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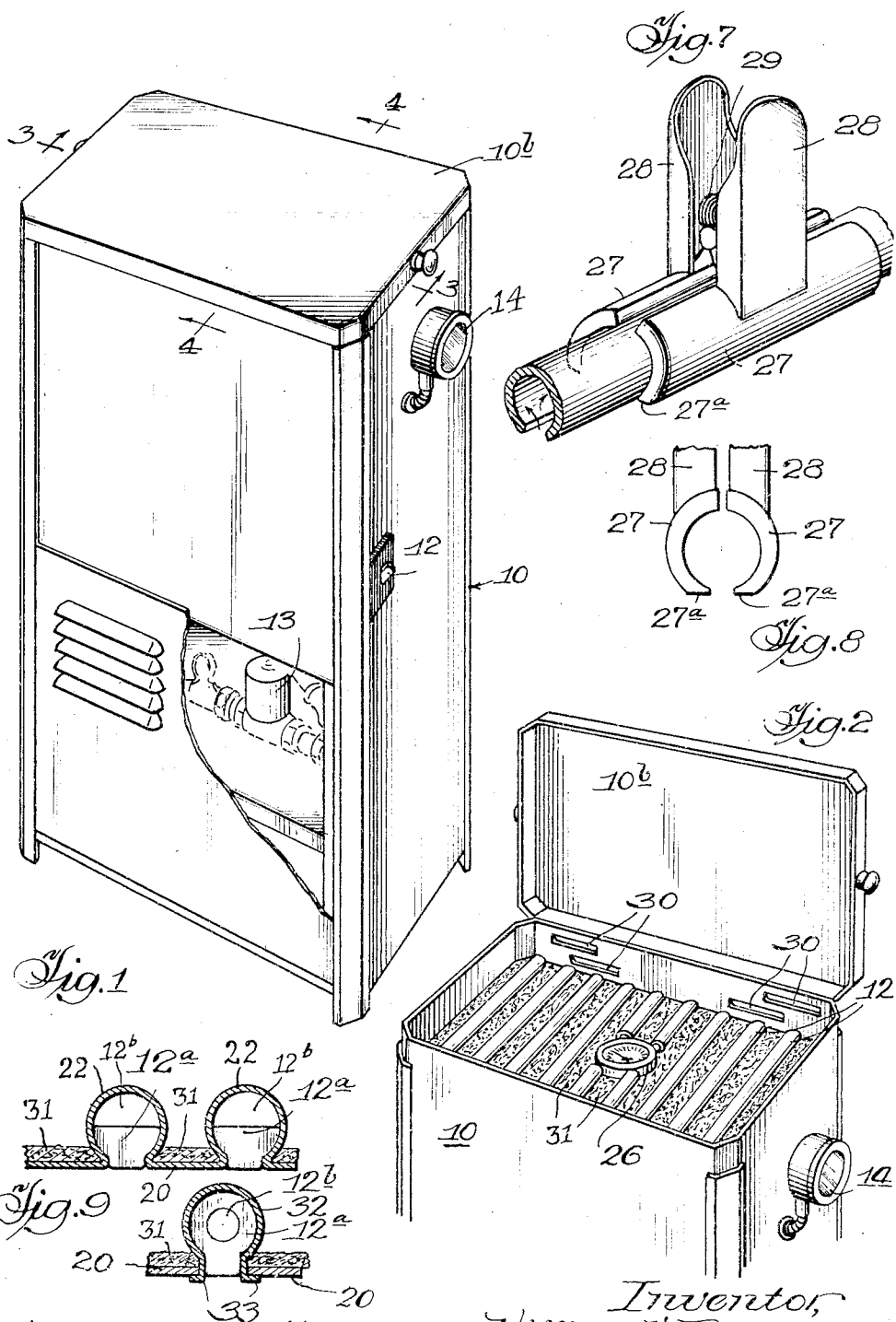
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HAIR WAVING APPARATUS

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2 Sheets-Sheet 1



Witness:
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Fig 10

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HAIR WAVING APPARATUS

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9 Claims. (Cl. 126—229)

This invention relates to improvements in hair waving apparatus.

