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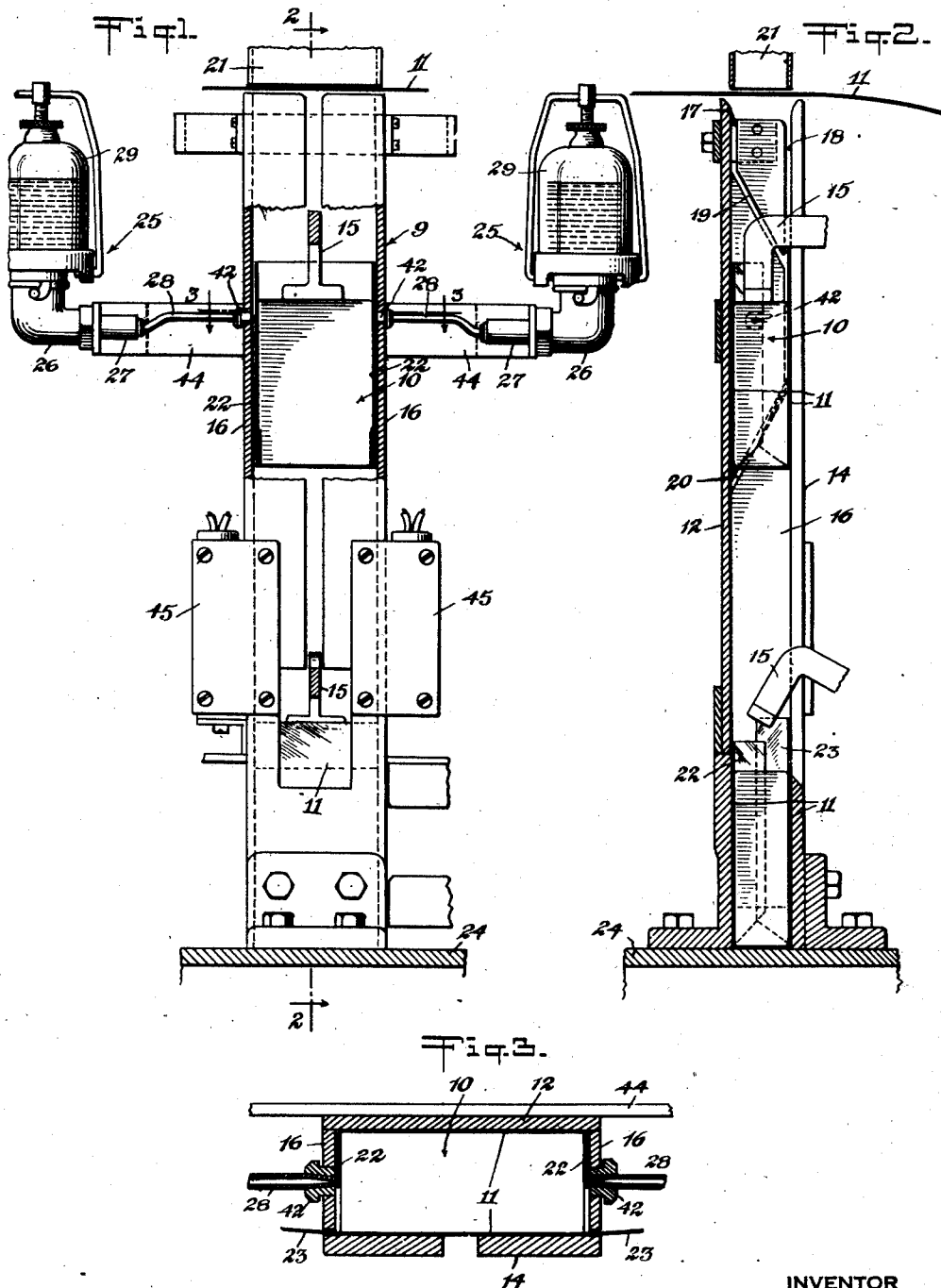
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2,361,818

