

Nov. 27, 1956

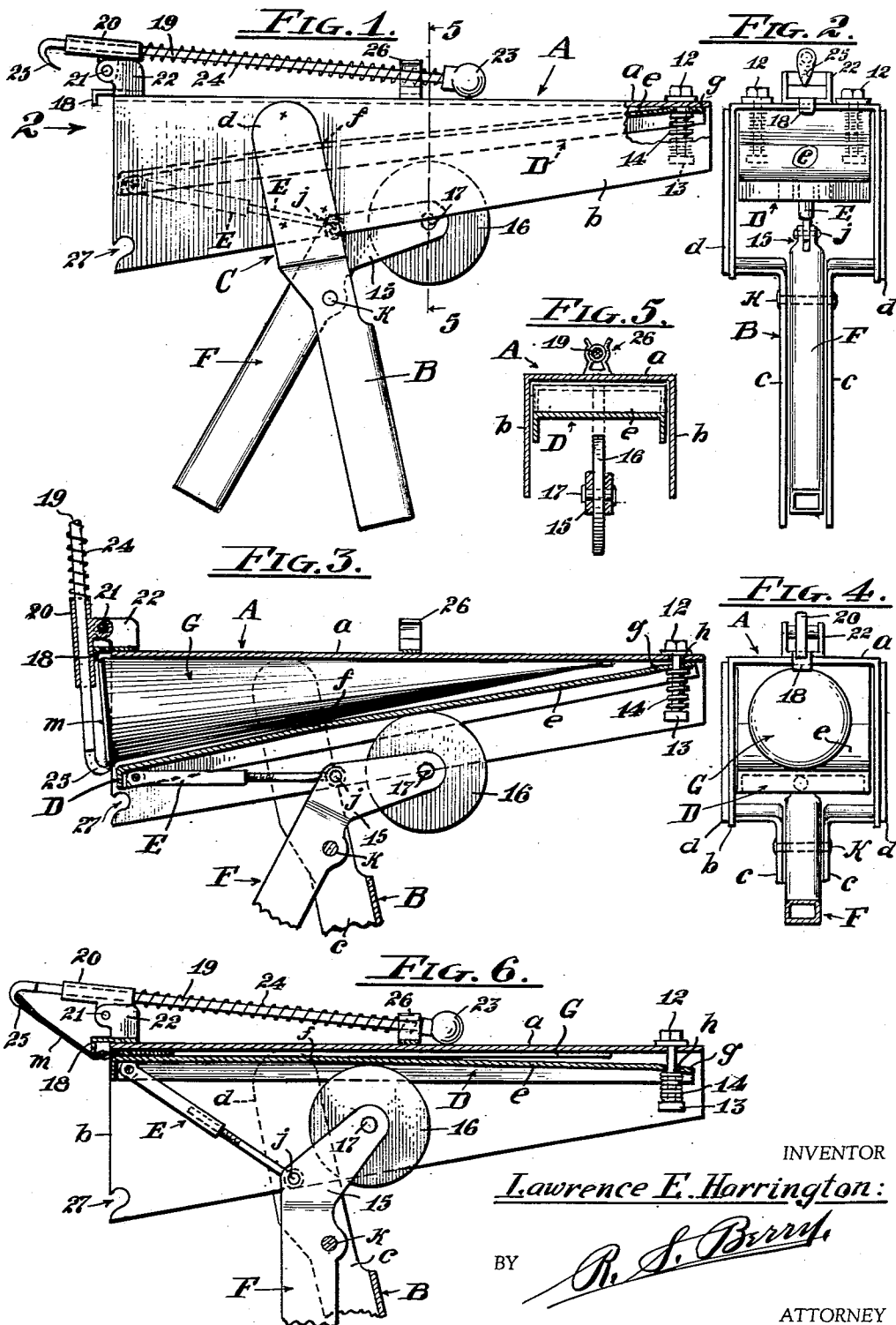
L. E. HARRINGTON

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COLLAPSIBLE TUBE SQUEEZER

Filed Feb. 2, 1955

2 Sheets-Sheet 1



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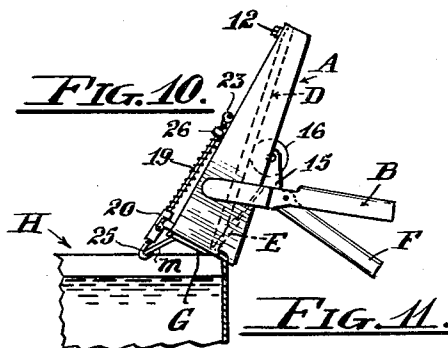
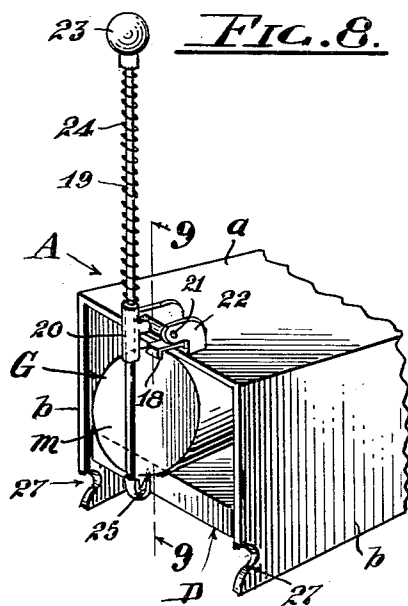
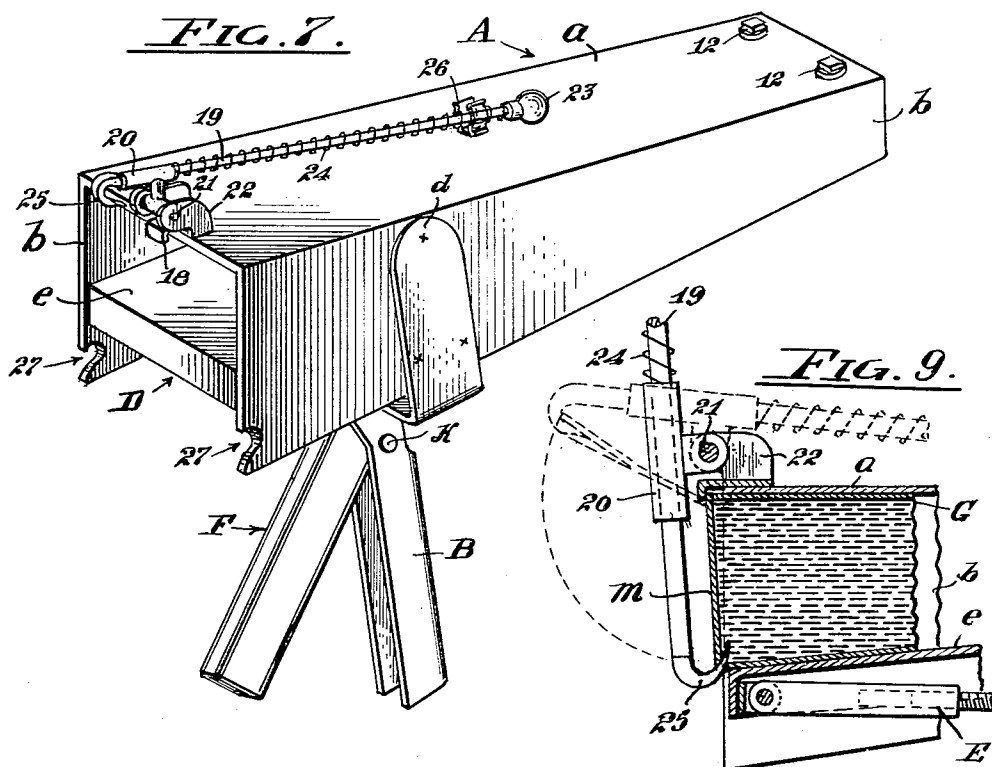
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COLLAPSIBLE TUBE SQUEEZER

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7 Claims. (Cl. 222-82)

This invention relates to a device of squeezing collapsible tubes and has as its primary object the provision of a hand actuated tube squeezer which is operable to rapidly collapse a tube and effect substantially complete discharge of the contents thereof in a single operation, the invention being particularly applicable for use in squeezing tubes of paint in the preparation of selected colors involving the mixture with a base paint, such as white, of the contents of one or more tubes of colors in accordance with a prescribed formula for producing a paint of a particular hue.

