United States Patent [19]

Sette et al.

[11] **3,884,745**

[45] **May 20, 1975**

[54] **ENVELOPE MOISTENING AND SEALING APPARATUS**

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[73] Assignee: **Pitney-Bowes, Inc.**, Stamford, Conn.

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[21] Appl. No.: **452,676**

[52] **U.S. Cl.** **156/441.5**; 156/578

[51] **Int. Cl.** **B43m 5/04**; B65c 11/04

[58] **Field of Search** ..... 156/441.5, 442.1, 442.2, 156/578; 93/61 R, 62, 36 MM; 53/31, 206

[56] **References Cited**

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[57] **ABSTRACT**

An apparatus for moistening the gummed section of an envelope flap for the purpose of sealing the flap to the body of the envelope. The apparatus is unique in its design and construction, which results from the fact that letters are transported with a vertical orientation through a high speed letter handling system to the moistening apparatus. The vertical orientation of the letters, and their high speed movement through the system, necessitated a complete restructuring from classical moistening apparatus design. The invention comprises a trough-like container having a vertically extending window for dispensing moisture to a vertically oriented envelope flap. A rotating disc disposed within the container dips into fluid disposed within the container and carries the fluid upon its surface to said window. A brush projecting through said window into the container, contacts the rotating disc and absorbs the moisture carried by the disc. An incoming envelope flap passing between the brush and the window separates the brush from the disc and in so doing moistens its gummed section.

