requirements:

- guaranteed working operation;
- good protection against robbery attempts of money or items;
- low production and maintenance costs.

Known dispensing apparatuses may be divided in two groups: a first group includes only mechanical apparatuses; a second group includes electro-mechanical apparatuses.

The apparatuses belonging to the first group are generally less expensive than the ones belonging to the second group, but involve problems in their working.

On the other hand, the second group dispensing apparatuses are generally more sophisticated than the ones belonging to the first group, but involve higher costs.

In many mechanical apparatuses it was found to be relatively easy to withdraw with fraud the goods items contained therein.

This fraud easiness is due to the conformation of the dispensing apparatuses, which include a store compartment within which there is located a stack of items resting on a slide that can be moved from outside.

In the forward stroke of the slide the stack progressively loses the support given thereby, until the end of the slide stroke, when it goes to rest onto a surface positioned beneath the slide.

The backward stroke of the slide results in withdrawing a prefixed number of items and delivering these items to the outside through an opening made in the side walls of the slide and store compartment.

It appears to be clear that, with the help of a small hook or the like, it is possible subsequently to withdraw a number of items while keeping the slide at the end position of the forward stroke.

It is an object of the present invention to provide a mechanical type dispensing apparatus which will enable a correct working in every operating conditions, and which will require low production and maintenance costs.

Yet another object of the present invention is to provide a dispensing apparatus that can easily be transformed in a money-change machine while keeping the same criteria as far as safety and cheapness are concerned.

The characteristic features of the present invention, which do not come out from what has been stated above, will be set forth in the following, with particular reference to the accompanying drawings, in which:

- Fig. 1 shows a front view of the dispensing apparatus as it is seen from outside;
- Fig. 2 shows a top view of the dispensing apparatus;
- Figs 3a, 3b, 3c show cross-sections of the dispensing apparatus taken along the plane III-III of Fig. 1, each in a particular operating stages;
- Fig. 4 shows a view taken along the plane IV-IV of Fig. 3c.
- Fig. 5 shows a top view of a different embodiment;
- Fig. 6 shows a view taken along the plane IV-IV of Fig. 5.

Referring to the above figures, reference numeral 100 indicates an item dispensing apparatus, of fully mechanical type.

The dispensing apparatus includes a structure 1 made up of a vertical wall 1a and a horizontal wall 1b, arranged so as to form a "L".

The structure 1 is designed for being inserted into a suitable support (that is not shown) and blocked therein.

The structure 1 supports a coin acceptor 2 (of known type) wherein there is a first slot 3 sized for the insertion of coins and/or tokens having a prefixed size and corresponding to a certain monetary value (see Fig. 1).

The coin (or token) is first inserted in the slot and then is conveyed to a specially made recess. If it is not considered valid or proper, the coin or token may be given back by bringing it to the outside through a second slot 4 that is situated under the first one, when the user pushes a first push-button 5.

If the coin (or token) is instead considered valid and proper, then it will cause a mechanical block to be released, thus allowing the operation of a mechanism 50 that is designed to withdraw a prefixed number of items 7 and to deliver them to the outside.

The operation of the mechanism 50 can be started by the user that, at a position near to a collecting area 8, pushes a second push-button 6 that is made accessible from outside the structure 1.

The mechanism 50 includes a store compartment 10 extending vertically, that is designed to hold a stack 17 of the goods items 7, resting on a horizontal base 11 fastened to the structure 1.

At a side of the store compartment 10, near to the base 11, there is located a pusher 13 having a proper shape that is moved when the second push-button 6 of the coin acceptor 2 is pushed.

A mobile shutter 14 is constrained to the inner surface of the wall 1a by means of sliding permitting means. The shutter is subjected to the action of elastic means 15 which keep the shutter 14 in a raised position A, so that it is possible to insert a coin or token in the first slot 3.

When the shutter is raised a first coloured sector 140a (for instance a green plate) is visible from out-

side through a small window 16 that is made in the wall 1a (see Figs. 1,3a,3b,6).

The sector is made integral with the shutter and indicates a "normal condition" working status for the dispensing apparatus 100.

The shutter 14 also features a ledge 14a projecting towards the store compartment 10.

A weight 18 is placed in the store compartment 10 on the top 17b of the stack 17, and features a prominence 18a designed to go in abutment on the ledge 14a, as it will be better explained in the following (see Figures 2,3a,3c,5,6).

In the region beneath the store compartment 10 there is located a chute 30 which leads to the outside passing through a slit 19 made in the wall 1a.

The chute 30 has side panels 31 aimed at guiding the goods items 7.

Working operation of the dispensing apparatus includes, as a first stage, filling the store compartment 10 up with a stack 17 of items 7 and placing the weight 18 on top of it. These actions are performed by assigned personnel (see Fig. 3a).

