May 31, 1932. J. E. B. WILLIAMS 1,861,040

HAIR STRAIGHTENING DEVICE

Filed March 3, 1932

Fig. 1,

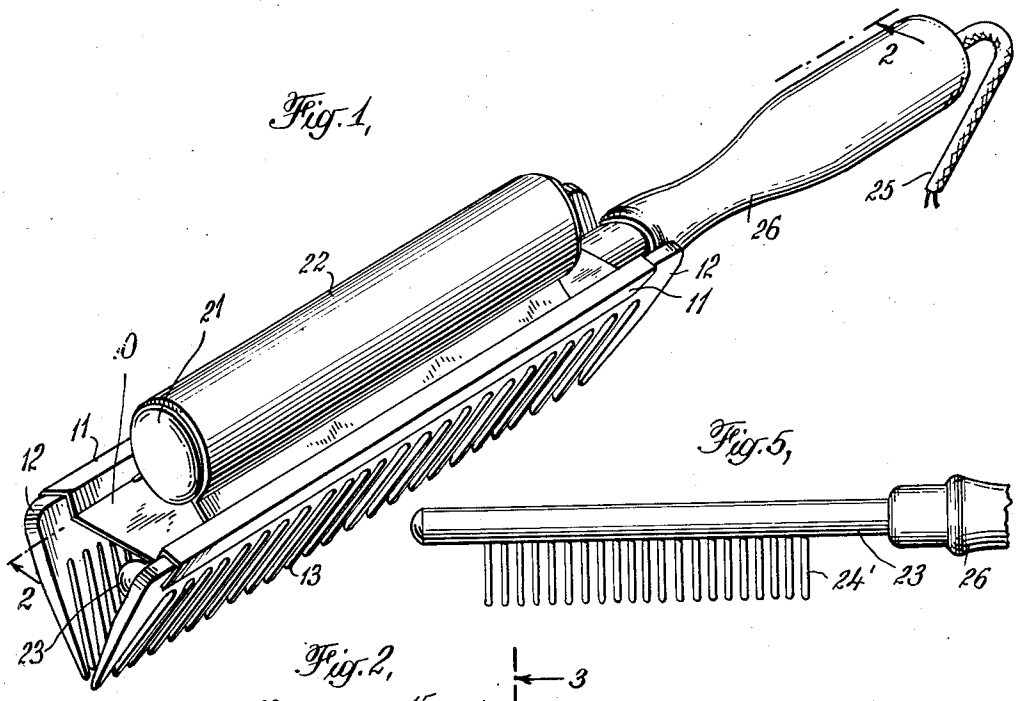


Fig. 5,

Fig. 2,

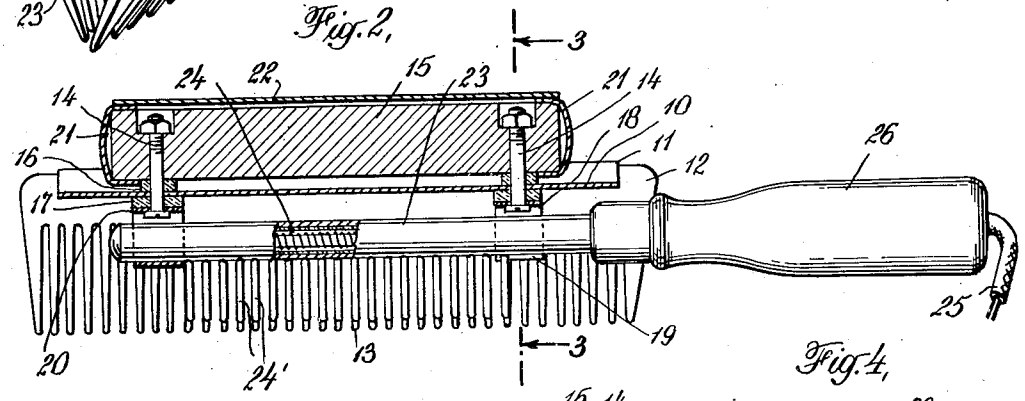


Fig. 3,

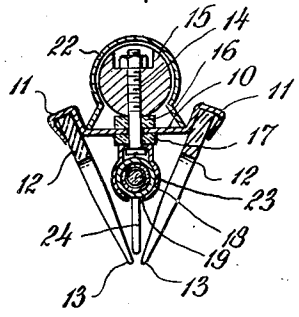
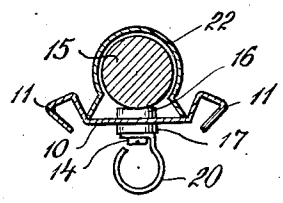


