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2,858,659

APPARATUS FOR APPLYING CLOSURES TO CONTAINERS

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2 Sheets-Sheet 1

Fig. 1

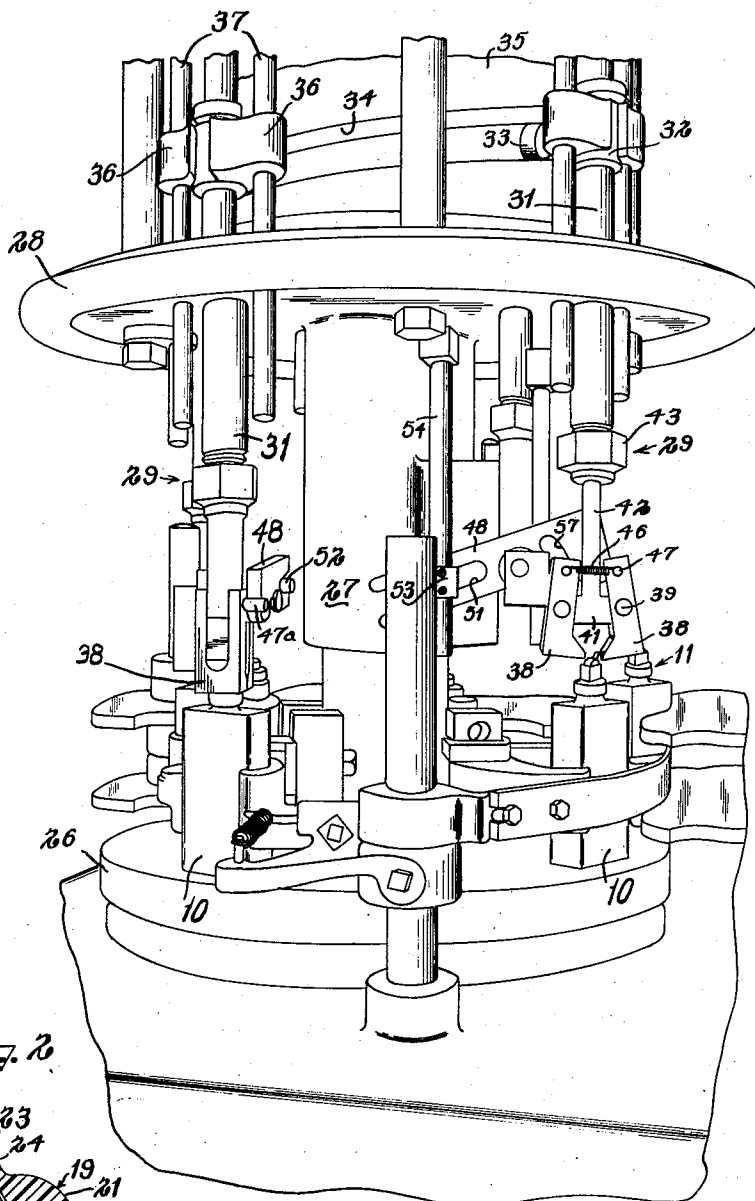
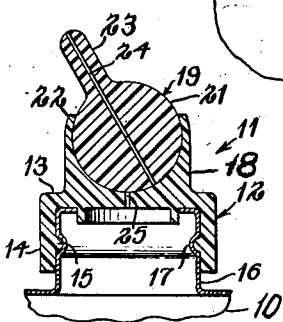


