

May 4, 1937.

S. H. LEVY ET AL

2,079,326

SHRINKING SEAL APPLICATOR

Filed Dec. 2, 1935

4 Sheets-Sheet 1

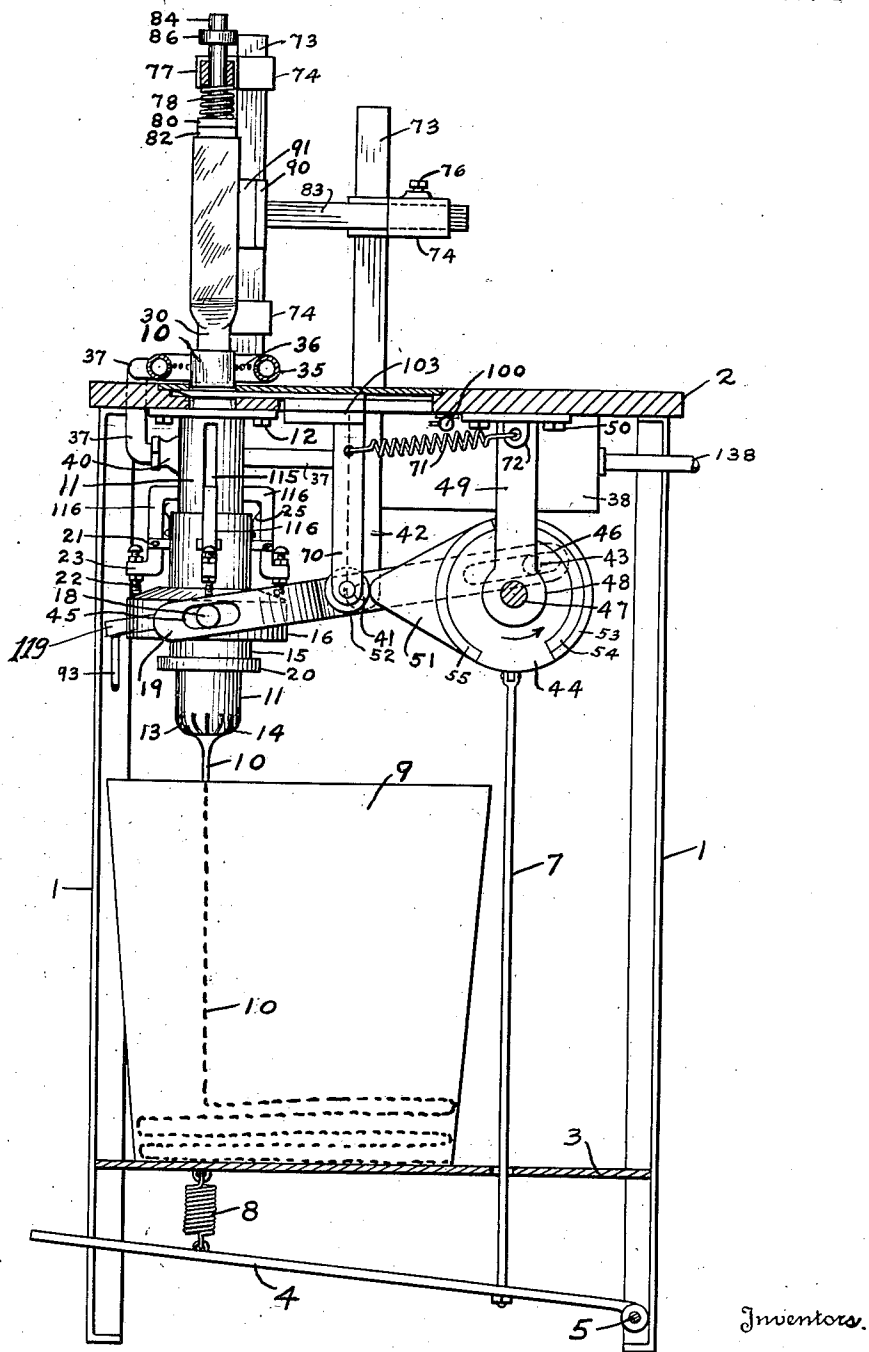


Fig. 1.

