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(54) An apparatus for conveying packaging containers

(57) In a filling machine for producing, for example, single use disposable packages for beverages, packaging containers (1) are displaced between work stations by means of cassettes (15) which are connected to an endless conveyor (11). Each cassette (15) includes volume flaps (17) which are movable between an inactive

and an active position, the flaps in the active position reducing the free area in a portion of the cassette so that a packaging container located in the cassette is stabilised and given the desired volume capacity.

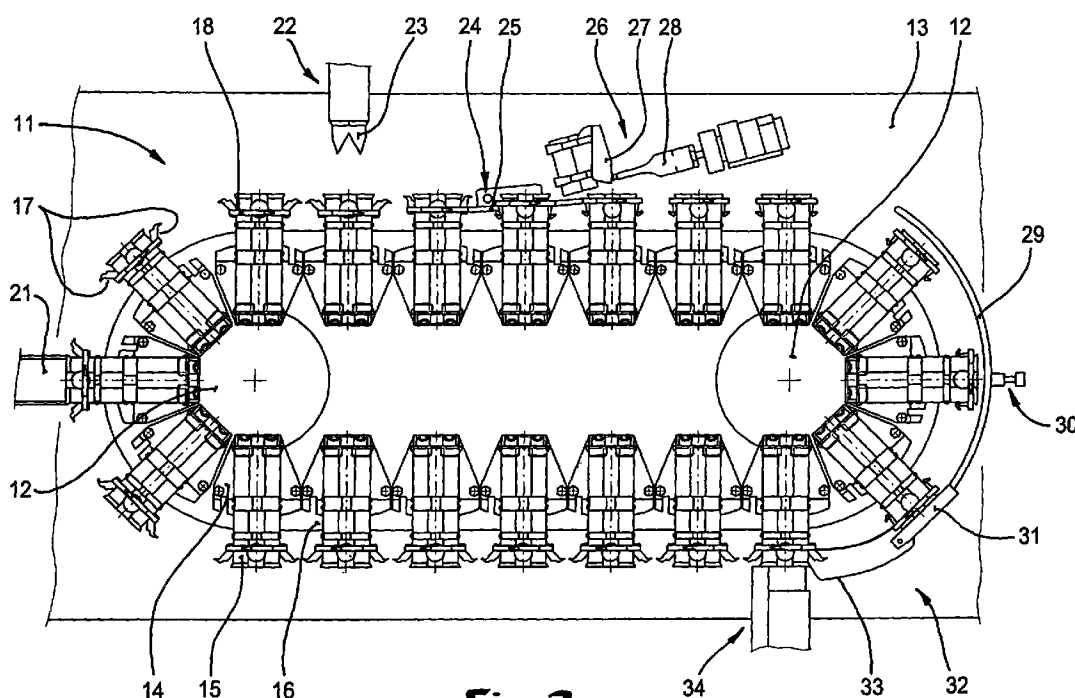


Fig 3

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Description

TECHNICAL FIELD

The present invention relates to an apparatus for conveying packaging containers between work stations in a filling machine, and comprising a number of cassettes which, with their one end, are connected to an endless conveyor.

BACKGROUND ART

Packaging containers for various types of foods, in particular liquid foods such as, for example, milk or juice are often manufactured from packaging laminates which include layers of both paper and plastic and which are folded and sealed to the desired configuration. The packaging containers are often also provided with parts made of plastic, for example end walls or opening arrangements. Common to many of these prior art types is that the packaging laminate is first formed into a sleeve or tube which is thereafter provided with end walls by folding and sealing of the material or by the application of prefabricated end walls, injection moulding, etc. A machine for forming filled and sealed packaging containers from tubular or sleeve-shaped, possibly prefabricated packaging container blanks is known from European Patent EP 413.927 to which reference is now made. This typical machine includes a conveyor with a number of cassettes in which the packaging containers are conveyed in the ready-to-fill state between different stations, e.g. a filling station for filling of the desired quantity of contents into each individual packaging container, a sealing station for sealing the end of each individual packaging container which is open during the filling cycle, and also a final folding station for folding and possible final forming of the sealed packaging container end.

In known filling machines, for example that mentioned above, each individual packaging container comprises a tubular or sleeve-shaped casing of plastic/paper laminate, which at each end has been provided with an end wall of injection moulded plastic. After the forming of the tubular casing and the end wall, the packaging container is placed in one of the cassettes of the conveyor, the injection moulded end wall which is subsequently to constitute the upper end of the packaging container being placed downwards so that the packaging container may be filled through its as yet unsealed bottom end. After filling with the desired contents, sealing and final forming of the bottom end take place, whereafter the packaging container is removed from the conveyor and turned so that its upper end provided with the opening arrangement faces upwards.

