Aug. 2, 1966 E. W. MERRILL 3,263,318

APPARATUS FOR APPLYING SEALING ELEMENTS TO CLOSURES

Filed Oct. 20, 1964 3 Sheets-Sheet 1

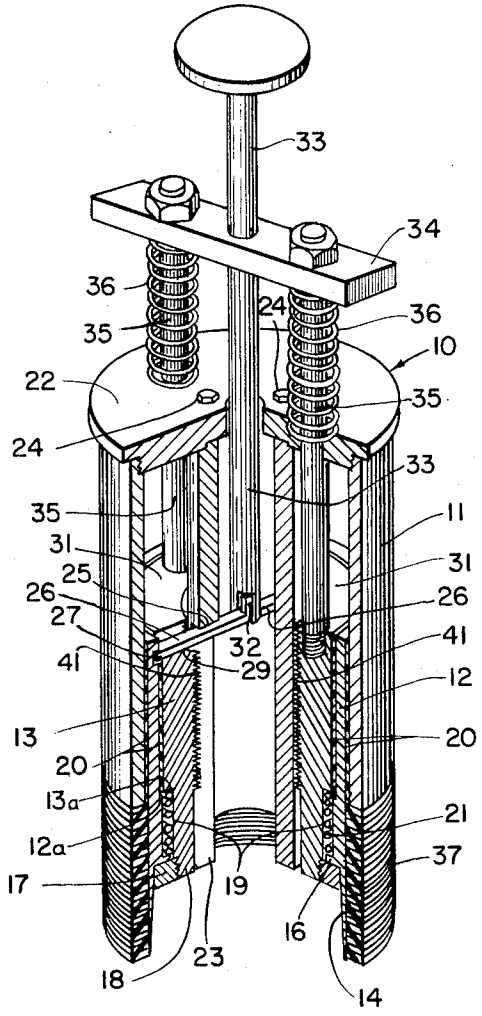


FIG. 1

APPARATUS FOR APPLYING SEALING ELEMENTS TO CLOSURES

Filed Oct. 20, 1964 3 Sheets-Sheet 2

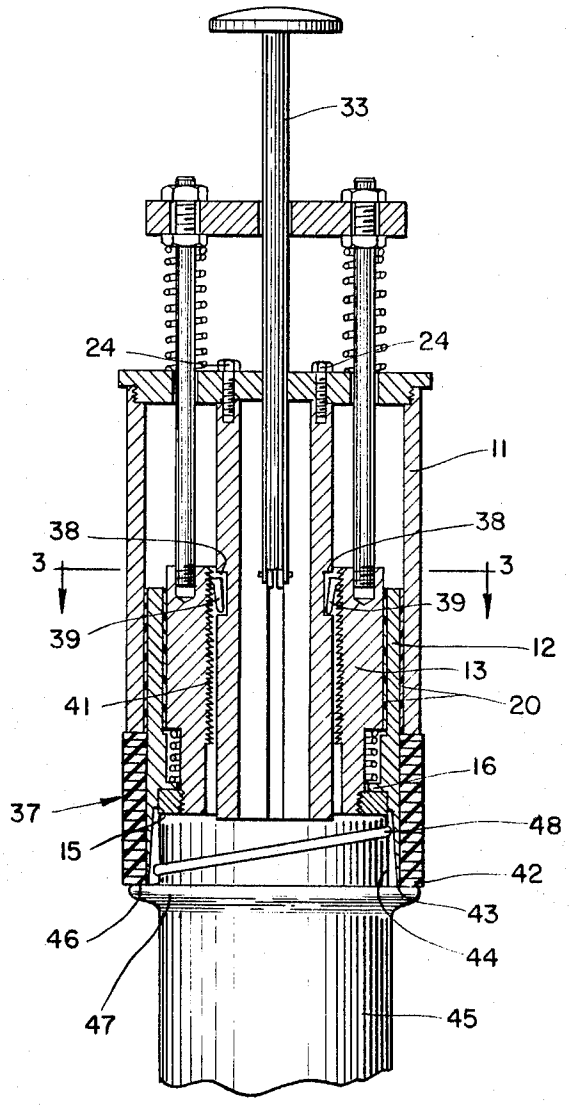


FIG. 2

APPARATUS FOR APPLYING SEALING ELEMENTS TO CLOSURES

Filed Oct. 20, 1964 3 Sheets-Sheet 3

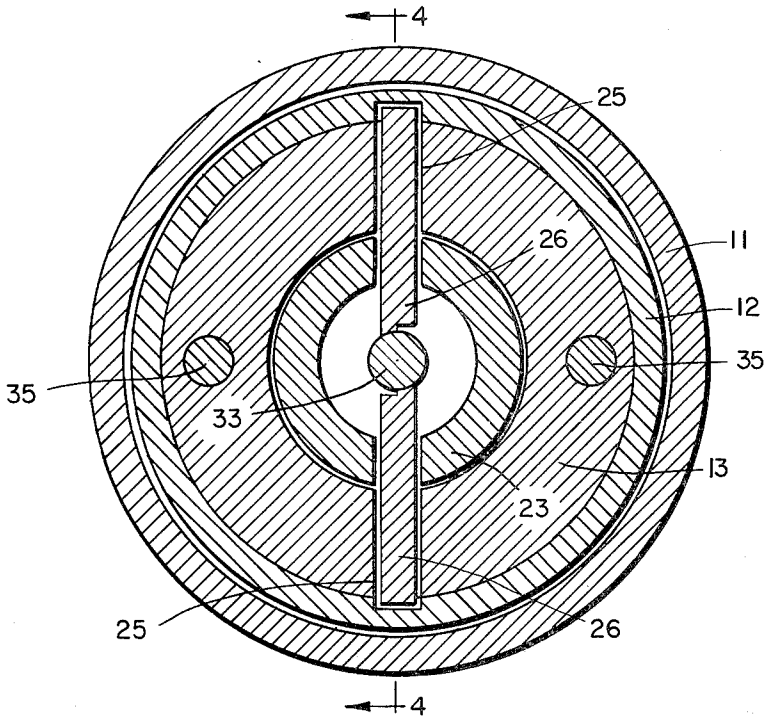


FIG. 3

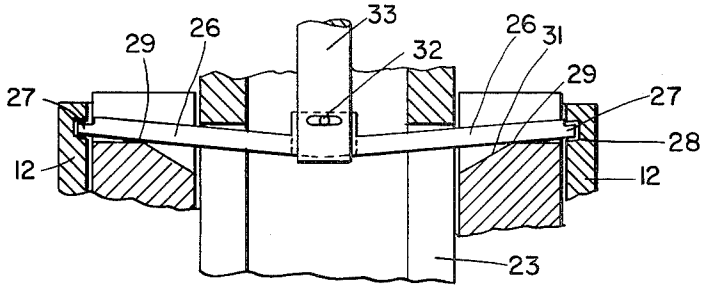


FIG. 4

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3,263,318

APPARATUS FOR APPLYING SEALING ELEMENTS TO CLOSURES

Edward W. Merrill, Belmont, Mass., assignor to W. R. Grace & Co., Cambridge, Mass., a corporation of Connecticut

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This invention relates to means for placing strip seal rings on jars.

Strip-seal rings are rings of elastic, distortable, sealing material. They surround the neck and are supported by the bead of the jar which, in this instance, has a flat top face extending outwardly from the jar neck and thus forms a shoulder on which the strip seal rests and against which it may be compressed as the skirt of the jar closure is either pushed or screwed down into its jar-sealing position. Frequently, strip-seals are provided with a tab which may be grasped and pulled. Pulling stretches and thins the seal and breaks the hermetic seal as the strip-seal is pulled out from between the lower margin of the cap and the bead on the jar.

In order for a strip-seal to seal a jar tightly, it is necessary that the material be distortable so that the margin of the closure may bed into it. It is also necessary that the material be elastic so that it may pass over the threads or leads on the exterior jar finish and thereafter retract to hug the neck of the jar tightly.

It is the principal object of the present invention to provide a device which will apply strip-seals to the necks of jars quickly and easily and to avoid what otherwise is a somewhat difficult and time-consuming operation.

