Aug. 23, 1938. C. M. HICKEY 2,128,183

FOUNTAIN COMB

Filed Nov. 13, 1936 2 Sheets-Sheet 1

FIG. 1

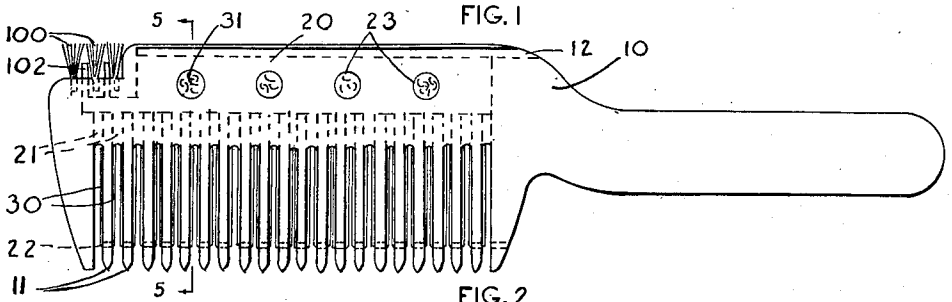


FIG. 2

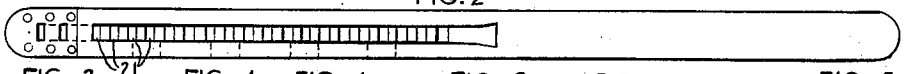


FIG. 3

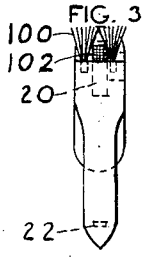


FIG. 4

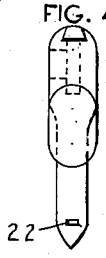


FIG. 6

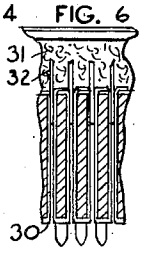


FIG. 8

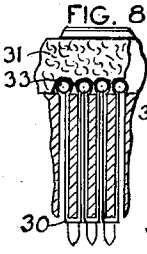


FIG. 7

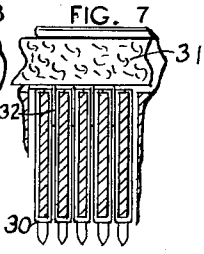


FIG. 5

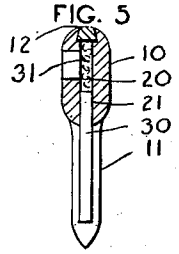


FIG. 9

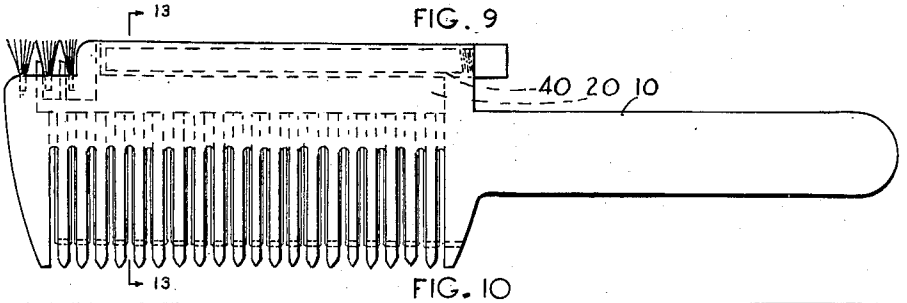


FIG. 10

FIG. 11

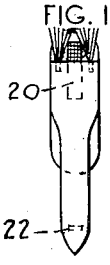


FIG. 12

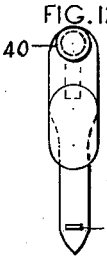


FIG. 16

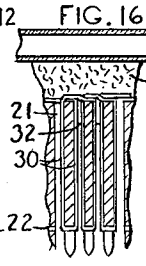


FIG. 17

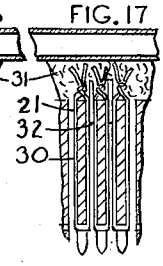


FIG. 18

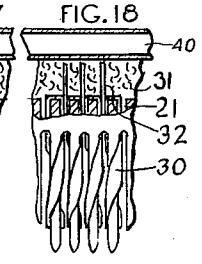


FIG. 13

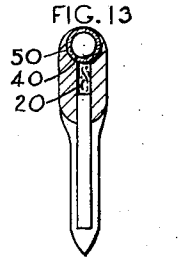


FIG. 14

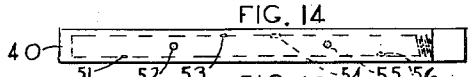


FIG. 15

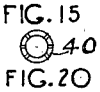


FIG. 19

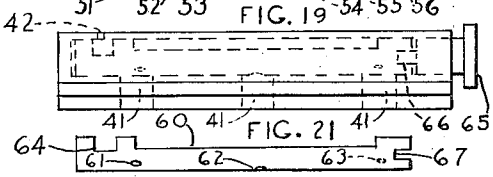


FIG. 20

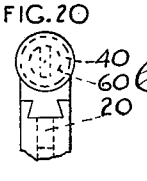
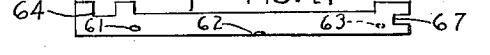


FIG. 21



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FOUNTAIN COMB

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FIG. 22

