# United States Patent [19]

**Over et al.**

[11] **3,760,561**

[45] **Sept. 25, 1973**


[54] **CAPPING MACHINE AND METHOD**


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[21] Appl. No.: **119,466**

[52] **U.S. Cl.** ..... **53/201**, 53/331, 53/338

[51] **Int. Cl.** ..... **B65b 7/28**

[58] **Field of Search** ..... 53/334, 338, 201, 53/343, 353, 3, 42, 317, 267, 277, 310, 331, 339, 340, 282, 183



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[57] **ABSTRACT**

A capping machine is provided which includes a rotatable turret with outwardly open vertical slots around its perimeter and a plurality of spindles secured in the slots for applying swage-on closures to containers wherein such swage-on spindles can be easily removed and replaced by spindles for applying roll-on closures. The turret includes two cams, with the upper cam being adapted to vertically reciprocate either swage-on spindles or roll-on spindles, and the lower cam being adapted to move rollers on spinning headsets on roll-on spindles against the skirts of closures on containers, and further includes drive means adapted to rotate such spinning headsets to roll threads in closures' skirts, wherein such drive means is in non-obstructing position with respect to swage-on spindles when they are mounted in the turret. A method is also provided for applying swage-on closures to containers by means of such a machine.


**1 Claim, 11 Drawing Figures**

**United States Patent** [19]
**Over et al.**

[11] **3,760,561**
[45] **Sept. 25, 1973**

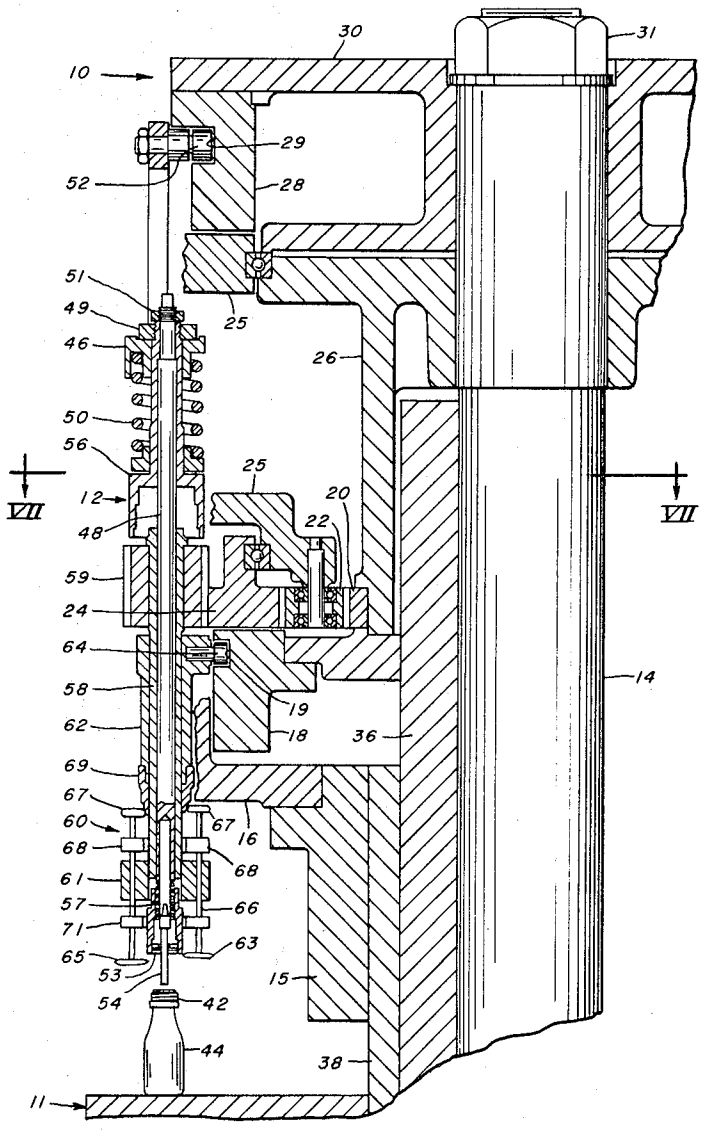

FIG. 1.

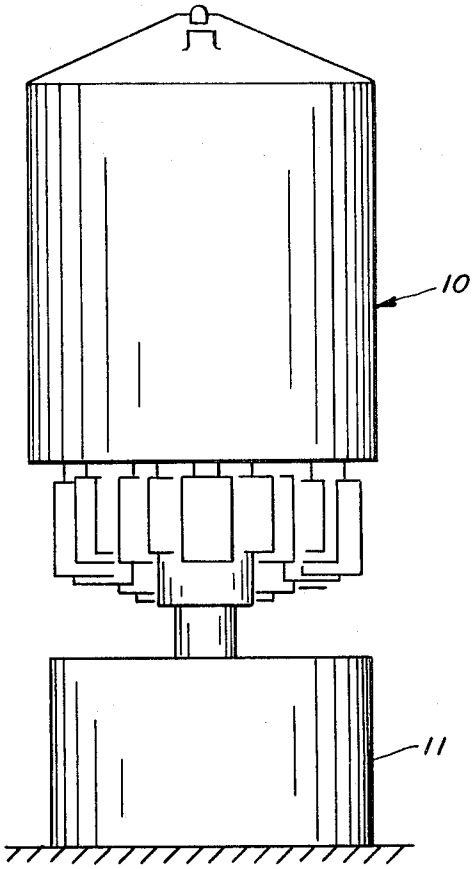


FIG. 9.

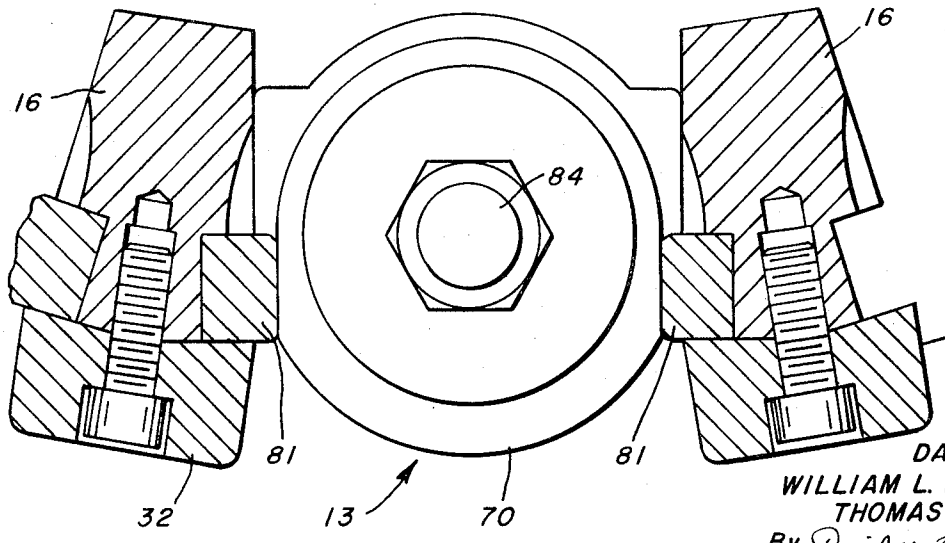


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FIG. 2.