1 Claim, 6 Drawing Figures

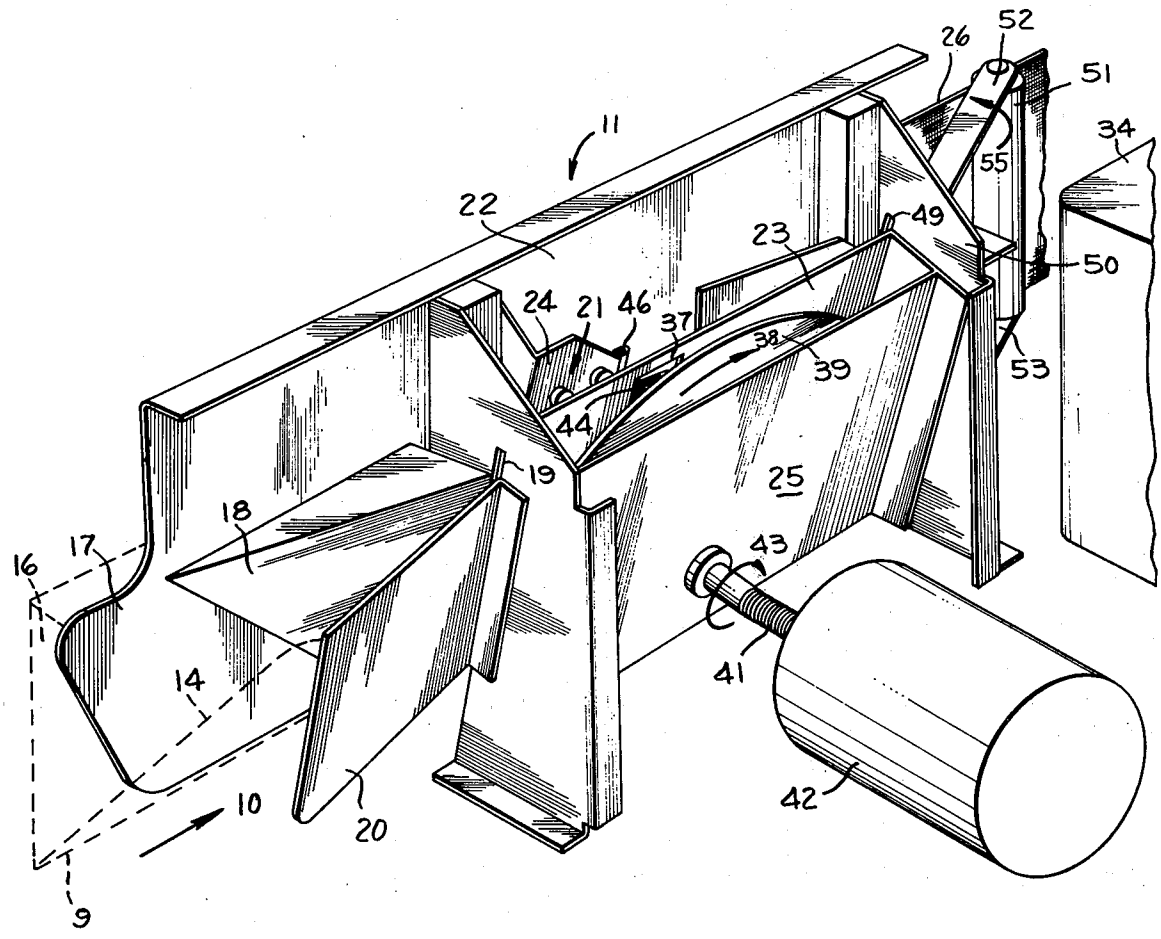
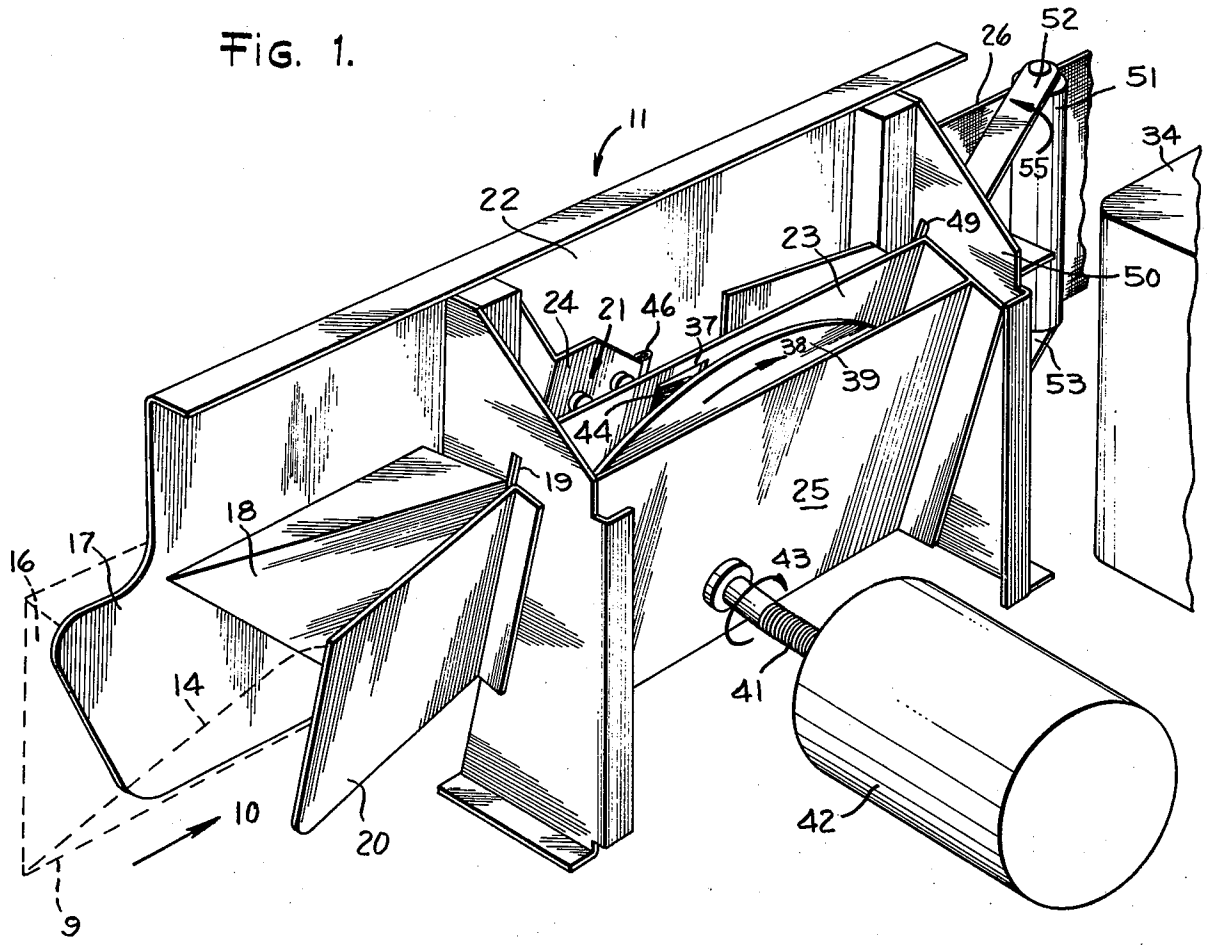


