

[54] **METHOD OF MAKING DISPENSERS**

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[22] Filed: **Dec. 6, 1971**

[21] Appl. No.: **205,277**

Related U.S. Application Data

[63] Continuation of Ser. No. 861,385, Sept. 26, 1969, abandoned.

[52] U.S. Cl. **156/69, 99/171 C, 99/171 M, 99/171 LP, 99/181 R, 156/215, 156/230, 156/293**

[51] Int. Cl. **B29c 23/00**

[58] Field of Search **156/69, 212, 215, 230, 156/556, 584, 293; 99/171 C, 171 M, 171 LP, 178, 181 R**

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[57]

ABSTRACT

A method and apparatus are provided for feeding packages, dispensing nozzles and attaching strips and for securing the strips on the packages to hold the dispensing nozzles in position on the packages for dispensing the contents of the packages upon a squeezing thereof.

7 Claims, 6 Drawing Figures

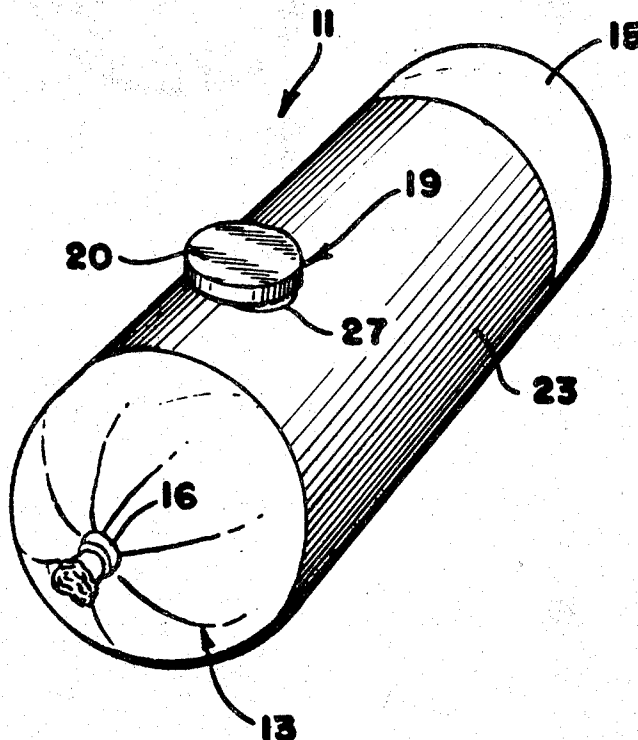


Fig 1

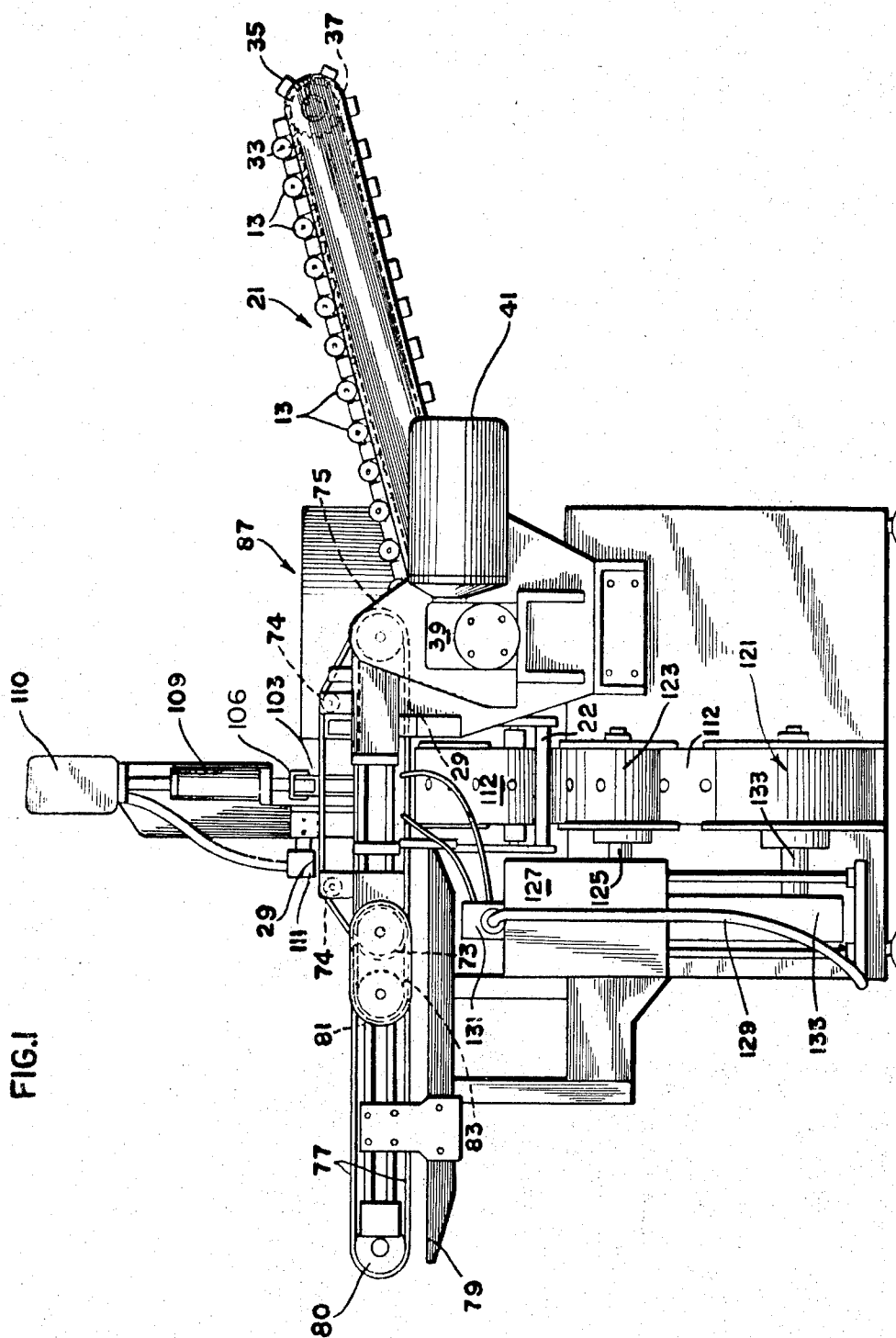


FIG. 2

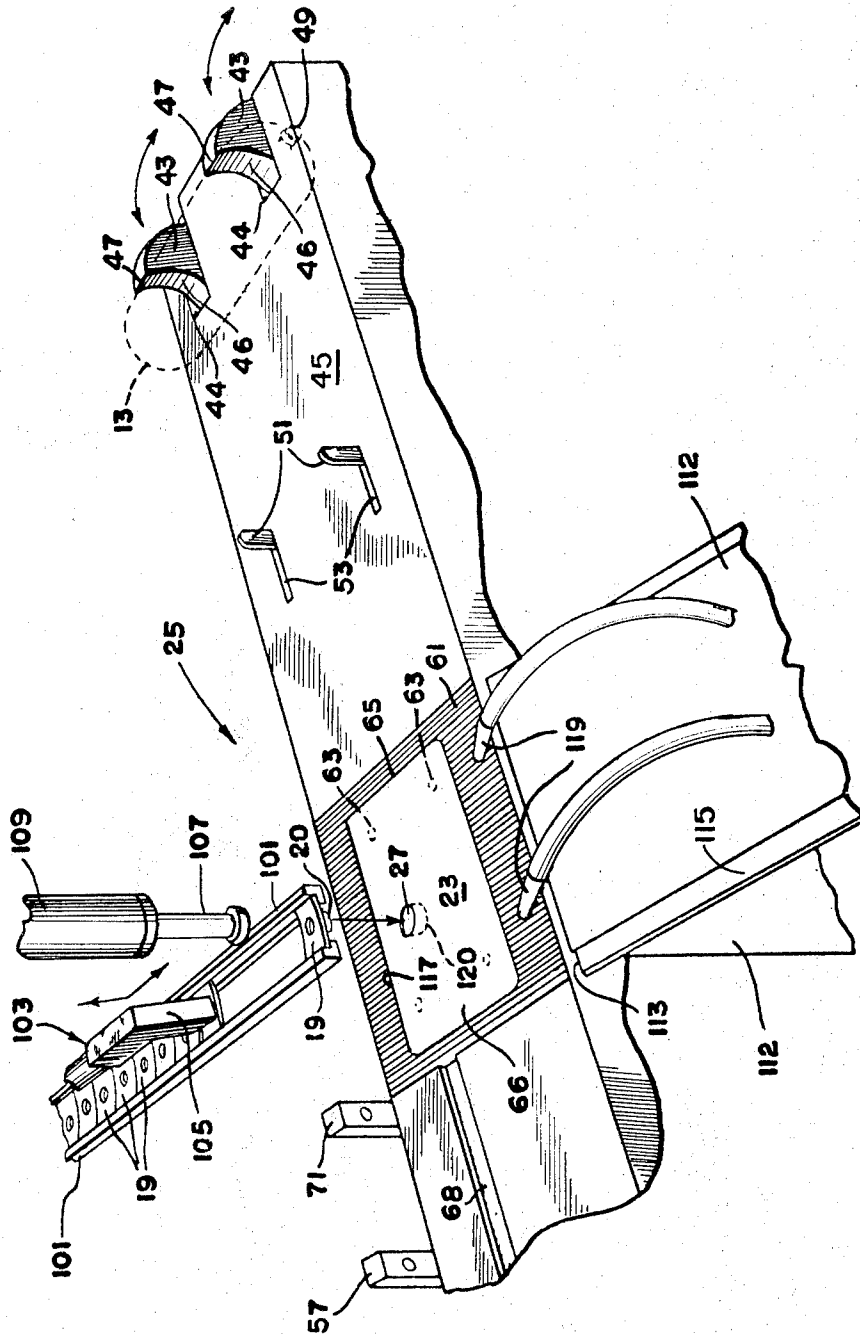


FIG.3

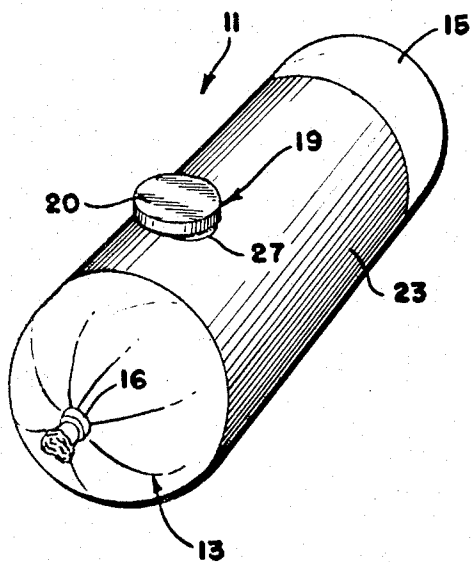


FIG.4

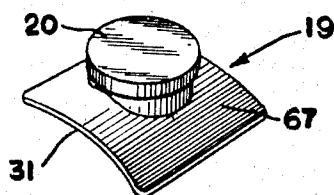


FIG.5

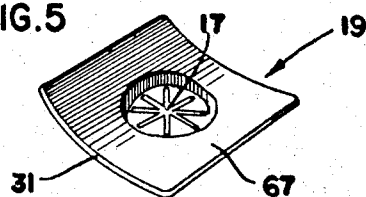
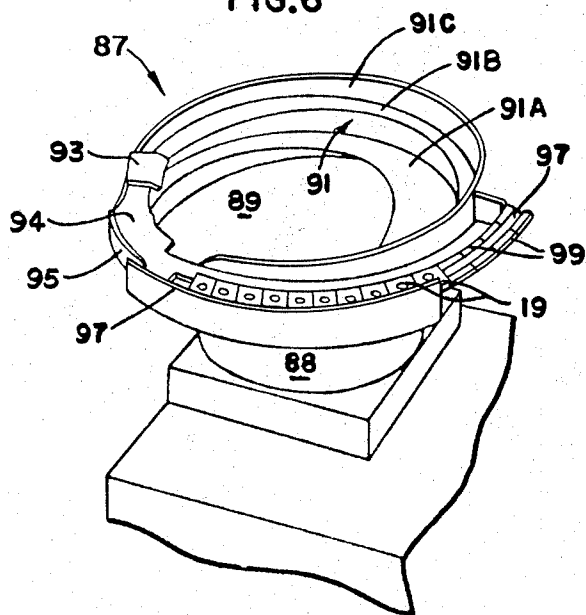


FIG.6



METHOD OF MAKING DISPENSERS

This is a continuation of application Ser. No. 861,385, filed Sept. 26, 1969, now abandoned.

This invention relates to a method of and apparatus for forming a dispenser of the kind in which a package carries a dispenser nozzle on its exterior wall for dispensing the contents of the package upon a squeezing thereof.

The present invention is described herein in connection with but is not limited to the making of collapsible, wall dispensers of the kind fully disclosed in copending application Ser. No. 700,474, entitled "Dispenser" and filed on Jan. 25, 1968 now U.S. Pat. No. 3,477,614. More specifically, this dispenser comprises a so-called "chub" package which is generally cylindrical in shape with a strip or band encompassing the exterior of the cylindrical package wall between the sealed ends for the imperforate package and securing a dispensing nozzle to the package wall. The strip reinforces the package wall which will be perforated at the nozzle when it is desired to dispense the package contents through the dispensing nozzle.