The cassettes employed in the prior art filling machines of the above-mentioned type are intended to make for simple insertion and removal of packaging containers provided with substantially parallel wall sur-

faces, the rest of the configuration of the cassettes being adapted to the cross sectional configuration of the relevant packaging container, i.e. round or square. Since each individual packaging container, when it is placed in a cassette, is already provided with one end wall, the dimensions of the relatively rigid end wall determine the inner free area of the cassette, which entails that that portion of the casing of the packaging container which is located a distance from the end wall cannot be entirely stabilised by the cassette because of its flexibility. This is accentuated particularly in certain types of packaging containers in which the injection moulded end wall has slightly larger area than the cross sectional area in the casing portion, with the result that the packaging container will be poorly fixed in the cassette and thereby not reliably situated in the correct position when the cassette reaches the sealing and final folding stations, which entails a risk that the sealing will be incomplete and/or the final folding operation will be a failure.

In order to minimise the amount of air in the sealed packaging container, a known technique is often employed which takes as its point of departure that the volume of the packaging container is reduced during the sealing operation proper. As a result, the liquid level rises in the package which, at the same time, will have slightly inwardly bulging side surfaces. When the packaging container is later opened and air is once again allowed into the packaging container, the side surfaces bulge outwards to their original position, with the result that the liquid level once again falls so that pouring of the first quantity of contents is facilitated. This technique is common and simple to apply on filling and sealing of low capacity packaging containers, but in packages which, during the sealing and closure cycles, are displaced relatively rapidly between different stations, it has hitherto proved difficult to realise, in a satisfactory manner, this volume contraction. A known technique comprises a number of springs disposed at each cassette which extend into the cassette and restrict its free area. However, the flexibility of the springs reduces precision and does not ensure the desired stabilisation and volume contraction in connection with the sealing operation, since the springs are influenced by the handling and by the liquid pressure from the contents filled into the packaging container. The springs must, moreover, be actively manoeuvred to an open position in connection with insertion of the packaging container into the cassette and its removal therefrom, which has proved to require a relatively complex and expensive operating device comprising pneumatically actuable operating means and also an associated electric control system. Such a design and construction has proved to render the machine more expensive and also to be relatively fault prone, in addition to which operating costs have also increased with current systems.

There is thus a general need in the art to realise an apparatus for conveying packaging containers between

work stations, the apparatus comprising cassettes with devices for, on the one hand, stabilising a packaging container placed in the cassette and, on the other hand, reducing the free area and thereby the volume of the packaging container in connection with closure and sealing of the packaging container.

OBJECTS OF THE INVENTION

One object of the present invention is thus to realise a simple and cost-effective conveyor apparatus for packaging containers, the conveyor apparatus comprising cassettes with actuable devices for acting on and stabilising a packaging container located in the cassette during transport and processing of the packaging container, the apparatus not suffering from the previously known and above-outlined drawbacks.

A further object of the present invention is to realise a reliable conveyor apparatus for packaging containers, comprising cassettes which have actuable devices for stabilising an asymmetric container located in the cassette, and for temporarily reducing the volume of the packaging container during a part of its transport through a filling machine.

Still a further object of the present invention is to realise a conveyor apparatus for packaging containers comprising cassettes with pivotally disposed devices which are movable between two positions by means of a simple arrangement disposed fixedly in the filling machine.

Yet a further object of the present invention is to realise a conveyor apparatus for packaging containers comprising cassettes with actuable volume devices, each cassette including locking means influencing the cassettes and displaceable by means of the fixed operating devices.

SOLUTION

The above and other objects have been attained according to the present invention in that an apparatus of the type disclosed by way of introduction has been given the characterizing feature that each cassette includes volume flaps which, by means of an operating device disposed fixedly in the filling machine, are movable between an inactive and an active position, the flaps in the active position reducing the free area in a portion of the cassette.

Preferred embodiments of the present invention have further been given the characterizing features as set forth in the appended subclaims.

ADVANTAGES

By providing each cassette with volume flaps which are actively movable between and lockable in an inactive and an active position, a repeatable restriction of the free area in the cassette will be ensured according

to the invention, and consequential action on a packaging container located in the cassette. The moving and locking of the flaps in the inactive and the active positions, respectively, with the aid of an operating ring disposed around each cassette which is actuated by means of operating devices fixedly disposed in the frame of the filling machine, offer a structurally simple and thereby inexpensive solution as compared with prior art arrangements.

