The present invention relates to a mechanism for applying seals to rims of containers, and more particularly to an improved roller mechanism for applying adhesive to rims of containers for gluing a thin disk thereon to provide a pilfer-proof and leak-proof closure over the mouth of containers. It has become common to seal containers with a replaceable cap which may be easily removed from the container by a twisting motion and which may be re-applied after a portion of the contents has been taken out. However, the contents of such containers may be partially removed before they are sold to the ultimate consumer, and hence, it has become the practice, particularly in connection with containers for powdered coffee and wine bottles, to provide a separate seal in the form of a thin disk which seals the rim of the container and which is torn off by the consumer after the closure has been removed.

This type of safety seal is secured over the rim of a container by gluing it in place. It has been found convenient to place the safety seal inside a cap and then simply to screw the cap onto the container, so as to bring the safety seal into engagement with an adhesive which has been previously deposited to the container rim. It will be understood that if the bond between the safety seal and the rim is not secure, there is a tendency for the closure to pull the disk off the rim when it is removed. In that event, the consumer is inclined to believe that someone has tampered with the package. It therefore becomes important to have adequate adhesion between the rim and the disk and to obtain a secure bond to form a leak-proof and tamper-proof seal.

Adhesive for coating the container rims is generally applied by a rotating roller. The containers pass beneath the rotating roller and their rims come into contact with the roller so that adhesive is deposited thereon. It has been found that sometimes the product being packaged, especially powdered coffee, may fail beneath the conveyor for the container or the container itself and thus fills the container. It has also been found that, in some instances, container rims have irregularities therein, such as high spots or low spots, and, in some cases, one side of the rim of the container may be slightly higher than the other side. In these events, the roller does not make proper contact with the glass finish and will not apply adhesive to the low spots of the rim, thereby not providing a secure bond for the safety seal throughout the entire rim and preventing the safety seal from being securely adhered to the entire rim of the container. Irregularities in conveyor chain or belt surface, or chain or belt support rails, are also a serious cause of top of glass finish and roller not making proper contact.

Attempts have been made to overcome this by mounting the roller on a universal mounting. However, it has been found that the universal mountings presently in use do not provide for re-alignment of the roller back to the original position after the roller has pivoted over a high spot on a container rim. Glue will not be distributed evenly on the adhesive applying roller until the roller is moved to its original level position. Most satisfactory method of controlling adhesive thickness on the roller is to use a knife or a scraper located and secured a fixed distance from the roller surface. The knife is mounted on the bottom of the pan and the roller on the end of the pan so that the pan, knife and roller move as a unit.

The present invention overcomes these defects and has for one of its objects the provision of an improved adhesive applying mechanism for applying a uniform film of adhesive to container rims. Another object of the present invention is to provide an improved means for applying adhesive to container rims, whereby irregularities in the rims of the container will not impair the bond between the safety seal and the container rim.

Another object of the present invention is to provide an improved universally mounted adhesive applying roller which will automatically return to its normal level after it has moved over a high spot on the container rim. Other and further objects of the invention will be obvious upon an understanding of the illustrative embodiment about to be described, or will be indicated in the appended claims, and various advantages not referred to herein will occur to one skilled in the art upon employment of the invention in practice.

A preferred embodiment of the invention has been chosen for purposes of illustration and description and is shown in the accompanying drawings, forming a part of the specification, wherein:

FIG. 1 is a plan view, partly in section, of the improved adhesive applying mechanism made in accordance with the present invention;

FIG. 2 is a side elevational view thereof showing the drive means for the adhesive applying roller;

FIG. 3 is an end elevational view showing the means for raising the glue pan when the machine is stopped;

FIG. 4 is a sectional view taken along line 4--4 of FIG. 1 showing the leveling means of the present invention.

Referring more particularly to FIG. 2, which shows the general operation of the mechanism, the improved adhesive applying mechanism of the present invention comprises a reservoir or glue pan 1 of adhesive which has a rotatable roller 2 mounted therein. A container 3 is adapted to be moved beneath the roller and makes contact therewith so that a film of adhesive is applied by the roller 2 to the container rim 4 of a container 3 passing thereunder. A safety seal (not shown) is then applied to the container rim by a subsequent operation.

Referring to FIGS. 1 and 2, adhesive applying roller 2 is driven by a suitable drive motor 5, mounted on a frame 6, by the intermediation of drive pulley 7, drive belt 8, driven pulley 9, and roller shaft 10. The roller 2 is mounted on the roller shaft 10 which is journalled in journals 18 of glue pan 1. A casing 11 may be used to cover the motor and related parts.

The glue pot is mounted on a rear support bracket 17 by means of rear support bars 17A lying in slots 17B of bracket 17. The glue pan 1 comprises a bottom wall 15 and a pair of side walls 16. Glue pot 1 is supported at its front end by a pair of forwardly extending arms 19 having a forward support bar 20 mounted therebetween.

The glue pot is supported on a three point support which comprises a pair of alignment pins 30 mounted on a forward support bracket 22 on which the bottom wall 15 rests for universal movement thereon. The pin 31 may be in the form of a ball pointed screw or in the form of a sharp point or could even be flat.

Together with the pin 31, on which the bottom wall 15 of the glue pot rests, the two alignment pins 30 provide a three-point support which will permit the glue pot to pivot when going over a high spot in a container rim and which
permits the glue pot to thereafter resume its original level position so that glue is uniformly distributed thereon for subsequent operations. Hence, the glue pot may tip from side to side or up and down for corrective action and will always return to its original level position.

