June 15, 1971 H. H. BARKER 3,584,390

HAIR DRYER

Filed Aug. 1, 1968 2 Sheets-Sheet 1

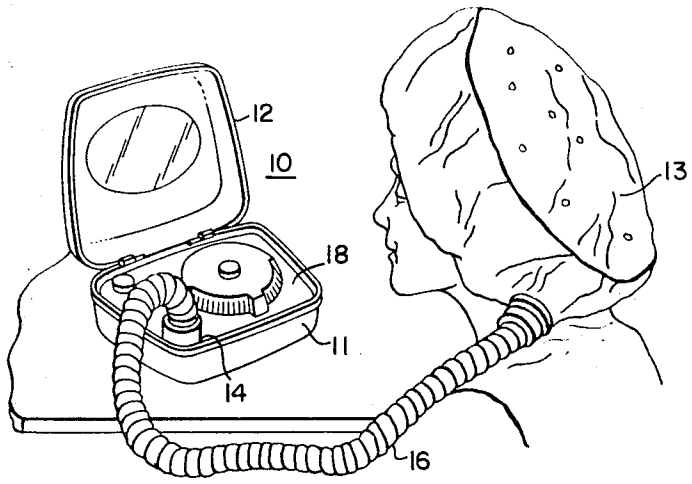


FIG. 1.

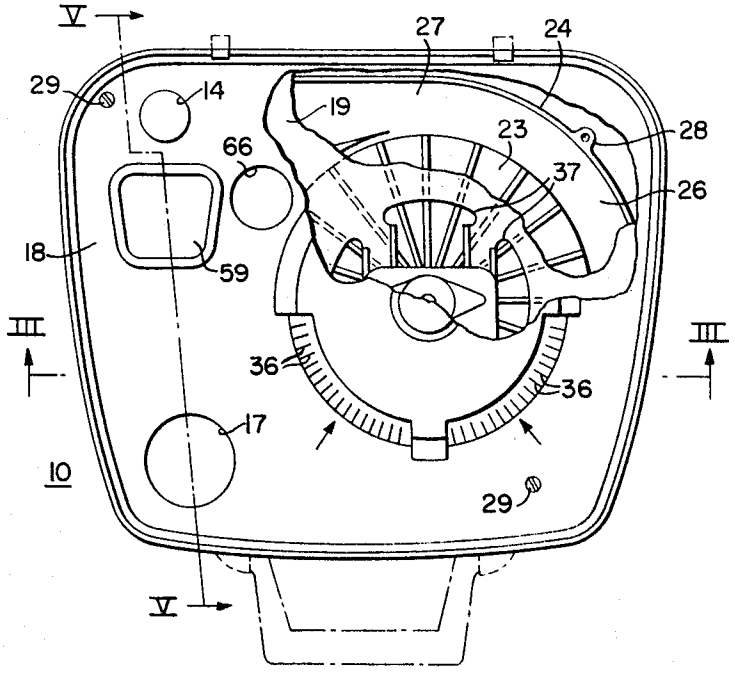


FIG. 2.

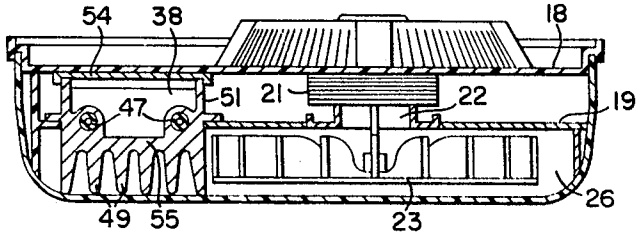


FIG. 3.