LIQUID DISPENSING APPARATUS

Filed Feb. 27, 1942

2 Sheets-Sheet 1



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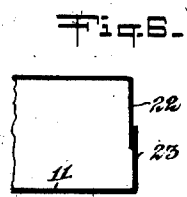
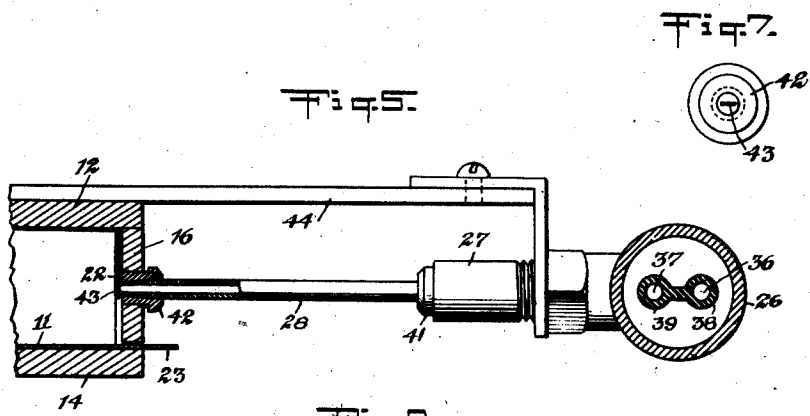
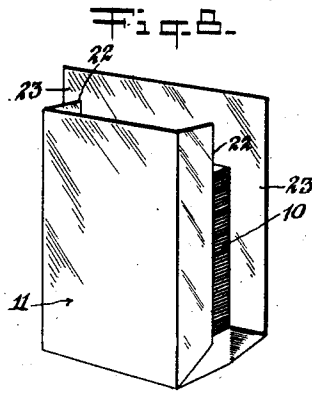
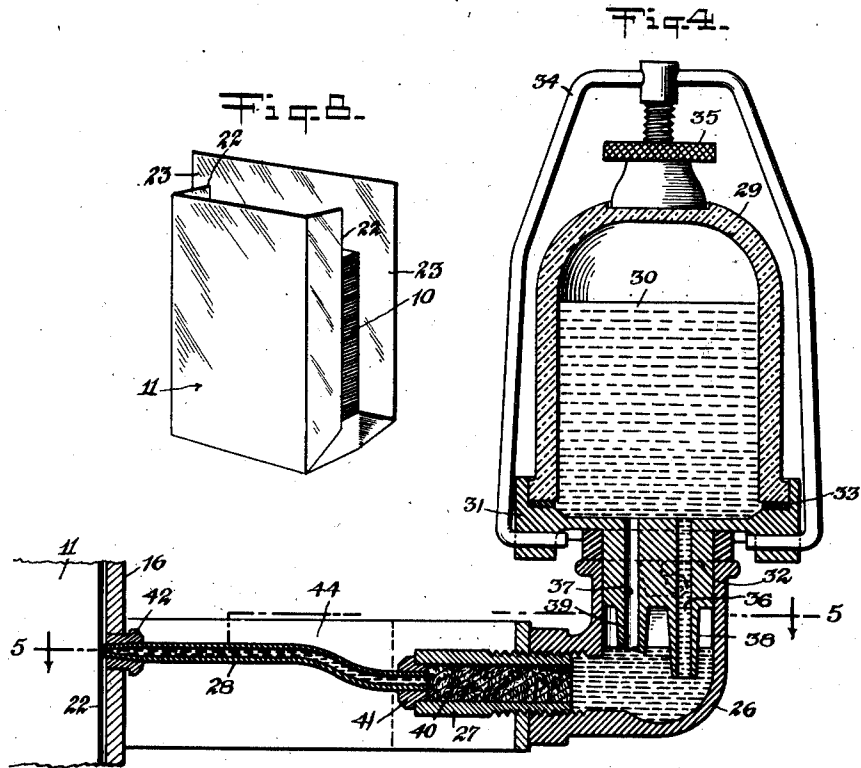
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LIQUID DISPENSING APPARATUS

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2 Sheets-Sheet 2



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# UNITED STATES PATENT OFFICE

2,361,818

## LIQUID DISPENSING APPARATUS

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Application February 27, 1942, Serial No. 432,585

3 Claims. (Cl. 91—12)

This invention relates to an improved liquid dispensing apparatus.

It is an object of the invention to provide improved apparatus of the above character for dispensing liquid and applying it to the surface of an object when the object is moved past the apparatus.

