

[54] **APPARATUS AND METHOD OF PERIPHERALLY SECURING A PLASTIC COVER TO A RIMMED OPEN TOP CONTAINER**

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[22] Filed: **Dec. 19, 1973**

[21] Appl. No.: **426,337**

[52] U.S. Cl. **53/42; 53/300; 53/333; 221/221**

[51] Int. Cl.² **B65B 7/28**

[58] Field of Search **53/38, 42, 300, 305, 329, 53/333, 334, 281, 282; 221/221**

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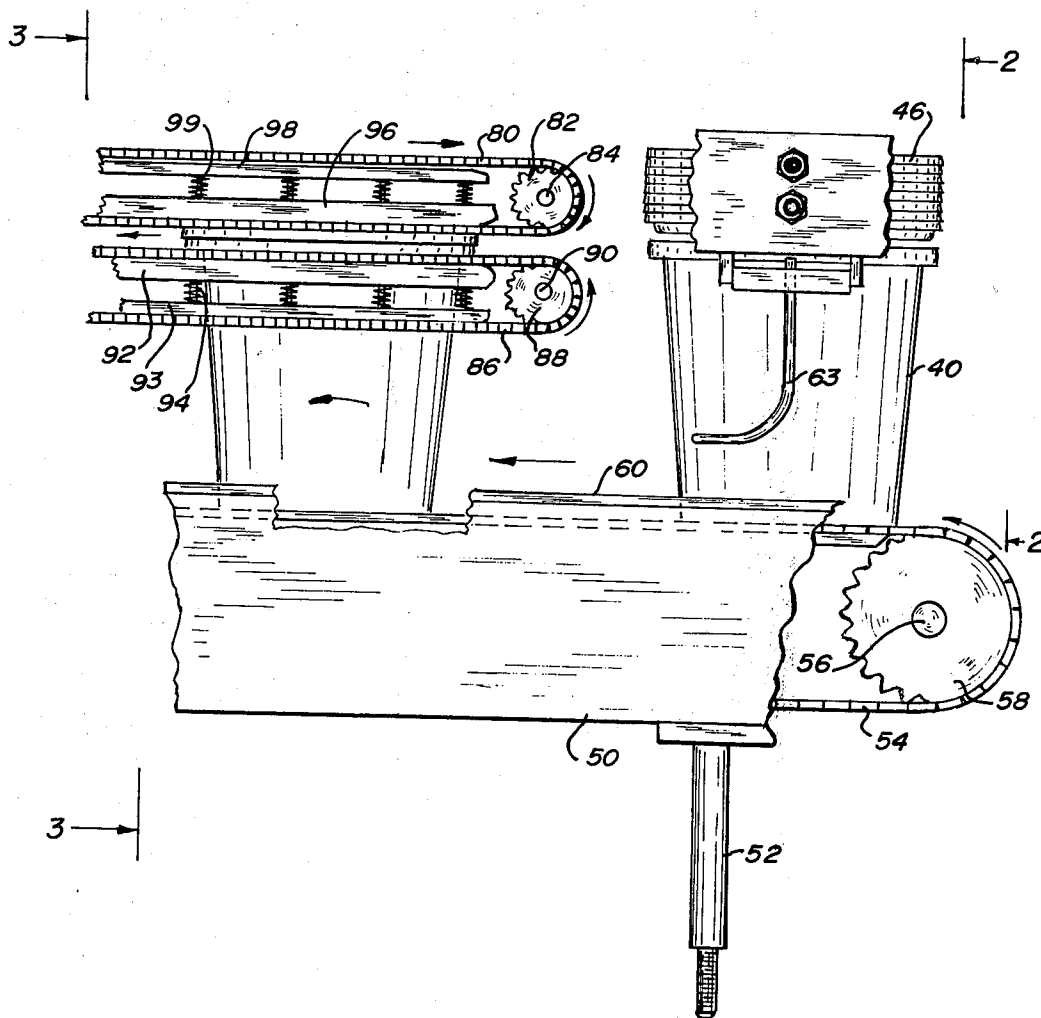
Primary Examiner—Robert L. Spruill

