Feb. 22, 1966 J. M. WHEATON Re. 25,962

CONTAINER CLOSING MACHINERY

Original Filed March 24, 1960 3 Sheets-Sheet 1

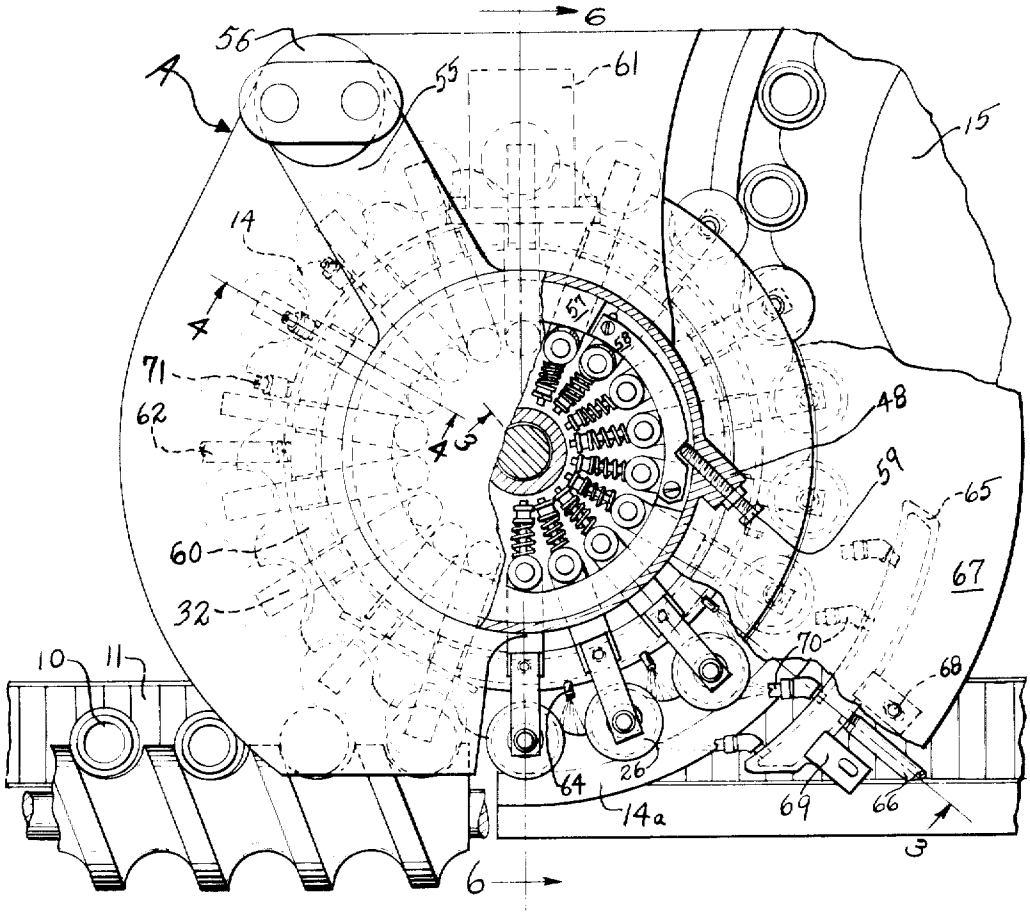


Fig. 2.

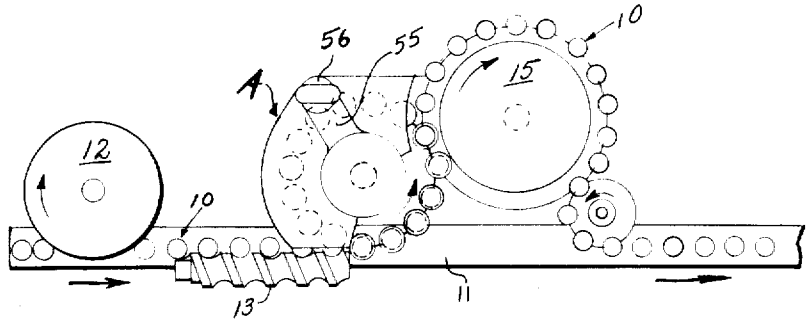


Fig. 1.

