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(54) **DISPENSER FOR GRANULAR OR POWDERED FOOD PRODUCTS, FOR EXAMPLE GRATED CHEESE AND SIMILAR LOOSE FOOD PRODUCTS, AND CORRESPONDING MANUFACTURING PROCESS**

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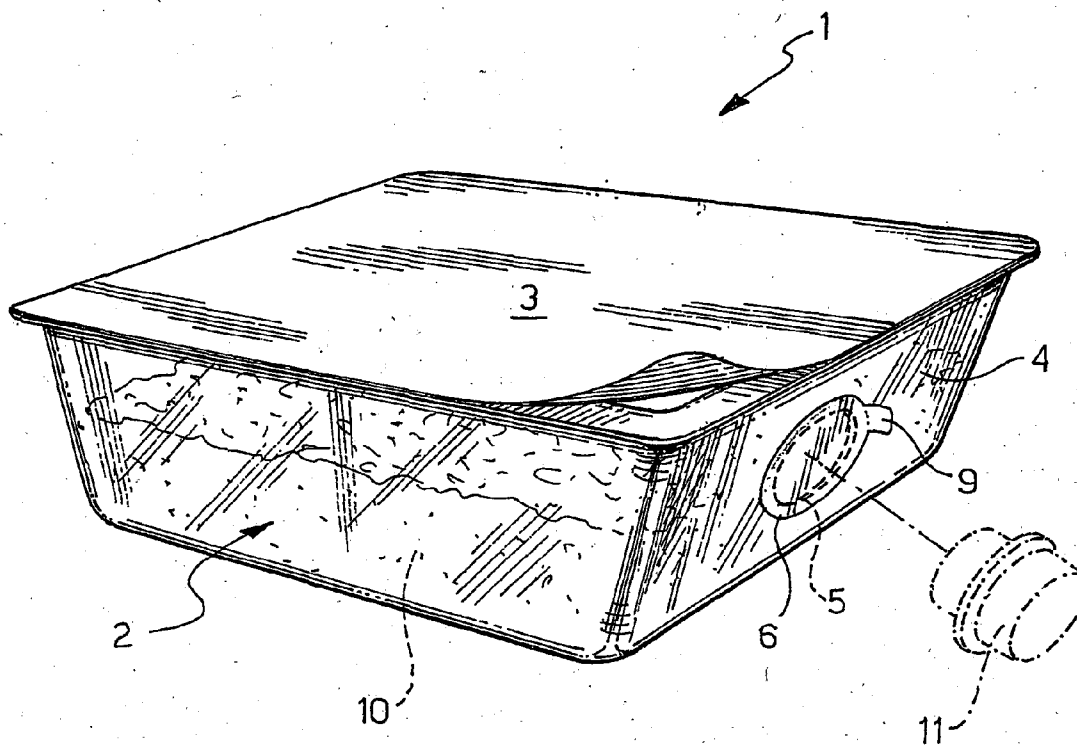
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(57) **ABSTRACT**

The present invention relates to a dispenser (101) of granular or powdered food products (119), e.g. grated cheese and similar loose food products. The dispenser (101) is a bi-valve holder (120), comprising a first valve (104) and a second valve (105) closed on themselves, with each valve (104, 105) moulded in one piece out of a single sheet of plastic synthetic material, said valves being joined along an edge line (106). At least one valve is equipped with a dispensing hole (114) and a label (116), removable by tearing, to cover the hole (114). Said valves (104, 105) before the sealing step, have heat-sealed side edges (109, 110) and approached top edges (111, 112). Advantageously, an automatic process is provided to manufacture said dispenser comprising the following steps: opening of the dispenser upper end by pressing on said side edges (109, 110) with subsequent expansion due to the fact that said top edges (111, 112) move away from each other, filling with the loose food product (119) through said opening; heat-sealing of said top edges (111, 112).



