March 31, 1942. H. C. STEARNS 2,278,335

PERMANENT WAVE HEATER

Filed Sept. 21, 1940

Fig. 1

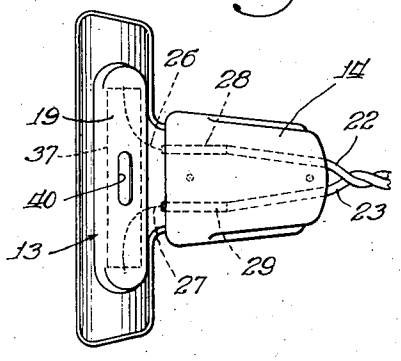


Fig. 4

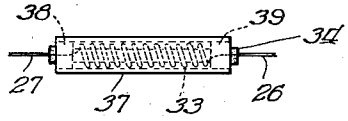


Fig. 2

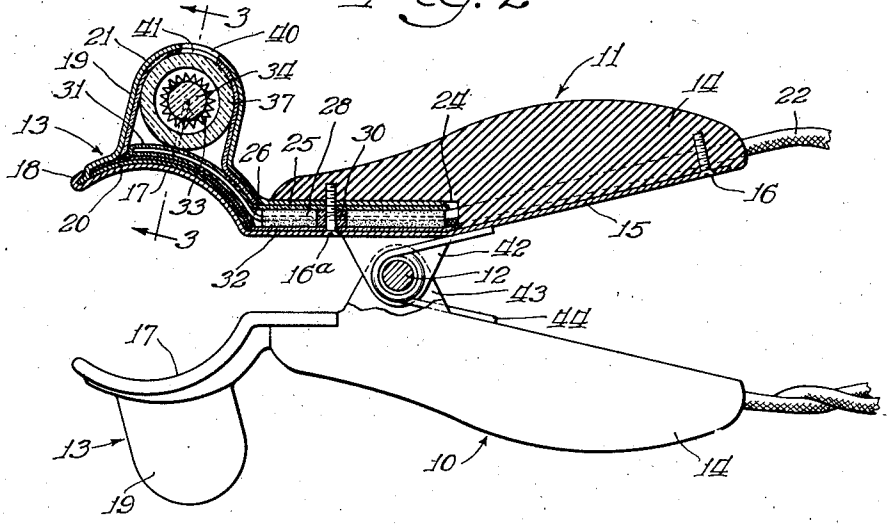
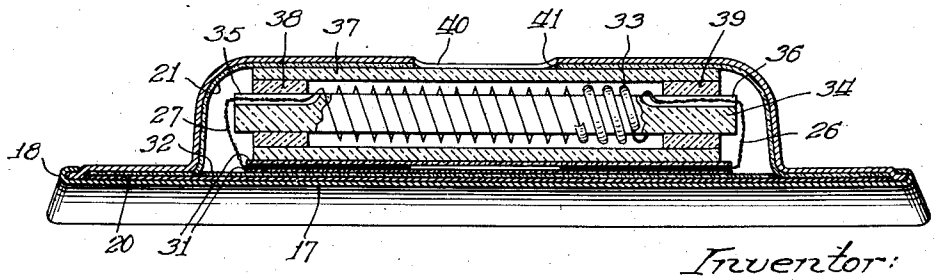


Fig. 3



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2,278,335

UNITED STATES PATENT OFFICE

2,278,335

PERMANENT WAVE HEATER

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Application September 21, 1940, Serial No. 357,773

1 Claim. (Cl. 219—24)

The present invention relates to heaters that are used in connection with waving human hair. These devices, since they are used close to the human head, need to be of light construction and yet capable of giving continuous service under conditions where the operators are not familiar with the construction of electrical devices.

It is one purpose of the present invention to provide a device of this character which is particularly adapted to display to the operator, in an unmistakable fashion, whether or not there is anything wrong with the electrical circuit by which the heater is heated. In this connection, it is contemplated to provide a device wherein a portion of the heating element is made visible at a convenient spot on the heater so that the operator may see directly whether or not the heating element is actually in operation.

It has been found necessary in order to obtain a commercially practical and simple construction for the broad purpose hereinbefore mentioned, without at the same time providing a danger spot on the heater, where excessive heat might burn the operator or customer, to construct the heater unit so as to disclose an active part of the heating element to the eye of the operator with sufficient light, due to the heat of the element, as to make it clearly visible, yet maintaining at the same time adequate insulation to prevent the high heat of the element from providing a hot spot that could readily come in contact with either the operator or the customer.

Another and more detailed object of the present inveniton is to provide, in a device of this character, a novel heating element construction which is particularly adapted to maintain continuously a resistance value such as is necessary to give the desired heating qualities and the desired visibility of the heating element.

Other and more detailed objects and advantages of the invention will appear as the description proceeds, reference being made to the accompanying drawing wherein a preferred form of the invention is shown. It is to be understood, however, that the drawing and description are illustrative only and are not to be considered as limiting the invention except insofar as it is limited by the claims.