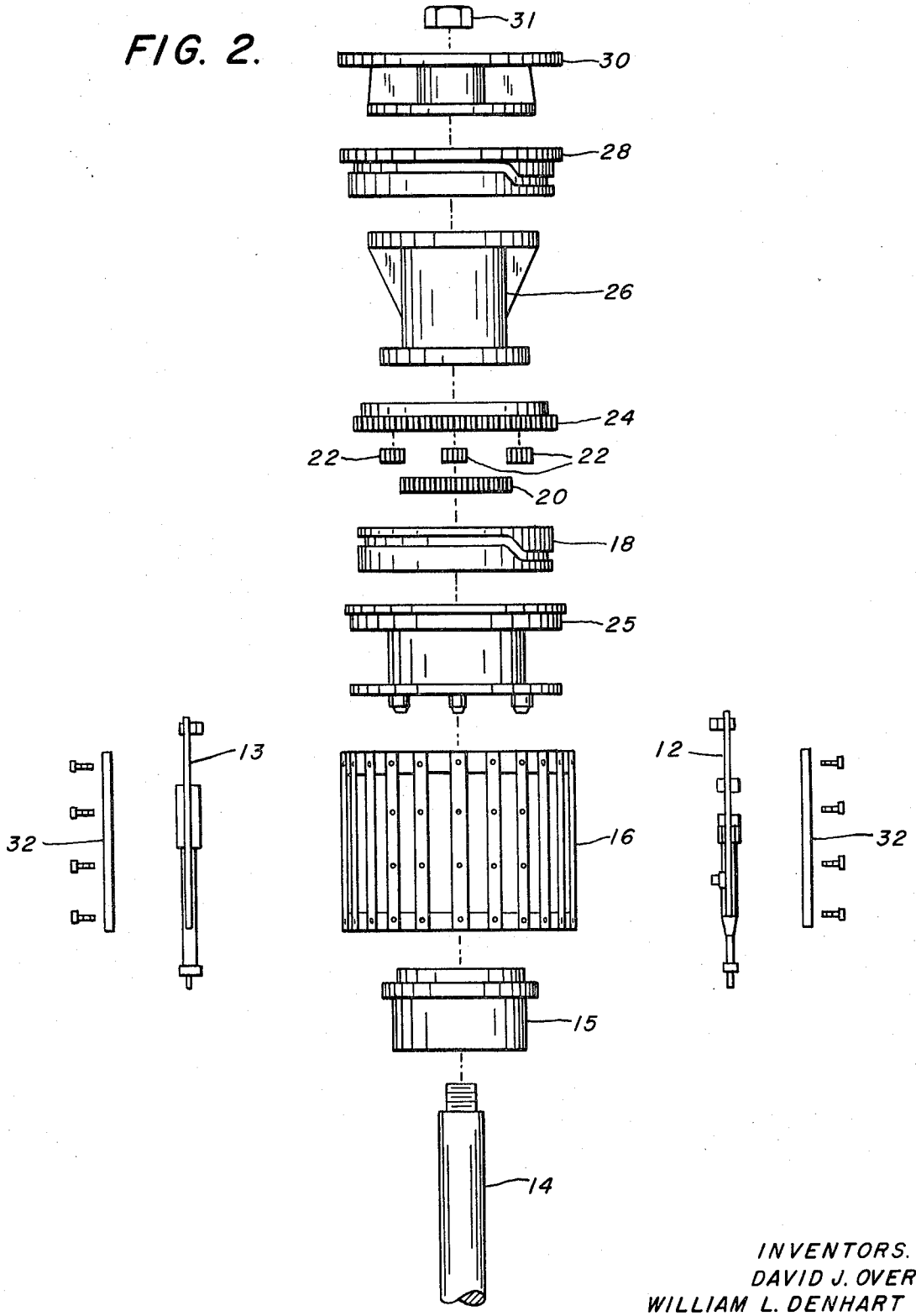


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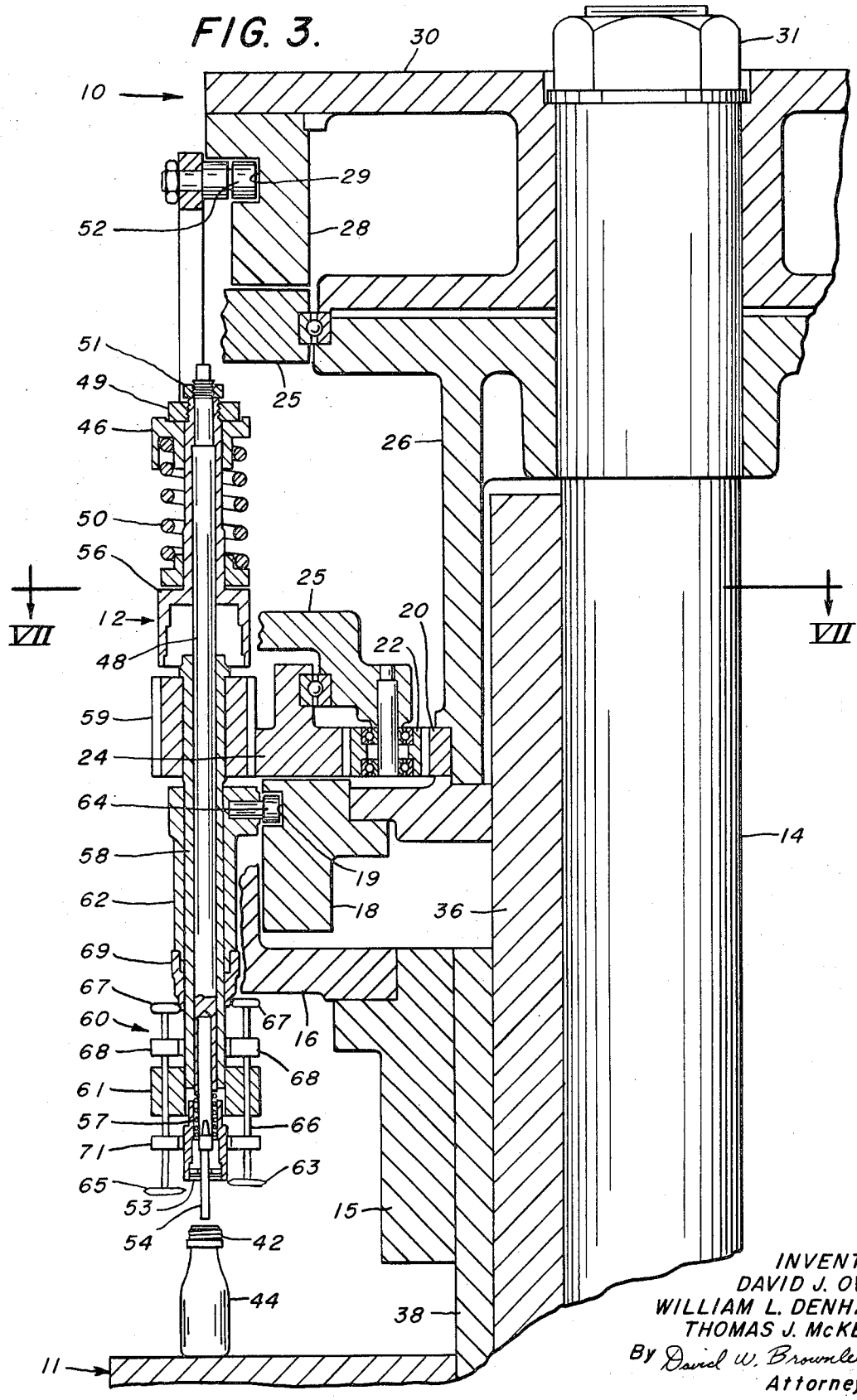
FIG. 3.

