

United States Patent Griffith

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[54] APPLICATOR INSTRUMENT

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[51] Int. Cl. B43m 11/06

[58] Field of Search 401/183-186, 102

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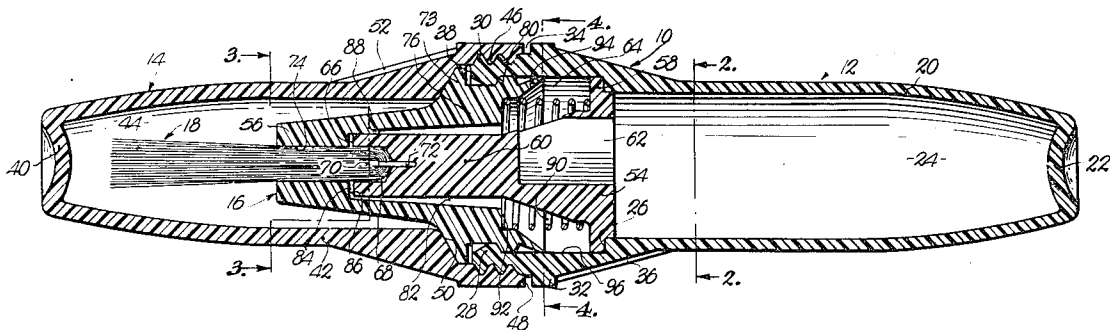
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ABSTRACT

An instrument for applying fingernail polish or the like having shiftable and interrelated parts, which automatically open a fluid passage from a reservoir to a brush element when a cover cap is removed and the main body of the instrument is squeezed, and which automatically close said passage and seal the brush element in a closed zone when the cover cap is emplaced on the main body.

10 Claims, 4 Drawing Figures



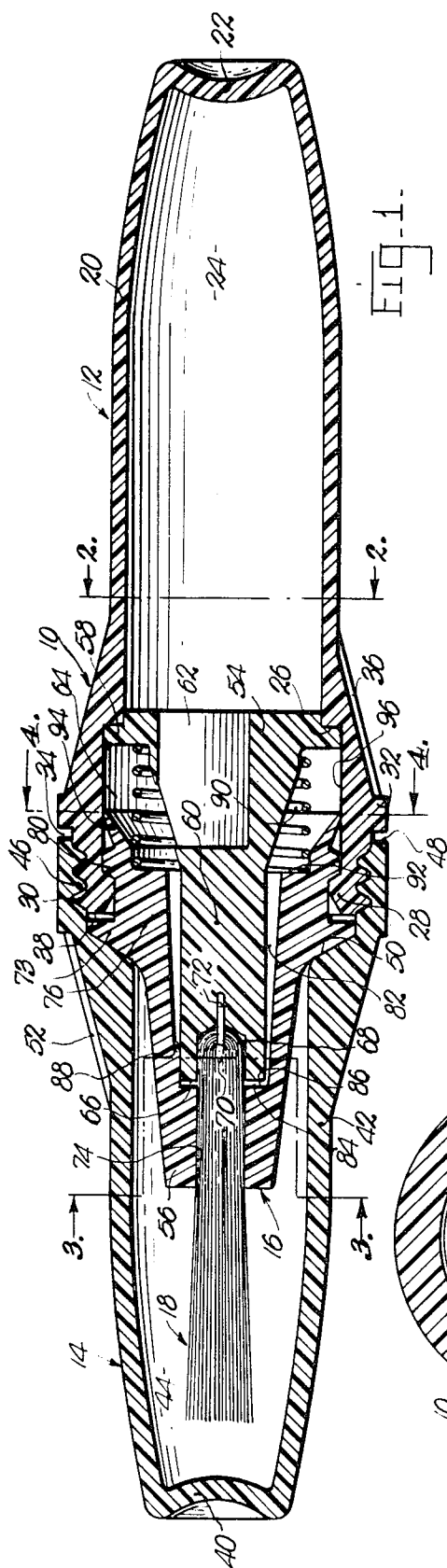


FIG. 1.