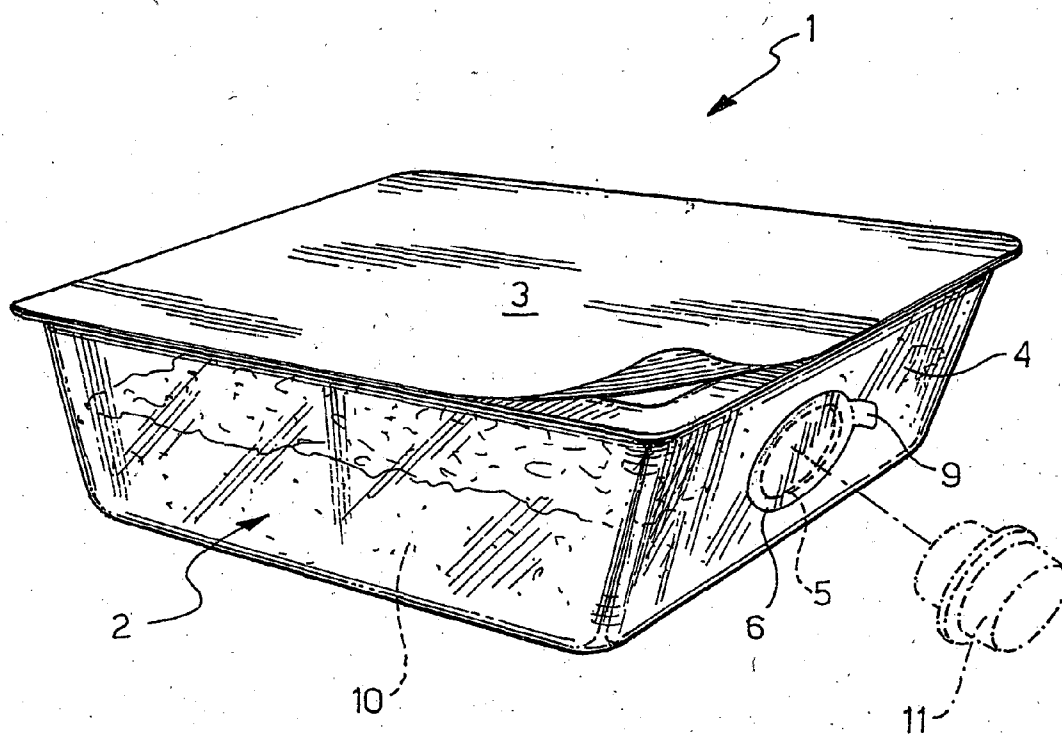


FIG. 1

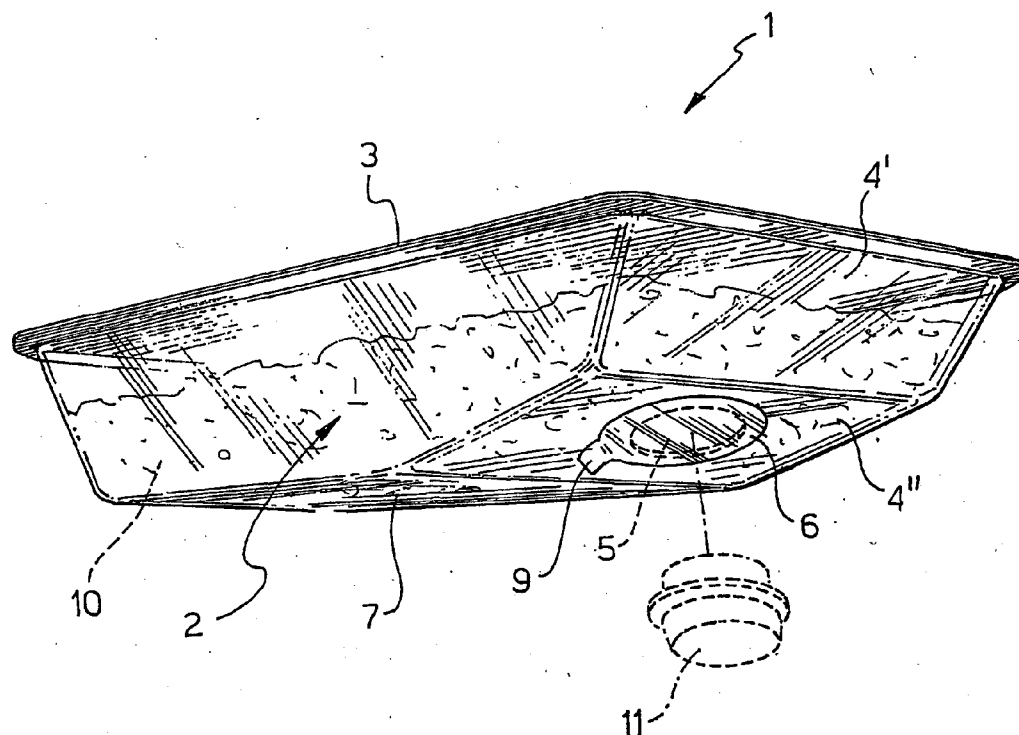


FIG. 2

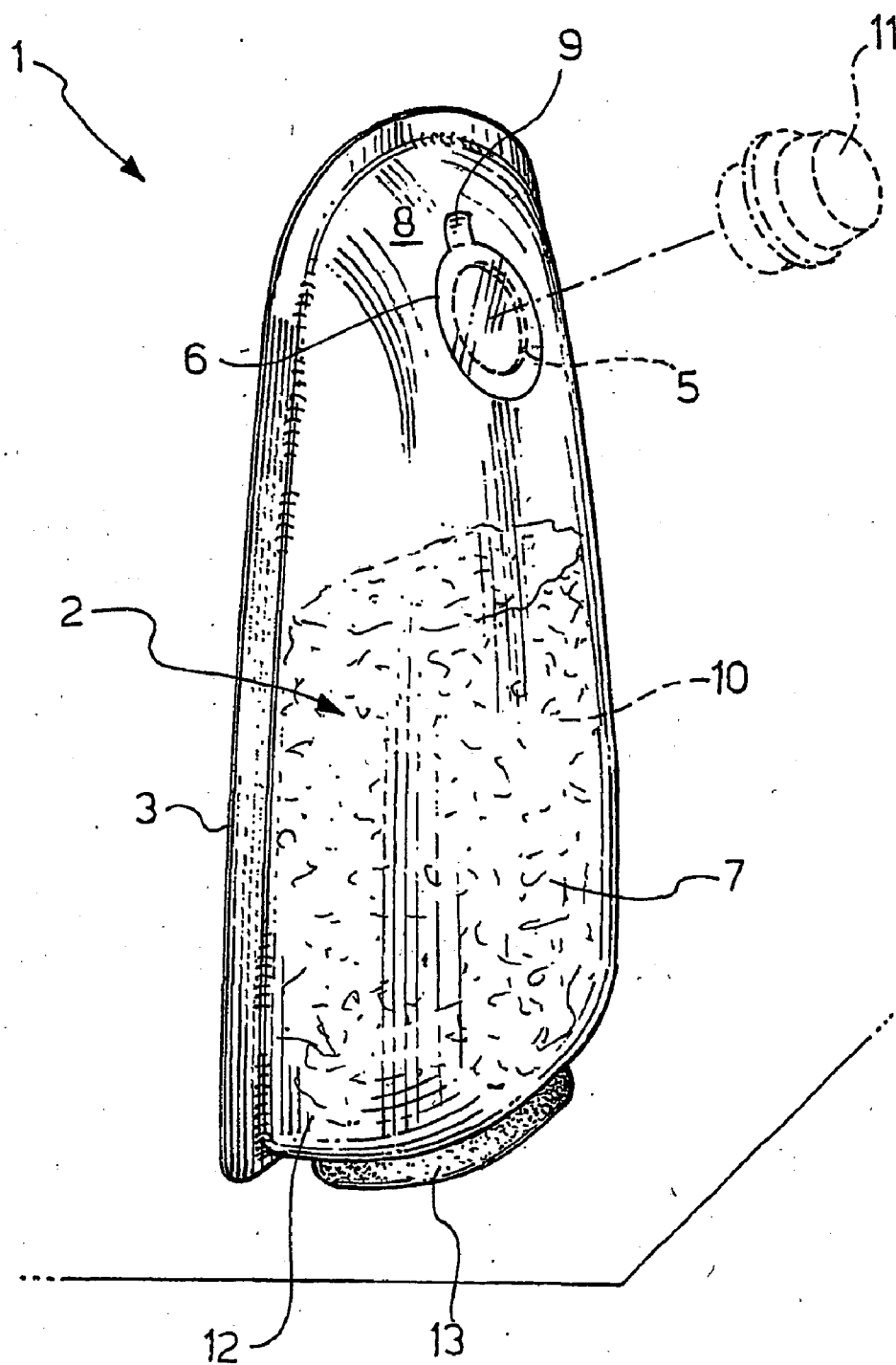


FIG. 3

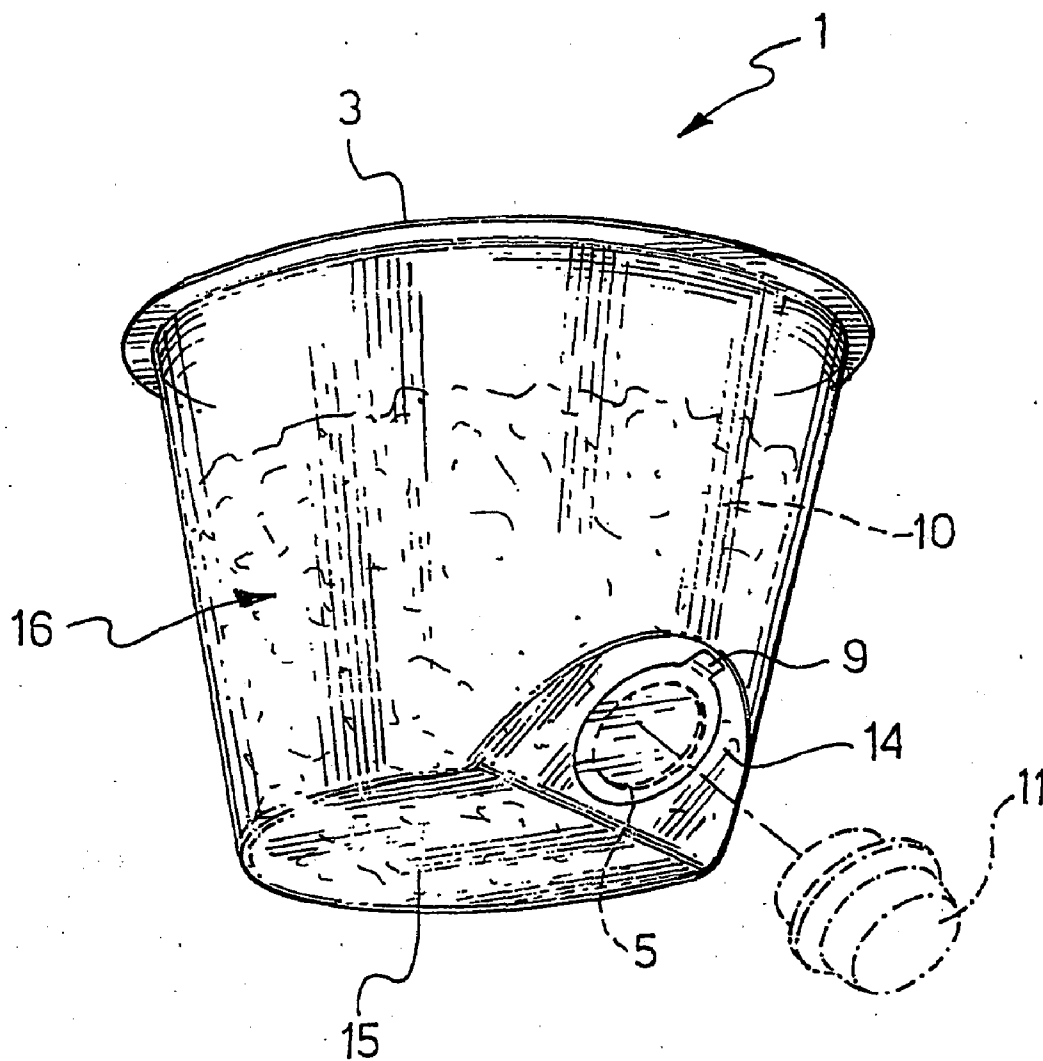


FIG. 4

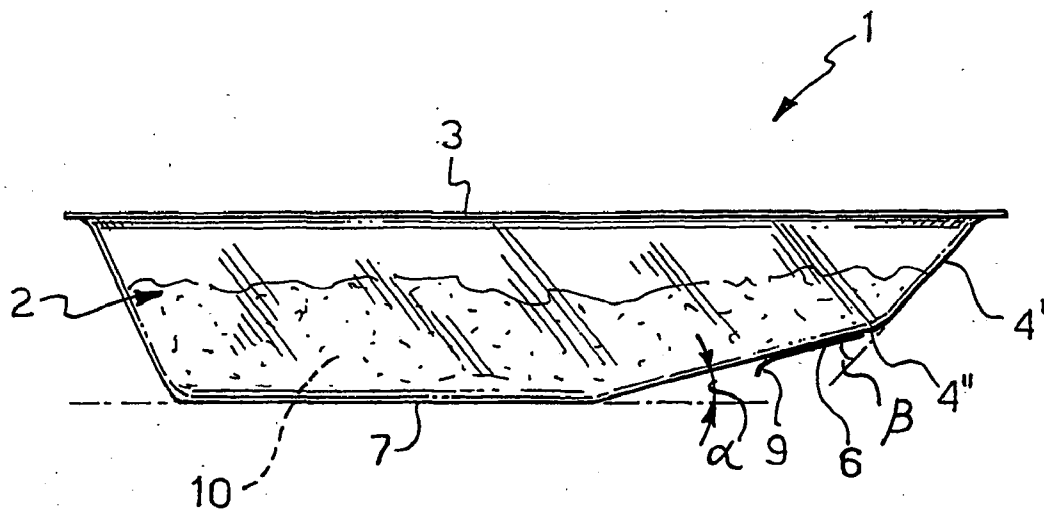


