Jan. 8, 1952 F. E. FINLAYSON 2,582,024

HEAT SETTING AND TEMPERATURE INDICATION IN FLATIRONS

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Fig. 1.

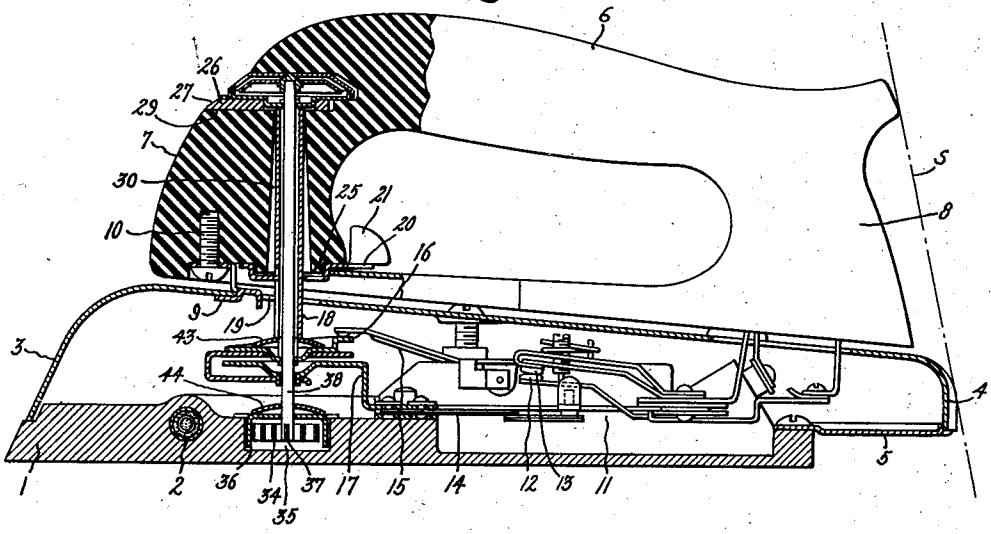


Fig. 2.

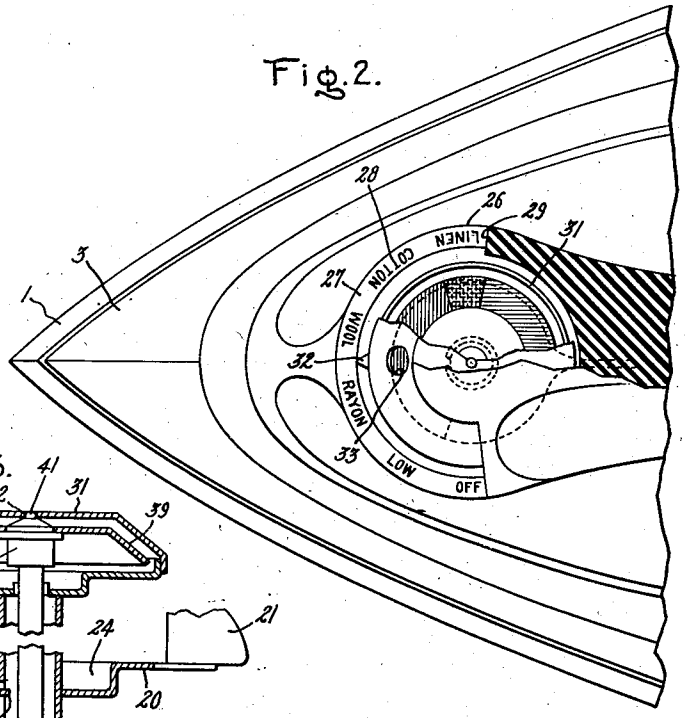
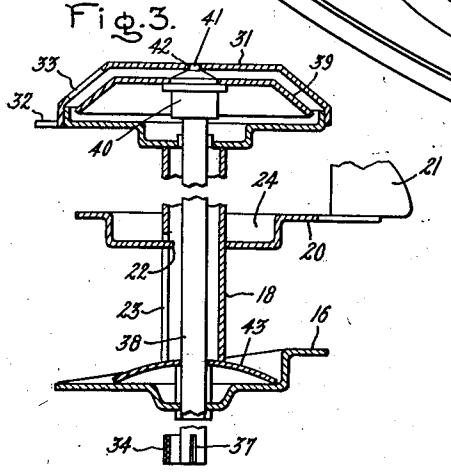


Fig. 3.