Another object is to provide a tube squeezer of the above character embodying a means whereby the discharge end of a collapsible tube may be readily opened preliminary to squeezing the tube by rupturing the tube along the juncture of the side and end walls thereof in a fashion to effect substantially complete removal of the end wall so as to fully open the tube and thus facilitate rapid discharge of the contents of the tube.

Another object is to provide an arrangement whereby the tube squeezer may be readily seated on and engaged with the margin of a container and then manipulated to deliver its contents into the container.

With the foregoing objects in view together with such other objects and advantages as may subsequently appear, the invention resides in the parts and in the combination, construction and arrangement of parts hereinafter described and claimed, and as illustrated by way of example in the accompanying drawing in which:

Fig. 1 is a view of the tube squeezer as seen in side elevation with portions broken away showing the operating parts in their normal position:

Fig. 2 is an end view as seen in the direction of the arrow 2 in Fig. 1:

Fig. 3 is a view of the tube squeezer in longitudinal section showing the parts thereof as positioned in initial engagement with a tube to be squeezed and with the tube opening device disposed in readiness to effect rupturing of the tube end:

Fig. 4 is a front end view of the structure shown in Fig. 3 with portions broken away:

Fig. 5 is a detail in cross section taken on the line 5-5 of Fig. 1:

Fig. 6 is a view of the tube squeezer in longitudinal section showing the parts as disposed on completion of the tube squeezing operation:

Fig. 7 is a perspective view of the tube squeezer showing one side, the front end and the top thereof with the parts disposed in their normal position:

Fig. 8 is a perspective view of the front end portion of the tube squeezer with the parts disposed as shown in Fig. 3 in readiness for rupturing the tube end:

Fig. 9 is an enlarged section taken on the line 9-9 of Fig. 8 illustrating the mode of operation of the tube opening device:

Fig. 10 is a diagram illustrating the manner of applying the squeezer to the margin of a container in readi-

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ness for ejecting the contents of the tube into the container: and

Fig. 11 is a perspective view of the collapsed tube when removed from the squeezer.

Referring to the drawings more specifically A indicates generally a housing constituting the body portion of the tube squeezer which housing is of generally inverted U-shaped cross section and embodies an elongated flat rectangular top wall *a* and parallel side walls *b-b* which walls are formed of a stiff sheet material of requisite stiffness of any suitable character. The housing A is open at its ends and on its under side.

A handle B is rigidly affixed to the housing A to project from the under side thereof at a point intermediate its ends which handle is here shown as formed of sheet metal bent into U-shaped cross section to provide side walls *c-c* the upper ends of which terminate in a yoke C embodying side members *d* which extend astride the side walls *b-b* and are affixed hereto as by spot welding.

Mounted within the housing A is a rectangular tube squeezing panel D which underlies the top wall *a* with its side margins paralleling inner faces of the side walls *b-b* proximate thereto. The panel D embodies a top plate *e* which is bent transversely intermediate its ends so that the end portions thereof slightly incline downwardly relative to each other and afford a transverse raised portion *f* intermediate the ends of the panel. The inner end of the plate *e* terminates in a flat portion *g* which extends in slight downward oblique relation to the adjacent portion of the plate which portion is mounted for rocking movement relative to the top wall *a* by means of a pair of bolts 12-12 extending downwardly through the top wall *a* and passing loosely through openings *h* in the oblique plate portion *g*. The bolts terminate in heads 13 between which and the plate portion *g* are expansion coil springs 14 encompassing the shanks of the bolts 12 and exerting an upward thrust against the under side of the portion *g* tending to seat the portion *g* against the under side of the top plate *a* so as to hold the panel D in a normal downwardly extended intermediate position relative to the top wall *a* as indicated in dotted lines in Fig. 1.