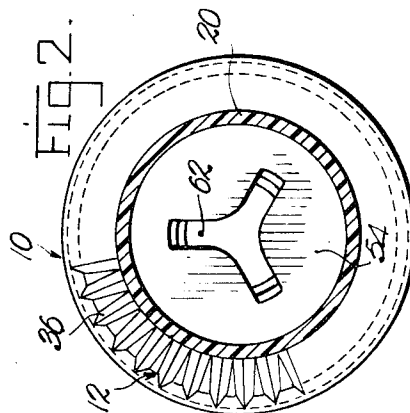


FIG. 2.

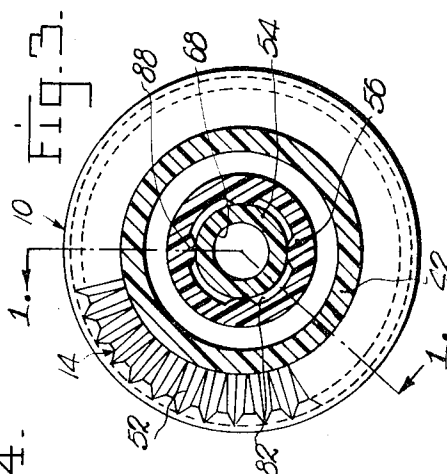


FIG. 3.

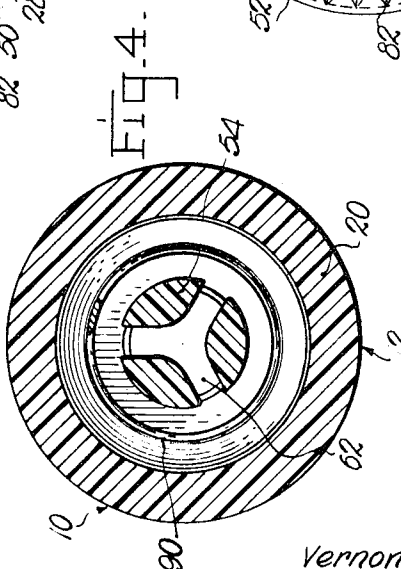


FIG. 4.

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APPLICATOR INSTRUMENT

This invention relates to the field of liquid applicator instruments and, more particularly, to such a device for use in the packaging and application of liquid fingernail polish or the like, which protects the brush between uses and prevents leakage of polish material during storage.

Liquid fingernail polish and similar materials are necessarily of a nature such that they will quickly dry and harden upon any prolonged exposure to the atmosphere. Such materials are conventionally applied, however, by means of a brush element which is either dipped into a separate container of polish as required or has associated therewith some sort of reservoir for the more or less continuous supply of polish to the brush element during use. In either case, it has long presented a problem when the polish material hardens upon the brush during periods between use. There have been, therefore, numerous attempts in the prior art to provide means for protecting the brush of a nail polish applicator against hardening of the polish material thereon between periods of active use. Such previous attempts to solve the problem have generally involved approaches that are either ineffective in practical every day use or are unduly complex and expensive to manufacture in an article that is by nature essentially expendable. Some of such attempts to solve the problem have involved structural arrangements requiring a plurality of independent actions to be taken by a user in order to attempt to achieve the desired protection and have, therefore, met with little success because of the tendency of typical users of such devices to ignore detailed instructions or a multi-step sequence of necessary manipulations that would be required to render the device effective in protecting itself against the effects of polish material hardening on the brush or other parts thereof.

Accordingly, it is the primary object of this invention to provide an improved liquid applicator that overcomes the aforesaid disadvantages of prior devices by providing for the automatic protection of the brush and other parts of the applicator against the hardening of polish thereon by the simple and convenient expedient of merely emplacing a cover cap upon the main body of the applicator.

It is another important object of the invention to provide such an applicator in which seals are simultaneously effected at three zones when the cover cap is emplaced upon the main applicator body to effectively exclude from contact with the outside atmosphere not only the brush itself, but also two different zones of the passage presenting means through which polish material may flow from a reservoir within the main body of the applicator to the brush element thereof.