Accordingly, a general object of the present invention is to provide a method of and an apparatus for making such a dispenser in a commercial and economical manner.

Other objects and advantages of the invention will become apparent from the following detailed description taken in connection with the accompanying drawings in which:

FIG. 1 is an elevational view of an apparatus embodying the novel features of the invention;

FIG. 2 is an enlarged, diagrammatic perspective view illustrative of the apparatus for view method of forming the dispenser;

FIG. 3 illustrates a dispensing package constructed in accordance with the preferred embodiment of the invention;

FIG. 4 illustrates a top view of the dispensing nozzle;

FIG. 5 is a bottom view of the nozzle of FIG. 4; and

FIG. 6 illustrates a vibratory feeder for orienting and feeding dispensing nozzles of the kind as shown in FIG. 4.

As shown in the drawings for purposes of illustration, the invention is embodied in an apparatus for and a method of forming a dispenser 11, as best seen in FIG. 3, which dispenses its contents when squeezed with sufficient force. The illustrated dispenser includes a chub package 13 having a continuous cylindrically shaped, collapsible wall 15 closed at opposite ends by clenched bands 16 to form a complete package to which a dispensing means is attached to control the flow of the contents of the package through an orifice 17 in a nozzle 19. The nozzle 19 carries a removable cap 20 which may be returned on the nozzle if the entire contents of the package are not dispensed. Very generally, the apparatus for making the dispensers 11 includes a conveyor means 21 for continuously moving a procession of packages 13 along a predetermined path of travel while, as illustrated in FIG. 2, nozzle securing strips 23 are moved along an intersecting path to be attached to the package at a nozzle attaching station 25. At this station, means are provided for attaching the strip to the package wall, preferably in the form of belts 29 which

roll the package onto the stationary strip which has a self-adhering adhesive thereon.

A fast and efficient method of forming dispensers 11 at commercial rates and quantities is achieved by feeding the strips 23, and nozzles 19 and the packages 13 in timed relationship and in carefully controlled positional relationships with respect to one another so that the strip 23 is centered on the wall of the package and is attached thereto without wrinkling and with the nozzle properly oriented with a concave side 31 thereon abutted against a similarly curved portion of the collapsible package wall 15. As will be explained in greater detail, the nozzles 19 are inserted into the apertures 27 in the strips and then the package moves into engagement with the strip which wraps thereabout and is suitably secured to the package wall.

Referring now in greater detail to the feeding of the packages 13, a procession of packages are fed forwardly, i.e., from right to left in FIG. 1, by the input conveyor means 21 which is formed of a pair of continuous chains 33 each of which has a series of upstanding lugs 35 attached thereto and spaced apart a sufficient distance to receive a chub package therebetween. The endless conveyor chains move about a forward drive sprocket at a right end 37 of the conveyor which is disposed upwardly relative to a lower sprocket which is suitably connected through a drive gear box 39 to a motor 41. In this preferred embodiment of the invention, the input conveyor 21 is driven continuously at a predetermined speed which determines the rate at which the dispensers 11 are made, the movement of the nozzles 19 and the label strips 23 being timed thereto as will be explained hereinafter.

For the purpose of transferring the packages 13 from the infeed conveyor 21 to a pair of endless belts 29, there is provided a transfer means which includes a pair of flippers 43, as best seen in FIG. 2, which are driven in and by a rotatable cam (not shown) in a cyclic manner from a lower receiving position within slots 44 in a horizontal support or table 45 to an upper discharging position shown in solid lines in FIG. 2. In the receiving position, points 47 on the flippers 43 are disposed beneath the plane of the package travel when discharging from the lower end of the inclined conveyor means 21, and curved cradle surfaces 46 on the flippers are disposed beneath the discharging package. The motor 41 drives the cam to turn the flippers 43 about their horizontally disposed axes 49, so that the cradle surfaces 46 lift the package from the infeed conveyor 21 and roll the same forwardly onto the supporting table 45.

