United States Patent [19]

Best

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[54] **METHOD AND APPARATUS FOR APPLYING A CARRIER TO A CLUSTER OF CONTAINERS**

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[52] **U.S. Cl.** **53/26,** 53/30, 53/35, 53/48

[51] **Int. Cl.** **B65b 35/36**

[58] **Field of Search** 53/26, 35, 48, 49, 53/389, 30; 29/450

[56] **References Cited**

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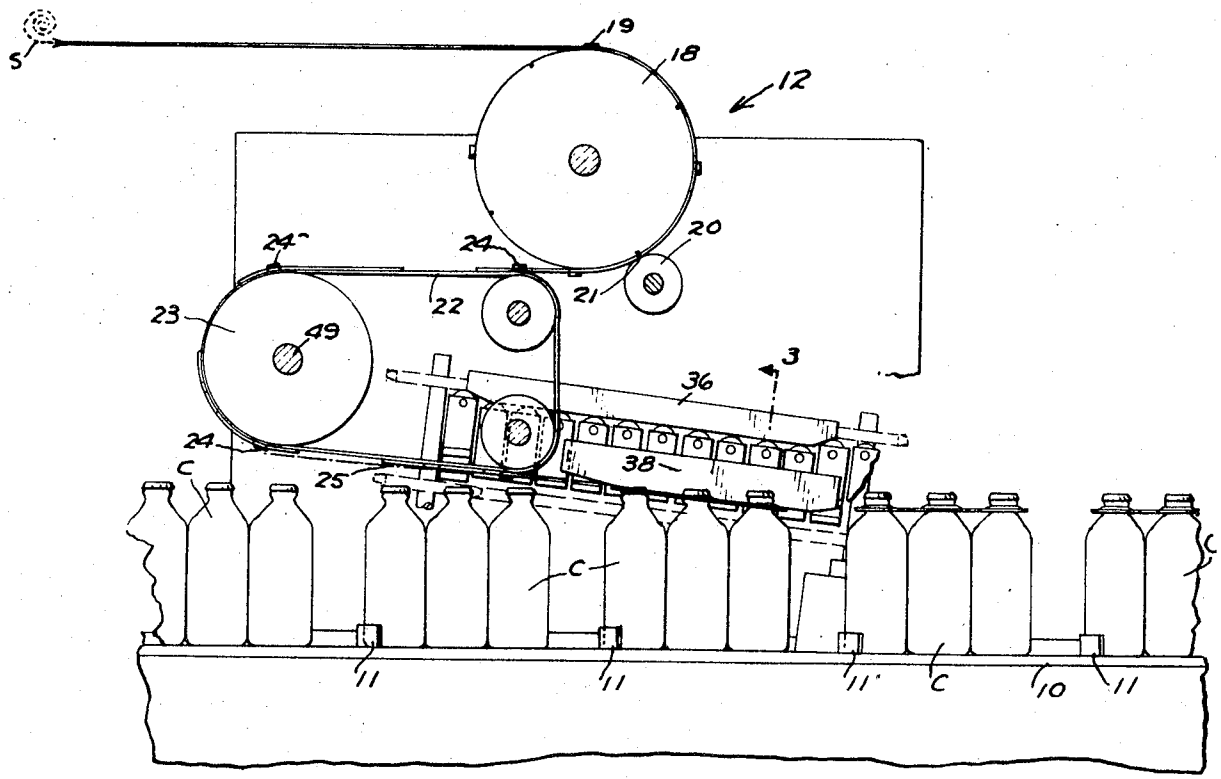
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[57] **ABSTRACT**

A method and apparatus for applying a carrier of elastic material onto a cluster of containers which comprises gripping the carrier adjacent the periphery thereof and stretching the carrier in the direction of the plane thereof. As the containers are moved along their path, the edges of the carrier are forced downwardly and simultaneously a central force is applied to the carrier while the carrier is stretched to force the carrier over the ends of the containers after which the carrier is released.

