A dispensing brush for dispensing a predetermined fluid on a head of hair. The dispensing brush includes a reservoir located within the brush head for retention of the predetermined fluid. The brush works without actuators or other mechanical devices for controlling flow of the fluid. The reservoir is in fluid communication with openings located on the top surface of the brush. The reservoir may have a funnel-like shape, which assists in regulating flow of fluid through the openings. The openings are centrally aligned on the top surface of the brush, and are located among the bristles of the brush.
Fig. 7
FLUID DISPENSING BRUSH
RELATED APPLICATION

BACKGROUND OF THE INVENTION
[0002] 1. Field of the Invention

[0003] The present invention relates to a dispensing brush. More specifically, the present invention relates to a dispensing brush having a reservoir for retaining a predetermined fluid, such as a hair-coloring product. The predetermined fluid is dispensed through dispenser apertures.

[0004] 2. Description of the Prior Art

[0005] The idea of applying a viscous liquid to the hair or scalp is not new. Many coloring products, hair gels, and conditioners are used to manage or style a head of hair. Dispersal of the product evenly over the hair is of concern during application to the hair. Many known applicator devices do not give the control necessary to evenly disperse a liquid while styling hair. Other devices may disperse liquid evenly, but do so in limited amounts such that multiple applications may be needed. Further, some devices are limited to dispersal of liquid having viscosity within a narrow range.

[0006] For example, Thiruppatti (U.S. Pat. No. 5,927,290) teaches dispersing liquids onto the hair by way of a spray pump and nozzle incorporated within a hairbrush. However, spray nozzles, such as those disclosed therein, accommodate liquids of moderate viscosity, rather than more viscous fluids that may be needed in hair coloring, for example. Furthermore, a spray nozzle may cover an area larger than required, leading to excess use of the liquid, and a lack of control over dispersal.

[0007] Another dispensing brush is disclosed in Velardi (U.S. Pat. No. 3,868,188). This disclosure suggests a toothbrush in which liquid is dispensed through bristles. However, the bristles of this design may become clogged, leading to uneven dispersal of the fluid. Also, since the fluid flow is manually controlled, this device does not easily lend itself to application of a hair product. While brushes may have been developed that dispense fluids, the shortcomings of uneven disbursement of the fluids and unnecessary manipulation of the brush by the user have not been adequately solved.

SUMMARY OF THE INVENTION
[0008] To ameliorate the noted concerns of known dispenser brushes, it is an object of the present invention to provide a novel liquid dispensing hairbrush that is easy to use and control, and may be used with a variety of fluids. The brush includes a hollow, refillable reservoir for storing the fluid to be dispersed, and a plurality of dispersal openings communicating with the reservoir. The device of the present invention evenly dispenses a predetermined fluid onto a head of hair or a scalp without need of manual regulation by the user. The hairbrush is designed to use gravity in the dispensing process rather than the pumps or controls seen in known devices.

[0009] A predetermined fluid, such as a hair colorant, is preferably added to the device through a fill aperture in one end of the brush. The fill aperture is in fluid communication with the brush reservoir. Once the reservoir is filled, the aperture may be closed with a plug or other stop means thereby retaining the fluid in the reservoir. The brush further includes a top surface and a bottom surface. The top surface preferably includes a plurality of bristles extending normal to the top surface, and a plurality of dispenser openings. The dispenser openings being in fluid communication with the brush reservoir. The dimensions and alignment of the dispenser openings in the top of the brush allow the user to easily control even dispersal of fluid on a head of hair. The following description will explain the invention in more detail.

DESCRIPTION OF THE DRAWINGS
[0010] FIG. 1 is a perspective view of a dispensing brush according to the present invention.

[0011] FIG. 2 is a top plain view of the dispensing brush seen in FIG. 1.

[0012] FIG. 3 is a partially exploded, longitudinal section of the dispensing brush seen in FIGS. 1 and 2, and taken along line 3-3 of FIG. 2.

[0013] FIG. 4 is an end view of the dispensing brush seen in FIGS. 1-3.

[0014] FIG. 5 shows the dispensing brush of FIGS. 1-4 in use with on a head of hair.