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HEAT SETTING AND TEMPERATURE INDICATION IN FLATIRONS

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4 Claims. (Cl. 38—82)

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My invention relates to automatic electric flatirons. More particularly my invention relates to improvements in heat setting and heat condition indicating arrangements for automatic flatirons.

It should be understood that automatic electric flatirons provide setting of the iron for a desired operating temperature and automatic maintenance of that temperature by the iron. However, when the iron is cool, that is, at the beginning of a period of use of the iron, there is an appreciable time interval between the connection of the iron to the power source and the attainment of the "setting" heat by the iron. Also if the setting of an iron is changed during operation, there is a time lag between the instant of changing the setting and the actual heating up or cooling down of the iron to match that setting. Therefore, some irons are provided not only with an indication to the user of the heat setting, but also with an indication of the condition or temperature of the iron relative to that setting. By this means an operator can tell whether or not the iron is above or below or at the proper operating temperature.

The present invention is directed toward improvements in the heat setting and heat indicating arrangement for electric flatirons. One object of my invention is to provide heat setting and temperature indicating mechanisms of a novel character. These improvements promote the ease of manufacture of devices of this type and facilitate their use. Another object is to increase the visibility of the indicators for both the heat setting and temperature reading. A still further object is to avoid expensive constructions so that heat setting and indicating mechanisms according to my invention may be made economically and have a high degree of dependability in use over a long period of time. According to one aspect of my invention, the coordinated calibration of the indicator and of the heat setting control is made easy. Protection of sensitive parts from accidental damage is another object of the invention. Improved appearance of heat setting and indicating devices in flatirons may be a further result of my invention.

The principal objects of my invention are met by placing the heat setting indicator and the temperature indicator both at the top of the iron at the front of the handle where they are visible at all times whether the iron is in horizontal position or if it is tilted backwardly on to its usual heel stand. Other objects and the details

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of that which I believe to be novel and my invention will be clear from the following description and claims taken with the accompanying drawing in which is illustrated an example of a device embodying the present invention and incorporating my novel heat setting indication and temperature indication mechanisms.

In the drawing Fig. 1 is a side view largely in cross section showing the interior parts of an electric flatiron; Fig. 2 is a plan view on an enlarged scale of the front end of the iron of Fig. 1 with certain parts broken away for clarity in illustration, and Fig. 3 is an enlarged vertical section through the essential movable parts of the heat setting and temperature indication mechanisms of Fig. 1.

As shown, an iron according to my invention has the usual sole plate 1 with a suitable heating element such as the one shown at 2 which may be embedded therein. The body of the iron proper is completed by the cover or shell 3 which extends over the sole plate and may project rearwardly therefrom in a heel portion 4, the bottom of which may be closed as by a bottom heel cover plate 5.

The usual handle for the iron has a horizontal hand grip portion 6 with a vertically extending post 7 at the front of the iron, and a corresponding post 8 at the back of the iron. The handle is shown here as secured to the body of the iron at the front as by the bracket 9, brazed, welded or otherwise suitably secured to the shell, and by the screw 10 passing through an extension on this bracket and threaded into the bottom of the post 7. The rear post of the handle may also be suitably secured to the iron in any desired fashion. I have not shown the customary electrical connections to the heating element within the iron although these may be brought into the back post 8 which may be made hollow for that purpose.