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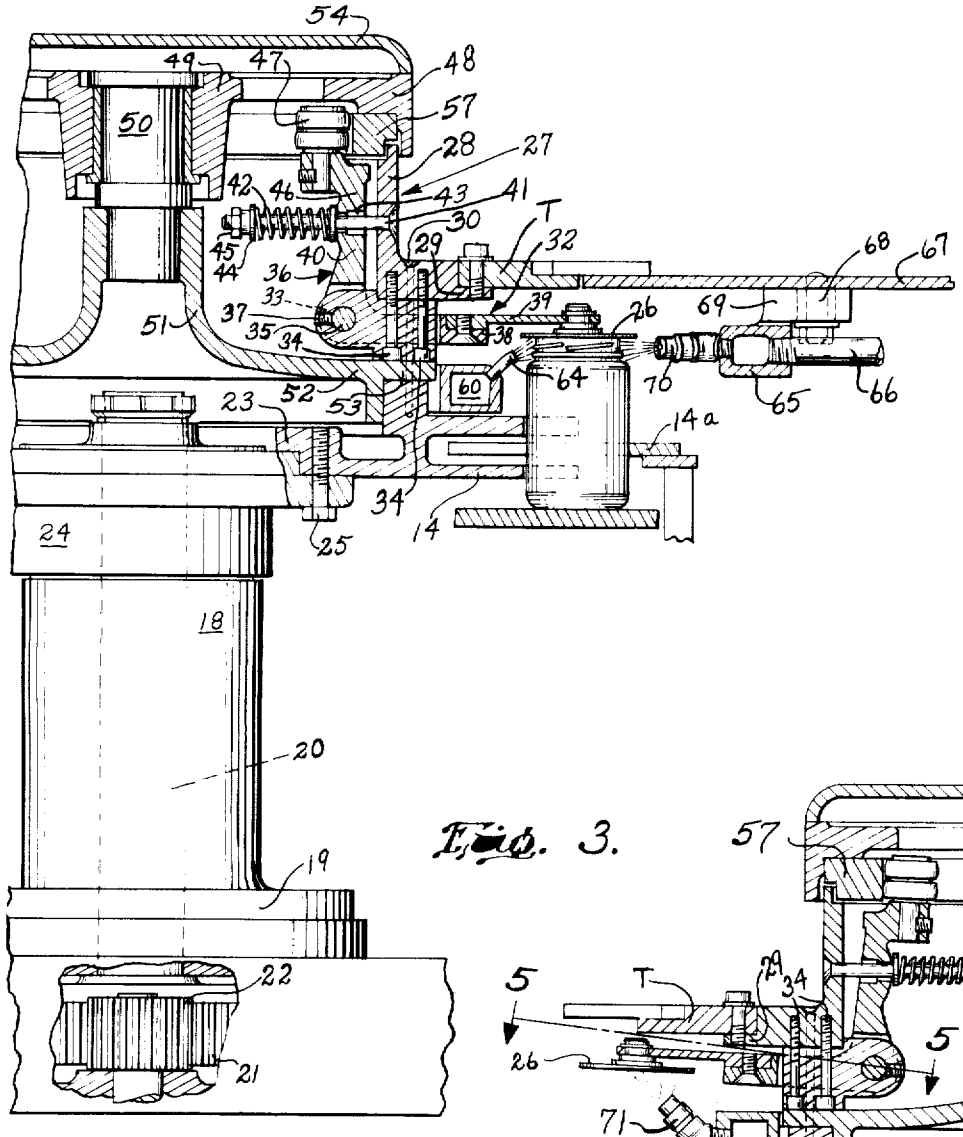


Fig. 3.

Fig. 4.