10 Claims, 4 Drawing Figures



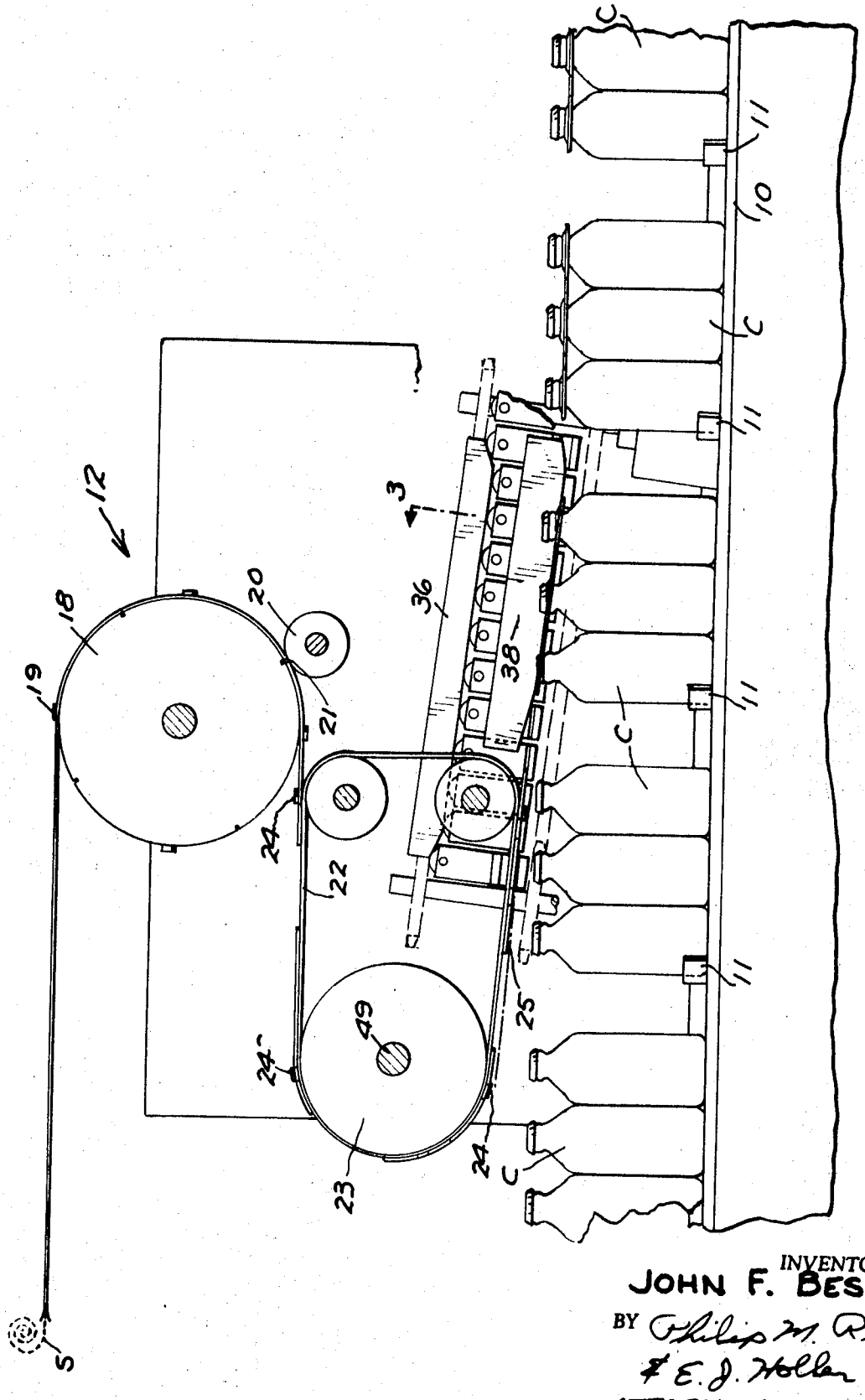


FIG. 1