Electric hair waving machines of a conventional type comprise a plurality of clips which contain electric heating elements which are clipped or clamped exteriorly to hair wound around rolls. These electrically heated clips are placed upon the rolled up hair and the current then turned on to supply the heat necessary to set the hair. While thermostatically operated means for interrupting the supply of current to the clip have been used, the clips are not of a size which makes feasible the provision of accurate means for indicating their individual temperatures, and consequently the operator has no means of knowing whether any particular clip or clips are functioning at the temperature best suited for the character or condition of the hair being curled. For example, more or less hair upon a roll or the use of more or less curling fluid may have an effect upon the temperature to which a particular curler clip or clips will rise within a given time which results in lack of uniformity of the permanence of the "set" or curl, and not infrequently in scorching the hair by excessive temperature generated by some of the clips.

To overcome some of the recognized disadvantages of machines employing clips provided with individual electric heating elements, the so called "machineless" or pre-heated method has been developed in which the clips are placed upon heating rods or tubes containing electric heating elements and when the clips have been heated to the desired temperature they are placed upon the previously prepared coils of hair. Since the temperature of the rod-like heating members can be indicated by suitable means, the operator knows that clips heated thereon are not in excess of such indicated temperature and hence there is less likelihood that the hair will be scorched by this method.

Another advantage of the machineless method described resides in the fact that the patron need not remain practically immobile during the curling operation as is the case where electric clips are used.

The present invention has for its object the provision of improved means for heating clips to a desired and indicated temperature by the use of gas or oil, for example, as fuel, or by electricity, if desired.

Another object of the invention is to provide heating means comprising a plurality of heating tubes for hair waver clips which, while supplied with heat from a common source, can be heated

substantially uniformly to an indicated temperature.

A further object of the invention is to provide heating apparatus comprising clip heating tubes wherein the heat generated by an electric heating unit or the hot gases generated by the combustion of fuel, such as gas or oil, pass into and flow along the tubes, thus insuring uniformity of temperature throughout the length of the tubes but providing a large heat absorption surface for effecting economies in current or fuel consumption.

Other objects of the invention relate to various features of construction and arrangement of parts which will be apparent from a consideration of the following specification and accompanying drawings, wherein:

Figure 1 is a perspective view of a heater embodying the present improvements designed for the use of gas as fuel.

Figure 2 is a broken perspective view showing the cover of the heater casing in open position.

Figure 3 is a partial sectional view taken on line 3—3 of Figure 1.

Figure 4 is a sectional view taken on line 4—4 of Figure 1.

Figure 5 is a top plan view of the heater with the cover removed.

Figure 6 is a sectional view taken on line 6—6 of Figure 3.

Figure 7 is a broken detached view of one of the clip heating tubes with a clip shown in position thereon.

Figure 8 is a broken end view of the improved clip.

Figure 9 is a broken end elevation of a modified heat conducting partition having clip-heating tubes integral therewith.

Figure 10 is an enlarged vertical sectional view of a clip heater tube illustrating a baffle or retarding member in the end thereof.

In the drawings, 10 is a casing preferably formed of sheet metal having therein a suitable source of heat such as gas burners 11. It will be understood that heat may be supplied by a suitable type oil burner, if desired, or by an electric heating unit.

In the lower portion of the casing 10 are located various control elements for regulating the supply of gas to the burner or burners 11, preferably of the Bunsen type. This mechanism is not per se a part of the present invention, but the arrangement is such that by means of an electric switch having a button 12 on the exterior of the casing, the solenoid valve 13 may be opened

for supplying gas to the burners under the control of a conventional control 14 which comprises a thermostat 15 shown in Figure 3. By moving the switch button 12 to the off position, the gas supply to the burner can be shut off leaving only a pilot burner 16 in operation.

Positioned above the burner 11 is a transverse partition 17 provided with perforations 18 so spaced and distributed as to prevent localization of the heat in any one portion of the chamber 19 in which the thermostat 15 is located. While only one partition 17 is illustrated, two or more of the same, arranged in vertically spaced relation, may be employed if desired.