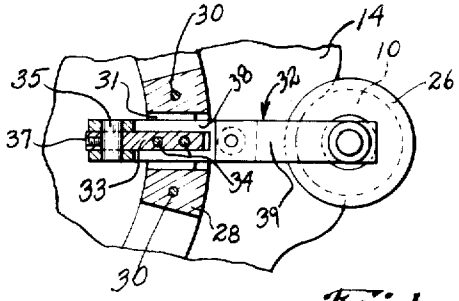


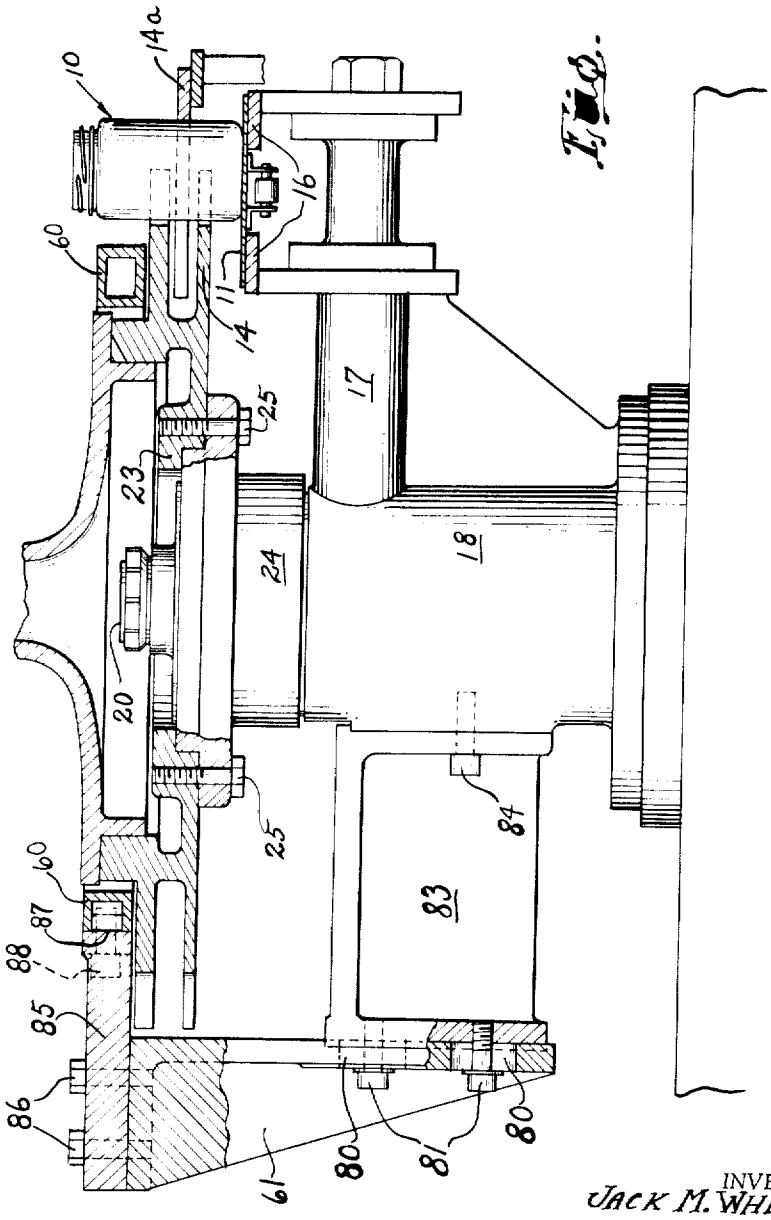
Fig. 5.

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Fig. 6.



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CONTAINER CLOSING MACHINERY

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Original No. 3,040,493, dated June 26, 1962, Ser. No. 17,322, Mar. 24, 1960. Application for reissue June 25, 1964, Ser. No. 390,253

6 Claims. (Cl. 53—167)

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates the additions made by reissue.

The present invention relates to improvements in container closing machinery and more particularly to apparatus for washing the exterior neck surfaces of filled containers prior to sealing with closure caps.

In the packaging of various products in small containers, glass jars for example, it often happens that product overflows or is spilled or incident to handling is splashed onto the exterior surface of the neck portion of the container. To leave the spilled product on this surface would result in product being trapped under the closure cap and result in rusting of the cap, contamination of the product, and the creation of a most unsightly appearance.

In certain types of closing machines, an example of which is disclosed in U.S. Patent No. 2,659,522, it is necessary to move the filled container in an arcuate path to the sealing machine. This latter described movement has been a limiting factor, which determined the speed at which the sealing machine could be operated. This is because as the filled containers move in an arcuate path, the resulting centrifugal force tends to throw some of the product out of the container, thereby causing spillage of the product and accumulation on the exterior surfaces of the neck.

