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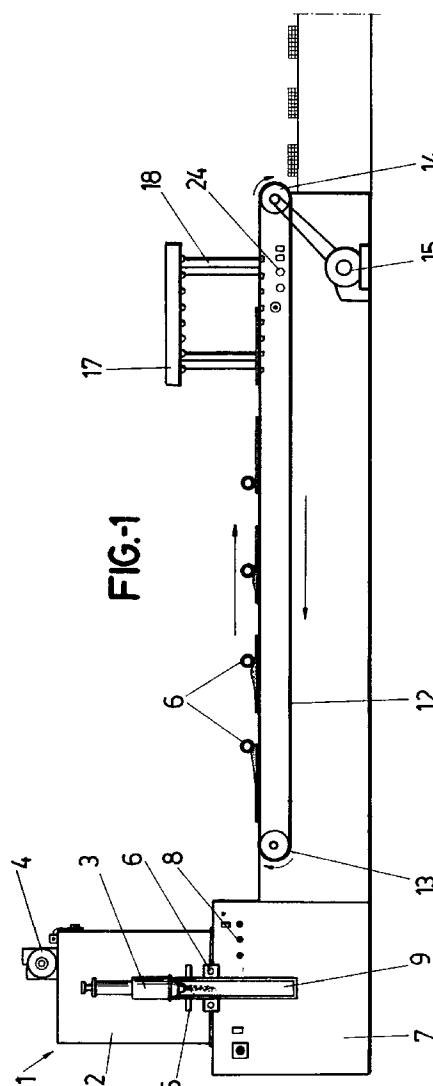
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(54) **Process for putting liquid products envelope-like containers, the filling machine for the performance of the process and the container so obtained.**

(57) The procedure consists in obtaining, in a first phase, oversized packages containing multiple unitary metered amounts of product and, in a second phase, by means of pressing, heat-sealing and cutting, to obtain multiple smaller packages containing respective unitary metered amounts and with any configuration.

The first phase is carried out in a conventional injection/metering/heat-sealing apparatus (1), from which oversized packages (9) are extracted which are subjected to the action of means (16) for smoothing and uniformly distributing the product inside each package (9) in order, finally and on a press (17), to carry out final subdivision, sealing and cutting of the unitary packages.



SUBJECT OF THE INVENTION

The present invention relates to a novel procedure for packaging liquid products in envelope-type receptacles or wrappers, commonly known as "packaging", which procedure is particularly suitable for packaging oily or viscous products such as, for example, honey.

The invention also relates to a packaging machine which permits implementation of the above-mentioned procedure.

The invention additionally relates to the package obtained with this packaging procedure and this packaging machine.

BACKGROUND OF THE INVENTION

As is known, it is an increasingly widely used practice to supply certain liquid or pasty food products, such as the above-mentioned honey, jams, etc., in conveniently packeted individual metered amounts which constitute units for consumption in a similar manner to conventional envelopes containing sugar.

Injection/metering machines are known, which, either using a continuous tubular body with a plastic nature or, alternatively, two sheets which the actual machine welds longitudinally in order to convert them into a tubular body, establish transverse heat-sealing lines in said tubular body and, immediately after each transverse heat-sealing line, supply the tubular body with a metered amount of product, thereby arriving at the various metered amounts being received in independent vessels established in longitudinal alignment over the continuous tubular body which is then divided up in order to obtain the unitary packages of product.

Productivity is limited by this packaging procedure in that, as may be appreciated from the aforesaid, each operating unit or each unitary machine can make and fill the packages only one by one, that is to say that this is a repetitive process, with intermittent stops, in which the following sequence of operations takes place: metering of the product and its supply to a unitary package, closure of the package; metering and supply of the product to a new unitary package, closure of the package, and so on.

Moreover, the packages can be closed only either at atmospheric pressure or, alternatively, at a specific pressure with which the operating mechanisms of the machine are surrounded and which requires pressurizing means separate from the machine, with the consequent rise in costs that this involves.

Finally, there is also considerable limitation with respect to the configuration of the packages, since the total closure of each one of them involves the partial or initial closure of the next one and each packaging unit has to offer a wide aperture for supply of the metered amount of product so, therefore, virtually the

only configuration without practical problems is the rectangular configuration, with very few variations.

DESCRIPTION OF THE INVENTION

The procedure proposed by the invention is based on a substantially different functional philosophy, according to which packaging takes place in two phases which, in addition, can be combined into a continuous process or, alternatively, be completely separate from each other.

