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METHOD FOR PACKAGING CONTAINERS

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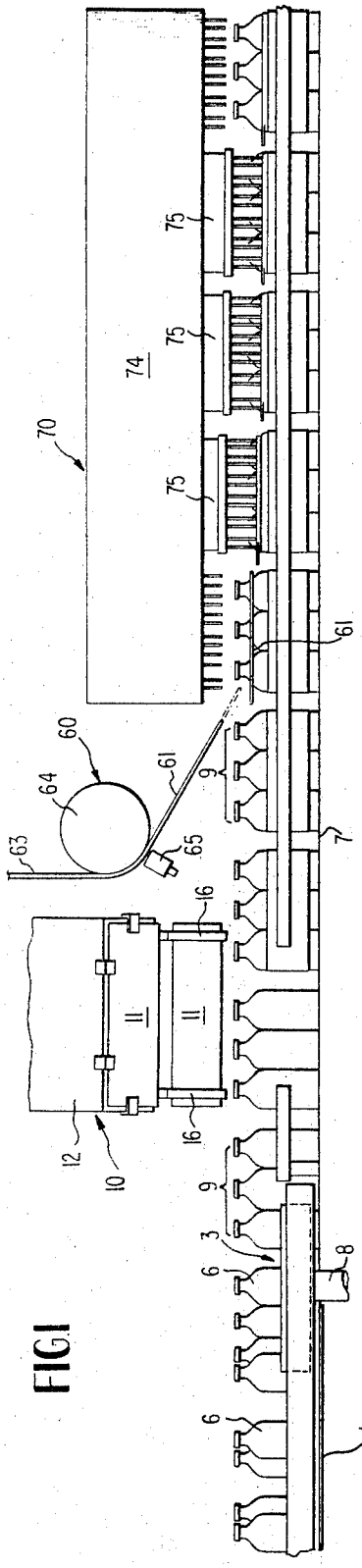


FIG. 1

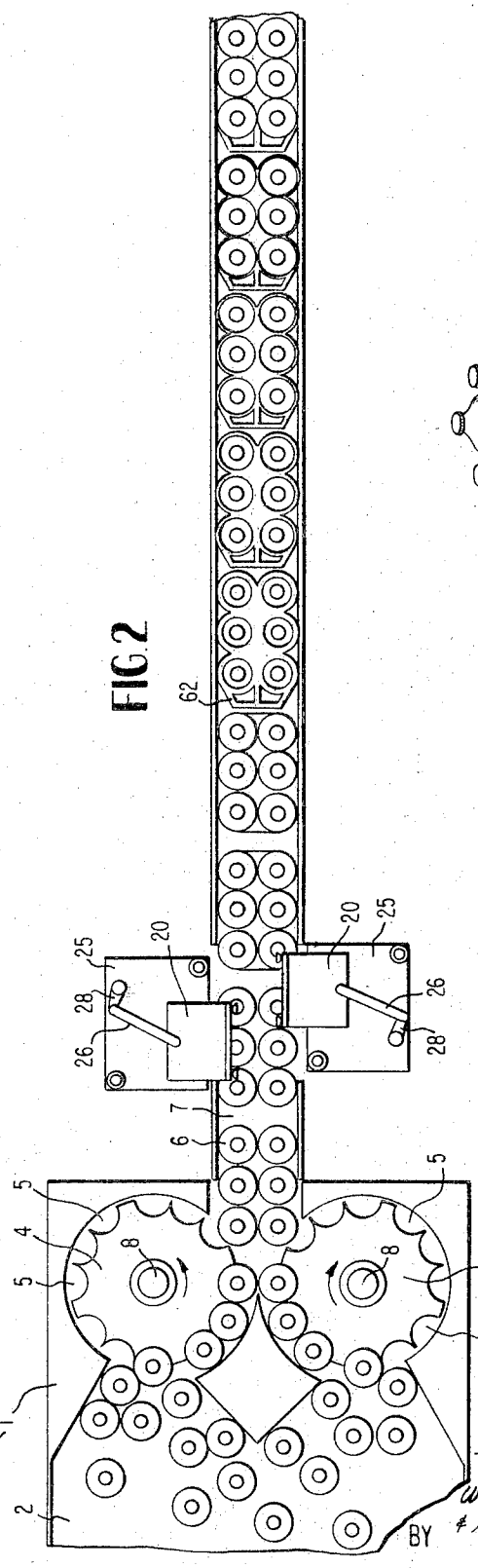


FIG. 2

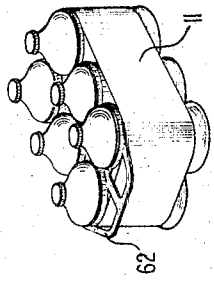


FIG. 15

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FIG. 3

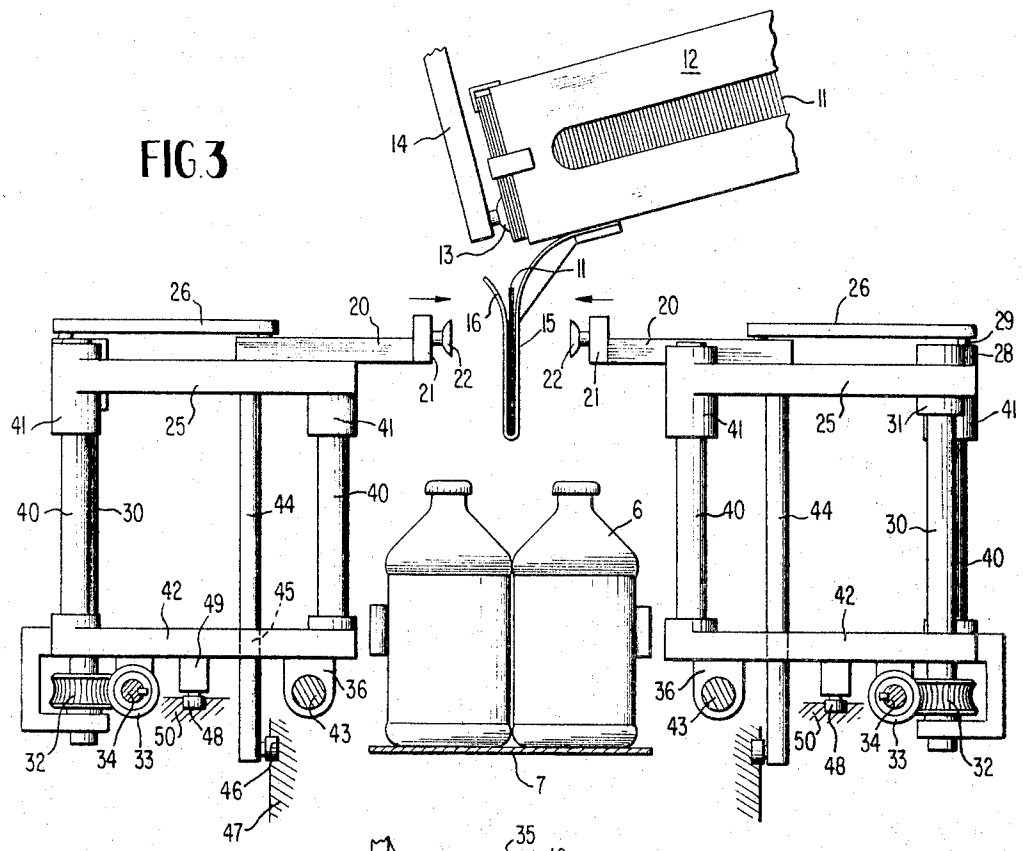
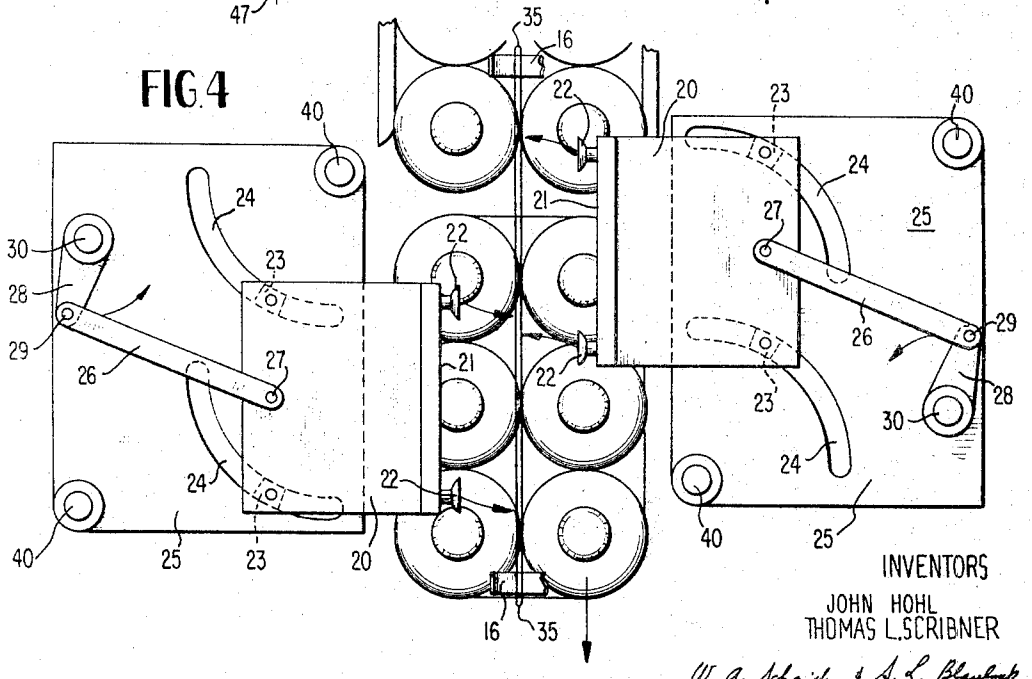


