

April 25, 1950

D. J. PALERMO

2,505,063

SELECTIVE SPRAYING MACHINE FOR CONTAINERS

Filed Sept. 8, 1947

Fig. 1

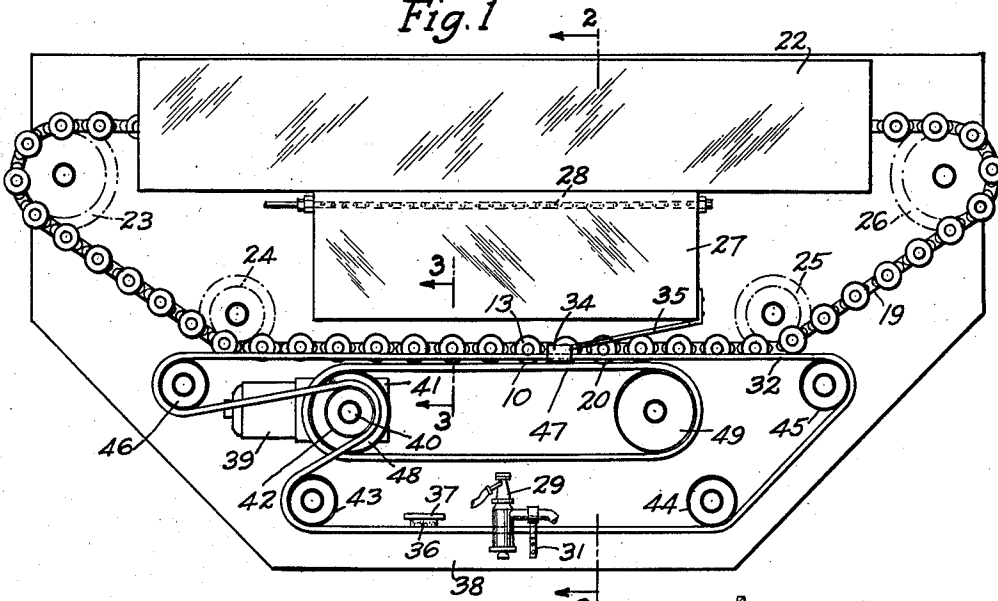


Fig. 2

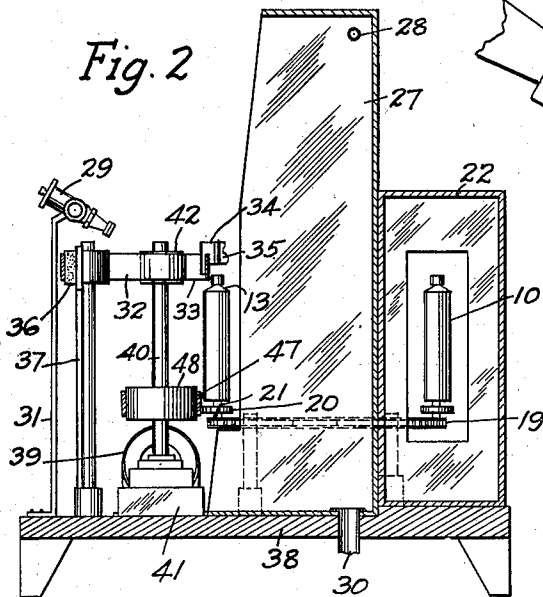
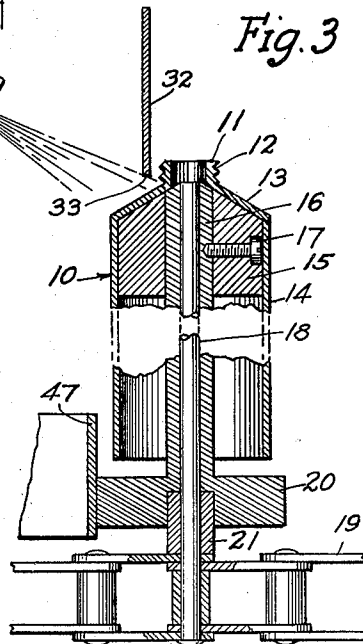


Fig. 3



INVENTOR.
Dominic J. Palermo
BY Harry Jacobson
ATTORNEY

UNITED STATES PATENT OFFICE

2,505,063

SELECTIVE SPRAYING MACHINE FOR CONTAINERS

Dominic J. Palermo, Brooklyn, N. Y., assignor to
Victor Industries Corporation, Brooklyn, N. Y.,
a corporation of New York

Application September 8, 1947, Serial No. 772,777

4 Claims. (Cl. 91—12)

1

This invention relates to machines for coating the outer surfaces of selected end portions of metallic containers such as collapsible tubes, and particularly to the masking means for shielding the parts which are not to be coated.

