

[54] **HAIR STEAMER**

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[56]

References Cited

UNITED STATES PATENTS

2,291,423 7/1942 Tiscornia 239/138
2,561,443 7/1951 March..... 219/273 X

2,897,554 8/1959 Myrick..... 239/138 X
1,999,265 4/1935 Tiscornia 239/138
2,244,180 6/1941 Williams et al. 219/273

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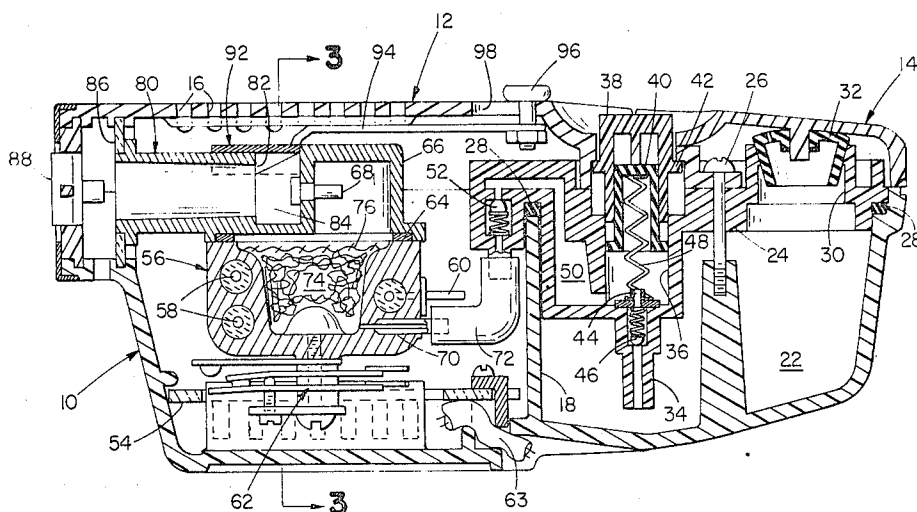
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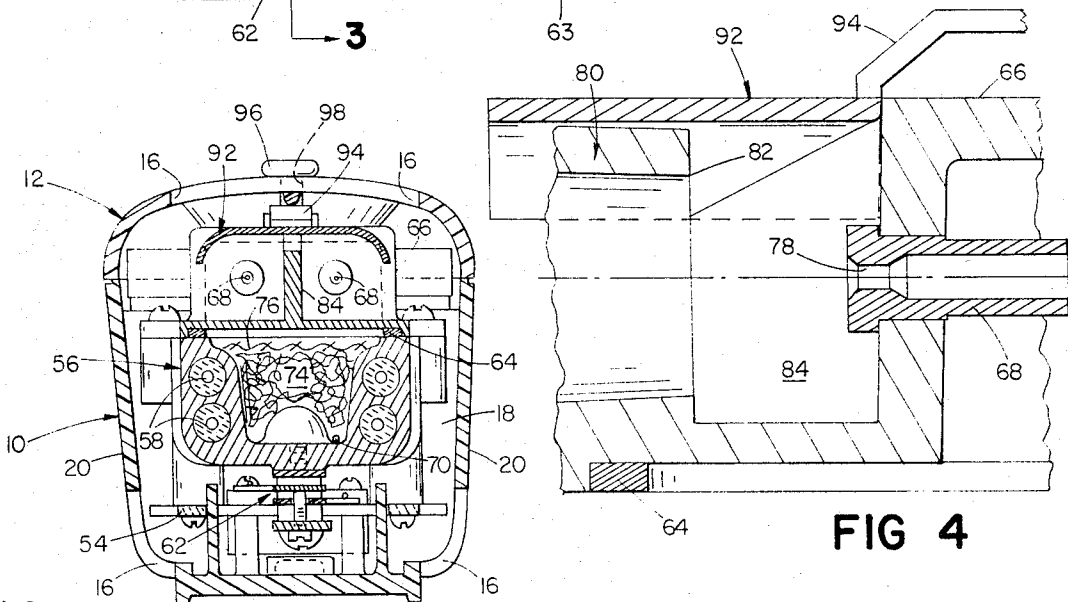
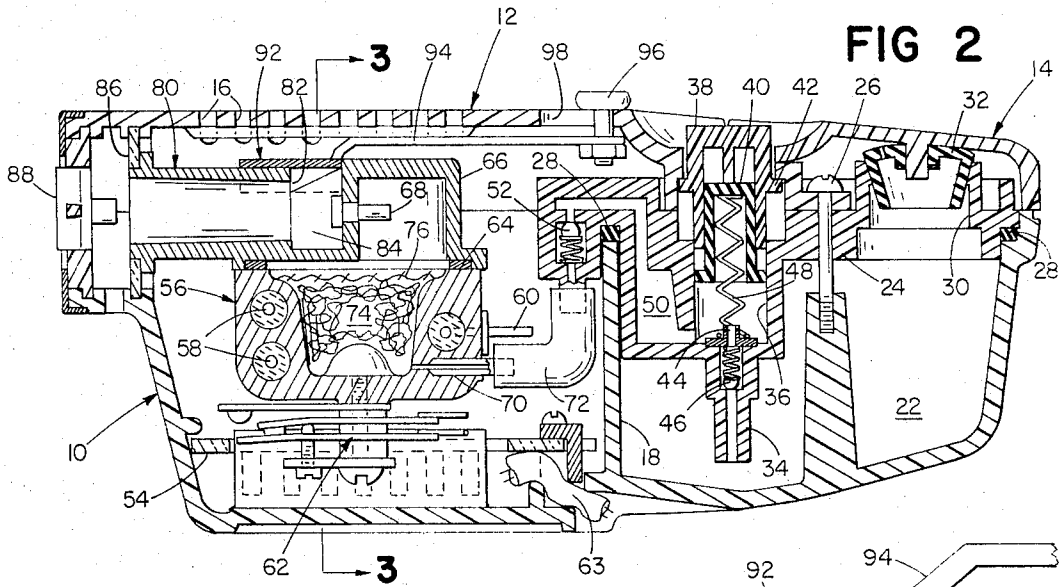
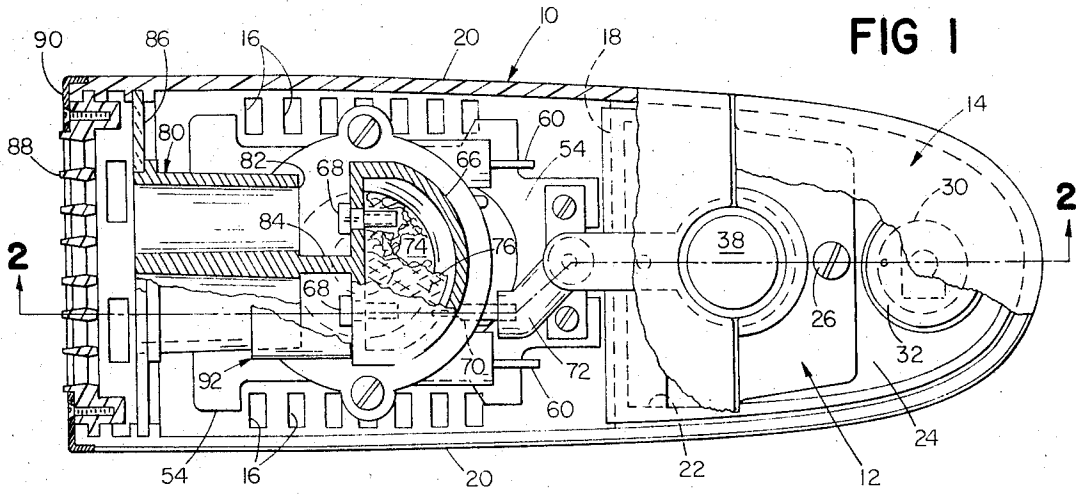
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ABSTRACT