[0015] FIG. 6 shows the dispensing brush of FIGS. 1-5 and a head of hair after application of fluid by the dispensing brush.

[0016] FIG. 7 is a perspective view of an alternate embodiment of a dispensing brush according to the present invention.

[0017] FIG. 8 is an exploded perspective view of a further embodiment of a dispensing brush according to the present invention.

[0018] FIG. 9 is a sectional view of the brush of FIG. 8 taken along the line 9-9 of FIG. 8.

[0019] FIG. 10 is a sectional view of the brush of FIG. 8 taken along the line 10-10 of FIG. 8.

DETALTED DESCRIPTION
[0020] Although the disclosure hereof is detailed and exact to enable those skilled in the art to practice the invention, the physical embodiments herein disclosed merely exemplify the invention that may be embodied in other specific structure. While the preferred embodiment has been described, the details may be changed without departing from the invention, which is defined by the claims.

[0021] Referring to FIG. 1, a perspective view of a fluid dispensing brush 10 is shown. The dispensing brush 10 includes a handle portion 12 and a head portion 14, and may be fabricated from any suitable material such as plastic, metal, wood, or other rigid material. The handle portion 12 may be of any shape that allows for easy manual gripping of the dispensing brush 10 and includes a proximal end 16 and a distal end 18. The head portion 14 of the dispensing brush
10 has a first end 15 and a second end 17. The head portion 14 of the dispensing brush 10 is connected to the proximal end 16 of the handle portion 12 at the first end 15 of the head portion 14. The head portion 14 further includes at least a top surface 20 and a bottom surface 19, with the top surface 20 holding a plurality of bristles 22 and further including a plurality of dispenser openings 24. The handle portion 12 and the head portion 14 as shown are fabricated from one piece of material, but it is to be understood that the dispensing brush 10 may be fabricated from multiple parts, if desired.

[0022] As seen particularly in the view of FIG. 4, a fill aperture 26 is preferably located at the second end 17 of head portion 14. A plug 28 removably engages the aperture 26, thereby allowing a predetermined fluid, such as a hair coloring fluid, to be placed and retained in a reservoir 30 (shown in FIG. 3) within the head portion 14. The reservoir 30 is preferably in fluid communication with the dispenser openings 24 and the fill aperture 26.

[0023] FIG. 2 shows a top plan view of the dispensing brush 10. As seen, the dispenser openings 24 are preferably located on the top surface 20 of the head portion 14 and are centrally situated between multiple linear rows of bristles 22, with the linear rows of bristles 22 being aligned along the central, longitudinal axis of the dispensing brush 10. The dispenser openings 24 are preferably located centrally on the top surface 20 of the head portion 14, and between the linear rows of bristles 22 to thereby cause the bristles 22 to control the alignment of the hair before and after application of a fluid and cause even placement of fluid by the dispenser openings 24. The dispenser openings 24 are preferably aligned in a linear configuration to aid in even dispersal of a predetermined fluid 38. The dispenser openings 24 include an inner diameter 24A. The inner diameter 24A is preferably at least approximately 0.25 inches (0.635 cm) in diameter to allow the predetermined fluid to flow from the reservoir 30 and through the dispenser openings 24. The number of rows of the bristles 22 on either side of the dispenser openings 24 is not critical to the scope of the invention and may vary according to user preference.

[0024] In FIG. 3, a section view of the dispensing brush 10 is shown as taken along a central, longitudinal axis. As seen, dispenser openings 24 are preferably in fluid communication with the reservoir 30. The fill aperture 26, which is also in fluid communication with the reservoir 30, includes a removable plug 28 for retention of fluid (not shown in this view) in the reservoir 30. While FIG. 3 illustrates the plug 28 as being threaded, any plug 28 that will removably engage and seal the aperture 26 will suffice, such as that having an interference fit.