A user may insert a coin, or other suitable token, in the first slot 3 and then pushes the second push-button 6 which actuates the pusher 13.

The pusher passes through a sized opening 10a, made in the store compartment 10, so as to contact and push a preset number of items 7, which are shifted out of the bottom 17a of the stack 17.

When the items 7 are clear of the base 11, they fall down on the underlying chute 30 and slide thereon up to the collecting area 8 that is located outside the structure 1 (see Fig. 3b).

In this area the items may be taken by the user, as already stated before.

While the pusher 13 is running the forward and backward strokes, the stack 17 rests on the same pusher (see Fig. 3b).

An arm 70, made integral with the pusher 13, lies outside the store compartment 10, parallel to the sliding direction of the same pusher (see Fig. 2).

A transverse striker 130 is fastened to the outer end of the arm 70 and has the task of preventing the dispensing apparatus from being tampered. More precisely the transverse striker prevents the lowermost item 7 of the stack 17 from being illegally withdrawn.

The striker 130 moves in synchrony with the pusher and let the items 7 at the bottom of the stack free when the pusher runs the forward stroke, while preventing the items from being withdrawn through the lower opening of the store compartment when the pusher is at its rest position.

This striker 130 forms, in fact, a barrier that cannot be overcome to reach the items 7 situated in correspondence with the store compartment opening, which as a consequence cannot be illegally withdrawn.

Furthermore, the striker 130 features a flange

extending towards the stack 17 of items 7, and aimed at supporting the items 7 when only a few of them remain to form the stack.

When the last group of preset number of items 7 has been delivered, the weight 18 is fully lowered resting on top of the base 11.

As a consequence of this, the prominence 18a, projecting from the weight 18, touches the ledge 14a of the shutter 14 and keeps the shutter in the lowered position B.

When at this position B, the shutter 14 partially covers the first slot 3 of the coin acceptor 2, thus preventing other coins or tokens from being inserted therein (see Figures 3c and 4).

In this situation a second coloured sector 140b, having a colour different than the one of the previously described sector (for instance red), is visible from outside through the window 16 (see Fig.3c). Also the second sector is made integral with the shutter 14, and indicates the "out of order" status for the dispensing apparatus.

Figures 2,3a,3b,3c show the dispensing apparatus 100 described heretofore as it is set for dispensing items 7 having box-like shape, particularly for dispensing an item each time.

Figures 5 and 6 instead show the dispensing apparatus 100 when it is transformed to a money changer, that is done by a simple modification of the store compartment 10 shape, of the weight 18 and of the pusher 13.

Also the chute may be modified although it would not be necessary for this transformation.

Working operation of this last version of the dispensing apparatus 100 is the same as for the version previously described as well as for a further version (that is not shown in the drawings) in which the dispensing apparatus 100, set in the money-change mode, has a number of store compartments 10 and a pusher 13 properly shaped for simultaneously withdrawing a corresponding number of coins and/or groups of coins.

In the examples shown in the figures, and according to a preferred embodiment, the supporting base 11 does not extend for the whole length of the items projection area, so that the items may be withdrawn with a stroke of the pusher 13 shorter than the length of the items.

This ensures for a better working of the apparatus while the stability is not jeopardized, since the center of gravity of the stack 17 is always situated within the outline of the base 11.

The characterizing features of the improved dispensing apparatus subject of the present invention are well evident from what has been stated above. The dispensing apparatus ensure for a good working operation although it includes only a few constructive elements which are simple but reliable.

The dispensing apparatus does not include elec-

tro-mechanical means and therefore it requires low production costs and offers a wide number of possible installations since it does not requires electric power supply.

The subject dispensing apparatus, because of its particular configuration, turns out to be very effective against robbery attempts aimed at gathering items illegally.

In fact, the items cannot be reached by passing through the slit 19.

Claims

1. Improved goods items dispensing apparatus including a structure (1), which supports a mechanical coin acceptor (2) featuring a first slot (3) for insertion of a coin or token, a first push-button (5) for giving back coins or tokens, which are not acceptable, by sending them to the outside through a second slot (4) that is situated under the first one, a second push-button (6) provided for operating a mechanism (50) designed for withdrawing and delivering a prefixed number of items (7), the said withdrawing and delivering mechanism being characterized in that it includes:
at least a store compartment (10) extending vertically and holding a stack (17) of said goods items (7), the stack resting on a horizontal base (11);
a pusher (13) actuated by said second push-button (6) of the coin acceptor (2), this pusher being movable horizontally so as to pass through a sized opening (10a) made in the said store compartment (10) in order to displace a prefixed number of said goods items (7) from the bottom (17b) of said stack (17);
a chute (30) underlying the said store compartment (10) adapted to convey the same prefixed number of items (7) and to transfer them to a collecting area (8) made accessible from outside;
a mobile shutter (14) constrained to the said structure (1) and subjected to the action of elastic means (15) which keep the shutter (14) in a raised position (A), in which insertion of a coin or token in the said first slot (3) of the coin acceptor (2) is allowed; a weight (18) resting on the top (17a) of the said stack (17) of items (7), the said weight featuring a prominence (18a) designed to displace the said shutter (14) to a lowered position (B) and to keep in such lowered position, so that introduction of a coin or token is prevented in said first slot (3) of the coin acceptor (2) when the stack (17) has located inside said store compartment (10) has run out of items (7) or has reached a prefixed height.

