July 28, 1959 H. K. RIEL 2,896,238

APPLICATOR

Original Filed Feb. 23, 1955 2 Sheets-Sheet 1

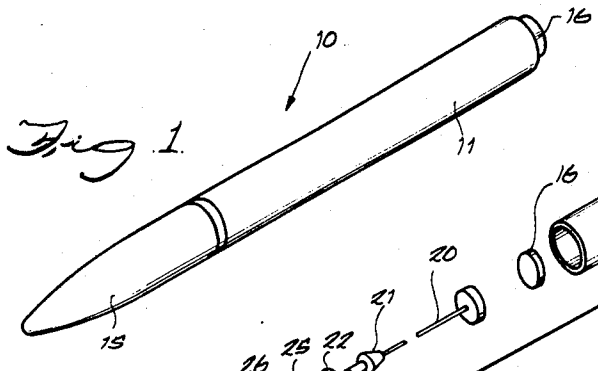


Fig. 1.

Fig. 2.

Fig. 3

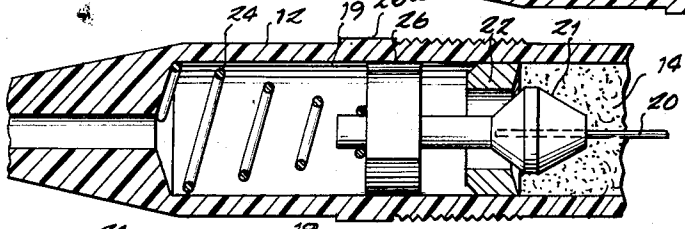


Fig. 4.

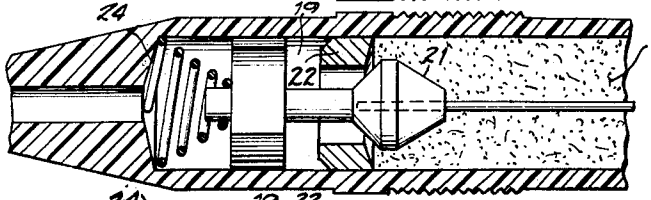


Fig. 5.

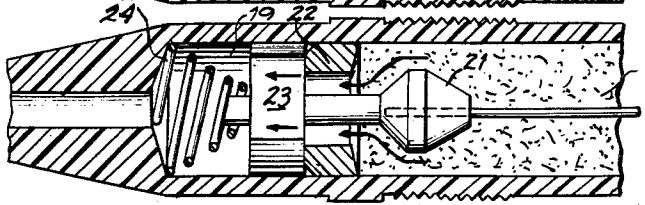


Fig. 6.

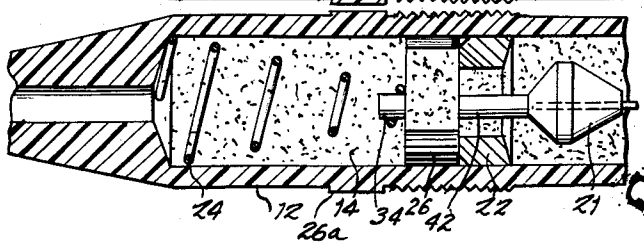


Fig. 7

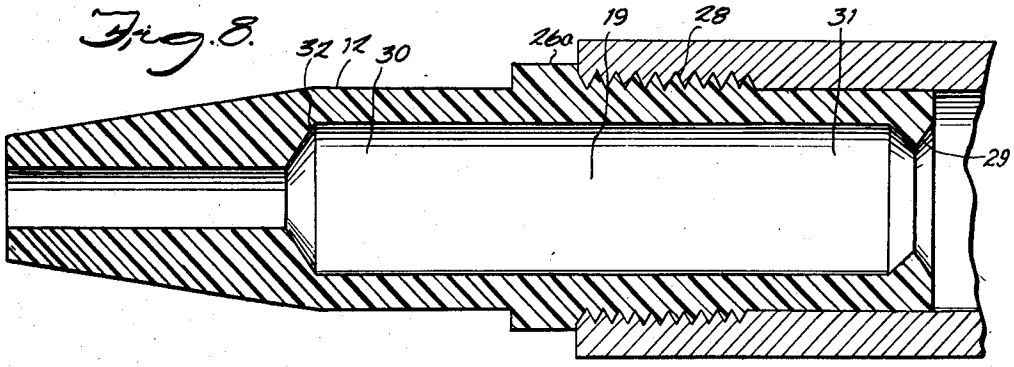
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Fig. 8.



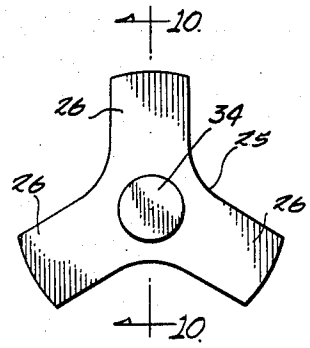


Fig. 9.