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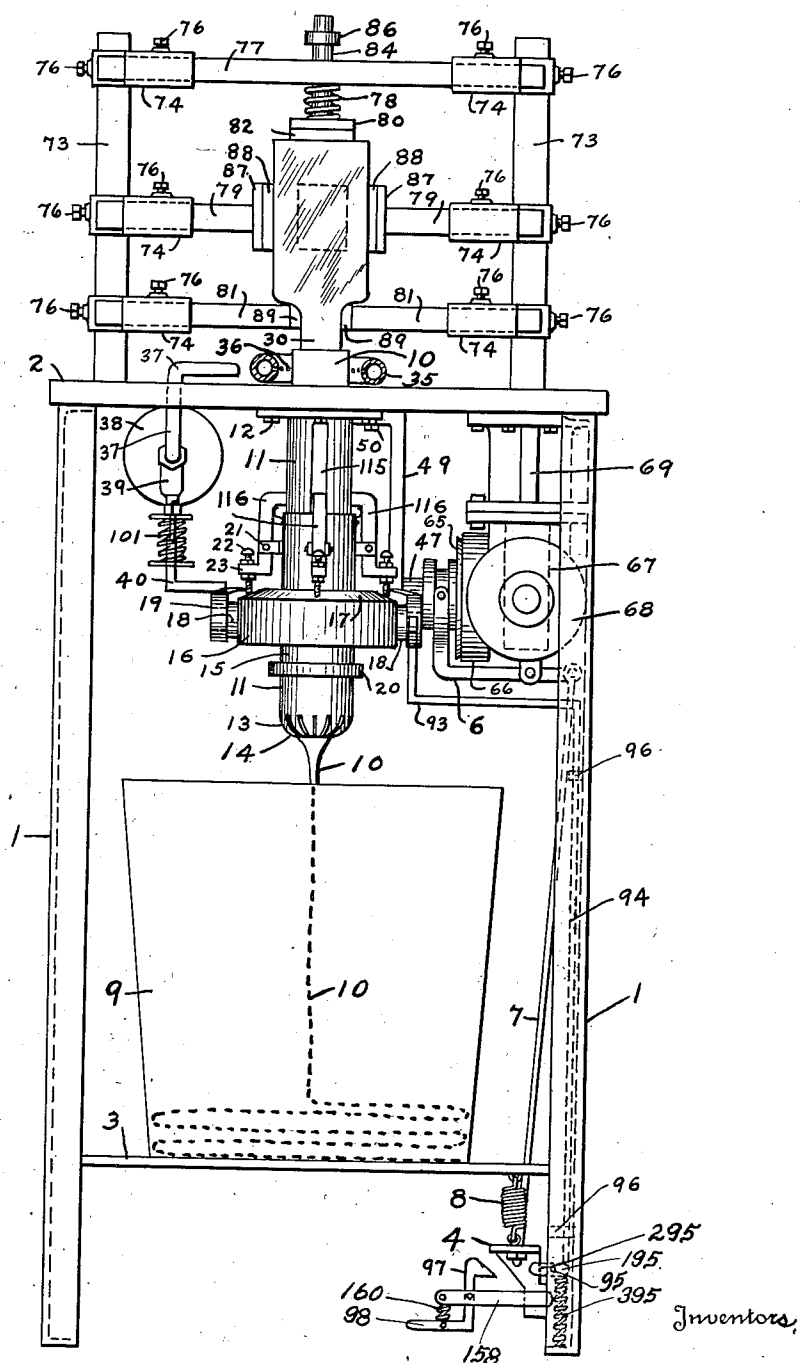
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4 Sheets-Sheet 4

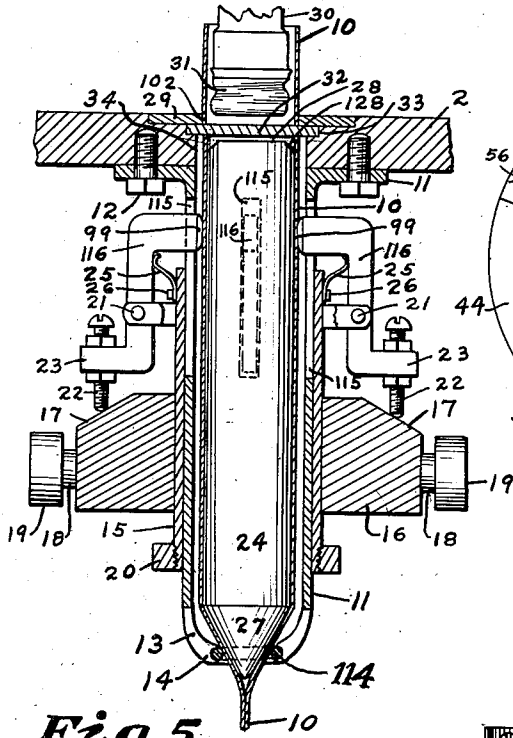


Fig. 5.