FIG. 4



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FIG. 5

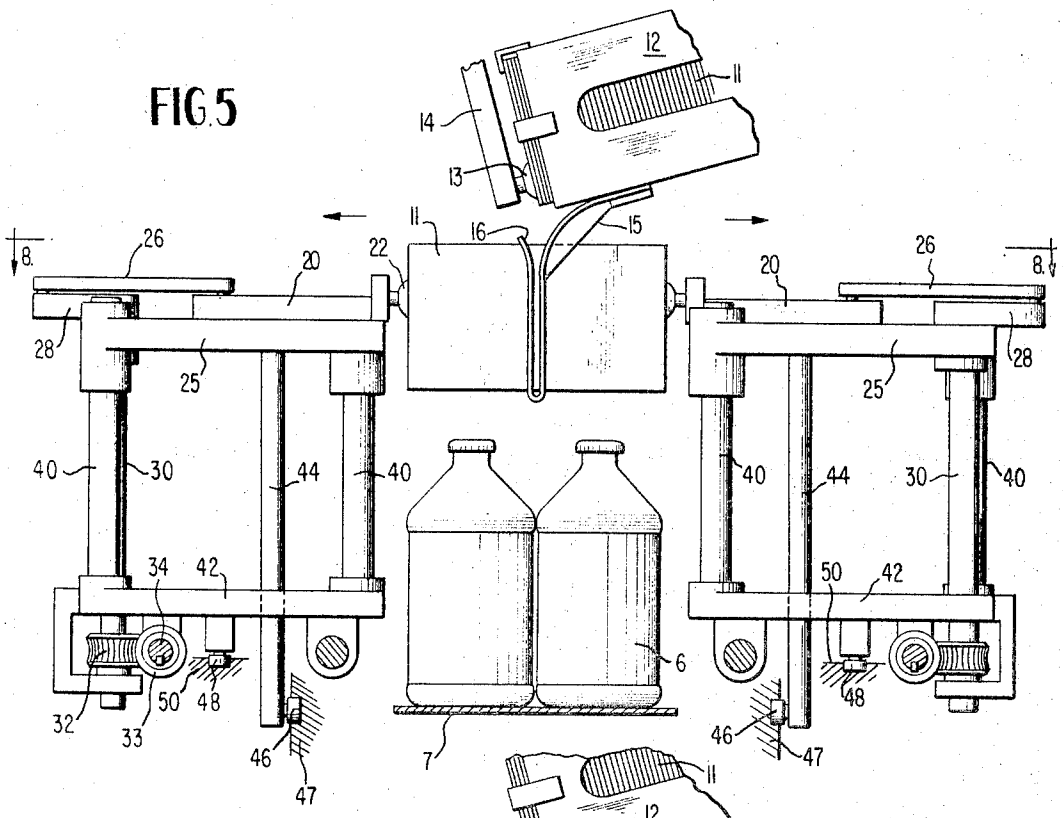
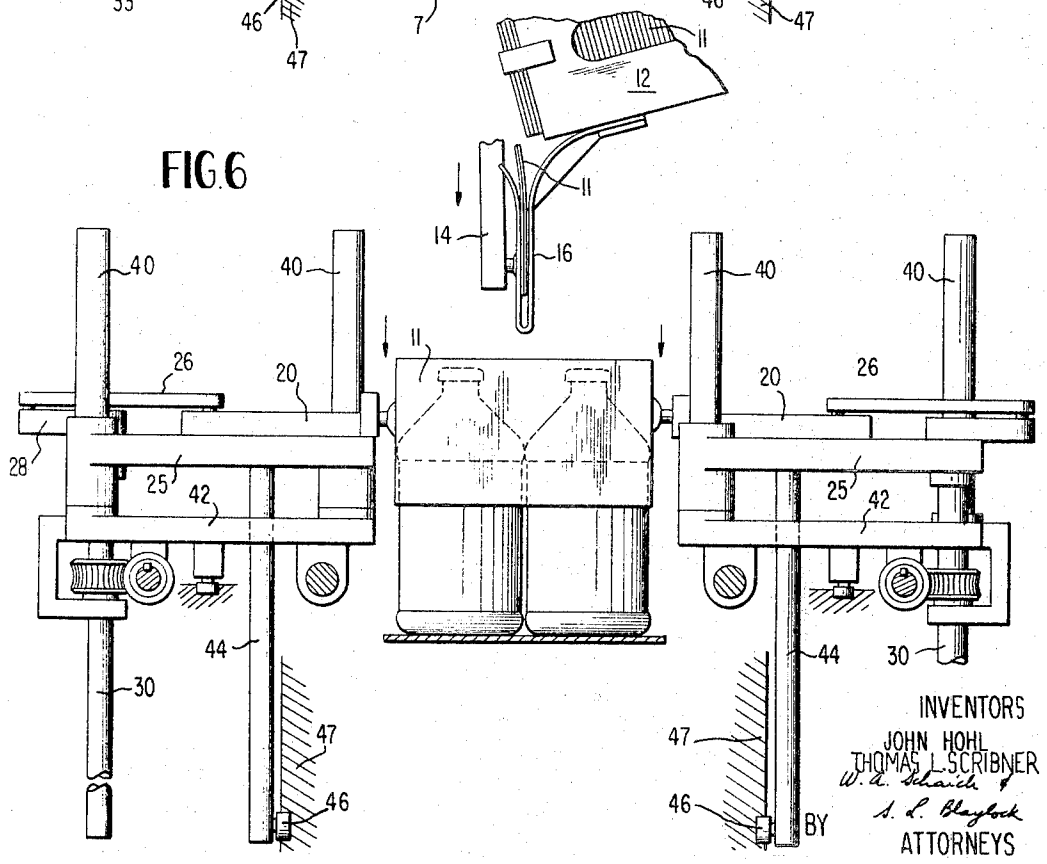