Fig. 2



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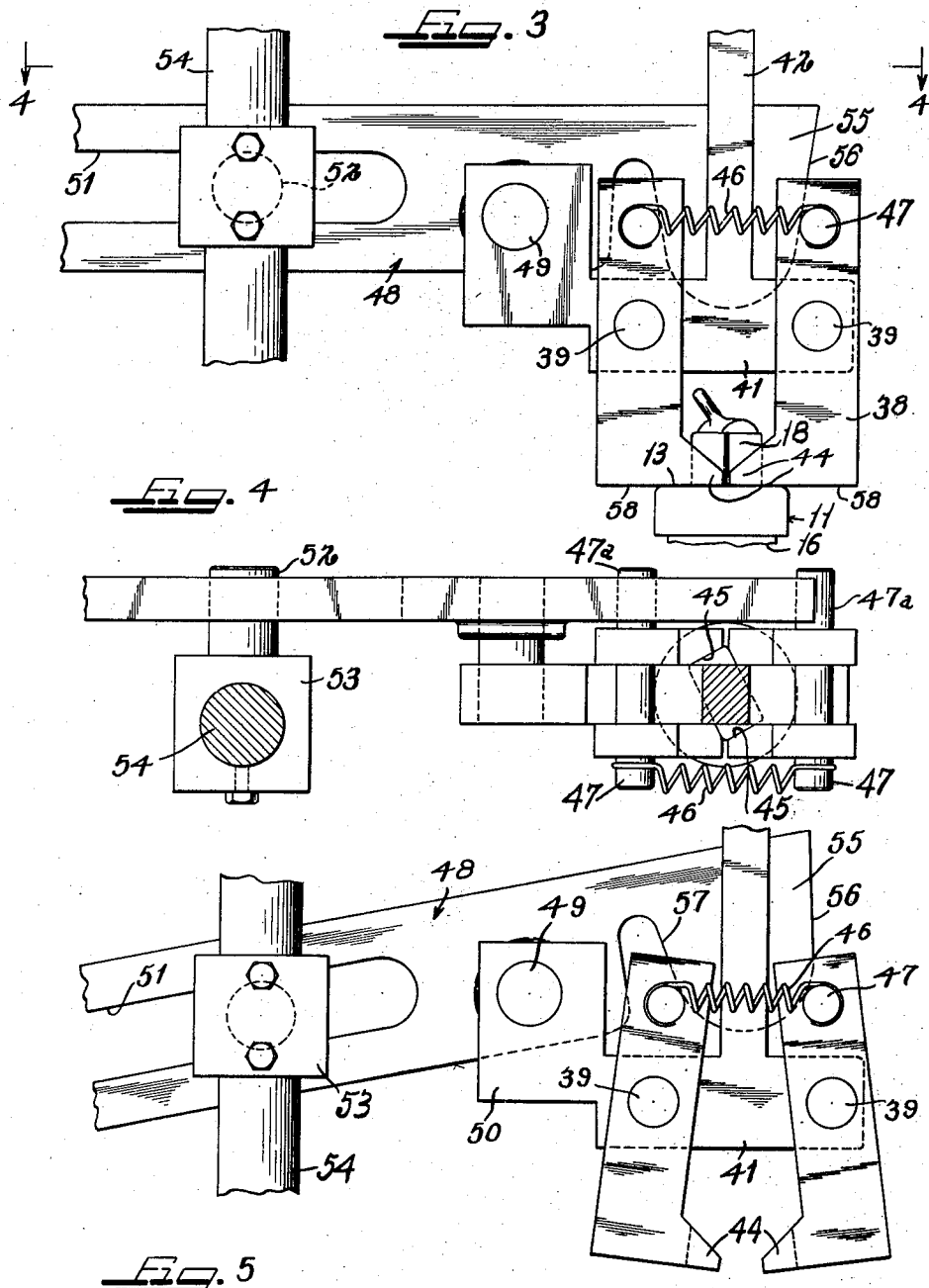
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2 Sheets-Sheet 2



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APPARATUS FOR APPLYING CLOSURES TO CONTAINERS

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21 Claims. (Cl. 53—287)

The invention relates to a method and apparatus for applying closures or spouts to containers.

Volatile fluid, such as lighter fluid, is merchandised in a small metal container having an upstanding tubular neck formed with an external circumferential groove. The groove receives therearound the skirt portion of a pliable plastic spout which, in the present instance, includes an intermediate shoulder portion that overlies the top of the neck and a substantially rectangular extension containing a turret valve. During packaging, containers are conveyed along a guide track onto a turntable. They may be filled before or after entering onto the turntable. The turntable has associated with it means to press a spout or other type closure, previously positioned loosely on the tubular neck, downwardly into embracing engagement with the external grooved neck.

Owing to the peculiar configuration of the spout, the means employed to press the spouts into place on the container necks preferably includes a pair of vertically reciprocal jaws or shoes which, during an applying operation, embrace a portion of the spout snugly while pressing said spout downwardly over the container neck. It is therefore an object of the invention to provide a novel method for applying spouts or other closures to the neck of a container.

Another object is to provide a novel apparatus for applying a plastic spout to a container.

Another object of the invention is to provide, in an apparatus for applying a closure or spout to a container, novelly constructed pressing shoes.

Another object is to provide an apparatus for applying a closure or spout to a container and a novel structure for actuating pressure shoes which engage said closure or spout.