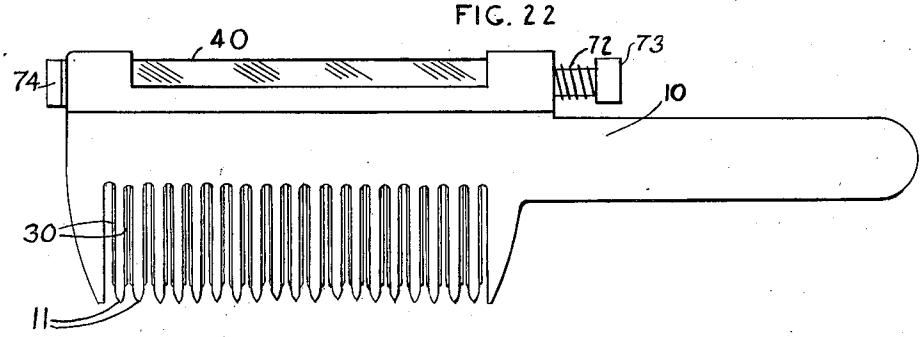


FIG. 23

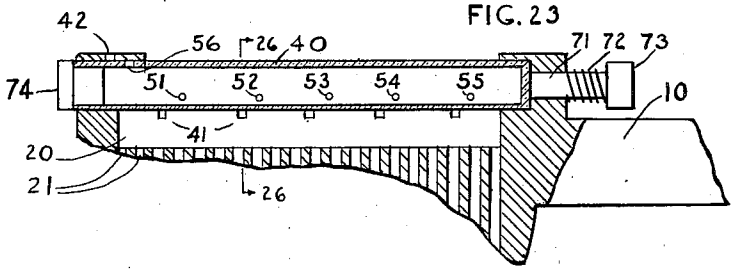


FIG. 26

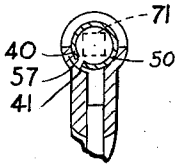


FIG. 24

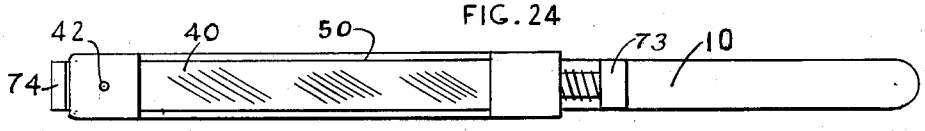
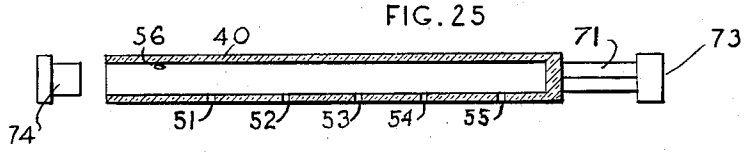


FIG. 25



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Charles M. Hickey

Patented Aug. 23, 1938

2,128,183

UNITED STATES PATENT OFFICE

2,128,183

FOUNTAIN COMB

Charles M. Hickey, New York, N. Y.

Application November 13, 1936, Serial No. 110,608

12 Claims. (Cl. 132—13)

This invention relates to a device for treating the hair and skin, and more particularly to a simple means for applying liquids to the hair either for coloring, bleaching, or straightening, and for therapeutic treatment of the hair and scalp.

An object of this invention is to provide means for accurately and uniformly supplying the desired amount of liquid to the hair and scalp during a treatment.

Another object is to provide a fountain comb having simple reservoir means for receiving, holding, and discharging the liquid as desired.

A further object is the provision of a fountain comb designed to efficiently and easily therapeutically treat the hair and scalp by the operation of combing the hair.