FIG. 6



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FIG. 7

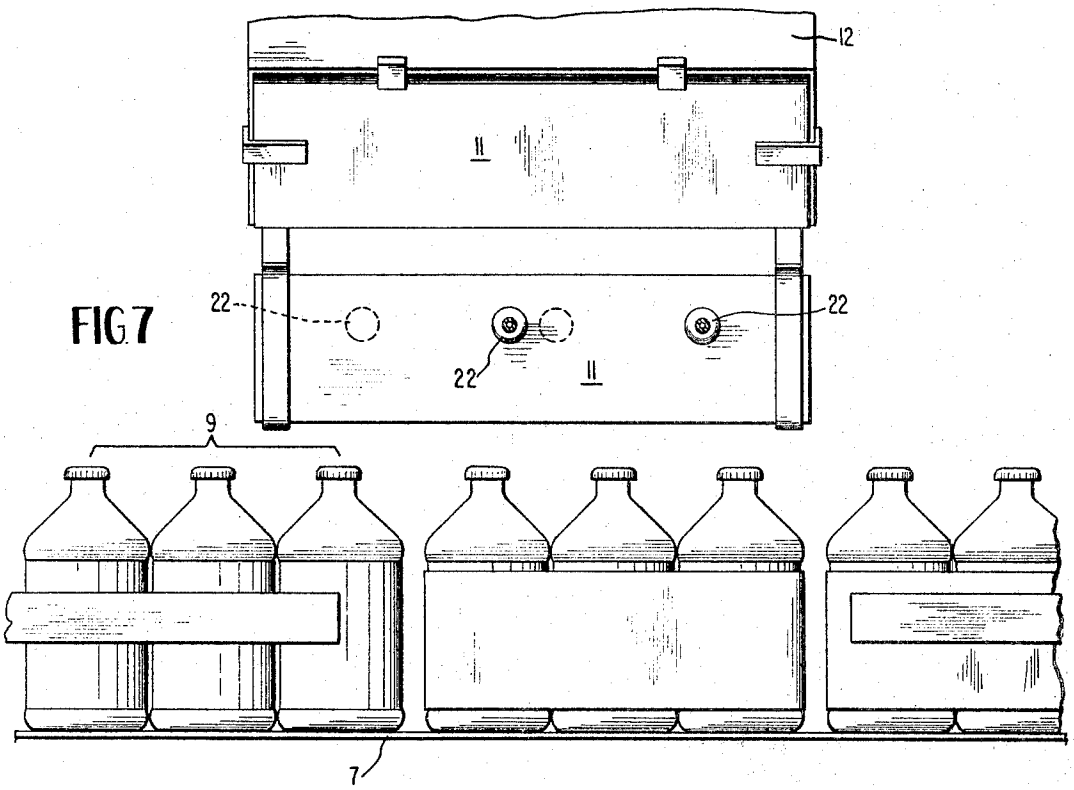
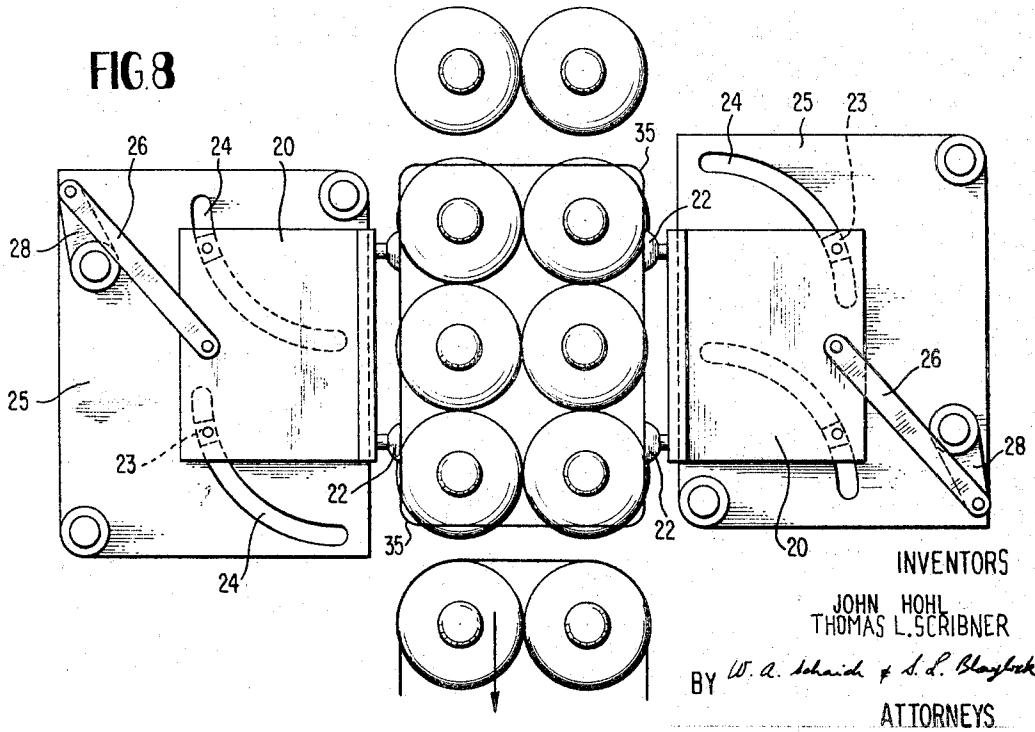