[0025] As further shown particularly in FIG. 3, the dispenser openings 24 each include a respective longitudinally extending collar portion 40, which is elevated above the top surface 20 of the head portion 14. While each of the dispenser openings 24 is shown having a collar portion 40, it is to be understood that the dispensing brush 10 may include at least one dispenser opening without the collar portion 40. The respective collar portions 40 of the dispenser openings 24 are preferably elevated a predetermined height above the top surface 20 of the head portion 14. The predetermined height is preferably approximately 0.125 inches (3.175 mm), although it is to be understood that the present invention may be practiced using greater or lesser heights, depending on user preference. For example, the height of the collar portions 40 above the top surface 20 could be greater than 0.125 inches (0.3175 mm), but a less viscous fluid may not dispense evenly if the height is much less than 0.125 inches (0.3175 mm). The collar portions 40 function to inhibit uncontrolled liquid dispersal from the dispenser openings 24. Further, the entire height of the dispenser openings 24, from the reservoir 30 to the top of a respective collar portion 40 is preferably 0.25 inches (0.635 cm). This height allows adequate control of a predetermined fluid during passage from the reservoir 30, to exit onto a head of hair (See FIGS. 5 and 6). Again, although 0.25 inches (0.635 cm) is preferable, the height may be decreased or increased according to the viscosity of the fluid used, or user preference.

[0026] FIG. 4 shows an end view of the dispensing brush 10 viewed from the second end 17 of the head portion 14. As seen, the reservoir 30 is aligned with the dispenser openings 24 along the center of the dispensing brush 10. The dispenser openings 24 are symmetrically located between the rows of the multiple linear rows of the bristles 22. Likewise, the fill aperture 26 is also aligned with the reservoir 30 for facile filling with a predetermined fluid (not shown). As seen, the fill aperture 26 preferably includes a diameter 26A of at least approximately 0.25 inches (0.635 cm) in diameter for a viscous fluid to properly enter the reservoir 30. The fill aperture diameter 26A may be more than approximately 0.25 inches (0.635 cm) in diameter, but it is not recommended for the aperture diameter 26A to be much less than approximately 0.25 inches (0.635 cm) in diameter for applicable flow of a viscous fluid.

[0027] Referring now to FIG. 5 and FIG. 6, the dispensing brush 10 is shown in use to apply a predetermined fluid 38 to a head of hair 36. The dispensing brush 10 is brought through the hair 36 with the bristles 22 facing towards the hair 36. As the bristles 22 of the dispensing brush 10 pass through the hair 36, the predetermined fluid 38 is dispensed through the dispenser openings 24 and onto the hair 36. After the dispensing brush 10 is pulled through the hair 36, the fluid 38 is left behind on the hair 36 (See FIG. 6). The design of the bristles 22 around the openings 24 and the height of the collar portions 40 above the top surface 20 allow the fluid 38 to be evenly dispersed over the head of hair 36, as is shown by the streaks of the fluid 38 in FIG. 6. The head of hair 36 is evenly treated with the fluid 38, with relative ease on the behalf of the user.

[0028] FIG. 7 shows a perspective view of an alternative embodiment of the present invention wherein the fill aperture 26 is located on the bottom surface 19 of head portion 14. As in the previous embodiment, the plug 28 preferably removably engages the aperture 26 with the reservoir 30 in fluid communication with the dispenser openings 24 and the fill aperture 26.

[0029] FIG. 8 is a perspective view of a further embodiment of the dispensing brush 100. The dispensing brush 100 builds on the previous embodiments by enhancing the features that allow the brush to operate without the need of valves or discharge assistants to allow the fluid 38 to dispense from the dispensing brush 100. The dispensing brush 100 comprises a handle portion 102 and a head portion 104 that forms a reservoir 105. The head portion 104 has a
closed end 106 and an open end 108. The open end 108 provides a fill aperture 110 for the fluid 38 to be poured into the reservoir 105. The open end 108 will be closed with a cover 109. The cover 109 may also be considered a plug for closing the fill aperture 110. Alternatively, a second fill aperture 112 with a second plug 114, similar to the aperture 26 and the plug 28 of the previous embodiments, may be used to fill the reservoir 105 with the fluid 38 (not shown). The fill aperture 112 is preferably located in an end portion 113 of the head portion 115. The end portion 113 is understood to be the side of the brush 100 opposite of the bristles 22. The relationship of the reservoir 105 and the second fill aperture 112 will be discussed further with respect to FIGS. 9 and 10.