Fig. 1.


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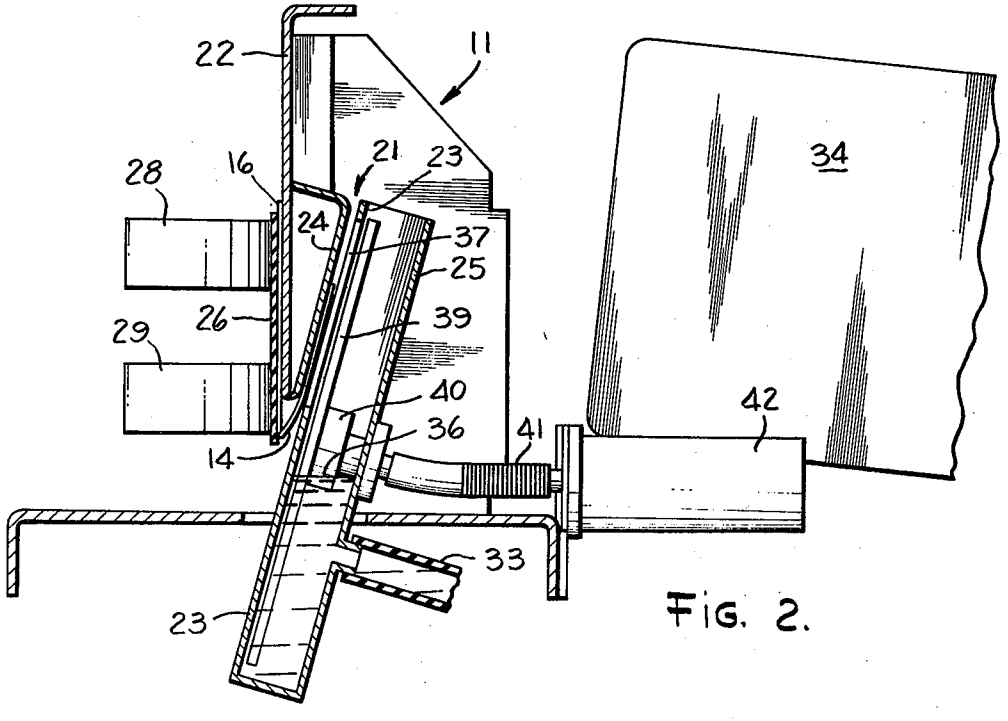

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Fig. 2.

Fig. 3.