FIG. 8

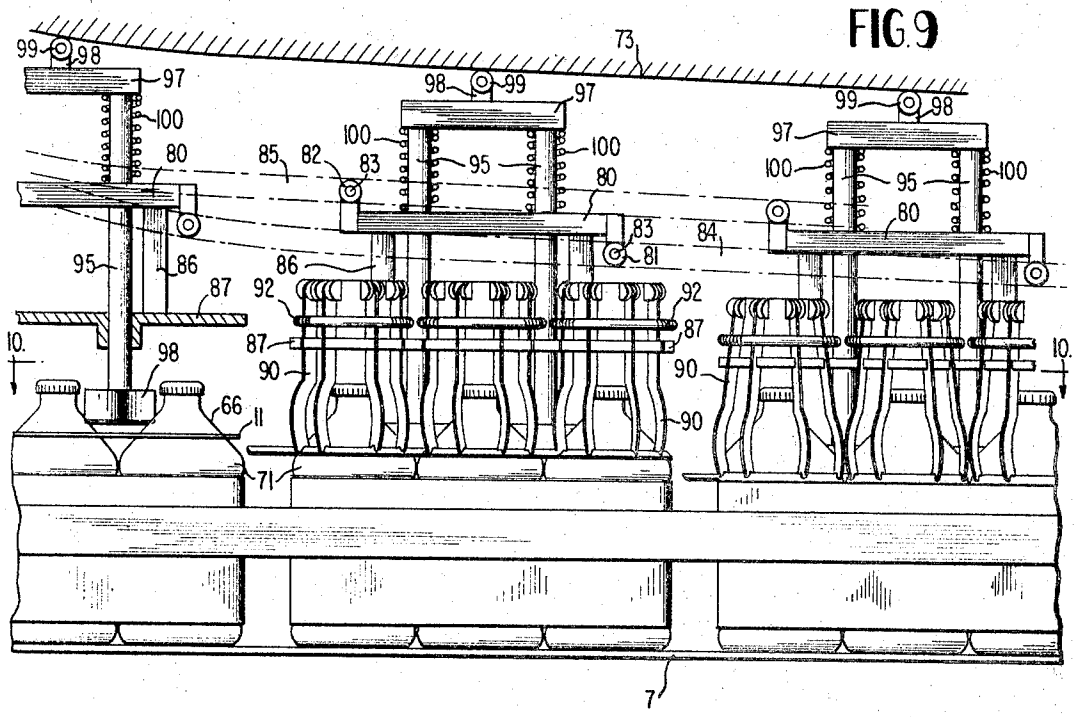


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FIG. 9



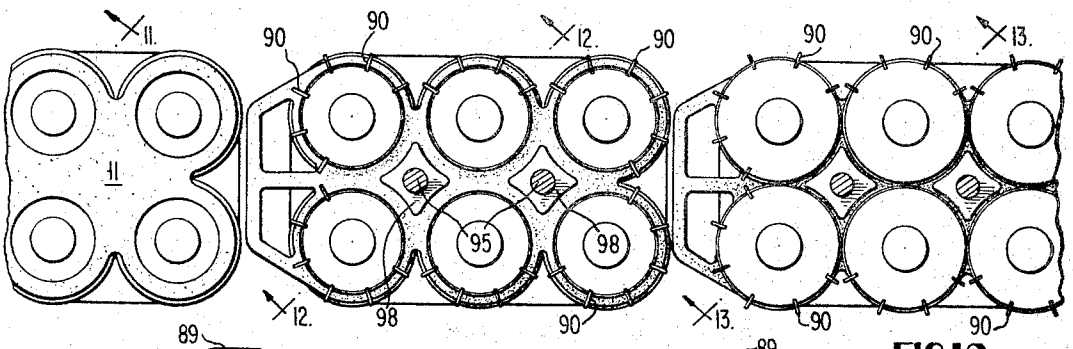


FIG. 10

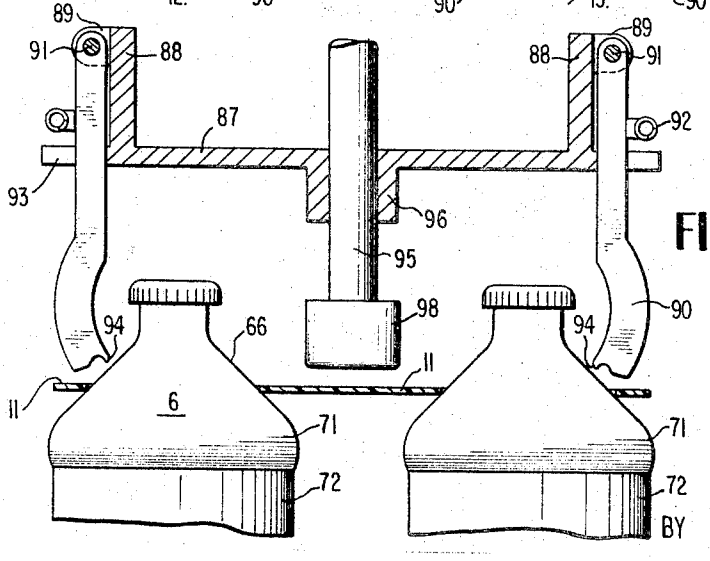


FIG. 11

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FIG. 12

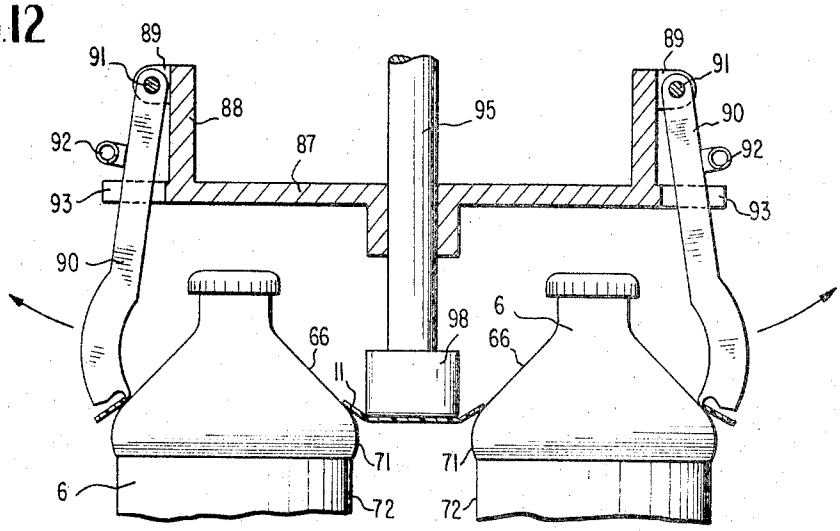


FIG. 13

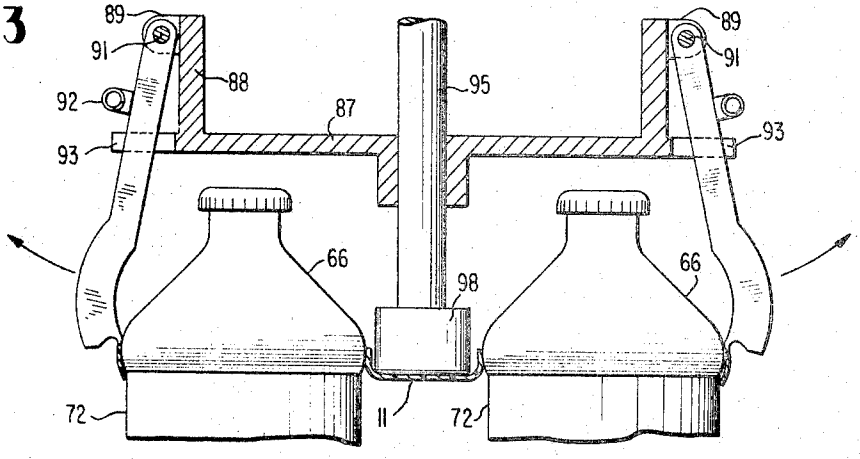
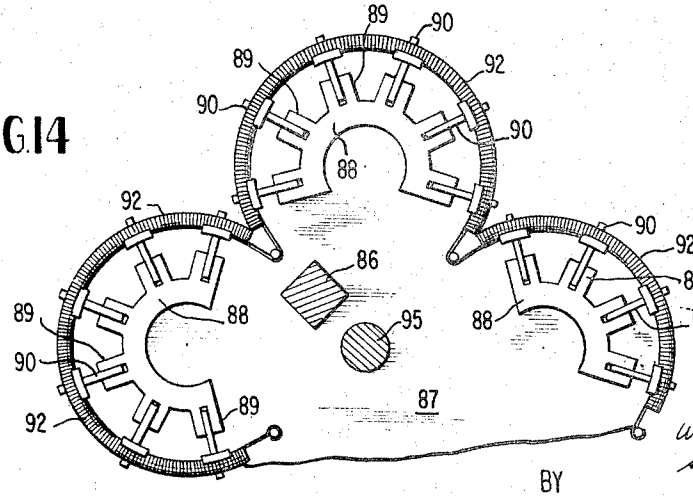