Another object is to provide a rugged closure or spout which embodies novel features of construction, is not expensive to manufacture, operate and maintain, and which is entirely automatic in operation and very efficient in use.

With the foregoing and other objects in view which will appear as the description proceeds, the invention consists of certain novel features of construction, arrangement and combination of parts hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportion, size and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

For the purpose of facilitating an understanding of my invention, I have illustrated in the accompanying drawings a preferred embodiment thereof, from an inspection of which, when considered in connection with the following description, my invention, its mode of construction, assembly and operation, and many of its advantages should be readily understood and appreciated.

Referring to the drawings in which the same characters of reference are employed to indicate corresponding or

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similar parts throughout the several figures of the drawings:

Fig. 1 is a fragmentary elevational view of a spout applying apparatus embodying the features of the present invention.

Fig. 2 is an enlarged detail sectional view through the neck of a container and a spout of the kind mounted by the present apparatus.

Fig. 3 is an enlarged detail elevational view of the pressure applying mechanism.

Fig. 4 is a top plan view of the pressure applying mechanism illustrated in Fig. 3 taken substantially on lines 4—4 of said figure.

Fig. 5 is a view similar to Fig. 3 showing the pressure applying mechanism elevated and the pressure shoes spread.

The apparatus illustrated and the best suited for practicing the method of the present invention is of the type designed to accommodate a continuous flow of containers 10 onto a turntable with which is associated the means for pressing previously applied loosely mounted closures or spouts firmly onto the necks of the containers. After the spouts have been applied by the means disclosed herein, the containers are conveyed off of turntable in any conventional manner not specifically disclosed herein. In order to best describe the apparatus and the method of application, it is thought that a brief description of the container and closure or spout will facilitate a better understanding thereof.

The spout 11 is best illustrated in Fig. 2. As shown, it consists of a pliable plastic body 12 having an intermediate shoulder portion 13 and a depending annular skirt 14 provided on its inside face with an annular rib or bead 15 adapted, when the spout is in place on a container neck 16, to engage in an external circumferential groove 17 in said neck to securely mount the spout in place. Projecting upwardly from the intermediate portion 13 is a substantially rectangular shaped portion 18 having a turret valve 19 mounted therein. As shown, the turret valve includes a disk part 21, which is retained in the rectangular portion 18 by the intumed upper margins 22 of said portion, and a snoot or nozzle 23. When the turret element 19 is in the position illustrated, a passageway 24 extending therethrough is out of alignment with a vending port 25 in the spout body 12. However, upon rotating the valve element 19 into a substantially vertical position, the passageway 24 therein aligns with the port 25 to permit dispensing of the contents of the container.

The spouts 11 are positioned loosely on the container necks 16 prior to the movement of the containers on to the turntable 26 of the spout applying apparatus. Referring particularly to Fig. 1, the turntable 26 is provided on the lower end of a rotatable hub 27 which carries, spaced above said turntable, a circular flange 28 adapted to mount various component parts of the spout applying apparatus. When the containers 11 move onto the turntable, they are carried with it, circumferentially, for a part of one complete revolution thereof, whereupon they are ejected from said turntable and conveyed to suitable inspection or packaging stations.

It is during the movement of the container with the turntable that the spouts 11 are pressed downwardly into positive retention on the container necks 16. In the disclosure selected for purposes of illustration, there are four spout attaching mechanisms which are located, with relation to the container's position on the turntable, one in direct vertical alignment with each container. For example, as illustrated in Fig. 1, two such spout attaching mechanisms, generally indicated at 29, are illustrated. The attaching mechanisms are identical in structure and consequently only one will be described in detail, it being understood that the description

is equally applicable to the other structures and that like numbers identify corresponding parts.

As illustrated, each spout applying mechanism includes a vertically reciprocal rod 31 slidably mounted in the circular flange 28. The upper extremity of said rod, projecting above the flange 28, carries a header 32 having a laterally projecting trunnion carrying a guide roller 33. This guide roller travels at all times in a circumferential track or groove 34 formed in a stationary mounting 35 above the flange 28. Misalignment of mechanism carried on the lower end of the rod 31, which is described in detail hereinafter, is avoided by forming the header 32 with side wings 36, each of which carries firmly therein a guide rod 37, both of which extend through and slide freely in the annular flange 28. It should be quite evident at this time that as the turntable 26 rotates, carrying with it in unison the circumferential flange 28, the vertically reciprocal rod 31 moves in unison with said turntable. As the roller 33 associated with said rod moves along the groove 34, said rod is first moved downwardly from the position illustrated on the right-hand side of the Fig. 1 illustration into the position substantially illustrated on the left-hand side of said Fig. 1 illustration, after which said rod 31 moves upwardly into its initial position so as to be located for cooperation with a later admitted container and spout as it is again returned to the position approximating the location where the containers move onto the turntable.

