Feb. 7, 1950 R. OPPERMAN 2,496,746

ELECTRIC IRON

Filed Nov. 4, 1944

FIG. 1.

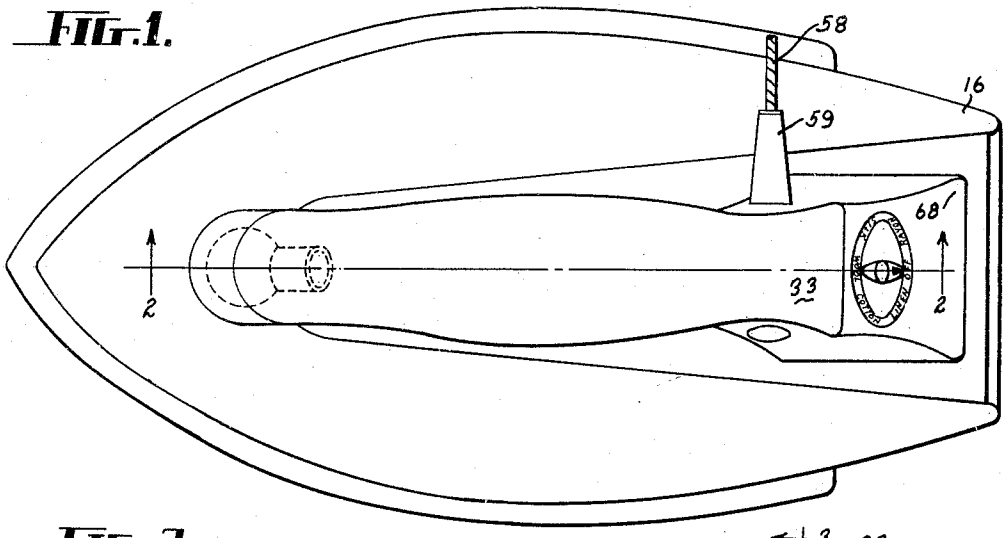


FIG. 2.

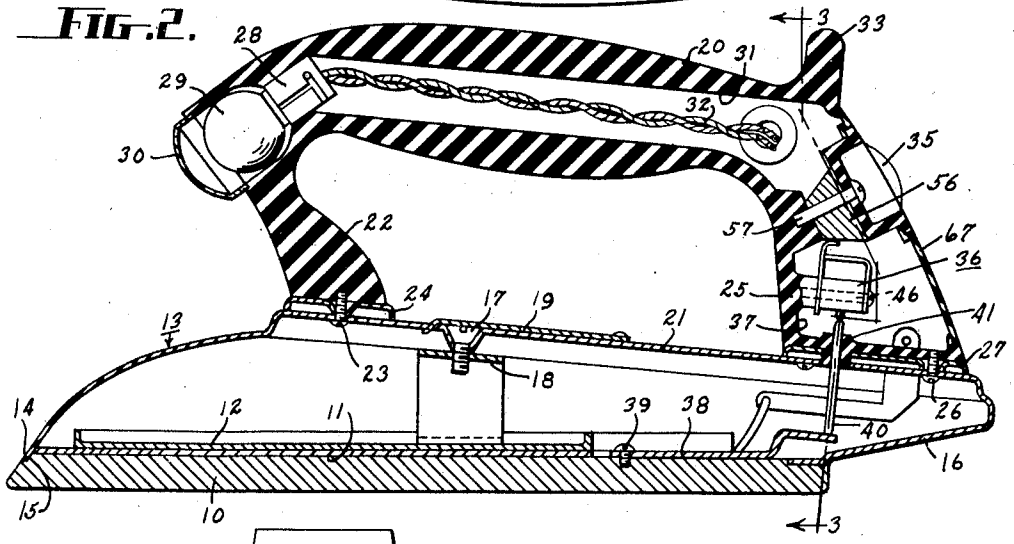


FIG. 3

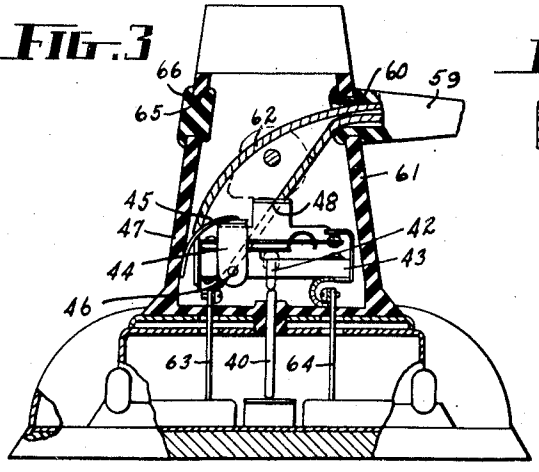
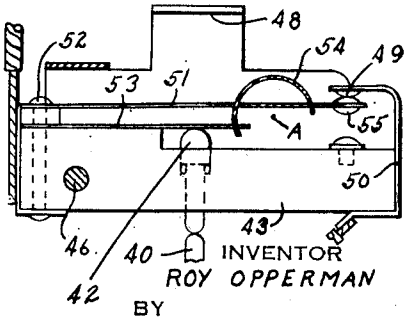


