Aug. 25, 1953 W. W. EGEE ET AL 2,649,756

MACHINE FOR APPLYING A TREATING LIQUID TO YARNS

Filed May 31, 1952

FIG. 1

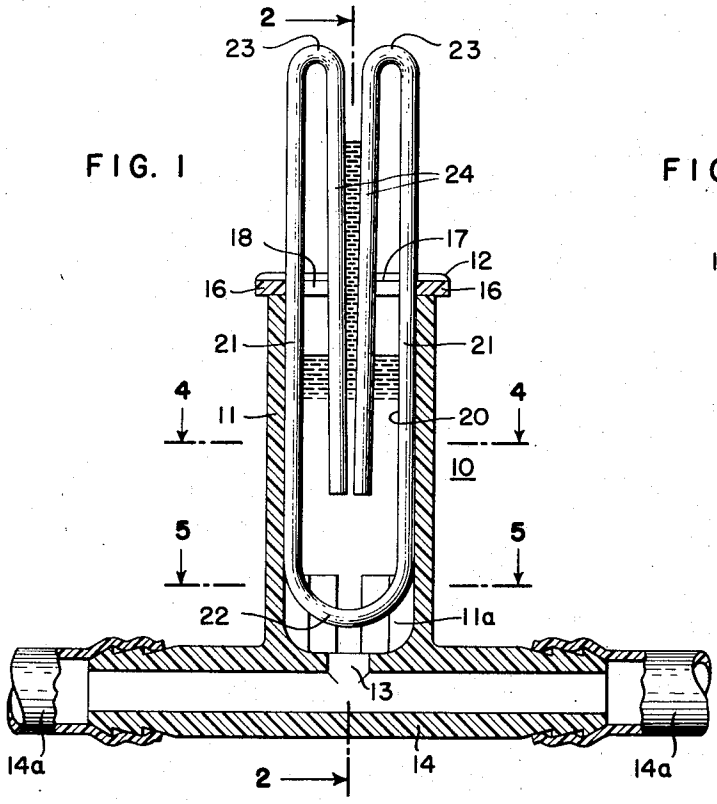


FIG. 2

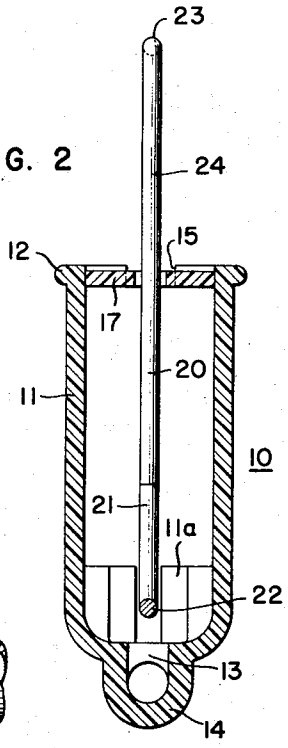


FIG. 3

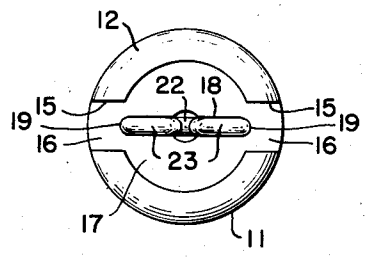


FIG. 4

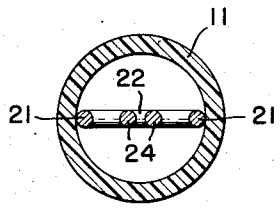
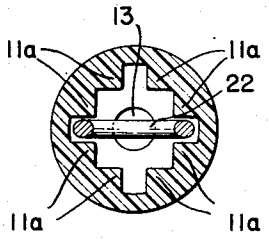


FIG. 5



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MACHINE FOR APPLYING A TREATING LIQUID TO YARNS

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10 Claims. (Cl. 118—401)

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This invention relates to the treatment of yarns with liquids, and more particularly to improved apparatus for the treatment of yarns of natural filaments as well as those of artificial or synthetic filaments, such as nylon and the like.

In the treatment of yarns of various types it is frequently desired to apply a liquid thereto for moistening, for applying size, or for other purposes. The quantity of liquid supplied must be adequate but not excessive.