BRIEF DESCRIPTION OF THE ACCOMPANYING DRAWINGS

One preferred embodiment of the apparatus according to the present invention will now be described in greater detail hereinbelow, with particular reference to the accompanying, schematic Drawings, which show only those details essential to an understanding of the present invention. In the accompanying Drawings:

Fig. 1 is a perspective view of a per se known packaging container of a type which the apparatus according to the present invention is intended to handle;

Fig. 2A shows the packaging container of Fig. 1 with an as yet unsealed lower end;

Figs. 2B and 2C show stepwise the sealing and final forming of the lower end of the packaging container;

Fig. 3 shows a part of a filling machine with an apparatus according to the present invention;

Fig. 4A shows an individual cassette with volume flaps in the closed position; and

Fig. 4B shows the cassette according to Fig. 4A with the volume flaps in the open position.

DESCRIPTION OF PREFERRED EMBODIMENT

Fig. 1 shows in perspective a prior art packaging container 1 of a type which the apparatus according to the present invention is intended to handle during filling and sealing. The packaging container 1 has a casing 2 of laminated material comprising, for example, layers of plastic, paper and possibly aluminium foil. At its bottom end (Fig. 2A), the casing 2 is provided with a number of bottom panels 4 which, by means of crease lines, are defined from the casing and given such geometric configuration that, by folding together and thermosealing, they together may form the liquid-tight bottom 3 of the packaging container. At the bottom end of the casing 2, there are also a number of sealing panels 5 for sealing together the bottom end, as will be described in greater detail hereinbelow.

The packaging container 1 illustrated in Fig. 1 includes, at its upper end, an end wall 6 which is injection moulded at the upper end of the casing 2 and connects thereto in liquid-tight fashion. The end wall 6 may, naturally, also be manufactured in any other appropriate

manner, for example in that the casing 2 is provided at its upper end with a prefabricated end wall. The end wall 6 further includes an opening arrangement 7 with a projecting pull ring 8 by means of which the opening arrangement 7 may be opened so that the contents of the packaging container can be conveniently poured out. As is apparent from Figs. 1 and 2C, the bottom 3 of the packaging container is substantially square, while the end wall 6 located at the upper end of the packaging container has powerfully rounded corners. The upper end of the packaging container is also of slightly larger cross sectional area than the bottom end of the packaging container, and this asymmetry creates certain difficulties in handling and transport of the packaging container. The apparatus according to the present invention has for its object int. al. to obviate such difficulties.

The packaging container according to Fig. 1 is shown in Fig. 2 in the inverted and as yet not bottom-sealed position. i.e. in the position in which the packaging container is located when it is to be filled with the desired contents and be end-sealed. After the filling operation, the bottom panels 4 are folded together in a per se known manner such that the sealing panels 5 abut against one another and may be thermosealed for the formation of a sealing fin 9 (Fig. 2B) extending over the bottom 3 of the packaging container. Since the packaging laminate from which the packaging container 1 is manufactured comprises outer layers of thermoplastic material, the thermosealing operation may be put into effect by heating and compression thereof, but it is naturally also possible to utilise other methods. For geometric reasons, the bottom panels 4 form, on folding together, two opposing and substantially triangular, flat-laid corner flaps 10 projecting from the bottom 3, and these corner flaps - after sealing of the bottom 3 and flat-laying of the sealing fin 9 - are folded in towards the centre of the bottom 3 and sealed to subjacent bottom panels so that a substantially planar, square packaging container bottom 3 is formed (Fig. 2C). After this final folding or final forming, the packaging container is thus filled and sealed in liquid-tight fashion, and is hence ready for further transport and sale to consumers.

Fig. 3 shows an apparatus according to the present invention which constitutes a part of a per se known filling machine for producing packaging containers 1 of, for example, the type described in the foregoing. A filling machine of this type is described, for example, in European Patent EP 413.927, to which reference is now made for further information on the remaining parts of the filling machine. The apparatus according to the present invention is intended to handle packaging containers which, by the remaining component parts of the machine, have been given the configuration illustrated in Fig. 2A, and with the aid of the apparatus according to the present invention, the packaging containers are conveyed through the machine in order to be filled, end-sealed and finally formed before they are ready for dis-

charge and delivery. The apparatus according to the present invention thus includes an endless conveyor 11 which, by means of a prime mover (not shown), is stepwise advanced in a reciprocating part between two spaced-apart bending rollers 12. The rollers are rotatably journaled in the frame 13 of the machine and, naturally, the remaining parts are also directly or indirectly connected to this frame. The conveyor chain of the conveyor 11 includes a number of mutually interconnected anchorages 14 each one of which supporting a cassette 15 for accommodating packaging containers 1. The anchorages 14 and, thereby, the cassettes 15 are displaceable along a rail 16 and, by means of the prime mover (not shown), the conveyor is indexed a distance which each time corresponds to the distance between two mutually adjacent cassettes 15. The height of the cassettes 15 substantially corresponds to the height of the casing 2 proper, i.e. after placing in a cassette, the bottom and sealing panels 4 and 5 of the packaging container 1 will extend outside the cassette, which is a precondition for the folding together and sealing of the bottom 3 to be able to take place.