My invention is particularly applicable to wrapping machinery, and it is a primary object of this invention to provide apparatus for dispensing liquid solvents and adhesives to wrapping material as it is being wrapped around a package or other article to be used in securing the wrapping material in position.

The dispensing apparatus heretofore employed for dispensing solvents and adhesives in wrapping machinery, have had certain disadvantages. Thus, some of the apparatus did not provide for a uniform flow of the liquid, with the result that some packages would receive too much, detracting from the appearance of the package, and other packages would receive too little, and the wrapping material would not be properly held in wrapped position. Also, some of the apparatus leaked or dripped, in the absence of a package, and this was undesirable because it not only resulted in wasting the liquid, but also at times detracted from the appearance of the package and interfered with the proper wrapping of the packages. In many instances, the liquid dispensing apparatus employed wicks to conduct the liquid to the point where it was to be applied to the wrapping material, and the wicks required adjustment, cleaning and replacement from time to time.

It is a further object of the present invention to overcome the difficulties and disadvantages heretofore encountered, and to provide improved apparatus of the above character for dispensing liquids, which is particularly suitable for use in connection with wrapping machinery, and which insures a uniform flow of the liquid and will not leak or drip in the absence of a package, and which does not require the use of a wick to conduct the liquid to the point at which it is to be applied to the wrapping material.

Other objects will be apparent from the following detailed description of the drawings, in which—

Fig. 1 is an elevational view, partially fragmentary, of a folding chute of one form of wrapping machinery having attached thereto my improved apparatus for dispensing liquids;

Fig. 2 is a longitudinal sectional view in the direction of the arrows on the line 2—2 of Fig. 1;

Fig. 3 is a cross sectional view in the direction of the arrows on the line 3—3 of Fig. 1;

Fig. 4 is a detail sectional view of the liquid dispensing apparatus;

Fig. 5 is a sectional view in the direction of the arrows on the line 5—5 of Fig. 4;

Fig. 6 is a sectional view of the wrapping material showing the manner in which it adheres together after the liquid has been applied thereto;

Fig. 7 is a view of the discharge outlet of my dispensing apparatus; and

Fig. 8 is a perspective view of a package partially in a sheet of wrapping material.

As stated above, my apparatus is particularly adapted to be used in connection with wrapping machinery, although it may be used for other purposes.

In the accompanying drawings, I have illustrated the apparatus as applied to the folding chute 9 of a wrapping machine of the type shown in my Patent No. 2,144,448, granted on January 17, 1939. This machine is adapted to wrap packages of cigarettes or the like, as shown at 10, in sheets of transparent wrapping material 11, made from regenerated cellulose, cellulose hydrate, or the like.

The folding chute is of a well-known type and comprises front and back plates 12 and 14, the plate 14 being slotted to receive the pusher arms 15 which feed the packages through the chute. The chute is also formed with side walls 16 which are formed so as to fold the sheet of wrapping material around the sides of the package. Thus, it will be seen that a pair of slots 17 and 18 are formed on the two sides of each wall 16 at the upper portion thereof, the slot 17 terminating in a diagonally disposed transverse slot 19, communicating at its lower end with the slot 18. The slot 18, in turn, terminates in the diagonally disposed slot 20 extending across the side wall. Each of the side walls 16 is similarly formed.

The packages are fed downwardly from the guide chute 21. The lower portion of the package engages the sheet of wrapping material 11 which extends between the guide chute and folding chute. As the package is fed downwardly through the folding chute, the front and rear walls 12 and 14 fold the sheet over the two faces of the package so that the upper ends extend above the package in the manner shown in Figs. 1 and 2.

The lateral edges 22 and 23 of the sheet of wrapping material project outwardly through the

slots 17 and 18. As the package moves downwardly, the lateral edges 22 encounter the diagonal slots 19 which cause the edges 22 to fold inwardly against the package, in the manner shown in Figs. 3 and 8. As the package continues downwardly in the chute, the lateral edges 23 finally encounter the diagonal slots 20 which fold the edges 23 against the package in superimposed relationship with respect to the edges 22, in the manner shown in Fig. 6. The pusher arms 15 continue to feed the package 10 to the bottom of the chute where it is discharged into another chute which completes the wrapping operation. It will be appreciated that the folding chute is suitably supported on the frame 24 of the machine, in the manner indicated in Figs. 1 and 2.