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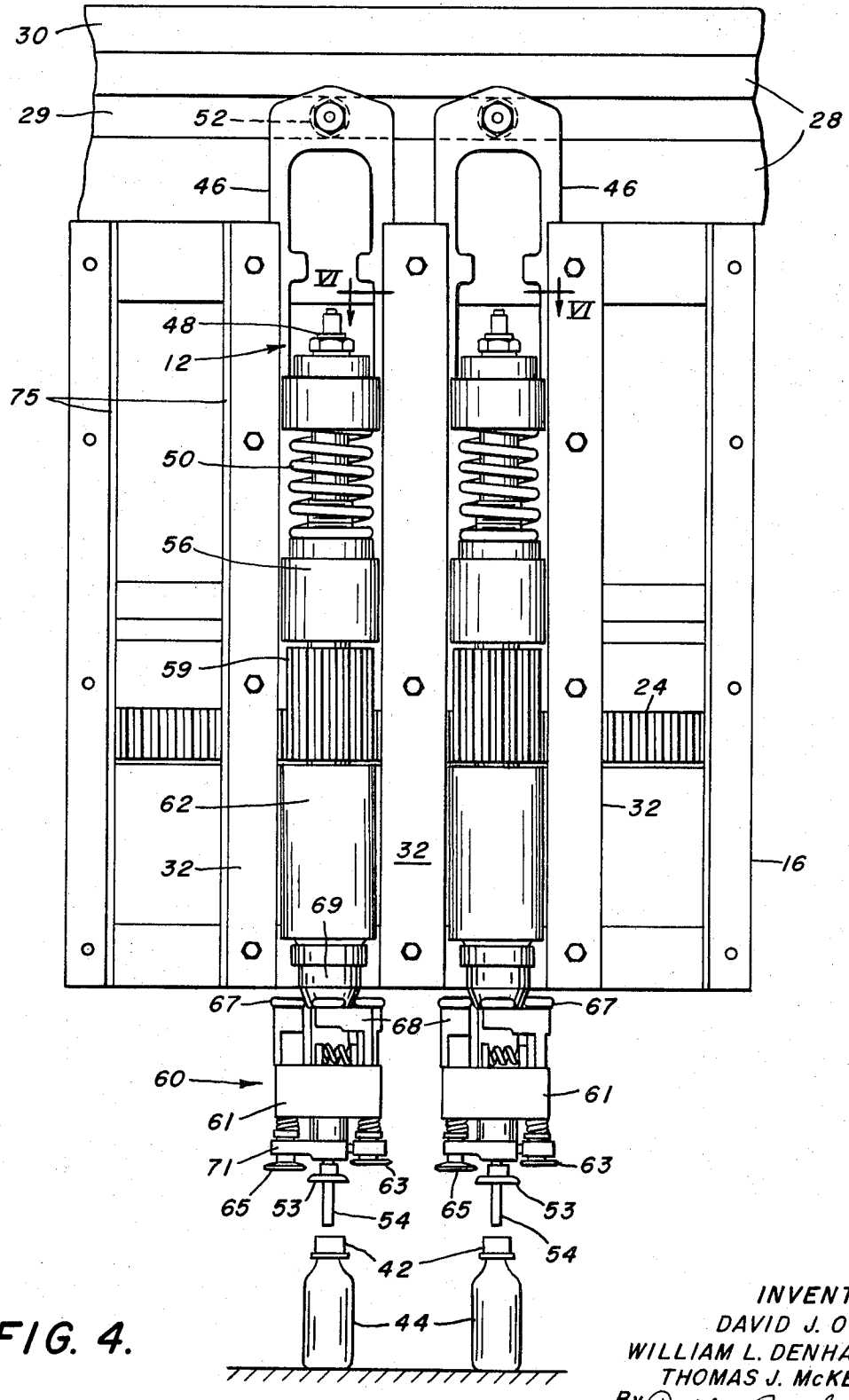


FIG. 4.

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FIG. 5.

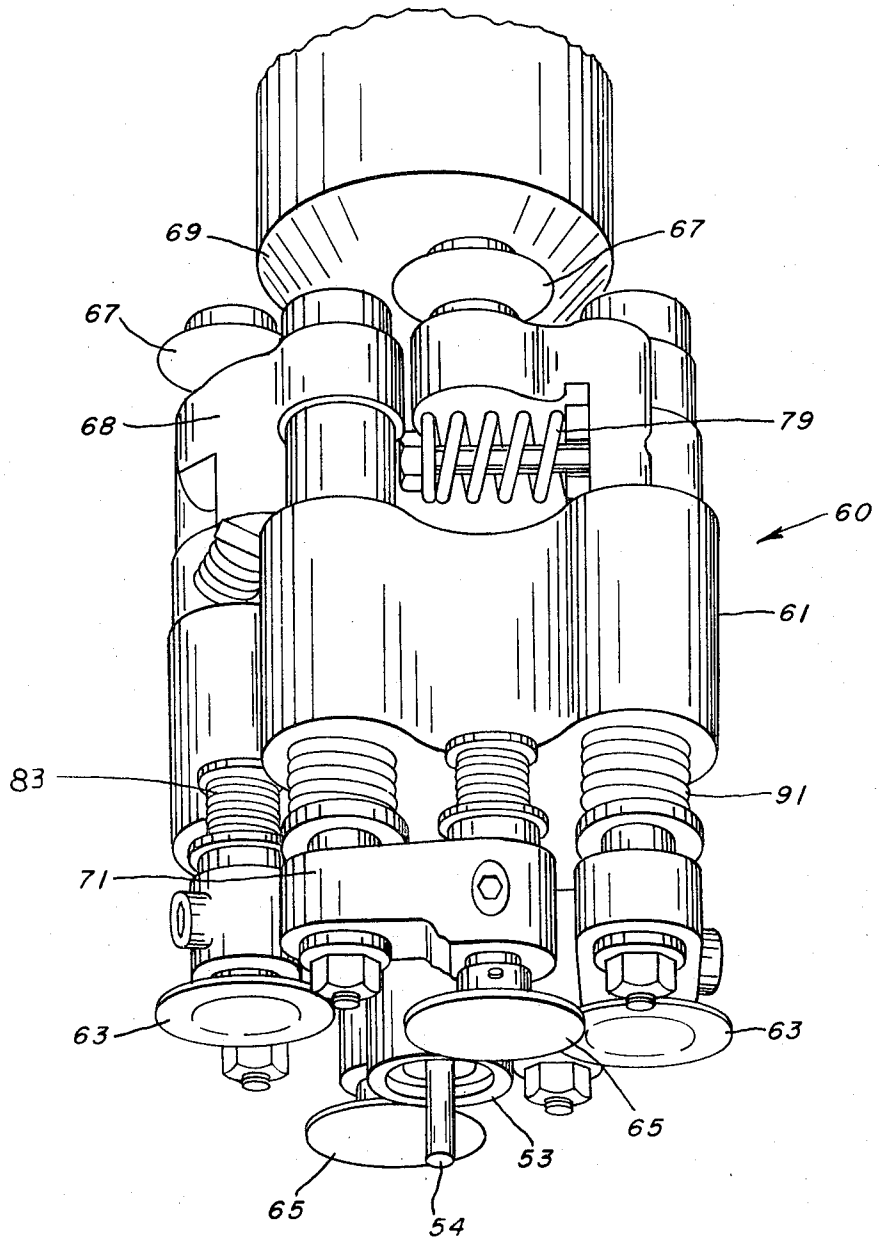


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FIG. 6.

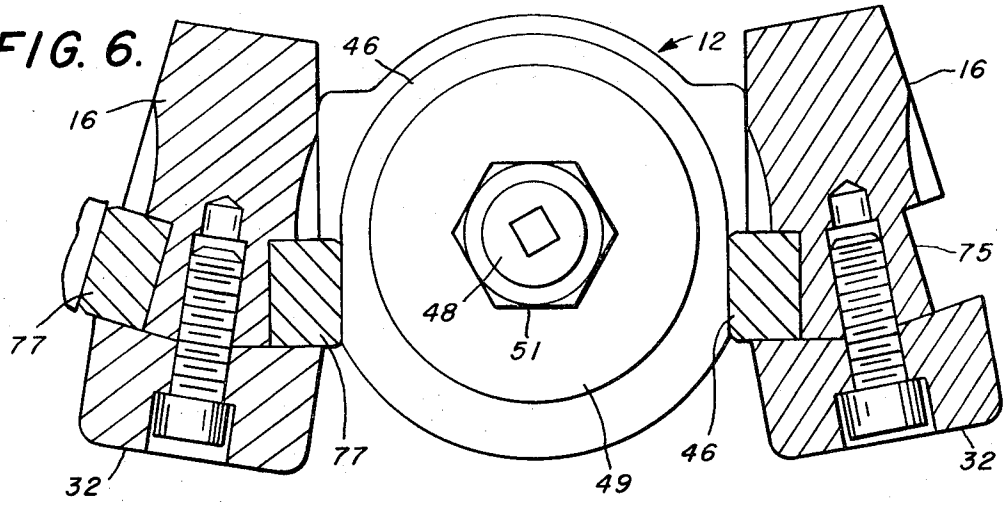


FIG. 7.