FIG. 14



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METHOD FOR PACKAGING CONTAINERS

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Filed Jan. 27, 1965, Ser. No. 428,406
8 Claims. (Cl. 53—26)

ABSTRACT OF THE DISCLOSURE

Disclosed herein is a method for assembly of bottles into packages for carrying. The method involves forming the bottles into groups of predetermined numbers, applying a band around each group and then applying a resilient apertured carrier onto each group.

This invention relates to a method and an apparatus for assembling containers into a package, and more particularly to a method and an apparatus for assembling a resilient apertured carrier with a group of bottles to form a package convenient for handling and carrying.

It is common practice to merchandise many items such as containers of soft drinks, beer, or the like, in packages containing a number of containers, with the package normally including a handle or other means to facilitate carrying the package. One of the most common packages consists of a relatively rigid paperboard blank formed around a group (usually six) of containers, with the folded blank usually being interlocked with itself and with the containers in the package. However, these paperboard blank packages have not been entirely satisfactory in that they are relatively expensive and are comparatively difficult to form, particularly at the high speeds required by modern filling and closing machines.

To overcome these deficiencies of the folded paperboard blank, cans have recently been packaged by assembling the cans with an apertured carrier formed from a sheet of resilient plastic material, with the beaded end of the cans being inserted through the apertures. The periphery of the apertures grip the side walls of the cans, and are locked beneath the bead securely enough to permit carrying of the package by a handle attached to the central portion of the resilient plastic carrier. However, it has not heretofore been considered practical to package bottles in this manner because the elongated neck and shoulder portions of the bottle projecting upwardly from the cylindrical body portion made existing methods and apparatus impractical for packaging bottles. Further, the relatively great distance over which the carrier must be moved in applying the carrier onto the body portion of a bottle made it necessary to install the carrier on successive bottles substantially simultaneously to avoid excessive distortion and tearing of the plastic carrier. Also, the projection of the neck and shoulder of the bottle made it impossible to use the conventional stripping mechanism for stripping the carrier from the applying mechanism of conventional equipment.

Accordingly it is an object of this invention to provide an improved apparatus for assembling bottles into packages for carrying.

Another object is to provide an improved method for assembling bottles into packages for carrying.

Another object is to provide an improved apparatus for assembling a resilient apertured carrier onto a group of bottles to form a package for carrying.

Another object is to provide an improved method for assembling a resilient apertured carrier onto a group of bottles to form a package.

Another object is to provide an improved apparatus

for assembling a flexible inelastic band around a group of bottles to form a package.

Another object is to provide an improved method of assembling a flexible, inelastic band around a group of bottles to form a package.

Another object is to provide an improved apparatus for applying a band around a group of bottles, and subsequently apply a resilient apertured carrier to the banded group to form a package convenient for carrying.

Another object is to provide an improved method for applying a band around a group of bottles, and subsequently applying a resilient apertured carrier to the banded group to form a package convenient for carrying.

Another object is to provide an improved apparatus for assembling a resilient apertured carrier onto a group of bottles by depositing an apertured carrier onto the group with an aperture surrounding the neck and resting on the shoulder of each bottle, and subsequently advancing the aperture over the shoulder of each bottle simultaneously to embrace the body portion of the bottles.

Another object is to provide an improved method for assembling a resilient apertured carrier onto a group of bottles including the steps of depositing an apertured carrier onto the group with an aperture surrounding the neck and resting on the shoulder of each bottle, and subsequently advancing the aperture over the shoulder of each bottle simultaneously to embrace the body portion of the bottle.

Another object is to provide such an apparatus for assembling a resilient apertured carrier onto a group of bottles and including a carrier feeding mechanism for depositing individual resilient apertured carriers onto the group of bottles moving through the apparatus.

The foregoing and other objects are attained in apparatus suitable for performing the method of this invention and adapted for use with a high speed filling and capping machine to receive the filled capped bottles issuing from the machine and form them into packages such as the conventional six-pack employed to merchandise soft drinks and beer. The bottles to be packaged are fed by a suitable star-wheel feeding mechanism onto a horizontal belt conveyer in spaced groups each normally consisting of two parallel rows of three bottles each in upright, side-by-side relation. The groups of bottles are carried by the conveyer past a banding station, a carrier feeding station, and a carrier applying station, successively, with the groups maintaining their initial spaced relation throughout the movement through the apparatus. At the banding station flexible endless bands are fed from a magazine in a folded-flat condition, one at a time into a positioning rack where they are subsequently picked up by a pair of vacuum heads and opened into a generally rectangular configuration. The opened bands are then moved downwardly and along the conveyer by the vacuum heads to telescope the endless band over the top of a group of bottles moving on the conveyer.

From the banding station, the banded groups of bottles pass in succession beneath a carrier feeding station where a resilient apertured carrier is deposited loosely on top of each group with the neck of each bottle in the group projecting through an aperture in the carrier. Preferably the individual carriers are formed from a sheet of relatively thin, elastic, plastic material such as polyethylene, with the edges of the individual carriers being joined to form an elongated strip which may be wound upon a reel for feeding. The individual carriers are then severed from the strip by the feeding mechanism and are permitted to drop free in timed relation to the movement of the bottles on the conveyer so that the neck of each bottle in a group projects through an aperture in the carrier, with the carrier coming to rest on the shoulder portion

of the bottles. The carrier preferably includes an integrally formed handle portion on one end thereof and the spacing of the groups of bottles along the conveyer is such as to permit the carriers to fall onto the bottles without interference with the handle.

The groups of bottles with the band and carrier positioned thereon moves through a carrier applying station where a carrier applying head, moving on an endless track engages the carrier and progressively advances the carrier over the shoulder and into embracing relation with the cylindrical body portion of each bottle as the group moves on the conveyer. Advancing the carrier into embracing relation with each bottle in the group tends to separate the top portion of the bottles from one another slightly to apply a light tensile load to the band to assure its remaining in place around the body portion of the group of bottles.

The carrier applying mechanism includes an endless track positioned above the conveyer with a relatively straight portion of the track extending above and in slightly convergent relation to the conveyer. A plurality of carrier applying heads are movably mounted in spaced relation around the track, with the spacing of the heads corresponding to the spacing of the groups of bottles moving on the conveyer. Each carrier applying head includes a plurality of downwardly depending fingers in position to engage the carrier positioned on the shoulders of the bottles in a group moving on the conveyer. The carrier applying heads are driven about the endless track at a rate corresponding to the rate of movement of the conveyer so that, as succeeding groups of bottles move beneath the track on the conveyer, the carrier positioned thereon is engaged by succeeding heads moving on the track. As a group passes beneath the converging portion of the track, the carrier is progressively advanced over the shoulder of each of the bottles in the group simultaneously to move into embracing relation with the body portion of the bottle.