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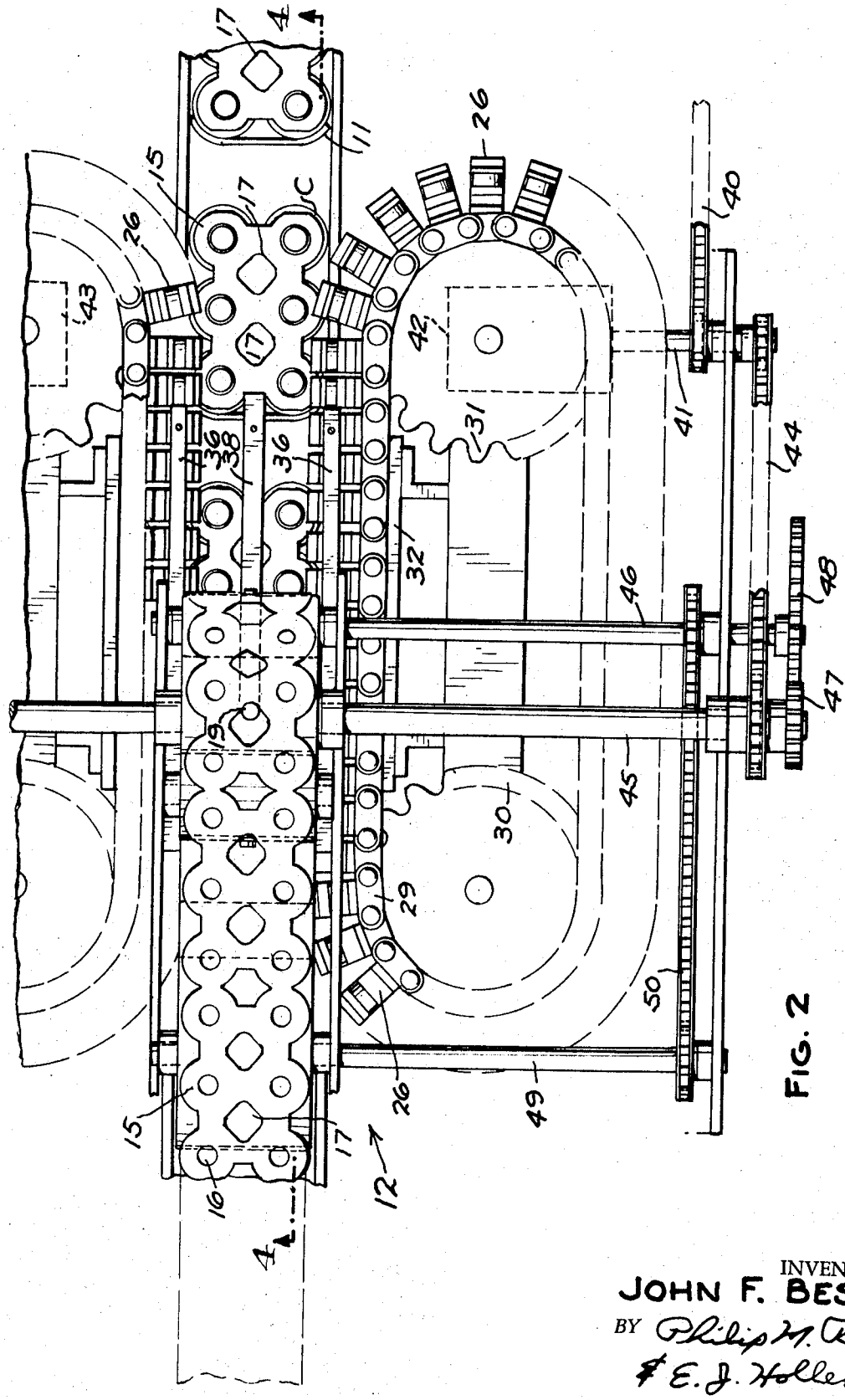