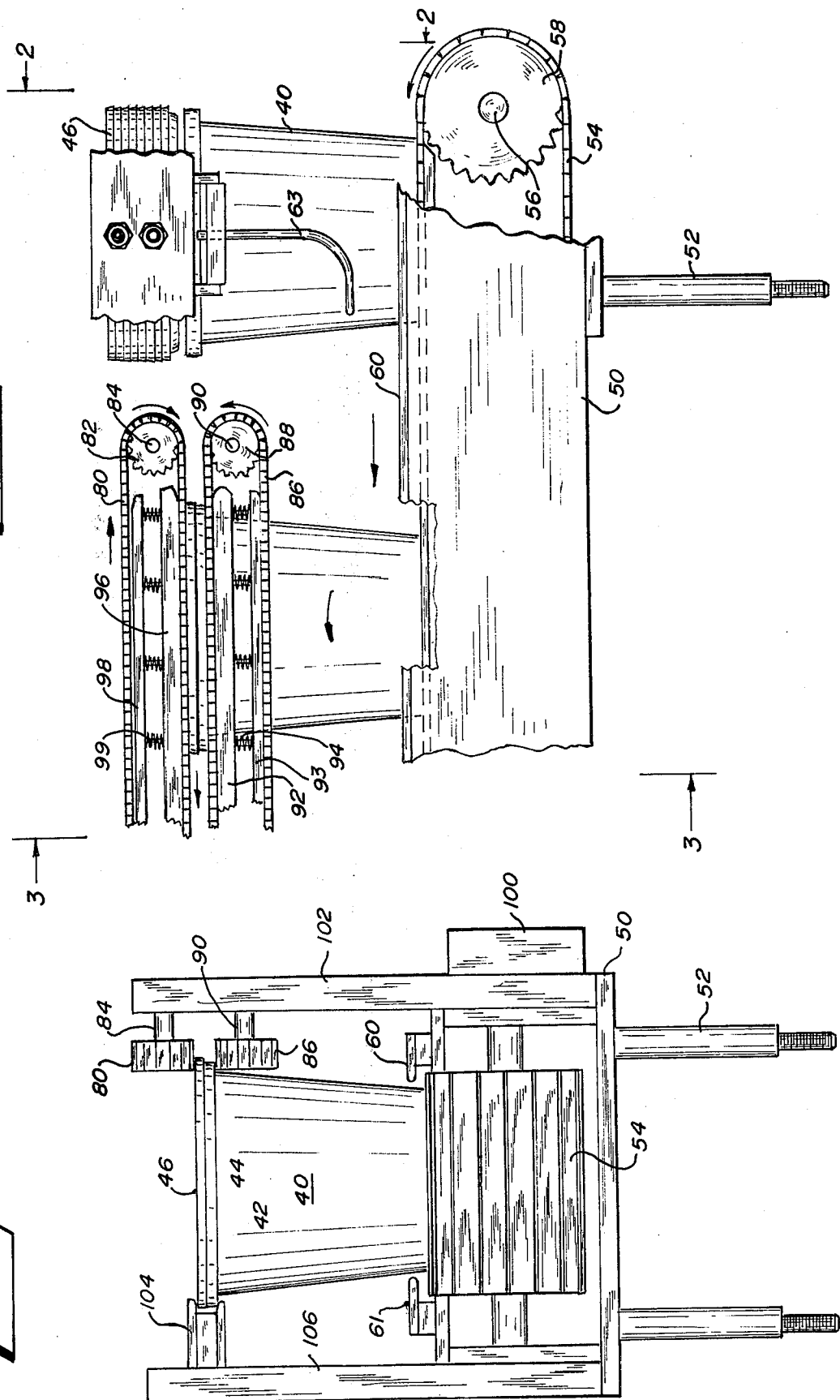
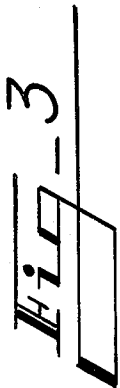
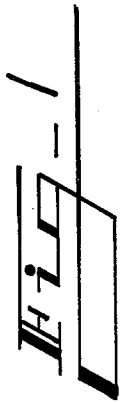
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[57] ABSTRACT

The present invention pertains to automatic apparatus for and the method of securing and retaining a plug-type container cover in position in the open top of a rimmed container. Securing apparatus is adapted to locally and progressively press the U-shaped rim of the cover into locked and seated condition on the rim of the container while providing support to the outer rim of the container.