Generally cylindrical metallic containers, such as collapsible tubes, which are provided with constricted projecting threaded necks intended to receive caps, have usually been decorated by a suitable enamelling machine, as by coating the outer cylindrical surface of the body of the container with enamel and with suitable printing. Owing to the difficulty and expense of coating the tapered shoulder of the collapsible tube, or the annular end portion of any other similar container between the neck and the body thereof while protecting the neck and the threads thereof, such portion of the container has usually been left uncoated and the metal at that area has usually remained exposed to the atmosphere, whereby the metal becomes tarnished or corroded and loses its polish and finish.

The present invention therefore contemplates the provision of a simple machine for automatically coating the annular end portions of containers having protruding constricted necks while protecting the necks as well as the screw threads or caps thereon from the coating material, whereby the end surfaces of such containers may be rapidly and inexpensively coated in the same or in a contrasting color as the material coating the body, and the otherwise exposed metal is adequately protected.

The invention further contemplates the provision of a continuously moving mask in the form of an endless belt, for shielding the parts not intended to be coated, and of means for wiping the belt during its movement, whereby the belt is kept free of excess coating material and sufficiently clean to perform its function with little attention.

The invention further contemplates the provision of means for conveying the tubes past a spraying station while rotating the tube to be sprayed to insure that the entire annular area to be coated is exposed to the spray.

The various objects of the invention will be clear from the description which follows and from the drawings, in which

Fig. 1 is a top plan view of the coating machine.

Fig. 2 is a vertical section view thereof taken on the line 2—2 of Fig. 1.

Fig. 3 is a fragmentary vertical sectional view foreshortened of the tube, conveying, rotating and masking means taken on the line 3—3 of Fig. 1.

In the practical embodiment of the invention shown by way of example, collapsible tubes as 10 are illustrated as the containers to be coated, each of the tubes having a constricted neck 11 provided with external screw threads 12 intended to

2

have a suitable cap applied thereto, the tube having a tapered or conical shoulder 13 joining the neck to the main cylindrical body part 14. It will be understood, however, that the machine is equally applicable to the coating of any selected portion of the non-cylindrical part of a container while protecting the parts not intended to be coated. Each of the tubes 10 is mounted manually upon a suitable relatively short mandrel 15 shaped to fit and to hold the upper end of the tube and removably secured to the rotatable upright shaft 16 as by the set screw 17 to permit a mandrel of a different diameter to be substituted therefor when correspondingly different tubes are to be coated. The shaft 16 is rotatably supported by the relatively fixed rod 18 upstanding from the conveyor chain 19, the shaft at its lower end carrying the pulley disc 20 resting on the bearing member 21 projecting upwardly from the chain and fixed to the rod 18.

Said chain is continuous and carries the rods 18 with the corresponding upright shafts and mandrels, at suitably spaced intervals, the chain passing through a suitable heating chamber 22 of the required length to dry the coated tubes, and being driven continuously in any suitable manner as by means of an electric motor (not shown) operatively connected to the sprocket wheel 23, additional sprocket wheels as 24, 25 and 26 being arranged at the proper points to change the direction of movement of the chain as required.

In front of the heating chamber is arranged the spray collector or shielding compartment 27, open at the front and closed at the top, bottom and sides. A perforated water pipe as 28 passes transversely through the top portion of the compartment and showers the waste coating material projected into the compartment by the spray gun 29 arranged at the spraying station, thereby washing such material down into the waste pipe 30 draining the bottom of the compartment. A suitable bracket 31 serves to support the spray gun adjustably in a predetermined fixed position at the spraying station so that the spray discharged therefrom may be directed accurately toward the area of the tube to be coated when the tube reaches said station. As shown, to coat the inclined or conical shoulder 13, the spray gun is preferably inclined to the vertical and to the horizontal.

However, since any coating material on the screw threads 12 of the tube neck would interfere with the attachment and removal of the screw cap for the tube, means are provided for shielding the threads, or if the tube is capped, for shielding the cap from the coating spray. As shown, the shielding means takes the form of a continuously moving endless belt 32 of sufficient width to perform its shielding function and arranged with its wide faces vertical and sufficiently close to the

neck of the tube to be coated and at the proper height adequately to mask the threads or cap from the spray emitted from the spray gun. Preferably, the lower edge 33 of the belt is in the line drawn between the center of the discharge opening of the spray gun and the bottom of the threads or other line limiting the area on to which the coating material is to be sprayed.