FIG. 2

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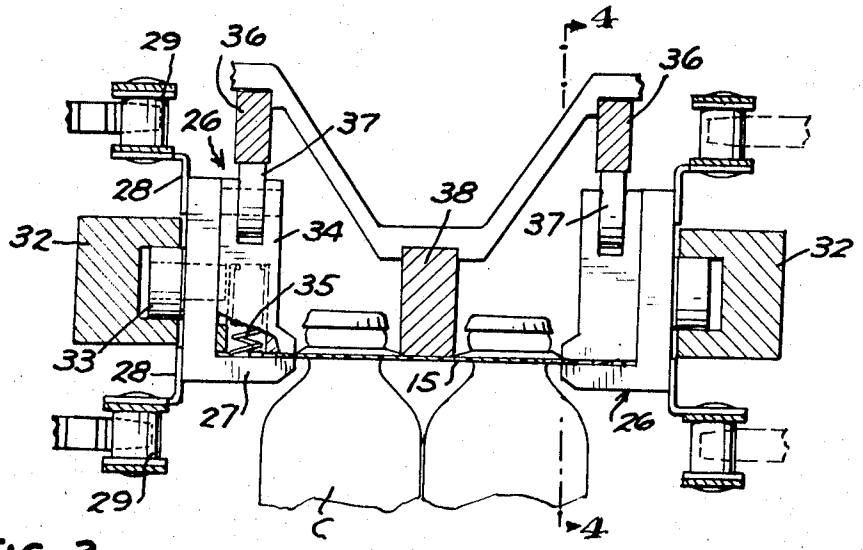


FIG. 3

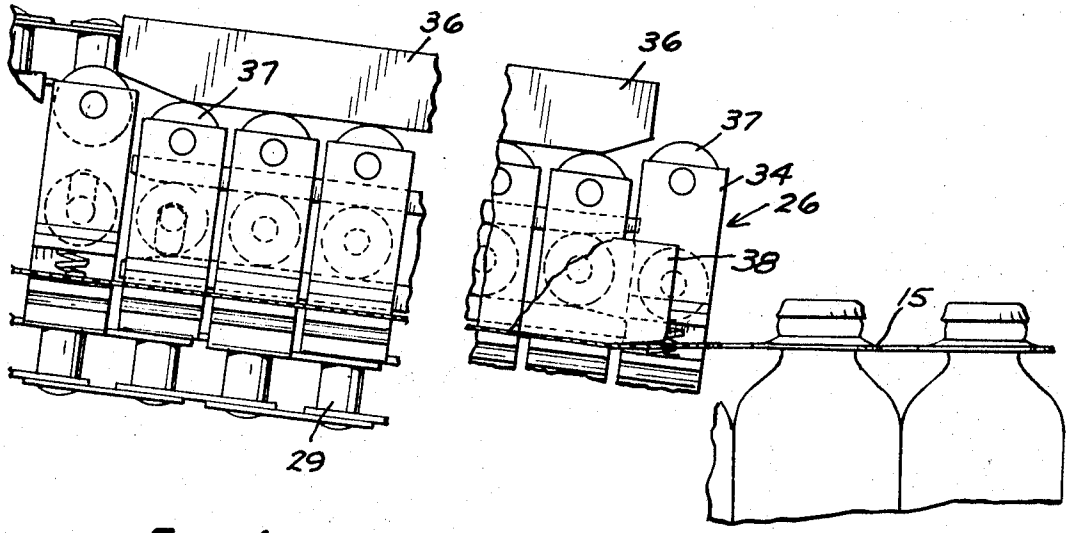


FIG. 4

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METHOD AND APPARATUS FOR APPLYING A CARRIER TO A CLUSTER OF CONTAINERS

This invention relates to applying carriers to clusters of containers.

BACKGROUND OF THE INVENTION

In the handling of containers such as bottles having a body portion and a relatively smaller neck portion, it has become common to utilize a package which comprises a carrier of elastic material that is forced over the ends of the containers and is provided with hand openings to permit gripping and handling of the cluster of containers.

In the application of the carrier, the prior methods have comprised utilization of fingers which stretch the openings in the carrier and force them downwardly over the ends of the containers. Such a prior method may cause possible damage of the closures or containers because of the contact of the fingers therewith.

Among the objects of the invention are to provide a method and apparatus for applying plastic carriers to clusters of containers without the use of fingers or the like so that there is no contact between the carrier applying mechanism and the containers; wherein the carriers are applied to the clusters of the containers as they are moved continuously and uninterruptedly in a predetermined path; and which is relatively simple and fast.

SUMMARY OF THE INVENTION

The invention comprises a method and apparatus for applying a carrier of elastic material onto a cluster of containers which comprises gripping the carrier adjacent the periphery thereof and stretching the carrier in the direction of the plane thereof. As the containers are moved along their path, the edges of the carrier are moved downwardly and simultaneously a central force is applied on the carrier while the carrier is stretched to force the carrier over the ends of the containers after which the carrier is released.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevational view of an apparatus embodying the invention.