It will be noted that when the iron is tipped backwardly it rests on the heel rest 4 and on the tip of the back post of the handle, being supported by an ironing board or other surface S (see dot-dash line in Fig. 1) as is common with electrical flatirons. It is also usual in automatic electrical flatirons to have an electrical control switch of suitable character which will open the circuit to the heating element when the iron has attained the desired operating temperature. I have shown a thermostatic control switch 11 with contacts 12 and 13, the contact 13 being moved away from the contact 12 upon the flexing of a bimetallic strip 14 which is suitably secured within the iron body. The position of the two

contacts relative to each other, and therefore the temperature at which the two contacts will separate to break the circuit to the heating element, is governed by the position of a temperature setting control lever arm 15. The forward tip of this switch controlling arm rides on rotatable cam member 16, which is suitably supported within the chamber under the shell as by the Z-shaped bracket 17. Rotation of the cam 16 about its vertical axis on the supporting bracket 17 will change the position of the arm 15 and the heat setting for the thermostatic switch 11. The particular thermostatic switch and heat setting control cam therefor need not be of the exact form shown. I have chosen to illustrate the form of device originally shown and claimed in my application Ser. No. 676,909 filed June 15, 1946, and assigned to the same assignee as the present application. Obviously thermostatic switches and controls of other design could be used according to the present invention.

Rotation of the cam 16 and therefore regulation of the setting of the switch 11 is controlled manually by rotation of a control shaft or mechanism shown here as a vertically extending tubular member 18 suitably secured at its bottom end to the cam 16, and extending through a hole 19 in the shell 3 to the outside of the iron body. The rotational position of this tubular shaft is controlled by the angular position of the horizontally extending lever control arm 20 which has a handle or finger piece 21 at its outer end. The inner end of this lever arm is, of course, secured to the tubular member 18, as by the small lug 22 on the arm which rides in the slot 23 in the tubular member. Pivotal mounting for the lever arm and for the tube may be obtained through the cooperation of a dished portion 24 on the lever arm with a boss 25 on the bottom of the handle post 7, or in any other desirable fashion.

Heat setting indications, which may take the form of fabric markings, may be placed on the body of the iron opposite the various positions of movement of the handle piece 21 for the thermostat control lever. However, I prefer to place these fabric markings on top of the handle of the iron at the front as shown best in Fig. 2. The fabric markings for indication of the heat setting might be embossed upon or impressed in the material of the handle itself, but I prefer to use a separate indicating piece in the form of a wafer 26 having a beveled edge 27 on which the various indications such as 28 are marked. This fabric marking wafer may be slipped into a slot 29 in the front of the top of the handle and cemented in place or held in place by the mechanisms about to be described.

The front post of the handle is made hollow to provide a vertically extending passageway 30 between the slot 29 and the base of the post for receiving the upper end of the tubular member 18 and other parts for indicating the heat setting. As shown best in Fig. 3 the tube 18 has secured at its top a circular disc member in the form of a hollow shell 31 having a pointer 32 extending from one portion of the edge thereof. Radially opposite this pointer is a small window 33 for purposes which will appear later. With this arangement, as the tubular shaft 18 is rotated by movement of the arm 20, the disc like shell 31 will also rotate and move the pointer 32 opposite any desired one of the heat setting markings 28; at the same time the thermostatic switch will be adjusted so that the flat iron will operate at

approximately the desired temperature for the marking selected. However, as pointed out above, this does not insure that the iron will always be at the selected temperature and therefore I have provided a heat indicating or temperature reading mechanism which is used in connection with the heat setting indicator to show when the iron is at the proper operating temperature.

The temperature indicating mechanism is driven by a coil or spiral of bimetal 34 mounted in a cavity 35 in the sole plate of the iron directly underneath the end of the passageway 30 of the handle. The bimetal is secured at its outer end to a support 36 which in turn is forced or otherwise secured within the cavity 35. The central end of the bimetal spiral is connected as by a slot 37 to the bottom of a rod 38 which passes rotatably through a central hole in the bimetal supporting member 36. Upon bending of the bimetal 34, caused by heating or cooling of the bimetal by the heating element in the sole plate, the rod 38 will be rotated in one direction or another about its vertical axis.