A fixed belt-steadying member 34 arranged as closely as possible to the spraying station serves to prevent such vibration of the masking portion of the belt as would tend to render inaccurate the boundary of the sprayed area. Said member 34 is provided with a suitable groove open at the bottom and closed at the top for the reception of part of the belt and is supported adjacent the spraying station as by means of a suitable bracket 35 shown as secured to the side of the compartment 27.

The belt is continuously wiped and kept free of excess coating material which might otherwise drip therefrom by the fixed wiper 36 faced with absorbent material such as cloth or felt and supported as by a suitable support member 37 shown as upstanding from the base 38 of the machine.

To operate the masking belt, an electric motor as 39 drives the upright shaft 40 through suitable reduction gearing indicated by the gear box 41. The belt passes around the pulley 42 on the shaft 40 and is driven thereby, additional pulleys as 43, 44, 45 and 46 on upright shafts journaled in suitable bearings on the base 38, being arranged at the points where the direction of movement of the belt changes. It will be seen that by reason of the continuous movement of the belt, insufficient coating material is deposited thereon to drip off at undesired places, that the belt sharply cuts off the unwanted upper portion of the coating spray and thereby sharply defines the boundary of the coated area of the tube and that the belt is continuously wiped relatively free of excess coating material by means of the fixed wiper.

The tube 10 is rotated as it approaches and passes the spraying station, by means of a second belt 47 in pressed tangential engagement with the pulley discs 20 on those chain rods 18 adjacent the spraying station. Said belt 47 passes around the pulley 48 on the shaft 49 and around a second pulley 49 suitably supported by an upright shaft journaled in a bearing on the base 38. As the tube on the mandrel 15 approaches the spraying station, the projecting disc pulley 20 is pressed into contact with the moving belt 47 and is rotated thereby, the spray from the gun 29 meanwhile coating the rotating shoulder 13 of the tube to coat the entire annular area thereof while the masking belt protects the threads 12. Rotation of the tube is continued somewhat past the spraying station to insure complete coating and a uniform distribution of the coating material on the coated area, the straight reach of the belt 47 being made long enough for that purpose. The coated tubes are carried by the chain into and through the heating chamber 22 to dry the tubes, which are removed manually as they emerge from the chamber, the coated and dried tubes on the mandrels being replaced with uncoated tubes and the operations repeated as above described.

It will now be seen that I have provided a simple machine for effectively coating selected exterior annular end areas of containers having projecting necks or caps, while adequately protecting the necks or caps, and that the machine is

well adapted to meet severe practical requirements.

While a certain specific embodiment of the invention has herein been shown and described, various obvious changes may be made therein without departing from the spirit of the invention defined in the appended claims.

I claim:

1. In a machine for spraying the conical shoulder of a collapsible tube with coating material, a sprocket-engaging link conveyor chain, a series of rods upstanding at spaced intervals from the chain, a rotatable upright hollow shaft on each rod, each shaft terminating at its lower end in an enlarged disc and being supported by and rotatable on the rod, a tube-supporting mandrel having a conical upper surface adapted to fit and engage the conical shoulder of the tube and removably carried by and around the shaft and rotatable therewith, a relatively fixed sprayer arranged to spray coating material at a spraying station toward the conical upper surface of a mandrel on a shaft when the shaft has been carried by the chain to the spraying station, a first endless belt movable parallel to the chain and tangentially engaging the disc to rotate the disc when the disc reaches a position at and adjacent to the spraying station, and a second endless masking belt having a part between the sprayer and the shaft and parallel to the chain and across the spraying station and in the path of the upper portion of the spray produced by the sprayer, thereby to shield that part of the container tube above the shoulder from the spray, said masking belt part being in sufficient spaced relation to the shaft to avoid contact with the shielded part of the tube at the spraying station.

2. The machine of claim 1, an upright drive shaft, and a pair of spaced apart pulleys on the shaft, the first belt passing around one pulley and the masking belt passing around the other pulley, said other pulley constituting a support for the masking belt in spaced relation to the spraying station.

3. The machine of claim 2, a fixed member arranged adjacent to the spraying station and in spaced relation to the support for the masking belt, said member having a groove therein receiving a peripheral portion of the moving masking belt and thereby steadying said belt against such vibration as might render the masking effect of the belt inaccurate.

4. The machine of claim 1, means for supporting and driving the masking belt and a fixed member in spaced relation to said supporting and driving means and having a groove therein for the reception and passage of a peripheral portion of the masking belt and thereby steadying said belt against displacement of the masking area thereof.

DOMINIC J. PALERMO.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,256,599	Schoop	Feb. 19, 1918
1,894,729	Bozarth	Jan. 17, 1933
1,999,903	Harshberger	Apr. 30, 1935
2,088,542	Westin	July 27, 1937

FOREIGN PATENTS

Number	Country	Date
530,198	Germany	July 9, 1931