More specifically, the first phase coincides with the conventional method of packaging, but with the particular feature that a greatly oversized package is achieved which holds inside a considerable number of unitary metered amounts of product which are, however, combined as a multiple metered amount. In the second phase of the procedure, the package with the multiple metered amount obtained in the first phase is subjected, firstly, to a uniform distribution of the product accommodated inside and then to a dividing-up operation, using heat-sealing and cutting, which results in the definitive unitary packages with their corresponding metered amounts which are also unitary.

In accordance with this novel procedure, in a single operating phase, a package with a multiple metered amount is achieved which may correspond, for example, to ten unitary packages, which obviously involves a considerable increase in production.

Complementarily, the bulk product may be pre-packaged in the oversized packages containing multiple metered amounts and be kept under these conditions, while it is deemed convenient, up to definitive compartmentalization and dividing-up of these packages.

This is more advantageous if account is taken of the fact that the procedure in question makes it possible, in its second phase, to give the unitary packages any configuration so that, at any time, the oversized packages can result in unitary packages with the configuration which is in greatest demand on the market.

This possibility of giving the unitary packages any configuration is due to the fact that the compartmentalization and dividing-up of the oversized packages is carried out by means of pressure and heat-sealing of the two walls of the packages, over lines or zones which are deemed convenient so that, by using simple straight lines, the rectangular and oversized package can be divided up into small packages, which are also rectangular, whilst, by using areas or surfaces of variable outline, cavities with any configuration such as, for example, the outline of a bird, of a flower, etc., can be produced in said oversized package.

Obviously, the greater the surface of contact between the two walls of the oversized package ob-

tained in the first phase, the greater will be the constriction of the volume experienced by said oversized package and, consequently, the greater will be the pressure within the unitary packages obtained.

The machine for implementing the procedure, in addition to the conventional injection/metering/heat-sealing apparatus for carrying out the first phase of the procedure, will incorporate a conveyor belt for receiving the oversized packages obtained in the first phase, on which belt a series of smoothing rollers responsible for uniformly distributing the product inside said oversized packages will act. At the end of the above-mentioned conveyor belt, over which said packages slide conveniently palletized, is a press or subdividing station equipped with grids which can be changed (or which can be regulated in terms of height when dealing with envelopes), with which the product is held along lines which form parcels or segments of various configurations. These changeable grids are located both in the movable part and in the stationary part of the press, those in the movable part being of rubber in order to deform the wall of the package without damaging it, whilst those in the stationary part of the press are constructed as cutting resistance elements.

More specifically and in accordance with another of the characteristics of the invention, provision has been made for the above-mentioned smoothing rollers to be eliminated, the operation of uniform distribution of the product being carried out on the press or subdividing station, in which press there are four operating sectors so that, in each functional cycle of the press, the latter acts simultaneously on four packages of large dimensions, carrying out on them the four phases necessary for definitive dividing-up or compartmentalization of said oversized package into multiple packages carrying unitary metered amounts.

To this end, the four operating sectors mentioned above are in the upper block of the press, generally the movable block, in longitudinal alignment. A package press plate is located in the first of them; a plurality of presser-expeller rubbers aligned in one direction, for example longitudinally, in the second; presser-expeller rubbers are also in the third sector but, in this case, in a cross arrangement with respect to those of the previous sector, for example in the transverse direction; finally, in the fourth and last sector there is a die, the cutting lines of which coincide numerically and in terms of position both with the longitudinal and transverse presser-expeller rubbers.

Complementarily, in the lower block, are four sectors opposite those of the upper block. The first sector is smooth and the upper sector consisting of the package press plate acts on it; the second sector is provided with resistance elements which coincide numerically and in terms of position with the presser-expeller rubbers of the second sector of the upper block; the third sector is provided with resistance elements

which assume an arrangement coinciding with that of the presser-expeller rubbers of the third sector of the upper block; finally, the fourth sector is provided with a plurality of longitudinal and transverse grooves defining a reticular cut for actuation of the cutting die in the fourth sector of the upper block.

The four sectors of each block, the upper block and the lower block, may be physically independent from one another, associated with a common support inside each block, or may constitute a monobloc assembly without this affecting the functional characteristics of the press, the upper block of which will preferably be actuated by pneumatic pistons.

