Nov. 18, 1958 G. H. JAMES 2,860,359

MOISTENER

Filed Aug. 1, 1955

Fig. 2

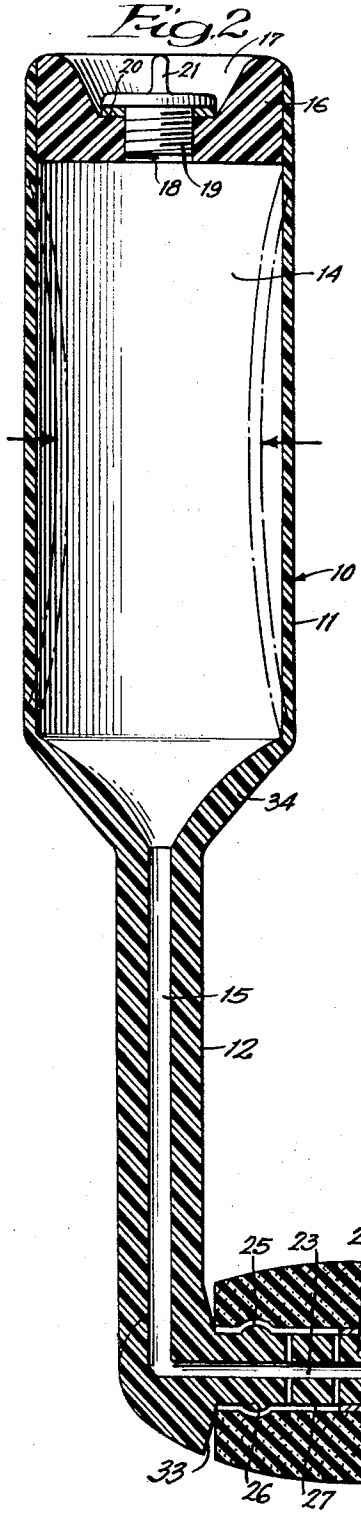


Fig. 1

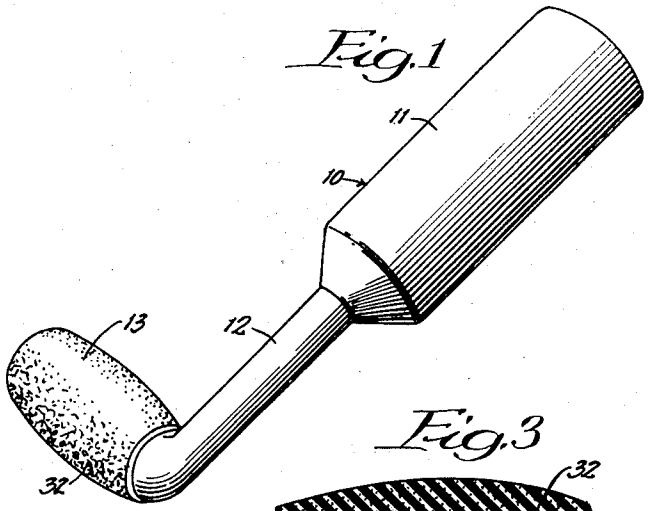


Fig. 3

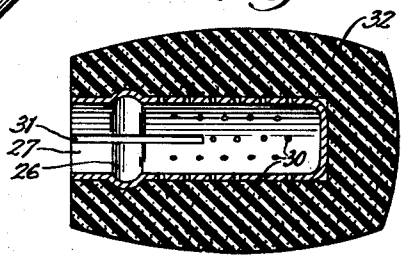
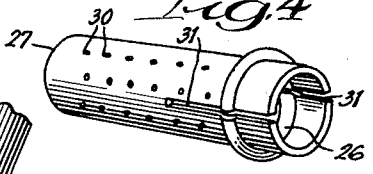


Fig. 4



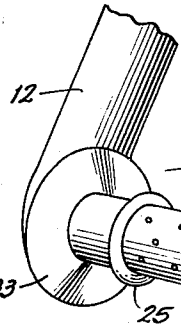
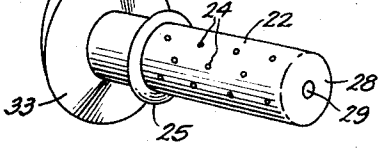


Fig. 5



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MOISTENER

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5 Claims. (Cl. 15—132.5)

This invention relates to a moistener, and more particularly to a device for wetting or moistening surfaces, as for example, the adhesive coated flaps of envelopes, and the invention has particular utility in the environmental setting of a moistener for the wettable adhesive of envelope flaps.

In offices and other business establishments that send out a considerable volume of mail, the task of sealing the envelopes is tedious and time consuming. The primary reason for this is that no efficient and dependable device is presently available for wetting the adhesive coating on the envelope flaps prior to the sealing thereof. The lack of a suitable moistener device exists irrespective of the large number of moisteners that are commercially available.