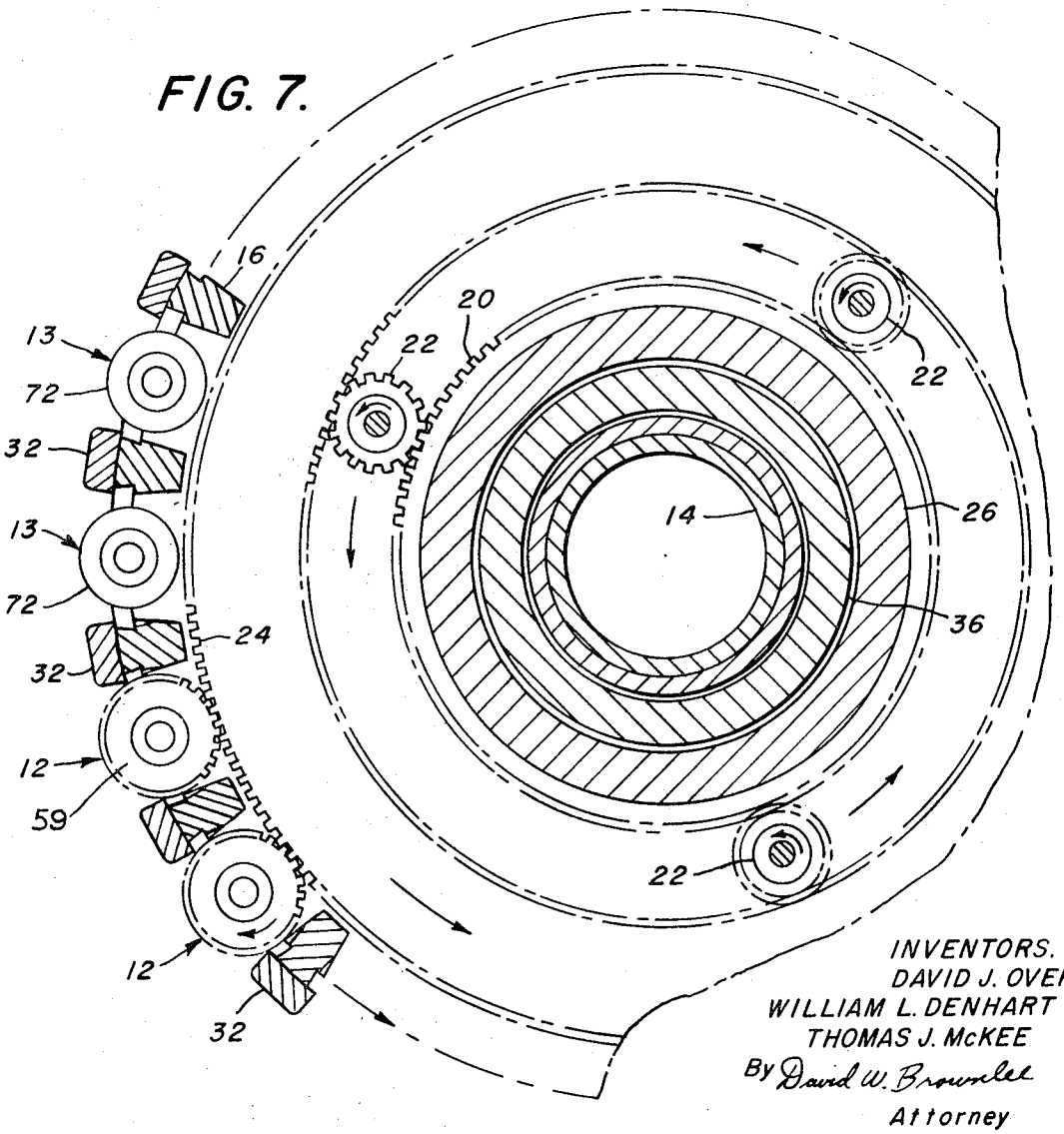


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FIG. 8.

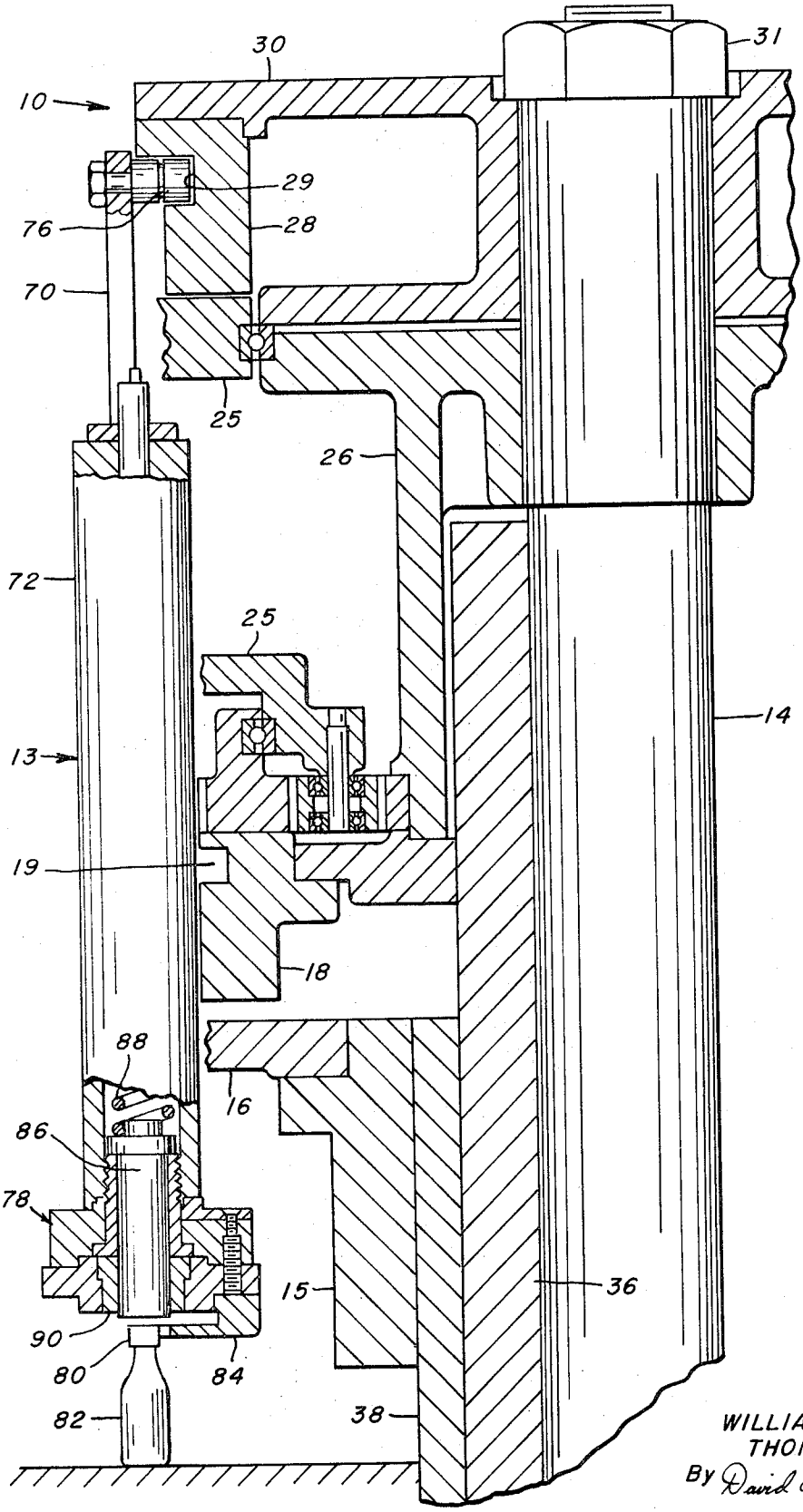


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FIG. 10.