12 Claims, 4 Drawing Figures





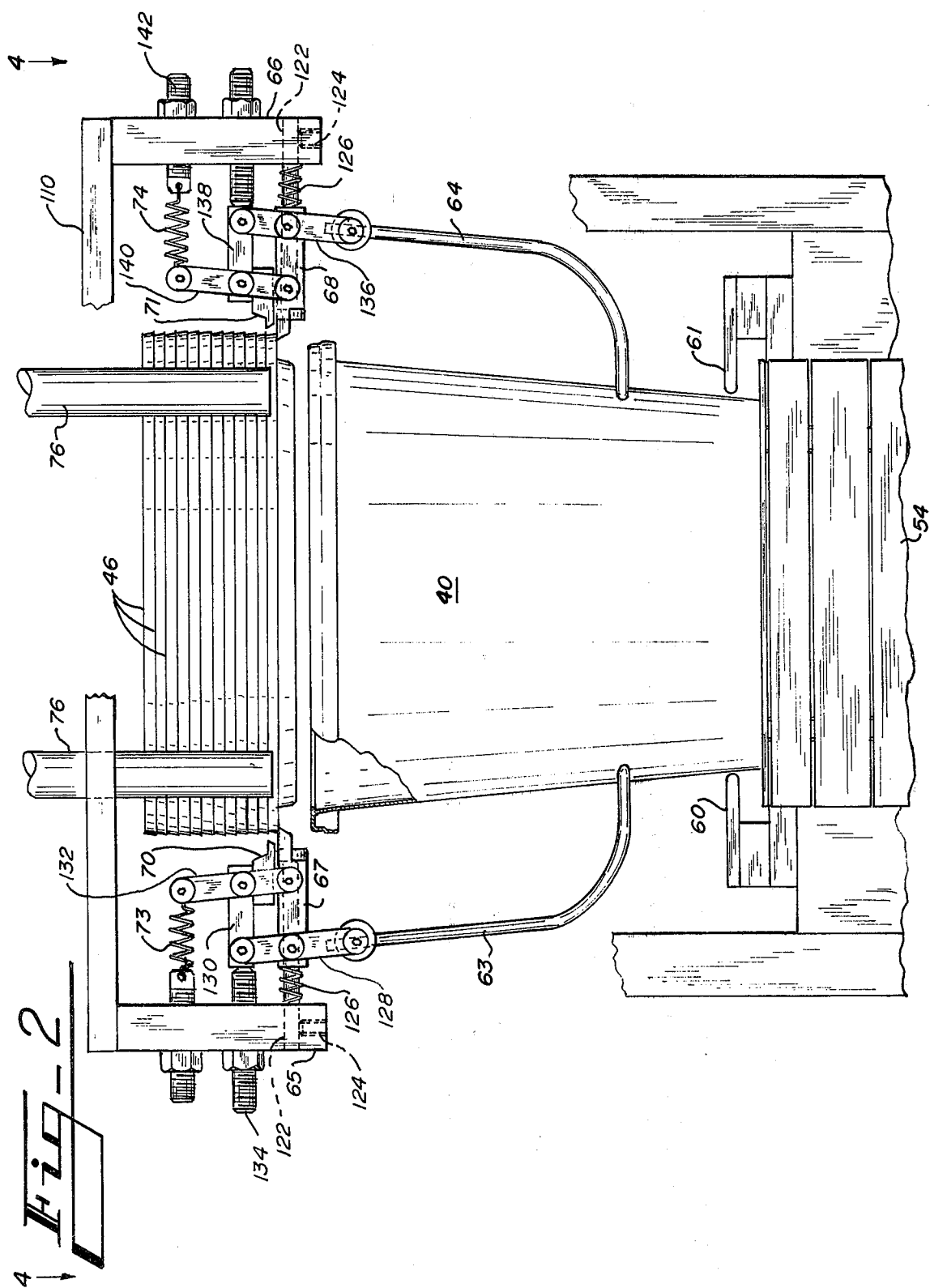
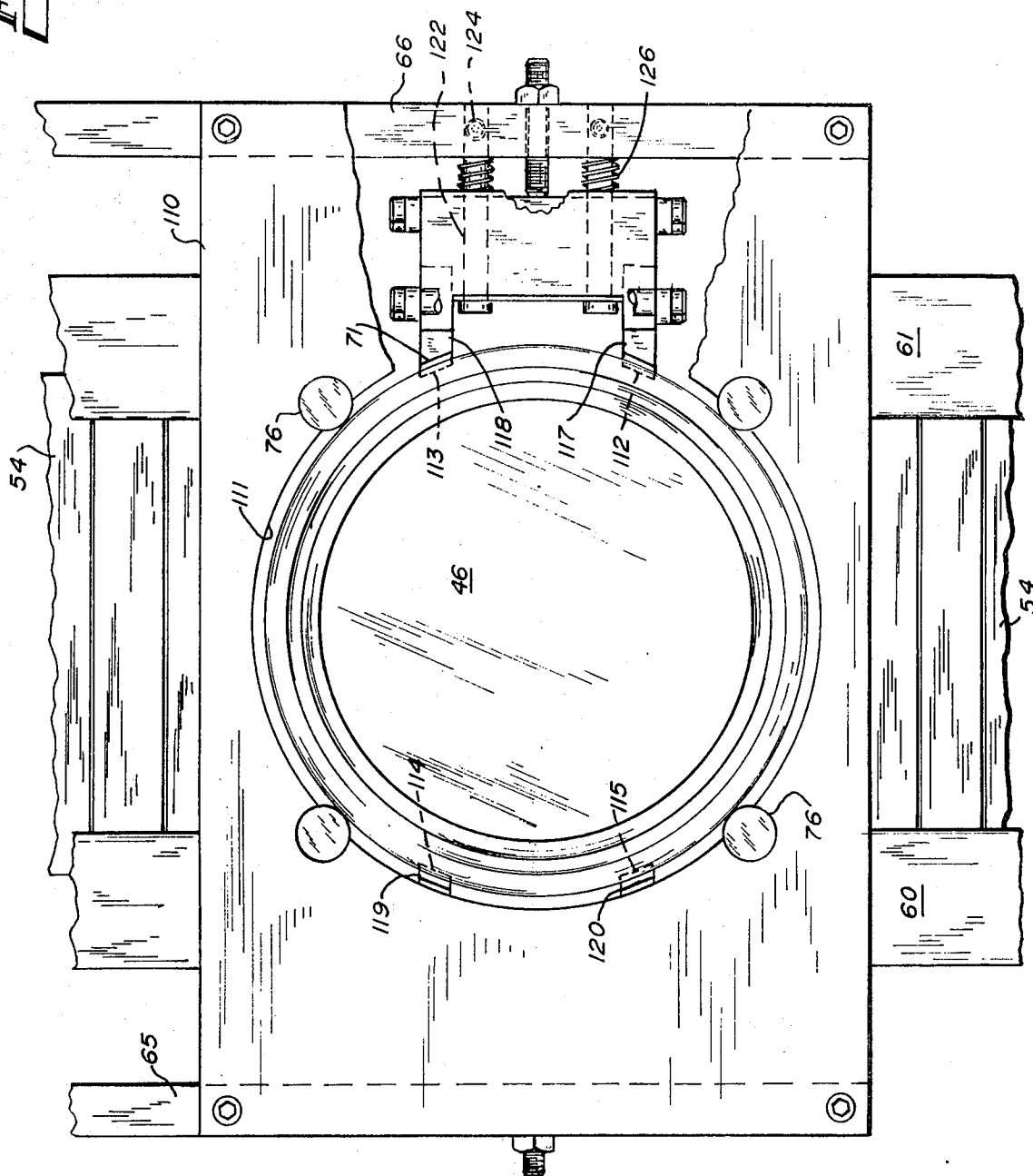


Fig. 4



APPARATUS AND METHOD OF PERIPHERALLY SECURING A PLASTIC COVER TO A RIMMED OPEN TOP CONTAINER

CROSS-REFERENCE TO RELATED PATENT

This patent refers particularly to rimmed containers and covers as are shown and described in my U.S. Pat. No. 3,730,382 as issued on May 1, 1973 based on application Ser. No. 122,303, filed Mar. 9, 1971 and entitled, "Plastic Pail With Integral Handle and Plug-Type Plastic Cover". Reference is also made to containers and covers as found in my U.S. Pat. application Ser. No. 275,443 as filed on July 26, 1972 and entitled, "Plastic Container with Plug-Type Plastic Cover, now U.S. Pat. No. 3,817,420 issued June 18, 1974.

BACKGROUND OF THE INVENTION

1. Field of the Invention

With reference to the classification of art as established in the United States Patent Office the present invention pertains to art as found in the general Class entitled, "Package Making" (Class 53) and the subclass thereunder entitled, "separate closure applying rotary tool or die" (subclass 334). Attention is also directly toward the general Class entitled, "Sheet Metal Ware, Making" (Class 113) and the subclass thereunder entitled, "head applying" (subclass 30).