The panel D is designed to be rocked vertically in the housing A and for which purpose the outer end thereof is pivotally connected to one end of a link E in the form of a turn-buckle, the other end of which link is pivotally connected by a pivot pin *j* to a rocker arm 15 carried on a pivot pin *k* supported on the side members *c-c* of the handle B, the rocker arm 15 being formed on a lever F normally extending in angular relation to the handle B and adapted to be grasped with the latter in the hand of the operator and manipulated to rock the rocker arm 15 to exert an initial upward thrust on the outer end of the panel D through the link E. The link E normally extends downward from the panel D in angular relation thereto.

Mounted on the outer end of the rocker arm 15 is a roller 16 carried on a pivot pin 17. The roller 16 is normally disposed in spaced relation to the under side of the plate *e* when the panel D is in its intermediate position but is adapted to abut the under side of the plate *e* when the panel is in a lowered position as indicated at Fig. 3 and also to bear against the under side of the plate *e* when the panel D is actuated to effect a tube squeezing action.

The space between the plate *e* and the wall *a* is designed to receive a tapered filled collapsible tube G which is inserted endwise with its reduced end foremost into such space from the open outer end of the housing A to a position where the outer end *m* of the tube is positioned just forwardly of the outer end of the panel D which terminates adjacent the outer end of the housing.

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Mounted on the outer end of the top wall A is a tongue 18 which projects downwardly to afford an abutment for the upper marginal portion of the end *m* of the tube G positioned in the housing A.

Means are provided for ripping the tube end *m* at least in most part from the side wall portion of the tube G positioned in the housing which means is here shown as embodying a combined slide bar and lever 19 slidably supported in a guide tube 20 pivotally mounted on a pivot pin 21 carried on a yoke 22 secured at the forward end of the wall *a*. One end of the bar 19 is fitted with a knob 23 and bearing between the knob and the guide tube 20 is an expansive coil spring 24 which normally disposes the bar 19 in a retracted position. The other end of the bar 19 projects from the guide tube 20, and is formed with a sharp pointed hook 25 which when the bar 19 is disposed in an upwardly extending position forward of the housing A is adapted to be thrust into penetrating engagement with the side wall of the tube G at the juncture of the latter with the tube end wall *m* as particularly shown in Fig. 9.

Means are provided for normally holding the bar 19 in a position overlying the top wall *a* of the housing A, which means is here shown as comprising a U-shaped spring clip 26 carried on the wall *a*.

The lower outer end portions of the side walls *b-b* are formed with opposed notches 27 adapted to receive and afford seating engagement with the margin of a container H to support the housing A relative to the container H in inclined relation thereto with the forward end of the housing presented to the interior of the container as shown in Fig. 10.

In the operation of the invention on inserting a collapsible tube G in the outer end of the housing A which is effected when the parts of the squeezer are disposed in their normal position as shown in Fig. 1, the tube squeezing panel D will be depressed by the tube in opposition to the springs 14 to a lowered position as shown in Fig. 3 where the plate *e* of the panel D will seat on the roller 16 as shown in Fig. 3. When the tube is thus positioned with its outer end adjacent the outer end of the panel D, the raised portion *f* of the plate *e* will initially engage the under side of the tube to securely grip the latter against displacement. The upper side of the tube will then seat against the under side of the wall *a* with the upper marginal portion of the tube end wall *m* engaged by the tongue 18. The bar 19 is then freed from the grip 26 and swung to an upwardly extending position and at the same time is advanced in the guide tube 20 in opposition to the spring 24 to position the pointed end of the hook 25 in engagement with the lower marginal portion of the tube end wall, the hook 25 penetrating the tube side wall at its juncture with the end wall. Where the contents of the tube are to be squeezed into a container H, the housing A is engaged with the container rim as before stated, the lever F and handle B being then held firmly in the hand of the operator and slightly squeezed toward each other to cause the roller 16 to press the plate *e* upwardly to cause the raised portion *f* thereof to indent the tube G and thereby securely hold the latter against displacement. The upper end portion of the bar 19 is then forced rearwardly and downwardly thereby causing the hook 25 on the lower end thereof to swing outwardly and upwardly in such fashion as to rip the tube end wall *m* from the tube side walls along the margin of the latter. In this fashion the tube end is nearly but not quite detached from the tube body; the portion of the tube end *m* overlapped by the tongue 18 remaining intact and serving as a hinge on which the tube end *m* is swung to an upwardly inclined position as shown in Fig. 6 and as indicated in dotted lines in Fig. 9. The bar 19 is then reengaged with the clip 26 to thereby retain the tube end *m* in its fully open position. The lever F is then swung inwardly toward the handle B under the grip of the hand of the operator thereby causing the