A hair steamer comprising a steam generating chamber having at least one restricted nozzle for delivering a jet of steam, a heater for preheating and maintaining the chamber at a temperature above the boiling point of water, a tank for holding a supply of water separate from the chamber, manually actuatable supply means for introducing a limited quantity of water into the chamber from the supply tank, and air inlet means mounted adjacent the outlet of the nozzle for introducing a controlled quantity of air into the steam jet. A choke is provided for adjusting the ratio of air to steam.

5 Claims, 4 Drawing Figures





HAIR STEAMER

This invention relates to a portable hand-held steamer for applying adjustable quantities of steam and air to the hair, skin, textile fabrics or other desired articles.

Hair steamers previously known such as the hair steamer of Omohundro U.S. Pat. No. 3,546,428 generally require that a large mass of water be heated to the boiling point, much more than may be required for the amount of steam needed for application to a single tress of hair, with the attendant disadvantages that a relatively long time is required after actuating the heater before steam is available for use, and that the supply of steam terminates gradually as the water supply continues to simmer after the heating is discontinued rather than being terminated immediately. While a liquid spray device such as that shown in Tiscornia U.S. Pat. No. 2,291,423 is so constructed that only a small portion of water is heated at a time, there is no provision for eliminating the liquid supply and no provision for injecting cooling air.