This rod carries at its top end a circular temperature indicating disc 39 which is mounted to rotate freely inside of the shell 31. The upper end of the rod 38 and the center of the temperature indicating disc 39 are secured together preferably by a bearing piece 40 having an upper point or tip 41 rotatably seated within a hole or recess 42 in the center of the top of the shell 31. Portions of the temperature indicating disc 39 are visible at all times through the window 33 in the shell and I prefer that the temperature indication be made in the form of different colors which are printed or otherwise applied to the disc 39 on the areas which will be exposed under the window 33. For instance, the color yellow might be selected for one area on the disc 39 to indicate that the iron has reached a temperature satisfactory for the heat setting opposite the window. The color red might be used to indicate a temperature of the iron above the setting. The color blue might be used to show that the iron was below the temperature at which it was desired to operate. Fig. 2 shows the position of parts as they would appear if the iron had been operating at the high "Linen" heat setting and had reached proper temperature, and the heat control setting had just been changed to the lower setting between "Wool" and "Rayon" but the iron had not yet cooled. The temperature indicator shows red under the window, informing the operator that the iron is too hot for the new setting.

Naturally, the "correct" temperature setting indicating area might utilize a color different than yellow, and other colors might also be used in place of the red and blue mentioned above. However, whatever color is used, the colored area which is to indicate proper operating temperature of the iron is placed between the other two colors around the circumference of the disc 39 and usually, if not always, should be made of less angular extent around the circumference. Therefore, after the iron heat control has been set at the desired temperature, the color viewed through the window 33 opposite the pointer will indicate to the user whether the iron is above, below, or within the range of the proper ironing temperature.

Spring washers such as those at 43 and 44 may be used to restrain the tubular shaft 18 and the rod 38 from unwanted movement, and introduce a slight amount of friction in the operation of these parts so that they will not slide around in an undesirable fashion.

Because the disc shell 31 extends through the slot in the front and top of the handle post of the iron, both the heat setting and temperature indicating devices are visible at the top and front of the iron handle. These may therefore be seen by the user not only when the iron is in horizontal or ironing position but also when the iron is tilted backwardly toward the rest position on the supporting surface S while the user is waiting for the iron to heat up or cool down to a desired temperature. The manual thermostat control lever, being located under the handle, is away from the indicating dials, and movement of this lever by the hand of the operator will not obstruct either indicator during adjustment of the heat setting.

The calibration of the heat setting and temperature indicators together on a comparable basis is made easy by keeping the window opening 33 narrow, and by making the central colored section (for the "correct" operating temperature) on the temperature indicating disc as wide as operating conditions permit. Absolute accuracy of calibration is not necessary in manufacture because a wide "correct" operating temperature indicating area will compensate for considerable error in adjustment of the parts. Absolute accuracy of calibration is not needed in use of the device, because the two indications are used only on a comparative basis, that is, any heat setting covers a range of several degrees of temperature of the desirable results, and therefore the registry of the window 33 with a particular color segment on the disc 39 need not be absolute or precise in nature. It is enough if the temperature indicator shows the general condition of the iron within a comparatively broad heat setting range.

If desired, the entire top of the shell disc may be made of transparent material, instead of using the window opening 33. In this case, the operator can watch the progress of the temperature indicating color disc, and thus may be able to judge when the iron is approaching close to the heat setting. This is useful in cases where a precise temperature is not regarded as necessary for a particular article being ironed.

The circular disc or shell-like nature of both the member 31 and the member 39 insures that the heat setting and temperature indicating members will be in proper mechanical balance at all times. The pointer may be a spot marking on a continuous circumferential flange projecting from the shell, instead of a radial point as shown, further balancing the mechanical structure.

The mounting of the entire temperature indicating mechanism, including its operating shaft or rod as well as its indicating disc, entirely within the tubular operating shaft and the heat setting indicating shell of the thermostat control mechanism insures that the temperature indicating mechanism will not be damaged either accidentally or by malicious design. In order to prevent any possible touching of the disc 39 from outside of the window 33 as by a pencil or other sharp instrument, the window 33 may be made preferably as a transparent section of the shell 31 and need not be an open hole. In this case the rest of the shell 31 is made opaque as by painting, frosting or otherwise treating the shell 31, preferably on its inside surface. If the shell is made of opaque material, the window may be covered by a transparent sheet on the inside or outside.