The alignment pins 30 and swivel pin 31 are threaded to permit the roller 2 to be vertically adjusted. If desired, suitable seats 32 (Fig. 4) may be formed in the forward support bar 20 on which the pins 30 may enter.

The operation of the machine will be obvious from the description of the various parts outlined above. Containers 3 are moved beneath the roller 2 which is being rotated by means of a suitable motor 35 and adhesive is applied to the container rims. Scraper 41 (Fig. 2) in the glue pot scrapes off excess adhesive from the roller so that only a thin film is applied. Side scrapers 42 (Fig. 1) are also provided to prevent any adhesive from spilling over the sides of roller 2. The height of the mechanism is adjusted vertically, by means of raising or lowering the whole assembly by a suitable mechanism (not shown) so that the roller 2 is slightly below the rim 4 of container 3. In this manner the roller will be raised off alignment pins 30 when a container passes beneath it. If the container rim has a high spot thereon, or if one side of the rim is higher than another edge, the glue pot 1 will swivel on the universal ball 31 so that the roller will contact the low portion of the rim and apply adhesive thereto. In order to permit the glue pot to pivot, the roller shaft 10 (Fig. 1) is provided with a universal connection 40.

In its swivelling action, the glue pot 1 tilts the front support rod 20 with respect to the two upstanding alignment pins 30. After the roller passes over a container, the glue pot will swivel back to its original position and the front support bar 20 will abut against and rest on the upstanding front pins 30 to insure return of the glue pot to the same level that it was in before it was pivoted over a container. Hence, the roller is now in position to apply adhesive to other containers passing therebeneath.

When the machine is stopped for any reason, a suitable solenoid 43 is activated and lifts one end 45 of a flexible arm 44 (Fig. 2) pivotally mounted at 46 and thereby depresses the other end 47 to apply pressure to a lug 48 extending from the rear of the pan 1 to lift the roller 2 to prevent the application of glue while the machine is inactive and eliminates the possibility of any adhesive falling into the product. When the machine is re-started the solenoid 43 is de-energized and the arm 44 returned to its normal position by spring 48.

When the glue pot is to be removed a coupling 50 on roller shaft 10 is unscrewed and pulled back to disconnect the drive and the arm 44 is slid back by a knob 51 to move the rear portion 47 thereof off the lug 48 and permit the glue pan to be lifted vertically without spilling adhesive.

The roller 2 shown in the drawings is provided with a hard inner core 46 made of metal such as brass and machined smooth to permit scrapers to remove excess adhesive from the sides and a softer outer core 47, preferably made from a resilient material, such as rubber. As the container rims pass beneath the roller, the softer outer core will tend to flex into the low spots and over the high spots to coat the entire rim of the container with a film of adhesive. In the drawings, the roller is shown as having a smooth outer periphery. If desired, the roller may have a plurality of adhesive retaining grooves, as more fully described in my copending application Serial No. 583,551, filed May 8, 1956, now Patent No. 2,552,239, which will prevent the roller from wiping off adhesive from container rims and will apply the adhesive in alternate zones or ridges of heavier and lighter adhesive.

It will be seen that the present invention provides an improved adhesive applying mechanism which will apply adhesive to container rims in a uniform manner and which will permit the adhesive applying roller to flex over high spots on container rims and automatically return to its original position and which also provides for easy adjustment of the height of the glue pot to permit containers of various heights to be coated.

As various changes may be made in the form, construction and arrangement of the parts herein without departing from the spirit and scope of the invention and without sacrificing any of its advantages, it is to be understood that all matter herein is to be interpreted as illustrative and in a limiting sense.

After having thus described my invention, I claim:

1. An adhesive applying mechanism comprising a frame, an upstanding bearing member mounted on said frame, a reservoir of adhesive having bottom, side and rear walls and having an open front end, said reservoir resting on said upstanding bearing member to permit the reservoir universal movement, an adhesive applying roller rotationally mounted in said open front end of the reservoir and communicating with the interior of the reservoir to permit it to receive adhesive from said reservoir, a leveling device on said frame, said reservoir being adapted to pivot said leveling device after being pivoted to permit the reservoir to return to its original position.

2. An adhesive applying mechanism as claimed in claim 1, wherein said leveling device comprises a pin mounted on said frame on each side of the longitudinal axis of said reservoir.

3. An adhesive applying mechanism as claimed in claim 2, wherein an arm extends forwardly from each side wall of said reservoir, said arms are connected together by a support bar, and wherein said pins are connected to said support bar and are adapted to contact said support bar to return the reservoir to its original position.

4. An adhesive applying mechanism as claimed in claim 3, wherein said pins are vertically adjustable.

5. An adhesive applying mechanism as claimed in claim 4, wherein said upstanding bearing member is a vertically adjustable pin.

6. An adhesive applying mechanism as claimed in claim 5, wherein a solenoid is mounted on said frame, an arm mounted on the armature of said solenoid, said arm being pivotally mounted on said frame, said arm being connected to the rear of said reservoir, whereby energization of said solenoid will move the armature and pivot said arm to tilt said reservoir and lift the roller.

References Cited in the file of this patent

UNITED STATES PATENTS

447,907 Salomon ---------------- Mar. 10, 1891
1,282,950 Reifsnyder ---------------- Oct. 29, 1918
1,392,117 Clark --------------- Sept. 27, 1921
2,559,988 Calles et al. -------- Jan. 30, 1951
2,747,541 Chew ---------------- Mar. 29, 1956