Another important object of the invention is to provide such an applicator in which nozzle means for supplying liquid polish material to the brush element includes a pair of relatively shiftable parts which automatically shift to a position clearing a passage for delivery of polish material to the brush during operation of the applicator with the cover cap removed, but which are moved to a position preventing leakage by capillary action or otherwise to protect the brush against polish material flowing thereto during periods of storage between uses when the cover cap is in place.

Still other important objects of the invention will be made clear or become apparent from the drawing and from the description of the illustrative embodiment of the invention that follows.

In the drawing:

FIG. 1 is essentially a central, longitudinal, cross-sectional view of the applicator of this invention, except that the stem and ferrule portions of the internal nozzle assembly are shown with the lower half thereof as they would appear in a plane angled 135° from the plane of the upper half of FIG. 1 and as generally indicated by the line 1—1 of FIG. 3, the parts of the applicator being shown for clarity of illustration of certain passage means as in a condition in which the cover cap is emplaced upon the main body, but not tightly screwed into fully seated position thereon as it would be between periods of use;

FIG. 2 is a cross-sectional view taken on line 2—2 of FIG. 1;

FIG. 3 is a cross-sectional view taken on line 3—3 of FIG. 1; and

FIG. 4 is a cross-sectional view taken on line 4—4 of FIG. 1.

The referred embodiment of the liquid applicator of this invention shown in the drawing and to be described for illustrative purposes is generally designated by the numeral 10 and broadly includes a main body portion 12, a removable cover cap portion 14, an internal nozzle assembly portion 16, and a brush element 18.

The main body 12 is preferably formed of a resilient but yieldable plastic material for purposes hereinafter described and is generally elongated and hollow with a sidewall 20 and an endwall 22 enclosing a chamber 24 that is initially open at the end thereof opposite end wall 22. The wall 20 is provided with an internal annular shoulder 26 facing the open end of the reservoir chamber 24 and spaced inwardly of the latter from an annular inwardly extending flange 28 on the wall 20 defining the initially open end of the reservoir chamber 24. The wall 20 is externally threaded as at 30 adjacent the open end of chamber 24 of the body 12, and there is an annular external flange 32 on the wall 20 presenting an annular shoulder 34 facing toward the threaded portion 30 of the external surface of body 12. The wall 20 is also preferably provided with a serrated surface zone 36 adjacent the flange 32 to facilitate positive holding of the body 12 in the hand of a user. It will be understood that, during manufacture of the applicator 10, the reservoir chamber 24 will normally be filled with a suitable supply of liquid nail polish or the like. By virtue of the yieldable nature of the portions of wall 20 between the serrated zone 36 and the end wall 22, the body 12 is adapted to be squeezed by a user to subject polish material within the chamber 24 to a pressure that will cause it to flow from the chamber 24 as needed and along a path hereinafter more fully described leading to the brush element 18. It should be noted that, at its open end, the wall 20 of body 12 terminates in a flat annular edge or shoulder 38.

The cover cap 14 may be formed of either rigid material or material similar to that used in making the body 12 and includes an end wall 40 and an elongated sidewall 42 defining a hollow chamber 44 therewithin. The sidewall 42 is internally threaded adjacent its open ends as at 46 for mating with the threads 30 of body 12. The open end of cap 14 terminates in an annular flat edge or shoulder 48 which is juxtaposed in opposition to the external shoulder 34 on body 12 when the cap 14 is emplaced upon the body 12. The sidewall 42 of cap 14 is also provided with an annular inclined shoulder 50 for purposes hereinafter to be described. A zone of the external surface of cap 14 adjacent the internally threaded portion 46 thereof is serrated as at 52 to facilitate gripping of the cap 14 by a user while emplacing the cap 14 upon the body 12 and fully seating the threads 46 upon the threads 30.

The nozzle assembly 16 includes a stem element 54 and a collar-like ferrule element 56. The stem element 54 has an annular external flange 58 that is abutted against the shoulder 26 of wall 20 of body 12, and the stem element 54 may be permanently secured to the wall 20 of body 12 by fastening the flange 58 to the wall 12 in any suitable fashion, as by sonic welding, heat, adhesives, press fitting or the like.