At its one end, each cassette is provided with two volume flaps 17 which are movable between active or closed (Fig. 4A) and an inactive or open position (Fig. 4B) by means of an operating ring 18 surrounding the cassette 15. The volume flaps 17 are pivotally supported in slots in the cassettes 15 and extend, in the active position, partly in through the slot (not visible in the Drawings), so that the free space or cross sectional area in the cassette 15 is restricted. In order to define both positions of the volume flaps 17, they are provided with recesses 19, 20 for cooperation with the operating ring 18. More precisely, the operating ring will, when it is located, for example, in its upper position, cooperate with the upper recess 19 of the volume flaps 17, which not only defines the active position of the operating ring 18 but also prevents the volume flaps 17 from being displaced towards the inactive position by any possible action from the inside of the cassette 15. In a corresponding manner, the operating ring 18 will, on downward displacement, actuate the volume flaps 17 towards the open position and, at the end of its movement, engage with the recesses 20 which are located at the lower end of the volume flaps 17. The operating ring 18 thus also serves as a locking device and will be described in greater detail hereinbelow.

As is apparent from Fig. 3, the conveyor 11 has an upper part which is disposed to be displaced stepwise to the right in the Figure. At the left-hand end of the conveyor 11, there is an infeed station 21 for packaging containers 1. The infeed station is illustrated only schematically, but may consist of guide rails or belts for infeed of packaging containers 1 with the upper end wall 6 first into the cassettes 15. At the upper end of the conveyor 11, there is first (seen in the clockwise direction of movement of the conveyor), a filler station 22 which includes a filler nozzle 23 for supplying the desired

quantity of contents to each individual packaging container located in a cassette 15. Along the upper part of the conveyor 11, there is thereafter an operating device 24 which includes a guide 25 inclining in relation to the conveyor for cooperation with the operating rings 18 of the cassettes 15 and displacement thereof from the lower (Fig. 4B) to the upper (Fig. 4A) position, i.e. the operating rings 18 are lifted as is apparent from Fig. 3 progressively when the cassettes 15 pass the operating device 24 and the operating rings 18 come into contact with the guide 25.

After the operating device 24, there is provided a closure station 26 which is similarly connected to the frame 13 and which displays, on the one hand, a folding device 27 for folding together the bottom panels 4 of the packaging container, and, on the other hand, a sealing device 28 for sealing the transverse sealing fin 9 of the packaging container. Both the folding device 27 and the sealing device 28 may be of per se known types, for example of the type shown in the previously cited European Patent Specification.

After the closure station 26, the apparatus according to the present invention displays a folding rail 29 which extends a slight distance outside the upper end of the cassettes around the right-hand bending roller 12 of the conveyor 11. The folding rails are intended to enter into engagement with and influence the corner flaps 10 and, along a portion of the folding rails 29, there are provided both a heating device 30 and a compression device 31 of per se known type for realising the end closure of the packaging container 1, as will be described in greater detail hereinbelow. The heating device 30 is preferably of the hot air type and includes nozzles for directing hot air towards and heating desired portions of the bottom panels or corner flaps 10 of the packaging container. The compression device 31 is of the reciprocating type and includes flaps which act on the corner flaps 10 to the closed position (Fig. 2C). Immediately after the compression device 31, there is provided an additional fixed operating device 32 with a guide 33 which corresponds to the guide 25 but is of opposite inclination such that, on contact with the operating rings 18 of the cassettes 15, it displaces the rings from the outer end of the cassettes in a direction towards the anchorages 14, i.e. in such a manner that the volume flaps 17 are pivoted from the active to the inactive position. Immediately after the operating device 32, there is finally provided a discharge station 34 which may be designed analogous to the infeed station 21 and, for example, include guides or belts for the discharge of the filled and sealed packaging containers 1 out of the cassettes 15 of the conveyor 11.