2. Description of the Prior Art

Plastic containers of the type commonly known as "Tupperware" and the many similar containers used to package products such as ice cream, margarine and the like are manufactured by the millions each year. In such packaging the container body is sufficiently rigid to permit the placing of the cover on the rim of the filled container and with force applying means mount this cover which is flexible on the container. As the packaged content is usually very viscous or semisolid, flexible snap-tight covers are satisfactory and the force for securing is quite low.

Where and when the container has its opening provided with a plurality of sealing ledges or ring-like surfaces and the mating plug-type cover has compatible sealing surfaces, a semirigid cover such as described in the cross referenced applications requires that the applying force be quite high. The applying apparatus commonly used with flexible, snap-tight covers if used with the covers and containers such as are shown and described in my U.S. Pat. No. 3,730,382 and my application Ser. No. 275,443 would likely damage the side walls of the container and/or result in an incomplete securing of the cover and/or a seal of the cover to the container. The present invention discloses a cover applying automatic apparatus, which employs engagement of the underside of the rim of the container and with localized pressure on the cover rim the cover is pressed into sealed condition.

Automatic cover placing apparatus and cover securing means is shown in U.S. Pat. No. 3,712,021 as issued to LOGEMANN et al. on Jan. 23, 1973 and provides a tucking seal of the cover to the container. The sequential peripheral closing means utilized in the present invention is neither shown nor suggested is this prior art example. Rotary motion and local die pressure is used in certain can manufacturing processes and, as an example, reference is made to U.S. Pat. No. 3,730,118 as issued on May 1, 1973 to DEL-FRATE. In this patent there is no suggestion of the supporting of the container

by the rim during the rotary attachment of the cover to the container.

In the automatic apparatus of this invention, to be hereinafter more fully described, the apparatus provides means to engage the cover rim and the container rim at a localized area and to press the cover into position. The rim of the container is locally engaged and supported so as to prevent unwanted or undue stress on the side walls of the container. Rotary means is imparted to cause a roller or strand of chain to engage and push the cover into position on the container.

SUMMARY OF THE INVENTION

This invention may be summarized at least in part with reference to its objects.

It is an object of this invention to provide, and it does provide apparatus for securing a plug-type cover to an open top plastic container whereby a local engagement of the cover rim and the container rim is achieved and by rotary movement the cover and container are pressed into sealed condition.

It is a further object of this invention to provide, and it does provide, automatic apparatus providing for the automatic delivery of covers to containers delivered by conveying means to an applying station. With the cover positioned on the container, the container is engaged and lifted on one side of its rim by a lower link-type chain which in addition to lifting the container supports the container as an upper link-type chain presses the cover into the desired secured condition. Opposite side guide means retain the container in the desired position during the advancement and pressing of the cover into seated condition on the rim of the container.

The automatic apparatus includes a conveyor which transports the container to a cover supply station whereat the covers are delivered one-at-a-time with one cover being delivered to each container as it is brought in way of the cover delivery apparatus. A short distance downstream and while still on the conveyor, the container and positioned cover are brought into the securing station. A pair of roller or link-type chains are positioned so that simultaneously one chain engages the underside of the container rim and the other chain engages the cover rim. These chains are carried on slide guides which maintain them in a spaced relationship whereby the cover is moved into the seated condition. Guide means on the opposite side of the container engage and retain the cover and container rims and insure that the advancing container is retained in the desired orientation during the cover securing operation.

In addition to the above summary the following disclosure is detailed to insure adequacy and aid in understanding of the invention. This disclosure, however, is not intended to cover each new inventive concept therein no matter how it may later be disguised by variations in form or additions of further improvements. For this reason there has been chosen a specific embodiment of an automatic apparatus for peripherally securing semirigid plastic covers to open top containers and showing a preferred means and method for performing the desired securing operation. This specific embodiment has been chosen for the purposes of illustration and description as shown in the accompanying drawings wherein:

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 represents a fragmentary side view of an auto-

matic cover applying and securing apparatus in which is provided a cover dispenser, a transport conveyor and cover closing means utilizing upper and lower link chain strands;

FIG. 2 represents an end view partly fragmentary and in an enlarged scale and showing the preferred apparatus for meter dispensing of a cover onto an advancing container, this view taken substantially on the line 2—2 of FIG. 1;

FIG. 3 represents an end view, partly diagrammatic and showing the closing mechanism by which the cover is mounted to the container, this view taken on the line 3—3 of FIG. 1 and looking in the direction of the arrows, and

FIG. 4 represents a partly diagrammatic top view partly in section of the cover dispensing apparatus of FIG. 2 and showing in greater detail the mechanism controlling the action of the lower blades and upper fingers.

In the following description and in the claims various details will be identified by specific names for convenience. These names, however, are intended to be generic in their application. Corresponding reference characters refer to like members throughout the several figures of the drawings.

The drawings accompanying, and forming part of, this specification disclose the details of the preferred construction for the purpose of explanation of the broader aspects of the invention, but it should be understood that structural details may be modified and that the invention may be incorporated in other structural forms than shown.

AUTOMATIC ASSEMBLY AS SEEN IN FIGS. 1, 2, 3 and 4

Referring to the automatic apparatus as shown in FIGS. 1, 2, 3 and 4 there is depicted automatic cover supplying and securing apparatus which includes a frame 50 carried by legs 52. A conveyor belt 54 is carried at one end by a head shaft 56 and sprockets 58 and at its other end conventionally by a like tail shaft and sprockets, not shown. Side guides 60 and 61 are carried on frame 50 and are spaced so as to engage and guide an advancing container 40 as it progresses leftwardly as seen in FIG. 1.

As seen in FIGS. 1, 2, and 4, the initial first station just left of sprockets 58 in FIG. 1 is adapted to deliver covers 46 one-at-a-time in response to the passing of a container 40 thereunder. As seen in detail in FIG. 2, the container 40 as it is advanced on conveyor 54 is brought into engagement with like depending arms 63 and 64. These arms are pivotally retained and supported on upper supports 65 and 66 and at a short distance down from their pivoted end are connected to and actuate lower support blades 67 and 68. Arm 63 is pivotally connected to and is adapted to reciprocally move the left-hand lower support blade 67. Arm 64 is similarly pivotally connected to and is adapted to reciprocally move the right-hand lower support blade 68.