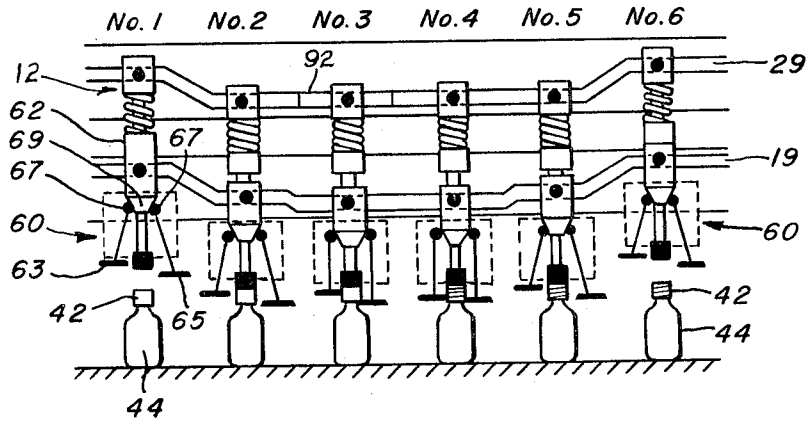
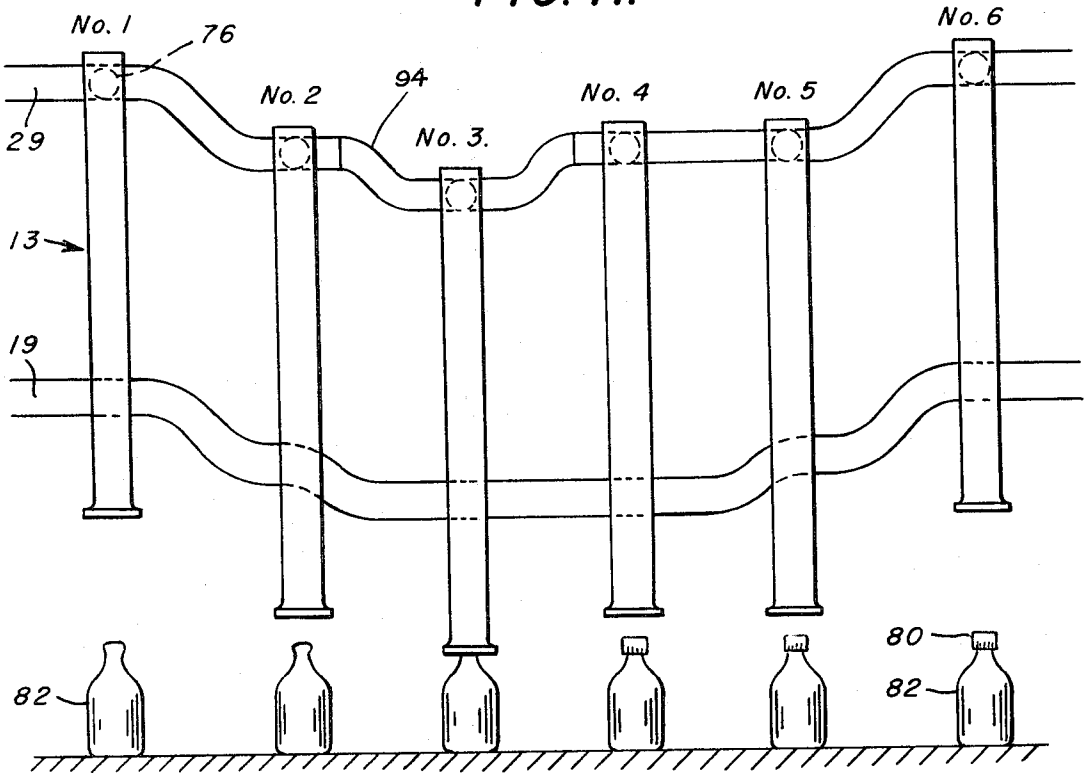



FIG. 11.

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# CAPPING MACHINE AND METHOD

## BACKGROUND OF THE INVENTION

Capping machines for applying roll-on closures have been in use for many years wherein the skirt of a closure has threads or other impressions formed in it by deformation of the skirt against a finish on a container mouth. One kind of roll-on capping machine or capper of relatively recent introduction comprises a rotatable turret with outwardly open vertical slots in it and vertically movable capping spindles in the slots wherein pressure blocks on the spindles apply top pressure against closures on containers to develop a top seal and/or a side seal, and thread rollers on the spindles move against the closures 'skirts and rotate around the closures to form threads in the skirts. Cappers for applying swage-on closures, such as crown closures, have also been in use for many years comprising a rotatable turret with vertically movable capping spindles and collets or collars on the spindles which are moved downward against closures on containers to crimp the skirts of the closures under retaining beads on the containers. A swage-on capper requires only vertical relative movement between the closure skirt and a tool to deform the skirt into affixation with a container, and requires no rotation of the capping head during affixation of a closure. But a roll-on capper has, apart from need for relative movement, forming rollers that must be rotated with respect to the closure to form threads in the closure skirt (or otherwise deform the skirt) around its entire circumference. Another difference between most roll-on cappers and swage-on cappers is that spindles and rolling headsets on roll-on cappers are usually larger in diameter and must be spaced farther apart center to center than are spindles in most swage-on cappers.

Capping machines are known as described in U.S. Pat. No. 3,470,667 which can be quickly adapted to apply either of two or more forms of swage-on closures such as crown and convenience type tear-off closures, but no capping machine has been known which can be quickly and easily changed to apply either roll-on or swage-on closures. In order to alter a capping line from the application of roll-on closures to the application of swage-on closures or vice versa, it has heretofore been necessary either to remove the complete turret of the capping machine for applying one kind of the closure and replace it with another turret for applying the other kind of closure, or to have two completely separate machines through which the flow of bottles can be alternatively routed depending on which form of closures is to be applied. The interchange of turrets is time consuming and requires that the capping line be shut down for several hours with a resultant loss in production, and the provision of two separate machines requires valuable floor space, only half of which is used at a time. Accordingly, it is desirable to provide a capping machine which can be quickly and easily changed from the application of roll-on closures to the application of swage-on closures and vice versa.

## SUMMARY OF THE INVENTION

The invention provides a capping turret which is adapted to receive and operate either roll-on or swage-on spindles, either of which spindles can be quickly and easily removed and replaced by the other form of spindles.



Accordingly, an object of the invention is to provide a capper which is adapted to receive and operate either roll-on or swage-on capping spindles.

Another object of the invention is to provide a turret for a capping machine which has outwardly open vertical slots around its perimeter for receiving either roll-on or swage-on spindles, and which has a first cam means for vertically reciprocating either form of spindle, a second cam means for moving rollers of headsets on roll-on spindles against a closure skirt and drive means for rotating the headsets on roll-on spindles, wherein the drive means is in non-obstructing position with respect to swage-on spindles when they are positioned in the turret.

A further object of the invention is to provide a method of quickly and easily changing a capper from the application of swage-on closures to the application of roll-on closures and vice versa.