WITNESSES

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HAIR DRYER

Filed Aug. 1, 1968 2 Sheets-Sheet 2

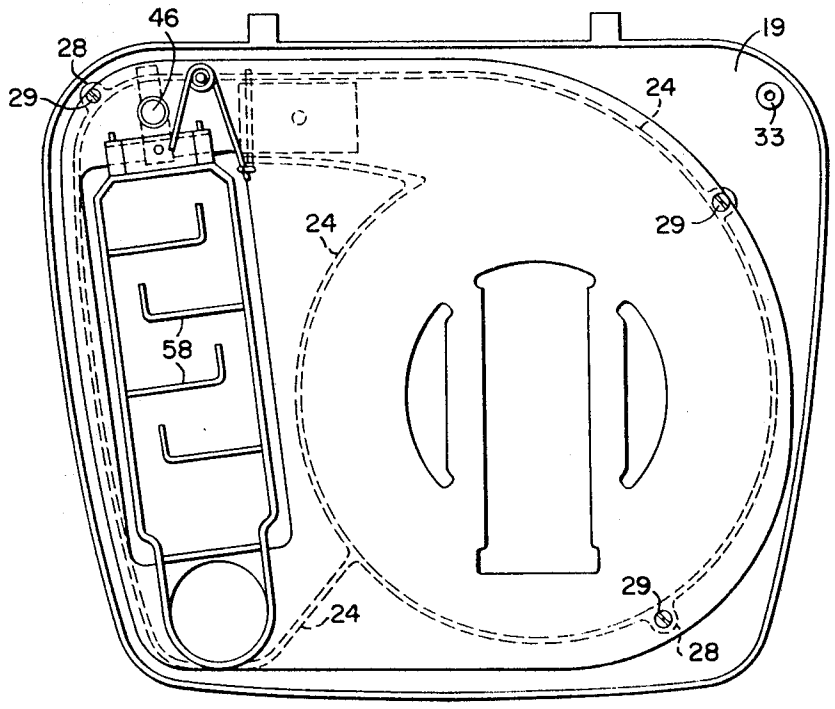


FIG. 4.

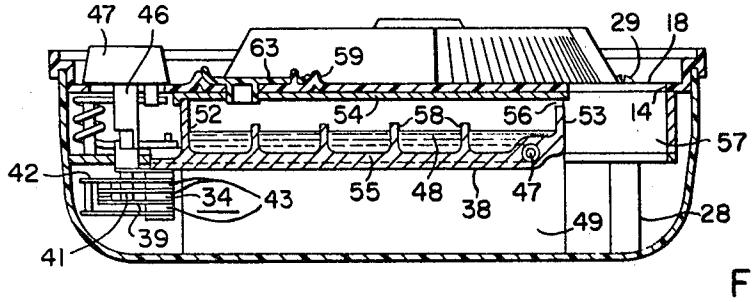


FIG. 5.

United States Patent Office 3,584,390
Patented June 15, 1971

3,584,390

HAIR DRYER

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Filed Aug. 1, 1968, Ser. No. 749,486
Int. Cl. A45d 20/18
U.S. Cl. 34—99 3 Claims

ABSTRACT OF THE DISCLOSURE

A portable, soft-bonnet hair dryer provided with a combination boiler and heater which serves to simultaneously convert water to steam and to heat forced air which is subsequently united with the steam for delivery to the bonnet. The hair dryer constitutes a self-contained unit, in that, the boiler unit, unlike prior art constructions, is disposed in the same housing with the fan and heater.

BACKGROUND OF THE INVENTION

This invention relates, in general, to portable hair dryers and, more particularly, to soft-bonnet hair dryers of the portable type.

The effect of moisture on women's hair as an aid in the conditioning thereof is well known. For a long time, a common practice in setting the hair has been to apply water followed by rolling of the hair on curlers. Alternately, the hair has been rolled with curlers, while in a dry condition, and subsequently treated by applying wet towels.

Such practices paved the way for the application of moisture in conjunction with salon type hair dryers. Such constructions rely on the steam rising from the steam generator to the hood, the steam generator being remote from the hood. Because salon type hair dryers are constructed from rigid materials, the steam rises quite satisfactorily, but the same is not true with respect to hair dryers utilizing a soft or collapsible bonnet. This is attributable, at least in part, to the presence of restrictions inherent in a flexible construction. For example, the collapsible bonnet comprises sheets of plastic material bonded together in a manner to provide air ducts therebetween. In the collapsed state, the sheets of material impede the flow of steam.