An upper support finger member 70 is carried a determined distance above blade 67 and is moved with a reciprocating motion which is counterflow to the instant motion of blade 67. A like upper support finger member 71 is carried a determined distance above blade 68 and as with upper support finger member 70 is moved with a reciprocating motion which is counterflow to the instant motion of blade 68. Spring 73 is con-

nected to the linkage actuated by arm 63 so as to urge arm 63 in way of the path and passage of the lower side wall of the advancing container 40 until displaced by the engagement of the container. A like spring 74 is connected to the linkage actuated by arm 64 and is adapted to urge arm 64 into engagement with and in way of the lower side wall of the advancing container 40. Guide rods 76 align and maintain the stack of covers 46 in the desired gravity actuated and oriented condition. A full discussion of the cover discharge apparatus is hereinafter more fully discussed in connection with FIG. 4.

As the advancing container 40 is moved from the cover discharge station the arms 63 and 64 are moved back to the receiving position of FIG. 2. Spring 73 pulls arm 63 into position while spring 74 pulls arm 64 into position.

As and when a container 40 is brought to the cover discharge station, the lower sides of the container engage and outwardly displace opposed arms 63 and 64. The outward movement of these arms initiates an action which results in a similar but reduced outward movement of opposed lower support blades 67 and 68 which at their maximum outward limit of movement are sufficiently outward of the stack to remove the supporting engagement of the lowermost cover 46 which then drops onto the container 40 immediately below. To prevent the other covers in the stack from falling, the linkage is arranged so that the outward movement of arms 63 and 64 does not commence their movement until a pair of opposed upper fingers 70 and 71 are moved inwardly into supporting engagement of the lower edge of the rim of the next above cover. These upper fingers 70 and 71 retain the stack during the time period of drop of the lower cover to and onto the container. As fingers 70 and 71 are moved outwardly from supporting engagement of the covers the lower blades 67 and 68 are already in position to receive the dropping stack of covers and retain them in the condition of FIG. 2 until the next container arrives to repeat the above-described operation.

AUTOMATIC COVER SECURING MECHANISM OF FIGS. 1 AND 3

As the container 40 with cover 46 in place but not secured is advanced, the container is guided by side guide members 60 and 61 as it enters the securing station. At this station a pair of endless roller chain assemblies are arranged with an upper strand 80 being carried on and moved by a front sprocket 82 mounted on head shaft 84. Not shown is the tail shaft and sprocket which carries the other end of the strand 80. A lower strand 86 is similarly carried on a front sprocket 88 mounted on a lower head shaft 90. Likewise not shown is the tail shaft and sprocket for this lower strand 86. The upper extent of the lower strand 86 is carried on a support slide 92 which is positioned to engage the lower edge 44 of the container 40 and to lift the container slightly. This slide is resiliently supported by lower fixed support member 93 and is movable upwardly by the springs 94 which provide the desired upward resilient support.

In a like manner the upper strand 80 is positioned from lower strand 86 by a slide guide 96 which is carried by fixed support 98 and is spring biased downwardly by springs 99. Drive means for the upper and lower strands 80 and 86 is provided by a motor 100 which not only powers conveyor 54 but by means of a

roller chain or similar drive, not shown, carried within support 102 also drives the strands 80 and 86. The cover closing means is disposed on the other side of the conveyor provided by channel guide 104 as carried on supports 106 which are secured to frame 50.

USE AND OPERATION OF AUTOMATIC COVER SECURING MECHANISM OF FIGS. 1, 2 AND 4

Although many cover dispensing mechanisms might be provided there is shown in particular in FIGS. 2 and 4 a one-at-a-time cover dispensing means wherein the guide rods 76 are retained in scalloped holes formed in a support plate 110. A hole 111 found in this plate is sized to permit free passage of the stack of covers 46. These guide rods are positioned so that inner lengthwise portions of each rod extend into hole 111. Plate 110 is carried on the upper end of upper supports 65 and 66. Below this plate is disposed the lower support blades 67 and 68 which, as depicted, are U-shaped plate-like members with each leg extending inwardly and contoured so as to provide short peripheral supports 112, 113, 114 and 115 disposed to engage the lower rim at four points on the lowermost cover. This four point support prevents undue tipping of the cover stack. In a like manner, the depicted upper support fingers 70 and 71 are each U-shaped plate-like members with the inner end of each extending portion contoured so as to form and provide short peripheral supports identified as 117, 118, 119 and 120. These supports are spaced from and above supports 112, 113, 114 and 115 so as to be moved into supporting engagement with the lower rim surface of the cover next above the one being discharged.

Controlled motion of the lower support blades and the upper support fingers may be by pneumatic or electric power but a mechanical means is shown in FIGS. 2 and 4 wherein lower blade members 67 and 68 are each slidably carried on a pair of headed rods or pins 122. The reduced or shank ends of these rods are carried in holes formed in either member 65 or 66. Set screws 124 carried in threaded holes transverse of the holes in which are carried pins 122 secure these pins at an established position whereat the heads of the pins limit the inward movement of the blades 67 and 68. A compression spring 126 is carried on each pin 122 and is disposed so as to urge the blades inwardly. The pair of springs 126 which urges blade member 67 rightwardly is of a greater combined stiffness than the tension of spring 73. In a like manner the pair of springs 126 which urges blade member 68 leftwardly is of a greater combined stiffness than spring 74. A pivot block is adapted to carry each depending arm. Arm 63 has its upper end adjustably secured to a midportion of pivot block 128 which is first pivotally connected to the near and far sides of blade member 67. Two continuing beam portions of block 128 extend upwardly from this pivot point to a pivoted connection with horizontal link plate 130. This link plate extends rightwardly to a pivot connection midlength of link arm 132. On its lower surface link plate 130 carries the upper support finger 70 at a determined distance above the lower support blade 67. A set screw 134 carried in support member 65 is adjusted to position the outward limit of movement of link plate 130.