FIG. 4



INVENTOR
ROY OPPERMAN
BY
Toulmin & Toulmin
ATTORNEYS

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ELECTRIC IRON

Roy Opperman, Miamisburg, Ohio, assignor, by mesne assignments, to Radiron Corporation, Miamisburg, Ohio, a corporation of Ohio

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10 Claims. (Cl. 219—25)

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This invention relates to electric irons.

An object of the invention is to provide an improved construction of an electric hand-iron.

Still another object of the invention is to provide an electric hand-iron wherein the thermostat control for regulating the temperature of the iron is positioned within the handle of the iron.

Still another object of the invention is to provide an improved construction of electric iron wherein the thermostat control switch is remotely located from the thermostat element that operates the switch so that the switch may be placed in a location that will not cause it to be subjected to high temperatures.

Still another object of the invention is to provide an improved thermostat control for a hand electric iron.

Further objects and advantages will become apparent from the drawings and the following description.

In the drawings:

Figure 1 is a plan elevational view of the electric iron of this invention.

Figure 2 is a vertical cross-sectional view taken substantially along line 2—2 of Figure 1.

Figure 3 is a vertical cross-sectional view taken substantially along line 3—3 of Figure 2.

Figure 4 is an enlarged cross-sectional view of the control switch of the electric iron.

In this invention, the electric iron consists of a sole-plate 10 upon which there is placed an electric heating element 11 that is retained upon the sole-plate 10 by a pressure pad or plate 12.

A housing shell 13 encloses the heating element 11 and has the bottom edge 14 thereof positioned within a recess 15 provided around the top edge of the sole-plate 10. The housing shell 13 is provided with a rearwardly extending portion 16 that provides a resting point for the iron when it is positioned vertically during use of the iron. The shell 13 is secured upon the sole-plate 10 by means of a screw 17 that is in threaded engagement with the bracket 18. A name-plate 19 is adapted to cover the screw 17.

A handle 20 constructed of suitable heat-resisting material is secured to the top wall 21 of the shell 13. The handle 20 has a front leg 22 that is secured to the top wall 21 by suitable fastening means such as the screws 23, a ventilated spacing member 24 being provided between the shell 13 and the front leg 21 to reduce the quantity of heat transmitted from the shell 13 to the front leg 22 of the handle. The handle 20 is also provided with a rear leg 25, that is secured to the top wall 21 of the shell 13 by means

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of screws 26, a ventilated spacing member 27 being positioned between the shell 13 and the leg 25 to reduce conduction of heat into the rear leg 25 of the handle.

An electric lamp socket 28 is positioned in the handle 20 directly above the front leg 22 for directing the rays of light from a lamp bulb 29 positioned therein toward the toe of the electric iron for suitably illuminating the work. A removable cover lens 30 is provided for enclosing the lamp bulb 29. The handle 20 is provided with a longitudinal bore 31 therein through which the electric cord 32 passes for conducting current to the lamp-socket 28.

The handle 20 is also provided with an upwardly extending portion 33 that co-operates with the rearwardly extending portion 16 for supporting the electric iron when it is to be positioned vertically during use. The extending portions 16 and 33 are of such size and length as to prevent the rear leg 25 from engaging a surface upon which the electric iron is supported when resting upon the ends of the portions 16 and 33, and thus prevent the thermostat control knob 35 from being moved due to engagement of a surface when the iron is in a temporarily idle position.

The thermostat control for the electric iron comprises a control switch 36 positioned within the cavity 37 provided in the rear leg 25 of the handle 20. The electric control switch 36 is operated by means of a bi-metal control member 38 secured to the sole-plate 10 of the electric iron by means of a screw 39. The bi-metal control member 38 engages a pin 40 that extends through a guide boss 41 in the bottom wall of the rear leg 25 of the handle into engagement with an operating pin provided in the control switch 36 for making and breaking circuit through the control switch in response to movement of the bi-metal control member 38.

The control switch 36 comprises a base member that receives the operating pin 42. The base member 43 carries a bracket member 44 that has a leaf spring 45 secured thereto. The base member 43 is pivotally positioned upon the pivot pin 46 as carried in the wall of the rear leg 25 so that the base member 42 can rotate about the pivot pin 46.