As the package is deposited by the flippers 43 on the table 45, the pair of overhead feed belts 29 engage the top of the package and exert forwardly directed friction forces on the package causing the same to roll along the table towards the nozzle applying station 25. During this forward feeding along the table 45, the packages abut a pair of upstanding stops 51 which pivot between the upper stop position in which the package becomes positioned with its longitudinal axis disposed at right angles to the path of travel and a retracted position in which the stops are pivoted downward through slots 53 in the table to a position beneath the plane of the table 45. If the package is canted so that the axis of the package is at a position other than substantially normal to the path of travel, the leading end of the canted package will abut one of the two stops 51 and the package will be held at this end while the other

trailing end is fed forward by the other feed belt 29 to also abut the other stop whereby both stops engage and hold the package with its axis disposed substantially normal to the path the belts are traveling. The belts will continue to roll the chubs held by the stops. The stops are pivoted downwardly to the retracted position below the plane of the table 45 to release the chub for forward travel when a previously formed dispenser 11 discharges from the station 25 and passes a sensing means 57 in the form of an electric eye located downstream of the nozzle applying station 25. A suitable motor operator (not shown) retracts the stops and permits the package 13 to roll forwardly onto the strip 23 which is being held by a pressure differential on a plate 61 which has apertures 63 connected to conduits leading to a vacuum pump (not shown). Thus, the plate 61 functions as a vacuum plate to hold the label 23 in a flat unwrinkled condition and against movement with an edge 65 of the strip substantially parallel to the axis of the package, i.e., normal to the axis of the package travel, and with a pressure sensitive adhesive on its upper side 66 positioned for engagement with the package.

The feed belts 29 apply sufficient pressure to the package that when it engages the edge 65 of the pressure sensitive adhesive on the label strip, this edge immediately adheres to the package. As the package is rolled forwardly across the strip 23 towards the nozzle 19 which is inserted into the aperture 27 in the label strip 23, the leading edge of the strip is carried upwardly toward the feed belt 29. The interior concave surface 31 on the nozzle 19 is positioned to engage the convexly curved surface of the package so that the flange abuts tightly against the package wall and is intermediate the label strip 23 and the package wall 15. The nozzle moves upwardly towards the feed belts while the package continues to move and roll forwardly across the vacuum plate to be discharged from the nozzle applying station 25. The feed belts 29 are spaced so that they do not engage the nozzle 19 and the latter rolls within a slot 68 provided in the discharge side of the table 45. The feed belts 29 serve to roll the package from the nozzle attaching station 25 to and across a path of a sensing means 71 in the form of an electric eye which will, when detecting the finished dispenser, establish circuits to cause the next label strip 23 to feed into position on the plate 61 and also cause the feeding of a nozzle 19 into the aperture 27 in the label strip.

The dispenser 11 is rolled to the left as viewed in FIGS. 1 and 2 and is discharged from the feed belts 29 at sheaves 73 at which the belts 29 travel upwardly to idler rollers 74 and then reversely along a return run to idler rollers and then downwardly to forward sheaves 75 at which the belts accept packages 13 from the flippers 43. From the belts 29, the dispensers 11 roll beneath a pressure belt 77 which is preferably formed of an elastomeric material and spaced above a lower horizontally disposed support surface 79 which is in a continuation of and in the plane of the table 75. Preferably, the support surface 79 has a channel therein to accept the nozzle 19 as the pressure belt 77 continues to roll the package along the support surface 79 towards a discharge roller 80 at the discharge end of the machine. From the discharge roller, the belt moves reversely along an upper return run to a forward roller 81 at which the belt is fed downwardly for pressing engagement with discharging dispensers. The pressure belt 77

may be driven in any simple manner such as by means of a chain drive 83 extending from its rollers 81 to the discharge sheaves 73 for the feed belts 29.

Referring now to FIGS. 1, 2 and 6, the preferred manner of providing a procession of nozzles 19 having their concave surfaces 31 aligned to contact the package walls and with the caps thereon facing down for insertion through the aperture 27 in the label strip is by means of a vibratory feeder which includes a vibratory hopper 87 having an open top into which may be deposited a large mass of non-oriented nozzles 19. As best seen in FIG. 6, the nozzles 19 are vibrated in the hopper by means of a motor 88 located beneath a bottom hopper wall 89 in which the nozzles are deposited. The nozzles travel radially outward from the center of the bottom wall 89 toward an upwardly spiralling track 91 which leads upwardly along successive turns 91A and 91B to a top turn 91C. The nozzles 19 which have their caps down travel up along the track 91 in a counterclockwise direction to a deflector 93 overhanging the portion 91C of the track which returns to the bottom wall 89 those nozzles which are not properly situated on the track 91C. Those nozzles which are properly positioned with the cap down and the concave surface 31 positioned up slide radially outwardly along a surface 94 to abut an upstanding guide wall 95 which guides the same for forward movement with the caps and nozzle heads falling into a groove 97 between a pair of spaced rails 99.