Accordingly, it is the primary object of this invention to provide a new and improved soft-bonnet hair dryer.

It is a more particular object of this invention to provide a new and improved soft-bonnet hair dryer which is capable of applying steam to the hair.

Another object of this invention is to provide, in a soft-bonnet hair dryer, mechanism for simultaneously generating steam and heating fan-forced air which heated air and steam are subsequently combined before application to the hair.

SUMMARY

Briefly, the present invention accomplishes the above-cited objects by the provision, in a portable hair dryer of the soft-bonnet type, of a combination water boiler and air heater which converts the water to steam while simultaneously heating fan forced air. The heated air is combined with the steam and is then conveyed to the bonnet.

The combination boiler and heater comprises an aluminum casting having a sheathed heater embedded therein, intermediate a water reservoir portion and a plurality of heat dissipating fins, across which the air is directed. The reservoir portion is provided with a cover having an aperture therein for the introduction of water. Adjacent ends of the reservoir and of the cover cooperate to form a slot therebetween for egress of steam. The forced air

travels along and between the fins below the embedded heater and at the end of the fins adjacent the slot, picks up the steam. The steam-laden air is then directed, by means of a flexible conduit, to a collapsible bonnet comprising two sheets of material bonded together to form air ducts for directing the air to outlet holes provided in the innermost sheet of material.

Further objects and advantages of the present invention will become more apparent when considered in view of the drawings and detailed description of the preferred embodiment forming a part hereof.

DESCRIPTION OF THE DRAWING

FIG. 1 is a perspective view of a hair dryer representing the invention;

FIG. 2 is a top plan view, partly broken away, of a hair dryer casing structure forming a part of the apparatus illustrated in FIG. 1;

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

FIG. 4 is a top plan view of the hair dryer casing structure shown in FIG. 2 but with a top cover removed to reveal a combination heater and boiler structure forming a part of the apparatus shown in FIG. 1; and

FIG. 5 is a cross-sectional view taken along the line V—V of FIG. 2.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings, especially FIG. 1, reference character **10** designates generally a hair dryer apparatus comprising a casing structure **11** having a hinged top **12** shown in the open position. A conventional hood or collapsible bonnet **13**, adapted to cover the hair of the user, is connected to air outlet means **14** by a flexible hose or conduit **16**. The outlet means **14** is in the form of an opening in a cover **18**, provided for the casing structure **11**.

As shown in FIGS. 2 and 3, a support plate **19** is provided in the casing structure **11**. The plate **19** supports a motor **21** on its top wall while the motor shaft extends through an opening **22** and has staked to the end thereof an impeller **23**.

An upstanding wall **24** (FIGS. 2 and 4) integral with the casing structure **11** has a substantially scroll-shaped configuration as viewed in FIG. 2. The wall **24** cooperates with the plate **19** to form an impeller chamber **26** and an air duct **27** communicating therewith. Formed integrally with the wall **24** are a plurality of screw receiving support posts **28** to which the plate **19** is secured by a plurality of screws **29** and a pair of depending sleeves **31** carried by the underside of the cover **18** (see FIG. 5). A plurality of screws **32** extend through the depending sleeves **31** and are received in the posts **28** and posts **33**.

Energization of the motor **21** by means of a stacked switch structure **34**, causes the impeller **23** to draw air, in the direction of the arrows, through a plurality of openings **36** provided in the cover **18**. The air continues through a plurality of openings **37** in the plate **19**, through the impeller **23** and chamber **26**, to the outlet **17** via the air warming portion of a combination boiler and heater structure **38**. The structure **38** is secured to the plate **19** by screws **29** and is partially disposed in the air duct **27**.