FIG. 5

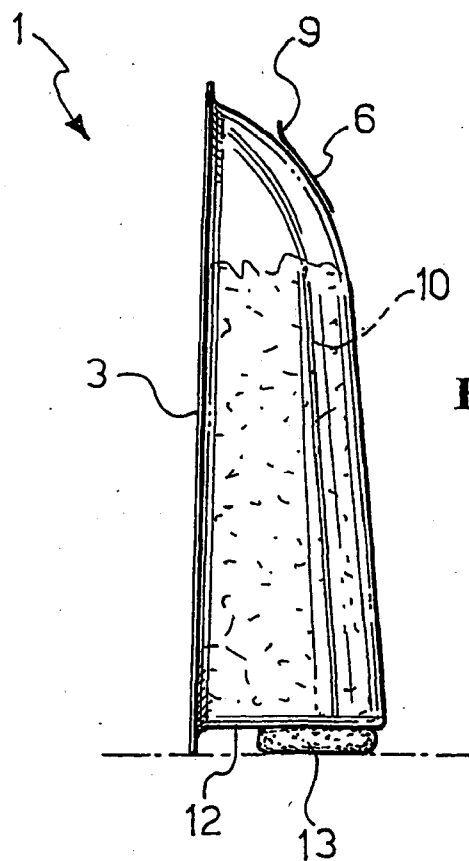


FIG. 6

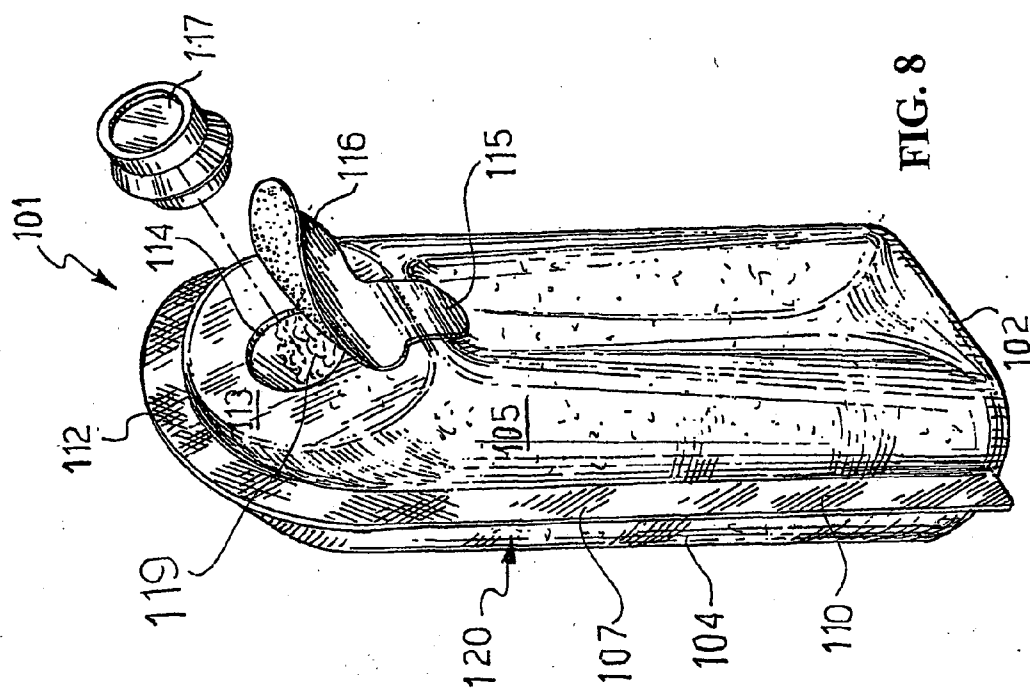


FIG. 8

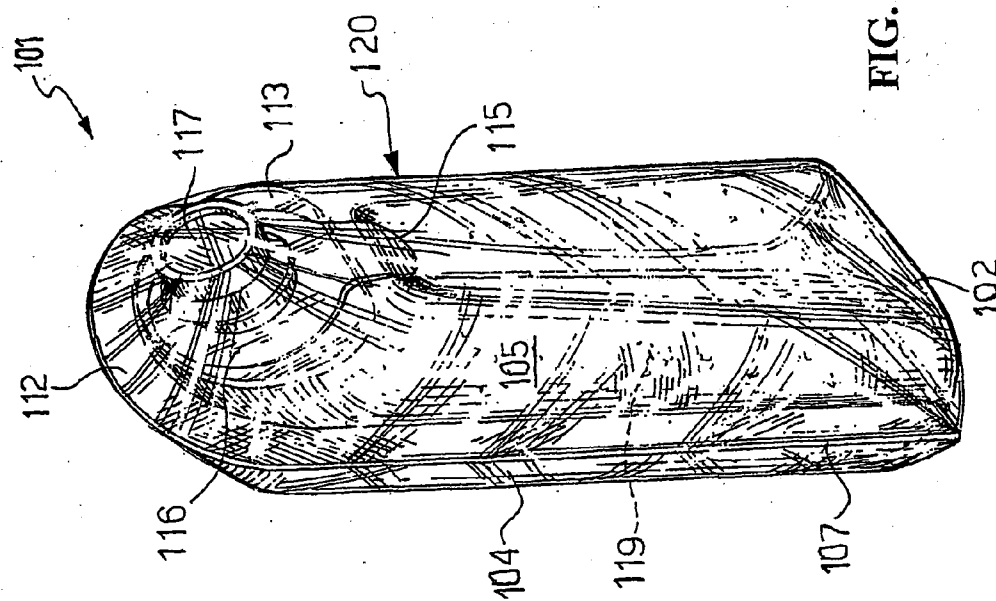
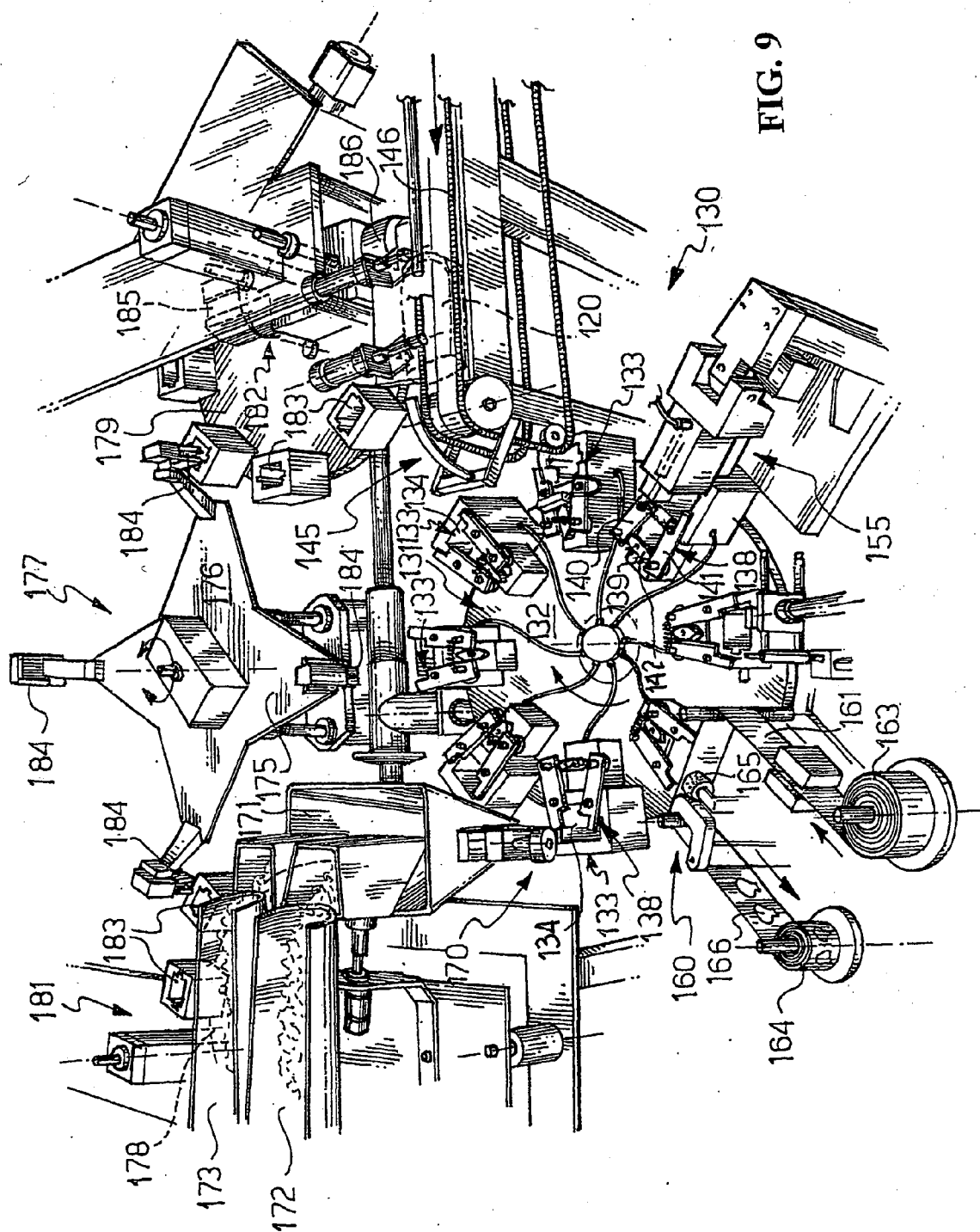
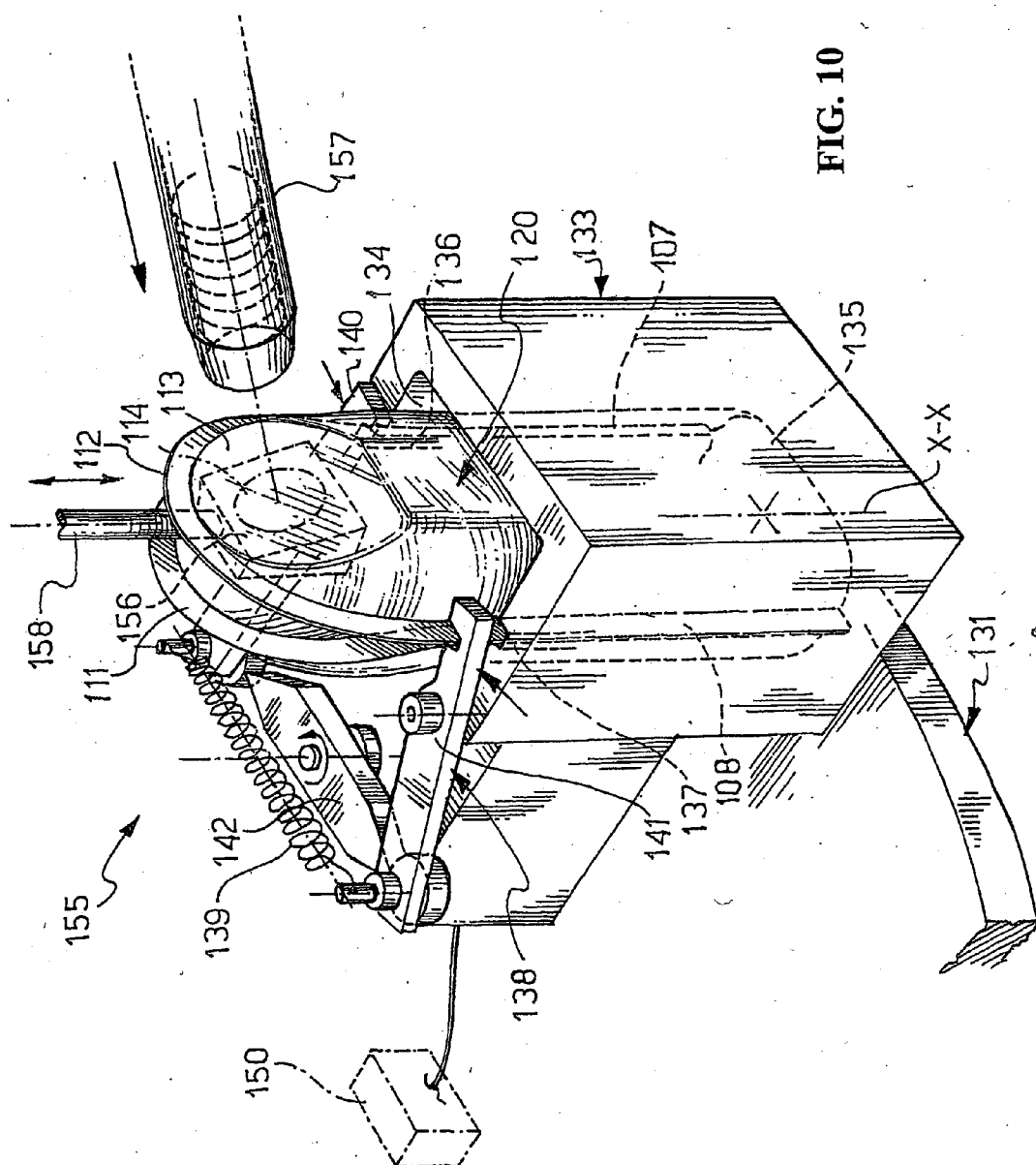