From the discharge rails 99 of the vibratory feeder, the procession of nozzles move forwardly for movement along a pair of channels 101 which extend to the nozzle attaching station 25 and directly over the aperture 27 in the strip 23. The nozzles are vibrated along the channels to move forwardly to a combined stop and feed pawl 103 which has a tooth 105 aligned with and in contact with the top of the foremost one of the nozzles to push the nozzle forwardly during a forward stroke thereof. The feed pawl 103 positions the nozzle directly below a reciprocating plunger 107 which, on its downward stroke, strips the nozzle from the channels 101 and forces the nozzle head and cap down and through the aperture 27 in the strip 23 therebelow. The preferred plunger 107 is driven by a pneumatic cylinder 109 which is driven through a suitable air supply control 110 including a valve 111 which is opened by a circuit operated by the sensing means 71 sensing a discharging dispenser 11. That is to say, the passage of a dispenser past the sensing means 71 causes electrical circuits to operate the valve 111 to admit air to the cylinder 109 to force the plunger 107 down to strip the nozzle 19 from the channels and insert the same into the aperture 27 in the label strip 23. The feed pawl 103 is also actuated by a means including a crank 106 which is suitably attached to the plunger 107 to cause the pawl 103 to move through a nozzle feeding cycle. During the return movement of the feed pawl 103, the pawl tooth 105 is raised by a cam (not shown) to a position above the nozzles and then is lowered onto the top of the leading one of the abutted procession of nozzles in the channels 101. The pawl remains stationary at this point holding the procession until the pawl is again reciprocated forwardly to position another nozzle in position for the plunger to engage the same.

Turning now to label strips 23, the latter are adhered in closely spaced relationship on a carrier web 112 by their respective pressure sensitive adhesive faces 66.

The carrier web 112 carries the strips to a position adjacent the nozzle attaching station 25 at which the strips are peeled from the carrier web and transferred to position on the vacuum plate 61 to receive a nozzle 19. The preferred manner of removing the strips from the carrier webs is by automatically peeling the pressure sensitive face 66 from a release-coated, side of the carrier web by turning the carrier web around a sharp corner 113 with a quick very substantial change in direction. More specifically, the strips 23 are fed upwardly towards the corner 113, which is an upper edge of a flat, inclined plate 115, adjacent a side of the plate 61; and at the corner a leading edge 117 of the strip separates its adhesive from the carrier web which is reversing its direction of travel by more than 270°. The leading edge 117 of the strip 23 is subjected to jets of air issuing from a pair of nozzles 119 attached to compressed air hoses. The jets of air abut against the pressure sensitive adhesive face 66 and force the strip 23 down towards the top of the plate 61. Once it starts to peel, the strip 23 continues to peel from the carrier web 112 and slides along the plate 61 with the leading edge 117 thereof advancing towards a nozzle receiving hole 120 in the plate 61. In this manner, the strip 23 is removed from the carrier web 112 and thereafter, the carrier web halts. Even though the air jets continue to blast on the peeled strip 23, the same is held against lateral displacement by the pressure differential caused by the vacuum holes 63 being covered by the strip.

The carrier web 112 is removed from a lower supply roll 121 which is spaced laterally outwardly of the nozzle applying station 25 and travels upwardly towards the underside of the inclined plate 115 while spaced therefrom until reaching the corner 113 of the inclined plate 115. The carrier web turns about the corner 113 and is partially wrapped about a hold-down tensioning roller 122 before winding on a take-up roller 123 which is located above the supply roll. The take-up roll 123 is supported on an end of a horizontally disposed support shaft 125 which is attached to and driven by a motor 127 which in this instance is an air motor. The air motor 127 is driven by a source of compressed air from a conduit 129 which leads to a suitable control valve 131 mounted on the top of the motor 127. Each time a completed dispensing package passes the sensing means 71, the valve 131 is operated to cause the motor 127 to turn the supply roll 123 through a distance sufficient to pull the carrier web forwardly to peel one label strip 23 therefrom and to position a leading edge 117 of the next subsequent strip adjacent the corner 113.