Fig. 4,



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UNITED STATES PATENT OFFICE

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HAIR STRAIGHTENING DEVICE

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This invention relates to hair straightening devices and has particular reference to an arrangement whereby curly or kinky hair may be straightened effectively to remain straight for a substantial period of time.

It has been the practice heretofore to straighten curly or kinky hair by applying heat to the hair while combing it straight. In order to be effective, the heat must be applied to the full length of the hair, so that the comb must be moved as close to the scalp as possible in order to reach the base of the hair. Inasmuch as the degree of heat applied to the hair by this process must be relatively high in order to obtain the straightening action, great care must be practiced to prevent the scalp from being severely burned. Also, if the temperature employed is too high the hair is likely to be scorched. For example, in one well-known prior process a metal comb is heated by suitable means and is drawn through the hair to straighten and apply heat directly thereto. Because the comb is directly heated and difficult to manipulate properly, the scalp is frequently burned during this process and, in any event, the subject is usually in a state of apprehension while the process is being carried on because of the likelihood of burning.

The present invention is directed to the provision of a hair straightening device in which the danger of burning the scalp or of scorching the hair of the subject under any circumstances is eliminated, even when the device is operated by an unskilled person.

In the device of the present invention, a heating element is arranged in non-heat-conducting relation to the comb and the comb is a non-conductor of heat, the ends of the teeth of which extend beyond the lowermost portion of the heating element. With this arrangement, no part of the heating element can come in contact with the scalp nor is any substantial amount of heat conducted to the scalp by the comb, so that no hot part of the device engages the scalp.

In order to insure that there is no contact between the heating element and the scalp even when the comb is carelessly or incorrectly used by an unskilled person, a second comb is provided whose teeth are located closely adjacent the teeth of the first comb and which forms with the first comb a chamber in which the heating element is located.

This heating element is provided with a handle and the combs are supported on a frame which is removably mounted on the heating element, although the heating element bears a rigid relationship to the combs. Surplus heat is radiated to the atmosphere by a radiating member mounted on the frame.

In one arrangement of the invention, heat conducting members extend in spaced relation from the heating element toward the ends of the teeth of the comb but stop short thereof, so that heat is conducted directly to the hair but cannot engage the scalp.

The combs are formed of hard rubber, composition or other thermal non-conducting material and are secured in the frame for removal and replacement for sterilizing purposes and for substitution of combs having teeth of different spacing.

For a more complete understanding of the invention, reference may be had to the accompanying drawings, in which

Figure 1 is a perspective view of the new hair straightening device of this invention;

Fig. 2 is a longitudinal section therethrough as seen along the line 2—2 of Fig. 1;

Fig. 3 is a transverse section as seen along the line 3—3 of Fig. 2;

Fig. 4 is a transverse section through the frame, from which the combs and the heating element have been removed, and

Fig. 5 illustrates the construction of the heating element.

In these drawings, numeral 10 designates a frame of sheet metal having formed along its side edges the channels 11 which, because of the springiness of the sheet metal from which they are formed, serve as clamps for resiliently but removably mounting the combs 12. These clamps 11 are arranged at an angle to each other so that the combs 12 secured therein are arranged to the form of a V as seen in the section illustrated in Fig. 3, the ends 13 of the teeth of each comb 12 being located closely adjacent the ends 13 of the teeth of

the other comb 12. These combs 12 are preferably made of hard rubber, composition, or other suitable non-heat-conducting material.

