UNITED STATES PATENT OFFICE

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TILTING ELECTRIC FLATIRON

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The present invention relates to flatirons and particularly to that type of flatiron primarily intended for hand use and so designed that its heated working surface will be automatically raised out of contact with the goods being ironed when the operator releases the handle by means of which the flatiron is manipulated.

Various types of flatirons equipped with means to automatically effect disengagement of the heated ironing surface from the goods being acted upon have heretofore been designed or suggested, but such flatirons have not come into widespread use for one reason or another. It is, of course, one necessary prerequisite of a flatiron which is intended to be hand operated that its weight be maintained relatively low in order that it shall not unduly tire the user. It has been found, for instance, that a flatiron the weight of which is greater than six pounds is, generally speaking, unsuitable for domestic use. For this and other reasons it has been generally found to be impractical to provide a flatiron with an overbalancing weight to effect the upward tilting or lifting of the working surface thereof. Generally speaking also, other mechanisms provided for automatically disengaging the heated working surface of a flatiron from the goods being acted upon have not become popular. It will be appreciated by all of those who use flatirons that such irons must be simple, preferably having no moving parts, and that they must be of light weight.

It is a primary object of the present invention to provide a flatiron of the automatically up-tilting type which is of such character as to fully meet all requirements of the users thereof; which will function automatically when released, is light in weight so as not to be tiring even though used over considerable periods of time, which embodies no mechanism such as spring-pressed lifting devices for effecting the up-tilting and which is rugged in construction and attractive in appearance. The improved flatiron has two work-engaging surfaces in angularly disposed planes and its center of gravity so located that, when subject to no pressure of the hand or other operating force, the flatiron quickly tilts until one of these work-engaging surfaces is in full contact with the work and the other surface is lifted entirely out of contact with the work. The surface which is automatically lifted in this manner is, of course, the actual working surface of the iron and is, in the general case, a smooth surface formed upon the bottom of a metal sole plate.

That surface which engages the work when the iron is released is formed on the underside of a rearward extension of the iron which may be designated a rear portion or heel and which is fabricated of material of low heat conductivity. Its temperature at no time rises to such an extent that contact between this portion of the iron and the work can result in injury to the work. In order that this highly desirable result may be obtained without unduly increasing the weight of the flatiron as a whole the forward portion thereof, which includes the sole plate, the heating element, the covering shell or casing, and the major portion of the handle, is constructed as lightly as possible consistent with necessary strength and ability to communicate heat to the work. The several metallic parts are preferably formed by stamping or pressing metal sheets and the handle portion is preferably fabricated of a plastic material and is entirely hollow. In addition, the electrical heating means which is associated with the sole plate is constructed to weigh as little as possible. The thermostatic control for the heating means is so designed that it may be located principally in the rear or heel portion of the iron. The conduits for supplying electrical current are brought into the iron toward the rear of the heel portion thereof and the heel itself is made relatively solid so as to provide the necessary weight, a small added weight being inserted in this portion of the iron, if necessary, to effect the overbalancing movement.

The thermostatic control means is of novel character and may, if desired, be employed in association with electric irons other than irons of the up-tilting type. It embodies relatively movable contacts and means including an adjusting disc for modifying the relative positions of these contacts, the contacts being wholly housed within a recess formed in the flatiron and the disc-like adjusting member likewise being so housed, its periphery only being accessible to the fingers of the operator.

Within the import of the invention various modified forms of flatirons may be designed and constructed, one such embodiment being illustrated in the accompanying drawings by way of example.

In the drawings:

Figure 1 is a view of the flatiron from the side portion thereof, being shown in elevation and the remainder in axial section, the iron being shown in full lines, with its heated surface in work-engaging position and, in dotted lines, with its unheated surface in work-engaging position;

Figure 2 is a section on line 2—2 of Figure 1;
Figure 3 is a section on line 3–3 of Figure 1; Figure 4 is a section on line 4–4 of Figure 1; Figure 5 is a perspective view of portion of the thermostatic control means; and

Figure 6 is a diagram showing the circuit through the heating element of the iron and through the automatic temperature control device.

When the flatiron is disposed as it is shown in full lines in this figure, with the undersurface of its sole plate 12 in contact with the work, which is in the position to which the flatiron occupies when the operator is pressing downwardly upon the handle 13, the rearwardly and upwardly inclined metallic sole plate and shell are relatively disposed at an acute angle to the horizontal. This is the working position of the iron and that portion thereof which lies vertically above the sole plate and is indicated by the numeral 10 may be said to comprise the forward portion of the iron, whereas, that portion 11 which lies vertically above the inclined work surface 14 comprises the rear portion or heel of the iron. The iron is so designed that the center of gravity lies vertically above the surface 14 and so, when the handle 13 is released, the iron automatically moves into the position in which it is shown in dotted lines.

The sole plate 12 is preferably formed by pressing or stamping sheet steel or other metal and likewise the shell 15 which overlies the sole plate and is secured thereby by a plurality of elongated screws 19 may advantageously be fabricated by stamping or pressing sheet metal. The handle 13 is hollowed out as shown and is preferably formed of a suitable plastic material of low heat conductivity. At its forward end it is attached to the shell 15 by means of bracket members 17 which project downwardly from the undersurface of the handle, through slots 14a formed in the shell 15, into position to engage the undersurface of the top wall of the shell. The rear end of handle 13 is attached, as by means of a securing screw 20, to a heel part 21 shaped as shown in the drawings, this heel part having a forward extension which is secured, as by means of a screw 22, to the shell 15 and which is hollowed out to provide a recess for the main portion of the thermostatic control elements. The block 21 is fabricated of a material of low heat conductivity, preferably a plastic material which may be molded. The recess 21a formed in block 21 is closed from below by a block 22 which is not only of low heat conductivity, but is also of high dielectric strength, block 22 being secured in the position in which it is shown in the drawings by means of the screws 23 and 24. As constructed, therefore, the flatiron comprises five principal elements rigidly connected together, i.e., the sole plate 12, shell 15, handle 13, rear or heel block 21, and insert 22. The metallic sole plate and shell are relatively thin and of light weight, likewise the handle 13, while those portions of the flatiron which lie within the limits of the rear or heel part are relatively heavy.