Downward movement of the rod 31 effects final pressing downwardly of the related spout 12 onto the container neck 16. In view of the peculiar structure of the spout, it is feasible to provide the rod 31 with novel pressing and gripping shoes 38. As shown, there is a pair of such pressing shoes pivotally mounted at 39 to a T-shaped end 41 of an extension 42 carried on the lower end of the reciprocal rod 31. A mounting nut 43 serves to hold the extension 42 in rigid association with the rod 31 while at the same time afford means whereby the extension 42 may be removed should it become necessary to dismantle any part of the mechanism carried thereby.

Each jaw or shoe 38 is fashioned from a piece of square stock longitudinally slotted at one end to receive between the leg portion defined thereby, the T-shaped head 42. The lowermost end of each shoe 38 is provided with a lateral extension 44 so that, when the shoes are in the position illustrated in Fig. 3, said extensions are located to close contact one with the other. The extension on each shoe 38 is cut away, as best illustrated in Fig. 4, to define a recess 45 on the innermost end thereof to conform to one-half of the substantially rectangular portion 18 of the spout 11. The movement of the shoes into the position illustrated in Fig. 3, from their open position best illustrated in Fig. 5, is accomplished in a manner to be described presently. It should be noted, however, that a spring 46 bridges said shoes and has its ends connected to pins 47, one carried on the upper end of each shoe. These pins extend entirely through the shoe on which they are mounted and project rearwardly therefrom, as shown in Fig. 4, to provide extensions 47a. These extensions constitute means readily engageable by a cam lever or rocker arm generally indicated at 48. The cam lever is designed to normally be in the inclined or elevated position illustrated in Fig. 5 whereby the shoes are positioned with their lower ends spaced apart owing to the tendency of the spring 46 to pull the upper ends thereof towards one another.

The cam lever or rocker arm 48 is pivotally mounted, at 49, on an extension 50 of the T-shaped head 41 and consequently is movable vertically during reciprocal movement of the rod 31. The cam lever 48 extends a considerable distance beyond the pivot 49 and is formed with a longitudinally slotted end portion 51. The slot 51 receives therein stationary means in the form of a stud 52 fixedly mounted on and projecting rearwardly from a bracket 53 adjustably secured on a fixed vertical rod 54.

Adjustment of the bracket 53 on the rod 54 is required only to insure proper coordination of the parts and once this adjustment is effected, it should not be necessary to readjust said bracket.

The structure of the cam lever 48, insofar as it has been described, is such that when the rod 31 carrying the T-head 41 moves downwardly, the pivot 49 is carried downwardly thus rocking the cam lever 48 in a clockwise direction because of the fixed position of the stud 52. When the cam lever 48 is rocked from, for example, the position shown in Fig. 5 into the position illustrated in Fig. 3, its wedge-shaped nose portion 55 moves downwardly between the pin extensions 47a on the shoes 38. This relative movement carries the cam edges 56 and 57, of said nose portion, between the pin extensions 47a to thereby cause said pin extensions to move outwardly away from each other. When this occurs, the lower ends of the jaws or pressing shoes 38 are closed firmly about the upper portion 18 of the spout 11.

When the jaws or shoes 38 are in the position illustrated in Fig. 3, there is a small amount of downward movement of the rod 31 still effected by the track or groove 34. It is this movement following closing of the pressing shoes about the spout 11 that causes the lower faces 58 of said shoes to bear down firmly against the intermediate portion 13 of the spout and urge it downwardly over the container neck 16. During this downward movement of the spout, the spout skirt 14 flares outwardly sufficiently to permit the internal bead 15 therein to ride over the surface of the container neck and subsequently snap into the external circumferential groove 17, thus securely affixing the spout in position. When the reciprocal rod 31 begins its upward movement, following the application of a spout, the pressing shoes immediately start to open under the effect of the spring 46. Consequently, there is no frictional binding between the pressing shoes 38 and the cap and, the pressing shoes may move upwardly without hindrance into their fully open position so as to be conditioned to act upon a succeeding spout and container moved therebeneath.