2. Dispensing apparatus as claimed in claim 1, characterized in that the said pusher (13) is shaped

in such a way as to support the stack (17) while the prefixed number of items (7) is being withdrawn from the bottom of the same stack (17).

3. Dispensing apparatus as claimed in claim 1, characterized in that the said shutter (14) has two coloured sectors (140a,140b) made integral therewith, each of these sectors being visible from outside, through a window (16) made in the structure, when the shutter (14) is in the raised position (A) and when the shutter (14) is in the lowered position (B) respectively.

4. Dispensing apparatus as claimed in claim 1, characterized in that the said pusher (13) has an arm (70) made integral therewith and located outside the said store compartment (10), this arm being arranged parallel to the sliding direction of the same pusher and supporting a transverse striker (130) shaped in a way such as to allow a free withdrawing of the said prefixed number of items from the bottom (17b) of the stack (17) during the forward stroke of the pusher (13), while preventing any access to the items located at the bottom opening of the store compartment.

5. Dispensing apparatus as claimed in claim 4, characterized in that said transverse striker has a flange extending towards said stack (17), aimed at supporting the said items (7) when only a few of them remain in the said stack.

FIG. 1

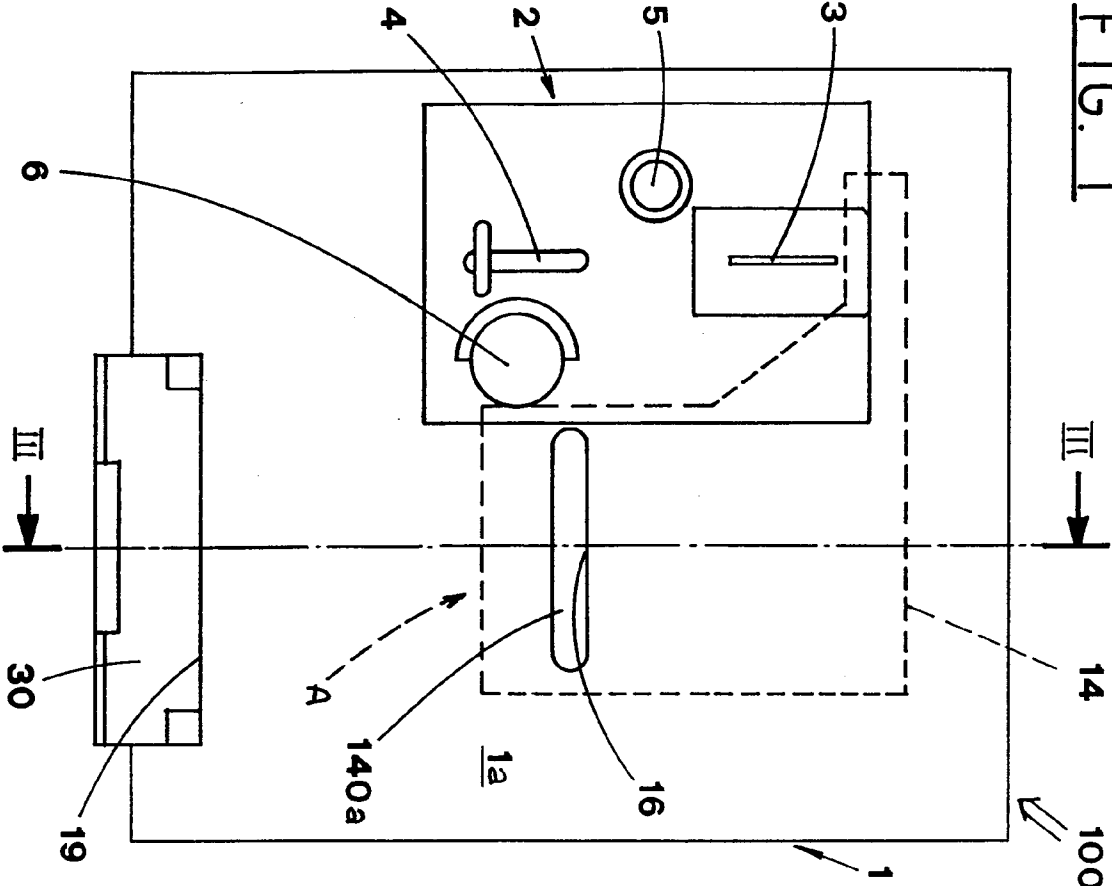


FIG. 2

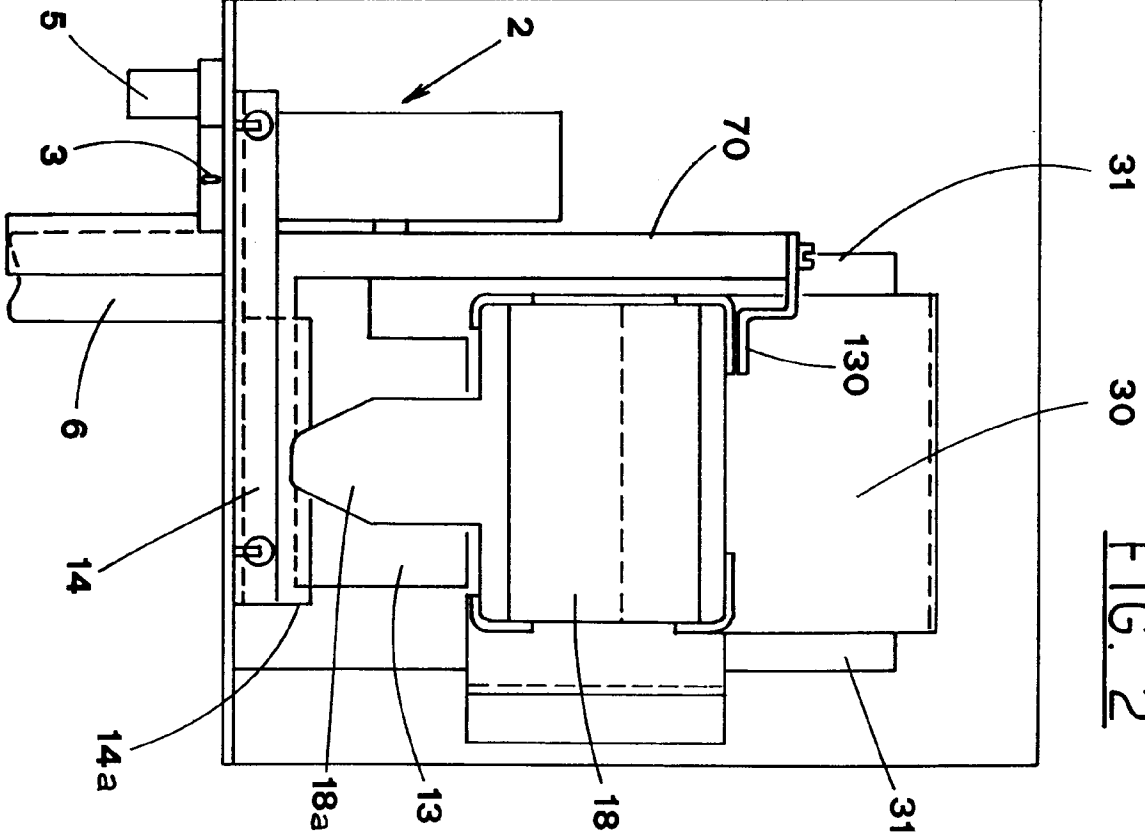


FIG. 3a

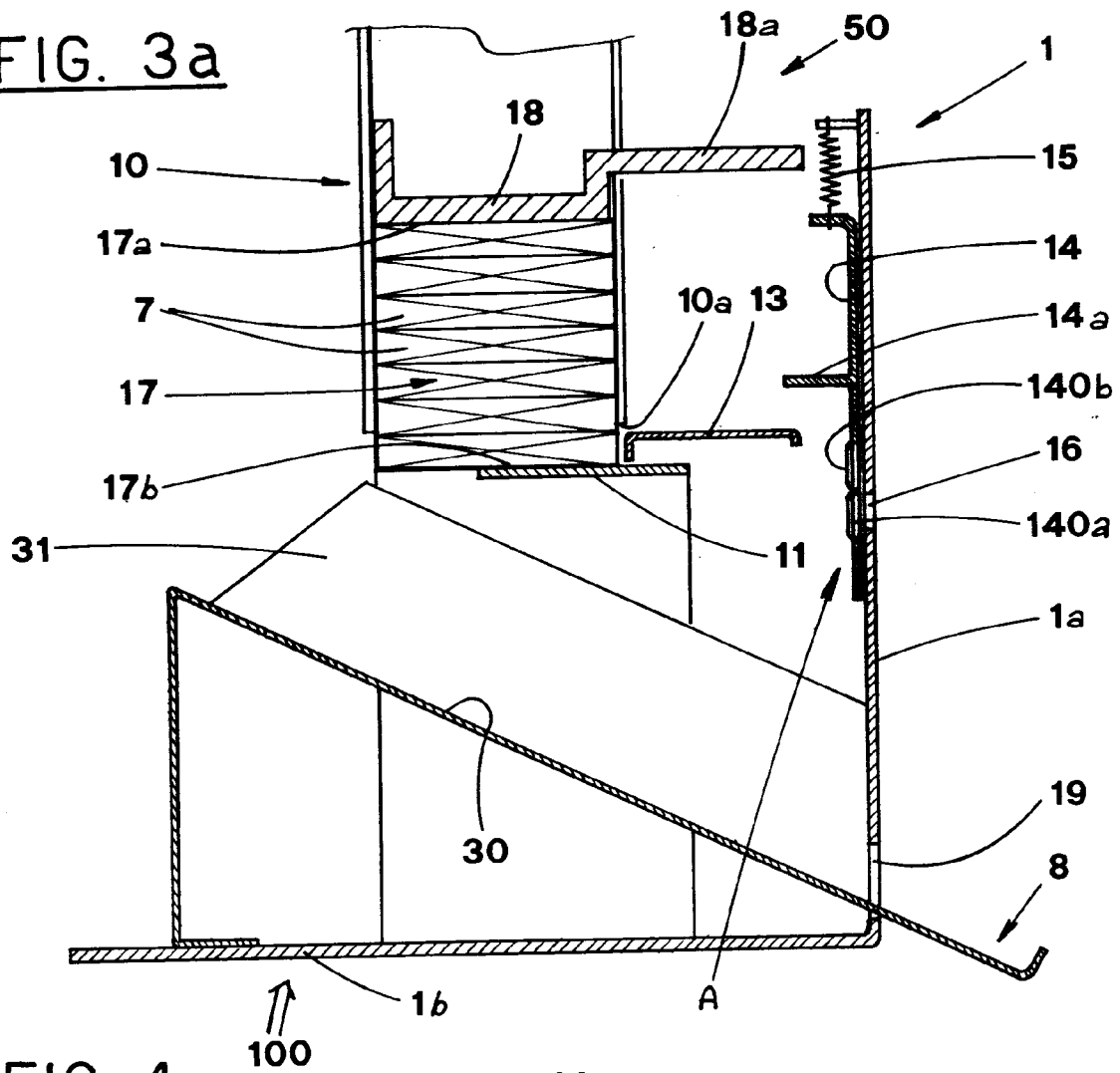


FIG. 4

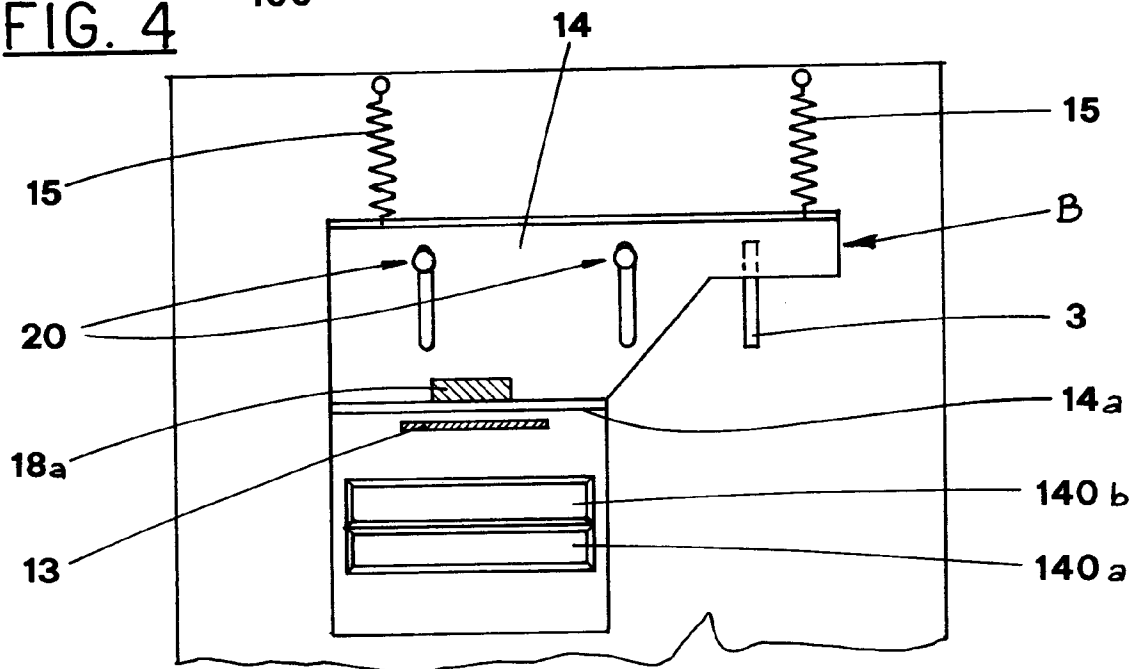


FIG. 3b

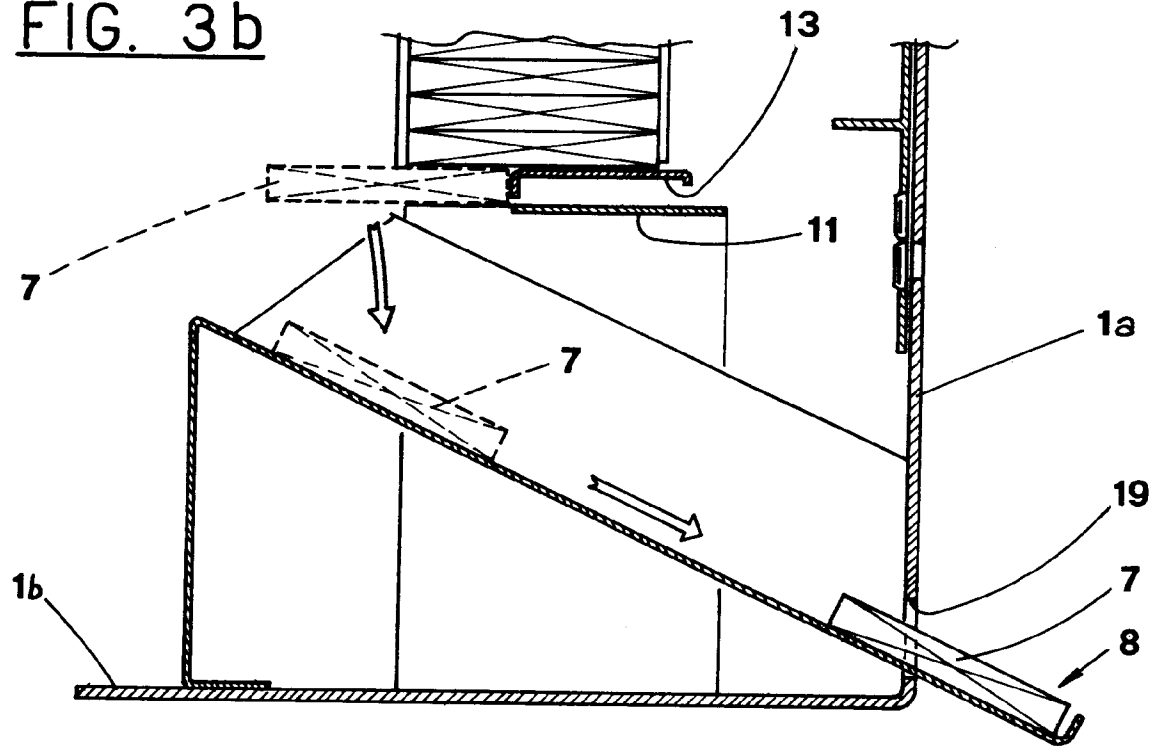


FIG. 3c

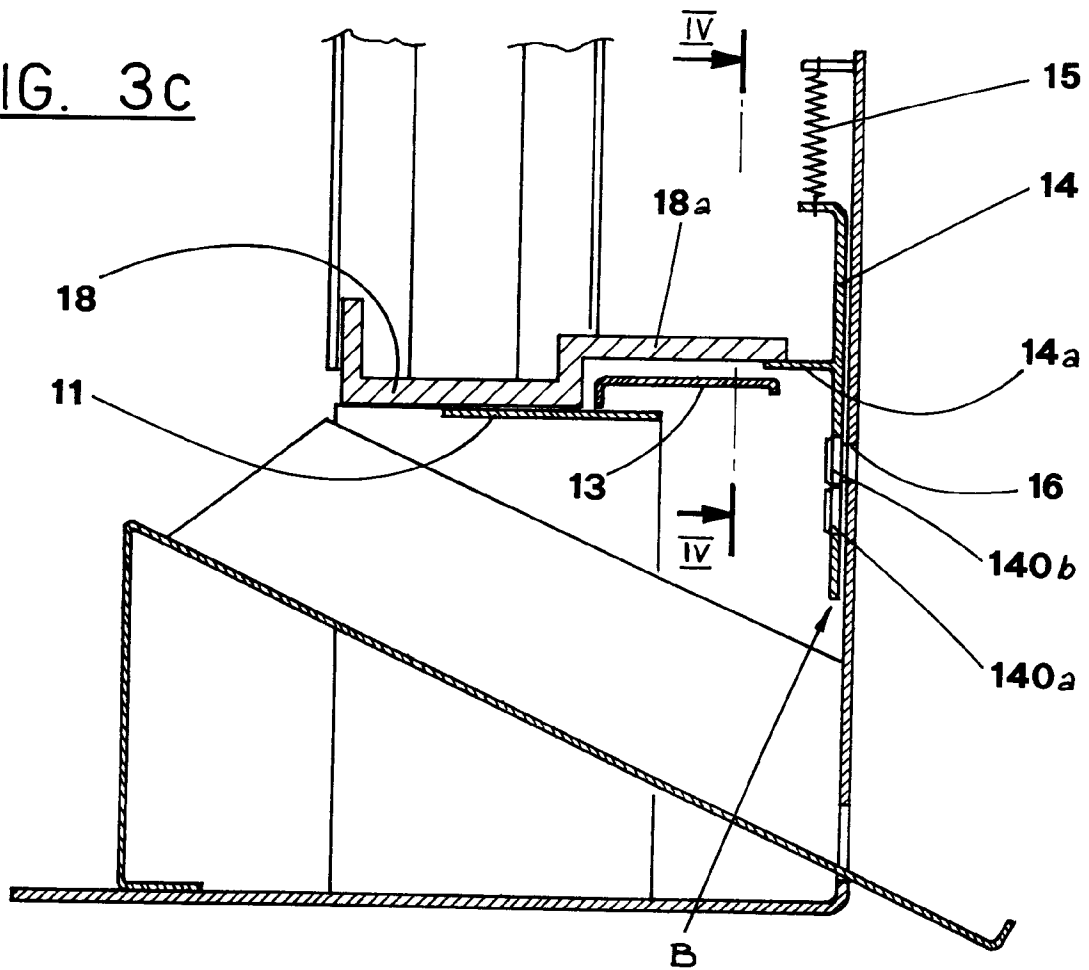