## BRIEF DESCRIPTION OF THE DRAWINGS

The above and other objects and advantages of the invention will be more fully understood and appreciated with reference to the following description and the drawings appended thereto wherein:

FIG. **1** is an elevational view illustrating a turret of the invention encased in protective shrouding;

FIG. **2** is a perspective assembly drawing of the turret of FIG. **1** illustrating the major components of the turret;

FIG. **3** is a partial cross-sectional view of the turret of FIG. **1** showing a roll-on spindle in one of the vertical slots in the turret;

FIG. **4** is a partial side elevation view of the turret of FIG. **3** showing two roll-on spindles mounted in the turret;

FIG. **5** is a perspective view of a headset for a roll-on spindle;

FIG. **6** is an enlarged cross-sectional view of the spindle of FIGS. **3** and **4**, taken along line VI—VI of FIG. **4**, and illustrating securement of the spindle in the turret;

FIG. **7** is a partial cross-sectional view through the turret taken along line VII—VII of FIG. **3** illustrating drive means for operating roll-on spindles in the turret, along with two roll-on spindles and two swage-on spindles;

FIG. **8** is a partial cross-sectional view similar to FIG. **3** illustrating a swage-on spindle in one of the turret slots;

FIG. **9** is an enlarged cross-sectional view similar to FIG. **6** except illustrating securement of a swage-on spindle in the turret;

FIG. **10** illustrates cam tracks in a turret of the invention laid out in plan to show the functioning of roll-on spindles and headsets in the cam tracks; and

FIG. **11** is an illustration similar to FIG. **10** showing swage-on spindles and their functioning.

## DESCRIPTION OF A PREFERRED EMBODIMENT

Referring to FIG. **1**, a capping machine of the invention is illustrated in the form of a turret assembly **10** which is adapted to be mounted on a conventional capper base **11** which supports and drives the turret for the application of closures to containers. Turret assembly **10** may have spindles mounted in it for applying roll-on closures, or alternatively may have spindles mounted in it for applying swage-on closures. As used herein,

swage-on spindles means spindles with capping heads which include a collar, collet, crimping ring or the like which is moved axially to crimp, swage, draw or otherwise constrict a portion of a closure to affix it to a container. Roll-on spindle is used to mean a spindle with a spinning headset which rotates around a closure to deform it against a container. As is conventional, a capper base on which turret **10** is to be mounted may have means associated therewith such as a star wheel, feed screw or the like (not shown) for conveying containers to the turret for affixation of closures to the containers, and similar means not shown for moving sealed containers laterally away from the turret. A capper will also usually include a cap feed system, not shown, for feeding closures onto containers or into the capping heads for affixation to containers. A turret of the invention may be adapted to receive any number of spindles with capping heads, but for purposes of illustration, turret **10** will be described with positions for mounting 20 spindles therein. Obviously, the greater the number of spindles, the greater the number of containers which can be capped per revolution of the turret. However, the greater the number of spindles, the larger the turret will be. Accordingly, an appropriate number of spindles may be selected depending on the space available for the turret and desired capping speeds. It is noted that a turret of the invention can be operated with spindles mounted in less than all of the positions for receiving such spindles, for example, in only every other spindle position.

Referring to FIG. **2**, the major components of a turret assembly are illustrated as comprising a center support column **14**, a turret hub **15**, a turret frame **16** with a plurality of outwardly open vertical slots around its circumference, a lower cam **18**, a bull gear **20**, three planetary gears **22**, a ring gear **24**, a planetary gear support **25**, a turret support sleeve **26**, an upper cam **28**, an upper cam support **30** and a nut **31**. Also shown are a roll-on spindle **12** and a swage-on spindle **13**, a complete set of one or the other of which may be disposed in the vertical slots in turret frame **16** with a gib plate **32** secured over each such spindle.

It is a feature of the invention that turret frame **16** comprises a plurality of vertical bars which are joined at their ends by circular discs with vertical slots between the bars for receiving either roll-on or swage-on closure-affixing spindles therein. A drive means is provided in the turret which rotates headsets on roll-on spindles and which is particularly designed so that it can remain in the turret when swage-on spindles **13** are mounted in the turret slots and will not interfere with such swage-on spindles. It is another feature of the machine that a common cam track effects the vertical movement of either roll-on spindles or swage-on spindles, depending on which set of spindles is mounted in the turret. However, as will be explained, a section of the upper cam track may be interchangeable depending on which set of spindles is mounted in the turret. With a turret of the invention, a full set or complement of both roll-on and swage-on spindles will usually be provided, but only one set will be mounted in the turret at any one time. The other set of spindles will be stored until it is desired to change the capping capability of the turret. When such change is desired, gib plates **32** can be removed from the turret to permit easy removal of the spindles which are mounted in the turret, and the other set of spindles can be positioned in the turret slots and the gib plates secured thereover. When this has been done the closure feed system is changed to supply an alternative type of closure, and turret **10** is ready to perform its alternative capping capability. Such change of capping capability can be effected in approximately 4 hours which means only a small loss in production.

Turning to FIG. **3**, a turret assembly **10** is illustrated with a roll-on spindle **12** mounted in one of the vertical slots. Turret assembly **10** is mounted on a capper base **11** which includes a support sleeve **36** and a drive sleeve **38** for rotating turret frame **16** with roll-on spindles **12** therein during capping. Center support column **14** of the turret assembly extends through the support sleeve **36** and is fixedly secured and positioned in the support sleeve by means not shown. The capper base may also include means, not shown, for adjusting the height of the turret assembly to accommodate various container heights. A turret support sleeve **26** and an upper support **30** are secured on the upper end of center support column **14** by means of a nut **31** or the like, and are secured to the column by means of a key or other locking means not shown. Lower cam **18** is secured to turret support sleeve **26**, and upper cam **28** is secured to upper support **30**. Since the turret support sleeve, upper support and two cams are secured to center support column **14** which does not rotate, these parts also do not rotate. Turret hub **15**, turret frame **16** with spindles mounted therein, and planetary gear support **25** are secured to drive sleeve **38** which does rotate. Accordingly, when drive sleeve **38** is driven, support **25**, turret hub **15**, turret frame **16** and the spindles therein are rotated around center support column **14** and rotated with respect to stationary cams **18** and **28** and cam tracks **19** and **29** in the cams.

A cross-section of roll-on spindle **12** mounted in one of the outwardly open slots in turret frame **16** is shown in FIG. **3**. This spindle is mounted in the frame by means of gib plates, not shown, mounted over marginal edges of the spindle which are disposed in guide ways in the frame as will be described. For purposes of illustration, a roll-on spindle has been selected which is adapted to apply closures **42** of a well-known kind to containers **44**, wherein threads are formed in the closure skirt and a bottom edge portion of a locking band on the closure is turned under a retaining bead on the container, as described in U.S. Pat. No. 3,303,955. However, other rotatable spindles, with or without the capability of turning the edge of a locking band, may be mounted in a turret of the invention. Such rotatable spindles may even include spindles for applying screw-on closures which are rotated with respect to containers during application.

Referring to FIGS. **3** and **4**, roll-on spindle **12** comprises a support yoke **46** resiliently mounted on a shaft **48** by means of a coil spring **50** and a housing **56**, with a cam follower **52** secured to the top of the yoke. Cam follower **52** is disposed in cam track **29** in cam member **28** and follows the up and down path of the track to move yoke **46** up and down as spindle **12** is rotated around the turret and the stationary cam track (FIG. **10**). Cam follower **52** may include two rollers, one of which contacts only the top face of track **28** and the other of which contacts only the bottom face of the track. With two such rollers, both rollers always maintain their same direction of rotation during rotation of turret **10** and spindles **12**. This produces less wear on the cam follower than is created in a cam follower

which has only one roller which contacts the top of the track during part of its travel and the bottom of the track during part of its travel and which must reverse its direction of rotation when moving from contact with one surface to contact with the other.