[0030] FIGS. 9 and 10 show sectional views of the dispensing brush 100. As in the previous embodiments, the reservoir 105 is in fluid communication with a plurality of dispenser openings 116 that are each surrounded by a respective collar 118. The collars 118 and dispenser openings 116 are sized similar to the previous embodiments. The inner diameter 16A of the dispenser openings is preferably approximately 0.125 inches (0.3175 cm), although it is to be understood that the present invention may be practiced using a greater or lesser diameter, depending on user preference and the viscosity of the fluid. Likewise, the height of the collars 118 extending from the reservoir 105 is preferably approximately 0.25 inches (0.635 cm), but the height may be varied and still fall within the scope of the invention.

[0031] Still referring to FIGS. 9 and 10, the inner diameter 16A and the height 118A of the collar 118 are significant dimensions for the present invention. Because the present invention does not need actuators, pumps, or other mechanical contraptions to activate the flow of the fluid 38 through the openings 116, the dimensions were designed to specifically allow for an even flow of the fluid 38. The dimensions allow the fluid 38 to form a meniscus 120 at the discharge end of the collars 118. The meniscus 120 forms because surface tension allows the fluid 38 to be held within the collars 118 and the reservoir 105 until the brush 100 is moved through the head of hair 36 (see FIGS. 5 and 6). This is a significant advantage over the prior art in that it simplifies the overall mechanics needed for a properly functioning brush.

[0032] Referring further to FIGS. 9 and 10, the reservoir 105 is shown having a funnel-like or teardrop shape. Such an arrangement also contributes to the functionality of the brush 100. Because the dispensing of the fluid 38 occurs only when the meniscus 120 is broken when the brush comes in contact with the hair 36 (FIGS. 5 and 6), the teardrop shape of the reservoir 105 further assists in providing retention means for the fluid 38 within the reservoir 105 when the brush 100 is not in use. While the shown shape is preferred, other shapes, such as possible pyramidal shapes or triangular shapes would fall within the scope of the present invention. The funnel shape provides enough tension so that fluid 38 is retained within the reservoir 105 when the brush 100 is not in use. The second fill aperture 112 and the plug 114 may also contribute to the fluid 38 being held within the reservoir 105. When the plug 114 is secured within the aperture 112, constant pressure is applied to the fluid 38 within the reservoir 105, which will make it even harder for the fluid 38 to escape from the brush 100 when the brush 100 is not in use, allowing the brush 100 to be stored with fluid 38 within the brush 100. The constant pressure on the fluid 38 will force the fluid 38 downwardly towards the dispenser openings 116, but, because of the funnel-like shape of the reservoir 38, the amount of fluid pushed towards the openings 116 is greater than the area of the openings 116. The extra force exerted on the fluid 38 will prevent leakage through the openings 116. Thus, the plug 114 provides partial pressurized retention means for the fluid 38 when the plug 114 is secured within the aperture 112. The plug 114 and the aperture 112 act as a venturi or a carburetor that can assist in dispensing the fluid 38 from the brush 100. Though not necessary, it is preferred that the plug 114 be removed from the aperture 112 when using the brush 100 for a more even flow of the fluid 38, which can be more advantageous for the user to regulate fluid flow, without mechanical devices or actuators. However, the brush will still work properly if the plug 114 is secured within the second aperture 112 when dispensing the fluid 38.

[0033] The present invention presents a dispensing brush that has simplified and economized hair styling and coloring procedures. The brush functions by utilizing the concepts of surface tension and gravity in a manner that has not been previously used or known in the art of hairstyling. The brush does not need levers, actuators, or other moving parts to dispense the fluid from the brush. Also, the fluid will flow out of the brush evenly without manipulation and control necessary by the individual user. Likewise, the brush will retain fluid within the brush until application without needing to plug or close the dispenser openings. Thus, the brush delivers regulated fluid in a much more efficient manner than previous devices known or used in the hairstyling field.

[0034] The brush also provides a more economical manner for coloring and streaking a head of hair. Previously, a person would have to go to a stylist, who would spend considerable time and effort for the streaking process. It was difficult for the user to properly streak one's own hair in an even fashion. The present invention allows the individual to color his or her own hair, quickly and affordably.