The upper limit of the chamber 19 is defined by a second transverse partition 20 which is provided with a plurality of exhaust passages 21 which may be in the form of slots or, as illustrated in Figure 5, in the form of rows of perforations. The partition 20 preferably is made of sheet copper or other material having satisfactory heat conducting characteristics. Secured to the partition 20 are clip heating tubes 22 which may also be made of sheet copper and are provided with longitudinal slots 23 therein which are arranged to register with the passages 21 whereby hot gases rising from the burners 11 and passing through the distributor plate 17 can pass through the passages 21 directly into the tubes 22 and flow longitudinally of the tubes to enable the latter to absorb the heat thereof. As shown in Figure 5, the tubes 22 terminate at their ends short of the side walls 10a of the casing which permit the gases to exhaust from the tubes and rise upwardly from the casing when the cover 10b thereof is removed or turned back as shown in Figure 2.

The tubes 22 may be secured to the plate or partition 20 by any approved means such as, for example, by means of rivets 24, the heads of which span the slots 23 within the tubes and pass downwardly through certain of the openings 21 where they are riveted over the under side of the partition. If desired, the tubes may be integral with the plate as illustrated in Fig. 9.

To effect a more uniform heating of the tubes by the hot gases arising into and flowing through the same I have shown plugs 25 (see Figure 5) located centrally of the tubes. Thus hot gases arising into the tubes on either side of the plugs must flow toward the adjacent ends of the tubes. This arrangement is preferred to preclude the development of heat currents from one end of the tube to the other, thus causing the non-uniform heating of the tubes and consequently non-uniform heating of the clips placed upon the same.

The ends of the tubes 20 preferably are partially closed by any suitable means, such as by members 12a inserted in the tube ends, shown in enlarged view in Fig. 10. The partial closing of the tube ends by members 12a retards the flow of hot gases through the tubes to enable the latter to absorb heat more efficiently, while the total area of the openings 12b permit adequate flow of the hot gases and products of combustion from the heat source at such a rate as not to impede complete combustion of the fuel or efficient transfer of heat. The size of the members 12a relative to opening 12b will, of course, be dependent on the number and size of the tubes employed and the capacity of the burner.

The modified form of tube 32 shown in Fig. 10 is provided with flanges 33 which may be welded to the lower surface of the plate 20. The outlet ports 12a of this tube are shown as circular.

I have shown a thermometer or heat registering device 26 which is calibrated to indicate the temperature of the partition and the tubes carried thereby. The clips to be heated, as shown in Figure 7, are attached to the tubes by the operator, the clips comprising the clamp members 27, which may be of aluminum or other suitable material, and which are provided with handles 28 by means of which the clips can be opened up against the action of a spring 29 to snap the same on to the tubes or on to the coils of hair above referred to. In heating the clips the same are snapped on the tube as illustrated in Figure 7, each tube preferably being long enough to accommodate from two to four of the clips. In Figure 5, the two central tubes are interrupted to accommodate the thermometer 26.

Assuming that the thermostatically operated control 14 is set to shut off the gas or other fuel supply to the burners 11 at a predetermined temperature, the burner will operate until the tubes 22 have been raised to such temperature which will be indicated by the thermometer 26. The operator then will know that the clips placed on the tubes will not have a temperature above that indicated by the thermometer, and that if such is the proper temperature for the hair being curled, there will be no danger of scorching or otherwise damaging the hair. When the clips have been raised to the desired temperature they are, of course, clipped upon the hair in the usual manner, and left for the desired time, and if necessary, removed and reheated. The clip illustrated in Figs. 7 and 8 is preferably provided with parallel lower edges 27a to facilitate attachment of the same in proper position on the rolls during use.

It will be apparent that the clips heated by the present apparatus will never be heated to temperatures above that desired, or as indicated by the thermometer 26, and thus the likelihood of scorching or damaging the hair of the patron is avoided.

As shown in Figures 2 and 3, one of the side walls 10a is provided with slots or openings 30 above the level of the tubes 22. These slots permit the gases and products of combustion to exhaust from the top of the casing in the event the cover should be closed while the burner is in operation. The openings 30, as will be noted in Figure 3, are positioned above the level of the tubes so that should air currents tend to flow through the openings 30 during operation of the machine due to air circulation within the room, the flow of the hot gases within the tubes toward the ends thereof as above described will not be impeded.