When the apparatus according to the present invention is in operation, it is fed with packaging container blanks of the type illustrated in Fig. 2A. As was mentioned previously, the apparatus according to the present invention is included as part of a per se known filling machine, and the parts of this filling machine

which are not shown on the Drawings have, in a per se known manner, raised and produced the packaging containers 1 from a flat blank of laminated paper/ plastic material which has been folded into tube form and provided with the upper end wall 6 of the packaging container 1 by injection moulding. The packaging containers 1 are thereafter fed with the injection moulded upper end wall 6 first via the infeed station 21 to a cassette 15 momentarily located in register with the infeed station 21. Both volume flaps 17 of the cassette are, in this instance, located in the open position and, consequently, do not extend with any part into the interior of the cassette 15, for which reason the free area of the cassette is uniformly large throughout the entire height of the cassette 15, which is a precondition for the end wall 6 of the packaging container 1 to be able to pass the volume flaps 17, since, as has been mentioned previously, the end wall 6 is of slightly greater area (cross sectional dimension) than the remaining parts of the packaging container (particularly in comparison with the bottom end of the packaging container 1). When the packaging container with the end wall 6 has reached the bottom of the cassette, the conveyor 11 is advanced one step such that a subsequent, empty cassette 15 may be filled with the ensuing packaging container 1.

When a cassette 15 with packaging container has, after a number of advancement steps, been displaced from the infeed station 21 to the filler station 22, this is activated in order, in a per se known manner, to fill the desired quantity of contents into the relevant packaging container via the filler nozzle 23. After completed filling, further stepwise displacement of the packaging container takes place to the right in Fig. 3, the cassette 15 passing the operating device 24. The guide 25 will, in such instance, come into contact with the operating ring 18 which is provided with suitable sliding surfaces and, on continued displacement of the cassette 15, the operating ring with therefore progressively be moved from its lower position to its upper position. The operating ring 18 is, in other words, displaced under the action of the volume flaps 17 from the opened to the closed position progressively from the position illustrated in Fig. 4B to that illustrated in Fig. 4A. In such instance, the volume flaps 17 will be pivoted inwards so that, in the active position, they extend partly in through the flap slots and come into contact with the casing of the packaging container 1 located in the cassette, the casing being partly compressed such that the liquid level in the packaging container is raised somewhat at the same time as the bottom end of the casing 2 is stabilised and given a defined, slightly flattened configuration. The volume flaps 17 remain in the active position, since they are locked in this position by the engagement of the operating ring 18 with the upper recess 19 of the volume flaps.

Further displacement of the conveyor 11 places the relevant cassette 15 in the closure station 26, whereupon parts (the bottom panels 4 and sealing panels 5) of the packaging container 1 projecting outside the cas-

sette are acted on by the folding device 27 so that they are folded together to the position illustrated in Fig. 2B, whereafter the sealing device 28 is activated so that the mutually abutting sealing panels 5 in the sealing fin 9 are sealed in liquid-tight fashion to one another utilising the sealing properties of the thermoplastic, and this may preferably be put into effect by ultrasound sealing. After sealing, the packaging container is once again released and fed from the closure station 26 in the position illustrated in Fig. 2B, i.e. with the formed, substantially flat-laid corner flaps 10 projecting laterally. On continued advancement of the packaging container, the corner flaps 10 are grasped by the folding rails 29 which progressively fold the corner flaps upwards so that they extend longitudinally in relation to the packaging container. With the aid of the heating device 30, hot air is fed to the insides of the corner flaps, the thermoplastic layer located there being softened such that, after additional folding with the aid of the folding rails 29, the corner flaps may be sealed to the other bottom panels 4 of the packaging container with the aid of the compression device 31 which, in a per se known manner, compresses the corner flaps and urges them against the bottom of the packaging container so that they are sealed thereto.

After completed final folding or final forming, this relevant packaging container 1 is displaced to the discharge station 34, the guides 33 located between the compression device 31 and the discharge station 34 coming - in a manner corresponding to that of the guides 25 - into contact with the operating ring 18 and displacing it axially along the cassette 15 but in the opposite direction, i.e. from the active position illustrated in Fig. 4A to the inactive position illustrated in Fig. 4B, in which the volume flaps 17 are disposed in the open position. In such instance, the volume flaps 17 will be displaced out of the flap slots in the cassette 15 so that the area of the cassette will be of uniform size throughout the entire height of the cassette, which makes it possible for the discharge station 34 to displace the finished packaging container out of the cassette for further transport to a group package (multipack) or to delivery. The empty cassette 15 is, in this instance, displaced along the lower return part of the conveyor 11 once again to the infeed station 21 and the cycle is repeated.