FIG. 7





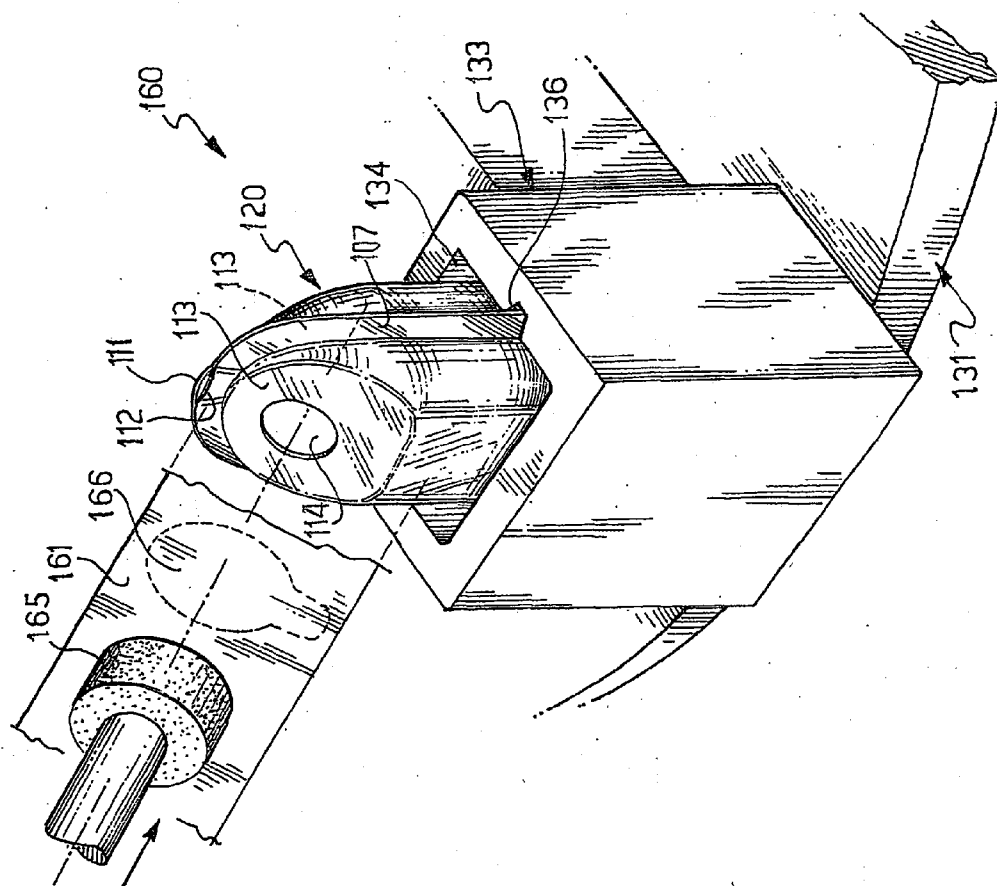
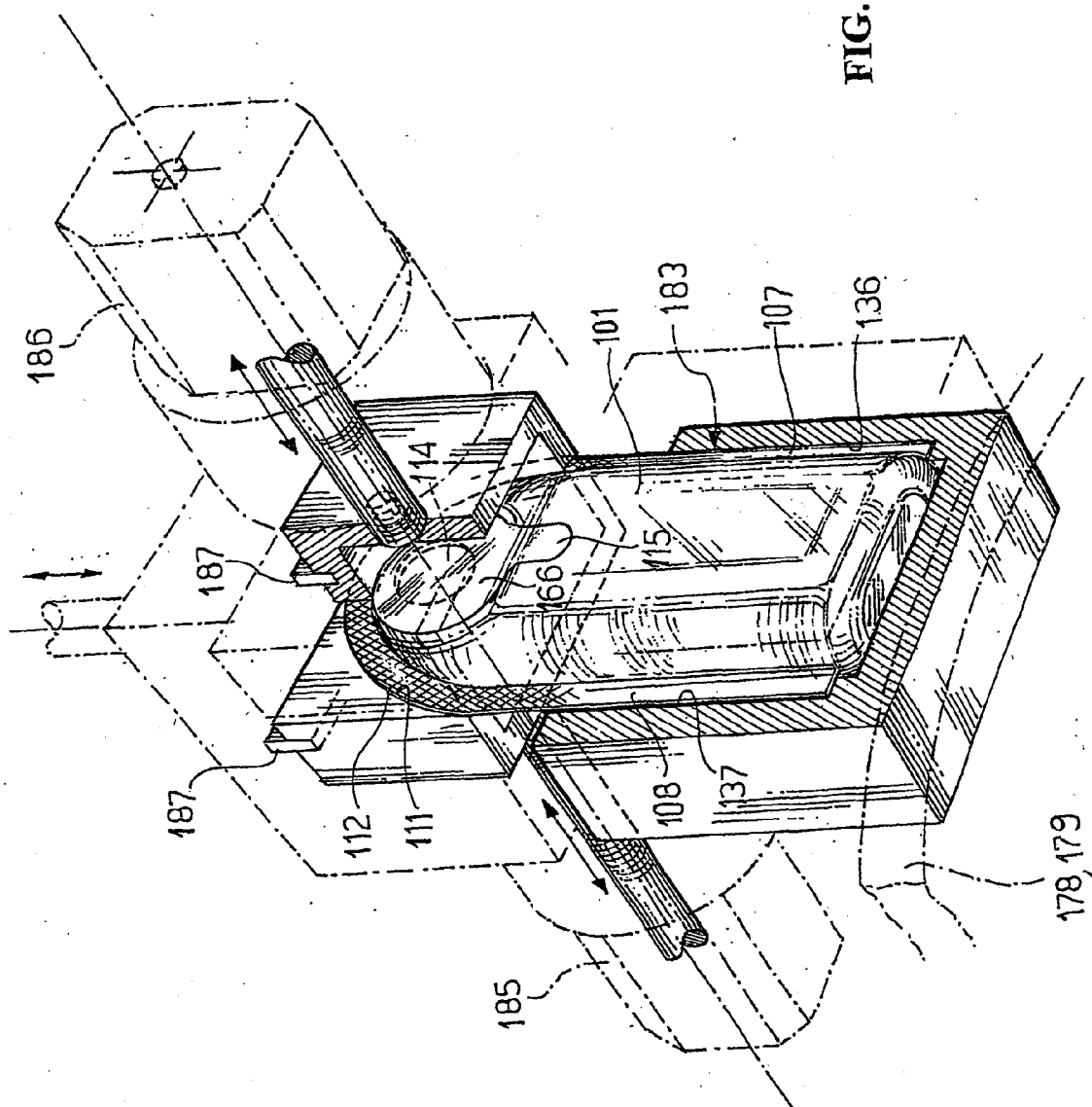