In our application for Letters Patent for Treatment of Yarns, filed June 19, 1952, Serial No. 294,332, the treatment of yarn with liquids is shown for which the apparatus of the present invention is particularly suitable.

It is the principal object of the present invention to provide improved apparatus for the treatment of yarn and more particularly for the continuous application of liquid thereto while the yarn is in motion.

It is a further object of the present invention to provide improved apparatus for the application of liquid to yarn in which the quantity of liquid delivered to yarn may be varied as desired.

It is a further object of the present invention to provide apparatus for the application of liquid to yarn which includes a container for the liquid, an applicator within the container and extending therefrom, and a cover for the container which is capable of use for adjusting the delivery capacity of the applicator.

It is a further object of the present invention to provide apparatus for applying liquid to yarns in which an applicator is provided with a suitable adjusting structure for determining the quantity of the liquid delivered to the yarn.

Other objects and advantageous features of the invention will be apparent from the specification and claims.

The nature and characteristic features of the invention will be more readily understood from the following description taken in connection with the accompanying drawings forming part hereof, in which:

Figure 1 is a vertical central sectional view, enlarged, of a preferred form of apparatus in accordance with the present invention;

Fig. 2 is a vertical sectional view taken approximately on the line 2—2 of Fig. 1;

Fig. 3 is a top plan view of the liquid container with the cover plate and applicator in position;

Fig. 4 is a horizontal sectional view taken approximately on the line 4—4 of Fig. 1; and

Fig. 5 is a horizontal sectional view taken approximately on the line 5—5 of Fig. 1.

It should, of course, be understood that the description and drawings herein are illustrative merely, and that various modifications and changes may be made in the structure disclosed without departing from the spirit of the invention.

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Like numerals refer to like parts throughout the several views.

Referring now more particularly to the drawings, in which a preferred embodiment of the invention is illustrated, a liquid container 10 is illustrated with a hollow cylindrical upper body portion 11 terminating at a rim 12. The lower portion of the container 10 has positioning ribs 11a formed therein, and has a bottom opening 13 for the supply of liquid. The interior of the container is thus in communication with a tube 14 preferably formed integral with the container 10 and disposed perpendicularly to the axis of the container body. The container 10 and tube 14 may be made of any preferred material, such as glass or molded synthetic plastic material resistant to the liquid delivered thereto, but the container 10 is preferably of transparent material so that the level of the liquid therein may be determined by visual inspection.

The tube 14 is adapted to be connected by tubing 14a in series with other tubes of other containers, and with a suitable source of liquid supply (not shown) which is preferably also of a character to maintain a uniform level of liquid within the containers 10.

The rim 12 of the container 10 is preferably provided with alined recesses 15 for the reception of opposed extensions 16 formed on a cover plate 17.

The cover plate 17 is provided with a diametrically disposed slot 18 therethrough with the termini 19 spaced at a predetermined distance for purposes to be explained. It will be noted, that the extensions 16 when positioned in the recesses 15 prevent turning of the cover plate 17 as well as reducing access of dust and the like to the interior of the container 10.

The applicator 20, as shown more particularly in Figs. 1 and 2, preferably comprises a piece of round wire of any preferred size, wire of a diameter of 0.07 inch having been found satisfactory.

The applicator 20 included a pair of outer side legs 21 connected at the bottom by a resilient loop 22, which permits of springing these legs 21 slightly by engagement with the termini 19 for purposes of adjustment. The legs 21 at the top are connected by loops 23 to inner legs 24. The inner legs 24 are straight throughout their lengths and are initially disposed in downwardly converging relation so that they are closer as

their lower termini than at their place of connection to the loops 23, but are capable of being brought to a substantially parallel or converging relation to adjust the gap therebetween.

The maximum exterior dimensions of the applicator 20, transversely considered and as seen in Figs. 1 and 3, are slightly greater than the distance between the ends 19 of the slot 18 so that by selection of a particular length of slot 18 the spacing between the inner legs 24 may be fixed as desired. If desired, the legs 24 may be preset at the desired spacing and employed with a slot 18 of a length which does not engage the legs 21 at its termini 19. The applicator 20, if bottomed in the container 10, may thus be set for a particular spacing of the legs 24.