In brief, the device includes a barrel which holds a stack or rings on its lower exterior surface. The interior diameter of the barrel just slips over the leads at the mouth of the jar. A pusher cylinder, which surrounds the barrel and surmounts the stack of rings, is moved downwardly by a rack-and-pawl mechanism. Since each advance of the pusher cylinder equals the thickness of one ring, the lowermost ring is pushed off the end of the barrel whenever the device operates, and since the ring at this time is already approximately in its final position, it snaps into contact with the neck and lies flatly against the bead.

The device may best be described by reference to the drawings in which

FIG. 1 is an elevation having a cut-away showing certain parts in section;

FIG. 2 is a vertical section of the device positioned on a jar having a strip-seal form of bead;

FIG. 3 is a horizontal section on the line 3—3 of FIG. 2; and

FIG. 4 is a vertical section on the line 4—4 of FIG. 3.

The device **10** comprises an exterior or pusher cylinder **11**, a strip-seal ring-holding cylinder or barrel **12**, a ratchet cylinder **13**, and a guide cylinder **23**. Cylinder **12** slip-fits within cylinder **11**. Similarly, cylinder **13** slip-fits within cylinder **12**. Barrel cylinder **12**, the lower internal diameter of which is proportioned to the jar on which it is intended to be used, is formed with a thin, cylindrical, tapered bottom portion **14**. The internal wall is slightly tapered to allow it to pass easily over the lead **15** of the jar. Barrel cylinder **12** is shouldered at **16** and is held in position by locking ring **17** which is screwed on to the lower threaded portion **18** of the ratchet cylinder **13**. Both the interior and the exterior walls of barrel cylinder **12** are covered with a coating **20** of polytetrafluoroethylene about .003 of an inch thick. The lower portion of the exterior wall of ratchet cylinder **13** is cut away to form a recess **19** which houses a helical spring **21**. Barrel cylinder **12** and ratchet cylinder **13** are provided with opposed interfering shoulders **12***a* and **13***a*. These shoulders

limit the possible motion of the barrel cylinder. The maximum distance between the two shoulders is slightly more than the thickness of one strip-seal ring—in this instance, 0.075 inch. Pusher cylinder **11** is capped by the top plate **22** which, in turn, supports the innermost or guide cylinder **23** which is suspended from the head plate **22** by the bolts **24—24** or other appropriate fastening means.