In the body of spindle **12** coil spring **50** is supported on a housing **56** which is rigidly attached to shaft **48.** A nut **49** is threaded on the end of housing **56** to secure yoke **46** thereon, and a nut **51** is threaded on the end of the shaft **48** so that the vertical movement of the yoke resiliently acts on the shaft with compression of the spring moving the upper end of the shaft upward through an open center of the yoke. The bottom end of pressure shaft **48** has a pressure block **53** mounted on it and may include a small plunger **54** resiliently mounted in shaft **48** by means of a spring **57** for holding a closure **42** on a container **44.** Pressure block **53** may also include a closure stripper or knock-out which is not shown.

Spindle **12** further includes a drive sleeve **58** with driven gear **59** secured thereto mounted on head pressure shaft **48** below housing **56** so that the collar and gear can freely rotate on shaft **48,** and a slide **62** over drive sleeve **58** with a cam follower **64** attached to the upper end of the slide and a tapered cone **69** attached to its lower end. During capping, gear **59** is continually rotated by drive means which will be described, which in turn rotates drive sleeve **58** and spinning headsets **60** which are attached to the sleeve.

Referring to FIGS. **3–5,** headset **60** selected for illustration essentially comprises a head body **61** fixedly attached to sleeve **58,** at least one thread roller **63,** at least one band roller **65,** pivot shafts **66** through the head body for each roller **63** and **65,** cam rollers **67** for each roller **63** and **65,** cam follower arms **68** mounted resiliently on pivot shafts **66** through springs **79,** spinning roller arms **71** mounted on each pivot shaft, and torsion springs **91** for holding the cam rollers on upper cam follower arms **68** against the outer surface of cone **69.** Rollers **63, 65** and **67** are all mounted in holes in pivot arms **68** and **71** and are free to rotate when in contact with a non-rotating surface such as the surface of a closure skirt or the outer surface of cone **69** about which headset **60** rotates. A headset for applying closures with locking bands preferably includes two each of the thread and band rollers **63** and **65** along with the required pivot arms, pivot shafts and cam rollers for each such roller, although this is not essential to the invention. For example, a headset for applying closures which do not have locking bands will require no band rollers. Headsets **60** may also include springs **83** on each roller **63** and **65** for resiliently mounting these rollers to accommodate small variations in the vertical height of the finish on a container **44,** and to allow roller **63** to follow the thread helix on the container.

As stated above, cam rollers **67** roll on the outer surface of tapered cone **69.** This cone is attached to slide **62** which is vertically reciprocated according to the movement of cam follower **64** in cam track **19** (FIG. **10**). This vertical movement of slide **62** and cone **69** cam rollers **67** in and out with respect to the axis of spindle **12** and this pivots rollers **63** and **65** in and out on the spindle by means of pivot arms **68** and **71** and pivot shaft **66.** Accordingly, as spindles **12** are rotated around turret **10,** thread and band rollers **63** and **65** are pivoted in and out against the skirt of closure **42** on container **44** and rotated around the closure to roll threads in the closure skirt and turn a lower edge of a locking band on the closure around its entire circumference as will be described.

To secure spindles **12** in turret frame **16** wherein the spindles will be free to move vertically as described above, ways **75** are provided in the edges of the vertical bars in the turret frame (FIGS. **4** and **6**) and ribs **77** on the marginal edges of yoke **46** and lower cam slide **62,** not shown, are disposed in the ways and retained therein by means of gib plates **32** which are bolted to the turret frame. The guide grooves formed by the ways **75** in the bars of turret frame **16** and gib plates **32,** and ribs **77** on the marginal edges of yoke **46** and cam slide **62** are dimensioned so that the ribs have a slight clearance with respect to the grooves to permit the ribs to slide freely in the grooves. Grease or other lubrication may be provided between the grooves and ribs to facilitate this relative motion.

Referring to FIG. **7** in conjunction with FIG. **3,** a drive means for the capper is illustrated which will rotate headsets on roll-on spindles **12** in a clockwise direction on the axes of the spindles as the spindles are rotated in a counter-clockwise direction around the axis of the turret. The direction of rotation of the turret on its axis is not important to the capping operation, but it is desirable to rotate headsets **60** in a clockwise direction in order to form right hand threads in closures **42** during their affixation to containers **44.** Turret **10** could rotate in a clockwise direction instead of counter-clockwise as shown, and other known arrangements could be provided for rotating headsets **60** in the desired clockwise direction.

In the drive means selected ffor illustration, bull gear **20** is secured to main support frame **26** and is stationary as is the main support frame. Planetary gears **22,** however, are carried by gear support **25** (FIG. **3**) which rotates with turret frame **16.** Consequently, gears **22** rotate around the bull gear **20** in the same counter-clockwise direction as does turret frame **16.** This counter-clockwise rotation of planetary gears **22** around the axis of the turret causes gears **22** to rotate in a counter-clockwise direction on their own axes, and ring gear **24** to rotate in a counter-clockwise direction about the axis of the turret assembly. The counter-cockwise rotation of ring gear **24** in turn rotates driven gear **59** and headset **60** clockwise about the axes of the individual spindles as the spindles are rotated around the capper axis. Gears **20, 22, 24** and **59** are all selected with an appropriate gear pitch and gear diameters so that a headset **60** will be rotated a sufficient number of rotations about the axis of the spindle on which it is mounted in each revolution of the turret **12** on its axis in order to ensure that the complete circumference of a closure skirt will be deformed against a container's finish during the rolling operation as will be explained. It is noted that the vertical bars in turret frame **16** may have notches cut in it at the vertical location of gears **59** as shown in this FIG. **6** to provide space for the gears, but this depends on the size of the gears and the space provided between the bars in the turret frame, and is not critical to the invention.

Referring to FIG. **8,** a turret assembly **10** is illustrated with a swage-on spindle **13** in one of the vertical slots in turret frame **16.** Turret assembly **10** illustrated here has not been changed from that illustrated in FIG. **3** and described above except that a section of the upper cam track has been removed and replaced with another

section (FIG. 11), and swage-on spindles 13 have replaced roll-on spindles in the turret. As will be described, a section of upper cam track 29 has been replaced so that head pressure will be applied against swage-on closures and containers for only a short period of time. Spindle 13 may include a yoke 70 similar to the yoke on a roll-on spindle 12. Yoke 70 is mounted on spindle body 72 and has a cam follower 76 attached to its top which is disposed in upper cam track 29 in cam 28 for following the path of the cam track as the spindle is rotated around the capper. A capping head for applying a swage-on closure 80 to a container 82 is mounted on the bottom end of spindle 13, and may be any of a variety of well known heads. Capping head 78 selected for illustration includes a head pressure shaft 86 resiliently mounted in the spindle by means of spring 88, a crimping collar 90 and a semi-circular closure guide member 84. A closure 80 is preferably fed into the space between head pressure shaft 86 and guide member 84 for affixation to container 82 upon the downward stroke of spindle 13.

As shown in FIG. 9, yoke 70 and the spindle body (not shown) on swage-on spindle 13 have opposed mounting ribs 81 for slidably mounting spindle 13 in the ways in the vertical bars of turret casting 16 in a manner similar to that illustrated in FIG. 5 wherein roll-on spindles 12 are mounted in turret frame 16. The same gib plates 32 can be used to effect this securement of swage-on spindles 13 in the turret as were used to secure roll-on spindles 12 in the turret. With this securement means, roll-on or swage-on spindles, as the case may be, can be easily removed and replaced by the other form of spindles. Referring to FIG. 7, it is noted that spindle body 72 does not interfere with ring gear 24 in the turret assembly when swage-on spindles 13 are mounted in the turret. Although both roll-on spindles 12 and swage-on spindles 13 are shown in the turret assembly of FIG. 7, this is done only for purposes of illustration. Both types of spindles would not be mounted in a turret at the same time during the operation of a capping machine.