In a large number of the moistening devices commercially available for wetting the adhesive coatings of envelope flaps, rollers are employed and the rollers are intended as they rotate to pick up water and deposit it on the adhesive coatings. However, because of the particular structural arrangements, the rollers soon collect a coating of adhesive thereon which interferes with and ultimately prevents the free rotation thereof whereby the moisteners become ineffective and useless. Further, in known devices of this type, no arrangement is provided for regulating or adjusting the quantity of water picked up by the rollers and deposited on the adhesive coatings. In some of the moisteners which may or may not employ rollers, but in any event have an equivalent deposition member for engagement with the adhesive coatings, water flows from a reservoir under the influence of gravity to the deposition member, and with such an arrangement the amount of water carried to the deposition member will depend upon the quantity of water within the reservoir. That is to say, because of the changes in water pressure, more liquid will be carried to the adhesive coatings when the reservoir is full than when the reservoir is partially empty. Moreover, adhesive collections soon form on the deposition member and such collections interfere with the free flow of water to the surfaces of deposition members and onto the adhesive coatings. Such devices, and all others of which I am aware of, fall far short of satisfying the needs for a dependable and easily operated moistening device for wetting the adhesive coatings of envelope flaps.

There is then a need for an improved moistening device, and it is accordingly an object of this invention to provide an improved moistener especially suited for use in the wetting of adhesive coatings on envelope flaps. Another object of this invention is to provide a moistener wherein means are present for enabling the user to regulate and selectively determine the quantity of water fed to a deposition member for depositing on the adhesive coating of envelope flaps. Still another object is in the provision of a moistening device employing a roller as the deposition member for applying moisture to the adhesive of envelope flaps, and wherein the roller is supported for free rotation in a manner such that adhesive collections

thereon will not interfere with the free rotation thereof.

A further object of the invention is that of providing a moistener wherein the surface tension of the water is utilized in preventing the flow of water to a moistening roller except when the user desires to overcome the surface tension and meters out a measured volume of water that is delivered to the roller. Yet a further object is in the provision of a moistener of the character described having a flexible handle providing a reservoir therein communicating through a stem with a sponge roller rotatable mounted thereon, water being forced from the reservoir and into the sponge roller when the handle is flexed, but otherwise being substantially confined within the reservoir and stem by the small openings communicating with the sponge roller and the surface tensions of the liquid at those openings. Additional objects and advantages will become apparent as the specification develops.

An embodiment of the invention is illustrated in the accompanying drawing, in which—

Figure 1 is a perspective view of a moistener embodying the invention; Fig. 2 is a longitudinal sectional view of the moistener illustrated in Fig. 1; Fig. 3 is a detailed sectional view of the roller and mounting sleeve therefor; Fig. 4 is a perspective view of the mounting sleeve; and Fig. 5 is a broken perspective view showing the lower end portion of the stem and mounting member provided thereby.

As is shown most clearly in Figure 1, the moistening device is designated generally with the numeral 10, and comprises a handle 11, a stem 12 and a roller or liquid deposition assembly 13. In use of the moistener the handle 11 is gripped within the hand of the user and the roller assembly 13 is placed against the adhesive coating on an envelope flap and as the roller rolls over such coating liquid is deposited on the coating by the roller.

Referring now to Figure 2 in particular, it is seen that the handle 11 and stem 12 may be formed integrally and preferably the stem is relatively stiff while the handle 11 is flexible and may be compressed or flexed inwardly, as is shown by dotted lines in Figure 2. It will be apparent that the stem and handle may be separately formed and secured together by any suitable means, but for convenience in production it is preferable to form these members integrally. A number of suitable materials may be employed for forming the handle 11 and stem 12, and one of the well known plastics may be employed. Flexibility of the handle 11 may result from making the walls thereof relatively thin while the stem 12 has walls that are relatively thick.

The handle 11 provides a reservoir or chamber 14 therein that is in open communication with a longitudinally extending passage 15 in the stem 12. The handle 11 at the upper end thereof is provided with a closure plug 16 that may be a separate plastic member received within and bonded to the walls of the handle. Preferably, the plug 16 is provided with a generally frusto-conical recess 17 therein that empties into a threaded opening or bore 18 that communicates with the reservoir 14. A threaded closure cap 19 is adapted to be threadedly received within the opening 18 as is shown in Figure 2, and may be drawn tightly against a resilient washer 20 to seal the opening and prevent the escape of liquid from the reservoir 14. The cap 19 may be equipped with a finger grip 21 to facilitate rotation thereof.