This comb in general in its preferred form comprises a chamber or reservoir for holding a supply of the treating liquid, a distributing chamber containing capillary distributing material such as wicking for uniformly distributing the liquid to the teeth of the comb, and tape of capillary material leading from the distributing chamber down along the juxtapositioned sides to near the points of the teeth of the comb.

The holding chamber or reservoir is preferably cylindrical in shape and made of transparent or translucent material to readily permit observation of the amount of liquid in the holding chamber at any time. The holding chamber is filled from time to time when the supply of liquid requires replenishing and the liquid is drained as needed from this reservoir in small quantities to the capillary media first through that in the distributing chamber and then therefrom to the tapes or wicks on the sides of the teeth of the comb.

A more detailed description of this invention follows and is illustrated in the accompanying drawings.

Fig. 1 is a side view of one arrangement of the improved fountain comb.

Fig. 2 is a top edge view of Fig. 1.

Figs. 3 and 4 are left and right end views of Fig. 1.

Fig. 5 is a transverse cross-section of Fig. 1 along the line 5—5.

Figs. 6, 7, and 8 are longitudinal cross-section views through a portion of the teeth section of Fig. 1, showing in particular different arrangements of associating the capillary wicks with the teeth of the comb.

Fig. 9 is a side view of a modified arrangement of the fountain comb to include a liquid holding chamber.

Fig. 10 is a top edge view of Fig. 9.

Figs. 11 and 12 are left and right end views of Fig. 9.

Fig. 13 is a transverse cross-section of Fig. 9 along the line 13—13.

Fig. 14 is a side view of the liquid holding chamber or reservoir of Fig. 9.

Fig. 15 is a transverse cross-section of Fig. 14.

Figs. 16, 17, and 18 are longitudinal cross-section views through a portion of the teeth section of Fig. 9 showing particularly different arrangements of associating the capillary wicks with the teeth of the comb.

Fig. 19 is a side view of a modified arrangement of the liquid holding chamber or reservoir portion of the comb.

Fig. 20 is a right end view of Fig. 19.

Fig. 21 is a side view of the valve member in Fig. 19.

Fig. 22 is a side view of a further modified arrangement of the fountain comb.

Fig. 23 is a partial longitudinal cross-section of Fig. 22.

Fig. 24 is a top edge view of Fig. 22.

Fig. 25 is a side view of the transparent liquid holding chamber or reservoir of Fig. 22.

Fig. 26 is a transverse cross-section of Fig. 23 along line 26—26 of Fig. 23.

Similar reference characters on the different drawing figures refer to corresponding parts.

Referring first to the form of the invention shown in Figs. 1 to 8 the exterior of this fountain comb is similar to that of an ordinary comb. The body of the comb 10, with its teeth 11, is provided with a liquid distributing chamber 20 from which ducts 21 extend between the teeth to their base. The top of the distributing chamber is closed by the cover 12 which may be held tightly in place by suitable grooves and removed at will. Holes 22 parallel with the longitudinal axis of the comb pass through each tooth near its point. Tape wicks 30 of good wearing material and having strong capillary attraction are threaded through the ducts 21 and the holes 22 in such manner that the wicks are positioned adjacent to the left and right sides of each tooth as shown more in detail in Figs. 6, 7, and 8. A portion of these wicks is within the distributing chamber 20 and in contact with the absorbent filling or packing 31 extending throughout the length of the chamber and in intimate contact with each of the wicks 30. Openings 23 in the side of the distributing chamber are provided for supplying or injecting liquid into the absorbent material 31 to saturate it and thus pro-

vide a supply which is carried by capillary attraction throughout the wicks 30 along the sides of the teeth. A bristle brush section 100 with wicks 102 leading from the distributing chamber 20 to the brush for supplying liquid thereto is provided for applying liquid or medication to difficult places such as around the ears or roots of the hair. The capillary conducting tape wicks 30 extending along the left and right sides of the teeth of the comb are held closely to the sides of the teeth preferably by a lacing arrangement which permits the tape to pass from distributing chamber 20 through a duct 21, a hole 22 in the tooth, and back through an adjoining duct 21 into the distributing chamber where the ends may be fastened by any suitable means such as are shown in Figs. 6, 7, and 8. In Fig. 6 the tape wicks have their upper ends laid over at the top of each tooth and cemented to the floor of the distributing chamber. A plug and wick extension 32 of material having capillary attraction and of suitable size is pressed between the two wicks passing through each duct 21 to close the duct, assist in holding the wicks in place and carry liquid by capillary action to the wicks 30. The space in the distributing chamber 20 above and around the top of the wicks 30 and the plug wick extensions 32 is packed with absorbent material 31 as heretofore mentioned. Fig. 7 shows another arrangement of fixing the ends of the wicks on the floor of the distributing chamber 20 which is a variation of the arrangement in Fig. 6. Fig. 8 shows the wicks 30 laced in a continuous strip through a plurality of successive teeth. The short cylindrical members 33 of resilient material placed at the top of each duct 21 and under the tape as it is threaded from tooth to tooth permits drawing the tape wicks up taut and they also close any opening at the top of the ducts 21.