The present invention provides a novel steamer comprising a steam generating chamber having at least one restricted nozzle for delivering a jet of steam and a heater for preheating and maintaining the chamber at a temperature above the boiling point of water, a protective housing for shielding the steamer to prevent burning or scalding of the skin, a tank for holding a supply of water separate from the chamber, manually actuable supply means for introducing a limited quantity of water into the chamber from the supply tank, and air inlet means mounted adjacent the outlet of the nozzle for introducing air into the steam jet. The air introduced by the inlet means is drawn from the surrounding atmosphere which is normally at room temperature and after mixing with the steam on a controlled basis serves to cool the steam jet to eliminate the danger of scalding or burning the scalp or skin of the person on whom the device is being used. In addition, a manually adjustable choke is provided in the preferred embodiment to make it possible to vary the relative proportions of air and steam in the output jet so as to control the temperature.

The steamer may be used on hair which is unstrained or which is maintained in position by any desired combs, rollers or clips to impart a curl or wave to the hair. It has particular value for use as a hair or skin steamer because of its safety and the control of the steam jet temperature which it makes possible, even though it is also useful for steaming textile fabrics such as clothing.

The steamer is lightweight in construction and readily portable. It provides complete control of temperature, velocity and moisture content of the jet impinging upon the hair and can safely be used while held in any position or attitude without risk of spillage of hot water or of scalding. Because only a small portion of the total water supply is heated at any one time, the device is ready to use in a very short time, of the order of a minute, after connection with an electric power supply. Proper selection of the size of the steam chamber orifice provides for a jet having a velocity effective to penetrate deeply into the hair without sacrifice of the safety features. In the drawing,

FIG. 1 is a plan view partly broken away and in section of a hair steamer according to the invention;

FIG. 2 is a view in vertical section taken along line 2—2 of FIG. 1;

FIG. 3 is a cross-sectional view taken along line 3—3 of FIG. 2; and

FIG. 4 is a view of a portion of FIG. 2 on a greatly enlarged scale showing the air injector means.

As shown in the drawings, this embodiment of the invention comprises a three-part molded plastic protective housing including a bottom section 10, a top section 12 and a removable cover 14 for the upper rear portion. Ventilating slots or louvers 16 are provided in both the bottom and top sections to permit air to be freely drawn into the interior of the housing and to circulate therethrough. Bottom section 10 is provided with a transverse bulkhead 18 secured to sidewalls 20, 20 to form in the lower rear portion of the bottom section a water storage tank 22. The rear portion of top section 12, which underlies cover 14, bears upon a molded plastic element 24 which serves both as a pump housing and as a closure for tank 22, being secured in place beneath the rear portion of top section 12 by means of screw 26 and being sealed to bottom section 10 by means of gasket 28. Element 24 includes a filler opening 30 which is sealed by means of an elastic stopper or closure 32 fixed to the inner bottom portion of cover 14. Cover 14 is removably held in place by conventional detents (not shown).

The pump housing which forms a part of element 24 includes an intake tube 34 extending to a position adjacent the bottom of tank 22 and communicating with pump cylinder 36. Mounted in cylinder 36 and extending upwardly through mating openings in top section 12 and cover 14 is a piston 38 provided with an elastic sealing member 40. Piston 38 is provided with an outwardly extending annular flange 42 which engages under the margin of the opening in top section 12 and serves as a stop to retain and limit the stroke of the piston within the cylinder 36 when the device is assembled. It has been found advantageous to use a silicone grease to lubricate piston flange 42. Element 44 fixed to the bottom of cylinder 36 at the inner end of intake tube 34 serves as a retainer for spring-loaded check valve 46 and as a seat for compression spring 48 which maintains piston 38 in elevated position, as shown in FIG. 2. Also communicating with cylinder 36 is delivery passage 50 provided with a second spring-loaded check valve 52. Upon finger actuation of piston 38, water is drawn from tank 22 into cylinder 36 and forced out through delivery passage 50 past check valve 52.

Mounted in the forward portion of bottom section 10 on a suitable heat insulating base member 54 is a metallic steam generating chamber 56 in the wall of which is embedded a spirally wound electrical resistance heater 58 provided with suitable terminals 60, 60 which are connected through suitable wiring (not shown) with a thermostatic switch 62 mounted in the bottom of chamber 56, a thermal link (not shown) mounted close to the boiler, and thence through a conventional conductor 63 to a suitable source of electric power. Mounted on a top of steam generating chamber 56 and sealed thereto by gasket 64 is a steam manifold chamber 66 provided with dual outlet jet passages 68, 68. A water inlet passage 70 is provided near the bottom of chamber 56 and connected by means of flexible tubing 72 to the outlet end of pump delivery passage 50. When piston 38 is actuated, a measured quantity of water is