Other objects and advantages of the invention will become more apparent from the following specification taken with the drawings in which:

FIG. 1 is a side elevation view schematically showing a package assemblying apparatus according to the present invention;

FIG. 2 is a top plan view of the apparatus shown in FIG. 1, with certain parts eliminated to more clearly illustrate the operation of the apparatus;

FIG. 3 is an end elevation view schematically showing an apparatus according to the present invention for applying a flexible endless band to a group of bottles;

FIG. 4 is a top plan view of the banding mechanism illustrated in FIG. 3, with parts broken away to more clearly illustrate the operation of the other parts;

FIG. 5 is an end elevation view similar to FIG. 3, with certain parts illustrated in an alternate position;

FIG. 6 is a view similar to FIG. 5 again showing certain parts in an alternate position;

FIG. 7 is a side elevation view showing the magazine band support;

FIG. 8 is a top plan view taken on line **8—8** of FIG. 5, with certain parts broken away;

FIG. 9 is a fragmentary section view schematically illustrating the mechanism for simultaneously applying the carrier into embracing relation with each of the bottles in a group;

FIG. 10 is a plan sectional view taken on line **10—10** of FIG. 9;

FIGS. 11, 12 and 13 are fragmentary sectional views taken on lines **11—11**, **12—12**, and **13—13** respectively of FIG. 10 and illustrating a carrier being telescoped over the bottles moving through the carrier applying mechanism in varying stages of progress through the mechanism;

FIG. 14 is a fragmentary sectional view schematically illustrating the carrier engaging elements of the carrier heads; and,

FIG. 15 is a perspective view of a package of bottles formed by an apparatus according to this invention.

Referring now to the drawings, an apparatus embodying the present invention is illustrated as including an apron **1** for receiving filled bottles discharged from a high speed filling and capping machine, not shown. The apron includes a driven belt conveyer, illustrated at **2**, for moving the bottles into a feeding mechanism **3** including a pair of star wheels **4** mounted for rotation on vertically extending shafts **8** and having a plurality of container engaging pockets **5** formed around their outer periphery for engaging the side walls of bottles **6** to feed the bottles, upon rotation of the star wheels about shafts **8**, from the apron onto an endless belt conveyer **7**. As most clearly seen in FIG. 2, the pockets **5** are spaced around the circumference of star wheels **4** to vary the spacing between certain of the bottles fed by the respective star wheels. In the illustrated embodiment, the pockets **5** are arranged to feed the bottles **6** in groups of three bottles with a space between successive groups of bottles fed by the individual star wheel. The pair of star wheels are driven in synchronization to discharge the bottles **6** in parallel, side-by-side rows of three each to form a generally rectangular group **9** consisting of six bottles as in the conventional six-pack.

From the feeding mechanism **3**, the groups **9** are moved by the endless belt conveyer **7** past a banding mechanism **10** which applies an endless flexible band **11** around the spaced groups as they are moved along the conveyer. The banding mechanism **10** includes a magazine **12** containing a supply of endless tubular bands **11** collapsed into a flat, rectangular condition as seen in FIG. 3. A vacuum cup **13**, supported on the end of a movable arm **14**, is provided to remove the collapsed bands **11**, one at a time, as needed, from the magazine **12** and deposit them in a supporting rack **15** positioned vertically above conveyer **7**. The rack **15** includes a pair of generally U-shaped brackets **16** positioned beneath magazine **12** and spaced along the longitudinal center line of conveyer **7** to engage and support a folded band **11** adjacent its ends.

Preferably, the individual bands **11** are formed from a length of paper or similar flexible, inelastic material with the ends of the length being bonded together in overlapping relation to form a tube. Alternatively, the individual band **11** may be formed either from a length or a continuous band of resilient material, such as a film of plastic material. The tubular band is of sufficient length to substantially span the length of the cylindrical body portion **72** of the bottles **6** between the conventional heel portions **71** formed thereon, and the diameter of the tube is sufficient to permit the tube to be telescoped over the end of a group of bottles to embrace the group around the body portion of the bottles and form the side walls of the package. To facilitate handling and packaging of the bands, they are collapsed into a plane containing the axis of the tube to form a rectangle which may readily be fed from a magazine by the vacuum cup **13** into the rack **15** and subsequently opened to be telescoped onto the groups **9**.

The bands **11** are fed into the supporting rack **15** in the collapsed condition, as mentioned above, and consequently must be opened into the generally rectangular shape of the groups **9** of bottles **6** to be telescoped over the top of a group moving on conveyer **7**. To accomplish this, a pair of band support heads **20** are movably mounted, one on each side of support **15**, in position to engage opposite sides of a collapsed band **11** supported on fingers **16**. Each head **20** is provided on its face **21** with a suitable vacuum means **22** for engaging and supporting the opposed sides of band **11**. Heads **20** are supported for movement toward and away from rack **15**, by a pair of guide blocks **23** which, in turn, are slidably mounted in tracks **24** formed in a support plate **25**. Blocks **20** are moved along tracks **24** by an elongated linkage **26** pivotal-

ly mounted at one end to block **20**, as by pin **27**, and at the other end to a crank arm **28**, as by pivot pin **29**. Crank arm **28** is fixedly secured on a shaft **30** which is rotatably mounted, as by bearings **31**, for movement about a vertical axis extending through support plate **25**. Shaft **30** may be driven by any suitable means such as gear **32** rotatably fixed and slidable along one shaft **30** in engagement with a driven worm **33** rotatably fixed on a drive shaft **34**.

As most clearly seen in FIGS. 4 and 8, tracks **24** are curved to provide movement of blocks **20** in a direction both perpendicular and parallel to the sides of the folded bands **11** positioned in support **15** so that the vacuum means **22** carried on the respective heads **20** engage opposite sides of the band at positions offset from one another along the longitudinal axis of the conveyer **7**. Since band **11** has been folded flat, a crease **35** is formed at each end thereof which, upon opening of the band, inherently tends to form an interruption of the smooth contour of the band. This interruption conveniently may be employed to locate a corner of the desired rectangular shape which the tubular band must take before being telescoped over a group of containers as illustrated in FIG. 8. Accordingly, the vacuum means **22** on the respective heads are positioned to engage opposite sides of the collapsed band **11**, one adjacent each crease **35**, and then be moved along curved tracks **24** into alignment and spaced apart transversely of conveyer **7**, as illustrated in FIG. 8, to form band **11** into a generally rectangular configuration.

