

PATENT SPECIFICATION

769,888



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COMPLETE SPECIFICATION

Improvements in or relating to the Production of Tetrahedron-shaped Packages.

We, HERMORION LTD., of Dominion Bank Building, 68, Young Street, Toronto 1, Canada, a joint stock company organized according to the laws of Canada, do hereby
5 declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:

10 This invention relates to liquid-filled tetrahedron-shaped packages and to a method of producing the same.

15 It has been previously suggested to produce packages in the form of tetrahedra by compressing and sealing a tube of packing material alternately in mutually perpendicular directions transverse to the axial direction of the tube and to fill such packages with a liquid during their production. The
20 liquid is supplied in such manner as to lie continuously above that level where the compressing and sealing takes place, so that the sealing so to speak is effected through a liquid column. Due to the compression and
25 sealing the walls of the packages become outwardly curved and each package is filled with the maximum volume it may contain due to the pressure on the liquid and the flexibility and yieldability of the package
30 walls.

It has been found that this complete filling is somewhat disadvantageous when the package is to be opened for discharging its contents. The opening is usually carried out
35 by placing the tetrahedron-shaped package on a table with its lower surface substantially horizontal after which the corner opposite said surface is pierced or cut off. With such opening of the package it has proved
40 to be practically impossible to avoid the liquid contents leaking out during the cutting operation which must be regarded at least as a hygienic inconvenience.

45 The object of this invention is to provide a process of manufacture of such liquid-

filled packages which avoids this disadvantage.

According to the present invention a method of producing liquid-filled, tetrahedron-shaped packages from a tube of
50 packing material sealable by heat and pressure by successively compressing and sealing the tube along narrow zones transverse to the axial direction of the tube and alternately
55 in two mutually perpendicular directions while supplying liquid to the tube at such a rate that the liquid continually lies above the zone being sealed includes the step of subjecting the walls of the packages during
60 the compressing and sealing operations to an external pressure so as to force them to enclose a somewhat smaller internal volume than that which would automatically be obtained without such pressure due to the pressure of the packed liquid and the elasticity
65 and flexibility of the material of the package walls.

The said pressure is suitably applied simultaneously to two triangular wall surfaces of the tetrahedron-shaped package,
70 extending from one and the same sealing edge so that these surfaces become plane to slightly concave in comparison with the convex shape obtained when no outside pressure is applied, all the edges except the
75 sealing edges however remaining rounded. When opening a package manufactured in this way air will be sucked in as soon as the wall is cut through, the walls are forced outwardly so that the inner volume is increased and as a result the liquid level inside
80 the package does not reach the border of the opening made and consequently no liquid will leak out during the perforation of the wall at the top corner of the package.
85

The decrease in volume during manufacture should naturally be adapted to the size of the package so that a zone of suitable extent is obtained at the top corner within
90 which the perforation can be made without

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the risk of leakage. This zone may be simply marked by means of an indicating line or the like on the outer surface of the package.

5 The invention will be hereinafter described by way of example with reference to the accompanying drawing, showing diagrammatically two co-operating jaws compressing between them a tube-shaped element to form
10 packages. This drawing may be regarded as a modified detail of a machine constructed as described in the specification of our prior Patent Application No. 711,855 for continuously producing packages from an
15 elongated tube of a thermoplastic material by compressing and sealing together opposite sides of the tube along narrow zones disposed transversely to the longitudinal axis of the tube, the machine including a
20 frame through which the tube may be moved vertically downward, a pair of conveyor frames supported in said machine frame and at opposite sides of the path of travel of the tube, an endless conveyor supported on
25 each of said conveyor frames for travel in an endless path, each conveyor path including a substantially vertically extending run and the vertically extending runs of the respective conveyors being substantially
30 parallel and opposed to each other at opposite sides of the path of travel of the tube, means for driving said conveyors simultaneously and at the same rate for downward movement of said vertically extending
35 and opposed runs of the respective conveyors, and co-operating means carried by the conveyors for compressing narrow transverse zones of the opposite sides of the tube into engagement and sealing the same to
40 each other, said co-operating means comprising a set of clamping jaws supported upon each conveyor and extending towards the other conveyor at said opposed runs of the respective conveyors, the several jaws of
45 each set being spaced apart to align with a complementary jaw of the other set to flatten said tube and press the opposite sides thereof into engagement, means for heating the jaws of one set, and means including a
50 roller bed movable on one of said conveyor frames to increase the pressure between a pair of co-operating jaws during travel thereof down said opposed parallel runs of the respective conveyors.

55 Referring to the drawing, 1 and 2 designate two co-operating clamping jaws compressing between them a tube-shaped element 3 of packing material for the formation of tetrahedron-shaped packages 4 having transverse sealed joints 5 and 6 extending
60 alternately in mutually perpendicular directions.