[0035] While the above description is illustrative of the invention, numerous modifications to the invention may occur without changing the scope of the invention. For instance, the shape of the handle and head of the brush may be changed while still being within the bounds of the invention. Likewise, the length and width of the brush may be modified, and the number of bristles and openings, and the size of the fluid reservoir may be modified as deemed necessary.

What is claimed is:
1. A dispensing brush comprising:
   a handle portion, said handle portion including a proximal end and a distal end,
   a head portion, said head portion including a first end and an oppositely disposed second end, said first end of said head portion connected to said proximal end of said handle portion,
   said head portion having a top surface and a bottom surface,
   a plurality of bristles laterally extending from the top surface of said head portion,
a fluid reservoir, said fluid reservoir located in said head portion,
a fill aperture, said aperture being in fluid communication with said reservoir,
a plug removably engaging said fill aperture,
said top surface of said head portion including a plurality of dispenser openings, said dispenser openings being in fluid communication with said fluid reservoir, said dispenser openings having a predetermined diameter, said predetermined diameter providing a surface tension to said fluid at an open end of the dispenser openings, said surface tension retaining the fluid within said reservoir until openings come into contact with an external surface.

2. The dispensing brush of claim 1 wherein said fill aperture is located in said second end of said head portion.

3. The dispensing brush of claim 1 wherein said fill aperture is located on said bottom surface of said head portion.

4. The dispensing brush of claim 1 wherein said plurality of bristles is arranged in multiple linear patterns.

5. The dispensing brush of claim 4, wherein said plurality of dispenser openings is longitudinally aligned along a central axis of said top surface of said head portion, said openings being centrally located between said multiple linear patterns of bristles.

6. The dispensing brush of claim 1, wherein said fill aperture has a diameter of at least 0.25 inches (0.635 cm).

7. The dispensing brush of claim 1 wherein at least one of said plurality of dispenser openings includes a surrounding collar, said collar elevated a predetermined height above said top surface of said head portion.

8. The dispensing brush of claim 7, wherein said predetermined height is at least 0.125 inches (0.3175 cm).

9. The dispensing brush of claim 4, wherein said reservoir is adapted to receive a fluid through said fill aperture.

10. The dispensing brush of claim 5, wherein said plurality of dispenser openings is adapted to dispense a fluid from said reservoir.

11. A method for applying a fluid to a head of hair consisting of the steps:

   providing a head of hair;

   providing a dispenser brush, said brush including a handle portion and a head portion; said head portion including a first end and a second end; said first end of said head portion connected proximally to said handle portion; said head portion having a top surface and a bottom surface, a plurality of bristles laterally extending from said top surface, a fluid reservoir located in said head portion; and a fill aperture; said fill aperture being in fluid communication with said reservoir, a plug removably engaging said fill aperture, said top surface of said head including a plurality of openings, said openings being in fluid communication with said reservoir;

   filling the reservoir of the dispensing brush with a predetermined fluid; and

   passing said bristles through said head of hair, thereby dispensing said predetermined fluid from the reservoir through said dispenser openings onto the head of hair.

12. A dispensing brush for dispensing a fluid onto a head of hair without needing an actuator valve or discharge assistant to dispense the fluid, said dispensing brush comprising:

   a handle portion, said handle portion including a proximal end and a distal end,

   a head portion, said head portion including a first end and an oppositely disposed second end, said first end of said head portion connected to said proximal end of said handle portion,

   said head portion having a top surface,

   a plurality of bristles laterally extending from the top surface of said head portion,

   a fluid reservoir, said fluid reservoir located in said head portion,

   a fill aperture, said aperture being in fluid communication with said reservoir,

   a plug removably engaging said fill aperture,

   said top surface of said head portion including a plurality of dispenser openings, said dispenser openings being in fluid communication with said fluid reservoir, said dispenser openings having a predetermined diameter, said predetermined diameter providing a surface tension to said fluid at an open end of the dispenser openings, said surface tension retaining the fluid within said reservoir until said surface tension is broken by contact with an external surface.