FIG. 6

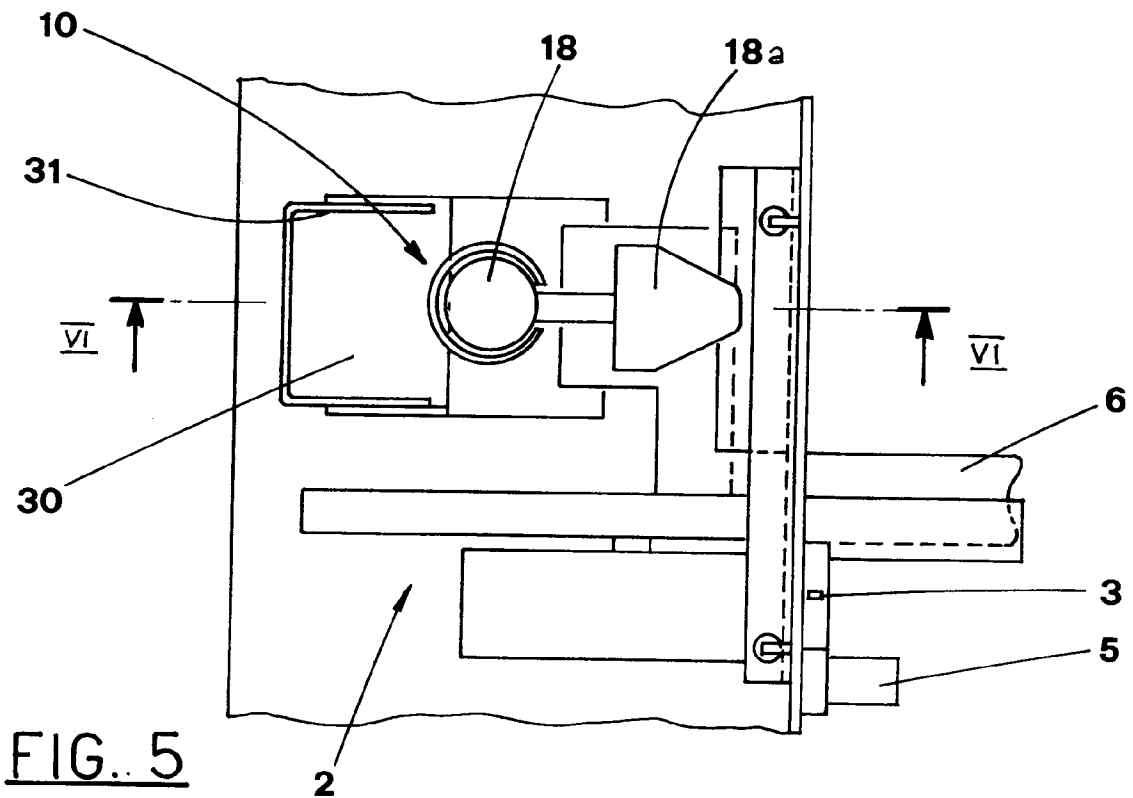
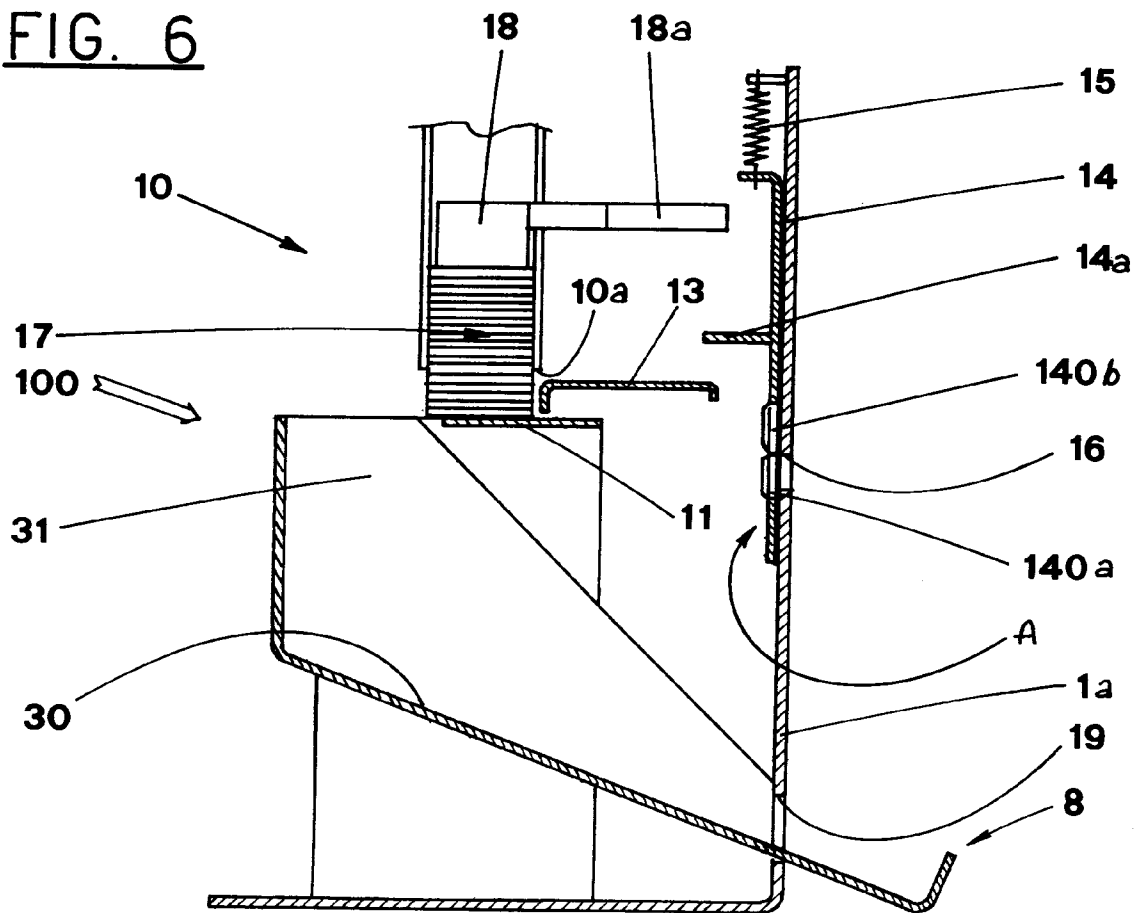


FIG. 5



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EUROPEAN SEARCH REPORT

Application Number
EP 93 83 0294

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.5)
X	GB-A-368 848 (F.S. AUTOMATICS) * page 6, line 71 - line 93; figures *	1,2	G07F9/02 G07F11/18
A	---	3	
Y	GB-A-912 801 (FISHER & LUDLOW) * the whole document *	1,2	
Y	---		
Y	US-A-1 686 949 (F.J. BRANDT) * the whole document *	1,2	
A	---		
A	GB-A-480 636 (SEITZ-WERKE) * claims; figures *	1,4,5	
A	---		
A	US-A-1 778 187 (A.H. DU GRENIER) * page 2, line 68 - page 3, line 68; figures *	1,2,4,5	

			TECHNICAL FIELDS SEARCHED (Int.Cl.5)
			G07F
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		25 October 1993	DAVID, J
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