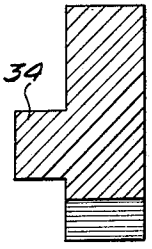


Fig. 10.

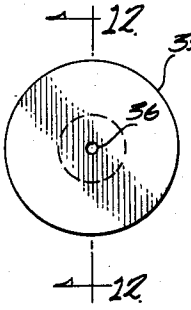


Fig. 11

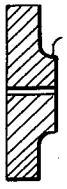


Fig. 12.

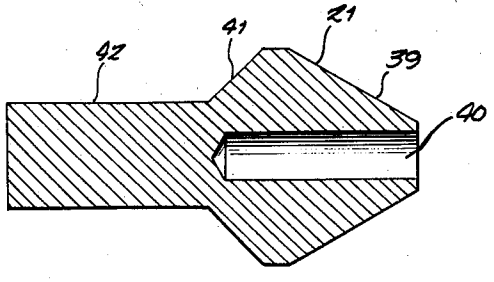
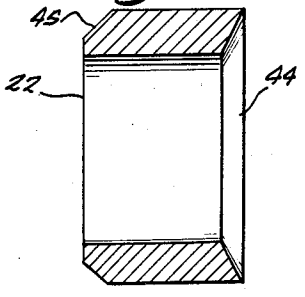


Fig. 13

Fig. 14.



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APPLICATOR

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Continuation of application Serial No. 489,981, February 23, 1955. This application November 14, 1955, Serial No. 546,698

1 Claim. (Cl. 15—137)

The present invention relates to an applicator for viscous materials. A particular embodiment of the invention is a lip paint applicator which may be carried in a lady's purse. This application forms a continuation of the application Serial No. 489,981 filed February 23, 1955, now abandoned.

Lip paint and paste applicators may embody various details of construction, but the majority employ a positive pressure from a single piston to force the paste or paint directly onto the applicator. Although such action will deliver the paste or paint to the applicator, it does not necessarily insure the uniform delivery of a predetermined charge to the applicator. In addition, such paints and paste being normally composed of oils, pigments, and in some cases waxes, may display a tendency to separate upon standing. With a sealed unit, there is little opportunity to mix the materials. As a result, a variation in consistency may be experienced when the contents are delivered to the applicator.

Accordingly, it is the general object of the present invention to provide an applicator for viscous materials which delivers a predetermined charge of material to the applicator head in response to a "push-button" action by the user. A related object of the invention is to insure the delivery of a well mixed paint or paste to the applicator head.

Another object of the invention is to provide an applicator, the components of which, although small, may be mass produced within economical tolerances.

Further objects and advantages of the invention will become apparent as the following description of an exemplary embodiment of the invention proceeds, taken with the accompanying drawings, in which:

Figure 1 is a perspective view of a lip paint applicator illustrative of the present invention.

Fig. 2 is an exploded perspective view of the lip paint applicator shown in its closed or carrying condition in Fig. 1.

Fig. 3 is an enlarged section of the valve mechanism of the lip paint applicator showing the position of the components in the released condition.

Fig. 4 is an enlarged section of the valve mechanism showing the position of the components as the changing cycle begins by depressing the plunger.

Fig. 5 is an enlarged section of the valve mechanism of the lip paint applicator showing the relation of the component parts when the plunger has been fully depressed.

Fig. 6 is an enlarged section of the valve mechanism showing the action of the lip paint or paste with reference to the valve mechanism as the plunger is released.

Fig. 7 is an enlarged section of the valve mechanism of the lip paint applicator showing the components in the same position as in Fig. 3, but illustrating how the lip paint or paste has been moved forwardly toward the applicator brush as a result of completing the cycle diagrammed in Figs. 3 through 6.

Fig. 8 is an enlarged section of the lip paint applicator nose and valve mechanism shown diagrammatically in Figs. 3 through 7.

Fig. 9 is an end view of the spider.

Fig. 10 is a cross-section of the spider shown in Fig. 9 taken along section 10—10.

Fig. 11 is a plan view of the plunger disc.

Fig. 12 is a sectioned view of the plunger disc shown in Fig. 11 taken along section 12—12.

Fig. 13 is an enlarged view in full section of the reservoir valve.

Fig. 14 is an enlarged section of the annular valve seat.

To repeat, the invention deals with an applicator for lip paint, pigmented pastes and the like. The present illustrative embodiment of the invention shows it in an elongated pencil shaped form intended for use as a lady's lipstick applicator. Fig. 1 shows the pleasing external configuration which can be achieved with an applicator such as contemplated by the invention. Fig. 2 more clearly reveals the relationship of the internal component parts of the lip paint applicator, and clearly illustrates how the small parts can be fitted within the confines of an applicator comparable in size to a pencil or a fountain pen.