The stem element 54 is generally elongated and extends from the flange 58 outwardly through and beyond the open end of chamber 24 of body 12 and includes an elongated, generally cylindrical portion 60 at the end of element 54 remote from the chamber 24. The portion of stem element 54 adjacent the chamber 24 is provided with a passage 62 communicating with the chamber 24 and with a zone or chamber 64 surrounding that portion of the stem element 54. As best illustrated in FIGS. 2 and 4, the passage 62 is preferably formed in irregular or spoked cross section in order to insure an even flow of material from the chamber 24 through the passage 62 to the chamber 64 on all sides of the stem element 54.

The end of stem element 54 remote from chamber 24 is provided with an annular flat surface 66 extending about a cavity 68 in that end of the stem element 54. The brush element 18 has an innermost stretch 70 thereof received within the cavity 68 and secured to the stem portion 60 in any suitable fashion as by a staple 72.

The collar-like ferrule element 56 of the nozzle assembly 16 is provided adjacent its outer end with a bore 74 through which the brush element 18 extends, the ferrule 56 thence extending to an inner portion 76 thereof that is shiftably mounted upon the body 12 by means of spaced, external, annular flanges 73 and 80 that are spaced more widely than the corresponding dimension of the internal flange 28 on the body 12. The ferrule element 56 has a tapered internal chamber 82 that receives the portion 60 of the stem element 54, communicates at one extremity thereof with the chamber 64 and, during operation, communicates at the opposite extremity thereof with a small chamber 84 between the edge 66 of the stem element 54 and an opposed flat surface 86 circumscribing the inner extremity of bore 74 of the ferrule element 56. Internal guides 88 on the ferrule element 56 within the chamber 82 serve to provide a low friction guide for shifting the ferrule element 56 relative to the stem element 54.

If desired, although by no means absolutely essential, a coil compression spring 90 may be provided within chamber 64 and oppositely bearing against the flange 58 of stem element 54 and an opposed surface 92 on ferrule element 56. Also optional but included in the presently preferred embodiment is the provision at the extremity of ferrule element 56 proximate the chamber 24 of an annular sealing flange 94 that inclines into sliding engagement with an internal cylindrical surface 96 of the wall 20 of body 12.

In the normal operation of the applicator 10, the cover cap 14 is removed and the user squeezes the wall 20 of body 12 to force polish material from the reservoir 24 through the passage 62 into the chambers 64, 82 and 84 whereupon such material contacts and wets the brush element 18 for application of such material by the user to a fingernail or the like. It will be understood that the pressure exerted upon the material by squeezing of the sidewall 20 of body 12 will serve to shift the ferrule element 56 in a direction away from the reservoir 24, thereby opening the chamber or passage 84 for flow of material to the brush element 18. Such movement of the ferrule 56 moves the internal flange 80 of the ferrule element 56 into abutting and sealing engagement with the opposed face of internal flange 28 of body 12 to prevent leakage from the chamber 64 to the exterior of the applicator 10; additionally, if the sealing flange 94 is provided, as is preferred, the pressure of the liquid material will tend to force the sealing flange 94 into tighter engagement with the surface 96 of wall 20 to virtually assure against any possibility of leakage from the chamber 64 despite the pressure being applied to the liquid material therewithin.

When the spring 90 is provided, it will be perceived that it yieldably biases the ferrule element 56 toward a normal position in which the chamber portion 84 of the material passage is opened and in which the sealing abutment between the flanges 80 and 28 is effected even prior to the exertion by the user of squeezing pressure upon the wall 20 of the body 12. The spring 90 will also hold the flange 58 in place against the shoulder 26 of wall 20, so that permanent fastening of the latter may be omitted.