Support plate **25** is slidably mounted on a pair of vertical columns **40** extending through bushings **41** formed in plate **25**. Columns **40** are rigidly mounted on a carriage block **42** which, in turn, is slidably mounted, as by journals **36**, along a fixed shaft **43** extending in a direction parallel to conveyer **7**. Plate **25** is moved vertically by a vertical support rod **44** which has its upper end rigidly fixed to support **25** and which extends downwardly through a bearing in carriage **42**. A cam follower **46**, mounted on the lower end of support rod **44**, is positioned within a cam track formed in a movable cam **47** positioned below carriage **42**, and a second cam follower **48** is rigidly fixed to carriage **42**, as by spacing block **49**, in position to engage a track in a second movable cam **50**. Cam **47**, acting through follower **46**, effects vertical movement of support shaft **44** to cause support plate **25** to move vertically along columns **40** to raise or lower heads **20** as illustrated in FIGS. 5 and 6. Further, movement of cam follower **48**, as a result of movement of cam **50**, effects movement of carriage **42** along track **43** in a direction parallel to conveyer **7**. The movement of the cam followers **46**, **48** within the movable cams **47**, **50**, respectively, is coordinated with movement of heads **20** which, in turn, are coordinated with the movement of the feed mechanism **3** so that, when a band has been formed into the generally rectangular configuration illustrated in FIG. 8, the opened band will be positioned vertically above a group **9** of bottles **6** moving on conveyer **7**. Movable cam **47** is then actuated to effect vertical movement of support plate **25** to lower the opened band supported by vacuum means **22** on heads **20** around the group of bottles, and simultaneously cam **50** is actuated to move the carriage **42** longitudinally along conveyer **7** at a rate corresponding to the rate of the bottles moving on the conveyer so that the band is telescoped over the group **9** without interrupting its movement on the conveyer. Also, the vacuum feed cup **13** on movable arm **14** is actuated to feed the next succeeding band **11** from magazine **12** into support **15** while support plate **25** is in the lowered position.

Once the band is telescoped over a group of bottles, the vacuum to vacuum means **22** is broken, thereby releasing the band, and movable cams **47**, **50** are actuated to return the carriage **42** and support plate **25** to their initial position, and heads **22** are moved inwardly to engage the next band **11**. This cycle is repeated to telescope a band over each successive group of bottles moving on conveyer **7**.

Referring now to FIG. 1, it is seen that the groups **9** are moved on conveyer **7** from the banding mechanism **10** to a carrier feeding mechanism **60** where a resilient apertured carrier **61** is fed onto each of the groups moving thereunder. Preferably, the carriers **61** are formed from a relatively thin sheet of elastic plastic material such as polyethylene, and is formed with an integral handle **62** on one end thereof. The individual carriers **61** are integrally joined into an elongated strip **63** which may be wound upon a reel, not shown, for feeding by the carrier feed roller **64** of feeding mechanism **60**. The individual carriers **61** are then severed by a suitable cutting mechanism illustrated generally at **65** along the edge of handle **62** to permit the carriers **61** to fall free upon successive groups **9** moving under feed mechanism **60** with the neck of the bottles extending through the apertures and with the carriers **61** resting upon the shoulder portion **66** of the individual bottles **6**, as best seen in FIG. 11.

If desired, the carrier feed mechanism may include a heating element for warming the carriers **61** to render them more flexible and to lessen the probability of damage during the subsequent application onto the bottles. This heating element, not shown, might conveniently be incorporated in the feed roller **64**.

As an alternative to the feed mechanism described above, the carriers may be formed individually and fed from a magazine, with the feeding mechanism being synchronized with movement of the banding mechanism **10** so that an individual carrier **61** will be deposited on each banded group **9** of bottles **6** passing on conveyer **7**.

From the carrier feed mechanism **60** the groups **9**, each having a band **11** extending therearound and a carrier **61** positioned on shoulders **66** of the bottles, move through a carrier applying mechanism **70** where the carrier is advanced simultaneously over the heel portion **71** and onto the cylindrical body portion **72** of each of the respective bottles **6** as the groups move therethrough. The carrier applying mechanism **70** includes an endless track supported above conveyer **7** in vertically spaced relation thereto within a suitable frame mechanism illustrated generally by the numeral **74**. As shown in FIG. 9, the endless track includes cam surface **73** and cam tracks **84**, **85**, each having a relatively straight portion extending in slightly converging relation with conveyer **7** in the direction of movement of the bottles on the conveyer. A plurality of carrier applying heads **75** are supported in frame **74** for movement along the endless track by any suitable drive means such as an endless drive chain, not shown. The carrier applying heads **75** are spaced along the track in accordance with the spacing of the groups **9** moving on conveyer **7**, and the heads are moved therealong at a rate equal to the rate of conveyer **7** so that, as each succeeding group **9** moves beneath the frame **74**, a carrier applying head **75** descends thereon to engage and progressively advance the carrier **61** over the heel **71** of each of the bottles fed in the group simultaneously as the group moves on the conveyer **7** beneath the converging portion of track, as illustrated in FIGS. 9 and 10.

The carrier applying heads **75** are identical in structure and function and accordingly, only one will be described in detail. Referring to FIGS. 9–14, it is seen that the head **75** includes an elongated carrier block **80** having a pair of cam followers **81**, **82** rotatably mounted thereon one adjacent each end thereof as by pins **83**. Cam follower **81** is positioned in a cam track **84** while follower **82** is positioned in a cam track **85** with cam tracks **84**, **85** (illustrated in phantom in FIG. 9) being contoured to maintain the elongated carrier block **80** in a horizontal position while head **75** is moving in the same direction as conveyer **7**. A pair of support rods **86** are rigidly mounted, as by welding, to the underside of carrier block **80**, as viewed in FIG. 9, and extend downwardly therefrom to position a support plate **87** in spaced relation to block **80**. Support plate **87** includes a plurality of arcuately shaped brackets extending in the direction of carrier block **80** with each having a plurality of journal blocks **89** extending radially outward therefrom adjacent its upper end. A plurality of

carrier engaging fingers **90** are pivotally mounted to brackets **88** by pins **91** extending through journal blocks **89**. Fingers **90** extend downwardly past support plate **87** and are resiliently urged inwardly toward bracket **88** by suitable means, such as a coil spring **92**. Support plate **87** may be provided with radially extending grooves **93** to guide fingers **90** in their pivotal movement about pins **91**.

The brackets **88** are positioned on plate **87** so that the fingers **90** supported thereon are positioned above a single bottle in a group moving through the applying mechanism when the head **75** is in position above the group. Referring particularly to FIGS. 10 and 14, it is seen that the fingers **90** are positioned to engage the bottles of a group only around the portion of the individual bottles around the outer periphery of the group. Thus, a greater number of fingers are employed to engage the end bottles of a conventional six bottle group than is employed for the center bottles of the group as the end bottles have a greater portion of their circumference forming a part of the group periphery.

As a group **9** moves through the carrier applying mechanism **70**, a carrier applying head **75** moving on the endless track within frame **74** is lowered thereover until a hook **94** formed on the lower end of fingers **90** engages the shoulder **66** of bottles **6** at a point above the apertured carrier **11** positioned on the bottles. Further lowering of the head **75** causes hook **74** to be cammed outwardly by the cone-shaped shoulder **66** to pivot finger **90** about pin **91** against the resilient force of spring **92** as illustrated in FIG. 12. Continued lowering of the head **75**, and consequently fingers **90**, causes hook **94** to engage the inner periphery of the apertures in carrier **11** to force the carrier down over the heel portion **71** onto the cylindrical body portion **72** of bottles **6**. Since carrier block **80** of head **75** is maintained in a horizontal position, the carrier is simultaneously advanced over the shoulder of each of the bottles **6** in the group **9**.