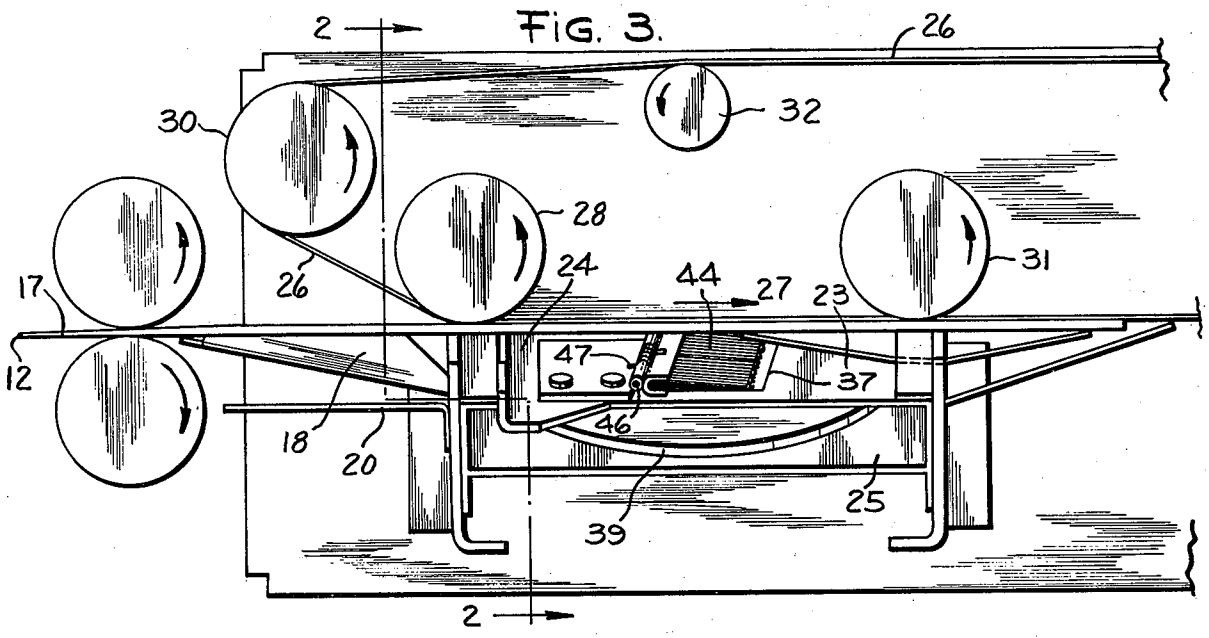


Fig. 4.

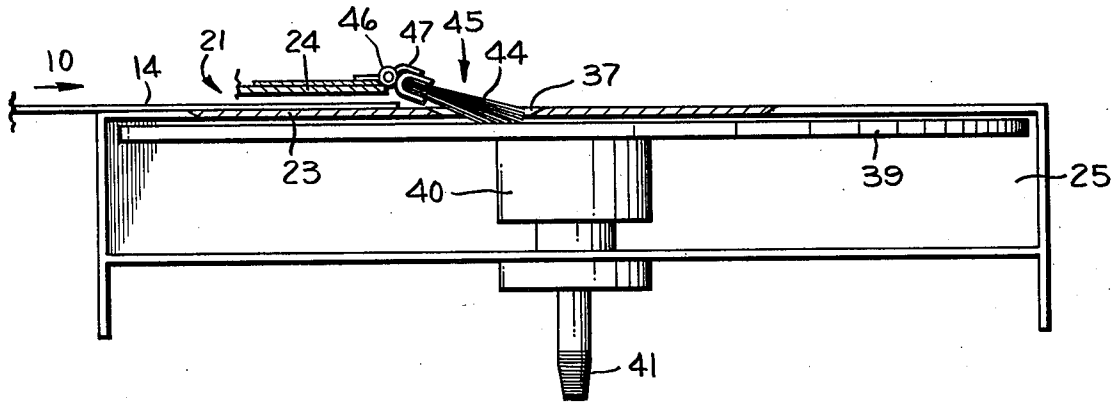


Fig. 5.