A second form of the invention is shown in Figs. 9 to 18. This arrangement has the additional feature of a liquid holding chamber or reservoir 40 positioned above the liquid distributing chamber 20. The liquid holding chamber is cylindrical and preferably made of transparent material to give the user a view of the quantity of liquid therein. The top of the comb body above the distributing chamber contains a longitudinal cylindrical cavity or channel 50 in which the cylindrical chamber 40 snugly fits. The top and bottom sectors of the channel 50 subtending approximately sixty degrees, do not fit around the holding chamber. The sector cut away at the top gives a clear view of the holding chamber to permit viewing the quantity of liquid therein, while the sector cut away at the bottom spans the top of the distributing chamber 20 filled with absorbent material and permits draining liquid through a number of port orifices 51 to 56 in the side of the cylindrical holding chamber when it is rotated to position one or more of the orifices over the open top of the distributing chamber 20 and at the same time expose one orifice at the top to act as a vent to the open air. Figs. 11 to 15, especially the last two, show more in detail the arrangement of the cylindrical holding chamber. This chamber 40, fitting in the channel 50 formed by the left and right sides at the top part of the comb, also acts as a movable part of a rotatable valve and thus permits closing the orifices 51 to 56 in the cylinder when it is turned to angularly position the orifices opposite to the side walls of the channel, and permits the opening of the orifices when the cylinder is turned to angularly position the orifices opposite the cut away portions in the side walls of the channel. In order that the liquid may drain from the holding chamber into the distributing chamber to the absorbent material therein an orifice is turned to the cut away sector in the top of the comb to act as a vent whenever an orifice is turned to the cut away portion at the top of the distributing chamber. The orifices in the cylindrical chamber may be spaced in longitudinal alignment in one side of the cylinder for draining the liquid into the distributing chamber and a vent orifice is positioned angularly opposite the draining orifices so that it is exposed to the open air when the liquid is draining. Whether liquid drains into the distributing chamber depends upon the angular position of the orifices. The drainage orifices may be arranged as described above, spaced along an element of the cylinder and all drain liquid simultaneously, or as earlier described they may be helically positioned so that only one drains at a time and by rotating the cylinder one after another opens along the top of the distributing chamber and drains liquid to the absorbent material therein, thus insuring the liquid being injected at different points along the distributing chamber. Figs. 14 and 15 especially show a helical arrangement of the orifices 51 to 56 so arranged that each one may act in turn as a drainage orifice and as a vent orifice. When one orifice is draining liquid another orifice angularly displaced by 180 degrees is acting as a vent. The cylindrical chamber and valve member may be rotated 360 degrees and such rotation causes six drainage and six vent orifices in successive pairs to open, thus distributing liquid from end to end to the distributing chamber. Fig. 15 shows the angular distribution of the orifices and Fig. 14 the longitudinal distribution.

Figs. 16, 17, and 18 are longitudinal cross-sections of portions of the teeth sections of the comb and show further alternative arrangements of positioning the tape wicks around the teeth. Fig. 16 is a modification quite similar to that of Fig. 6. The individual wicks 30 extend down through a duct 21, down one side of a tooth, through opening 22 near the point of the tooth, up the other side of the tooth through another duct 21, and for a short distance into the distributing chamber 20. A short piece of plug wick 32 is pressed between the adjoining wicks in the ducts 21. The extending end of each wick may be laid down on the floor of the distributing chamber. Cement may be sparingly used to assist in holding the wicks in place by using it along the side of the wicks adjacent to the comb frame in such manner as not to impede the capillary flow of the liquid in the wicks. The space in the distributing chamber above the wicks is filled with absorbent material 31. Fig. 17 shows a modification in which each wick 30 is passed around a tooth and then its upper ends are tied together to tightly hold it around the tooth. Plug wicks 32 are passed between the wicks where they pass through the ducts 21. The space in the distributing chamber around the ends of the tied wicks and plug wicks is preferably packed with absorbent material. This arrangement and that of Fig. 8 is particularly adapted for holding the tape wicks in place without the use of cement and thus avoids any impedence of the capillary action which cement might cause. Fig. 18 is a further modification of the arrangement of positioning the tape wicks. Here the wicks pass through a duct 21, wrap around an edge of the