As was mentioned above, the fact that the volume flaps 17 extend into and restrict the free area of the cassette not only implies that the packaging container is stabilised during sealing and final forming, but also that the liquid level in the packaging container rises which is essential in connection with the bottom sealing, since the quantity of air which is enclosed in the packaging container is hereby reduced. Expressed otherwise, this entails that the packaging container is filled with a smaller quantity of contents than is theoretically possible, which, after closure and sealing of the packaging container, entails that the flexible walls of the packaging container bulge inwards somewhat. When the packag-

ing container is opened by the consumer, the entry of air will result in the liquid level falling and the walls of the packaging container once again bulge outwards so that pouring of the first quantity of contents is considerably facilitated for the consumer. The reduction of the air volume of the packaging container also entails a rise in the quality of the product, since air entrapped in the packaging container may, in certain product types, have a negative effect. Thus, the apparatus according to the present invention realises a plurality of advantages and the apparatus is also, as compared with prior art similar apparatuses, considerably simpler in its design and construction, which not only gives more reliable function but also makes for the production of the apparatus at a considerably lower cost than has hitherto been possible.

The present invention should not be considered as restricted to that described above and shown on the Drawings, many modifications being conceivable without departing from the scope of the appended Claims.

Claims

1. An apparatus for conveying packaging containers (1) between work stations (21, 22, 26, 34) in a filling machine, and comprising a number of cassettes (15) which are connected to an endless conveyor (11), **characterized in that** each cassette (15) includes volume flaps (17), which, by means of an operating device (24, 32) fixedly disposed in the filling machine, are movable between an inactive and an active position, the flaps (17) in the active position reducing the free area in a portion of the cassette (15).
2. The apparatus as claimed in Claim 1, **characterized in that** the volume flaps (17) are pivotally mounted at recesses in the cassettes (15), a portion of the volume flap extending, in the active position, in through the recess and restricting the free space in the cassette.
3. The apparatus as claimed in Claim 1 or 2, **characterized in that** each cassette (15) carries at least one volume flap (17).
4. The apparatus as claimed in Claim 1 or 3, **characterized in that** an operating ring (18) surrounding the cassette is disposed to actuate the volume flaps (17) between the active and the inactive positions.
5. The apparatus as claimed in Claim 4, **characterized in that** said operating device (24, 32) includes a first guide (25) extending along a portion of the conveyor (11), and being disposed, on movement of the conveyor, to displace the operating ring (18) from a lower, inactive position to an upper, active position.

6. The apparatus as claimed in any one or more of Claims 1 to 5, **characterized in that** the conveyor (11) displaces the packaging container (1) between one station (21) for infeed of packaging containers (1) into the cassettes (15), a station (22) for filling the packaging containers, a station (26) for end-closure and sealing of the packaging containers, and a station (34) for discharge of filled and sealed packaging containers out of the cassettes.
7. The apparatus as claimed in Claim 6, **characterized in that** the operating device (24) for the volume flaps (17) is located between the infeed station (21) and the end closure and sealing station (26).
8. The apparatus as claimed in any one or more of Claims 1 to 7, **characterized in that** a second operating device (32) for moving the volume flaps (17) from the active to the inactive position is disposed along the conveyor (11) between the end closure and sealing station (26) and the discharge station (34).

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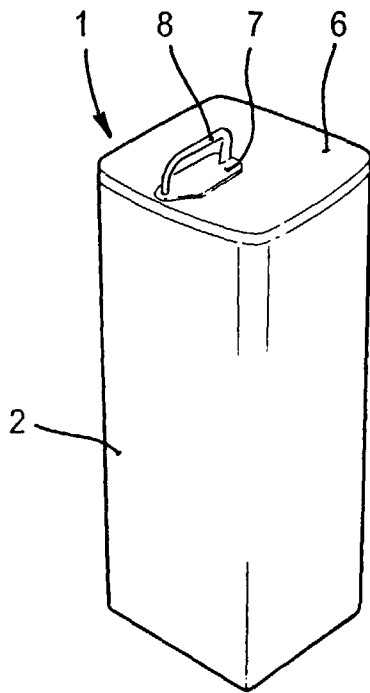