Accordingly, it is an object of this invention to provide an apparatus for cleaning the neck portion of filled containers.

Another object of my invention is to provide an apparatus for preventing spillage of product from filled containers as the latter are transferred from a main conveyor line to an adjacent closing machine.

The specific nature of this invention, as well as other objects and advantages thereof, will become apparent to those skilled in the art from the following detailed description taken in conjunction with the annexed sheets of drawings, on which, by way of example only, the preferred embodiment of this invention is illustrated.

In the drawings:

FIG. 1 is a schematic plan view of a container filling and closing line showing the position occupied by the neck cleaning apparatus;

FIG. 2 is a top plan view, partly in section, of the neck cleaning apparatus;

FIG. 3 is a vertical sectional elevational view of the neck cleaning apparatus taken substantially along the line 3—3 of FIG. 2;

FIG. 4 is a fragmentary vertical sectional view taken substantially along the line 4—4 of FIG. 2;

FIG. 5 is a horizontal sectional view taken along the line 5—5 of FIG. 4; and

FIG. 6 is a fragmentary vertical sectional view taken substantially along the line 6—6 of FIG. 2.

Basically my invention comprises an apparatus for automatically temporarily closing the mouths of containers with discs as they move in an arcuate or other path to a capping or sealing machine **15** and then cleaning the neck portion of the containers while their mouths are thus covered. These discs serve the dual purpose of preventing the cleaning agent from entering the containers and the product from spilling out of the containers as they move in an arcuate path. In addition, my invention also includes means for cleaning the discs when they are not covering the mouth of a container.

Referring to FIG. 1, containers **10**, glass jars for example, are carried on a horizontal line conveyor **11** to a conventional filling machine **12**. After being filled, the containers **10** are again deposited on the conveyor **11**. Moving along the conveyor **11**, the containers **10** come into contact with a spacing and timing screw **13**, which provides for the proper delivery of the containers **10** to the neck cleaning apparatus A. From this neck cleaning apparatus A, the containers **10** move to a conventional vapor sealing or capping unit **15**, from which they are removed and transfered back to the conveyor **11**, the latter carrying the sealed containers to a packing station (not shown).

The aforementioned conveyor **11** (FIG. 6), in proximity to the neck cleaning apparatus A, rides upon guide rails **16** which are supported upon a bracket **17**, the latter extending horizontally from a pedestal **18**. Referring to FIG. 3, this pedestal **18** rises from a base **19** and houses a vertical shaft **20**, the lower end of which carries a ring gear **21**, running in mesh with a driving pinion **22**. A conventional star wheel **14** is connected to the upper end of the shaft by means of a web **23** and flanged hub **24**, said web and hub being secured together by screws **25**, or bolts. This star wheel is of conventional form and together with an arcuate guide rail **14a** accurately positions the filled jars beneath and in proper register with the mouth covers **26**. These mouth covers **26** are arranged in an annular series and are mounted upon a rotary carriage **27**.

This rotary carriage **27** moves as a unit with the star wheel **14** to which it is separably and rigidly connected and includes a cylindrical vertical wall **28** having a radial attaching flange **29**. The flange carries a rotatable closure supporting table T and in turn rests upon the star wheel to which it is secured by screws **30**. The pupose of this closure supporting table is disclosed in U.S. Patent No. 2,659,522. Below this flange **29** the vertical wall **28** is of greater thickness than above said flange and in this area is provided with an annular series of radial openings **31** (FIG. 5) corresponding in number to that of the mouth covers **26**. In each of these openings a mouth cover carrier **32** is mounted.