tooth in a half turn, pass through the hole 22 near the end of the tooth, further wrap around another edge of the tooth in a second half turn and then pass through a duct 21 into the distributing chamber where the ends are fixed in place by any suitable means such as the locking action of the plug wicks 32 pressed into the ducts 21 between adjacent wicks. The locking of the tape wicks around and through each tooth especially holds them in place. The ends of the wicks may extend for some distance into the distributing chamber and occupy a large part or even all of the space in this compartment.

In all of the arrangements the spaces between the teeth of the comb and the thickness of the tape wicks is such that there is sufficient space left for the hair of a person to be readily combed and passed between adjacent moistened wicks so that liquid is transferred in minute quantities to the hair contacting the wicks with each stroke of the comb.

Figs. 19 to 21 show a modified arrangement of the liquid holding chamber 40. It may be made of transparent material and designed to be attached to the top of the comb above the distributing chamber 20 by any suitable means such as a dove-tail tongue and groove connection. A plurality of longitudinally spaced narrow fixed ports 41 lead from the circular holding chamber into the distributing chamber 20. A circular valve member 60, shown separately in Fig. 21, has a plurality of port orifices 61, 62, and 63, shown helically positioned, which may be separately rotated into alignment with the fixed ports 41. An air vent valve is provided by the valve member 60 having a port orifice 64 which aligns with the port opening 42 in the top side of the chamber 40 when the valve member is rotated to drain liquid into the distributing chamber through any one of its port orifices and closes when it is not so turned. A combined valve stem and stopper 65 snugly fits into the right end of the cylindrical holding chamber 40. This stopper is removable to permit the filling of the holding chamber 40 with liquid and rotatable to turn the valve member 60 as above explained. Connection between the valve stem and the valve is made by a tongue 66 and a groove 67 which permits the stem or stopper to be removed without moving the valve. The holding chamber member is constructed as a complete unit for attachment to the comb member as heretofore explained.

A third form of the invention is shown in Figs. 22 to 26. This arrangement is a modification of the form exemplified by Fig. 9. The chief difference between the two forms is that the one now to be described has a cylindrical supply chamber which is moved lengthwise to open and close its drainage ports connecting with the distributing chamber while the other arrangement provides for a rotation of the supply chamber. The comb member 10 is provided with a distributing chamber 20 and above it is located a longitudinal circular cavity or channel 50 in which the cylindrical holding chamber 40 is positioned with a close fit, but adapted to be reciprocated lengthwise through a short distance to cause the opening and closing of the drainage ports 51 to 55. These ports are normally closed by being in contact with the circular side of the channel 50. Spaced short circular grooved ports 41 are cut in a side of the channel 50 in such positions that they are normally out of alignment with the port orifices in the holding chamber 40 but may be aligned by moving the holding chamber lengthwise a short distance. A square or otherwise non-rotatable shank or stem 71 extends through the right end of the channel 50 a distance sufficient to carry a compression coil spring 72 and a collar or knob 73 for normally holding the cylinder and for moving it lengthwise to respectively position the drainage orifices 51 to 55 in the chamber in alignment with the ports 41 and in addition align the air vent orifice 56 with the vent port 42. A removable stopper 74 closes the left end of the holding chamber 40 and permits filling it with a liquid. The spring 72 permits the user of the comb to very easily control the moistening of the tape wicks associated with the teeth of the comb.

It is important to prevent flooding of the wicks or capillary media and the resulting waste and spilling of the liquid. Three means for achieving this result are disclosed herein. The first, as exemplified by Fig. 1 in which the supply reservoir is a separate unit associated with the comb only when the wicks require moistening; the second, as exemplified by Fig. 9 or Fig. 22 in which the supply reservoir is normally associated with the comb but has openable and closable valve passages which are generally closed; and the third, as exemplified by Fig. 22, modified to have its orifices properly sized and open and directed to the absorbent media packed in distributing chamber 20 and against the orifices or wiers leading from the liquid supply reservoir. These orifices may be continually open provided their length and diameter is so limited or diminished that the surface tension of the liquid and friction in the orifices balance the hydrostatic pressure of the liquid at the orifices and the capillary attraction of the associated absorbent media. Where large passages or conduits lead from the liquid supply chamber and are continually open the liquid first saturates the absorbent material and then "bleeds" over the exterior of the comb and to any contacting material until the supply of the liquid is exhausted. This invention, by each of the three methods above recited, prevents super-saturation of the absorbent material and the resulting capillary leakage or "bleeding".