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wheel 16 to advance the squeezing panel D upwardly on its pivotal connection with the bolts 12-12. Initial upward movement of the panel D is effected by the pressure imposed thereon by the roller 16 but when the link E is swung to an upwardly inclined position by upward movement of the panel D, the link will come into play and co-operate with the roller 16 in forcing the panel D to its uppermost position as shown in Fig. 6. The tube G will then be completely flattened out and collapsed as illustrated in Fig. 11 and whereby the contents of the tube G are substantially completely evacuated. The housing A is then removed from the container H and the bar 19 is disengaged from the clip 26 and manipulated to free the tube end *m*. The bar 19 is then restored to its normal position in engagement with the clip 26. The pull on the lever F is then released to allow the squeezing panel D to return to normal and thereby free the flattened tube which is then shaken clear of the housing.

The squeezer is now in condition in readiness for another operation.

While a specific embodiment of the invention has been shown and described, the invention is not limited to the exact details of construction set forth, and the invention embraces such changes, modifications and equivalents of the parts and their formation and arrangement as come within the purview of the appended claims.

I claim:

1. A tube squeezer comprising a housing having a top wall, and side walls and open at its forward end, a tube squeezing panel in said housing having side margins extending adjacent the inner faces of said side walls, said panel being pivotally connected at its inner end to swing toward and away from the under side of said top wall, a handle fixed to said housing and projecting therebeneath, a lever pivoted to said handle and normally extending in angular relation thereto, and means on said lever for actuating said panel toward said top wall on advancing said lever and handle toward each other to thereby squeeze a tube interposed longitudinally between said top wall and panel.

2. The structure called for in claim 1 together with manually operable means carried on said top wall for ripping a tube end from a tube body arranged in said housing.

3. In a tube squeezer, a housing having a top wall and an open forward end adapted to longitudinally receive a collapsible tube to be squeezed with the tube end presented to the open end of said housing, means for clamping the tube within the housing against said wall, a slide bar pivotally mounted on the housing top wall adjacent the forward end thereof, and a hook on the outer end of said slide bar engageable with a marginal portion of the end wall of the collapsible tube whereby on swinging said bar the tube end wall may be ripped in most part from the tube side wall.

4. The structure called for in claim 3 together with spring means on said slide bar normally maintaining the latter in a retracted position.

5. The structure called for in claim 3 together with spring means on said slide bar normally maintaining the latter in a retracted position, and means on the housing top wall engageable with said slide bar to detachably retain the latter in a folded position against said top wall.

6. In a collapsible tube squeezer, a housing having a flat wall, a tube squeezing panel pivotally mounted in said housing arranged opposite said wall, a handle fixed on said housing, a rocker arm pivoted on said handle, a lever attached to said rocker arm for actuating same, a link connecting the outer end of said panel to said arm, and a roller on said arm arranged to bear on the under side of said panel intermediate the ends thereof to co-operate with said link in advancing said panel toward said wall to effect a squeezing action on a collapsible tube interposed between said panel and wall.

7. In a collapsible tube squeezer, a housing having a

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flat wall, a tube squeezing panel extending opposite said wall, said panel being pivoted to swing toward and away from said wall, a handle fixed on said housing, a rocker arm pivoted on said handle, a link connecting the outer end of said panel to said arm, a roller on said arm arranged to bear against said panel intermediate its ends on swinging said rocker arm in a direction to advance the outer end of said panel by said link, a lever attached to said rocker arm extending in angular relation to said

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handle for actuating said rocker arm, and spring means for retracting said panel.

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