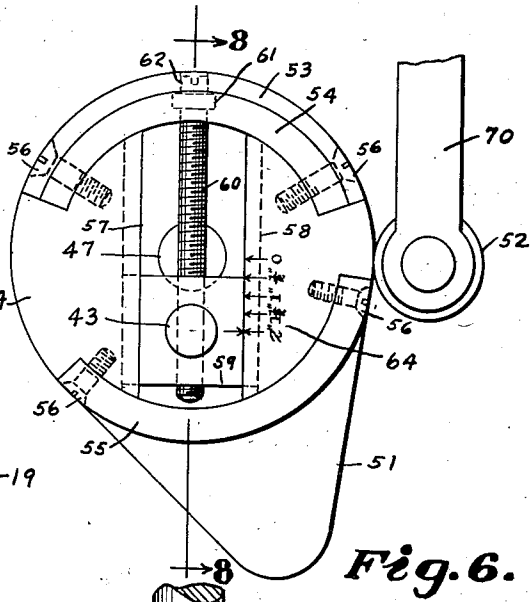


Fig. 6.

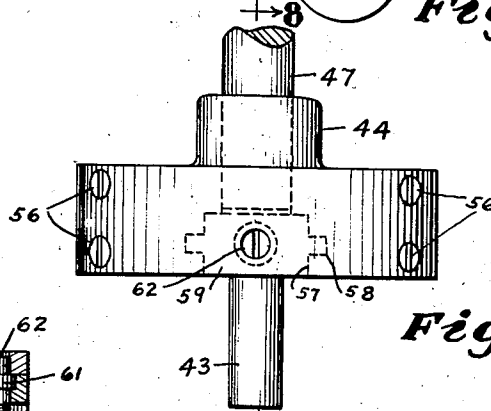


Fig. 7.

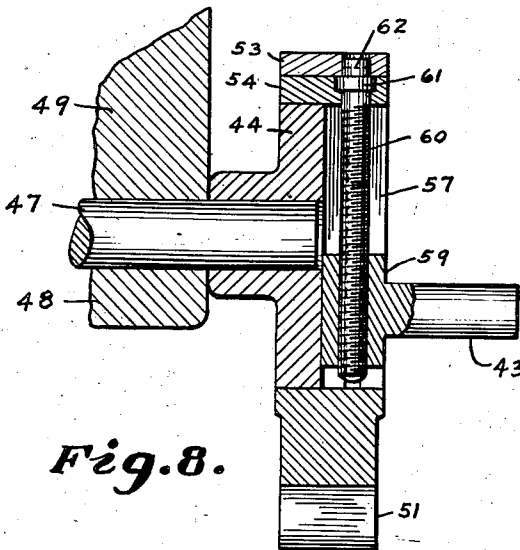


Fig. 8.

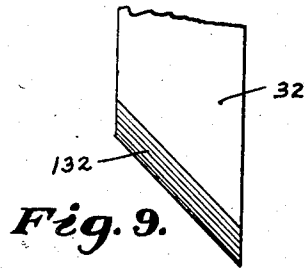


Fig. 9.

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2,079,326

SHRINKING SEAL APPLICATOR

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Application December 2, 1935, Serial No. 52,494

14 Claims. (Cl. 226—80)

This invention refers to package machinery and more particularly to a device for placing seals of a shrinking flexible nature around the tops, caps or closures of bottles and other containers. It has among its objects to provide a machine that will flow shrinking seal material and the like used for sealing bottle caps and packages, on to the bottle, cut it off to a predetermined size and assist in the shrinking of the material. Another object is to provide for automatic feed of the material and the various steps for the placing of the material on the packages. Its main purpose is to provide for a convenient, efficient, and effective way of placing this material on the packages without manual operation. A further object is to have the device so that it will reduce the hazards arising from handling the materials and the liquids in which they are kept.

The present methods of placing the so-called flexible shrinking seals over the caps of bottles and packages, where such seals are arranged to shrink tightly into place and over the caps and bottles, consist in general in the following arrangement: The seals are individually cut to size and then allowed to soak in a container full of formaldehyde, alcohol, or other suitable liquids or solutions, which are normally used to keep the material from shrinking while in stock. They are taken out individually by hand and placed over the bottle caps, which they "set over" very loosely. They are then allowed to "set" and after about an hour, shrink sufficiently to tighten securely on the bottle and cap or whatever package is used, as the solution evaporates from them. This material has to be picked up by the hands of the operator from its solution which may enter the system of the person. In the work of placing the seals on the bottles, much time is occupied in opening the seals beforehand. In this invention there are no individual seals, but in their place of a tube of the material of suitable diameter is used. It is drawn up by fingers on the device and the solution is strained off back into the container as it passes up into the machine. The tube is forced onto the bottle neck and cap and when in place is cut off to suit the bottle by a knife of the device, after which the machine blows air across the seal to expedite its shrinking action.