delivered into the bottom of chamber 56 where it is immediately vaporized. Chamber 56 is filled with a mass of stainless steel wool or woven mesh 74 and separated from manifold 66 by a stainless steel wire screen 76. Screen 76 and wool 74 serve to prevent entrainment of water droplets by the steam as it is generated, thus ensuring that only water in vapor form will be delivered through jet passages 68. Similarly, the entrances to jet passages 68 are spaced inwardly from the wall of manifold 66 to prevent any small droplets of water which might condense on the surface of the wall from entering the jet passages. The jet orifices or nozzles 78, 78 located at the forward or outlet end of jet passages 68 are of relatively small diameter, preferably of the order of 0.030-0.037 inch, although diameters of 0.020-0.150 inch have been found to be useful. By providing two jet outlets rather than one, the risk that the device will be rendered completely inoperative by plugging of the jet orifice is greatly reduced. Extending forwardly from manifold 66 is the air inlet means including a pair of relatively large diameter imperforate metallic tubes 80, 80, each having its axes aligned with jet outlet passages 68, 68, and each having its inlet end 82 spaced from its corresponding jet orifice 78 by a gap which is open to the atmosphere to permit free access of air to the inlet end of the tube. A centrally located rib 84 provides support for the tubes.

The forward end of each tube 80 is positioned and supported by a bulkhead 86 of heat resistant material which in turn is supported and positioned by mating grooves in top section 10 and bottom section 12 of the housing. An open lattice work grill 88 is mounted in the forward end of the housing and has secured to its margin a bezel 90 which engages the outer margins of top section 10 and lower section 12 and serves to hold them together.

A manually actuatable choke 92 is slidably mounted inside top section 12 lying tubes 80 for movement along their length. In the rearmost position, as best seen in FIG. 2, choke 92 covers the top and upper side portions of the gap between inlet ends 82 of the tubes and the jet orifices 78; in its forward position, the gap is completely open. Linkage arm 94 connects choke 92 to control knob 96 which extends through slot 98 in top section 12 and is manually adjustable to any desired position along the length of the slot.

As will be seen from the foregoing, all of the heated parts of the steamer are enclosed within the plastic protective housing 10 which shields them from any possible accidental contact with the skin or any other surface which might be damaged by the heat.

In operation of the device, the thermostatic switch is set to maintain the temperature of steam generating chamber 56 at approximately 20°-60°C. above the boiling point of water. The choke 92 is adjusted to the desired position to provide the desired air-steam ratio, and the device is held with the grid 88 directed toward the hair to be steamed. Piston 38 is actuated with a fin-

ger to deliver the desired amount of water into steam chamber 56 where it is immediately vaporized, and the resultant steam passes out through each jet orifice 78 into the inlet end 82 of the corresponding tube 80. A heater having a rated capacity of 550 W. is adequate for vaporizing 8 to 12 grams of water per minute; heaters providing greater or lesser heat outputs may be used if desired, up to about 1,800 W. During passage of each steam jet from orifice 78, it carries with it a substantial amount of air as it enters inlet end 82 of the tube. The air being at normal room temperature serves to cool the steam so that the vapor emerging through grill 88 is not hot enough to cause injury to the skin or scalp. When the steamer is operated at a ratio of air to steam which is approximately 50 to 1 by volume, the orifice 78 having a diameter of 0.035 inch, the temperature measured 1 inch beyond grill 88 is 57°C. when tube 80 has an inside diameter of approximately 0.47 inch and a length of approximately 1.22 inch and when the length of the air gap between each orifice 78 and the inlet end 82 of the corresponding tube 82 is approximately 0.31 inch with choke 92 in the fully open position.

What is claimed is:

1. A portable hand-held steamer for applying adjustable quantities of steam and air to an article comprising a protective housing enclosing a steam generating chamber, said chamber having at least one restricted nozzle for delivering a jet of steam, a heater within said housing for preheating and maintaining said chamber at a temperature above the boiling point of water, a tank for holding a supply of water separate from said chamber, manually actuatable supply means for introducing a limited quantity of water into said chamber from said supply tank, and air inlet means mounted adjacent to and outside of the outlet end of said nozzle for introducing air into said steam jet, said air inlet means comprising an open ended tube having a diameter substantially greater than that of said nozzle, said tube having its axis aligned with said nozzle to receive said jet and having its end adjacent said nozzle spaced therefrom to form an air gap to permit air to be drawn into said tube by said jet of steam.

2. A steamer as claimed in claim 1 in which said heater comprises a thermostatically controlled electrical resistance heater.

3. A steamer as claimed in claim 2 in which said supply means comprises a positive displacement pump.

4. A steamer as claimed in claim 1 including a manually actuatable choke for varying the size of said air gap.

5. A hair steamer as claimed in claim 4 including a manually actuatable choke mounted for adjustable movement to and from a first position overlying said tube in which position the air gap is substantially unobstructed and a second position adjacent said nozzle in which position said air gap is restricted.

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