The outstanding advantages of the present invention stem from the unique valve mechanism employed. Although it will be appreciated that numerous alternatives and equivalent constructions may be employed to achieve the same sequential result, as illustrated by the two species shown, the invention relies upon the combination of functions performed by the structural elements.

In essence, the operation of the valve mechanism of the applicator relies upon delivering the paint or paste to the applicator by a combination of positive and negative pressure applications. The negative pressure application assists in preventing the pigment from separating from the paste in the reservoir and consequently insuring even application of pigmented paste throughout the use of the supplied material. The positive pressure, on the other hand, insures the delivery of a measured charge of paint or paste to the applicator head when each operational cycle is executed. These principles of operation will be more fully appreciated as the detail of the structure and operation of an exemplary embodiment is followed.

As will be seen from a reference to Fig. 2, the lip paint applicator **10** contemplates a reservoir housing **11** and an applicator head **12** removably secured to the reservoir housing **11**. Within the reservoir housing **11** will be found a charge of suitably pigmented and prepared lip paint or paste **14**. An applicator head cap **15** is provided of sufficient internal dimension to snugly and yet removably fit over the applicator head. The cap **15** closes the lip paint applicator for carrying conveniently in a lady's purse. When the entire unit is assembled, and readied for use, the only visible parts are the applicator head **15**, the reservoir housing **11**, and the plunger button **16**.

The operation of the unique valve mechanism will be best appreciated by reviewing the operation of a typical charging cycle illustrated in Figs. 3 through 7. Prior to use, the cap **15** is removed from the applicator head **12** so that visual inspection may be made of the amount of lip paint or paste deposited upon the brush bristles **18**.

As shown in Fig. 3, prior to actuating the plunger button **16**, the lip paint or paste **14** is free to move into the chamber **19** defined by the internal portion of the applicator head **12**. When the plunger button **16** is depressed the plunger rod **20** transmits a forward motion to the reservoir valve **21** thereby seating it against the annular valve seat **22** as shown in the relationship of the component parts in Fig. 4. At this point the conical spring **24**, in the forward portion of the applicator head chamber **19**, is urged into compression and yieldably re-

sists additional forward motion of the valve **21**. In addition, sufficient energy is built up to move the valve **21** back to its original released position as illustrated in Fig. 3.

After the reservoir valve **21** has seated itself within the annular valve seat **22**, the operator continues to depress the plunger button **16** and move the valve assembly forward to the position shown in Fig. 5. In the course of this motion the reservoir area within the reservoir housing **11** where the lip paint **14** is contained enlarges, and consequently the pressure within the lip paste area is reduced. Since the pressure within the applicator head chamber **19** has been correspondingly increased by this forward motion, some equalization of pressure will come through leakage around the plunger button **16** juncture with the reservoir housing **11**. This action causes a turbulence within the lip paint paste **14** and constantly tends to mix the pigment and vehicle oils in the course of operation, thereby reducing the possibility of a separation of the lip paint components. This action also serves to move the paste or pigment forward in the reservoir immediately behind the reservoir valve **21**.

When the plunger button **16** is released the coil spring **24** begins to move the spider **25** back toward the original position of the valve mechanism shown in Fig. 3. Since the spider **25** has open areas between its webs **26**, the lip paste or paint **14** which has been moved forwardly by the forward motion of the reservoir valve **21** then passes through the areas defined by the webs **26** as the valve seat **22** and spider **25** return to their original position. At this point it will be noted that the reservoir valve spanner **42** is of sufficient length so that the reservoir valve **21** and spider **25** alternatively engage the valve seat **22**. When the valve assembly returns, as shown in Fig. 6, the reservoir valve **21** is unseated from the valve seat **22** and consequently permits the lip paste **14** to migrate forwardly through the valve seat hollow central portion and between the webs of the spider **25** on into the forward applicator head chamber **19** as shown by the arrows in Fig. 6.

When complete release is achieved, as illustrated in Fig. 7, the applicator head forward chamber **19** becomes filled with the lip paint or paste **14** and the valve assembly is returned to its original position as shown in Fig. 3. The condition of the applicator head has been changed, of course, by filling the forward applicator head chamber **19** with lip paste **14**.

Upon beginning the second cycle, the lip paint or paste within the reservoir is moved forward and prepared for release into the forward housing chamber **19** as outlined above, but at the same time a positive pressure is placed upon the lip paint or paste in the forward housing. This results because the valve cone **21** when seated in the valve ring **22** for its forward travel, is converted into a piston which divides the forward chamber **19** from the reservoir chamber.