Finally, and as mentioned above, the invention also relates to the package obtained as a result of using the procedure and the machine which have been described above; this "envelope"-type package has its characteristics centred around a special configuration of its walls, according to which they have a cross section derived from a biconvex or elliptical lenticular shape as a result of the pressure exerted on the walls by the product, which leads to elimination of the conventional play between container and contents and ensures easier emptying-out of the contents. In the first phase of the procedure, filling of the oversized package takes place at such a pressure that, once said package is subdivided, each unitary package is filled to a proportion of approximately 80 - 85 %, which gives rise to a pressure permitting total emptying-out.

DESCRIPTION OF THE DRAWINGS

To supplement the description being made and with the aim of assisting better understanding of the characteristics of the invention, the present specification is accompanied, as an integral part thereof, by a set of drawings which, in an illustrative and non-limiting manner, show the following:

Figure 1. - This shows a diagrammatic representation in lateral elevation of a machine for packaging liquid products for implementing the procedure constituting the subject of the present invention.

Figure 2. - This shows a detail in plan view of one of the pallets carrying the oversized packages obtained in the first phase of the procedure, during the second phase thereof.

Figure 3. - This shows an enlarged detail of the press or subdividing station, in which said press appears in a position of closure, contrasting with the position of opening in Figure 1.

Figure 4. - This shows a diagrammatic representation in lateral elevation of a preferred embodiment of the press which forms part of the packaging machine in Figure 1, according to which the smoothing rollers located on the conveyor belt have been eliminated.

Figure 5. - This shows a lower plan view of the upper block of the said press in the previous figure.

Figure 6. - This shows an upper plan view of the lower block which complements that of the previous figure.

Figure 7. - This shows a detail of the second operating sector of the previous figure, from which part of its heat-sealing resistance elements have been eliminated for greater clarity in the drawing.

Figure 8. - This shows the operating sector of the previous figure via its opposite face, that is to say via the lower face.

Figure 9. - This shows an operating diagram of the press in the previous figures.

Figure 10. - This shows a sectional profile of one of the unitary packages obtained with the procedure and the machine in the previous figures.

Figure 11. - This shows a view in lateral elevation of the same package, in the phase of emptying out the contents thereof.

PREFERRED EMBODIMENT OF THE INVENTION

When viewing these figures and, especially, Figure 1, it is possible to observe how, for implementing the first phase of the procedure, use is made of a pneumatic metering device (1), which is conventional per se, with the following elements: the tank (2) for supplying the product, an injector (3) assisted by a motor (4) and a heat-sealer (5) with the corresponding timer controls (6), all this being mounted on a lower body (7) with its corresponding general controls (8). A series of packages (9), which are considerably oversized, are formed unitarily and sequentially in this metering unit, and these packages, as mentioned above, will each hold multiple metered amounts of the product in question accommodated in the tank (2), each of these oversized packages (9) being completely sealed.

In point of fact, these packages (9), conveniently grouped together, are set up at the exit from the injection/metering/heat-sealing apparatus (1) on pallets (10) in the form of a frame, in which they are conveniently fixed with the collaboration of end clamps (11), these pallets (10) being deposited on a conveyor belt (12) assisted by a pair of end pulling rollers (13) and (14), one of them actuated by the corresponding motor (15). Figure 2 shows a pallet in the form of a frame with six oversized packages (9) held by the clamps (11).

Along the conveyor belt (12) are a plurality of smoothing rollers (16), which can be graduated, which distribute the product uniformly inside each package (9) by means of different pressures.

In the final portion of the conveyor belt (12) there is a press (17), preferably actuated by pneumatic pistons (18), which press is intended to constitute a station for subdividing the packages (9) and which con-

sists of changeable grids (19) and (20) located respectively on its movable and stationary parts, the grid (19) having a series of ribs (21), preferably of rubber, which define a lattice with the shapes corresponding to the unitary packages (22) to be obtained, as may be observed especially in the detail of Figure 3, whilst, in the changeable grid (20) of the stationary part of the press (17), there are, forming a lattice of identical format, electrical resistance elements (23) for heat-sealing and cutting; the pressure of the movable grid (19) over the package (9) having a multiple metered amount, along the lines of the drawing formed by the ribs (21) and the electrical resistance elements (23), provided in the stationary grid (20), gives rise to the dividing-up of the package (9) into the various unitary packages (22).

Lastly, it only remains to point out that on the actual conveyor belt (12) there are local controls (24) complementing the controls (8) existing in the injection/ metering/heat-sealing apparatus (1) corresponding to the first phase of the procedure.

In accordance with the variant embodiment shown in Figures 4 to 9, the smoothing rollers (6) may be eliminated, carrying out an equivalent function in the actual press (17') which constitutes the exit element of the packaging machine and where the second phase of the procedure is carried out.