In the drawing, Fig. 1 is a plan view of a heater clamp embodying the present invention;

Fig. 2 is an enlarged side view, partly in section, of the heater clamp;

Fig. 3 is an enlarged sectional view taken on the line 3—3 of Fig. 2; and

Fig. 4 is a detailed view illustrating the mounting of the heater element.

Referring now in detail to the drawing. the present invention is embodied in a permanent wave heating clamp of the type usually referred to as Croquignole heaters. The heater comprises two parts 10 and 11 which are hinged together by a hinge pin 12. Each part comprises a heater proper 13 and a handle portion 14. The two parts are duplicates and a detailed description of one will suffice for both. The handle element 14 is made of a suitable insulating material and is mounted on the heating element by an extended plate 15 and suitable screws 16 and 16a. The plate 15 extends from the handle and is concave as indicated at 17 to provide a heating surface for delivering heat to the hair. The peripheral edge of the curved portion 17 is curled over, as indicated at 18, to mount a cover 19. The cover 19 is of metal, as is the plate 15. The curved portion 17 of the plate 15 is backed up by a concave sheet 20 which fits tightly against the portion 17 to transmit heat to it. This plate 20 is preferably constructed of a metal of high heat conductivity such as aluminum. Between the plate 20 and the cover 19, there is mounted a lining 21 of a good heat-insulating material such as asbestos in sheet form.

Electrical leads 22 and 23 are brought into the handle over the plate 15 to a recess 24 that is provided between the plate 15 and the extended portion 25 of the cover 19. Terminal wires 26 and 27 are extended from the conductors 22 and 23 through small porcelain tubes 28 and 29. The screw 16a passes through a spacer block 30 which is interposed between the tubes 28 and 29 to hold them in position. The tubes 28 and 29, and the leads 26 and 27, are separated from the metal parts by a folded sheet of mica, indicated at 31. This sheet of mica extends above the tubes 28 and 29 and extends between the leads 26 and 27 and the plate 20. The second sheet of mica, indicated at 32, extends below the tubes 28 and 29 and below the folded-over portion of the sheet 31, so as to lie between this sheet and the plate 20. As shown best by Fig. 3, the sheet 32 is wider over the curved portion 17 than the sheet 31 and extends out to the lining 21 of asbestos, so as to prevent the leads from coming in contact with any metal in the interior of the heater.

The particular heating element structure which I have found to be essential to my invention, comprises a helically wound resistance element 33 which is particularly adapted to withstand high temperature heating by electric current

without being affected as to its resistance value over a long period of time. The particular heating element used is a resistance wire containing iron, chomium, aluminum and cobalt, and now commercially available for heating unit purposes. I have found also that in order to obtain the practical results desired herein, the wire needs to be heated to a temperature substantially higher than normal for a few minutes. The temperature employed for this higher heating is 2000 to 2100 degrees Fahrenheit.

The heating element wound in helical form is wound spirally about a core **34** of ceramic material such as porcelain. The core **34** is grooved to receive the wire and hold the spirals thereof in spaced relation, the spirals being connected at the opposite ends of the resistance element to the terminal wires **26** and **27**. Grooves **35** and **36** are provided in the core **34** for the terminal wires. The assembly of the core and the resistance element is mounted in a sleeve **37**, small plugs **38** and **39** being used to position the core **34** so that the resistance element **33** is spaced from the sleeve **37** throughout its length.

I have found that in a construction such as that employed here, the high heat of the resistance element and the enclosure of the glass sleeve makes it necessary to employ a glass sleeve of fused silica, or at least of high silica content, so as to be capable of withstanding the high heat generated by the heating element **33**.

The heating element **33** is of such a nature that it glows brightly when in operation. I take advantage of this characteristic to provide the visibility necessary to enable the operator to see the heating element at all times. A small aperture **40** of elongated narrow shape is cut in the back of the cover **19**, and a similar aperture **41** is cut in the asbestos lining **21**. Where the sleeve **37** is of clear glass, this enables the operator to directly see the heating element through the aperture and thus determine whether or not it is operating and giving off the bright glow that indicates full heating capacity. If desired, one may, of course, apply coloring, either in the form of a separate glass shield, or directly on the sleeve **37**, at the aperture **40**, to give a distinctive red warning signal.

The two units **10** and **11** are pivoted on the pin **12** by means of ears **42** and **43** which are formed on the plates **15** of the units. A spring **44** is so wound about the pin **12** as to normally urge the concave portion **17** of the two units toward each other. In order to release the heater clamp, all the operator has to do is to press the handles **14** together.

It is believed that the foregoing description will be sufficient to enable those skilled in the art to construct and use the invention disclosed herein. The advantages of the invention are also believed to be readily apparent.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

A heater for hair waving comprising a heating element wound in a helix, said helix being wrapped upon a support of ceramic material, a glass sleeve in which said support is mounted, the sleeve being spaced from the heating element so as to avoid contact therewith, and a housing for said sleeve, said housing having a hair heating portion and a cover portion, the cover portion comprising an outer metallic sheet and an inner sheet of asbestos, and said cover portion having an aperture through which a portion of the glass sleeve and a portion of the heating element may be seen.

HARRY C. STEARNS.