The folding chute described above is one well-known type of folding chute, and does not constitute my present invention. It is merely intended as illustrative of one type of device with which my liquid dispensing apparatus is particularly adapted to be used. My invention comprises the liquid dispensing apparatus shown generally at 25 and which is so arranged as to dispense and apply a liquid solvent or adhesive to the outer surface of the flap 22 after it has been folded against the side of the package, and before the flap 23 has been folded downwardly against it in superimposed relationship.

Thus, it will be seen that when the package has been shifted below the diagonal slot 19, but is still above the diagonal slot 20, the flap 22 is folded against the side of the package, but the flap 23 still projects outwardly, in the manner shown in Figs. 3 and 8. Accordingly, I arrange my dispensing apparatus so as to communicate with the side wall 16 between the two diagonal slots 19 and 20, in the manner shown in the drawings.

It is common practice today to wrap packages, particularly cigarette packages, in a sheet of regenerated cellulose having a soluble coating, and commercially known as moisture-proof Cellophane. This material can be effectively sealed and the edges caused to adhere together by applying to the surface thereof a suitable solvent which partially dissolves or plasticizes the surface. The two surfaces of the material can then be held together until the solvent has evaporated, at which time the surfaces will firmly adhere together. Efficient liquid solvents have been developed for this purpose, and one such solvent is ethylene glycol monomethyl. A liquid solvent of this type is employed in the illustrated embodiment of my invention.

My apparatus comprises generally a constant level reservoir 26 which communicates through a choke and filter 27, with a tube 28 which, in turn projects through the side wall 16 of the folding chute between the diagonal slots 19 and 20. I provide two units of my apparatus, one mounted on either side of the folding chute, so that a liquid solvent is applied to each of the flaps 22.

The constant level reservoir may be of any desired type, but I have found that satisfactory results are obtained from the illustrated device which consists of an elbow-shaped fitting having a chamber therein and which is adapted to receive the inverted receptacle 29 containing a supply of the liquid solvent 30 from which the liquid in the reservoir is replenished as it is used. The receptacle 29 is received in the flanged upper portion 31 of the plug 32 which, in turn, projects into the upper portion of the reservoir 26. To prevent leakage between the receptacle and plug,

a suitable washer 33 may be provided, and the receptacle is preferably held firmly in position by means of the bracket 34, pivotally connected to the plug and provided with the screw-threaded abutment 35 for engaging a recess formed in the receptacle.

Extending through the plug 32 are a pair of ducts 36 and 37, and depending from the plug and coaxial with the ducts are a pair of tubular spouts 38 and 39, respectively, the spout 38 being somewhat longer than the spout 39. The duct 36 serves as a path of flow for the liquid solvent 30 to flow from the receptacle 29 into the reservoir 26, while the duct 37 serves as a path of flow for the air or other gas. When the level of the liquid in the reservoir 26 is below the lower end of spout 39, liquid will flow from the receptacle into the reservoir until it reaches the height of the lower end of the spout 39.

It will be appreciated that when the level of the liquid is below the lower end of spout 39, the air which is replaced by the entering liquid can flow upwardly from reservoir 26 into receptacle 29. However, after the liquid reaches the lower end of spout 39, it serves as a seal and prevents further escape of the air, with the result that the pressure of the air trapped in the upper portion of the reservoir will maintain the liquid in the reservoir at substantially the level shown in Fig. 4.

As the liquid is used from the reservoir, it will be replaced from the receptacle, with the result that it is maintained at a substantially constant level. While the specific form of constant level reservoir shown and described produces satisfactory results, it should be appreciated that I do not intend to limit my invention to this form, and that other types of reservoirs may be employed.

The choke and filter 27 comprises a tubular nipple threaded into the outlet end of the reservoir and having suitable filtering material, such as felt, disposed therein, as indicated at 40. The filtering material serves the dual purpose of filtering and cleaning the liquid and also preventing too rapid a flow of the liquid from the reservoir.