During operation of the burner, the tubes 22 are heated not only by the absorption of heat from the hot gases flowing into and through the same but also by conduction from the plate or partition 20 to which they are attached. Where the plate and tubes are made of sheet copper, it has been found that the same can be heated to operating temperature in a few minutes. If desired, the tubes 22 may be made integral with the plate 20 for increasing the thermal conductivity as between the plate and the tubes as illustrated in Figure 8. For the purpose of reducing heat losses by radiation, the portions of the upper surface of the plate adjacent the tubes may be provided with heat insulating material 31 as shown in Figure 3.

The wall linings 34 and the transverse wall 35 preferably are of polished metal and constitute

reflectors for reflecting heat upon the hot gases rising from the burner 11. While the wall 35 is shown as being plain, if may, of course, be given a more effective reflecting shape, as parabolic, if desired.

While I have shown and described an embodiment of my improvements for the purpose of illustration, I do not wish to be restricted specifically thereto except as so limited by the appended claims.

I claim:

1. A heater of the class described comprising a casing, a source of heat therein, a transverse partition in said casing above said heat source provided with a plurality of exhaust passages therein for hot gases arising from said source, and heat conducting clip-heating tubes each having the interior in communication with one of said passages for receiving hot gas therefrom.

2. A heater of the class described comprising a casing, a heat source therein, a heat conducting transverse partition in said casing above said heat source provided with a plurality of exhaust passages therein for hot gases arising from said source, heat conducting clip-heating tubes carried by said partition and each having a longitudinal slot therein communicating with one of said exhaust passages for admitting hot gas to the tube interior, and means for effecting the flow of gases within said tube in a given direction.

3. A heater of the class described comprising a casing, a heat source therein, a transverse perforated heat distributor partition above said heat source, a second transverse partition above said first partition, said second partition being provided with a plurality of exhaust passages therein for hot gases arising from said source passing through said first partition, and clip-heating tubes communicating with said passages for conducting the hot gases longitudinally thereof.

4. A heater of the class described comprising a casing, a heat source therein, a transverse partition above said source provided with exhaust passages for hot gases from said source, and clip-heating tubes of heat conducting material having longitudinal slots therein each aligned with one of said passages for receiving the hot gases from the respective passages and discharging the same from the ends of the tube.

5. A heater of the class described comprising a casing, a heat source therein, a transverse parti-

tion within said casing disposed below the upper end thereof, said partition having passages therein for the flow of hot gases therethrough, and clip-heating tubes having ports communicating with said passages throughout the length of the latter and having open ends for exhausting the gases at a level below the upper end of said casing.

6. A heater of the class described comprising a casing having a transverse heat conducting partition adjacent the upper end thereof, a source of heat beneath said partition, a plurality of clip-heating tubes carried by said partition, said tubes and partition having registering passages for admitting hot gases from beneath the partition into said tubes, and means located within said tubes for causing the gases therein to flow to and educt from opposite ends of the tubes to effect uniform heating of the same.

7. A heater of the class described comprising a casing, a heat conducting partition therein, a plurality of clip-heating tubes heat conductively carried by said partition, a source of heat beneath said partition for heating the same and said tubes, and means within said casing intermediate said heat source and said partition for distributing the flow of hot gases from said source to effect uniform heating of said partition.

8. A heater of the class described comprising a casing, a heat conducting partition therein, a plurality of clip-heating tubes heat conductively carried by said partition, a source of heat beneath said partition for heating the same and said tubes, and means within said casing intermediate said heat source and said partition for distributing the flow of hot gases from said source to effect uniform heating of said partition, said means comprising a transverse plate provided with heat distributing openings therein.

9. A heater of the class described comprising a casing, a source of heat therein, a heat conducting transverse partition in said casing above said source provided with exhaust passages for hot gases issuing from said source, heat conducting clip-heating tubes carried by said partition and having inlet ports intermediate the ends for admitting thereinto gases flowing through said passages, and means at the ends of said tubes for restricting the flow of hot gases from the tubes.

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