Preferably, the carrier web 112 is held in tension between the supply roll 121 and the take-up roll 123. It is also preferred that the supply roll 121 which is supported on an end of a support shaft 133 also be driven by a motor 135 to unwind a length of carrier web which is substantially longer than any one given strip 23. More specifically, a length of carrier web having several strips 23 is unwound with the operation of the motor 135; and to this end there is provided a dancer roll (not shown) which rests on top of the carrier web just forward of the supply roll. When the carrier web 112 unwinds from the supply roll, the dancer roll, pivots down and develops a loop and holds the loop under tension. Then, as the loop of the carrier web is dissipated by forward movement of the carrier web during which several labels are stripped from the carrier web

and several lengths of web are wound on the take-up roll 123, the dancer roll moves up and closes electrical contacts to operate the motor 135 which turns the supply reel to again form the loop whereby the dancer roll pivots downwardly to close other contacts which cause the motor 135 to be de-energized. Thus, in this manner the, carrier web is fed and the loop in the carrier web is maintained under tension by the dancer roll.

As an aid to understanding the invention, a brief review of the method and apparatus will be given. A procession of packages 13 are fed forwardly along a path toward the nozzle attaching station 25 by the conveyor means 21 to the flippers 43 which lift and transfer the packages to a position beneath the endless belts 29 which roll the package along the table 45 to abut the pair of stops 51. The stops hold the package until a previously formed dispenser moves past a sensing means 57 which causes the operation of a motor actuator to pivot the stops downwardly into a retracted position in the slots 53. By this time, the axis of the package will be disposed substantially normal to the path of travel and the package will be rolled forwardly by the belts 29 to engage the leading edge of the label strip 23 which has its pressure sensitive adhesive face 66 disposed upwardly. A nozzle 19 will already be inserted into the aperture 27 in the strip with concave surface 31 of the nozzle facing upwardly. The belts will roll the package onto the leading edge 65 of the strip 23 with sufficient pressure that the leading edge 65 will adhere to the package. As the package continues to roll its wall 15 will abut the flange 67 of the nozzle 19 which is then positioned intermediate the strip 23 and the package wall 15. The feed belts continually roll the package forwardly with strip 23 being wrapped completely thereabout.

The now formed dispenser 11 rolls forwardly to the sensing means 71 which senses the package and causes the valve 131 for the take-up motor 127 to open and admit compressed air to turn the shaft 125 on which the take-up reel 123 is mounted. As the take-up reel turns, it pulls the next strip 23 on the carrier web 112 upwardly to the corner 113 to peel the strip 23 therefrom. As the leading edge 117 of the strip 23 is peeled from the carrier web 112, the air jets from the nozzles 119 bend this edge down towards the plate 61. As the carrier web continues to travel, the strip continues to peel from the carrier web and move across the plate 61 towards a position beneath the nozzle applying plunger 107. After the strip 23 is completely separated from the carrier web, the take-up reel motor 127 stops pulling the carrier web 112. Soon thereafter, the second sensing means 57 senses the dispenser 11 which caused the strip to be peeled and the second sensing means operates the air valve 111 for the pneumatic cylinder 109 to cause the plunger 107 to move downwardly and strip the nozzle 19 therebelow from the supporting channels 101 and insert the same into the aperture 27 in the label strip 23 and into the aperture in the table. On the return upward stroke of the plunger 107, the feed pawl 103 moves forwardly to deposit the next nozzle 19 at the position below the plunger 107 and the feed pawl is returned to rest on top of the next nozzle to be fed forwardly for a strip 23. During this operation, the previously wrapped dispensing package has been transferred from the feed belt 29 to the discharge pressure belt 77 which feeds the same along the forward path of movement to discharge the same at a discharge end of

the belt 77. In the preferred embodiment of the invention, the packages are moved in a substantially continuous manner by the input carrier 21, the feed belts 29 and the discharge belts 77 while the strips 23 and nozzles 19 are fed intermittently.

From the foregoing, it will be seen that there is provided an apparatus which assembles and forms the dispenser in an automatic and continuous manner. The strips 23 are tightly bonded to the exterior wall 15 of the wall intermediate the ends of the package with the flange 67 of the nozzle adhering to the strip at the area about the aperture 27 in the strip. When the cap is removed from the nozzle, a sharp knife may be inserted through the discharge orifice 17 to puncture the package wall 15. By squeezing the collapsible wall 15, the contents of the package, for example, processed cheese, will extrude through the orifice. The package wall may begin to tear at the area of the puncture, but it will stop tearing as the flange 67 and the strip 23 bonded to the wall 15 reinforce the wall 15 about the area of the tear. The preferred strip 23 also serves as a label with appropriate data printed thereon describing the contents of the package. Hence, the adhering of the strip 23 in a precisely aligned, non-wrinkled condition is important to the appearance of the dispenser.