Secured by spaced bolts 14 to the frame 10 is the bar 15, preferably formed of wood or other suitable material. The ends of the bar 15 are provided with sheet metal caps or ferrules 21 which support the sheet metal radiating member 22, the ends of which engage the clamps 11 of the frame 10 as shown especially in Fig. 3.

Mounted on each bolt 12 and interposed between bar 15 and the upper surface of the frame 10 is an insulating washer 16. A similar insulating washer 17 is mounted on each bolt 14 between the lower surface of the frame 10 and the head of the bolt 14.

Clamped between the head of rear bolt 14 and the corresponding insulating washer 17 is a ring-shaped sheet metal clip 18 having a slot 19 in its lower end, as shown in Figs. 2 and 3. A similar clip 20 is secured between the head of the front bolt 14 and the corresponding insulating washer 17, but this clip 20 has no lower slot and is substantially circular, as is shown in Fig. 4. These clips 18 and 20 lie within the chamber formed between the two converging combs 12.

Removably inserted through the clips 18 and 20 of the frame 10 so as to extend longitudinally through the chamber formed between combs 12, is an elongated metal heating element 23 containing an electrical resistance unit 24 connected to the flexible electrical cord 25 passing through the heat-insulating handle 26. Extending radially from the heating element 33 and preferably located in the same plane are a plurality of metal heat-conducting members or tines 24′, which are preferably spaced apart the same distance as the teeth of the combs 12, although this spacing is not essential.

These heat conducting members 24′ begin at a sufficient distance from the tip of the heating element 23 to accommodate the clip 20 in which the tip to be supported thereby is inserted, the first tine acting as a stop for limiting the movement of the element into the clip 20.

These heat-conducting members 24′ extend through the slot 19 in the rear clip 18 and act as keys to prevent rotation between the element 23 and frame 10 when the device is in use.

These tines or heat-conducting members 24′ are of such length that their ends stop short of the ends 13 of the teeth of the combs 12, although they lie between and in close relation to the teeth of the combs 12, as shown in Fig. 3. By this arrangement, heat may be conducted directly to the hair at a point close to the scalp, but the tips 13 of the teeth of the combs 12 prevent actual contact between the heat-conducting members or the tines 14′ and the scalp.

While the use of the tines or heat-conducting members 24′ on the heating element 23 is preferred, they may be omitted or shortened or have a different shape. If these tines or heat conducting members 24′ are omitted, the heating element 23 is simply a straight rod inserted in the clips 18 and 20 for supporting the frame 10 and its appurtenant parts. In this arrangement, the slot 19 in the clip 18 will not be necessary.

In operating the hair straightening device of this invention, the combs 12 are inserted in the spring clips 11 of the frame 10 and this frame mounted on the heating element 23 by inserting the latter through the clips 18 and 20 of the frame 10. Then the current to the heating element 23 is turned on and after a short time the heat emitted by the heating element is of sufficient degree to begin the hair straightening operation. The device is grasped by the handle and the combs 12 are drawn through the hair. The leading comb straightens the hair mechanically, the heat conducting members or tines 24′ of the heating element 23 pass through the straightened hair and apply heat directly thereto to straighten the hair, while the following comb 12 lays the straightened hair in position.

It will be observed that the converging combs 12 form a chamber in which the heating element 23 is completely housed, so that the scalp is shielded from direct contact with the element 23. The ends 13 of the teeth of both combs 12 jointly bear on the scalp and guide the tines or heat-conducting members 24′ of the heating element 23 through the hair while preventing it from coming in contact with the scalp.

Inasmuch as the heating element 23 is held rigidly in the clips 18 and 20 of the frame 10, there is no likelihood that it will become displaced from the combs to burn the scalp accidentally. Also, no substantial amount of heat will be conducted directly to the scalp because the heating element 23 is arranged in spaced, non-heat-conducting relation to the combs 12 which are the only parts which touch the scalp, and the combs are of non-heat-conducting material so that they remain cool and cannot under any circumstances burn the scalp.