65 In the prior machine the jaws 1 and 2 were provided with wings or flanges extending from the surfaces of the jaws in a

direction indicated on the drawing by reference numeral 7. With this construction it was possible for the said walls of tetrahedron-shaped packages formed and filled with liquid to extend or bulge outwardly as indicated by the chain-dotted line 8. 70

In the present case according to the illustrated embodiment of the invention the wings of the jaws are provided with projecting surfaces 9, which during the end of the package forming operation and during the sealing operation press against the outer faces of the side walls of the packages so that these side walls become dented inwardly as indicated by the contour line 10. 75 80

In this way the packages will receive a partial subfilling. On piercing the container for emptying, air will be sucked into the package, the walls will bulge outwardly and the internal volume will thereby increase, so that there is no danger of the content of the package leaking out during the opening operation and soiling the outer walls of the package. 85

What we claim is:— 90

1. In a method of producing liquid-filled, tetrahedron-shaped packages from a tube of packing material sealable by heat and pressure by successively compressing and sealing the tube along narrow zones transverse to the axial direction of the tube and alternately in two mutually perpendicular directions while supplying liquid to the tube at such a rate that the liquid continually lies above the zone being sealed, the step of subjecting 100 the walls of the packages during the compressing and sealing operations to an external pressure so as to force them to enclose a somewhat smaller internal volume than that which would automatically be obtained 105 without such pressure due to the pressure of the packed liquid and the elasticity and flexibility of the material of the package walls.

2. A method according to Claim 1 in which the external pressure is exerted by projecting surfaces on jaws producing the compression and sealing along the transverse zones. 110

3. A method according to Claim 1 or 2 in which the external pressure is applied simultaneously to two triangular walls of the tetrahedron-shaped package extending from one sealing joint. 115

4. A liquid-filled tetrahedron-shaped package produced from a tube of a flexible and elastic material sealable by heat and pressure, by a method according to any of the preceding claims and having its walls which extend from a sealing zone of plane 120 or slightly concave form. 125

5. A method of producing liquid-filled tetrahedron-shaped packages substantially as hereinbefore described and illustrated.

the risk of leakage. This zone may be simply marked by means of an indicating line or the like on the outer surface of the package.

5 The invention will be hereinafter described by way of example with reference to the accompanying drawing, showing diagrammatically two co-operating jaws compressing between them a tube-shaped element to form
10 packages. This drawing may be regarded as a modified detail of a machine constructed as described in the specification of our prior Patent Application No. 711,855 for continuously producing packages from an
15 elongated tube of a thermoplastic material by compressing and sealing together opposite sides of the tube along narrow zones disposed transversely to the longitudinal
20 axis of the tube, the machine including a frame through which the tube may be moved vertically downward, a pair of conveyor frames supported in said machine frame and at opposite sides of the path of travel of
25 the tube, an endless conveyor supported on each of said conveyor frames for travel in an endless path, each conveyor path including a substantially vertically extending run and the vertically extending runs of the
30 respective conveyors being substantially parallel and opposed to each other at opposite sides of the path of travel of the tube, means for driving said conveyors simultaneously and at the same rate for downward
35 movement of said vertically extending and opposed runs of the respective conveyors, and co-operating means carried by the conveyors for compressing narrow transverse zones of the opposite sides of the tube
40 into engagement and sealing the same to each other, said co-operating means comprising a set of clamping jaws supported upon each conveyor and extending towards the other conveyor at said opposed runs of
45 the respective conveyors, the several jaws of each set being spaced apart to align with a complementary jaw of the other set to flatten said tube and press the opposite sides thereof into engagement, means for heating the jaws of one set, and means including a
50 roller bed movable on one of said conveyor frames to increase the pressure between a pair of co-operating jaws during travel thereof down said opposed parallel runs of the respective conveyors.

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70 liquid to extend or bulge outwardly as indicated by the chain-dotted line 8.

In the present case according to the illustrated embodiment of the invention the wings of the jaws are provided with projecting
75 surfaces 9, which during the end of the package forming operation and during the sealing operation press against the outer faces of the side walls of the packages so that these side walls become dented inwardly as indicated by the contour line 10.
80

In this way the packages will receive a partial subfilling. On piercing the container for emptying, air will be sucked into the package, the walls will bulge outwardly and the internal volume will thereby increase, so
85 that there is no danger of the content of the package leaking out during the opening operation and soiling the outer walls of the package.

What we claim is:—

90 1. In a method of producing liquid-filled, tetrahedron-shaped packages from a tube of packing material sealable by heat and pressure by successively compressing and sealing the tube along narrow zones transverse to
95 the axial direction of the tube and alternately in two mutually perpendicular directions while supplying liquid to the tube at such a rate that the liquid continually lies above the zone being sealed, the step of subjecting
100 the walls of the packages during the compressing and sealing operations to an external pressure so as to force them to enclose a somewhat smaller internal volume than that which would automatically be obtained
105 without such pressure due to the pressure of the packed liquid and the elasticity and flexibility of the material of the package walls.

2. A method according to Claim 1 in 110 which the external pressure is exerted by projecting surfaces on jaws producing the compression and sealing along the transverse zones.

3. A method according to Claim 1 or 2 115 in which the external pressure is applied simultaneously to two triangular walls of the tetrahedron-shaped package extending from one sealing joint.

4. A liquid-filled tetrahedron-shaped 120 package produced from a tube of a flexible and elastic material sealable by heat and pressure, by a method according to any of the preceding claims and having its walls which extend from a sealing zone of plane
125 or slightly concave form.

5. A method of producing liquid-filled tetrahedron-shaped packages substantially as hereinbefore described and illustrated.



FRANK WATSON,
Agent for the Applicants,
Aldwych House,
Aldwych,
London, W.C.2.



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