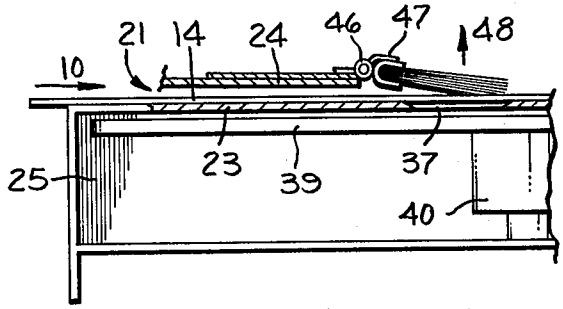
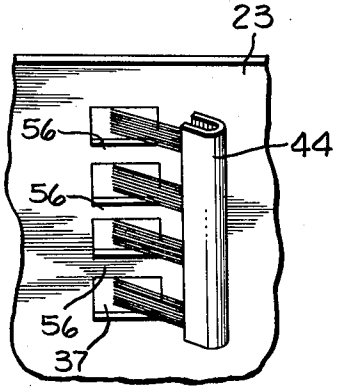


Fig. 6.



ENVELOPE MOISTENING AND SEALING APPARATUS

The invention relates to a moistening and sealing apparatus for envelopes and more particularly a moistening and sealing apparatus for moistening and sealing the gummed section of an envelope flap having a vertical orientation as it is transported through a high speed letter handling device.

BACKGROUND OF THE INVENTION

Heretofore, it has been common to feed letters with a horizontal orientation through mail and letter handling equipment.

With the growing need for high speed letter handling, it has been found necessary to change the orientation of the envelopes traveling through such equipment. In order to facilitate greater speeds, envelopes have now been made to assume a vertical orientation, either 90° to the horizontal, or some vertical angle between 45° and 90°.

The change of orientation has resulted in other modifications to such mail handling equipment, one of which is the moistening and sealing of envelope flaps, whose orientation has also become substantially vertical.

A vertical envelope flap orientation requires a different means of conveying fluid to the flap. Fluid would now have to be drawn essentially vertically towards the flap instead of substantially horizontally as previously done.

The apparatus of the present invention was conceived as a means for accommodating the aforementioned design changes.

SUMMARY OF THE INVENTION

The invention comprises a trough-like container having a vertically extending window for dispensing a moistening fluid to a substantially vertically oriented envelope flap. The fluid is conveyed from a reservoir to the bottom of the container, with the level of the fluid being below the dispensing window. The fluid is then raised to the window by means of a rotating disc which is disposed in the container, and which dips below the water line.

As the disc rotates through the fluid, moistening fluid will adhere to the peripheral surfaces of the disc by means of surface tension. The moistened surfaces of the disc are then rotated past the dispensing window, where an absorbent applicator (brush) picks the moisture from the disc. The applicator is disposed outside the container adjacent the window, and is spring-biased to project through the window so as to engate the disc.

A vertically extending envelope flap requiring moistening is then passed between the applicator and the window of the container, thus separating the applicator from the disc against its applicator, thus, wetting the gummed surface. The envelope is then passed between a pressure roller and transfer belt forcing the flap to adhere to the body of the envelope.

An object of the present invention is to provide a means to moisten and seal an envelope flap to the body of an envelope passing in substantially vertical orientation through a letter handling system. Another object of the present invention is to provide an improved moistening and sealing apparatus for envelopes; and still another object of this invention is to provide a reliable means for moistening and sealing an envelope being transported through a mail handling system.

These and other objects of the invention will become more apparent and will be better understood with reference to the following detailed description taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a prospective view of the moistening and sealing apparatus of this invention, with a phantom view of an envelope shown in situ.

FIG. 2 is a sectional view of the envelope flap guide and container mechanism of the invention of FIG. 1, taken along lines 2—2 of FIG. 3.

FIG. 3 is a top view of the inventive apparatus of FIG. 1.

FIGS. 4 and 5 are top views of the brush applicator and container mechanism of the inventive apparatus of FIG. 1, FIG. 4 depicting the brush applicator in a rest position absent the passage of an envelope through the moistening and sealing apparatus, and FIG. 5 illustrating in a cutaway view the brush applicator as an envelope passes through said apparatus.