After use of the applicator 10 is completed, it is merely necessary for the user to emplace the cover cap 14 upon the body 12, as generally indicated in FIG. 1, and then to screw them tightly together, in order to protect the brush element 18 and seal the passage means 62, 64, 82 and 84 at all critical zones thereof. When the cap 14 is so emplaced and screwed upon the body 12, the brush element 18 is tightly enclosed within the chamber 44 of cap 14 by virtue of a sealing abutment of the inclined internal shoulder 50 of cap 14 against an opposed external surface of the flange 73 of the ferrule element 56, and the chamber 44 will normally retain sufficient solvent vapors from the polish material to prevent any such material remaining on the brush element 18 from hardening. As the cap 14 is screwed into place on the body 12 the flange 73 is moved into sealing engagement with the end shoulder 38 of body 12 to effect a tight closure of the chamber 64. Simultaneously, the surface 86 of the ferrule element 56 moves into

sealing engagement with the surface 66 of the stem element 54 to eliminate the chamber 84 and seal the chamber 82 away from the brush element 18 and the bore 74; this prevents any capillary flow of polish material to the brush 18 or the chamber 44 during non-use, storage or transportation. Also simultaneously, if the parts are dimensioned in accordance with the contemplated preferred embodiment, the edge 48 of cap 14 will be moved into sealing abutment with the external shoulder 34 on the body 12 to effect still another overall sealing of the entire applicator 10 from the external atmosphere.

By the actions and seals described, it will be apparent to those skilled in the art that both the brush element 18 and the polish material remaining in reservoir 24 and passage means 62, 64 and 82 will be sealed from the atmosphere and protected against the deleterious effects of the hardening of such material that occurs when subjected to atmospheric conditions. It will also be apparent that such desirable results are primarily accomplished by the structure of the applicator 10 itself and require only the single and simple natural act of the user emplacing a screw-threaded cap. It will also be appreciated, of course, that a number of minor modifications and changes of details of construction might be made without departing from the principles and true spirit of the invention. Accordingly, it should be understood that the invention is to be deemed as limited only by the fair scope of the claims that follow.

I claim:

1. A liquid applicator instrument comprising:

a hollow body adapted to contain said liquid and having an open extremity;

a nozzle assembly mounted in the open extremity of the body and including relatively shiftable stem and ferrule elements;

liquid passage means through the nozzle, said passage means being open when said elements are in one relative position thereof and closed when said elements are in another relative position thereof;

brush means mounted on the nozzle assembly and disposed to receive liquid from the passage means when the latter is open; and

cap means removably mountable on the body in covering relationship to said brush means, said cap means being engagable with the nozzle assembly when the cap means is on the body for relatively shifting said elements to close the passage means.

2. The invention of claim 1, wherein is provided means for yieldably biasing said elements toward their passage-opening relative position.

3. The invention of claim 1, wherein said body is constructed of yieldable material and is manually compressible for forcing liquid from the interior of said body through said passage means and onto said brush means.

4. The invention of claim 1, wherein said stem element is fixedly mounted on said body; and said ferrule element is reciprocable relative to said stem element.

5. The invention of claim 4, wherein said body and said ferrule element are provided with cooperating interengagable parts for limiting the reciprocable movement of said ferrule element.

6. The invention of claim 5, wherein said parts include a pair of spaced, opposed shoulders on said ferrule element, and a flange on said body disposed between said shoulders, the spacing between said shoulders being greater than the corresponding dimension of said flange.

7. The invention of claim 4, wherein said cap means is threadably mountable on said body, and includes a shoulder surface slidably and rotatably engagable with an opposed surface on said ferrule element for shifting the latter relative to the body and the stem element.

8. The invention of claim 4, wherein there is provided a compression spring oppositely engaging said elements for urging said elements into their passage-opening relative position when said cap means is removed from the body.

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9. The invention of claim 1, wherein said passage means includes a chamber between said elements, an opening through said stem element communicating said chamber with the interior of said body, and a bore through said ferrule element communicating said chamber with the exterior of the instrument when said cap means is removed, said passage means being interrupted between said chamber and said bore when

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said elements are shifted to their passage-closing relative position.

10. The invention of claim 9 wherein said brush means is mounted on said stem element and extends outwardly through said bore.

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