FIG. 11

FIG. 12



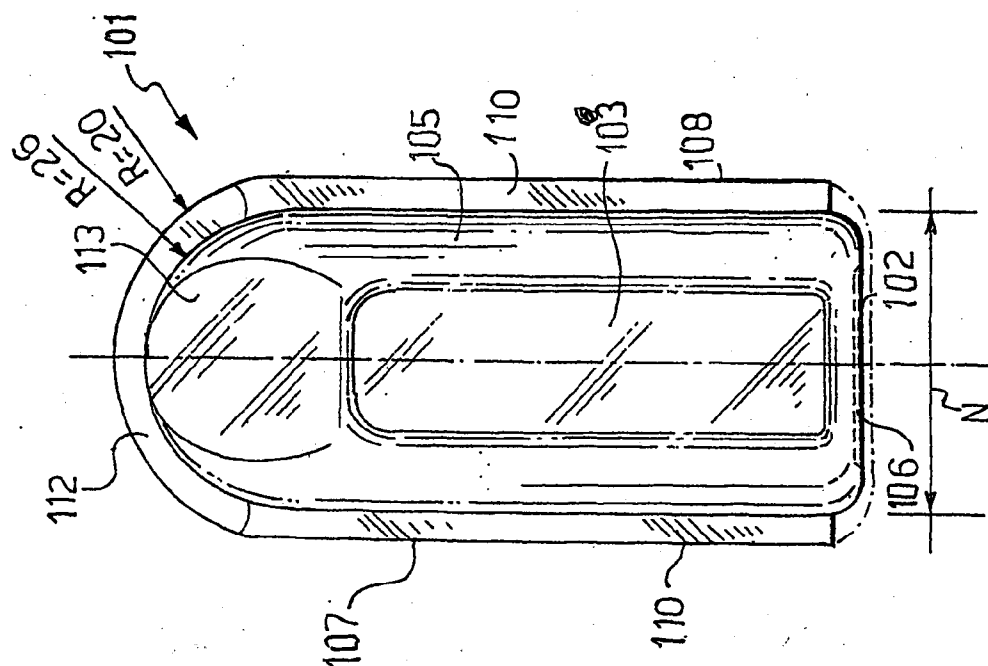


FIG. 14

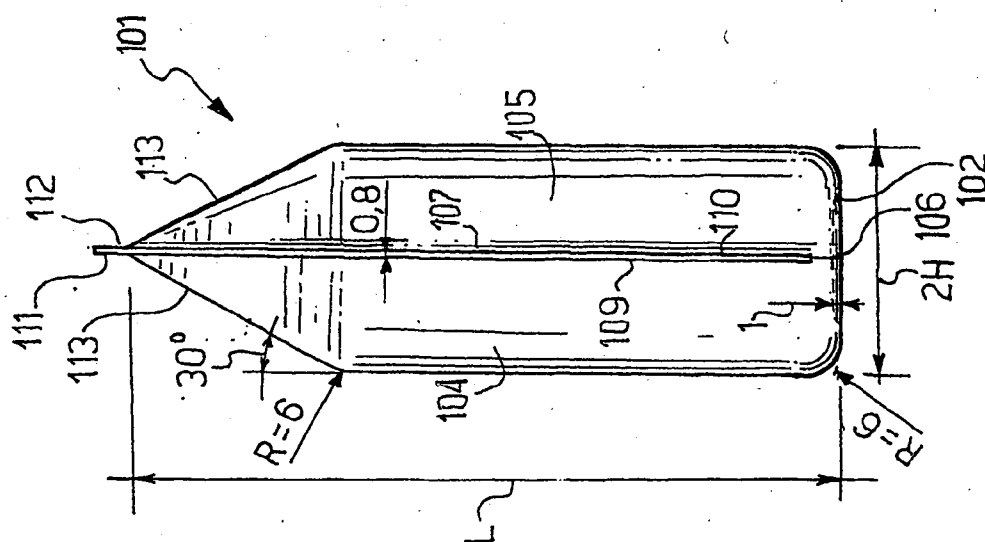


FIG. 13

**DISPENSER FOR GRANULAR OR POWDERED
FOOD PRODUCTS, FOR EXAMPLE GRATED
CHEESE AND SIMILAR LOOSE FOOD
PRODUCTS, AND CORRESPONDING
MANUFACTURING PROCESS**

TECHNICAL FIELD

[0001] The invention relates, particularly but not exclusively, to a dispenser for granular or powdered food products, such as grated cheese and the like food products in loose form.

[0002] The invention relates, particularly but not exclusively, to the packaging, the long-term preservation and the dispensing of such dairy products as grated cheese, and this description covers this field of application for convenience of illustration only.

BACKGROUND ART

[0003] Already for some years, there has been growing acceptance by the consumer public of certain food products which, despite their perishable nature, can be bought at the food store in an as-fresh condition by virtue of the products having been packaged under an inert medium and/or stored at a low temperature, e.g. at +4° C.

[0004] A typical example may be that of freshly made "pasta", regarded nowadays as a product with a medium shelf-life to be kept in the cooled counters of food stores.

[0005] Packaging techniques have been developed which represent useful contributions towards preserving the organoleptic characteristics of food products, and which suit different sorts of perishable products and consumption styles. For dairy products, such as e.g. aged cheese, a packaging technique has long been in use, whereby cheese cuts are vacuum packaged under a transparent film envelope, the film being wrapped around the product and heat sealed in the process of drawing the vacuum. Further as relates to aged cheese, consumers appear to welcome pre-grated cheese, which are customarily sold in pliant bag packages.

[0006] Another way of storing grated cheese in a durable manner is to pack it into tray-type containers of a thermoformed plastics material, which containers are closed at the top with a sheet cover heat sealed all around the container rim. Although advantageous on several counts, such containers are of limited serviceability for, once opened for consumption, they cannot be re-sealed to ensure a good preservation of the product, so that the latter has to be consumed within a comparatively short period of time.

[0007] In this context, there also exists a growing demand from consumers for containers that can also serve as dispensers of a loose product packaged therein.

[0008] For this purpose, the prior art provides rigid containers of a generally cylindrical shape, which mount sophisticated dispensing and re-sealing structures effective to preserve, within limits, the organoleptic characteristics of the product and at the same time ensure that it can be conveniently dispensed.

[0009] These dispensing containers have major limitations in their high cost, due to the complicated construction of their dispenser part, and in their unsuitability to provide

disposable packages, a form that is looked upon favorably by both consumers and store operators.

[0010] A cheaper alternative is disclosed in Italian Utility Model Patent No. RE95U000016, which provides a cup-shaped container that is closed at the top with a sheet cover heat-sealed to the cup rim, the container having an aperture at its bottom for dispensing its contents.

[0011] The last-mentioned solution is quite inexpensive, but has failed to attract commercial interest due to an important flaw in its design. The downward tapering shape of the cup combines with the weight of its contents to funnel and crowd the granular particles toward the cup bottom. Thus, the particles become tightly packed and cannot be dispensed through the bottom opening any more. This effect is enhanced in the case of products with a high moisture content, such as grated cheese.

[0012] The technical problem underlying this invention is that of providing a dispenser for loose food products, in particular granular or powdered products such as grated cheese, with appropriate structural and functional features to allow a long-term preservation of the food products therein contained, as well as to facilitate dispensing in precise amounts, thereby to overcome the drawbacks outlined with reference to the prior art.

DISCLOSURE OF INVENTION

[0013] The principle upon which the solution proposed in the present invention is founded is that of providing a dispenser in the form of a tray-type container having at least one side wall formed with a discharge port that is normally closed by a tear-off label.

[0014] Based on this principle, the technical problem is solved by a dispenser as previously indicated and defined in the characterizing part of claims 1 and following.

[0015] The features and advantages of a dispenser according to the invention will be apparent from the following description of an embodiment thereof, given by way of non-limitative example with reference to the accompanying drawings.

BRIEF DESCRIPTION OF DRAWINGS

[0016] In the drawings:

[0017] **FIG. 1** is a schematic perspective view of a dispenser of loose food products according to the invention;

[0018] **FIG. 2** is a schematic perspective view of a second embodiment of the inventive dispenser;

[0019] **FIG. 3** is a schematic perspective view of a preferred embodiment of the inventive dispenser;

[0020] **FIG. 4** is a schematic perspective view of a modified embodiment of the inventive dispenser;

[0021] **FIG. 5** is a schematic side view of the dispenser shown in **FIG. 2**; and

[0022] **FIG. 6** is a schematic side view of the dispenser shown in **FIG. 3**.