As will be evident from the foregoing description certain aspects of my invention are not limited to the particular details of construction of the example illustrated and I contemplate that various and other modifications and applications of the invention will occur to those skilled in the art. It is, therefore, my intention that the appended claims shall cover such modifications and applications as do not depart from the true spirit and scope of my invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. In an automatic electric flatiron of the type having an ironing body with a heating element therein, a thermostatic control for maintaining a given temperature for said element, manually operable heat setting means for altering said control for the production of selected degrees of heat in the iron, and a handle secured to said ironing body with a vertically extending post near the front of said iron, that improvement in a heat setting and heat indicating arrangement for the iron comprising a vertically extending passageway in said post opening at the top and front thereof, a rotatable hollow circular shell mounted for rotation about a central vertical axis at the top of said post, a vertically extending tubular shaft fixed to said shell and extending through said passageway into said ironing body, means connecting the lower end of said tubular shaft to said heat setting means, a thermally responsive member in said ironing body movable in response to the temperature of said heating element, a vertically extending rotatable rod secured to said thermally responsive member at its lower end and extending from said member through said passageway inside of said tubular shaft, and a circular disc shaped indicator at the top of said shaft within said shell, said shell being provided with a transparent window for observing the position of said disc.

2. In an automatic electric flatiron of the type having an ironing body with a heating element therein, a thermostatic heating element control for automatically maintaining a selected temperature of said body by closing and opening the electrical circuit to said heating element, manually operable heating setting means for altering said selected temperature and a handle secured to said body including a front supporting post therefor, that improvement comprising a passageway in said post extending from said ironing body to the top of said post and having an opening at the front thereof, a rotatable heat setting indicator in the form of a hollow circular shell located at and visible through said opening, a rotatable hollow shaft for said indicator shell extending through said passageway and connected to said heat setting means to move therewith, a temperature indicator in the form of a circular disc rotatably mounted within said heat setting indicator shell, said indicator shell having a window through which the circular disc is visible, a rotatable rod for said temperature indicator disc mounted coaxially within and free to move independently of said hollow shaft, and means responsive to the temperature of said ironing body connected to said shaft for turning the shaft to position said indicator disc.

3. In an automatic electric flatiron of the type having an ironing body with a heating element therein, a heating element control for maintaining a selected temperature of said body by closing and opening the electrical circuit to said heating element in response to temperature changes of said element, manually operable heat

setting means for altering said selected temperature and a handle secured to said body including a front vertical supporting post therefor, that improvement comprising a vertical passageway in said post extending from said ironing body toward the top of said post and having an opening near the top of said post at the front of said handle, a heat setting indicator in the form of a hollow shell rotatably mounted about a vertical axis in and visible through said opening, a hollow driving shaft fixed to said indicator shell and extending vertically through said passageway, a lever arm extending from said driving shaft, adapted for manual rotation of said shaft and simultaneous operation of said heat setting means, a temperature indicator in the form of a disc rotatably mounted within said shell, a viewing window in said shell above said temperature indicating disc, a driving rod for said temperature indicator disc rotatably mounted coaxially within said hollow driving shaft and a temperature responsive element in said ironing body connected to said driving rod to rotate it in response to temperature changes in said body.

4. In an electric flatiron having an ironing body, a thermostat and switch for controlling the temperature of the ironing body, manually

operable means for adjusting the setting of said thermostat, and a handle for the body, a heat setting and temperature indicator comprising heat setting indicia on said handle, a hollow shell rotatably mounted in said handle adjacent said indicia, means connecting said shell to said manually operable means, a pointer on the circumference of said shell co-operating with said indicia for indicating heat settings of said flatiron, a window in said shell located radially opposite said pointer, a temperature indicating disc rotatably mounted within said shell, having temperature indicating areas visible through window, and means responsive to the temperature of the ironing body for positioning said indicating disc.

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