A pivot block 136 adjustably carries the upper end of depending arm 64. At its midlength block 136 is pivotally connected to the near and far sides of blade mem-

ber 68. Two continuing beam portions of block 136 continue upwardly to a pivoted connection with horizontal link plate 138. This link plate extends leftwardly from this connection to a pivoted connection midlength of link arm 140. On its lower surface link plate 138 carries the upper support finger 71 at a determined distance above the lower support blade 68. A set screw 142 carried in member 66 is adjusted to establish the outward limit of movement of link plate 138.

In use the covers 46 are arranged in a vertical stack substantially as shown in FIG. 2. These covers are made so that their outer rim is tapered downwardly and outwardly to provide a circumferential engaging lip. As stacked and before the arrival of a container 40, the lower edge of the lowermost cover is engaged by contoured peripheral supports 112, 113, 114 and 115 to retain this and the above covers until release of this lowermost cover 46 in a one-at-a-time response to the movement of a container 40 in way of the delivery station.

The outward movement of arm 63 causes a rotating motion around the pivoted connection of pivot block 128 to lower blade 67. This occurs since springs 126 are stronger than spring 73 with this weaker spring allowing link plate 130 to move rightwardly away from screw 134. This movement carries upper support finger 70 into engagement with the rim of the next from the bottom cover. The contour on the two peripheral support portions 117 and 118 are positioned so as to engage the rim and to also pass under the lip for a distance that is less than to the outer side of the rim of the lowermost cover. As and when the upper support finger 70 is stopped from its rightward movement the movement of the horizontal link plate 130 is also stopped. The continued outer movement of arm 63 now causes the pivot block 128 to rotate around the pivot connection at horizontal link plate 130. This starts and causes lower blade 67 to move outwardly until it no longer supports the lowermost cover which now falls onto the open top of the container 40.

In a like but mirror image motion the outward movement of arm 64 causes pivot block 136 to pivot around the connection at lower blade 68. The contour on the two peripheral support portions 119 and 120 engages the right side rim portion of the next to the bottom cover. Their engagement causes springs 126 to be overcome and lower blade 68 to move outwardly until it no longer supports the lowermost cover.

The counterflow motion of the lower blade and the upper fingers is not simultaneous but staggered. One is completed before the other begins. After the container 40 passes by the arms 63 and 64 the more powerful springs 126 first urge lower blades 67 and 68 into the position of FIG. 2. After the inward movement of the blades is stopped by the heads of pins 122 the weaker springs 73 and 74 pull the associated arms 63 and 64 to the position of FIG. 2 and the upper fingers 70 and 71 release the stack to permit their dropping a distance of one cover onto the lower blades and their peripheral support portions 112, 113, 114 and 115.

Linkages other than those shown can also be used as well as rack and pinion mechanisms. The desired sequence above-noted is desirable in that the cover stack is fully controlled as and while the lowermost cover is discharged.

USE AND OPERATION OF AUTOMATIC COVER SECURING MECHANISM

The placed cover 46 is secured to the rim 42 of the container in combination with the rotative motion of the container and cover in securing guide 104. During this rotation the rim of the cover 48 and the container rim 42 are forced by guide 104 into the desired secured condition. As the container 40 with cover 46 positioned on its open top is moved from the cover supply station, the near peripheral edges of the container rim and cover rim are brought to and between strands 80 and 86. The upper extent of strand 86 and the lower extent of strand 80, as seen in FIG. 1, are moving from right to left as indicated by the arrows. These strands move at a like lineal speed which preferably is at a determined amount greater than the lineal speed of the conveyor 54.

As the cover and container rim portions enter between strands 80 and 86 they are gripped by the strands with the upwardly biased supported strand 86 lifting the engaged side of the container from conveyor 54. This amount of lift is usually about one-sixteenth of an inch which insures a positive engagement and support of the rim 42. This engagement is insured by the downwardly biased upper strand 80 as positioned by slide guide 96. As the strands 80 and 86 travel faster than the conveyor 54, the container and cover are rotated around its axis. The securing opposite side guide 104 insures that the cover rim and container rim are retained between the upper and lower strands and during the rotative action are not dislodged from the desired grip of the strands. The securing guide 104 has a tapered inlet whereby it first receives the cover and container rims and then between the extending tongue portions locally brings the cover to a sealed condition.

The effective lengths of the strands 80 and 86 and channel guide 104 are determined by the peripheral length of the cover and container rims. It has been found satisfactory to provide about one and one-quarter revolutions of the container to insure a full and satisfactory seating of the cover onto the container open top. As reduced to practice, it has been found that making the strands 80 and 86 with plastic surface members attached as part of the links has provided gripping means which does not mar or otherwise scuff the container and cover rims. The tongue members of the channel 104 are of steel to withstand the applying force necessary to force the cover onto the container rim.

The speed of strands 80 and 86 is a selected speed since the lifting of the container from all but one edge of the bottom and the gripping of the container and cover by these strands causes rotation at the speed of the strands. For practical reasons the speed of the strands is made sufficient for the container to be advanced at a speed slightly faster than conveyor 54 thus preventing any jam-up or interference of one container to another of the containers on the conveyor 54. The spacing of the inner faces of the tongue members of the securing channel is made quite accurate to insure the desired sealing. The variations in cover rim configurations and in the container rim are usually less than one or two percent so that the facing spacing of the tongue members which is quite precise achieves the desired result.

Although preferably the apparatus is for a tapered container it can also be used for a container with

straight sides. It is also to be noted that guide 104 may be formed so that during the rotating securing action the container can be lifted substantially clear of the conveyor 54. After the securing action has been completed the guide 104 is then contoured to permit the container to again rest on the conveyor 54.