In the construction shown in the drawings:—
Figure 1 is a side elevation of a machine embodying this invention,

Figure 2 is a front view of the machine shown in Figure 1,

Figure 3 is a view showing the mechanism under the main plate of the machine,

Figure 4 is a plan view of Figure 1,

Figure 5 is a sectional view through the seal tube,

Figure 6 is a detail side view of the cam wheel of the mechanism,

Figure 7 is a plan view of the cam wheel shown in Figure 6,

Figure 8 is a section view through Figure 6 on line 8—8.

Figure 9 is a detail of the angular portion of the knife used in this invention.

Similar reference characters refer to similar parts throughout the drawings.

In the drawings, 1 represents the legs of a metal frame on which a table 2 is mounted and an under-tray 3 is secured. A pedal bar 4 is pivoted to the frame with a pin 5 and serves to operate a clutch yoke 6 through a link bar 7, attached as indicated. A spring 8 attached to the undertray 3 at 4 serves to keep a tension on the pedal bar. A tub container 9 is set on the undertray 3 to hold the tube of shrinking seal material 10 used for the seals, as well as the liquid or solution for soaking the same and keeping same normal size. This material is brought into the seal casing 11 which is bolted to the table 2 at 12, through its mouth 13 which is preferably slotted at 14 and restricted by a flexible ring 14 to strain the liquid or solution off the material as it is carried through, and supports expanding cylindrical plunger 24. This casing has wall slots 115 to permit jaw members 116 to pass through and make contact with the material 10 and allow ample clearance. A cylindrical sliding sleeve 15 reciprocates on the outside wall of the casing and has a loosely mounted exterior collar 16 with a bevelled edge 17 on its upper portion, and cross pins 18 on its peripheral wall for holding operating arms 19, to be described later. A screw-threaded stop-collar 20 controls the downward movement of the collar 16. The jaw member mechanism is secured to the sleeve 15 and fulcrumed on journals 21 and has adjusting screws 22 on extensions 23 to make contact with the bevelled edge 17. This actuates the jaws with their rubber tips 99 inwardly against the shrinking seal material as it passes over the expanding cylindrical plunger 24. This plunger is vertically mounted in the casing and is inserted in the shrinking seal tube as it progresses towards the bottle to be sealed. Springs 25 attached to the sliding sleeve 15 with screws 26 tend to keep the

jaws out from the axis of the plunger to prevent pulling back the seal on the down stroke. The pressure upwardly exerted on the set screws 22 (extensions, and jaw mechanism incidently) by the pressure of the edge 17 against them, actuates the jaws to press on the seal material and raise same. The lower portion 27 of the plunger is tapered to insert in the sealing tube gradually and thereby readily open the material without tearing same.

The upper portion 28 is flat, preferably with chamfered edge 128 while the body in general is cylindrical. A narrow coverplate 29, preferably of metal, is set flush in the table 2 above the plunger, knife and casing and is provided with a seal orifice 102 for the tubular shrinking seal tube to pass through to cover the neck of a bottle 30 and cap 31 for the sealing purpose. A knife 32 for cutting the shrinking-seal material reciprocates in a slot 33 provided in the table and the cutting edge is preferably in an angular direction so as to more smoothly cut same. The table 2 is recessed for the cover-plate and knife and has a hole 34 for the tube material and plunger to operate in and pass through to the bottles or packages to be sealed.

The table has a hollow perforated ring 35 positioned around the bottle and cap where the seal is placed and rests on or is attached to the table. It serves to convey air through its holes 36 to the seal after it is placed on the package and thereby expedite its shrinking in place. This perforated ring is supplied with air through suitable piping 37 and tank chamber 38 and source 138. The tank 38 is secured to the underside of the table. The piping is provided with a control valve 39 for opening and closing the line of piping, through a mechanism 40 and spring 101 connected with the operating arms 19 and collar 16.

The sliding sleeve 15 is raised as the bevelled surface 17 of the collar 16 makes contact with the adjusting screws 22 and through the journals 21 when the arms 19 raise the collar 16 through the cross-pins 18. These arms are pivoted at 41 to a stationary arm 42 and pin 43 on the portion of the arm on the opposite side of the pivot which is engaged in a cam wheel 44. The slots 45 and 46 respectively permit the pins 18 and 43 to actuate freely in the arms as the angularly arc-stroke of the arms 19 reciprocates the collar 16.

The shaft 47 of the cam wheel is journaled at 48 in a hanger 49 suspended from the lower surface of the table 2 by bolts 50. This cam wheel is made in any suitable manner but preferably as indicated in the drawings, in which a cam 51 is designed to give a quick reciprocating movement to its roller 52. The parts 53, 54 and 55 are recessed into the main casting as indicated and secured in place with screws 56. The slot 57 with its grooves 58 is arranged to permit a cross-head 59 and the pin 43 held by it to be adjustable in the same.

A cam-throw adjusting lead screw 60 is arranged in the cam wheel with its collar 61 set in the parts 53 and 54 to hold it in place, and permit same being turned at its head 62 for raising the cross head or lowering it, in the slot. Calibrations 64 for setting same in a predetermined manner for controlling the movement of the arms 19, are provided as shown.

The cam wheel has its shaft 47 attached to a conventional clutch member 65 which engages with its separated but corresponding member 66

when moved over by the yoke 6 actuated by the link bar 7. This allows a motor 68, through its shaft connections and speed reducer 67 and the member 66, to rotate the member 65. The motor 68 is suitably supported by a structure 69 to the table 2 on its underside.

The roller 52 is attached to a rod 70 that in turn is guided on the table 2 and holds the knife 32, and has a horizontal reciprocating movement, the return stroke being controlled by a coil spring 71 secured to a stationary hook 72 attached to the table.

A series of posts 73 of rectangular cross section are vertically positioned on the upper portion of the table. They are provided with sleeves 74 that slide thereon and keep directional control of same as well as adjustably secure arms 77, 79, 81, 83 that have plates designed to hold the bottle or package to be sealed, securely in place. Set screws 76 serve to hold arms and sleeves in any selected place. A coil spring 78 tensions the plate 80 with its rubber bumper 82 on its holding bolt 84, the latter having an adjustable collar 86 for preventing excessive movement. The arms 79 have plates 87 with rubber bumpers 88 while the arms 81 have plates and rubber bumpers 89. The rear post is provided with an arm 83 which has a plate 90 and rubber bumper 91. All these plates and bumpers serve to hold the bottle or package securely while being sealed, and permit same being readily held or detached therefrom.

An automatic release mechanism for controlling the continuous or individual cycle operation of the machine consisting of a finger 119, rods 93, 94, guides 96 and a tripping pawl 95 is provided to periodically stop the feeding arrangement of the device. The pawl 95 consists of an outward end 195, actuated upwardly by a spring 395, and an inward end 295 actuating downwardly retaining the pedal 4 in a locked position, for one continuous cycle, after which the treadle 4 will be released automatically, unless the treadle 4 is engaged by catch 97, in which event the machine will continue to operate continuously until released by pressing down extension 98 so it will place catch 97 out of registry with treadle 4, a spring 160 attached to a supporting bar 158 tensions the extension 98 with its catch 97 as indicated.

The machine is provided with a counter 100 attached conveniently to the table and actuated by the rod 70, so as to indicate each cycle. The shrinking seal material is laid in the tub in layers or like a coil of rope. The material is composed of ingredients made under special formulae and may soak or rest in formaldehyde, alcohol, ether, and other suitable solutions tending to keep the material enlarged and unshrunk. One suitable material on the commercial market is known as "Sylphseal".

The operation of the machine is as follows:—

The operator slides the shrinking seal tubing into the casing 11 and around or over the plunger 24 which opens the tubing up and makes it pass upwardly in a cylindrical tubular form until it reaches the cap and bottle. The machine is then started by throwing in the clutch and motor connections and circuit 92, and the cam wheel 44 is turned, which in turn operates the arms 19 and causes the loose collar 16 to move vertically up and down. On its upward movement, the bevelled edge 17 comes in contact with the adjusting screws 22, forcing same upwardly to rotate the jaw members 116 so their rubber tips press against

the seal tubing. As the jaws move upwardly their rubber or resilient tips 99 carry the seal tubing upwardly also. While this is occurring the plunger 24 will slip by its weight through the incoming seal tubing entering the casing through its mouth at 14. The incoming tubing will be strained of liquid as it presses between the tapered end 27 and against the restricted sides of the casing and the excess solution carried up will drain down through the slots at 14 back to the tub 9.

The seal tubing, as it covers the cap and bottle, will be sheared off by the movement of the knife 32, and will stay on by its natural stickiness or resiliency. Then, as the air from the ring 35 will be freed by the operation of the valve 39 through the mechanism 40, its action will evaporate the liquids on the shrinking seal and cause it to shrink with its clamping or tightening action. Just sufficient seal tubing is sheared off to seal the bottle and its cap, the size or length of the seal is predetermined by suitably setting the cross-head in its slot, by turning the screw 60. This screw may be turned by using a screw-driver in the slot in its head. The arrows on the drawing show the direction of rotation of parts of the machine. The cam-wheel in rotating carries the pin 43 around with it and in turn raises and lowers the arm 19 on the cam-wheel side of the pivot 41. The arm 19 on the opposite side of the pivot raises and lowers oppositely, and will proceed to raise the collar 16 by pressing on the cross-pins 18. This collar slides over the sleeve 15 which it diametrically surrounds, until the bevelled surface 17 presses against the end portions of the screws 22, which have been adjusted to operate at a predetermined point of the cycle. The extensions holding the screws are rotated on the pivots 21 and in turn rotate the jaws with their rubber or resilient tips 99 towards the seal tubing until they press against same, the plunger 24 serving to provide sufficient resistance in back of the seal tubing to enable it to be tightly engaged by these jaws without raising the plunger. On further upward movement of the collar, and the sleeve and jaw mechanism with same, the tubing is pushed upwardly towards the cap and bottle through the orifice in the table, until it is placed around the cap and bottle. At the same time the valve 39 is opened and allows air or other shrinking medium to blow against the seal. The cam 51 is also pushing the knife against the tubing, through its contact with the roller 52, the rod 70 and the holder 103 holding the knife. After the knife has with its angular edge 132 sheared through the shrinking-seal tubing, and left the cut off portion over the neck of the bottle and cap, it retreats, due to the pulling action of the coil spring 71 and the shape of the cam following against the roller 52. The cut-off shrinking seal begins shrinking and fastens on the bottle and cap sufficiently to permit it to stay in place and allow the removal of the bottle and the placing of another in the holder plates and pumpers. The cam-wheel continues rotating and carrying the pin 43 around, with the arms 19 returning the stroke of the collar and allowing the casing to lower and loosen its jaws on the tubing and slide down over same. The knife returns out of the way and the air or other medium is turned off from the ring 35. At the end of each single cycle the arm 19 and finger 119 strike the rods 93 and moving end 195 of pawl 95 downwardly, compressing spring 395, the end 295 moving upwardly to such a position as to

release the treadle 4. If it is desired to operate the machine continuously without stopping at the end of each cycle, the treadle 4 may be depressed downwardly towards the left so it will engage with the catch 97. In this position the pawl 95 will not be engaged and the machine will operate until the catch 97 is released manually from the treadle 4. In either instance the treadle 4 will be returned to its upward rest position through the tension of the coil spring 8, which raises the link 7 and shifts the clutch to disconnect the machine from the source of power, or motor 68.

The operation is repeated after the new bottle and cap are placed in the holder. The operation of the holders does not appear to require further elucidation.

In its operation, the seal tubing is held in the casing by the restricted mouth ring 114 and the clamping action of the weighted plunger's tapered head against its interior. This prevents the tubing falling back into the tub container. This weight also offers sufficient resistance to enable the tube to be frictionally engaged by the jaws and opened out from its flat natural form. It also stretches it somewhat, lessening the amount required and bringing about a quicker shrinking. The air or other evaporation reduces the time of shrinking considerably and thereby increases the rate of production over present methods. The avoidance of handling by hand or other parts of the body avoids the possibility of actual contact with the material or solution and its absorbing action into the system of the operator and consequent danger to his well-being, is a material advantage that this device provides. It saves the liquids and solutions by draining the excess back into the tub container. The device enables tubing of shrinking-seal material to be used in considerable lengths, that can be readily taken up by the machine, which is not only cheaper but avoids the difficulties of picking out individual seals that may stick together in twos and threes and in inconvenient ways.

It should be noted that the bottles or packages are preferably held in an inverted position while being sealed, preventing the excess liquid from running over and destroying the bottle labels, etc. The function of the bevelled edge 17 is to enable the jaw mechanism to be operated more effectively as it will take up the tilt of the levers on this surface readily. The counter is operated in a conventional manner at the end of the cycle by the rod 70. The slots 115 in the casing 15 are large enough to permit the jaw members and tips 99 to slide easily along and in same. The various adjustments do not seem to require detailed explanation but such do allow for the variation of the stroke of the arms 19; the movement of the knife, the action of the jaw members, and other incidental connections and parts. The cover plate is removable and the stop collar permits a slight adjustment. The construction is relatively simple and permits accessibility to its parts and eliminates complicated movements. While but one form of the construction of this invention is shown in the drawings, it is not desired to limit this invention to this particular form, or in any other way otherwise than limited by the prior art, as it is appreciated that other forms could be used using the same principles and coming within the scope of the appended claims.

Having thus described the invention, what is claimed is:

1. A device of the class described comprising in combination, a table, a frame supporting the table, means for holding a capped bottle or package on the table, a casing attached to the table
 5 for guiding shrinking-seal material to the holder adjacent the capped bottle, means for placing said material thereon, means for automatically cutting the material in predetermined sizes and while "set" on the capped bottle ready for seal-
 10 ing.
2. A device of the class described comprising in combination, a table, a frame supporting the table, means for holding a capped bottle or pack-
 15 age on the table, a casing attached to the table for guiding shrinking-seal material to the holder adjacent the capped bottle, means for placing said material thereon, means for automatically cutting the material in predetermined sizes and while "set" on the capped bottle ready for seal-
 20 ing, and means for automatically feeding the shrinking-seal material on the capped bottle.
3. A device of the class described comprising in combination, a frame, bottle holders with resilient bumpers for holding bottles or packages
 25 therein, connected with the frame, a casing for conveying shrinking-seal tubing towards the bottle held by the holders, means for opening the tubing to pass over the cap and bottle neck so held, and means for cutting the tubing after
 30 passing over the cap and bottle neck in a size to fit same.
4. A device of the class described comprising in combination, a frame, bottle holders with resilient bumpers for holding bottles or pack-
 35 ages therein, connected with the frame, a casing for conveying shrinking-seal tubing towards the bottle held by the holders, means for opening the tubing to pass over the cap and bottle neck so held, means for cutting the tubing after
 40 passing over the cap and bottle neck in a size to fit same and means for propelling the tubing, and mechanism for operating the parts of the device in a predetermined cycle.
5. A machine for sealing bottles and packages
 45 with shrinking-seal material comprising in combination, a support, a table therefor, holders for securing a bottle in position to be sealed on the table, a cutting device for shearing material passing to the holders, a cam wheel mechanism
 50 for operating the cutting device in a predetermined cycle, means for operating and controlling the cam wheel mechanism, means for feeding the material to the holders and a bottle held thereby for sealing, and an evaporating device
 55 for facilitating the shrinking action of the material on the bottle.
6. A device of the class described comprising in combination, a support, a package or bottle holder mounted on said support, a shrinking-
 60 seal-conveying mechanism disposed on said support adjacent the said holder, means for providing shrinking-seal material for said mechanism, means for expanding the shrinking-seal material in said mechanism and guiding same to said
 65 holder and package held thereby, means for detaching the material at the holder and package held thereby, and mechanism for operating the parts of the device in predetermined relation.
7. A device of the class described comprising in combination, a supporting frame, a table there-
 70 on, bottle holders mounted on the table, a casing attached to the table for shrinking-seal material, a plunger in the casing for distending the said material, a guiding sleeve exterior to the
 75 casing having jaws for engaging with the material passing into the casing.
8. A device of the class described comprising in combination, a supporting frame, a table
 5 mounted on the frame, a plurality of posts erected in the upper surface of the table and of angular cross-section, a plurality of holders ad-
 10 justable on the posts and having plates and rubber bumpers attached thereto, means for locking the holders in place on the posts, a cylindrical casing attached to the underneath
 15 portion of the table and under the said openings having a restricted mouth portion with drainage slots in the lower portion and wall slots for the jaw members in the upper portion thereof, said
 20 casing adapted to contain and guide shrinking-seal material therethrough, a cylindrical plunger loosely disposed in the casing and having the lower portion tapered to substantially conform with the restricted mouth portion aforesaid,
 25 means for engaging and propelling the shrinking-seal material through the casing towards the said openings and on to packages held by the said holders, and a cutter for detaching the shrinking-seal material as it engages with the
 30 packages.
9. A device of the class described comprising in combination, a supporting frame, a table
 35 mounted on the frame, a plurality of posts erected in the upper surface of the table and of angular cross-section, a plurality of holders adjustable on the posts and having plates and rubber
 40 bumpers attached thereto, means for locking the holders in place on the posts, a cylindrical casing attached to the underneath portion of the table and under the said openings having a re-
 45 stricted mouth portion and wall slots for the jaw members in the upper portion with drainage slots in the lower portion thereof, said casing adapted to contain and guide shrinking-seal material
 50 therethrough, a cylindrical plunger loosely disposed in the casing and having the lower portion tapered to substantially conform with the restricted mouth portion aforesaid, means for en-
 55 gaging and propelling the shrinking-seal material through the casing towards the said openings and on to the packages held by the said holders, and a cutter for detaching the shrink-
 60 ing-seal material as it engages with the packages and mechanism for operating said means and cutter in predetermined relation and cycle,
 65 mounted on the said frame.
10. A device of the class described comprising in combination, a supporting frame, a table
 70 mounted on the frame, a plurality of posts erected in the upper surface of the table and of angular cross-section, a plurality of holders adjustable on the posts and having plates and rubber
 75 bumpers attached thereto, means for locking the holders in place on the posts, a cylindrical casing attached to the underneath portion of the table and under the said openings having a restricted mouth portion with drainage slots in the lower portion and wall slots for the jaw members in the upper portion thereof, said casing adapted to contain and guide shrinking-seal material therethrough, a cylindrical plunger loosely disposed in the casing and having the lower portion tapered to substantially conform with the restricted mouth portion aforesaid, means for en-
 80 gaging and propelling the shrinking seal material through the casing towards the said openings and onto the packages held by the said holders, a cutter for detaching the shrinking-seal material as it engages with the packages, mechanism 75