It is believed that my invention, its mode of construction and assembly, and many of its advantages, should be readily understood from the foregoing without further description, and it should also be manifest that while a preferred embodiment of the invention has been shown and described for illustrative purposes, the structural details are nevertheless capable of wide variation within the purview of my invention as defined in the appended claims.

What I claim and desire to secure by Letters Patent of the United States is:

1. A capping machine of a character to press a plastic spout having a depending skirt portion firmly onto the neck of a container comprising a vertically movable pair of normally spread pressing shoes, a rod carrying said shoes, cam means effective to move the rod and shoes downwardly over the spout, a cam lever carried by the rod, stationary means engageable by one end of the cam lever effective to rock said lever when the rod moves downwardly, and cam surfaces at the other end of said lever, said cam surfaces being engageable one with each shoe to cause said shoes to close around the spout during downward movement of the rod.

2. A capping machine of the character recited in claim 1, in which the spout has an intermediate section defining a shoulder against which the shoes bear during downward movement.

3. A capping machine of the character recited in claim 1, in which each shoe is formed on its inside face to receive and embrace a portion of the spout.

4. A capping machine of the character recited in claim 1, in which the shoes each embrace a portion of the spout and the spout has a shoulder against which the shoes bear during downward movement.

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5. A capping machine of the character recited in claim 1, in which springs hold the shoes normally spaced apart.

6. A capping machine of the character recited in claim 1, in which the stationary means is adjustable.

7. A capping machine of the character recited in claim 1, in which the shoes have projections thereon between which the cam surfaces are moved.

8. A capping machine of the character recited in claim 1, in which the shoes are pivotally mounted substantially midway between their ends.

9. In a capping machine of a character to press plastic closures firmly into place on the necks of containers, a pair of cooperating jaws positioned normally above a closure placed loosely on a neck, said jaws having their effective ends spread apart, means carrying said jaws downwardly against and to press the closure firmly onto the neck, and a cam lever effective during downward movement of said jaws to close them about a portion of the closure just prior to the final pressing operation.

10. In a capping machine, a turntable on which containers having closures positioned loosely on the necks thereof are adapted to be carried, vertically reciprocal normally open jaws located above and maintained in vertical alignment with each closure as it moves with said turntable, means to lower said jaws, and means operable to close said jaws about the closure during the downward movement of said jaws.

11. A capping machine of the character described in claim 10, in which the closure has a peripheral shoulder and the jaws are engageable with said shoulder to press the closure tightly onto the neck.

12. A capping machine of the character described in claim 10, in which the closure has a resiliently yieldable skirt to snugly embrace the neck after being pressed thereon by the depending jaws.

13. A capping machine of a character described in claim 10, in which the jaws are shaped to conform to and embrace a portion of the closure during the final stages of pressing the closure onto the container neck.

14. A capping machine of a character described in claim 10, in which the means to close the jaws includes a cam portion progressively engageable therewith.

15. A capping machine of the character to press a cap

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having a resiliently deformable skirt portion firmly onto the neck of a container, a turntable structure adapted to receive a container thereon, an axially reciprocal rod mounted on said turn-table structure in vertical alignment with a container thereon, a stationary cam operatively associated with the reciprocal rod to cause vertical reciprocation of said rod during movement of the turn-table structure, a pair of normally spread pressing shoes on said rod, a rocker arm pivotally mounted intermediate its ends and movable with said rod, means on the turn-table structure engageable with one arm end to rock said arm when the rod is reciprocated, and a cam portion on the other arm end engageable with the pressing shoes to cause said shoes to close over a top surface of the cap while the rod is moving downwardly to press said cap onto the container neck.

16. A capping machine of a character recited in claim 15 in which the rod includes a bracket pivotally mounting the pressing shoes and rocker arm.

17. A capping machine of a character recited in claim 15 in which each shoe has a projection engageable by the rocker arm cam portion.

18. A capping machine of a character recited in claim 15 in which the pressing shoes are formed to embrace a portion of the cap during the pressing operation.

19. A capping machine of a character recited in claim 15 in which the stationary cam is concentric with and located above the turn-table structure.

20. A capping machine of a character recited in claim 15 in which the rod has a bracket secured thereon for engagement with the stationary cam.

21. A capping machine of a character recited in claim 15 in which the means engageable by one rocker arm end consists of a stud and the said arm end is bifurcated to receive said stud therein.

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