Connected to the outlet end of the choke and filter, as by means of the plug 41, is a conduit, in the form of tube 28, which is offset, in the manner shown, so that the outlet or discharge end thereof is disposed just slightly below the level of the liquid in the reservoir. The tube projects through the side wall 16 of the folding chute and is suitably held in position, as by means of the plug 42. The discharge opening of the tube is preferably formed into a restricted narrow slot, as shown most clearly at 43 in Fig. 7, and it is positioned in the path of movement of the flap 22 so that it will engage the flap and apply solvent to the outer surface thereof as the package is fed through the folding chute.

The size of the outlet 43 and the relative height of the outlet with respect to the level of the liquid in the reservoir, should be carefully proportioned so that the surface tension of the liquid is normally sufficient to overcome the force of gravity and prevent the flow of the liquid outwardly from the reservoir through the choke and tube and through the outlet. Thus, in the absence of a package in engagement with the outlet of the tube, the liquid will remain in a static condition in the reservoir, choke and filter, and tube, and a small globule of the liquid will project outwardly to a slight degree from the

end of the outlet of the tube, the surface tension of the projecting globule serving to maintain the liquid in static condition.

When the package moves downwardly through the chute, the flap 22 will engage the globule and the liquid will be wiped along the surface of the flap. This will permit the liquid to flow under the force of gravity and under the action of the slight suction which the wiping action creates, and a sufficient quantity of liquid is applied to the surface of the flap. The filter and choke serve to prevent too sudden a rush or flow of the liquid from the reservoir through the tube to the outlet with the result that after the package has passed by the outlet 43, the small globule will again form at the outlet, and the surface tension will again serve to maintain the liquid in static condition.

As previously explained, the liquid that has been withdrawn from the reservoir, is replenished from the receptacle 29 and the level in the reservoir is thereby maintained substantially constant.

The two units 25 are of similar construction, and they are suitably supported on the two sides of the folding chute, as by means of the brackets 44. After liquid solvent has been applied to the outer surface of the flap 22, it is fed downwardly through the chute and the flap 23 is folded against it in superimposed relationship, as shown in Fig. 6. The solvent serves to soften or partially dissolve the surface of the wrapping material. Thereafter the package is fed past the heating units 45 which evaporate the solvent, causing the two flaps to adhere together.

From the foregoing it will be seen that I have provided an improved form of liquid dispensing apparatus which is particularly suitable for use in connection with wrapping machinery, and which insures a uniform flow of liquid, will not leak or drip in the absence of a package, and which does not require the use of a wick to conduct the liquid to the point to which it is to be applied to the wrapping material.

While I have illustrated my invention as embodied in apparatus for dispensing a liquid solvent and applying it to a package in a wrap-

ping machine, it should be understood that my invention may also be used in other associations. It should also be understood that modifications may be made in the illustrated and described embodiment of my invention without departing from the invention as set forth in the accompanying claims.

I claim:

1. Liquid dispensing apparatus comprising means providing a constant level liquid reservoir having an outlet therein, a combined choke and filter including a nipple having a fluid flow bore therethrough and having inlet and outlet ends, a plug of fibrous material within said bore, the inlet end of said nipple communicating with the outlet in the reservoir, and a conduit having an inlet end communicating with the outlet end of the nipple and having a discharge orifice positioned slightly below the normal liquid level in the reservoir.

2. Liquid dispensing apparatus comprising means providing a constant level liquid reservoir having an outlet therein, a combined choke and filter including a nipple having a fluid flow bore therethrough and having inlet and outlet ends, a plug of fibrous material within said bore, the inlet end of said nipple communicating with the outlet in the reservoir, and a conduit having an inlet end communicating with the outlet end of the nipple and having a restricted discharge orifice positioned just slightly below the normal liquid level in the reservoir whereby the surface tension of the liquid at the discharge orifice is normally sufficient to maintain the liquid in static condition.

3. Liquid dispensing apparatus comprising means providing a constant liquid level reservoir having an outlet, conduit means connected to said outlet, said conduit means terminating in a restricted discharge orifice disposed slightly below the level of liquid in said reservoir and means in said conduit means for filtering and for restricting the flow of fluid therethrough including a plug of fibrous material within the conduit and positioned between the reservoir and said discharge orifice.

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