Surplus heat emitted by the heating element 23 is distributed to the atmosphere by radiation from the surfaces of the metal frame, whose radiating surfaces are increased by the radiating member 22 having a large surface area. The bar 15 within this radiator 22 forms a support therefor and renders the entire structure rigid.

It will be seen that the new device of this invention can be used by unskilled persons for straightening wavy or kinky hair without liability of burning the scalp or scorching the hair. It can be used for combing in both directions so that no special care need be ex-

ercised in operating the comb in any particular way. The heating system, including the element 23, the radiating surfaces of the frame 10 and the radiating member 22, is so arranged that the heat conducted to the hair by the tines or heat-conducting members 24', or radiated to the hair if the heat-conducting tines or members are omitted, is of a sufficiently high temperature to perform the hair straightening function most effectively.

I claim:

1. In a hair-straightening device, the combination of a frame, a comb mounted on the frame, and a heating element mounted on the frame in non-heat-conducting relation to the comb and spaced inwardly from the ends of the comb teeth.

2. In a hair-straightening device, the combination of a frame, a comb mounted on the frame, and a heating element mounted on the frame in rigid spaced relation to the comb and spaced inwardly from the ends of the comb teeth.

3. In a hair-straightening device, the combination of a frame, a spring clip on the frame, a comb removably supported in the spring clip, and a heating element mounted on the frame in non-heat-conducting relation to the comb.

4. In a hair-straightening device, the combination of a frame, a comb mounted on the frame, rings on the frame, and a heating element removably inserted in the rings for cooperation with the comb.

5. In a hair-strighening device, the combination of a heating element having a handle, frame having securing means for removably receiving the heating element, and a comb arranged on the frame for cooperation with the heating element.

6. In a hair-straightening device, the combination of a frame, a heating element mounted on the frame, a comb mounted on the frame, and a heat radiating member mounted on the frame.

7. In a hair-straightening device, the combination of a frame, a comb mounted on the frame, a heating element mounted on the frame in non-heat-conducting relation to the comb and spaced inwardly from the ends of the comb teeth, and means on the frame for engaging the head simultaneously with the comb to prevent contact between the heating element and the head.

8. In a hair-straightening device, the combination of a frame, a comb mounted on the frame, a heating element mounted on the frame and extending longitudinally of the comb, and spaced heat-conducting members extending from the element toward the ends of the teeth of the comb.

9. In a hair-straightening device, the combination of a frame, a comb mounted on the frame, a heating element mounted on the frame and extending longitudinally of the comb, and heat-conducting members extending from the element toward the ends of the teeth and spaced apart substantially the same distance as the teeth of the comb.

10. In a hair-straightening device, the combination of a frame, a pair of combs mounted on the frame with the ends of the comb teeth adjacent each other, and a heating element mounted on the frame between the combs and spaced inwardly from the ends of the teeth of the combs.

11. In a hair-straightening device, the combination of a frame, a pair of combs mounted on the frame with the ends of the comb teeth adjacent each other, and a heating element mounted rigidly on the frame between the combs and spaced therefrom.

12. In a hair-straightening device, the combination of a frame, a pair of combs mounted on the frame with the ends of the comb teeth adjacent each other, and a heating element mounted on the frame, and heat-conducting members extending from the element between the ends of the teeth of the combs.

13. In a hair-straightening device, the combination of a frame, combs mounted on opposite sides of the frame in angular relation with the ends of the comb teeth converging, clips mounted on the frame between the combs and a heating element removably mounted in the clips of the frame.

14. In a hair-straightening device, the combination of a frame, combs mounted on opposite sides of the frame in angular relation with the ends of the comb teeth converging, a heating element mounted on the frame between the combs, and a heat radiating member on the frame.

15. In a hair-straightening device, the combination of a frame, spring clips arranged in angular relation on the sides of the frame, a pair of combs removably mounted in angular relation in the clips with the ends of the comb teeth converging, a heating element mounted on the frame between the combs, a heat radiating member on the frame, and heat-conducting members extending from the element toward the ends of the comb teeth.

In testimony whereof I affix my signature.

JACQUES E. B. WILLIAMS.