The leaf spring 45 secured to the bracket 44 engages the side wall 47 of the hollow rear leg 25 to normally urge the control switch 43 to rotate in a counter-clockwise direction around the pivot pin 46, and thus retain an ear 48 in engagement with the operating cam 56 secured to the thermostat control knob 35.

The base member 43 carries an electric contact upon a ram 50 secured to the base 43 in any suitable manner. A contact arm 51 is secured to the base 43 by a pin 52 above a spring arm 53 also secured to the base 43 by the pin 52. A circular leaf spring 54 has one end thereof retained upon the contact arm 51 and the opposite end thereof retained in engagement with the spring arm 53. The circular leaf spring 54 provides a snap-acting mechanism for operating the contact arm 51. When the contact 55 on the contact arm 51 engages the contact 49 for conducting current through the control switch 36, representing an "on" position of the electric iron, the axial center "A" of the circular leaf spring is below the contact arm 55 whereby the right-hand end of the spring 54 tends to urge the contact arm 51 upwardly. However, when the actuating pin 42 raises the spring arm 53 as a result of upward movement of the pin 40 as caused by upward movement of the right-hand end of the bimetal contact member 38, as a result of an increased temperature of the sole-plate 10, the axial center "A" of the spring 54 will be moved above the contact arm 51 and thus cause the force applied by the spring 54 to urge the contact arm 51 downwardly, and thereby break circuit between the contacts 49 and 55.

To regulate the temperature of the sole-plate 10, the operating cam 56 may be rotated upon the pivot pin 57 to thereby permit rotation of the control switch 36 about the pivot pin 45 and thus position the operating pin 42 closer to or farther from the upper end of the operating pin 40, and thereby require different deflections of the bimetal control member 38 before actuating the contact arm 51. Specifically, rotation of the operating cam 56 in a clockwise direction as viewed in Figure 3 permits counter-clockwise movement of the control switch 36 about the pivot pin 46 to raise the control pin 42 away from the end of the pin 40 and thus require a greater increase in temperature of the sole-plate 10 before the control switch 36 will be operated to open the circuit through the contacts 49 and 55.

It will be noted by the construction of the applicant's device that the actuating parts of the control switch 36 are positioned away from the influence of the heat within the shell 13, and is further insulated from the effect of the heat within the shell 13 by the heat-resisting qualities of the handle 20.

A suitable electric cord 58 having a rubber fastening member 59 is provided for the electric iron. The rubber fastening member 59 is provided with a groove 60 therein adapted to be snapped into position within an opening in the side wall 61 of the rear leg of the handle 20. The electric wires 61 are suitably connected to the control switch 36 and a terminal lead 63 for the resistance element 11. A second terminal lead 64 connects the opposite side of the resistance element to the contact bracket 50 to thereby complete the circuit.

An opening is provided in the side wall 47 of the rear leg of the handle 20 that receives a grommet 66 to close the same, which grommet can be removed to permit placement of the fastening member 59 on the electric cord 58 on the opposite side of the handle 20 from that illustrated in Figure 3, and the grommet 66 can then be inserted in the opening in the right-hand wall 61.

A cover plate 67 is provided for enclosing the cavity 37 provided in the rear leg of the handle 20 and is suitably secured to the handle 20 by screws 68.

While the apparatus disclosed and described herein constitutes a preferred form of the invention, yet it will be understood that the device is capable of mechanical alteration without departing from the spirit of the invention, and that all modifications that fall within the scope of the appended claims are intended to be included herein.

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

1. An electric hand-iron including in combination, a sole-plate, an electric heating element for heating said sole-plate, a handle connected with said sole-plate, a thermostatically actuated switch mounted within said handle for controlling the heating element, a thermostatic actuator therefor disposed adjacent said sole-plate, reciprocatory motion transmitting means interposed between the thermostatic actuator and the control switch but unattached to either, said motion transmitting means being guided in its movement by a portion of the handle, and means carried by said handle for changing the temperature response of said switch.

2. An electric hand-iron including in combination, a sole-plate, an electric heating element for heating said sole-plate, a shell attached to the sole-plate enclosing the heating element therein, a handle attached to said shell, a thermostatically actuated switch positioned within said handle, a thermostatic actuator for the switch wholly enclosed within said shell adjacent the heating element, and motion transmitting means freely supported by said handle and guided thereby interposed between the switch and thermostatic actuator but unattached to either, the construction and arrangement being such that the heater and thermostatic actuator, completely enclosed with the shell in distantly spaced relation with the switch, control operation of the switch through the intermediate motion transmitting means.