Fig 1

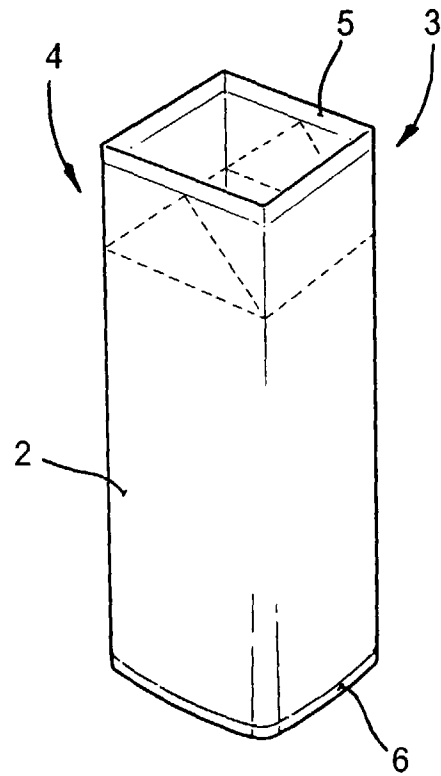


Fig 2A

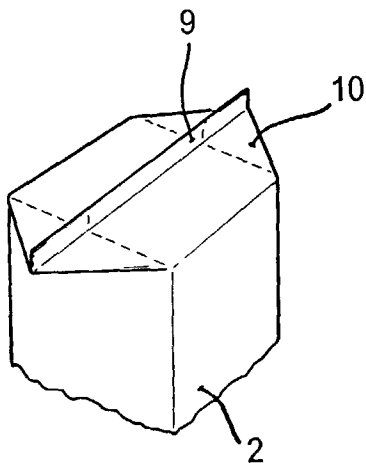


Fig 2B

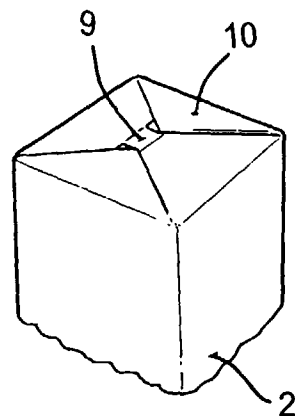


Fig 2C

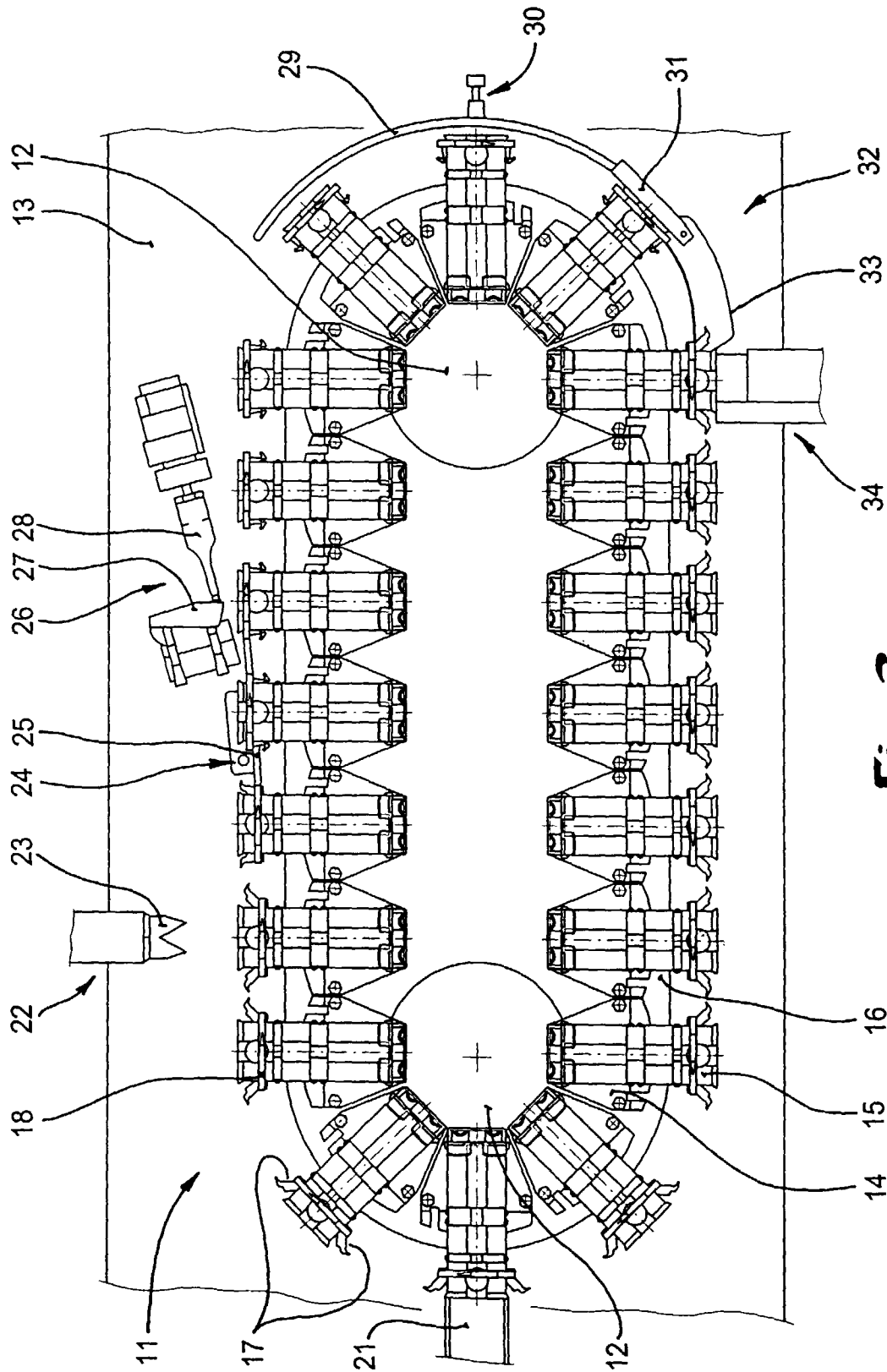


Fig 3

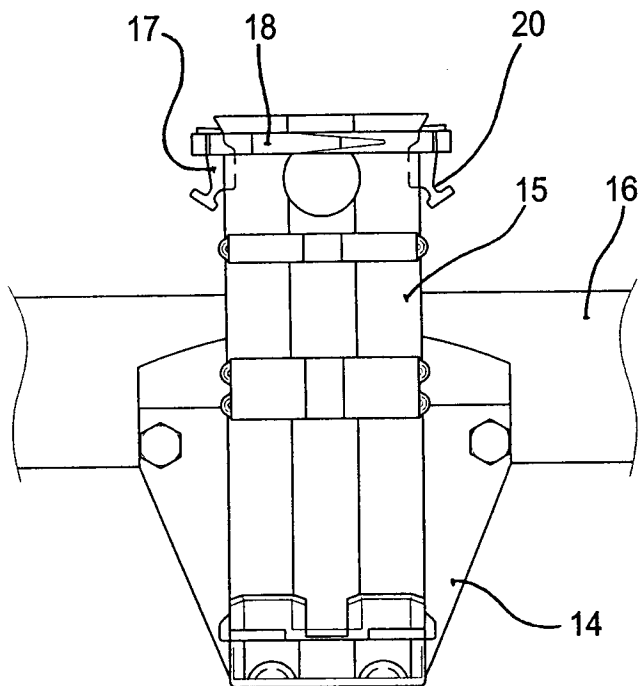


Fig 4A

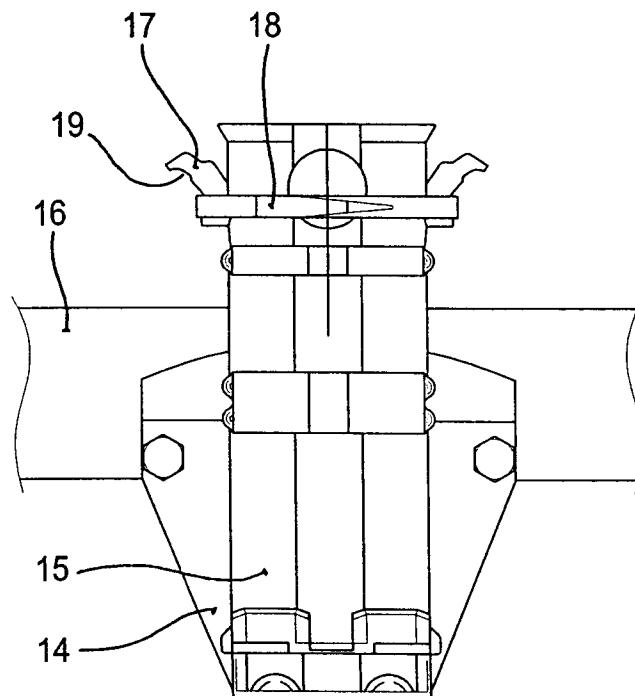


Fig 4B



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 98 10 3318.6

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)
X	US 4462202 A (REIL), 31 July 1984 (31.07.84) * figure 2, abstract, details 13,27, 29 *	1,2,3	B65B 61/24
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Y	EP 0413927 A1 (TETRA PAK HOLDINGS & FINANCE S.A.), 27 February 1991 (27.02.91) --	6	
X	US 3857223 A (DOMINICI), 31 December 1974 (31.12.74) * detail 18 *	1,2	
X	GB 1493855 A (ALTSTÄDTER VERPACKUNGS VERTRIEBS GMBH), 30 November 1977 (30.11.77) * figure 1, detail 7 *	1,2	TECHNICAL FIELDS SEARCHED (Int. Cl.6) B65B
A	US 3488915 A (A.F. DELESTATIUS), 13 January 1970 (13.01.70) --		
A	SE 318816 B (AB TETRA PAK), 15 December 1969 (15.12.69) -----		
The present search report has been drawn up for all claims			
Place of search STOCKHOLM		Date of completion of the search 25 June 1998	Examiner KRISTINA PEDERSON
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03.82 (P0401)