[0023] **FIG. 7** shows a perspective view of a dispenser of loose food products according to a further embodiment of the invention;

[0024] FIG. 8 shows a further perspective view of the dispenser according to the invention;

[0025] FIG. 9 shows a schematic perspective view of an embodiment of the invention for implementing the manufacturing process of the dispenser shown in FIG. 7;

[0026] FIG. 10 shows a schematic perspective view of a detail of the embodiment shown in FIG. 9;

[0027] FIG. 11 shows a schematic perspective view of a further detail of the embodiment shown in FIG. 9;

[0028] FIG. 12 shows a partial section schematic perspective view of a further detail the embodiment shown in FIG. 9;

[0029] FIGS. 13 and 14 show vertical elevation schematic side and front views, respectively, of the dispenser shown in FIG. 7.

MODES FOR CARRYING OUT THE INVENTION

[0030] With reference to the drawing views, a dispenser of granular or powdered food products, such as grated cheese or the like loose food products, according to this invention, is shown at 1 in schematic form and is adapted to conserve food products durably therein.

[0031] The dispenser 1 also serves as a container for the food product, a granular type of food product being generally shown at 10. This dispenser is also suitable for long-term storage of the products therein in the cooled counters of food stores.

[0032] Advantageously in this invention, the dispenser 1 comprises a tray-type container 2, which is closed at the top with a sheet cover 3 of a synthetic material heat-sealed all around the tray rim.

[0033] The container 2 is preferably made of a thermoformed synthetic plastics material for food applications. The product 10 is contained and preserved in the dispenser 1 under an inert atmosphere, preferably nitrogen gas.

[0034] In a preferred embodiment, the container 2 is thermoformed from a multi-layer sheet of a transparent synthetic material. More particularly, the multi-layer sheet comprises: an outward layer of polystyrene, polyolefin, or polyester resins; an intermediate barrier layer, e.g. ethylvinyl alcohol; and an inward layer of weldable polyesters.

[0035] The intermediate layer is substantially air-impervious and exerts an antagonist activity towards oxygen. Thus, the intermediate layer serves an anti-ageing function that contributes to a proper and durable product preservation.

[0036] Sheet 3 also has a multi-layered structure and includes an oxygen-antagonist intermediate layer.

[0037] The tray-type container has a shallow elongate shape, with a length dimension L greater than the width N, and a depth H being $\frac{1}{4}$ to $\frac{1}{2}$ the length L.

[0038] Preferably, the depth H of the tray-type container is less than one-third its length L.

[0039] Advantageously, at least one side wall 4 of the tray is formed with a discharge port 5 through which the loose granular product can flow out in use of the dispenser by a

consumer of the product. In such a way, the granular product is not crammed against the discharge port 5 by gravity, and the flaking off and delivery of the grated cheese is facilitated.

[0040] The port 5 is circular and has a diameter of 14 to 22 mm, preferably of 16 mm.

[0041] A label 6 is applied originally over the port. 5 to keep the dispenser 1 sealed throughout its shelf life, and is adapted to be torn off by the consumer. The label 6 also includes a barrier layer of the same type as that provided in the structure of the container 2.

[0042] The label 6 is of a self-sticking type with an adhesive-free tab 9 providing a grip for tearing off the label. Alternatively, the label 6 could be heat sealed.

[0043] The dispenser 1 is also provided with a stopper 11 for quick application to the port 5 to close it again after use. If desired, the stopper 11 may be perforated and include a snap-on cap.

[0044] In a second embodiment, shown particularly in FIG. 2, the dispenser 1 has a side wall 4' set at an angle β of inclination to the container bottom 7. This dispenser also has a flat side wall portion 4" set at a smaller angle α of inclination to the tray bottom 7 than angle β . The discharge port 5 for the product is provided in the flat portion 4", so as to further facilitate the flaking off and delivery of the granular product in use of the dispenser.

[0045] In the dispenser of this invention, the side walls actually define a funnel-shaped section in the tray, but the discharge port 5 is formed laterally in said funnel-shaped section, i.e. through a side wall rather than the bottom as in the state of the art.

[0046] In this way, the product aggregation and packing at the tray bottom, which made its issuing out of conventional dispensers practically impossible, is avoided.

[0047] In the dispenser of this invention, the port formed in a side wall has proved effective to promote the flaking off and the regular delivery of the product as required.

[0048] Of course, the port 5 in the wall 4" would also be covered with a self-sticking or heat-sealed label adapted to be torn off.

[0049] In a preferred embodiment, shown in FIG. 3, the tray container of the dispenser 1 is boat-shaped.

[0050] Advantageously, the discharge port 5 for the product is provided in the pointed forward end of the boat shape.

[0051] Here too, the port 5 is covered with a label 6, and a stopper 11 for re-closing the container is provided for quick application to the port 5.

[0052] In this particular embodiment, a side wall 12 of the tray-type container 2, located opposite from the side wall 4 with the port 5, advantageously extends almost square to the container bottom 7. This allows the dispenser 1 to stand upright on said wall 12.

[0053] Alternatively, a pad 13, located at the container bottom 7, may be associated with the wall 12 of the tray-type container 2 opposite from the side wall 4. The pad 13 has preferably an adhesive-coated surface for quick attachment to the side wall 12 of the dispenser 1, and is useful to prop

up the dispenser **1**, such that the latter can rest upright on the top edge of the wall **12** and the pad **13**.

[0054] Another embodiment of the dispenser **1** according to the invention will now be described briefly with reference to FIG. 4.

[0055] In this embodiment, the dispenser **1** is cup-shaped as at **16**, and the port **5** is provided in a flat portion **14** of the cup side wall close to the cup bottom **15**.

[0056] Here again, the cup-shaped container is made from a thermoformed transparent multi-layer sheet, and closed at the top with a sheet cover **3** of a synthetic material, which is heat-sealed around the cup rim.

[0057] In addition, the port **5** is covered with the tear-off label **6**, which label will then leave the place to the stopper **11** for re-closing the dispenser.

[0058] The dispenser of this invention does solve the technical problem, and affords advantageous features, foremost among which is that it doubles as a container for the long-term storage of food products under an inert atmosphere, and as a uniquely serviceable dispenser.

[0059] In fact, the grated product is allowed to run out smoothly and controllably, and even in the event of a product with a high moisture content tending to aggregate into lumps, a gentle shaking of the dispenser is enough to restore the product to its loose granular form for an efficient delivery.

[0060] In all conditions of use, the product will always be discharged through one side, and will not crowd toward the discharge port under its own weight, as is instead the case with conventional dispensers.

[0061] All of the above-described embodiments of the container according to the invention are suitable for a very large volume production and for being filled and sealed by means of currently available automatic filling apparatus.

[0062] Furthermore, the dispenser of this invention allows the food products packaged in it to be preserved and used for a relatively long time after the package is unsealed.

[0063] Now, with reference to the drawings FIGS. 7 to 14, a further embodiment is disclosed. In this embodiment a dispenser of granular or powdered food products, such as grated cheese and similar loose food products, embodying the invention and effective for the long-term preservation of said food products, is generally shown at **101** in schematic form.

[0064] The dispenser **101** also serves as holder **120** of the food product and the granular food products packed therein are generally shown at **119**. Said dispenser is also suitable for the long-term storage of the products **119** in the cooled counters of food stores.

[0065] Advantageously in the invention, the dispenser **101** is substantially bi-valve and is moulded out of a single sheet **103** of plastic synthetic material. The dispenser **101** is preferably made out of thermoformed plastic synthetic material for food application. The products **119** are packed and stored in the dispenser **101** in an inert atmosphere, preferably nitrogen.

[0066] In a preferred embodiment, sheet **103** is a multi-layer sheet of transparent synthetic material. More particu-

larly, the multilayer sheet comprises an outer layer, i.e. environment-side, of polystyrene, polyolefine or polyester resins; an intermediate barrier layer, e.g. ethylvinyl alcohol, and an inner layer, i.e. product-side, of heat-sealable polymers. The sheet **103** is preferably only 0.4 mm thick and the intermediate layer only few tens of microns.

[0067] The intermediate layer is substantially air-proof and effective to repel the oxygen molecules; therefore, thanks to its anti-ageing function, said intermediate layer favours the convenient and long-term food product preservation.

[0068] In detail, the bi-valve dispenser **101** comprises a first valve **104** and a second valve **105**, wherein the two valves **104**, **105** are moulded in one piece, the valves being joined along an edge line **106**.

[0069] Each valve **104** and **105** has substantially a tray-type elongate flat shape, with the length L greater than the width N and a limited depth H, for example comprised between 20% and 40% of the length L. Moreover, the tray width N is preferably less than half of the length L.

[0070] By way of non-limiting example, a dispenser **101** adapted for storing about 165 cc of loose product has a length L of 112 mm, a width N of 52 mm and a depth H of 19 mm.

[0071] The edge line **106**, effective to keep the valves joined, is an hinge line around which the valves are closed on themselves after moulding. The edge line **106** coincides with a short side edge N of the tray shape so that, with the valves closed on themselves, the dispenser has a flat supporting bottom **102**, the edge line **106** centrally extending to said bottom **102**.

[0072] When the valves **104**, **105** are closed on themselves, they are joined by juxtaposed edges. More precisely, said valves have coincident edges: edge line **106**, heat-sealed side edges **109**, **110**, but simply approached top edges **111**, **112**. The edges **109**, **110**, **111** and **112** protrude sidewise and peripherally from the holder **120** of about 5 mm, thus providing side ribbings **107** and **108** effective to serve as barrier, thanks to the appropriate side thickness. Said ribbings also play a relevant role in the manufacturing process of the dispenser **101**, as will be apparent in the following description.