For this purpose, as may be observed especially in Figures 4 to 6, there are four operating sectors both in the upper block (31) and in the lower block (32) of the press. In the upper block (31), the first operating sector (33) consists of a package press plate which flattens and smoothes the packages originating from the injection/metering/heat-sealing apparatus (1); a smooth base (34) in the first sector of the lower block (32) collaborates with this plate so that the package is pressed between these elements to achieve a uniform distribution of the product contained therein.

Immediately after this, there is a second sector (35) in the upper block (31), on the lower and operating face of which there are a plurality of presser-exPELLER rubbers (36) arranged in the longitudinal direction and uniformly distributed and which are intended to participate in forming, on the oversized package, longitudinal heat-sealing lines corresponding with said rubbers and for which purpose, in the lower block (32), there is a second operating sector (37) provided with a grid of electrical resistance elements (38) which coincide numerically and in terms of position and size with the above-mentioned rubbers (36) which they conveniently face.

Next, there is a third operating sector (39-40) in both the upper block (31) and in the lower block (32). The sector (39) corresponding to the upper block is provided with presser-exPELLER rubbers (36') which are similar to those mentioned above but are in a transverse arrangement, whilst the third sector (40) of the lower block (32) is, in turn, provided with a grid

(38') of electrical resistance elements which, in this case, also adopt a transverse arrangement.

Finally, the fourth sector (41) of the upper block (31) is provided with a cutting die (42), of reticular structure, corresponding with the longitudinal rubbers (36) and the transverse rubbers (36'), a reticular groove (43) in the fourth sector (44) of the lower block (32) collaborating with said die (42) so that, through this fourth sector (41-44) of the press definitive separation is achieved for the bag-type unitary packages (45), which are, in turn, shown in Figure 9.

Returning again to the grids of resistance elements (38-38'), these are closed on themselves with the aid of springs (46) which ensure perfect tensioning thereof, as may be seen in the detail of Figure 8.

Figure 9 shows, diagrammatically and sequentially, the operating process of the press, on the basis of the four operating sectors (33-34), (35-37), (39-40) and (41-44) in the upper (31) and lower (32) blocks of the press. Each time the upper block (31) descends, through actuation of the pneumatic pistons (47), the oversized package (48) arriving at the press and which has a broad rectangular surface undergoes, in the first sector, a uniform distribution of product contained inside it, in which phase the package has been given the reference number (49); next, said package passes to the second sector (33-38), where it is given the reference number (50) and a series of longitudinal heat-sealing lines (51) is made on it; next, and in the third operating sector, the package (52) receives the transverse heat-sealing lines (53), that is to say lines perpendicular to the previous ones, thereby defining within them the unitary packages (45), that is to say the packages carrying unitary metered amounts; finally, in the fourth operating phase, the die (42) attains complete separation between said unitary packages (45) as has been shown in the upper part of the figure, or a partial separation, by stamping lines (54) which define a block (55) in which the unitary packages are held together but are easily separable by means of tearing along said lines (54), as may be seen especially in the enlarged detail of said figure.

These packages (45) consist of a laminar structure of an impermeable nature, specifically based on two sheets of plastic which are heat sealed around their perimeter (56) to retain the viscous product (57) held inside and, through the effect of the actual pressure supplied to the original package (48) of large dimensions, they adopt, on application of the longitudinal (51) and transverse (53) heat-sealing lines, a markedly curved/convex configuration so that their cross section is derived from an ellipse, oval or biconvex lenticular shape. The package offers a large volume for specific perimeter dimensions, additionally facilitating emptying-out of the package with just one hand, after making a cut (58) in one of the corners of the package, as shown in Figure 11.

More specifically, the pressure exerted with just

one hand is added to the internal pressure of the package which causes the natural and virtually total exit of the viscous product contained therein.