FIG. 2 is a fragmentary plan view of the apparatus shown in FIG. 1, parts being broken away.

FIG. 3 is a fragmentary sectional view on an enlarged scale taken along the line 3—3 in FIG. 1.

FIG. 4 is a fragmentary part sectional view taken along the line 4—4 in FIG. 2.

DESCRIPTION

Referring to FIG. 1, in accordance with the invention, clusters of groups of containers C, herein shown as six in number, are carried by a conveyor 10 having pusher 11 continuously and uninterruptedly below a carrier applying mechanism 12. Each container C includes a body portion and a relatively small neck portion on which a closure is applied. The carrier applying mechanism 12 is adapted to take an endless web of interconnected plastic carriers from a source S, cut the carriers from the web, and transfer them to the continuously moving clusters.

As shown in FIG. 2, the web comprises a plurality of carriers 15 having openings 16 through which the narrow end of the containers is adapted to extend and

spaced hand receiving openings 17 by which the carrier and, in turn, the cluster of containers are carried. In the continuous web, the carriers 15 are interconnected and the web passes over a roller 18 having projections 19 adapted to engage at least some of the openings 16 to move the web and bring it adjacent a rotating cutter 20 having a blade 21 thereon which severs the line of connection of each carrier with the remainder of the web. The web then passes to an endless belt 22 having projections 24 thereon which engage openings 16 in the carrier to quickly take the severed carrier over a feed roll 23 for engaging the openings and deliver the carrier to spaced plates 25 where the carrier is gripped and applied to the clusters of containers as presently described.

As shown in FIG. 2, a plurality of grippers 26 are provided on endless chains and are movable in an endless path along each side of the path of movement of the clusters of containers.

As shown in FIG. 3, each gripper 26 comprises a body member 27 that is connected by brackets 28 to endless chains 29 that are trained over sprockets 30, 31. A roller track 32 is engaged by roller 33 on the body 27 and guides the grippers 26. In the area immediately adjacent the path of the containers, movable members 34 of the grippers 26, which are normally yieldingly urged upwardly by a spring 35, are cammed downwardly by a cam 36 to grip the edges of the carrier 15. The cams 36 are inclined downwardly so after the carrier is gripped, it is progressively moved downwardly bringing the openings 16 thereof into registry with the upper ends of the containers and moving the carrier over the ends to apply the carrier to the ends of the containers. In order to assist in the application of the carrier, a plow or cam 38 is provided centrally of the carrier and engages the carrier to apply a force along the center line of the carrier assisting the application of the carrier to the containers.

In order to minimize friction, as shown in FIGS. 3 and 4, a roller 37 is provided on the upper end of each movable portion 34 of each gripper 26.

It will be readily apparent that the movement of the grippers must by synchronized so that the carrier openings will be aligned with the ends of the carrier. This is achieved by the drive connection shown in FIG. 2 wherein through a chain 40 the shaft 41 is synchronized in its movement with the conveyor 10. The shaft 41 extends horizontally and drives gear box 42 that rotates the sprockets 30, 31 of each gripper assembly. The drive to the opposite group of grippers from shaft 41 is through chain 44 and transfer shaft 45. The shaft 45 drives shaft 46 on which the cutter roller 20 is mounted through gears 47, 48. In turn, the cutter shaft 46 drives the shaft 49 which drives the feed belt roller 23 through a chain 50. In this fashion, the feed roller 23 drives the belt 22 in synchronized relation feeding the carriers at proper intervals between the grippers 26 so that the openings 16 thereof are in alignment with the upper ends of the containers.

In operation, the clusters of containers are moved by the conveyor 10 continuously and carriers are severed continuously from the web, delivered to the gripper assemblies which grip and apply the carrier successively to successive clusters of containers without interruption in movement of the containers.

I claim:

1. The method of applying a carrier of relatively thin elastic material onto a cluster of containers having a body portion and a relatively smaller neck portion with abutment means adjacent the upper end of the neck portion, said carrier having openings therein which are adapted to receive the ends of the containers which comprises

gripping said carrier adjacent the periphery thereof beyond the openings and stretching said carrier in the direction of the plane thereof,

forcing the openings in said carrier over the neck portions of the containers and simultaneously applying a central force on the carrier while the carrier is stretched,

and thereafter releasing the grip on the periphery of the carrier and the application of the central force.