In operation of a capping machine of the invention, turret frame 16 may have either a set of roll-on spindles or a set of swage-on spindles mounted in the vertical slots in the turret with gib plates secured thereover for application of either kind of closures to containers. If, for example, roll-on spindles are mounted in the turret, the capping machine can be operated to affix closures to containers with a threaded finish thereon as illustrated in FIG. 10. This FIG. shows circular cam tracks 19 and 29 with the two tracks parallel except that a section of lower track 19 is offset further from upper cam track 29 than is the remainder of the track. Two steps in the lower cam track provide this offset. When roll-on spindles 12 are rotated around the stationary cam tracks, tracks 19 and 29 first cam the entire spindle downward from position No. 1 to position No. 2. This applies top pressure against closure 42 on container 44 to produce a top seal on the container. After the top seal is effected, lower cam track 19 moves cam follower 64 and slide 62 downward to move rollers 63 and 65 against the skirt of closure 42 by camming rollers 67 outwardly on the tapered cone 69 on the slide. Inasmuch as headset 60 is being continually rotated in a clockwise direction by a drive means described above, the pressure of rollers 63 and 65 against the closure skirt deforms the skirt against the container's finish around the entire circumference of closure 42 to affix the closure to container 44 as the closure and container are moved from position No. 3 to position No. 4.

After closure 42 has been affixed to container 44, lower cam track 19 moves slide 62 upward to permit rollers 63 and 65 to be pulled outward by mechanical springs 91 (FIG. 5) and away from the closure skirt (position No. 5). As spindle 12 moves from position No. 5 to position No. 6, the entire spindle is raised off the sealed container by both cam tracks acting simultaneously on the cams and the spindle. All of spindles 12 on a turret are moved around the turret in the path shown in FIG. 10, and each spindle applies a closure to a contianer during each revolution of the turret. Accordingly, with 20 spindles, 20 containers can be closed during each such revolution of the turret.

With roll-on capping machines which have been previously known, the machines have not had the capability of being quickly adapted to apply swage-on closures. To change a line from roll-on to swage-on closures, either the entire capper turret assembly had to be removed from a filling line and replaced with a turret to affix swage-on closures or the bottle path had to be changed to route bottles through a crowner instead of a capper. The present invention has simplified this by making the turret adaptable to receive either roll-on or swage-on spindles. To change the capping capability of the machine, it is a simple matter to remove the four bolts in each gib plate 32 for removal of the gib plates. With the gib plates 32 removed, roll-on spindles 12 can be removed from the open ways, and a section of the upper cam 28 can be changed if desired. Swage-on spindles 13 can then be positioned in the ways in place of the roll-on spindles, the gib plates 32 again bolted into position over the swage-on spindles, the cap feed system switched and the machine is ready to run.

Referring to FIG. 8, all the drive gears remain in the turret assembly when swage-on spindles 13 are mounted in the turret, but the gears do not contact or interfere with the swage-on spindles (FIG. 7). Further, the turret is designed so that swage-on spindles 13 can use the same upper cam track 29 as do roll-on spindles, but a section of the upper cam can be removed and replaced so that the swage-on spindle will be raised off closure 80 on container 82 within a few degrees of rotation after it has moved down to apply the closure. Cam follower 76 on the swage-on spindles is positioned in upper cam track 29 and follows the same path as cam follower 52 on roll-on spindles 12 except for the replaced section of the track. Lower cam 18 remains in the turret assembly when swage-on spindles 13 are mounted in the turret, but this cam is inoperative and does not interfere with the swage-on spindles. The reason that a section of upper cam track may be replaced by another section is to minimize the load on the turret and minimize the time period during which container 82 will be subjected to the top pressure of the pressure head against closure 80. There is no need for swage-on spindle 13 to dwell in a down position, whereas a roll-on spindle requires an extended down dwell in order to roll threads in a closure skirt. Accordingly, the upper cam track can be temporarily modified by changing a short section of cam 28. This can be done by removing a section 92 (FIG. 10) of upper cam 28 between positions No. 2 and No. 4 and replacing it with a section 94 (FIG. 11) which will add a short down stroke to the spindle travel between these positions. Since upper

cam track **28** is exposed outwardly, it is a simple matter to make this change with little time loss. The upper cam **28** can be partially cut out to receive either section which can be in the form of either a single piece or upper and lower sectors which may be bolted or otherwise secured in the cut out portion of the cam. This interchange of a section of upper cam **28** is not essential to the invention although it is preferred.

To apply swage-on or crown closures **80** to containers **82,** a turret assembly is rotated in the same manner as it is rotated for applying roll-on closures. This moves spindles **13** with respect to the stationary cam tracks as illustrated in FIG. **11** but does not rotate the heads on the spindles as is done with spinning headsets on roll-on spindles. Cam track **29** moves spindle **13** down to apply a crown closure **80** on a container **82** which has a locking bead on its entrance mouth. Referring to FIG. **8,** shaft **86** applies a top pressure against the top of the crown closure **80** during the downward travel of spindle **13** to compress spring **88,** and collar **90** moves downward against the closure skirt to crimp the fluted skirt of a crown closure under a bead on the container finish and thereby lock the closure on the container. A stripper, not shown, may also be provided on such a head for stripping a closure from the head on the upward stroke of spindle **13.**

Referring again to FIG. **11,** position No. **2** shows spindle **13** upon completion of the initial down stroke which would be the full down position for a roll-on spindle **12.** Spindle **13** is then lowered to its full down position No. **3** by the special cam insert and a closure **80** is swaged on container **82.** Cam follower **76** then raises spindle **13** between positions No. **3** and No. **4** and between positions No. **5** and No. **6,** and the spindle remains in the raised position for the remainder of the rotation of the turret. If upper cam track **29** had not been changed but remained as shown in FIG. **8** there would be no change between positions No. **2** and No. **5.** The turret assembly **10** would be lowered so that spindle **12** would be held against the closure on the container as spindle **13** moved around the turret between positions No. **2** and No. **5** with no effect on the closure between these positions. However, this would put the load of several spindles, as compressed downward against closures on containers, and might break the containers and would cause more load on the turret. Accordingly, a section of cam track **29** is preferably replaced to reduce duration of the load on each container. Lower cam track **19** is shown in FIG. **9,** but is not connected to spindle **13** and has no effect on it. When spindle **13** is raised by cam **76** to position No. **4,** spring **88** (FIG. **8**) moves head pressure shaft **86** downward through collar **90** to strip the collar from closure **80** on container **82** to free the sealed container so that it can be moved out from under the spindle. As with roll-on spindles, each swage-on spindle **13** applies a closure during each revolution of the turret.

To change turret assembly **10** from the application of swage-on closure to the application of roll-on closures, the reverse process of that described above is followed. Gib plates **32** are removed, swage-on spindles **13** are removed outward from the slots in the turret, a sector of cam **28** is temporarily modified as described above, roll-on spindles **12** are put into the slots, gib plates **32** are bolted on over the roll-on spindles, the cap feed is changed and the turret assembly is again ready to apply roll-on closure to containers.

It is therefore seen that a novel turret assembly has been illustrated and described and a method provided for changing such turret assembly from the application of roll-on closures to the application of swage-on closures and vice versa. Although particular spindles have been selected for illustration, any of a variety of known spindles for applying either form of closure, or even screw-on closures, can be mounted in a machine of the invention. Moreover, it will be obvious to one skilled in the capping art that many details of the machine can be changed without departing from the invention.

What is claimed is:

**1.** In a machine for applying closures which includes a rotatable turret with a plurality of outwardly open vertical slots around its circumference for receiving closure-applying spindles therein, upper cam means for moving spindles vertically in the slots, lower cam means for moving, when present, rollers of headsets on roll-on spindles radially inward with respect to the axes of the spindles and gear means for spinning such headsets when present, the improvement comprising said gear means including a stationary bull gear on the axis of the turret, at least one planetary gear in engagement with said bull gear and secured to the turret for rotation with the turret, and a freely rotatable ring gear in engagement with the planetary gear and adapted to engage gears on roll-on spindles to rotate spinning headsets on such spindles.

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