Claims

1. Procedure for packaging liquid products such as, for example, food products such as honey, in a package containing a unitary consumption metered amount, characterized in that, in this procedure, there are two successive and independent operating phases, a first phase in which oversized packages are formed, each containing multiple unitary metered amounts of product, and a second phase in which said oversized packages are firstly subjected to an operation of smoothing or homogeneous distribution of the product and, finally, to a phase of compartmentalization and separation by means of cutting and heat-sealing of the walls of the oversized package in order to form definitive unitary packages carrying respective unitary metered amounts, with any configuration or outline which is different from that of the initial oversized packages.
2. Packaging machine for implementing the procedure of Claim 1, characterized in that it comprises: an injection/metering/heat-sealing apparatus (1), of any conventional type, capable of forming the initial oversized packages (9); means for smoothing the oversized bags (9-48) and uniform distribution of their contents, and a press (17-17') equipped with heat-sealing and cutting means which subdivides each oversized package (9-48) into a plurality of packages (22-45) carrying respective unitary metered amounts.
3. Packaging machine according to Claim 2, characterized in that, for smoothing the oversized packages (9), provision has been made for them to be arranged on supports or pallets (10) which are displaced towards the press (17) on a conveyor belt which circulates under a plurality of smoothing rollers (3) having a position which can be graduated and which are arranged transversely to the direction of displacement of the conveyor belt.
4. Packaging machine according to Claim 2, characterized in that the press (17), actuated by means of pneumatic pistons (18), incorporates, in its movable and stationary parts, respective changeable grids, each grid corresponding to the movable part having a plurality of elastically deformable reliefs or protuberances (21), preferably of rubber, which define a lattice with the forms corresponding to the unitary packages (22) to be

obtained, whilst, in the grid of the stationary part of the press (17), there are cutting electrical resistance elements (23), complementing said protuberances (21), forming a lattice of identical format.

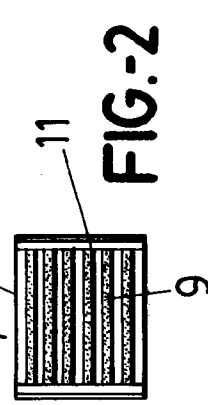
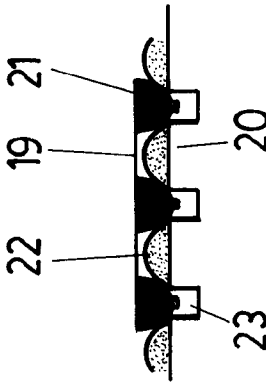
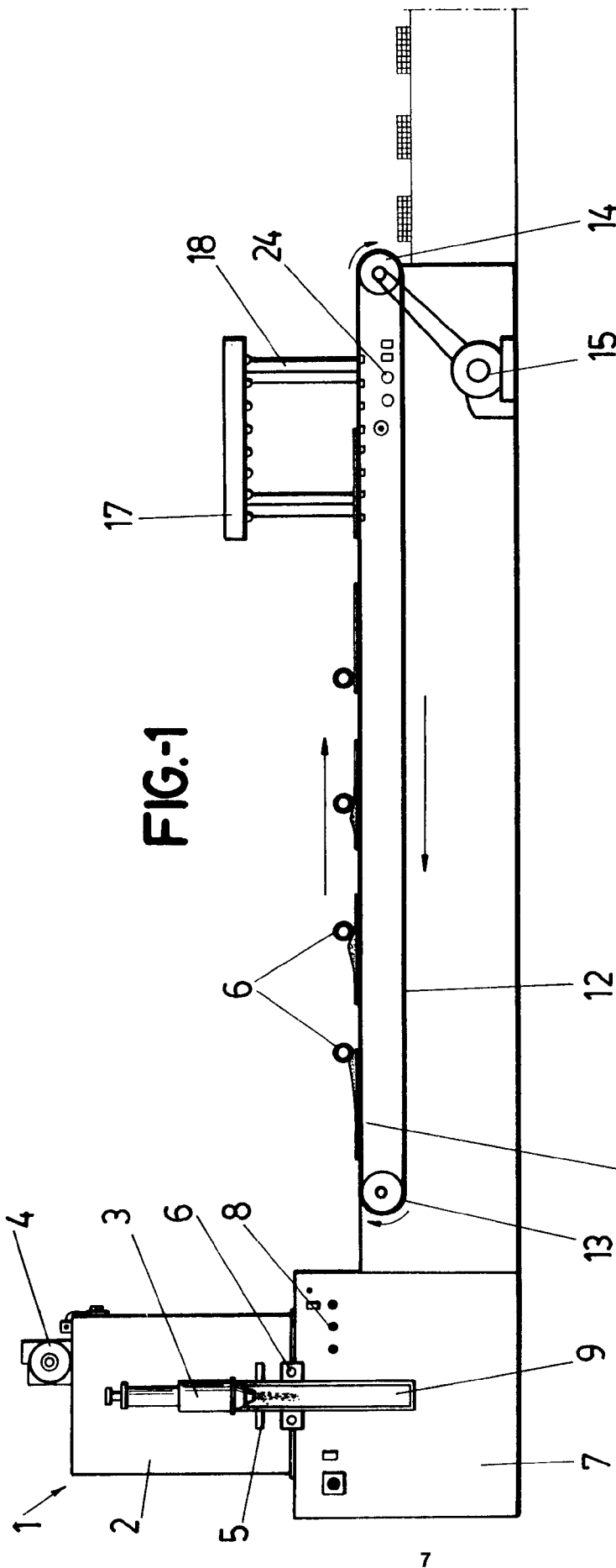
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5. Packaging machine according to Claim 2, characterized in that smoothing and subdivision of the oversized packages (48) takes place with the collaboration of a press (17') in whose upper (31) and lower (32) operating blocks there are four operating sectors: a first sector (33-34) in which the upper block incorporates a package press plate and the lower block incorporates a smooth base for uniform distribution of the product inside the package; a second sector (35-37) in which the upper block (31) incorporates a plurality of presser-expeller rubbers (36) aligned in a specific direction and the lower block (32) incorporates a grid (38) based on electro-heating resistance elements coinciding numerically and in terms of position and dimension with said rubbers (36); a third sector (39-40) in which the upper block (31) also incorporates presser-expeller rubbers (36') which are, however, aligned in a crossed direction with respect to those of the second sector and the lower block (32) incorporates a grid of thermo-heating electrical resistance elements (38') arranged to coincide with the presser-expeller rubbers of the upper block, and, finally, a fourth sector (41-44) in which the upper block (31) incorporates a reticular cutting die corresponding numerically and in terms of position with the presser-expeller rubbers (36-36') of the two previous operating sectors and the lower block (32) incorporates a grooved base (43) complementing said die (42).