FIG. 6 is a cutaway back view of the brush applicator and window section of the container for the apparatus of FIG. 1, looking towards the front of the apparatus.

DETAILED DESCRIPTION

Generally speaking, the invention is for a moistening and sealing apparatus for moistening and sealing a flap of an envelope to a body portion of the envelope. The letter (envelope) is transported through a letter handling system with a vertical orientation. The inventive apparatus comprises a container embodying an envelope moistening fluid which has a vertically extending window through which the moistening fluid is dispensed. Dispensing means are disposed within the container for feeding a quantity of the moistening fluid towards the window. An envelope to be sealed is transported along a feed path past the container window. The envelope with its flap are supported with a substantially vertical orientation as the envelope moves along the feed path. A moistening applicator means is disposed adjacent the container window and receives moistening fluid from the container through the window. The applicator means applied the fluid to an envelope flap moving past the window. A guide means disposed along the feed path guides the substantially vertically extending flap of the moving envelope into sufficient engagement with the moistening applicator means to provide the flap of the envelope with moisture to seal the envelope.

Now referring to FIG. 1, an envelope 9 is shown in phantom as it approaches (arrow 10) the moistening and sealing apparatus of the invention, which is generally shown by arrow 11. The envelope 9 is introduced to the moistening and sealing apparatus 11 with a vertical orientation as shown. The flap 14 of the envelope 9 is separated from the body section 16 prior to entering the sealing station. A knife-edge blade 12 of guide 17 guides the flap 14 and keeps it separated from the body section 16 of the envelope 9 as it moves forward. The flap 14 is further guided by a second tapered guide 18, and is then fed through a slot 19 which is positioned between and extends the length of guides 18 and 20. The slot 19 opens into a narrow flap supporting corridor, generally shown by arrow 21 in FIGS. 1 and 2. The body portion 16 of envelope 9 is now positioned behind

plate 22 (FIGS. 1 and 2). The flap corridor 21 is structurally composed of an inner wall 23 of container 25 and a guide bracket 24 (see FIGS. 1 through 3).

The envelope 9 is transported through the moistening apparatus 11 by means of a frictional belt 26, which frictionally engages with the envelope and drives it forward (arrow 27 of FIG. 3). The belt 26 is driven by means of a double set of rollers (an upper set and a lower set) two rollers 28 and 29, respectively, of the two sets being shown in FIG. 2. Roller 30 (FIG. 3) being a drive roller of the upper set of rollers, and rollers 28, 31 and 32, respectively being guide rollers of the upper set. The rollers 28, 30, 31 and 32 rotate in a counterclockwise manner (arrows) so as to move the belt and envelope in direction 27.

Container 25 of the moistening and sealing apparatus 11 is generally trough-shaped and receives a supply of water or other moistening fluid, through conduit 33 (FIG. 2), which is connected to reservoir 34 (FIGS. 1 and 2). The water 35 fills container 25 to a level 36, (FIG. 2) which is below a water dispensing window 37.

A plate 39 rotates in a clockwise direction 38 (FIG. 1) and is disposed within the container 25. The plate dips below water level 36 (FIG. 2). The plate 39 is shaped like a disc. The hub 40 of the disc (see FIGS. 2, 4 and 5) is attached to a flexible coupling 41 connected to motor 42 (FIGS. 1 and 2). The motor 42 rotates (arrow 43) the coupling 41, which in turn imparts a rotation (arrow 38) to disc 39 (FIG. 1).

As the disc plate 39 continuously rotates, a substantial portion of its peripheral surface is continuously wetted by water 35. The water 35 is carried upon the disc surfaces by means of surface tension. This fluid is carried past window 37, as disc 39 rotates. The fluid carried past the window is picked off the disc by a brush applicator 44, which is spring biased (arrow 45 of FIG. 4) towards the window 37 and into absorbing engagement with the disc 39. The brush 44 is articulatively mounted to guide bracket 24 by means of a hinge 46. A spring 47 wrapped about the shaft of the hinge 46 provides a biasing to the brush 44.