The foregoing description illustrates how the unique valve mechanism described is double-acting in the sense that negative pressure delivers the lip paint or paste throughout a portion of the cycle, and yet positive pressure is applied to the paint throughout the final discharge to the applicator brush **18**.

The details of the component parts will be more fully appreciated by referring to the detailed drawings in Figs. 8 through 14. In Fig. 8 it will be seen that the applicator head **12** contemplates an annular external shoulder **26***a* and threaded rear skirt **28**. An internal shoulder **29** extends inwardly at the rear portion of the applicator body base, beveled on both sides to permit convenient assembly. Since the applicator head body **12** will probably be molded of a semi-yieldable plastic material, the valve seat **22** can be inserted by slightly springing the skirt **28** of the applicator head. In the particular instance illustrated in Fig. 8, the chamber **19** within the applicator housing is divided into a forward chamber **30** and a rearward chamber **31**. The forward chamber **30** houses the coil spring **24**.

The spider **25** is shown in detail in Figs. 9 and 10. Its construction contemplates three webs **26** and a boss **34** which engages the coil spring **24**. Alternative constructions are contemplated which will permit the passage of paint and also support the valve seat for its engagement with the reservoir valve.

The plunger button sealing disc **35** shown in Fig. 12 has a hollow bore **36** to receive the plunger rod **20**. A shouldered portion **38** at the rear portion of the sealing disc abuts the plunger button **16**.

The construction of the reservoir valve **21** is shown in greater detail in the enlarged cross-section appearing as Fig. **13**. There it will be seen that the reservoir cone **39** slopes at an acute angle in order to permit the free flow of lip paint or paste over its surface into the forward chamber of the applicator head. A hollow bore **40** is provided within the conical valve forward portion to receive the plunger rod **20**. The frustoconical portion **41** of the reservoir valve **21** is angled to mate with a similarly shaped chamfered portion **44** of the annular valve seat **22**. The spanner shaft **42** of the reservoir valve **21** should be sufficiently stable to transmit the forward motion of the plunger rod **20** to the remainder of the valve mechanism. The base end of the spanner shaft **42** of the valve **21** may be of any suitable configuration to appropriately engage the spider **25**.

The valve seat **22** is shown in Fig. 14 as an annular ring having a chamfered seat **44** which engages the frustoconical section **41** of the reservoir valve **21**. A chamfered forward edge **45** of the valve seat **22** may be provided, if desired, to assist in seating the valve seat against a shoulder (not shown) projecting inwardly from the wall of the chamber **19** to divide that chamber into the forward and the rearward chambers **30** and **31**. The chamfered edge **45** also assists in inserting the valve seat **22** within the chamber **31** when it must pass over the conical shoulder **29** in applicator head skirt **28**.

It will be appreciated, of course, that variations in the external configuration of the component parts described in detail above may be necessitated by manufacturing tolerances, the materials employed, and other details of manufacture. It is also contemplated that the parts may be changed in their proportionate sizes and engagement with their housings and related structural members.

In addition, slight variations are contemplated which will render the applicator useful with a wide range of viscous materials. Specifically, it is contemplated that numerous additional applications of the applicator as illustrated may be found other than for applying lip paint or paste. For example, the structure may be used for touch-up paint kits, applying lubricant oil and grease to various parts, and other applications where a viscous material is to be held in a confined space by a removable reservoir and delivered to an applicator.

Although particular embodiments of the invention have been shown and described in full here, there is no intention to thereby limit the invention to the details of such embodiments. On the contrary, the intention is to cover all modifications, alternative embodiments, usages and equivalents of the applicator or fall within the spirit and scope of the invention, specification, and appended claim.

I claim as my invention:

An applicator for a viscous material comprising in combination, an applicator head having a hollow nose with applicator means at its forward end, a reservoir housing secured to the applicator head, an annular floating valve seat slidably mounted in said reservoir housing and having a central passage therethrough along its axis, a slidable valve member having a seat engaging portion engageable with said floating valve seat to close the passage

and having a spanner portion rigid with the seat engaging portion and extending from such portion and through the passage along said axis when the portion engages the seat, the spanner portion being of a length greater than the length of the passage, a spider member mounted in the housing, said member having legs engaging the interior wall of the housing and having passages between the legs to permit material to flow past the spider, the spider being mounted at the end of said spanner portion and the legs of the spider being engageable with the valve seat, and means for reciprocating the valve member and spider member so that when moved in one direction, the valve member will engage the valve seat thereby closing the passage and moving the valve seat in a piston action, and when reciprocated in the other direction, the valve

member moves away from the valve seat, opening the passage, and the spider member engages the valve seat and returns it to its original position for subsequent operation.

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