The stacked switch structure **34** is of a well known type comprising a plurality of contact carrying arms **39**, **41** and **42** spaced, one from the other by insulating washers **43**. A conventional bimetal control member **44** having a pin member carried by the free end thereof, engages the arm **42** to effect opening and closing of the contacts carried by the arms **39**, **41** and **42**. To adjust the temperature at which contact making and breaking occurs, a conventional rotatable shaft member **46** is provided which

shaft is actuatable by a control knob **47**. The contact arm **39** is operatively connected to a resistance heater **47**, to be discussed hereinafter, while the contact arms **41** and **42** are operatively connected to a common lead in the motor **21** in that order. The leads and their connections are conventional and therefore have been omitted for sake of clarity.

The switch structure **34** is secured to the combination boiler and heater structure **38** which structure comprises a cast construction, preferably of aluminum material. The switch structure **34** is so calibrated as to limit the maximum temperature of the casting to 250° F. The resistance heater **47** is embedded in the casting intermediate a boiler section **48** and an air heating section comprising a plurality of heat dissipating fins **49**. The fins **49** serve to channel the air through the duct **27** to the outlet **17**. The heater capacity is preferably 300 watts and the casting is so constructed as to transfer sufficient heat to the air in order to raise the temperature thereof to a maximum of 120° F.

The boiler section **48** comprises a plurality of upstanding walls **51**, **52** and **53**, a cover member **54** and a bottom wall **55** delineating a chamber or cavity wherein water is converted to steam. The steam, thus generated, discharges through a clearance opening **56** between the cover member **54** in the upstanding wall **53**, and is picked up by the heated air in an area indicated at **57**. The bottom wall **55** is provided with a plurality of L-shaped water traps **58** which allow water to be equally distributed over the surface of the bottom wall **55** when the casing structure is in a level position. If the casing structure **11** is tipped the water is prevented from leaving the boiler section, by the L-shaped water traps **58**. The cover **18** is provided with a recessed area **59** having an opening **61** therein which communicates with an opening **62** in the cover member **54**. The opening **61** is adapted to be selectively opened by means of a plug or stopper **63** and is utilized for introduction of water into the boiler section from a measuring bottle **64** stored in a recess **66** in the cover **18**.

Since numerous changes may be made in the above-described apparatus and different embodiments of the invention may be made without departing from the spirit thereof, it is intended that all matter contained in the foregoing description or shown in the accompanying drawings, shall be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. Hair dryer structure comprising:
- a collapsible bonnet;
- casing structure;
- means in said casing structure for effecting flow of air;
- means in said casing structure for heating the flowing air;
- means in said casing structure for converting water to steam;
- both said means for heating air and means for converting water having a common wall with the heater embedded therein and constitute a cast structure having a water reservoir portion on one side of said wall and a finned heat dissipating portion on the opposing side of said wall;
- said casing structure including a cover member having a water fill opening disposed in a recess in said cover member;
- said fill opening communicating with said reservoir portion;
- said reservoir portion comprises a plurality of upstanding walls cooperating with said cover member to form a cavity;
- one of said upstanding walls and said cover delineating a steam egress communicating with an area wherein the steam is mixed with the heated air.

2. Hair dryer structure comprising:
- a collapsible bonnet;
- casing structure;
- means in said casing structure for forcing the flow of air;
- means defining a generally enclosed steam generating chamber including reservoir means for holding water and orifice means above said reservoir for permitting the egress of steam from said chamber;
- means defining an air duct for directing said forced air through a portion of said casings wherein, said means defining said chamber and said means defining said duct include a common wall comprising a casting having upwardly extending peripheral walls generally defining said reservoir means on one side of said wall and fin means for dissipating heat into said air duct depending from the opposite side of said wall;
- means for heating said common wall sufficiently to convert said water in said reservoir to steam and to heat said air passing through said duct; and
- means providing a flow path for said forced air from said duct to said bonnet, and wherein said steam is emitted from said chamber through said orifice into said flow path to be mixed with said air.

3. The structure according to claim **2** wherein said means for heating said common wall comprises a sheathed heating element embedded in said casting.

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U.S. Cl. X.R.

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