The stem 12 is turned laterally at its free end to provide a bearing or mounting portion 22. The passage 15 through the stem also turns laterally to provide the passage extension 23 that terminates short of the outer end of the mounting member 22. Communicating with the passage extension 23 are a plurality of radially ex-

tending passages or openings **24** that communicate with the cylindrical surface of the bearing member **22**. A considerable number of passages **24** are provided so that liquid carried from the reservoir **14** will be dispersed relatively uniformly about the surface of the mounting member **22**. The passageways **24** are restricted and provide small openings at the surface of the mounting member. The openings are designed to be and are so small that the surface tension of the liquid, which ordinarily will be water, appearing at the surface of the member **22** will be sufficient to substantially prevent the water from flowing freely from the passageways under the influence of gravity and the liquid pressure within the reservoir **14** and passages **15** and **23**.

The mounting member **22** at the end thereof adjacent the stem **12** is equipped with an annular rib or lock member **25** that is adapted to be received within an annular channel **26** provided in a locking sleeve **27**. The sleeve **27** is cylindrical and is adapted to be received on the mounting member **22**, as is shown in Figure 2, and is freely rotatable thereon. The outer end of the mounting member **22**, as is shown at **28**, is closed, preferably by a plug **29** seated in the end of the passage **23**. Similarly, the cylindrical surface of the sleeve **27** is provided with a plurality of ports or openings **30** therethrough that are preferably all located on one side of the recess **26**; that is, on the side thereof adjacent the closed end **28**.

As is seen most clearly in Figure 4, the inner or open end of the sleeve **27** is split longitudinally, as is shown at **31**, so that it may be mounted readily on the member **22** with the split end portion thereof expanding slightly so as to move over the lock rib **25** of the mounting member. In a reverse operation the slit **31** also permits the mounting sleeve to be withdrawn or removed from the mounting member **22** for replacement. The sleeve may be formed of metal or plastic, but should be formed from a material that is not corroded by water and one that is relatively stiff so that it will rotate freely upon the mounting member **22**.

Secured to the sleeve **27** and mounted thereabout is a roller **32** that is absorbent and capable of retaining water forced thereinto. The roller may be formed from either natural or synthetic sponges. As is apparent from Figures 2 and 3, the sleeve **27** is received within a suitable opening centrally disposed within the sponge roller **32**, and is bonded to the sponge roller by any suitable means, such as an adhesive that is impervious to water so that the sponge will not become loose through use of the moistener device.

Referring now to Figure 5, it is seen that the stem **12**, at the lower end thereof, is equipped with an integral bearing face **33** that flares rearwardly or away from the edge of the roller **32**, as is apparent from Figure 2. In this manner the face does not interfere with the free rotation of the roller assembly, yet provides in conjunction with the sponge roller **32** a substantial liquid-tight seal about the sleeve **27**. In order to conserve material and to make the device more readily handled, the stem **12** is considerably smaller in cross section than the handle **11**, and these two members may be connected integrally through a tapered section **34**.

Operation

In use of the moistener device a sleeve **27** equipped with a sponge roller **32** is mounted upon the mounting member **22**, as is shown in Figure 2. The cooperating annular rib **25** and recess **26** prevent the roller assembly from being removed from the mounting member except when it is intentionally withdrawn therefrom. When it is intended to remove the roller assembly, a pulling force is applied thereto and the slitted end portion of the sleeve spreads slightly to permit it to move over the rib **25**. The roller assembly is mounted upon the member **22** by simply pushing it onto the member to bring the recess **26** in alignment with the rib **25**.

Next, the closure cap **19** is removed and water is poured into the reservoir **14**. In this operation the frusto-conical shape of the recess **17** makes the recess serve as a funnel so that the reservoir is readily and easily filled without spilling any of the water. The closure cap is then placed in position and is drawn tightly against the seal **20** to close the reservoir and prevent the escape of water therefrom. It will be apparent that the water within the reservoir flows downwardly through the passage **15**, laterally through the passage extension **23**, and into the restricted ports or passageways **24**.

As has been brought out hereinbefore, the flow passages **24** are restricted and are dimensioned so that the surface tension of the liquid appearing at the cylindrical surface of the mounting member **22**, or at the openings of the passageways, is sufficient to prevent any substantial escape of water into the sponge roller **32**. When it is desired to load the sponge with water, the handle **22** is compressed and water is forced therefrom, through the passages **15** and **23**, and outwardly through the passageways **24** and into the sponge roller **32**. The mounting sleeve **27** is provided with the openings **30** so that the water ejected from the passageways **24** may flow freely into the sponge roller **32**. Since the openings **30** and passageways **24** are distributed along the axial surfaces of the mounting member **22** and sleeve, a relatively uniform distribution of water is provided throughout the sponge roller **32**.