2. The method of applying carriers of relatively thin elastic material to groups or clusters of containers having a body portion and a relatively smaller neck portion with abutment means adjacent the upper end of the neck portion, said carrier having openings therein which are adapted to receive the ends of the containers which comprises

moving the containers in a continuous path,

segregating the containers into clusters as they move in said path,

moving an endless interconnected web of carriers continuously in the general direction of the path,

severing carriers from said web,

gripping said carriers along the sides of said path adjacent the periphery thereof beyond the openings,

moving said carriers while they are gripped successively downwardly onto said clusters as the clusters are moved in said path,

and thereby forcing the openings in said carriers over the neck portions of the containers of the clusters.

3. The method of applying carriers of relatively thin elastic material to groups or clusters of containers having a body portion and a relatively smaller neck portion with abutment means adjacent the upper end of the neck portion, said carrier having openings therein which are adapted to receive the ends of the containers which comprises

moving the containers in a continuous path,

segregating the containers into clusters as they move in said path,

moving an endless interconnected web of carriers continuously in the general direction of the path,

gripping said carriers along the sides of said path adjacent the periphery thereof beyond the openings,

moving said carriers while they are gripped successively downwardly onto said clusters as the clusters are moved in said path,

and thereby forcing the openings in said carriers over the neck portions of the containers of the clusters.

4. An apparatus for applying a carrier of relatively thin elastic material onto a cluster of containers having a body portion and a relatively smaller neck portion with abutment means adjacent the upper end of the neck portion, said carrier having openings therein adapted to receive the ends of the containers, which comprises

means for gripping said carrier adjacent the periphery thereof beyond the openings and stretching said carrier in the direction of the plane thereof,

means for forcing said openings in said carrier over the neck portions of the containers and simultaneously applying a central force on the carrier while the carrier is stretched,

and means for thereafter releasing the grip on the periphery of the carrier and the application of the central force.

5. An apparatus for applying carriers of relatively thin elastic material to groups or clusters of containers having a body portion and a relatively smaller neck portion with abutment means adjacent the upper end of the neck portion, said carriers having openings therein adapted to receive the neck portions of the containers, which comprises

means for moving the containers in a continuous path,

means for segregating the containers into clusters as they move in said path,

means for moving an endless interconnected web of carriers continuously in the general direction of the path,

means for severing said carriers from said web,

means for gripping said carriers along the sides of said path adjacent the periphery thereof beyond the openings,

means for moving said carriers while they are gripped downwardly onto said clusters and thereby forcing the openings in said carrier over the neck portions of the containers of the clusters.

6. The combination set forth in claim 5 wherein said means for gripping said carriers comprises endless means movable along the path of said clusters of containers and supporting grippers,

means for guiding said endless means,

means for actuating said grippers to grip said carriers.

7. The combination set forth in claim 5 including cam means for applying a downwardly force on said carriers after they are gripped and stretched along substantially the center line thereof to assist the movement of carriers onto said containers.

8. An apparatus for applying carriers of relatively thin elastic material to groups or clusters of containers having a body portion and a relatively smaller neck portion with abutment means adjacent the upper end of the neck portion, said carriers having openings therein adapted to receive the neck portions of the containers, which comprises

means for moving the containers in a continuous path,

means for segregating the containers into clusters as they move in said path,

means for moving an endless interconnected web of carriers continuously in the general direction of the path,

means for gripping said carriers along the sides of said path adjacent the periphery thereof beyond the openings,

means for moving said carriers while they are gripped downwardly onto said clusters and thereby forcing the openings in said carriers over the neck portions of the containers of the clusters.

9. The combination set forth in claim 8 wherein said means for gripping said carriers comprises endless means movable along the path of said clusters of containers and supporting grippers,

means for guiding said endless means,

means for actuating said grippers to grip said carriers.

10. The combination set forth in claim 8 including cam means for applying a downwardly force on said carriers after they are gripped and stretched along substantially the center line thereof to assist the movement of carriers onto said containers.

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