Various modifications of the assembled comb and of its parts are shown and it is obvious that different combinations of certain parts or designs may be incorporated in the assembled comb. For example, any of different arrangements of the wick lacing around the teeth of the comb may be employed in any assembly of the complete comb.

The design of this fountain comb is such that it may be formed by suitable dies rather than by a machine cutting process and the positioning of the openings through which the wicks are threaded or laced is such as to facilitate assemblying the comb, thus simplifying and reducing the cost manufacture to a minimum.

Modifications of details may be made to the forms of the invention herein illustrated and described without departing from the spirit of the invention or the scope of the claims.

What I claim is:

1. A device for treating and applying liquids to the hair and scalp comprising a toothed combing member, a plurality of wicks of material having the power of capillary attraction individually associated with respective teeth of said comb, a liquid supply member, and means positioned between said supply member and said wicks for

conducting liquid from said supply chamber to said wicks.

2. In combination a hair comb, a plurality of wicks for applying liquid to the teeth of said comb, a wick element common to said plurality of wicks, a liquid supply chamber arranged to transmit liquid to said common wick element, and valvular means for controlling, at the will of the user of the comb, the transmission of liquid from said supply chamber to said wick members.

3. In a comb for applying liquid to the hair, a capillary wick laced around a portion of the juxtapositioned sides of a plurality of the teeth of said comb, and means for holding each of said wicks laced around its associated tooth under tension.

4. In a comb for applying liquid to the hair, a capillary wick helically positioned around the exterior of each of a plurality of the teeth of said comb, and means for holding each of said wicks taut in its position on a tooth of the comb.

5. In combination a comb, a plurality of capillary tooth wicks mutually exclusively associated with respective teeth of said comb, a distributing wick common to said tooth wicks, a liquid holding reservoir associated with said distributing wick, and means for volitionally supplying liquid from said reservoir to said distributing wick.

6. A fountain hair comb for applying medicating, coloring, or bleaching liquids to the hair by the process of combing, comprising a liquid reservoir, a plurality of capillary conducting members individually associated with respective teeth of said comb, and volitionally controlled valvular means leading from the said reservoir to said capillary conducting members for governing the quantity of liquid reaching said capillary conducting members.

7. A fountain hair comb for applying liquids to the hair comprising a liquid holding reservoir, a liquid distributing chamber associated with a plurality of the teeth of said comb and individual wicks leading from said chamber to respective teeth of said comb.

8. In combination a comb and a brush for applying liquid to the hair and scalp comprising a liquid reservoir, individual capillary wick elements leading to respective teeth of the comb and to the bristles of the brush, and valvular means for controlling, at the will of the user, the transmission of liquid from said reservoir to said wick elements.

9. A comb for applying liquid to the hair comprising a liquid supply reservoir of transparent material, capillary material extending along one side of said reservoir, individual capillary conducting strips extending along side of respective teeth of the comb and connecting with said capillary material, and openable and closeable ports leading from said reservoir to said capillary material.

10. A comb for applying liquid to the hair comprising teeth having a hole through each tooth near its point, a hole between each tooth extending through the portion of the back of the comb supporting the teeth, wick material having the power of capillary attraction laced through said holes and along the sides of the teeth of the comb, means for holding the wick material in place and volitionally controllable means for applying from time to time limited amounts of liquid to said wick material.

11. In a fountain comb a liquid supply reservoir, capillary transmitting media along and individual to the respective teeth of said comb, and valvular control means arranged for being opened and closed for causing and for restraining respectively the flow of liquid from said reservoir to said media as the user of the comb may desire.

12. A device comprising a liquid reservoir, capillary media supplied with liquid drained from said reservoir, means for limiting the supply of liquid passed to said media to its absorbent capacity and avoiding flooding thereof which consists of employing orifices leading from said reservoir of such limited diameter that the surface tension of the said liquid across the orifices balances the hydrostatic pressure of the liquid at the orifices and the capillary attraction of the media when it is substantially saturated.

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