When a forward moving envelope flap 14 moves down corridor 21 (arrow 10) bounded by guide bracket 24 and wall 23 of container 25, the flap is caused to move between the brush 44 and the window 37 as shown in FIG. 5. When the flap 14 moves between the brush 44 and the window 37, it separates the brush from the disc 39 against its biasing (arrow 48 of FIG. 6). In so doing, the brush 44 is caused to wipe across the gummed portion of the envelope flap, which results in providing moisture to the gum. The wetted gum is not tacky, and the flap 14 will now be capable of adhering to the body section 16 of the envelope.

The tacky flap 14 is then made to pass from the moistening brush 44 through a slot 49 in bracket 50 (FIG. 1) where it is caused to come in contact with body portion 16 of the envelope.

A pressing roller 51 is pivotably hinged to bracket 50 by means of lever arms 52 and 53, respectively. The roller 51 is spring biased (arrow 55) towards frictional drive belt 26.

The envelope is caused to pass between roller 51 and belt 26. In so doing, the flap 14 and the body portion 16 of the envelope are caused to positively unite together forming a firm seal between themselves.

Referring to FIG. 6, the window 37 and brush 44 are depicted in greater detail. Restraining bars 56 are connected across window 37 as shown. These restraining bars are for the purpose of preventing the edge of an envelope flap 14 from projecting through the window 37 as it moves forward. If this were to happen, the flap 14 would snag, and the envelope would jam in the moistening apparatus.

Because the restraining bars 56 are an obstacle to the brush 44, and will tend to prevent the hairs of the brush from projecting through window 37, the hairs of the brush are grouped in a plurality of finger-like bundles 57. These bundles 57 are so spaced as illustrated, so as to project between the bars 56.

The brush hairs can be made from any suitable material which combines the characteristics of wear resistance, absorbency, and structural strength. The brush applicator may also be made from sponge-like materials and plastics to form a plurality of pad-like projections.

These and other modifications will naturally present themselves to the skilled practitioner in this art. All such obvious modifications and changes are deemed to lie within the purview, spirit, and scope of this invention as presented by the appended claims.

What is claimed is:

1. Apparatus for replenishing moisture dispensed by a fluid moistening applicator to a flap of an envelope, said apparatus comprising:

a reservoir for supplying a quantity of moistening fluid;

a trough-like container connected to said reservoir for receiving said moistening fluid therefrom, and for dispensing said fluid to said envelope flap, said container having a fluid level and a window disposed above said fluid level, a rotatably mounted plate disposed within said trough-like container for movement through said fluid and past said window during rotation thereof, said plate carrying fluid towards said window as it rotates, said window has a flap restriction spanning across said window which allows a brush to project through said window, but which prevents the flap of said envelope from projecting therein;

means connected to said plate for rotating said plate within the container, said plate being disc-shaped, and said means for rotating said plate being a motor having a rotative shaft which is flexibly coupled to a shaft connected to a center section of said disc-shaped plate;

moistening applicator means supported adjacent said container window, said moistening applicator means being biased towards said window and projecting through said window into engagement with said plate to absorb moistening fluid from said plate in the absence of an envelope, said moistening applicator means comprising a brush which is articulatively mounted opposite said window, and a spring acting upon said brush to bias the brush towards said window; and

means for transporting a flap of an envelope between said moistening applicator means and said window, whereby the flap of said envelope causes the moistening applicator means to separate from its engagement with said plate, and engage with said flap, thereby applying moistening fluid to said flap from said moistening applicator means.

* * * * *

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 3,884,745

DATED : May 20, 1975

INVENTOR(S) : Paul R. Sette and Anthony Storace

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 3, Line 52, change "not" to --now--.

Signed and Sealed this

second Day of December 1975

[SEAL]

Attest:

RUTH C. MASON
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents and Trademarks