13. The dispensing brush of claim 12 wherein said head portion has a bottom surface and said fill aperture is located in said second end of said head portion.

14. The dispensing brush of claim 12 wherein said fill aperture is located on said bottom surface of said head portion.

15. The dispensing brush of claim 12 wherein said plurality of bristles is arranged in multiple linear patterns.

16. The dispensing brush of claim 15, wherein said plurality of dispenser openings is longitudinally aligned along a central axis of said top surface of said head portion, said openings being centrally located between said multiple linear patterns of bristles.

17. The dispensing brush of claim 12, wherein said fill aperture has a diameter of at least 0.25 inches (0.635 cm).

18. The dispensing brush of claim 12 wherein at least one of said plurality of dispenser openings includes a surrounding collar, said collar elevated a predetermined height above said top surface of said head portion.

19. The dispensing brush of claim 18, wherein said predetermined height is at least 0.125 inches (0.3175 cm).

20. The dispensing brush of claim 19, wherein said reservoir is adapted to receive a fluid through said fill aperture.

21. The dispensing brush of claim 16, wherein said plurality of dispenser openings is adapted to dispense a fluid from said reservoir.

22. A fluid dispensing brush comprising:

   a handle portion, said handle portion including a proximal end and a distal end,
a head portion, said head portion including a first end and an oppositely disposed second end, said first end of said head portion connected to said proximal end of said handle portion,
said head portion having a top surface,
a plurality of bristles laterally extending from the top surface of said head portion,
a fluid reservoir having a funnel-like shape, said fluid reservoir located in said head portion,
a fill aperture, said aperture being in fluid communication with said reservoir,
a plug removably engaging said fill aperture,
said top surface of said head portion including a plurality of dispenser openings, said dispenser openings being in fluid communication with said funnel-like fluid reservoir, said funnel-like shape providing retention means for said fluid within said reservoir.

23. The fluid dispensing brush according to claim 22 wherein said dispenser openings have a predetermined diameter, said predetermined diameter providing surface tension for said fluid, said surface tension providing further means for retaining said fluid within said reservoir.

24. The dispensing brush of claim 23 wherein said plurality of bristles is arranged in multiple linear patterns.

25. The dispensing brush of claim 24, wherein said plurality of dispenser openings is longitudinally aligned along a central axis of said top surface of said head portion, said openings being centrally located between said multiple linear patterns of bristles.

26. The dispensing brush of claim 25 wherein at least one of said plurality of dispenser openings includes a surrounding collar, said collar elevated a predetermined height above said top surface of said head portion.

27. The dispensing brush of claim 26, wherein said predetermined height is about approximately 0.25 inches (0.635 cm).

28. The dispensing brush according to claim 23 wherein said predetermined diameter of said openings is approximately about 0.125 inches (0.3175 cm).

29. The dispensing brush according to claim 22 further comprising a second fill aperture and a second plug removably secured within said second fill aperture, said second fill aperture being in fluid communication with said reservoir.

30. The dispensing brush according to claim 30 wherein said second plug providing pressurized retention means when said plug is secured within said second fill aperture.

31. A dispensing brush for dispensing a fluid comprising:
a handle portion, said handle portion including a proximal end and a distal end,
a head portion, said head portion including a first end and an oppositely disposed second end, said first end of said head portion connected to said proximal end of said handle portion,
said head portion having a top surface and a bottom surface,
a plurality of bristles laterally extending from the top surface of said head portion,
a fluid reservoir having a funnel-like shape, said fluid reservoir located in said head portion,
a first fill aperture located in said second end of said head portion, said aperture being in fluid communication with said reservoir,
a first plug removably engaging said fill aperture,
said top surface of said head portion including a plurality of dispenser openings, said dispenser openings being in fluid communication with said funnel-like fluid reservoir, said funnel-like shape providing retention means for said fluid within said reservoir,
a second fill aperture located within said bottom portion of said brush;
a second plug removably engaging said fill aperture, said plug providing further retention means for said fluid when said plug engages said second fill aperture; and wherein said brush is void of mechanical discharge means for discharging said fluid.

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