[0073] In correspondence with each valve, the dispenser **101** advantageously has a top portion **113** sloping to the longitudinal axis. Said portion **113** is flat and substantially weathered with an inclination angle of about 60°.

[0074] Said flat portion **113** comprises a dispensing hole **114**. Said hole **114** is circular, with a diameter comprised between 14 and 22 mm, preferably 16 or 20 mm.

[0075] The granulated loose product can flow out through said hole **114** while the consumer is using the dispenser. In fact, due to the sloping portion **113**, the product is not crammed against the dosing hole **114**: it is thus possible to avoid the product to be crowded and stuck, and, indeed, the grated cheese can be easily dispensed.

[0076] In the dispenser according to the invention, the dispenser top defines a funnel-shaped section, but the dispensing hole **114** is formed sidewise in said funnel-shaped section, i.e. in correspondence with the sloping side wall

113. In this way, it is avoided for the product to crowd and stuck, which made its dispensing practically impossible.

[0077] In the dispenser according to the invention the hole **114** in the side wall **113** has proved to be effective to favour the smooth dispensing of the product according to necessity.

[0078] A label **116**, removable, by tearing by the consumer, is applied to cover the hole **114** during the holder filling and the shelf life of the dispenser **101**. The label **116** also comprises a barrier layer identical to that provided in the structure of the thermoformed sheet **103**.

[0079] The label **116** is preferably, but not exclusively, self-adhesive with an adhesive-free grip **115** essentially used for label tearing. Alternatively, the label may be heat-sealed, as described hereinafter.

[0080] The dispenser **101** is also provided with a closing plug **117** for quick application to said hole **114**. The plug **117** is made out of plastic material for food applications.

[0081] For sale in food stores, the dispenser **101** is provided with a cellophane protective cover wrapping also the plug **117**, as shown in **FIG. 7**.

[0082] The invention relates also to an automatic process for automatic manufacturing the dispenser as defined in claims **32** and following.

[0083] The operative step sequence of an automatic process for filling and sealing the dispenser **101** according to the invention will now be described in greater detail, with particular reference to the example shown in **FIG. 9**. At this purpose, an apparatus **130**, suitably structured for completing the filling and assembling the dispenser **101**, is provided.

[0084] Said apparatus **130** comprises a plurality of workstations **145**, **155**, **160**, **170** and **175** and a turntable **131** with a circular rotating plate **132**, equipped with a plurality of slots **133** for corresponding holders **120**.

[0085] Said slots **133** are located perimetrically on the plate **132** at regular distance; for example, as shown in **FIG. 3**, eight slots reciprocally angularly spaced by an angle of 45° are provided. Each slot **133** basically comprises a well housing **134** wherein the lower portion **135** of an holder **120** is inserted and held so to keep the holder standing upright or, however, with its main axis x-x perpendicular to the plane of the plate **132**.

[0086] The well housing **134** is provided with shape fit to the lower portion **135** of the holder **120**. At this purpose, the housing **134** is essentially rectangular with short side walls, wherein opposed grooves **136**, **137** are formed for engagement with the corresponding side ribbings **107**, **108** of the holder **120**.

[0087] Advantageously, each slot **133** is combined with a pliers **138** having opposed jaws **140**, **141** operating on the side ribbings **107**, **108** of each holder **120**. The jaws **140**, **141** are continually initiated to open by sprung means **139** and to close by actuator means **142**, shown in **FIG. 10**, which force the pliers **138** to pinch sideways the holder **120** in opposition to the sprung means **139**.

[0088] The operation of each pliers **138**, together with the corresponding slot **133**, is interlocked with computerised check and control means **150**.

[0089] Due to the grip of the jaws **140** and **141**, each holder **120** is sidewise compressed in correspondence with the ribbings **107**, **108**, leading to an expansion of the upper end of the holder **120**, and thus to a temporary open mouth configuration thereof caused by elastic deformation.

[0090] The different workstations, described hereinafter, are located around the turntable **131**, which turns, e.g. clockwise.

[0091] A first feeding station **145** supplies the turntable **131** with the holders **120**. The station **145** is the free end of a belt conveyer **146** drawing the holders **120** from a warehouse, conventional and thus not shown. The conveyer **146** is operated by electric motors and equipped with limit stop sensors which allow to quit its movement when a slot **133** of the turntable **131** fits in a grip position located beneath the conveyer free end.

[0092] A following punching station **155** enables the hole **114** to be drilled in the side wall portion **113** of the holder **120**.

[0093] In correspondence with said punching station **155**, the holder **120** is sidewise pinched by the pliers **138**, as just described, its upper end being open. A clashing element **156**, essentially anvil-shaped, is inserted into the holder **120** and positioned close to the inner surface of the side wall portion **113** to oppose to the thrust of a punch **157** operated by pneumatic means. The clashing element **156** is positioned at the end of an arm **158** operated by motor means along a substantially downward trajectory.

[0094] The punch **157** is preferably a hollow cylindrical tubular element with sharp free end effective to drill a hole in the side wall portion **113** of the holder **120**. Said punch **157** is operated to reciprocally approach to and move away from the side wall portion **113** of the holder **120**. At the same time, this operation, referred to as punching, also allows the removal of the scrap, i.e. the circular discarded element, which is held inside the tubular punch, packed with the previous scraps and discharged at the opposed end of the tubular element.

[0095] At the end of this operation, the clashing element **156** is extracted from the holder with inverse movement to the previous positioning thereof.

[0096] A following covering or labelling station **160** enables a closing label **166** to be applied to the previously drilled hole.

[0097] Each label **166** is drawn from a tape **161** suitable for holding the labels up to their use. Alternatively, the tape **161** can be made out of a plastic synthetic material incorporating the barrier layer and labels **166** can be formed directly in the tape **161** and substantially divided by a marked circular breaking line. The tape **161** is wound around a first reel **163** and extended in the workstation **160** along a broken line path.

[0098] The labelling station **160** comprises a first tape **161** unwinding reel **163** and a second scrap tape winding reel **164** located above the holder **120**.

[0099] A presser **165**, located beside the hole **114** to be closed, operates on the tape **161** to tear a label **166** from the tape and apply it to the holder **120** to close the hole **114**. The presser **165** performance is equal to the action of a hand

finger tip keeping on pressing to achieve an optimum bond of the label **166** and avoid any possible channels which would make the barrier layer ineffective.

[0100] A following filling station **170** comprises a funnel-shaped hopper **171** effective to load the granulated food product into the holder **120**. More particularly, a pair of channels **172, 173** for main and fine feeding respectively, are provided to dispense into the hopper **171** a predetermined and weighted quantity of product according to methods known in this field.

[0101] At the end of the filling with the granulated food product, the dispenser **1** is drawn by a grip arm **175** of a shunting station **177** which alternately loads the dispenser **101** in a corresponding slot **183** of a pair of outer turntables **178, 179** associated to the turntable **131** and belonging to the welding stations **181, 182** respectively.

[0102] The shunting station **177** is located between the turntables **178** and **179**, close to the turntable **131**, and comprises a star-shaped rotating plate **176** equipped, at the star ends, with grip pliers **184** grasping each dispenser **101** for transferring it alternately in a slot **183** of the turntables **178** or **179**. The rotating plate **176** also serves to discharge the dispensers **101** at the end of the welding step.

[0103] The welding stations **181, 182** are split with respect to the other workstations since the time required for sealing the upper end of the dispenser **101** is almost twice the time required for completing the other operative steps in the stations **145, 155, 160** and **170**. In fact, stations **181** and **182** are provided for completing the welding of the dispenser upper end simultaneously to the just described operative steps.

[0104] Advantageously, each welding station **181, 182** comprises a pair of press cylinders **185, 186** operated to reciprocally move away and approach in correspondence with the dispenser **101** top.

[0105] Each cylinder **185, 186** has a heated arch-shaped operative head, its profile corresponding to the top approached edges **111, 112** of the dispenser **101**.

[0106] Moreover, heating elements **187** are provided to heat the cylinder operative heads so that the heating, together with a repeated compression, enable the edges **111, 112** to be constrained to each other, thus obtaining a heat-sealing effect.

[0107] Advantageously, immediately before the welding step but with the holder **120** already positioned for the welding, the remaining air is sucked from the holder and replaced by an inert atmosphere, preferably nitrogen. The process for performing this operation is substantially known in this specific field and the relevant detailed description is thus omitted.

[0108] At the end of the welding step, a further cold pressure is provided immediately after, in order to confer a suitable stiffness to the heat-sealed edges **111** and **112**.

[0109] The previous description clearly shows how the dispenser of the invention and the corresponding manufacturing process solve the technical problem and afford several advantages, foremost among which is that the dispenser, formed as just described, has a double function, serving both

as holder for inert atmosphere long-term preservation of food products and uniquely practical and functional dispenser.

[0110] In fact, the dispenser-holder is so manufactured as to prevent the barrier layer, effective to repel oxygen penetration, from being stressed and weakened. Moreover, the particular dispenser shape favours the gradual dispensing of the grated product and, even with crumbs typical of products with high moisture content, a slight dispenser shaking is sufficient for the product to become again so loose and granulated as to be conveniently dispensed.

[0111] In all conditions of use, the product is always dispensed sidewise and the product weight will not crowd towards the dispensing hole, as is instead the case with conventional dispensers.