Each mouth cover carrier unit comprises a bearing block **33** (FIGS. 3 and 5) which is secured by screws **34** to the upper wall of the opening **31** and extends radially inwardly beyond said opening. A hinge pin **35** is mounted in the inner end of said bearing block and has its ends extended a short distance beyond each side of the latter to support a bell-crank lever **36**. A screw **37** secures the hinge pin in place. This bell-crank lever includes an arm **38** which extends radially outward through said opening **31** and is slotted to straddle the bearing block. The inner end of this arm is rockably mounted upon the hinge pin **35**. The outer end of this arm **38** is separably connected to a finger **39** to which the mouth cover **26** is secured. Such separable connecting facilitates interchanging the mouth covers as operating conditions and the size of the containers may require. The mouth covers are thin discs of a sterilizable material, such as stainless steel; and they are made sufficiently thin so that they can flex to take up slight variations in the top surface of the container. The other arm **40** of the bell-crank lever extends upwardly in proximity to the inner side of the cylindrical wall **28**. Spring means consisting of a guide pin **41** is anchored in the vertical wall **28** and extends radially inwardly through an opening **43** in said arm **40** and at its inner end carries a washer **44** and nut **45**, the

latter element being adjustable to regulate the tension of the coil spring **42**. The upper end **46** of the arm **40** of this bell-crank lever is offset and carries a pair of superposed cam rollers **47** which run upon cams **57** and **58** shaped to move the bell-crank lever as required.

These cams **57** and **58** are stationary and supported by a carrier **48** or spider, which includes a vertical center bearing **49** for a stub shaft **50**, the latter carried by a support **51**. This support **51** includes a peripheral flange **52** which is provided with an annular series of radial fingers **53** extending into openings **31** of said vertical wall **28**. The spider and a cover **54**, therefore, are connected by means of a horizontal arm **55** (FIGS. 1 and 2) to a post **56** and thereby further supported and held against undesired movement.

One cam **57** (FIGS. 2 and 3) is continuous and throughout a major part of its length is shaped to hold the bell-crank levers so that the mouth covers occupy their elevated positions. That portion of its length which is adjacent the spray nozzles **64** is shaped to allow the mouth covers to rest on the containers. This cam engages the lower cam rollers. An adjustable cam **58** is mounted in a cut-out portion of the first named cam **57** and is pivoted at one end to the latter. One end of the pivoted cam is engaged by an adjusting screw **59** which is mounted in the spider. By manipulation of this screw the pivoted, or adjustable cam may be located to permit any desired degree of elevation of the mouth covers. This varies in accordance with the point at which the containers are removed from the neck cleaning apparatus.

Encircling the upper portion of the star wheel **14** is a circular hollow chamber **60** which is supported and held stationary by a vertically adjustable bracket **61** (FIGS. 2 and 6). The bracket **61** has at its lower end vertically elongated slots **80**, through which extend bolts **81**, securing the bracket to a flanged support **83**. This support **83** is in turn bolted to the pedestal **18** by means of bolts **84**. The vertically elongated slots **80** permit vertical adjustment of the bracket **61**. The upper end of the bracket **61** is secured to a plate **85** by means of bolts **86**, the plate in turn is bolted to a flattened portion **87** on the chamber **60** by means of bolts **88**; thereby forming a rigid connection between the bracket and the chamber. This chamber **60** is connected to a cleaning fluid source (not shown) by a supply tube **62**. Chamber **60** also carries a series of circumferentially spaced radially outwardly directed spray nozzles **64** through which cleaning fluid, such as heated water or steam, is sprayed onto neck portions of the containers (FIG. 3). These spray nozzles **64** are adjusted so that the cleaning fluid will strike only those containers which have their mouths closed by the mouth covers **26**.

Spaced radially outward from the first-mentioned chamber **60** at the inlet to the cleaning apparatus A is a second hollow chamber **65**, which is connected to a supply of cleaning fluid by a supply tube **66**. This second chamber **65** is rigidly supported by a stationary plate **67** and connected to this plate by means of a spacer **69** and a nut and bolt **68**. The second chamber **65** carries a series of radially inwardly directed spray nozzles **70** which also spray cleaning fluid onto the neck portions of the containers. These spray nozzles **70** are adjusted so that they spray only closed containers.

On the opposide side of the circular chamber **60** from the first-mentioned spray nozzles **64** is another series of circumferentially spaced spray nozzles **71**. These nozzles **71** are adjusted so that they spray and cleanse the undersides of the mouth covers **26** (FIG. 4). These latter-mentioned nozzles **71** clean the undersides of the mouth covers, thereby preventing any build-up of material which might, if not cleaned off, be deposited in succeeding jars and cause contamination.