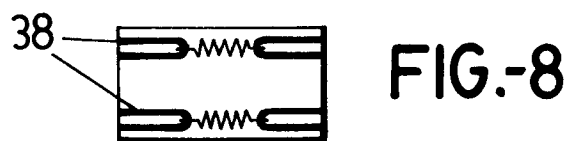
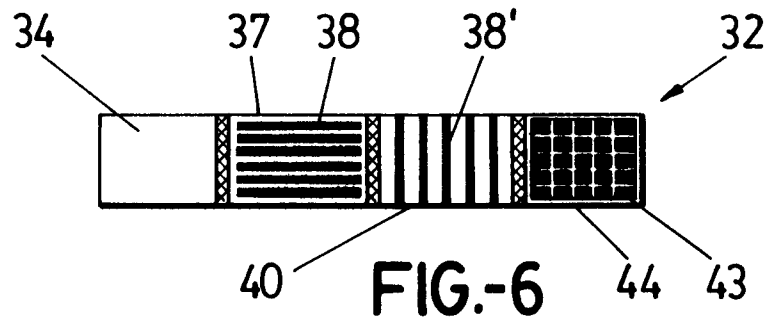
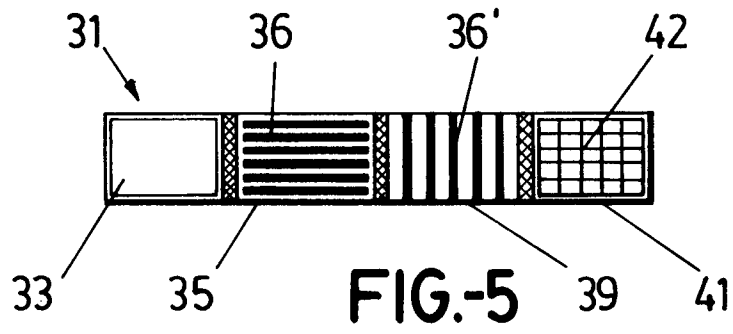
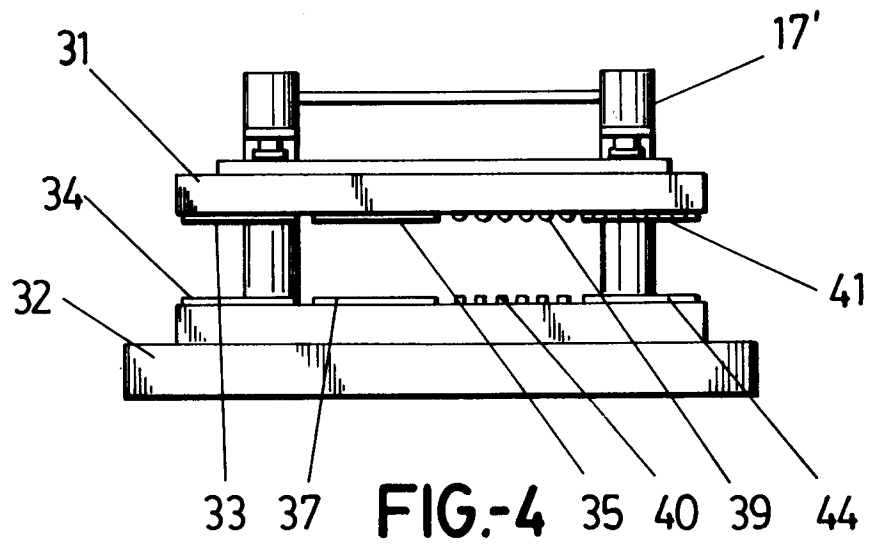
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6. Packaging machine according to Claim 5, characterized in that the electro-heating resistance elements (38-38') of the two intermediate operating sectors (37) and (40) of the lower block (32) are closed on themselves in the corresponding sectors and with the collaboration of springs (46) which act as tensioners therefor.