[0112] The dispenser according to the invention suits very large volume production and can be filled and sealed in a completely automated way by means of the previously described apparatus for implementing the filling and sealing process according to the invention.

[0113] The dispenser according to the invention allows thus the food product packed therein to be used for a relatively long time, at the same time ensuring its good preservation.

[0114] Moreover, known dispensers are moulded and thermoformed out of a sheet of plastic synthetic material for food applications. Generally, said sheet is a multilayer sheet comprising an intermediate barrier layer, e.g. ethylvinyl alcohol, which is substantially air-proof, effective to repel oxygen molecules and, thanks to its anti-ageing function, favouring the convenient and long-term food product preservation. Unfortunately the plies undergone by the synthetic material sheet during the dispenser thermoforming make the barrier layer so thin and weak that the oxygen molecule repellent action thereof is endangered.

[0115] On the contrary, the present invention allows obtaining a low cost dispenser equipped with an effective barrier layer since the thermoforming phase is not pushed to an extreme being the dept of each valve of the bi-valve dispenser substantially half of conventional tray tape containers.

1. A dispenser (**1, 101**) for granular or powdered food products (**10, 110**), such as grated cheese and the like food products in loose form, characterized in that it comprises a tray-type container (**102, 104, 105**), closed at the top with a cover heat-sealed around the tray rim, at least one side wall (**4, 113**) of the tray being provided with a discharge port (**5, 114**), and a tear-off label (**6, 116**) which have a multi-layered structure incorporating an antagonist barrier layer and is arranged to cover the port (**5, 114**).

2. A dispenser (**1**) according to claim 1 characterized in that the cover is a sheet of a synthetic material having a multilayered structure incorporating an antagonist barrier layer.

3. A dispenser (**1**) according to claim 2, characterized in that said side wall (**4**) includes a flat portion (**4'**) lying at a smaller angle to the tray bottom (**7**), and in that said port (**5**) is provided in said portion (**4'**).

4. A dispenser (**1**) according to claim 2, characterized in that said tray-type container (**2**) includes a barrier layer antagonizing penetration of oxygen into the container.

5. A dispenser (1) according to claim 2, characterized in that said tray-type container (2) is boat-shaped.

6. A dispenser (1) according to claim 5, characterized in that said port (5) is provided in the pointed forward portion (8) of the boat-shaped container.

7. A dispenser (1) according to claim 2, characterized in that said label (6) is self-sticking.

8. A dispenser (1) according to claim 2, characterized in that said label (6) is heat sealed.

9. A dispenser (1) according to claim 2, characterized in that said self-sticking label includes an adhesive-free gripping tab (109').

10. A dispenser (1) according to claim 2, characterized in that it includes a stopper (11) for re-closing it, which is adapted for quick application to said port (5).

11. A dispenser (1) according to claim 2, characterized in that one wall (12) of the tray-type container (2) lying opposite from said side wall (4) extends almost square to the container bottom (7), such that the container can be made to stand upright on said one wall (12).

12. A dispenser (1) according to claim 2, characterized in that one wall (12) of the tray-type container (2) lying opposite from said side wall (4) is associated with a pad (13) placed at the container bottom (7) such that the container can be made to stand upright on said pad (12).

13. A dispenser (1) according to claim 2, characterized in that said port (5) is a circular port of a diameter in the 14 to 21 mm range.

14. A dispenser (1) according to claim 2, characterized in that the height of the tray-type container (2) is less than one-half the length thereof.

15. A dispenser (1) according to claim 2, characterized in that the height of the tray-type container (2) is less than one-third the length thereof.

16. A dispenser (1) according to claim 2, characterized in that said tray has a flat elongate shape.

17. A dispenser (1) for granular or powdered food products (10), such as grated cheese and the like food products in loose form, characterized in that said container is a cup type (16), and that said port is provided in one side wall (14) near the cup bottom (15), a tear-off label (6) being arranged to cover the port (5).

18. A dispenser (1) according to claim 17, characterized in that said label (6) is self-sticking and it has a multi-layered structure incorporating an antagonist barrier layer.

19. A dispenser (1) according to claim 17, characterized in that said label (6) is heat sealed and it has a multi-layered structure incorporating an antagonist barrier layer.

20. A dispenser (1) according to claim 17, characterized in that said self-sticking label (6) includes an adhesive-free gripping tab (109').

21. A dispenser (1) according to claim 17, characterized in that it includes a stopper (11) for re-closing it, which is adapted for quick application to said port (5).

22. A dispenser (101) according to claim 1, characterised in that it is a bi-valve holder (120) comprising a first valve (104) and second valve (105) closed on themselves, wherein the two valves (104, 105) have each substantially a tray type shape and are moulded in one piece out of a single sheet of plastic synthetic material, said valves being joined along an edge line (106), with at least one valve being equipped with a dispensing hole (114) and a label (116), which is a multilayer and incorporating said barrier layer and is removable by tearing, to cover the hole (114).

23. A dispenser (101) according to claim 22, characterised in that said valves (104, 105) are tray-shaped and said edge line (106) coincides with a short side edge of the tray shape so that, with the valves closed on themselves, the dispenser (101) has a flat supporting bottom (102).

24. A dispenser (101) according to claim 22, characterised in that it comprises, in correspondence with at least one valve (104, 105) a flat top portion (113) sloping to the longitudinal axis, said hole (114) being drilled therein.

25. A dispenser (101) according to claim 22, characterised in that said valves (104, 105) are closed on themselves with coincident heat-sealed side (109, 110) and top (111, 112) edges.

26. A dispenser (101) according to claim 22, characterised in that it incorporates a barrier layer effective to repel oxygen penetration into the dispenser.

27. A dispenser (101) according to claim 26, characterised in that said label (116) is self-adhesive.

28. A dispenser (101) according to claim 26, characterised in that said label (116) is heat-sealed.

29. A dispenser (101) according to claim 22, characterised in that said self-adhesive label comprises an adhesive-free grip appendix (115).

30. A dispenser (101) according to claim 22, characterised in that it is equipped with a closing plug (117) for quick application in said hole (114).

31. A dispenser (101) according to claim 22, characterised in that said hole (114) is circular, and has a diameter comprised between 14 and 22 mm.

32. A process for manufacturing a dispenser (101) of granular or powdered food products (119), e.g. grated cheese and similar loose food products, wherein the dispenser (101) is a bi-valve holder (120) comprising a first valve (104) and a second valve (105) closed on themselves, each valve (104, 105) being moulded in one piece out of a single sheet of synthetic material which comprises a barrier layer and being joined along an edge line (106), said valves (104, 105) having heat-sealed side edges (109, 110) and simply approached top edges (111, 112), characterised in that it automatically provides the following steps:

opening of the dispenser upper end by pressing on said side edges (109, 110) with subsequent expansion due to the fact that said top edges (111, 112) move away from each other;

filling with the loose food product (119) through said opening;

heat-sealing of said top edges (111, 112).

33. A process according to claim 32, characterised in that, before the filling step, a preliminary step is provided, wherein a hole (114) is drilled in a top flat portion (113) of one of said valves (104, 105) by punching said flat portion (113) through an outer punch (157) and an opposed inner clashing element (156) inserted into the dispenser through said opening.

34. A process according to claim 33, characterised in that, after said punching step, and before the filling, a covering step by labelling of said hole (114) is provided.

35. A process according to claim 34, characterised in that said labelling step provides for the issue of a label (166) for sealing said hole (114), equipped with a barrier layer and combined with a tape (161) extended between a pair of reels (163, 164) located above the holder (120), and a pressing action on said label (166) to ensure the bond thereof.

36. A process according to claim 32, characterised in that said heat-sealing step of the top edges (111, 112) is provided downstream of the filling and simultaneously to the previous operative steps.

37. A process according to claim 32, characterised in that said heat-sealing step of the top edges (111, 112) is performed through the pressure exerted by a pair of heated operative heads activated to reciprocally move away from and approach to said top edges (111, 112).

38. An apparatus (130) for implementing the process according to claim 32, characterised in that it comprises a plurality of workstations (145, 155, 160, 170, 177) located around a rotating turntable (131) equipped with a plurality of perimetral angularly spaced slots (133) for corresponding holders (120), each slot (133) being associated to a pliers (138) with opposed jaws (140, 141) operating on the side ribbings (107, 108) of each holder to allow said opening of the dispenser upper end.

39. An apparatus according to claim 38, characterised in that each slot is provided with an housing (134) with shape fit to the lower portion of the holder (120).

40. An apparatus according to claim 38, characterised in that it comprises, in operative order, a feeding station (145)

of the holders (120) in said corresponding slots (133), a punching station (155) for drilling said hole (114) in a top portion (113) of the holder, a labelling station (160) for sealing said hole (114) with a covering barrier label (166), a filling station (170) for dispensing the loose food product (119) in the holder (120), a shunting station (177) of the holders (120).

41. An apparatus according to claim 40, characterised in that said shunting station (177), located close to said turntable (131), is effective to alternately shunt the holders (120) to corresponding welding stations (181, 182), operating simultaneously to said plurality of workstations (145, 155, 160, 170).

42. An apparatus according to claim 41, characterised in that each welding station (181, 182) comprises a pair of press cylinders (185, 186) with arch-shaped operative head and profile corresponding to said top edges (111, 112) of the dispenser (101), said operative heads being activated to reciprocally move away from and approach to said edges (111, 112).

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