Briefly, the operation involves feeding filled containers in succession to the neck cleaning apparatus A, lowering the mouth covers onto the mouths of the containers to temporarily seal the same and to prevent spillage of product, moving the containers while thus covered in an arcuate or other defined path and spraying their neck portions with a cleaning fluid to remove any product spilled during filling, elevating the mouth covers, and then passing the containers through the vapor or capping sealing unit **15**; and simultaneously with the above operations, elevating the mouth covers and spraying their under surfaces with a cleaning fluid to remove any product remaining thereon at a point where their path of travel does not overlie the path of travel of the containers.

It will, of course, be understood that the various details of construction may be modified through a wide range without departing from the principles of this invention, and it is not, therefore, the purpose to limit the patent granted hereon otherwise than necessitated by the scope of the appended claims. As an example, the mouth covers **26**, although stated to be thin discs of stainless steel, may in practice be formed of a plastic or some rubber or rubber-like material.

I claim:

1. In combination, means for moving upright open-mouthed, filled containers is succession along a horizontal path including an arcuate section, means for effecting uniform spacing of the containers along said path, a series of vertical movable container mouth covers movable along a closed horizontal, arcuate path at least in part overlying the path of said containers, means for moving the covers along said last-named path, means for lowering said mouth covers onto the mouths of said containers in one section of their path of travel, means for elevating the mouth covers and holding them elevated in another section of their path of travel, and cleaning means for directing a cleaning medium against the exterior surfaces of the mouth ends of said containers when their mouths are closed by said covers, said cleaning means comprising a non-rotatable circular hollow chamber adjacent and spaced radially inwardly from and concentric with the path of travel of said mouth covers, said chamber having an annular series of spray nozzles to direct cleaning fluid radially outwardly and means for supplying cleaning fluid under pressure to said chamber.

2. Apparatus as defined in claim **1**, and a stationary second chamber adjacent and spaced radially outwardly from the path of said mouth covers, said second chamber having a series of spray nozzles to direct a cleaning fluid against the exterior surfaces of the neck portions of said containers when their mouths are closed, and means for supplying cleaning fluid under pressure to said second chamber.

3. In combination, means for moving upright open-mouth, filled containers in succession along a horizontal path, bell-crank levers individual to and directly suptainers along said path, a series of vertically movable container mouth covers movable also along a horizontal path at least in part overlying the path of said containers, means for moving the covers along said last-named path, bell-crank levers individual to and directly supporting said mouth covers, spring means for moving said levers to thereby lower the mouth covers onto said containers and an adjustable cam for moving the levers in opposition to the spring means to thereby elevate said mouth covers and regulably predetermine the lowermost position of the mouth covers, means for directing a cleaning medium against the exterior surface of the mouth end of said containers when their mouths are closed by said covers, and means for cleaning the undersides of the elevated mouth covers.

4. In combination, means for moving open-mouth filled containers along a horizontal path comprising a star wheel mounted for rotation about a vertical axis, said star wheel having an annular series of container

spacing devices at its periphery, mouth covering means comprisnig an annular series of vertically movable discs arranged above said star wheel for movement with the latter about said axis, said discs being adapted to provide a liquid-tight seal with the mouths of said containers, means for lowering said mouth covers onto and elevating them relative to the containers whereby said containers are sequentially provided with a liquid-tight seal and opened, first cleaning means for directing a cleaning medium against the exterior surface of the mouth end of the containers when their mouths are sealed by said covers, and second cleaning means for cleaning the undersides of said mouth covers, said second cleaning means being located in a position remote from said first cleaning means.

5. The combination defined in claim **4**, wherein said first and second cleaning means are stationary and include a series of spray nozzles.

6. A washer for unsealed containers comprising the combination of means to move a plurality of containers in an arcuate path, a container sealer rotatably mounted above said container moving means including a plurality of said sealer into sealing contact with each of the

that a portion of the rotational path of said sealer is above the arcuate path of the containers on said container moving means, means to move a sealing member of said sealer into sealing contact with each of the mouths of containers on said container moving means, container washing means positioned to clean said container washing means positioned to clean said containers while sealed by said container sealer, and sealer washing means positioned to clean each of said sealing members when it is remotely positioned from said arcuate path.

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