While a preferred embodiment has been shown and described, it will be understood that there is no intent to limit the invention by such disclosure but, rather, it is intended to cover all modifications and alternate constructions falling within the spirit and scope of the invention as defined in the appended claims.

What is claimed:

1. A method of making a dispensing package having a dispensing nozzle positioned thereon from a nondispensing, imperforate, collapsible wall, closed package, comprising providing a flexible strip adapted to be secured to the outer surface of the imperforate wall of the closed package to restrain the wall against tearing during dispensing of its contents, said strip including a dispensing nozzle inserted therethrough, engaging said strip and its nozzle with the outer surface of the imperforate collapsible wall of the closed nondispensing package, conforming said strip to the shape of the collapsible wall, and securing said strip and its nozzle against the outer surface of the imperforate wall of the closed package.

2. A method of making a dispensing package having a dispensing nozzle positioned thereon from a nondispensing, imperforate, collapsible wall, closed package having a generally cylindrically shaped wall between opposite ends thereof, comprising providing a flexible strip adapted to be secured to the outer surface of the imperforate collapsible cylindrically shaped wall of the closed package to restrain the cylindrically shaped wall against tearing during dispensing of its contents, said strip having an aperture therein adapted to receive a nozzle, inserting a nozzle into the aperture in said strip, engaging said strip and said nozzle with the outer surface of the imperforate collapsible wall of the nondispensing closed package, and bonding said strip and said nozzle thereto with said nozzle being disposed interme-

diate the ends of the package.

3. A method in accordance with claim 1 in which said strip has adhesive coating thereon and is carried on a carrier sheet and comprising the further steps of stripping said strip from said carrier sheet by forcing the carrier sheet about a sharp corner so that the strip peels automatically from the carrier feeding and peeled strip to a wrapping station, and exerting a pressure differential on said pressure adhesive strip to hold the same in a predetermined position for engagement with said package wall.

4. A method in accordance with claim 3 in which said peeled strip is conveyed by a pressure differential to said wrapping station.

5. A method in accordance with claim 2 in which said nozzles have a flange and a protruding cylindrical part with a cap thereon and including the step of vibrating said nozzles to position said caps in a predetermined orientation and for feeding the same in a procession and inserting the protruding cylindrical part through an aperture with the flange abutting the strip.

6. A method in accordance with claim 2 including the steps of moving said packages forwardly in a procession along a predetermined path of travel, feeding said strips along an intersecting path to a wrapping station, and feeding said nozzles along another path to be inserted into an aperture in a strip prior to bonding said strip about said package wall.

7. A method of attaching a reinforcing pressure-sensitive adhesive label strip and a dispensing nozzle projecting through an aperture in said strip to the outer surface of a flexible, imperforate wall of a closed, generally cylindrical nondispensing imperforate collapsible wall package, comprising feeding a series of nondispensing imperforate collapsible wall cylindrical packages along a given first path of travel, orienting each of said cylindrical packages so that the longitudinal axis of said package is disposed in a predetermined position relative to said first path of travel, feeding a series of label strips along a second path of travel intersecting said first path of travel of said cylindrical packages, each of said strips having an aperture therein adapted to receive a nozzle and a pressure-sensitive adhesive coating on one surface thereof, holding one of said strips at a time with its adhesive coated surface outward at a nozzle attaching station, feeding a series of nozzle means having a flange and a projecting outlet oriented with their projecting outlets outwardly along a third path of travel to said nozzle attaching station, inserting the projecting outlet of said nozzle means into the aperture in said strip held at said nozzle attaching station and engaging the flange of said nozzle means against the adhesive coated surface of said strip, rolling one of said cylindrical packages across said strip and the flange of said nozzle means at said nozzle attaching station, and bonding said strip to the outer surface of the imperforate collapsible wall of said cylindrical package by means of the adhesive coating thereby reinforcing the imperforate wall while holding the nozzle means against the imperforate wall.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,821,046

Dated June 28, 1974

Inventor(s) Heinz F. Runge

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 1, line 19, change "the imperforate package" to -- the package --;

Column 1, line 20, change "the package" to -- the imperforate package --;

Column 1, line 34, change "vew" to -- view --;

Column 1, line 35, change "for view method" to -- for and method --;

Column 6, line 7, change "the, carrier" to -- the carrier --;

Column 8, line 7, change "feeding and peeled" to -- feeding the peeled --.

Signed and sealed this 28th day of January 1975.

(SEAL)
Attest:

McCOY M. GIBSON JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents