May 26, 1942. I. F. MANDELL 2,284,491

ADHESIVE APPLICATOR FOR CYLINDRICAL CONTAINER INTERIORS

Filed Feb. 9, 1939 3 Sheets-Sheet 1

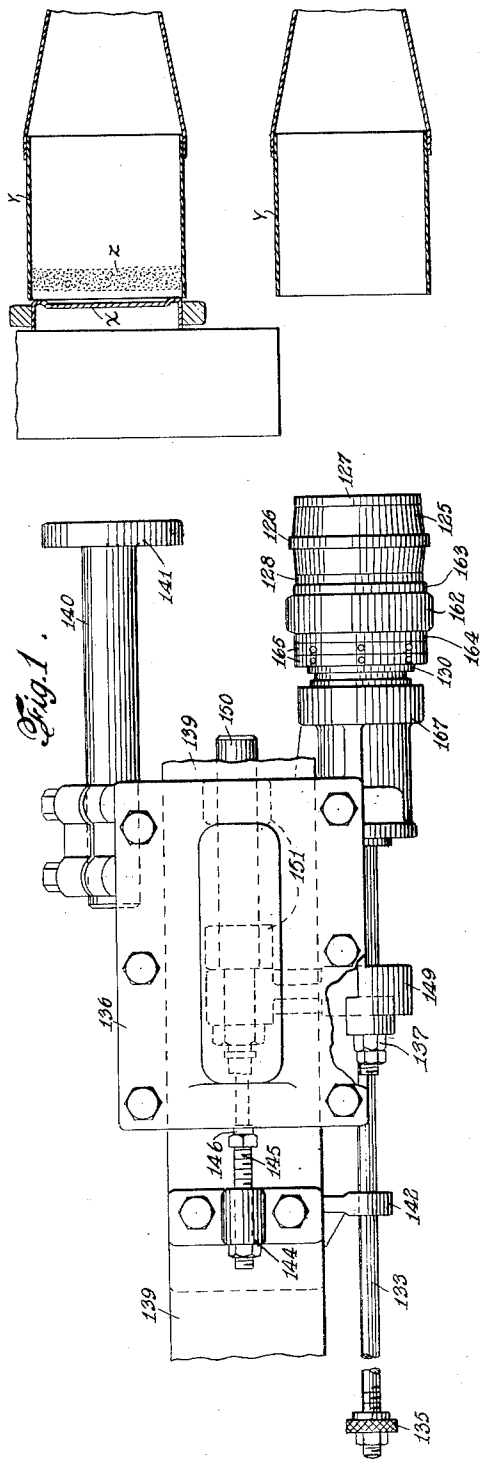


Fig. 1.

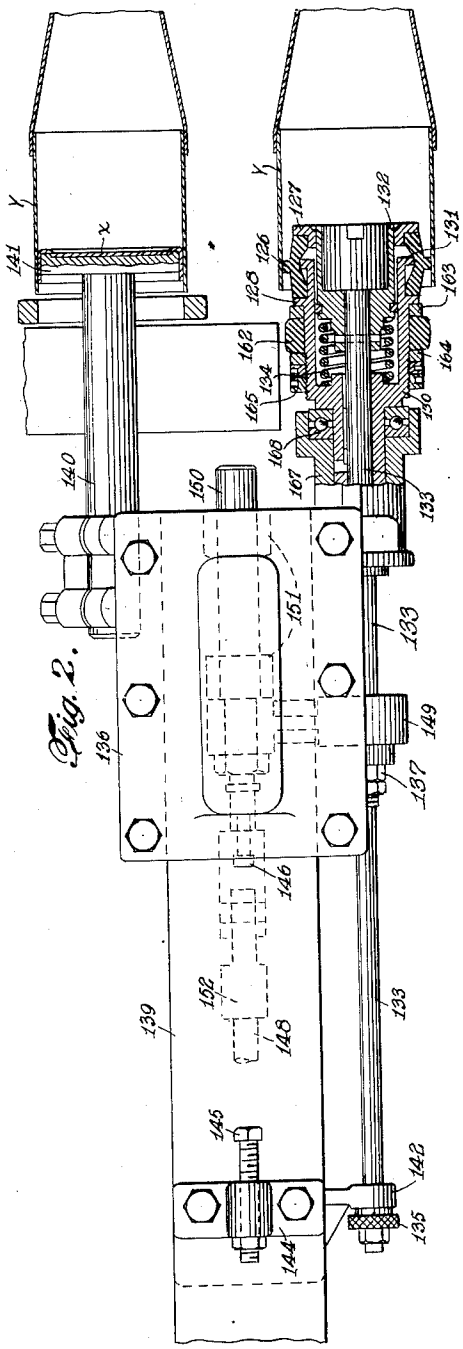


Fig. 2.

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Filed Feb. 9, 1939 3 Sheets-Sheet 2

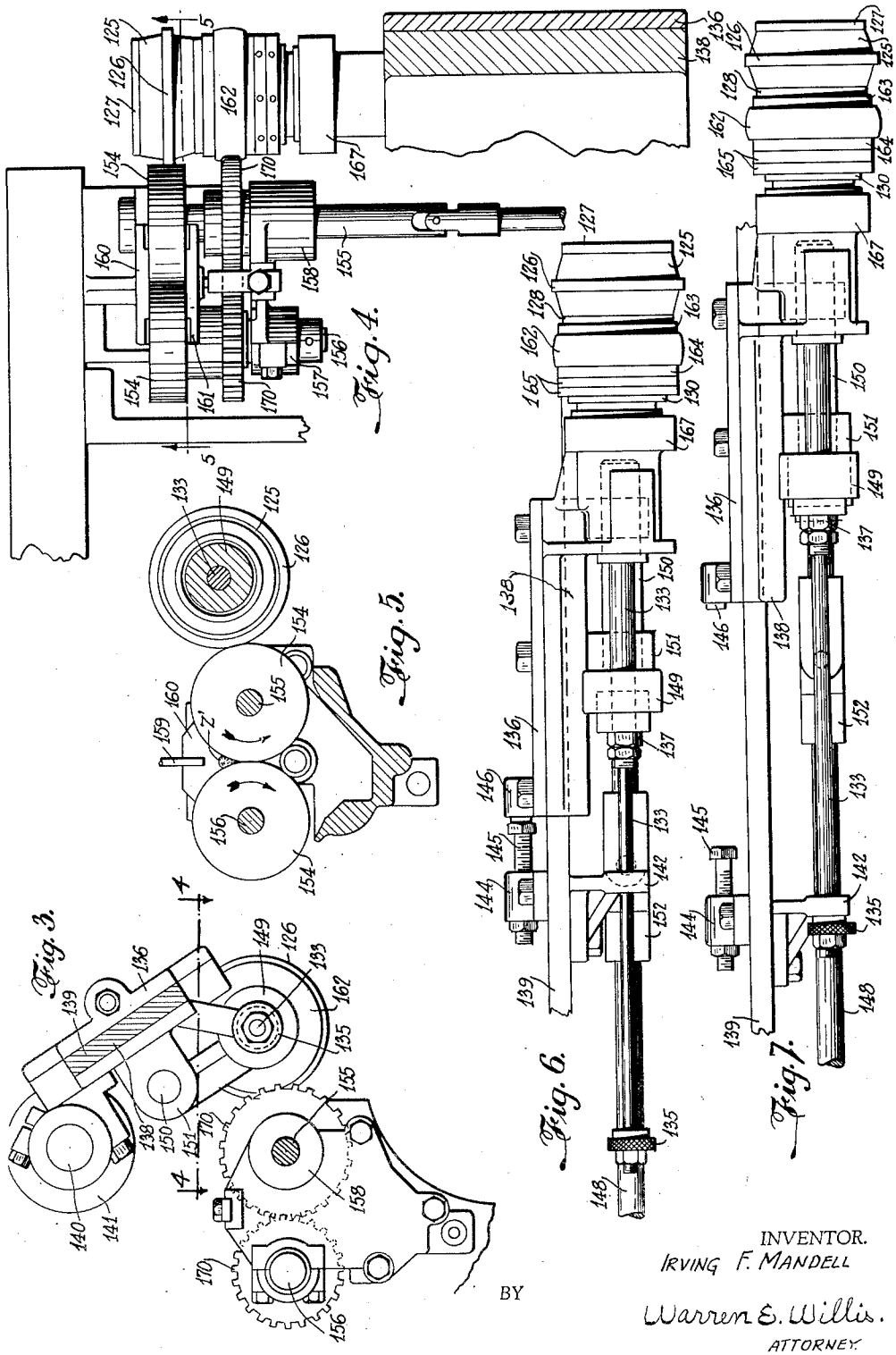


Fig. 4.

Fig. 5.

Fig. 3.

Fig. 6.

Fig. 7.

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Filed Feb. 9, 1939 3 Sheets-Sheet 3

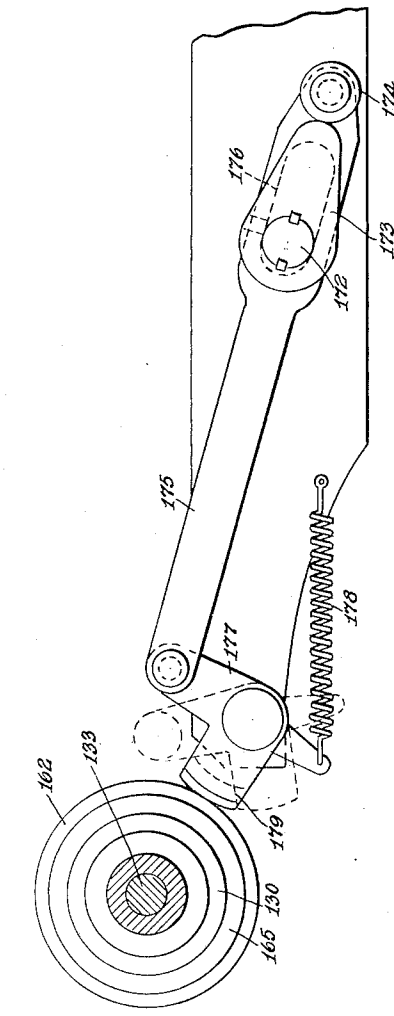


Fig. 8.

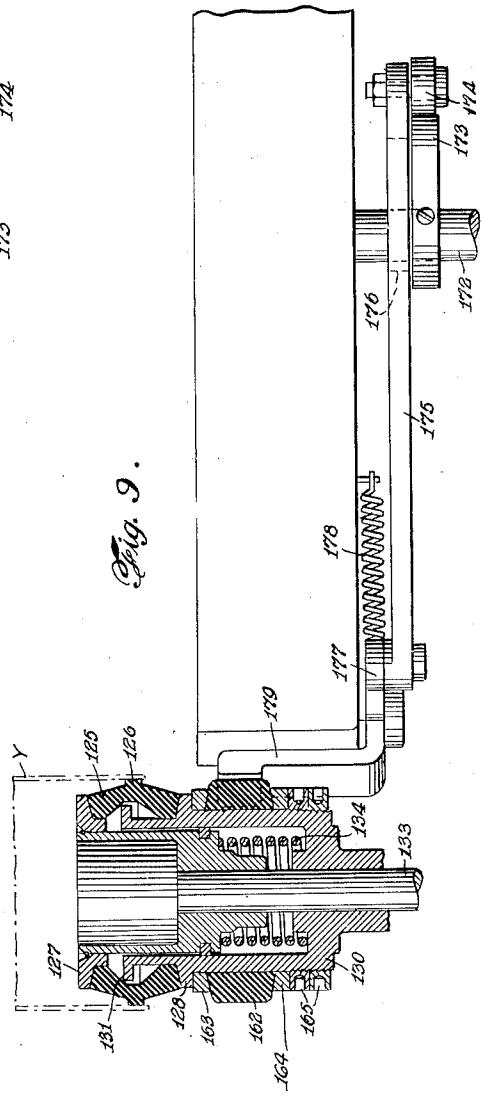


Fig. 9.

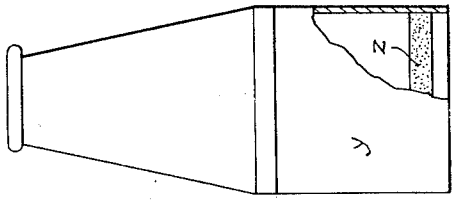


Fig. 10

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2,284,491

ADHESIVE APPLICATOR FOR CYLINDRICAL CONTAINER INTERIORS

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Application February 9, 1939, Serial No. 255,469

8 Claims. (Cl. 91—47)

This invention relates to means and mechanisms for setting closures in containers, especially those which are constructed of paper or similar material and, although it has particular reference to the bottom structures thereof, some of the mechanisms are equally applicable to either or both the top and bottom structures of certain types of containers.

Obviously, such containers of this type as are adapted for service as holders of liquids must have impermeable body walls, a bottom capable of resisting internal and external pressures to an extent limited only by actual disruption of the material, and they must necessarily be proof against leakage, even under rough usage, such as is ordinarily encountered in handling and shipment.

It will be apparent also that, in order to render such containers commercially successful, they must be manufactured from selected materials, under condition of quantity production, and the manufacture must be rapid and inexpensive to such an extent as may be accomplished by means and mechanisms designed and constructed by experts, after exhaustive experimentation.

An object of this invention is to provide an adjustable means for the application of an adhesive in controlled quantity and position, to an inner portion of the container wall.

A further feature is in the provision of an adhesive applicator having expansible elements whereby the adhesive may be applied as an internal band to the inner surface of a cylindrical container, at a definite distance from its bottom edge, preparatory to the entry of a closure therein.

These and analogous objects are accomplished by the novel and practical construction and combination of parts hereinafter described and illustrated in the accompanying drawings, constituting a graphical component of this disclosure, and in which:

Figure 1 is a plan view of an adhesive applicator made in accordance with the invention and shown in a retracted position.

Figure 2 is a similar view of the same but showing the operative parts extended.

Figure 3 is an end elevational view partly in section.

Figure 4 is a partial plan view, taken on line 4—4 of Figure 3.

Figure 5 is a transverse sectional view taken on line 5—5 of Figure 4.

Figure 6 is a side elevational view of the device as retracted.

Figure 7 is a similar view showing the applicator head in an advanced position.

Figure 8 is a diagrammatic view of a portion of the applicator, showing means for its partial rotation.

Figure 9 is a partial side elevational, partial sectional view of the elements shown in Figure 8.

Figure 10 is a side elevational view of a container, its side wall broken away to show an adhesive band deposited therein.

The drawings show an adhesive applicator, including a distortable annulus 125 of rubber or other elastic material of a particular sectional formation, a medial inner annular recess and a ring portion 126, to which a selected adhesive is applied; the annulus 125 is normally in contracted form and is expansible by action of mechanism later on described. A relatively movable annular flange 127, at the end of the applicator, and a flange 128, on the other side of the annulus 125, is carried on an outer sleeve 130, and internally of the flexible annulus 125, in its recess, is an outstanding annular flange 131, on the end of the fixed outer sleeve 130, while the movable flange 127 is carried on an inner sleeve 132, fast on a rod 133.

A coiled spring 134 is compressed between the sleeves 130 and 132, so that on longitudinally moving the sleeve 130, the annulus 125 is compressed between the flanges 127 and 128, and the applicator ring 126 is expanded diametrically, the expansion of the ring being at the end or limit of the forward movement of the applicator, within the container, and also at its backward movement to contact the adhesive feed roll.

The applicator head as shown is varied in the form of the flanges, which engage opposite bevelled side faces of the annulus 125, but the results obtained, as with the ring 126, is identical in both cases.

Adjusting means for the rod 133 are shown at 135—137 (Figures 1 and 2), and it is a feature of the annulus 125, that upon expansion of the ring 126, the flange 131 of the sleeve 130 is relatively moved from the central part of the recess of the annulus, onto its thickened portion to assure proper contact with the shell Y.

A carrier plate 136 having a back plate 138 bolted thereto, is slidably mounted on a guide bar 139 and carries a fixed stud 146 against which an adjusting screw 145 contacts to arrest motion of the applicator assembly at the rearward limit of its stroke. These plates carry the adhesive applicator complete, and also a stem

140, adjustably mounted and having a head 141, which inserts a formed bottom closure X into a container shell Y.

On the guide bar 139 is a bearing 142 for the rod 133, and also a fixed bracket 144 having an adjusting screw 145, whereby relative movement of the carrier plates 136—138 is accomplished on the fixed guide bar 139. Movement of the assembled members, including the carrier plates 136—138 on the fixed guide bar 139, is effected through a connecting rod 148.

When at the stopping point, at the forward end of the applicator motion, a nut 135, adjustable on the rod 133, contacts the fixed bearing 142, a sleeve 149, containing a thrust bearing on a rod 150, which is slidably mounted in lugs 151, on the plate 138, continues motion, carrying the applicator assembly slightly further, this motion being relative to the stopped motion of rod 133, causes relative motion to contract the space between the flanges 127 and 128 to expand ring 126.

The thrust sleeve 149 is normally held against the face of the lug 151 by action of a spring 134, and this controls motion of the applicator assembly forward and back, except as influenced by the stop action at rear of stroke.

At the rear of the stroke, when the stud 146 is against screw 145, a slight continuance of motion imparted to connections 148 and 152, moves the thrust member 149 away from the lug 151 and thereby moves rod 133 by its thrust bearing slightly, to contract the space between the flanges 127 and 128, thereby to expand the ring 126.

An adhesive is applied to the applicator ring 126, after it is expanded at the rearward position of the applicator assembly, by rolls 154, on carrying elements which include shafts 155—156, frame and bearing members 157—158. Between these rolls is shown an adhesive Z, delivered from supply tube 159, and confined by side elements 160—161 to retain the adhesive within the area of the circumferential portions of the rolls 154.

The applicator is also provided with an elastic ring 162, the diameter of which is controllable, and having on its opposite sides, slidable metal rings 163—164, one of which rests against the flange 128.

Threaded on the outer sleeve 130, adjacent the ring 162, is a pair of nuts 165 and on turning the nuts, the same force the slidable ring 163 against the elastic ring 162, to thereby increase its diameter, and cause the ring to grippingly urge its inner annular face against the sleeve 130.

The slidable rings are preferably formed with inclined side faces to correspond with those of the elastic ring 162 to produce an inward pressing function.

The applicator head is revolvably mounted relative to the plate 136 and a fixed member 167, in anti-friction bearings 168, and in order to revolve the head, to cause its ring 126 to pick up an adhesive from the rolls 154, before insertion in a container, cooperating toothed drive wheels 170 are provided, revolvable with the respective rolls 154, appropriately with each other, to transmit motion to the elastic drive ring 162, when the ring contacts the toothed wheel 170.

The annular distance or space between the applied adhesive band Z and the ring 126, immediately on contraction thereof within the container, is limited, and it sometimes happens that the adhesive is of a stringy nature, in which case, on longitudinal movement or extraction of the applicator, some stray portions might be deposited on the margin between the adhesive band and the edge of the container shell.

Means are shown to limitedly revolve the applicator head, immediately on contraction of the ring 126, thus to break off any strings or sticking parts of adhesive that may exist, and thus assure a cleanly and desirable appearance.

The partial turning means consists of an actuating spindle 172 on which is fixed a cam 173 operating a roll 174, rotatably mounted on an end of lever 175, having a slot 176 through which the spindle 172 passes, acting as a supporting guide; the other end of the lever is pivotally connected with an arm 177 of a pivoted bell crank. Normally, a tension spring 178 retains the other arm 179 of the bell crank clear of the drive ring 162, as shown in broken lines. On rocking the bell crank, against the action of the spring, from the broken line to the full line position, the ring 162 and therefore the applicator head are limitedly revolved for the stated purpose.

Pressing of the seam is performed just after application of the adhesive and the seam is subjected to some possible stress on the adhered parts during the spinning operation, it is a particular advantage to utilize the keeper ring 211, thereby maintaining the proper contour of the exterior of the container.

Variations may be resorted to within the scope of the invention, and parts of the improvements may be used without others.

Having thus described the invention, what is claimed as new and sought to secure by Letters Patent, is:

1. A device for applying adhesive to the inner surface of a cylindrical paper container, comprising a head having two spaced relatively movable flanges, an elastic band therebetween having a projecting adhesive applying roll, whereby said flanges may be moved so as to longitudinally contract the band thereby increasing the diameter of said roll.

2. An adhesive applicator for a paper container bottoming machine comprising a revolvable head, including a rigid sleeve having an adhesive applying roll, an elastic friction ring spaced from said roll, means for driving said ring, and means to periodically compress said roll whereby to temporarily modify its diameter.

3. An adhesive applicator for a paper container bottoming machine comprising a head having thereon an elastic band including a peripheral central adhesive applying roll, said band having an inner annular recess within the roll and relatively thin thereat, the opposed side portions of the roll being deep, and a rigid ring disposed in the recess at the thin part of said band, said ring engaging successively the thin portion and said deep annular portions, whereby to insure the concentricity of the adhesive applying roll.

4. A device for applying a band of adhesive to the inner surface of a cylindrical paper container, comprising a head having a fixed annular flange, a relatively movable flange spaced from the first flange, a resilient band in the interposed space and having thereon a projecting adhesive carrying roll of lesser diameter than the container, and means for drawing one of said flanges towards the other to compress said resilient band and urge said roll diametrically outward into engagement with the inner surface of the container.

5. An adhesive applicator for a paper container closure inserting machine, comprising a revolvable head including a rigid sleeve having

thereon an expansible elastic roll, an applicator for applying an adhesive to said roll externally of the container, means to insert said roll axially within the container for applying adhesive thereto, means for revolving the roll within the container, and means to expand the roll when therewithin.

6. In a machine for affixing closures in paper containers, in combination, an adhesive applicator for the inner surface of a container shell comprising a head having an elastic adhesive carrying roll thereon adapted to freely enter a container, means to charge said roll with an adhesive, means for expanding said roll into engagement with the container's inner surface, said means also being adapted to allow contraction of the roll, and means for at least partly rotating said roll within the container.

7. In a machine for securing closures in the ends of cylindrical containers and having a head to firmly grasp a container body entered therein to a definite distance, an elastic roll, means to supply said roll with an adhesive, means to expand and contract the roll, and means to advance and retract the roll, said roll when advanced and expanded applying a band of the adhesive at a predetermined distance within the container body from its end.

8. In a machine for securing closures in the ends of cylindrical containers and having a head to firmly grasp a container body entered therein to a definite distance, an elastic roll supplied with an adhesive, means to enter said roll within the open end of the container body to a predetermined distance, said means also operative to retract the same, means to expand said roll when entered within the body to contact its wall, said means causing contraction of the roll upon its retraction, and means to partially rotate said head, whereby upon the rotation and retraction of said elastic roll the same breaks any strings of adhesive adhering to said roll and said container.

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