The lower extent of guide cylinder **23** is slotted. The two diametrically opposite slots **25—25** permit the toggle bars **26—26** to ride downwardly as the stack of rings is pushed off barrel cylinder **12**. The far ends **27—27** of the toggles **26** enter two short slots or recesses **28—28** cut in the barrel cylinder **12** adjacent its top margin. The fulcrums of the toggles **26** lie at the points **29—29** formed at the juncture of the horizontal and angular portions of the top face **31** of the ratchet cylinder **13**. The inner ends of the toggle arms are pinned at **32** to the plunger **33** which projects through the top plate **22** and through a cross bar **34**. Posts **35—35** threaded into the top face of ratchet cylinder **13** extend through bores formed in the top plate **22** and corresponding bores in cross bar **34**. Helical springs **36—36** pushing on top plate **22** force the pusher cylinder **11** downwardly on the stack **37** of strip-seal rings. Two short slots **38—38** are cut in the exterior face of guide cylinder **23** and positioned at right angles to the toggle bar slots **25**. Slots **38** house the spring-pressed pawls **39—39** which engage the ratchet teeth **41—41** formed on the inner wall of ratchet cylinder **13**.

In operation, a stack of strip-seal rings, distended sufficiently to fit over the exterior of the barrel, is pushed off a disposable core and onto the exterior of the barrel cylinder **12**. The device is then placed over the mouth of a jar as illustrated in FIG. 2. When plunger **33** is pressed, the toggles rock downwardly about the fulcrum points **29** and push ratchet cylinder **13** downward one ratchet notch. Since the pawls **39** lock in the next lower position of the ratchet teeth **41**, the effect upon the release of pressure is to raise barrel cylinder **12** drawing it upwardly, in this particular instance, .0070 of an inch (the spacing of the ratchet teeth), and hence each upward movement of the barrel cylinder **12** must correspond to slightly more than the thickness of a single ring of the stack **37**. As the barrel cylinder **12** moves upwardly, ring **42**, which is now free to contract radially inward, pulls past the end **43** of the barrel cylinder **12** and snaps against the exterior wall **44** of the jar **45** (see FIG. 2) with a result that ring **42**, now properly seated on the upper surface **46** of the jar bead **47**, is in position. Closures placed over the mouth of the jar and screwed down by following the downward lead **48** will be bedded in ring **42**. Although screw caps are commonly used with ring seals, straight press-on closures are also useful.

The device may be quickly loaded with a stack of the ring seals which slip easily over the polytetrafluoroethylene coating. The antifriction coating on both inner and outer walls of barrel cylinder **12** provides an easy, smooth, non-sticking action. The jars may be fitted with seals as quickly as the jars can be brought under the device and the plunger can be pushed down.

I claim:

1. A device for applying strip-seal rings to the necks of jars comprising a hollow cylinder, a barrel cylinder adapted to hold a stack of strip-seal rings having an internally tapered lower end adapted to fit over the mouth portion of a jar, said barrel cylinder being slip-fitted within the cylinder first named, a ratchet cylinder having its upper face shaped to form a fulcrum and having ratchet teeth in its inner wall, toggles having their working ends socketed in said barrel cylinder, a top plate, means to support said ratchet cylinder from said top plate, pawls engaging said ratchet teeth, pawl support means, and

plunger means to rock the toggles, whereby, upon each reciprocation of the plunger, the barrel cylinder is drawn upwardly one ratchet tooth, and a ring is released from the end of the device.

2. A device for applying strip-seal rings to the necks of jars, said device having outer barrel ratchet and guide cylinders slip-fitted one within the other in the order named, the said barrel cylinder being externally and internally coated with a polymeric antifriction coating and adapted to hold a stack of strip-seal rings on its exterior surface, and means to cause the ring-by-ring release of a stack of rings placed on said barrel cylinder including a toggle fulcrumed on the top surface of said ratchet cylinder, pawls in said guide cylinder and ratchet teeth in said ratchet cylinder whereby upon the release of pressure upon the toggle, said barrel cylinder is drawn upward one ring thickness, and a ring is released from the end of the barrel.

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JOHN F. CAMPBELL, *Primary Examiner.*

THOMAS H. EAGER, *Examiner.*