In use, as will be seen in Fig. 1, the applicator 20 has the lower portions of the legs 21 and loop 22 therebetween and the lower portions of the inner legs 24 immersed in the liquid in the container 10 and the upper portions of the inner and outer legs 21 and 24 extend beyond the cover plate 17 for the reception, between the inner legs 24, of the yarn to which the liquid is to be applied.

The container 10 with the applicator 20 positioned therein may be disposed, as desired or required for a particular installation, with the longitudinal axis of the container 10 vertical, in which case the yarn may be advanced horizontally or at an angle such that it does not touch the cover plate 17. If desired, also, the container 10 may be disposed with its longitudinal axis inclined where vertical or inclined advance of the yarn is desired.

Liquid from the container 10 will rise by capillarity between and along the inner legs 24 and be available for application to the yarn passing between the legs 24. As the liquid is withdrawn by the advancing yarn, additional liquid will rise as needed by capillary action for continuous feed.

The quantity of liquid available for application to the yarn may be varied as desired by the positioning of the applicator 20 in the cover plate 17 which determines the spacing of the legs 24 and the size of the capillary gap therebetween. The quantity of liquid delivered to the yarn may also be varied by adjustment of the level of the liquid in the container 10.

We claim:

1. In apparatus for applying liquid to yarn, a liquid container, an applicator extending into the container and outwardly therebeyond for passage therethrough of the yarn, said applicator being made from wire and having a pair of outer legs connected by a loop at the lower ends thereof and a pair of closely spaced inner legs for the reception of the yarn connected at the upper ends to the outer legs by loops of smaller size than said first mentioned loop.

2. Apparatus for applying liquid to yarn as defined in claim 1 in which the container is provided with projections for engagement with the applicator for preventing turning of the applicator.

3. Apparatus for applying liquid to yarn as defined in claim 1 in which the applicator is made of round wire.

4. In apparatus for applying liquid to yarn, a liquid container, an applicator extending into the container and outwardly therebeyond for passage therethrough of the yarn, said applicator being made from a single piece of wire and having a pair of outer legs connected by a loop at the lower ends thereof and a pair of closely spaced inner legs connected at the upper ends to the outer legs, and means engaging the outer legs for varying the spacing of the inner legs.

5. In apparatus for applying liquid to yarn, a liquid container, a top cover for said container having a slot, an applicator extending through said slot into the container and outwardly beyond the cover for passage therethrough of the yarn, said applicator being made from wire and having a pair of outer legs connected by a loop at the lower portions thereof and a pair of closely spaced inner legs connected at the upper portions to the outer legs.

6. Apparatus for applying liquid to yarn as defined in claim 5 in which the cover and the container have interengaging portions for preventing turning of the cover and of the applicator.

7. Apparatus for applying liquid to yarn as defined in claim 5 in which the container has slots and the cover has projections for engagement in the slots for preventing turning of the cover and of the applicator.

8. In apparatus for applying liquid to yarn, a liquid container, a top cover for said container having a diametrically disposed slot, the end terminals of the slot being spaced at a predetermined distance apart, an applicator extending through said slot into the container and outwardly beyond the cover for passage therethrough of the yarn, said applicator being made from wire and having a pair of outer legs connected by a loop at the lower portions thereof and a pair of closely spaced inner legs connected at their upper portions to the outer legs, the spacing between the inner legs being determined by the positioning of the outer legs in engagement with said end terminals.

9. In apparatus for applying liquid to yarn, a liquid container, an applicator in the container and outwardly therebeyond for passage therethrough of the yarn, said applicator being made from wire and having a pair of outer legs connected by a resilient loop at the lower ends thereof and a pair of closely spaced inner legs round in cross section connected at their upper portions to the outer legs, said inner legs having their lower portions more closely spaced than their upper portions.

10. In apparatus for applying liquid to yarn, a liquid container, a top cover for said container having a diametrically disposed slot, the end terminals of the slot being spaced at a predetermined distance apart, an applicator extending through said slot into the container and outwardly beyond the cover for passage therethrough of the yarn, said applicator being made from a single piece of wire having a pair of outer legs connected by a loop at the lower portions thereof and a pair of closely spaced inner legs connected at their upper portions to the outer legs, the inner legs converging towards their lower ends and the spacing between the inner legs being determined by the positioning of the outer legs in engagement with said end terminals, the cover and the container having interengaging portions for preventing turning of the cover and of the applicator.

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JOHN W. BENNETT.

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