The heating element is of known type and is generally indicated at 27, being tightly secured upon the upper surface of the sole plate 12. As shown in Figure 4 the heating element is cut away to receive a rectangular bi-metallic thermostatic member 30, one end of which is attached directly to the sole plate 12, as by screws 31, and the other end of which is provided with a pad 32. The bi-metallic thermostatic member 30 is so designed that the pad 32 will be elevated with increase in temperature of the sole plate and will be lowered with decrease of temperature.

Means is provided for interrupting the flow of current to the heating element 27 when pad 32 rises higher than a predetermined position and for reestablishing the flow of current to the heating element when the pad 32 descends below such position. This means includes contact members or buttons 34 and 35. Contact 35 is mounted upon a vertically disposed resilient blade member 36 the lower end of which is fastened to the block 22 by means of a screw 37. Contact member 34 is mounted upon the adjustable element 38 disposed axially of the iron and extending through the annular insulating bushing 40 set into a circular opening in the spring-like member or blade 36. The rearwardly extending horizontal portion of element 33 is threaded and this portion has threaded engagement with a sleeve 42 which extends axially through the hub of an adjusting disc 43. Reduced axial extensions of the hub of the adjusting disc 43 are shown and are aligned apertures formed in the upper ends of the parallel upwardly extending arms of a U-shaped yoke member 44, the arrangement being such that member 43 may rotate about the axis of member 42, the sleeve 42 rotating with member 43 at all times. Element 39 is held against rotation by means of a spring blade 45, the lower end of this spring blade being attached to the U-shaped bracket 44 and the upper end thereof entering a vertical notch formed in the rear end of element 33. Element 39, therefore, is restrained against rotation at all times but may be axially adjusted by rotation of the adjusting disc 43, and, by rotating the disc 43, the relative positions of the contact buttons 34 and 35 may be changed at any time. The adjusting disc 43 is dielectric material, preferably a molded plastic.

It will be observed that the vertical leg of an L-shaped member 47 is attached to the upwardly projecting flange 12a of the sole plate by means of a screw 48 and that the forwardly and horizontally extending leg of member 47 has advantageously mounted upon its extremity the vertically disposed screw 50. The lower end of screw 50 rests at all times upon the pad 32 of the thermostatic member of the thermostatic control means is positioned so that such contact is maintained. The rear face of the vertical leg of member 47 rests against the forward face of the vertical member 36 previously referred to and, member 36 being flexible, it is clear that upward movement of pad 32 will so act upon screw 50 and member 47 that the upright spring member 48 will be flexed rearwardly, contact 35 being moved out of contact with member 34. When this occurs flow of current to the heating element 27 is interrupted, as will be clear from an inspection of the diagram in Figure 6 of the drawings. When the sole plate cools and the thermostatic member is lowered to the original position, the resilient member 36 will return contact 35 to original position, so that it engages contact 34, and the flow of current to the heating element is reestablished. As will be seen from an inspection of Figures 1, 3 and 6 the main or conduit 60 leading from a suitable source of current supply has its sole plate 12. As shown in Figure 4 the heating element is cut away to receive a rectangular bi-metallic thermostatic member 30, one end of which is attached directly to the sole plate 12, as by screws 31, and the other end of which is provided with a pad 32. The bi-metallic thermostatic member 30 is so designed that the pad 32 will be elevated with increase in temperature of the sole plate and will be lowered with decrease of temperature.

Various expedients may be adopted in order to
obtain the desired unbalance of the forward and rear portions of the iron. Light materials are utilized in the construction of such forward portion and heavier materials in the fabrication of the rear portion or heel. The heavier parts of the electrical connections and control devices are mounted, so far as possible, in the heel, and it is particularly helpful to mount the thermostatic adjusting means in this portion of the iron. So positioned, the adjusting disc 43 is accessible to the thumb of the user and may be readily turned as desired. It is, however, practically invisible to the observer and does not detract from the appearance of the flatiron.

Naturally minor rearrangements of the various component elements of the invention may be made, when desired, while maintaining its advantages.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. A flatiron having forward and rear portions provided, respectively, with work-engaging surfaces disposed in intersecting planes, the weight of the iron being so distributed that the work-engaging surface of the rear portion normally engages the work and the work-engaging surface of the forward portion is lifted out of contact with the work, and electrical heating means including a heating element mounted wholly on the forward portion and a thermostatic control device for regulating the heating action of said heating means, said device having a manually operable adjusting element, the rear portion of the iron having a recess formed therein, opening to a side surface thereof, within which said adjusting element is housed.

2. The combination set forth in claim 1 in which said adjusting element comprises a disc mounted for rotation about an axis extending longitudinally of the iron, the rear portion of the iron having a recess formed therein, opening to a side surface thereof, within which said adjusting element is housed, the outer elements of the said element being accessible to the operator.

3. A flatiron having an electrical heating element and a thermostatic control device, said device comprising separable contacts, a movable support for one such contact, and an adjusting disc having threaded connection with said support, said disc being housed within a recess in the flatiron.

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