To assure that the carrier **11** is advanced over the heel **71** around the entire circumference of the bottle, a pair of plungers **95** are moved downwardly simultaneously with fingers **90** to engage the central portion of carrier **11** between adjacent transverse rows of bottles of the group. Plungers **95** extend upwardly through bearings **96** in support plate **87** and openings, not shown, in carrier block **80** and are rigidly joined at their upper end by a crossbeam **97**. A bracket **98** extending upwardly from crossbeam **97** supports a cam roller **99**, and a pair of coil springs **100**, surrounding plungers **95** between carriage **80** and crossbeam **97**, resiliently urge crossbeam **97** upwardly to maintain cam follower **99** in engagement with cam surfaces **73**. An enlarged head **98** carried on the lower end of plunger **95** has its side walls contoured to closely conform to the side walls of the bottles so that no substantial portion of the carrier is unsupported as the aperture is advanced over the heel of the bottle. However, since the head **98** of plunger **95** engages carrier **11** at a point spaced from the inner periphery of the aperture while the hook portion **94** of fingers **90** engage the inner periphery of the aperture, the head **98** must be lowered a greater distance than the fingers, as illustrated in FIG. 13, so that the inner periphery of the aperture will be advanced over the heel around the entire circumference of the bottle. This is accomplished by the contour of the cam **73** which, acting through cam follower **99** lowers the plungers **95** a distance greater than that which fingers **90** are lowered. Once the carrier is in position embracing each of the bottles in a group, the plunger **95** may be quickly moved by springs **100** to remove head **98** from the position between the bottles of the group illustrated in FIG. 13.

By providing a plurality of carrier applying heads **75** spaced along the endless track, it is possible to have a number of these heads simultaneously engaging a separate carrier positioned on a group of bottles as illustrated in FIG. 1, with the succeeding heads being at varying elevations with respect to conveyer **7**. Thus, the carriers may be advanced slowly downward over the heel of the bottles by the fingers and plungers while the bottles are moving on the conveyer. The rate at which the carrier is pushed donwardly over the bottles can be varied as necessary to avoid damage to the carrier simply by increasing the number of carrier applying heads and decreasing the angle of convergence of track **73** accordingly. As soon as the carrier has been advanced over heel **71** into embracing relation with the cylindrical body portion **72** of the bottles **6**, the head may be vertically lifted clear of the group of bottles by the cams **73**, **81** and **82**, as illustrated at the extreme right in FIG. 1, to permit the package to continue on conveyer **7**. Once the head has been lifted clear of the package, it may then continue around the endless track to pick up another group of bottles, in turn with the other heads **75** mounted in the track.

Referring to FIG. 15, a package formed on the apparatus described above is shown with the integrally formed handle **62** projecting outwardly from the end of the carrier **61**. It is readily seen that the package may be easily carried simply by grasping the handle **62** and lifting the package. Thus, the need for a separate handle applying operation has been eliminated. Further, the relatively wide, flexible band **11** extending around and forming the side walls of the package effectively eliminates any tendency for the bottom portion of the bottles to separate when the package is supported by handle **62**, thereby maintaining a neatly shaped package and eliminating any tendency for the bottles to separate when supported by handle **62** or to collide when the package is again placed on a supporting surface. Further, the band, in combination with the plastic carrier, forms an effective light shield for the contents of the bottle, thereby making the package ideally suited for packaging bottles of beer, ale, or the like, which may be adversely affected by light.

While it is desirable to employ the flexible band **11**, particularly when packaging certain articles such as bottles of beer, a package containing six bottles assembled only with the carrier **11** has been supported by the handle **62** and subjected to rigorous shake tests without adversely affecting the bottles. Accordingly, it is contemplated that the carrier and band feeding mechanism described according to this invention may be employed to package groups of containers not having the band positioned thereon. Similarly, it is believed apparent that the banding mechanism might have widespread use in packaging operations other than in combination with the carrier feeding and applying mechanism.

While the method of assembling containers into packages according to this invention can readily be carried out by hand, such manual packaging obviously would be impractical for commercial use. Accordingly, it is preferable to employ automatic, high speed machinery such as that described and illustrated above to automatically carry out the steps of the method. Further, while we have described and illustrated a preferred embodiment of our invention, we wish it understood that we do not intend to be limited solely thereto, but that we do intend to cover all embodiments thereof which would be obvious to one skilled in the art and which come within the spirit and scope of our invention.

We claim:

1. The method of assembling bottles into a package for carrying comprising the steps of forming the bottles into a group containing a predetermined number of bottles, moving the group as a unit past a carrier feeding station and a carrier applying station, positioning a resilient apertured carrier onto the group at said carrier feeding station as said group is moving therepast with an aperture in the carrier extending over the neck and resting on the shoulder of each bottle in the group, and progressively advancing the carrier over the shoulder and into embrac-

ing relation with the body portion of each of the bottles in the group substantially simultaneously at said carrier applying station as said group is moving past said carrier applying station.

2. The method of assembling bottles into a package for carrying comprising the steps of forming the bottles into a group containing a predetermined number of bottles, each of said bottles in the group being in substantial contact with adjacent bottles, applying a flexible band around the group, and thereafter positioning a resilient apertured carrier onto the group with an aperture in the carrier extending over the neck and resting on the shoulder of each bottle in the group, and subsequently advancing the carrier over the shoulder into embracing relation with the body portion of each of the bottles in the group thereby urging the ends of the bottles adjacent the carrier slightly apart to impart tension to said band.

3. The method of assembling bottles into a package for carrying according to claim 2 wherein said flexible band is preformed and telescoped over the end of the group of bottles, and said apertured carrier is advanced over the shoulder of each of the bottles in the group substantially simultaneously.

4. The method of applying a resilient sheet carrier having apertures to each of the bottles of a group, each of said bottles having a shoulder tapering downwardly and outwardly from a neck and an enlarged heel below said shoulder, comprising the steps of

(a) arranging the bottles in a group corresponding to the number and positioning of the apertures,

(b) placing said carrier on said bottles with each of the necks extending through an aperture of said carrier, the carrier resting on the shoulders of the respective bottles,

(c) engaging simultaneously those portions of the respective shoulders lying adjacent the periphery of the group and the carrier telescoped thereover with movable elements,

(d) engaging a portion of the carrier lying between the bottles with a plunger,

(e) and moving said movable elements and said plunger relatively toward said enlarged heels to urge said carrier down the shoulders and over the enlarged heels to snugly engage the respective bottles of the group.

5. The method as defined in claim 4 wherein said group is moving horizontally at least during steps (c), (d) and (e).

6. The method as defined in claim 4 wherein said movable elements are urged outwardly by said shoulders during step (e).

7. The method of applying a resilient sheet carrier having apertures to a plurality of bottles, each of said bottles having a shoulder portion tapering downwardly and outwardly from a neck and an enlarged heel below said shoulder, comprising the steps of

(a) arranging the bottles in a group corresponding to the number and positioning of the apertures,

(b) moving said group horizontally,

(c) placing said carrier on said bottles with each of the necks extending through an aperture of said carriers, the carrier resting on the shoulders of the respective bottles,

(d) engaging portions of the carrier adjacent each of the bottles and urging such portions downwardly relative to such bottles to stretch the material of the carrier about the apertures over the shoulders and enlarged heels of the respective bottles while continuing the horizontal movement of said group.

8. The method as defined in claim 7 further including the step of applying a flexible band around the group while said group is moving horizontally.

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