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7. Packaging machine according to Claims 5 and 6, characterized in that the die (42) defines, on the heat-sealing lines produced by the electro-heating resistance elements (38-38'), continuous or discontinuous cuts (54), according to whether the packages (45) containing the unitary metered amounts of product are to be totally independent from one another at the exit from the machine or are to be kept joined and capable of separation along tearing lines (54).

8. Package obtained with the procedure of Claim 1

and the packaging machine of Claims 2 to 7, characterized in that each of its two walls which are superposed and fastened around the perimeter by heat-sealing have a marked curvature which is outwardly convex, symmetrical with respect to the imaginary plane of separation between them, as a result of the pressure the product exerts on them in the terminal phase of compartmentalization and separation.





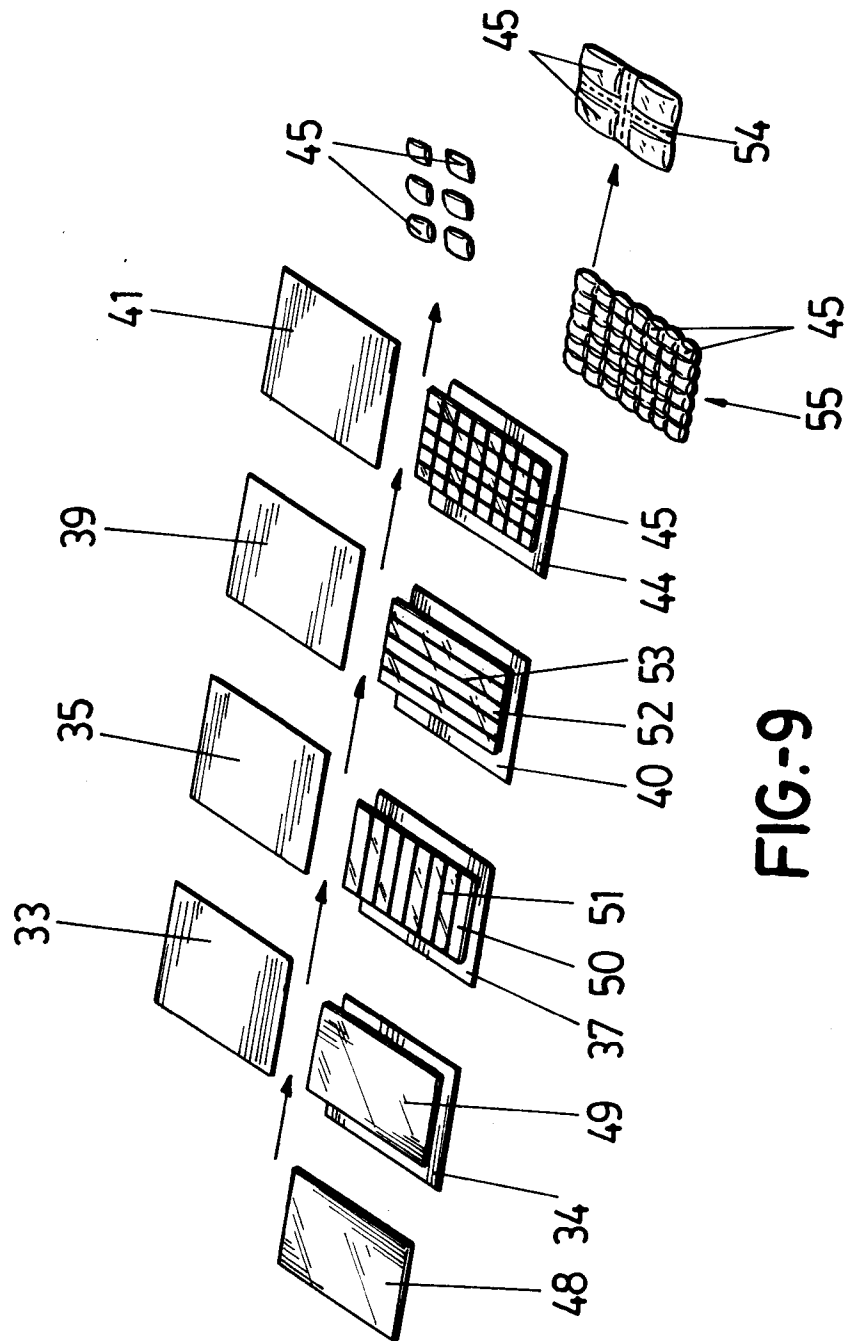
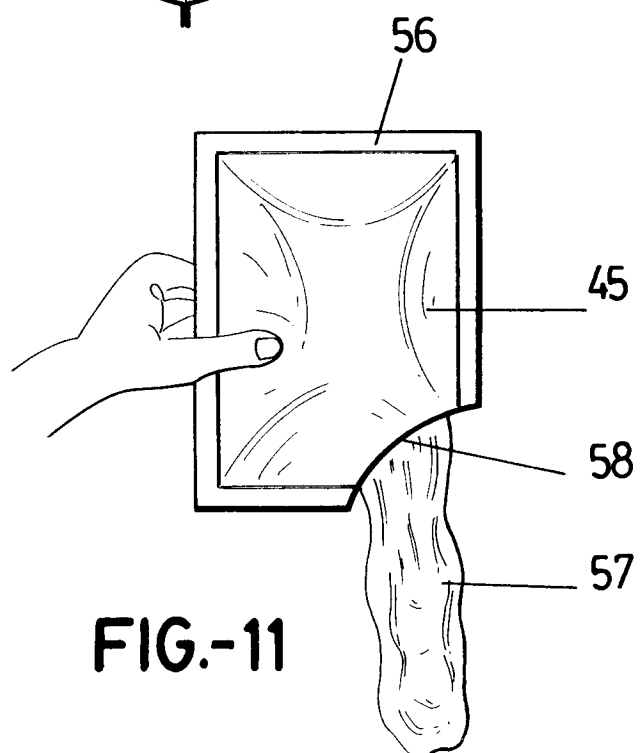
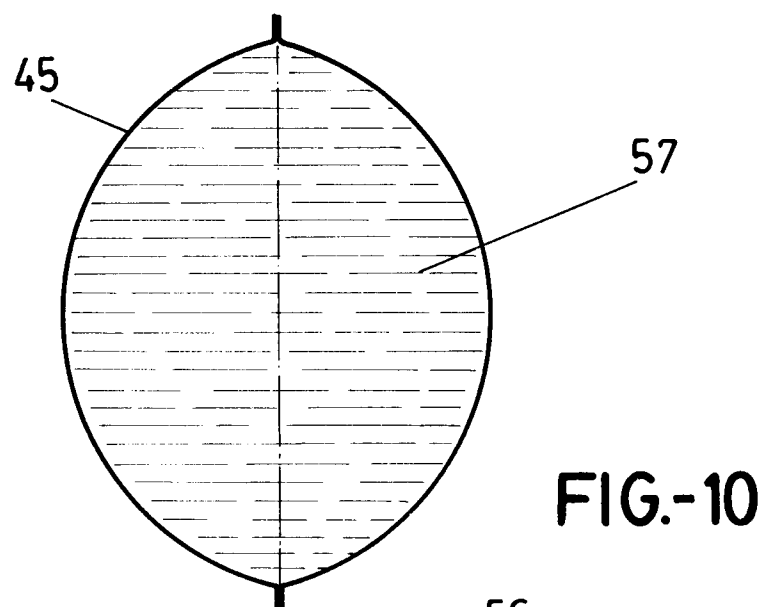


FIG-9





European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 94 50 0117

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 X	FR-A-1 101 438 (RADO) * the whole document *	1,2 8	B65B61/24
Y A	GB-A-2 050 987 (METAL BOX) * abstract; figure 2 *	1,2 3	
A	WO-A-92 01434 (KABI PHARMACIA) * page 4, line 30 - page 6, line 26; figures 1,2 *	1,2	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			B65B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 29 September 1994	Examiner Claeys, H
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