3. An electric hand-iron including in combination, a sole-plate, a shell attached to the sole-plate forming an enclosed chamber therebetween, an electric heating element in said chamber for heating said sole-plate, a handle attached to said shell, an electric circuit-breaker positioned within said handle for controlling flow of electric current to said heating element, a thermostatic control element enclosed within said chamber responsive to the temperature of said heating element and a plunger carried by the handle to actuate the circuit breaker upon flexing of the thermostatic control element, said plunger being interposed between the control element and circuit breaker but unattached to either.

4. An electric hand-iron including in combination, a sole-plate, a shell attached to the sole-plate forming an enclosed chamber therebetween, an electric heating element in said chamber for heating said sole-plate, a recessed handle attached to said shell, an electric circuit-breaker rotatably mounted within the recess of said handle for controlling flow of electric current to said heating element, a thermostatic actuator therefor enclosed within said chamber and responsive to the temperature of said heating element, motion transmitting means extending from the interior of the chamber to the interior of the recess in the handle, said motion transmitting

means being guided between but unattached to either the circuit breaker or thermostatic actuator, and a manually rotatable cam member within the recess of the handle engageable with the rotatably adjustable circuit breaker, the construction and arrangement being such that rotation of the cam member causes rotation of the circuit breaker into different positions of adjustment relative to the motion transmitting means to vary the temperature at which the circuit breaker is actuated thereby.

5. An electric hand-iron including in combination, a sole-plate, a shell attached to the sole-plate forming an enclosed chamber therebetween, an electric heating element within said chamber adjacent said sole plate for heating the same, a handle having at least one leg and attached to said shell thereby, a recess in said leg, a control switch mounted in said recess, a thermostatic actuator therefor carried by the sole plate within the enclosed chamber, and means extending from within the enclosed chamber to the interior of the recess for transmitting motion of the thermostatic actuator to the control switch, said means being supported by the handle portion and unattached to either the thermostatic actuator or the control switch.

6. An electric hand-iron including in combination, a sole-plate, a shell attached to the sole-plate and forming a closure therewith, an electric heating element within said closure adjacent said sole-plate for heating the same, a handle having at least one leg and attached to said shell thereby, a chamber in said leg, an electric circuit-breaker in said chamber for controlling flow of electric current to said heating element, a temperature-responsive element in said closure for responding to the temperature of said heating element, and means extending from within the closure to the interior of the chamber and being unattached to the temperature responsive element and the circuit breaker for transmitting motion therebetween, in response to temperature variations of said heater element, said means being guided in a bore in the chamber wall.

7. An electric hand-iron including in combination, a sole-plate, a shell attached to the sole-plate and forming a closure therewith, an electric heating element within said closure adjacent said sole-plate for heating the same, a handle having at least one leg and attached to said shell thereby, a chamber in said leg, an electric circuit-breaker movably mounted in said chamber for controlling flow of electric current to said heating element, a temperature-responsive element in said closure responding to the temperature of said heating element, reciprocatory means guided between and unattached to said temperature-responsive element and said circuit-breaker for actuating the same in response to temperature variations of said heating element, and a manual temperature-adjusting member positioned in said chamber and operably connected to said circuit-breaker for movably adjusting said circuit breaker to regulate the temperature-setting of the heating element.

8. An electric hand-iron including in combination, an electrically heated ironing member having a handle for carrying and operating the same, a thermostatically controlled switch positioned within said handle substantially isolated from the major heating effect of said electrically-heated ironing member, a temperature-sensitive actuating member therefor in contact with the ironing member and fully responsive to the temperature thereof, and reciprocatory means guided by said handle, said means being freely interposed between said temperature sensitive member and switch for transmitting actuating impulses of the temperature sensitive member to the isolated switch within the handle.

9. A hand iron including an electrically heated sole plate structure constituting a completely enclosed unit having heating means and a thermostatic element therein responsive to the heat of the sole plate, a handle unit detachably engageable therewith, said handle unit including a completely enclosed chamber remotely located relative to the sole plate structure, an electric switch therein for controlling the heating means, and means guided by said handle unit independently of direct connection to said switch and thermostatic element for actuating the switch upon movement of the thermostatic element within the sole plate structure in response to variations in temperature thereof.

10. A hand iron including an electrically heated sole plate structure constituting a completely enclosed unit having heating means and a thermostatic element therein responsive to the heat of the sole plate, a handle unit detachably engageable therewith, said handle unit including an enclosed chamber separated from the sole plate structure, an electric switch movably mounted therein for controlling the heating means, a manually adjustable cam member rotatably mounted within the chamber and engageable with the switch to adjust the switch into different positions of relative adjustment, and means guided by said handle unit freely extending within both the handle chamber and the sole plate structure for transmitting motion of the thermostatic element to the switch, the construction and arrangement being such that adjustment of the switch alters the temperature at which it responds to movement of the thermostatic element.

ROY OPPERMAN.

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