METHOD OF SECURING A PLASTIC COVER TO A CONTAINER

The operation of the apparatus above-shown and described particularly exemplifies a method of securing a cover to a rimmed container. Where the U-shaped cover must be pressed nearly directly downwardly onto the rim of the container and where the cover must be stretched diagonally to achieve mounted condition, the method suggested by either the manually operated apparatus or the automatic apparatus is preferably employed and the method steps generally include providing a support means selectively movable to a position whereat it engages a local portion of the lower edge of the rim of the container so as to locally support the rim during a cover applying step; providing a pressure applying means selectively movable to a position whereat it locally engages a portion of a U-shaped outer rim of a cover; providing a means for aligning the support means and the pressure applying means for positioning and moving the pressure applying means to establish a determined space from the support means so that the cover portion engaged thereby is locally urged into mounted condition on the cover rim; providing means for simultaneously moving the support means and pressure applying means so as to engage and move circumferentially around the container rim and cover rim to sequentially press the U-shaped rim portion of the cover into seated condition on the rim of the container and providing means for removing the container with its mounted cover from the apparatus.

The method of mounting a cover to a container includes automatically operated apparatus providing the steps of providing a conveyor which receives a container and carries this container on its bottom to and through a cover discharge station and includes the further steps of causing a cover supply apparatus to be actuated by the advancing container thereby releasing and delivering one cover from this supply to an initial position on the container and then delivering the container and deposited cover to cover mounting apparatus.

This automatic apparatus further includes providing at the cover discharge station retaining and guiding means for retaining the covers as and in a vertical stack permitting reloading from the top of the retaining and guide means and further includes providing and arranging at least one depending arm movable into and from the path of the container so that an advancing container engages the arm and displaces the arm outward from said path, the displacing of the arm actuating mechanism to cause the lowermost cover of the vertical stack of covers to be released from the stack and by gravity drop into the open top of the container as it is moved beneath the stack.

The method for the automatic mounting of a cover to a container further includes providing a guiding means which in association with the conveyor defines a prescribed path of travel for the container. The method further includes providing a pair of endless flexible chains disposed in this path and with the posi-

tioning of these chains so as to tangentially engage the rim of the cover and the container and with the movement of the chains in relation to the container causing a rotation of the container to occur. During this rotation a U-shaped channel guide engages the opposite side of the container and cover rim to locally press the cover into a seated condition. The pair of like endless chains is caused to run in a common plane so that the extents of the chains lay in a parallel arrangement and are moved at the same speed and in the same direction. The inner extents of chain are spring biased into engaging position.

The method for the automatic mounting of a cover to a container preferably includes providing each of the pair of chains with links which carry antimar block-like members of plastic and the like, with the chains disposed so that as they engage the container and cover rims the chain-engaged side of the container is lifted from the conveyor on which it is being transported. On the other side of the container path a channel guide of a selected length is mounted and locally slidably engages the cover and container at a position diametrically opposite their engagement by the chains, the channel portions of the guide forcing the cover rim onto the container rim to achieve the desired seating conditions.

Terms such as "left", "right", "up", "down", "bottom", "top", "front", "back", "in", "out", "clockwise", "counterclockwise" and the like are applicable to the embodiment shown and described in conjunction with the drawings. These terms are merely for the purposes of description and do not necessarily apply to the position in which the automatic cover applying apparatus may be constructed or used.

While particular embodiments of the apparatus and methods associated with the cover mounting have been shown and described it is to be understood the invention is not limited thereto and protection is sought to the broadest extent the prior art allows.

What is claimed is:

1. Automatically operated apparatus for securing a downwardly turned U-shaped outer rim portion of a cover onto the outwardly extending mating rim of an open top container so as to mount the cover on the container rim, the automatic apparatus including: (a) an advancing conveyor which receives a container and carries this container by its bottom to and through a cover discharge station; (b) means actuated by the advancing container for causing cover supply apparatus at said station to be actuated and to release and deliver one cover from a supply of covers to an initially installed position on the rim of the advancing container; (c) cover securing apparatus which includes guide means which in association with the conveyor defines a prescribed path of travel for the container; (d) a pair of like endless flexible chains running in a common plane with an extent of each of the chains disposed to lay in a parallel arrangement with the outer facing surfaces spaced from each other and maintained at this determined spacing by support means, the outer engaging surfaces of said parallel extent of each of the pair of chains traveling at like speeds and direction, the outer engaging surfaces of one chain during its passage along this parallel extent engaging the outer rim of the cover while the outer engaging surface of the other chain during its like passage along the parallel extent engaging the undersurface of the rim of the container, the engag-

ing of the chains with the cover and the undersurface of the rim causing rotation and progression of the container; (e) a support means selectively movable to a position where it engages a local portion of the lower edge of the rim of the container so as to locally support the rim during a cover mounting sequence; (f) a pressure applying means selectively movable to a position whereat it locally engages a portion of a U-shaped outer rim of a cover; (g) means for aligning the support means and the pressure applying means and for positioning and moving the pressure applying means to establish a determined space from the support means so that the cover portion engaged thereby is locally urged into mounted condition on the cover rim, said support means and pressure means engaging the cover at a position opposite the engaging of the container and cover by the traveling chains so that the support and pressure applying means circumferentially engages the rotated container rim and cover rim to sequentially press the U-shaped rim portion of the cover into seated condition on the rim of the container, and (h) means for removing the container with its mounted cover from the apparatus.

2. Automatic apparatus for mounting a cover to a container as in claim 1 in which the cover discharge apparatus includes a retaining and guide means for grouping a supply of covers as and in a vertical stack, said retaining and guide means open from and at the top permitting replenishing of the stack from the top of the retaining and guide means and in which the cover discharge apparatus and the actuating means associated therewith includes at least one depending arm which is moved into and from the path of a container so as to engage the side of an advancing container and in response to the displacement of the arm from said path by the advancing container the lowermost cover of the vertical stack of grouped covers is released from the stack and by gravity dropped in a loosely seated condition on the open top of the container as it is moved beneath the stack.