The charge of water loaded into the sponge **32** will be dependent upon the amount of compression or flexing imparted to the flexible handle **11**. Thus, a measured or metered volume of water is loaded into the roller. If only a slight dampening of the roller is desired, the handle **11** is flexed lightly, while if it is desired to saturate the roller, the handle **11** may be flexed repeatedly or a single compression force of substantial magnitude may be applied thereto.

The moisture laden sponge roller **32** is rolled over the adhesive coating on envelope flaps, and in rolling thereover moistens or wets the coating. The amount of wetting of the adhesive coating depends to a considerable degree upon the amount of water carried at any time by the sponge roller. Thus, since controlled or metered volumes of water may be injected into the roller, the extent to which an adhesive coating is wetted by the roller can be accurately controlled.

It should be noted that the roller assembly extends freely from the stem **12** and no structural members enclose or partially enclose the outer surfaces of the roller **32**. Thus, not only is the assembly freely rotatable initially, but any adhesive picked up by the roller will not interfere with the free rotation of the assembly. Further, because it is freely rotatable, there will be little tendency for the roller to pick up adhesive and it may be used for long periods without having to be purged of adhesive collections or replaced with a new roller. The line engagement of the roller **32** with the face **33** provides a seal about the inner end of the sleeve **27** so that any water that migrates inwardly along the mounting member **22** will not escape but will be picked up by the sponge. The flare of the face **33**, which may define an angle of about 5 degrees measured between the face and a plane normal to the longitudinal axis of the passage **23**, spaces the face from the roller throughout substantially the entire area of the face, thereby preventing interference with the free rotation of the roller assembly.

It is contemplated that occasionally the roller assembly may need to be replaced, and simple replacement units comprising the sleeve **27** and sponge roller **32** may be provided. Thus, to change the assembly, one roller and sleeve is withdrawn from the mounting member **22** and another similar assembly is placed thereon. Alternatively, the sponge rollers might be provided along with adhesive for bonding them to the sleeve **27**, which in such

case would be reused, or a snug fit might possibly be provided between the roller and sleeve so that adhesives or other bonding means might be eliminated and one roller simply would be withdrawn from the sleeve and replaced with another roller.

While in the foregoing specification an embodiment of the invention has been set forth in considerable detail for purposes of describing the invention in an environmental setting, it will be apparent that those skilled in the art may make numerous changes in the details set forth without departing from the spirit and principles of the invention.

I claim:

1. In a moistening device adapted for use in wetting the adhesive coating of envelope flaps, a flexible handle providing a deformable reservoir therein and having a cap-equipped opening for filling the reservoir with liquid, a stem extending from said handle, said stem being provided with a passage theren communicating with said reservoir, a mounting member carried by said stem and extending laterally therefrom, said mounting member being equipped with a plurality of restricted flow passageways opening through the surface thereof and communicating with said passage, a sleeve provided with a plurality of openings therethrough rotatably mounted upon said mounting member, and a sponge roller carried by said sleeve, said mounting member being provided with an annular rib extending laterally therefrom, and said sleeve being provided with at least one slit extending longitudinally therealong and with an annular recess aligned with and receiving said rib, said sleeve being removably mounted upon said mounting member, the split portion of said sleeve being operative to faclitate movement thereof onto and off of said mounting member about said annular rib.

2. The structure of claim 1 in which said mounting member is provided adjacent the inner end thereof with an inclined face continguous with said sponge roller along a concentric line adjacent the inner portions thereof.

3. In a moistening device adapted for use in wetting the adhesive coating of envelope flaps, a compressible handle providing a deformable reservoir therein adapted

to contain a liquid, a stem extending from said handle, said stem being provided with a passage therein communicating with said reservoir, a mounting member carried by said stem and extending therefrom, said mounting member being provided with a plurality of restricted flow passageways communicating with said passage and terminating in openings on the surface of the mounting member, a sleeve rotatably carried by said mounting member and being provided with a plurality of openings therethrough, an absorbent roller carried by said sleeve, said mounting member being provided with an annular rib extending laterally therefrom, and said sleeve being provided with at least one slit extending longitudinally therealong and with an annular recess aligned with and receiving said rib, said sleeve being removably mounted upon said mounting member, the split portion of said sleeve being operative to facilitate movement thereof onto and off of said mounting member about said annular rib.

4. The structure of claim 3 in which said mounting member is provided adjacent the inner end thereof with an inclined face in contiguous relation with said roller along a concentric line adjacent the inner portions thereof.

5. The moistening device of claim 3 in which said first mentioned openings are dimensioned with respect to the viscosity of the liquid contained in said reservoir so that the surface tension of such liquid present at such openings is effective to constrain the liquid therein so that such liquid must be positively fed from sad reservoir by compressing the same to moisten said roller.

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