for operating said means and cutter in predetermined relation and cycle, mounted on the said frame, and a container for holding the shrinking-seal material in solution adjacent and accessible to the casing for feeding the same continuously.

11. A device of the class described comprising in combination, a supporting frame, a table mounted on the frame, a plurality of posts erected in the upper surface of the table and of angular cross-section, a plurality of holders adjustable on the posts and having plates and rubber bumpers attached thereto, means for locking the holders in place on the posts, a cylindrical casing attached to the underneath portion of the table and under the said openings having a restricted mouth portion with drainage slots in the lower portion and wall slots for the jaw members in the upper portion thereof, said casing adapted to contain and guide shrinking-seal material therethrough, a cylindrical plunger loosely disposed in the casing and having the lower portion tapered to substantially conform with the restricted mouth portion aforesaid, means for engaging and propelling the shrinking-seal material through the casing towards the said openings and onto the packages held by the said holders, a cutter for detaching the shrinking-seal material as it engages with the packages, mechanism for operating said means and cutter in predetermined relation and cycle, mounted on the said frame, a container for holding the shrinking-seal material in solution adjacent and accessible to the casing for feeding the same continuously, and a device supported on the table for conveying a fluid to the detached shrinkage-seal material on the packages and expediting its shrinking action.

12. A device of the class described comprising in combination, a supporting frame, a table mounted on the frame, a plurality of posts erected in the upper surface of the table and of angular cross-section, a plurality of holders adjustable on the posts and having plates and resilient bumpers attached thereto, means for locking the holders in place on the posts, a cylindrical casing attached to the underneath portion of the table and under the said openings having a restricted mouth portion with drainage slots in the lower portion and wall slots for the jaw members in the upper portion thereof, said casing adapted to contain and guide shrinking-seal material therethrough, a cylindrical plunger loosely dis-

posed in the casing and having the lower portion tapered to substantially conform with the restricted mouth portion aforesaid, means for engaging and propelling the shrinking seal material through the casing towards the said openings and onto the packages held by the said holders, a cutter for detaching the shrinking-seal material as it engages with the packages, mechanism for operating said means and cutter in predetermined relation and cycle mounted on the said frame, a container for holding the shrinking-seal material in solution adjacent and accessible to the casing for feeding the same continuously, a device supported on the table for conveying a fluid to the detached shrinking-seal material on the packages and expediting its shrinking action, and means for controlling the operation of the mechanisms aforesaid manually and by predetermined intervals in the cycle of operation.

13. A machine for attaching shrinking-seals on a capped bottle comprising in combination, a casing having a hollow cylindrical form with its lower portion restricted as a mouth for the entrance of tubular shrinking material and to frictionally bind on same, a plunger resting in the casing and adapted to pass through the seal material and as it passes through the casing to expand and stretch the same, jaw members connected with the casing and adapted to engage with the seal material and propel same up through the casing, means for holding capped bottles above said casing and in registry with the seal material as it is propelled on the capped bottle.

14. A machine for attaching shrinking-seals on a capped bottle comprising in combination, a casing having a hollow cylindrical form with its lower portion restricted as a mouth for the entrance of tubular shrinking material and to frictionally bind on same, a plunger resting in the casing and adapted to pass through the seal material and as it passes through the casing to expand and stretch the same, jaw members connected with the casing and adapted to engage with the seal material and propel same up through the casing, means for holding capped bottles above said casing and in registry with the seal material as it is propelled on the capped bottle and means for expediting the shrinking action of the seal on the capped bottle.

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