3. Automatic apparatus for mounting a cover to a container as in claim 2 in which the actuating mechanism for releasing the lowermost cover includes at least two lower support blades which are reciprocally movable toward and from the stack of covers each blade having inwardly extending edges and at the inward limit of movement of the blades these edges engage and support the stack of covers and at the outward limit of movement of the blades the inward edges are removed from engagement and support of the cover and in which the actuating mechanism further includes at least two upper support fingers reciprocally movable toward and from the stack of covers, these upper support fingers at their inward limit of movement having edges which engage the next from the bottom cover and support this cover and the stack of covers thereabove and at the outward limit of movement of the upper support fingers the inner edges are moved from engagement and support of the covers, the actuating mechanism arranged so that when and while the lower support blades are in engagement with and support the stack including the lowermost cover the upper fingers are disengaged from the stack and just prior to and during disengagement of the inner edges of the lower support blades from the lowermost cover the inner edges of the upper fingers are caused to be brought into en-

gement with the next above cover to provide support for this cover and the above stack of covers.

4. Automatic apparatus for mounting a cover to a container as in claim 3 in which at least one of the lower support blades is U-shaped with the ends of the inwardly extending leg portions arranged and contoured to provide peripheral engagement and support to the lowermost cover and above covers and in which at least one of the upper support fingers is U-shaped with the ends of the inwardly extending legs arranged and contoured to provide peripheral engagement and support to the first above the lowermost cover and those covers above this first above the lowermost cover.

5. Automatic apparatus for mounting a cover to a container as in claim 4 in which both of the lower support blades are U-shaped and each blade is actuated by an associated depending arm which is moved into and from the path of the advancing container, and in which both of the upper support fingers are U-shaped with one support finger actuated with each depending arm, the support finger moving parallel to but counterflow to the movement of the associated lower support blade.

6. Automatic for mounting a cover to a container as in claim 5 in which the inward movement of the upper support fingers is completed before the outward movement of the support blades is begun.

7. Automatic for mounting a cover to a container as in claim 1 in which each of the pair of chains have links which carry antimar block-like members of plastic and the like, and in which the chains are disposed so that these block-like members engage the cover and container rims and as they engage said container and cover rims the chain-engaged side of the container is lifted from the conveyor on which it is being transported.

8. Automatic apparatus for mounting a cover to a container as in claim 7 in which the support means and pressure applying means are provided by a U-shaped channel guide of a selected length, this channel guide having its leg portions and their facing portions disposed and spaced to slidably engage the outer surface of the cover and container rim at a position diametrically opposite their engagement by the chains, these channel guides engaging and maintaining the container and cover in the desired position while the chains simultaneously locally engage the cover and rim of the same container to cause the cover to be moved into seated condition on the container.

9. The method for automatically securing a downwardly turned U-shaped outer rim portion of a cover onto the outwardly extending mating rim of an open top container so as to mount the cover on the container rim, the method steps including: (a) providing an advancing conveyor which receives a container and carries this container on its bottom to and through a cover discharge station; (b) actuating a cover supply apparatus at said station by the engagement of an advancing container and with said actuation releasing and delivering one cover from this supply of covers to an initially installed position on the container; (c) providing a guiding means which in association with the conveyor defines a prescribed path of travel for the container; (d) positioning a pair of like endless chains running in a common plane with an extent of each of the chains disposed to lay in a parallel arrangement with the facing surfaces of the chains spaced from each other and maintaining this determined spacing by sup-

porting guides, the outer facing surfaces of each of the parallel extents of the pair of chains moving at like speeds and in the same direction and causing the outer surface of one of the chains to engage the outer rim of the cover while the outer surface of the other chain engages the undersurface of the rim of the container, the engaging of the chains with the cover and the undersurface of the container rim causing advancing rotation of the container; (e) providing a support means selectively movable to a position whereat it engages a local portion of the lower edge of the rim of the container so as to locally support the rim during a cover applying step; (f) providing a pressure applying means selectively movable to a position whereat it locally engages a portion of a U-shaped outer rim of a cover; (g) providing a means for aligning the support means and the pressure applying means and for positioning and moving the pressure applying means to establish a determined space from the support means so that the cover portion engaged thereby is locally urged into mounted condition on the cover rim, said support means and pressure applying means engaging the container rim and cover at a position opposite the engaging of the container rim and cover by the traveling chain and with the rotation of the container, the support and pressure applying means circumferentially engage the rotated container rim and cover rim to sequentially press the U-shaped rim portion of the cover into seated condition on the rim of the container, and (h) providing means for removing the container with its mounted cover from the apparatus.

10. The method of automatically mounting a cover to a container as in claim 9 which further includes providing at the cover discharge station retaining and guiding means for grouping the covers as and in a vertical stack while permitting replenishing of the supply from the top of the retaining and guide means and which further includes the step of providing and arranging at least one depending arm movable into and from the path of the container so that an advancing container engages said arm to displace the arm outwardly from said path, the displacing of this arm causing a mechanism to release the lowermost cover of the vertical stack of grouped covers from the stack and by gravity drop to a seated condition on the open top of the container as it is moved beneath the stack.

11. The method of automatically mounting a cover to a container as in claim 9 which further includes providing each of the pair of chains with links which carry antimar block-like members of plastic and the like and the chains are disposed in their parallel extents so that as the block-like members engage the container and cover rims, the chain-engaged side of the container is lifted from the conveyor on which it is being transported.

12. The method of automatically mounting a cover to a container as in claim 11 in which support means and pressure applying means include providing a U-shaped channel guide of a selected length and positioning the legs of the channel guide so that their facing surfaces are disposed for slidably engaging the outer surface of the cover rim and the underside of the container rim at a position diametrically opposite their engagement by the chains and with the chain movement causing the rotating of the container and cover the oppositely disposed U-shaped channel to engage the same cover and container rim to cause the cover to be moved into a seated condition.

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