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ELECTRICAL STEAMING IRON

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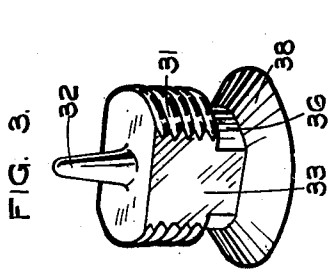


FIG. 3.

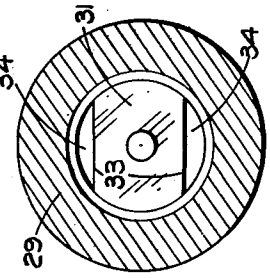


FIG. 4.

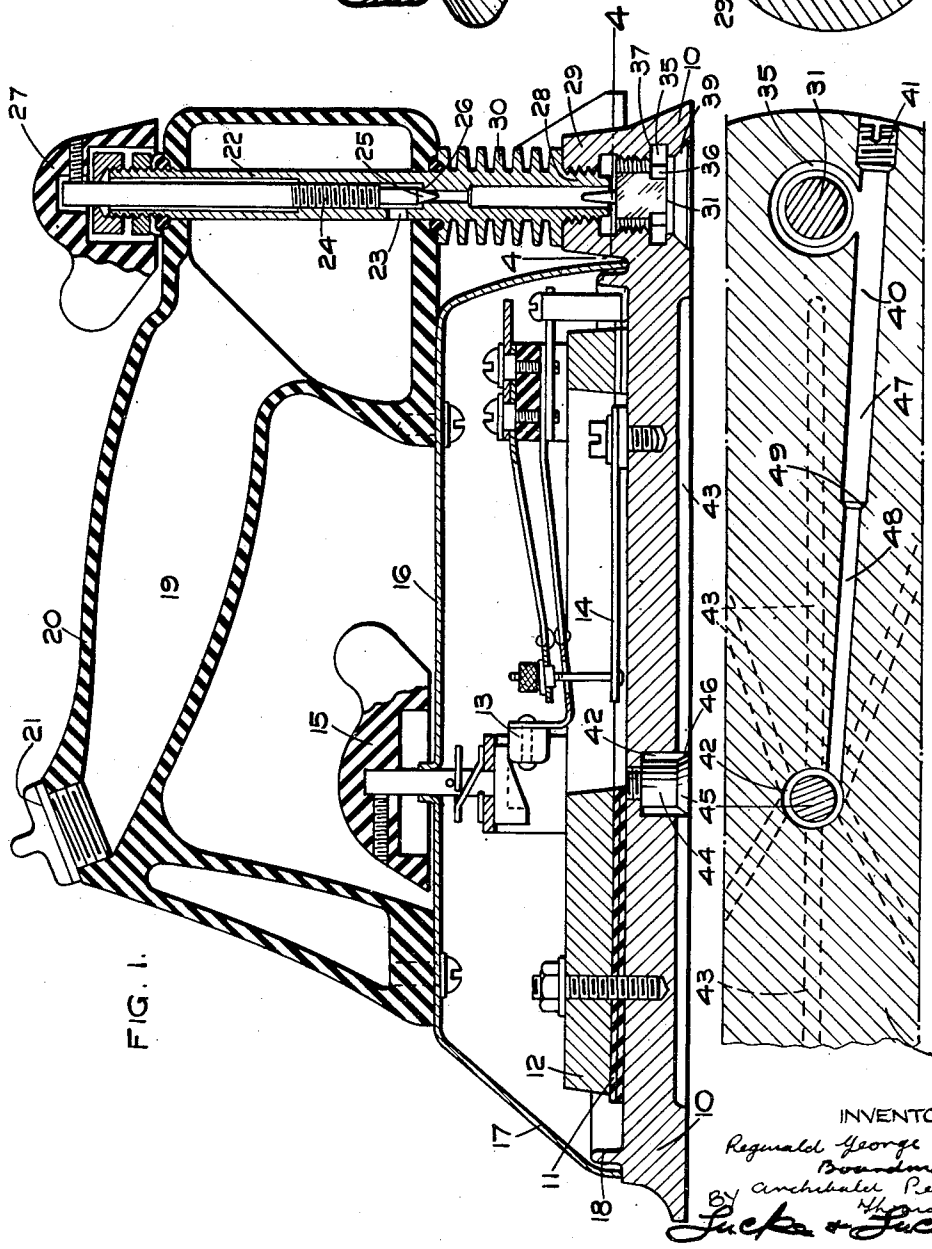


FIG. 1.

FIG. 2

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ELECTRIC STEAMING IRON

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7 Claims. (Cl. 38—77)

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This invention relates to smoothing irons of the kind which are electrically heated and provided with means for delivering steam to the underside of the sole plate, such means comprising a water reservoir disposed above the sole plate, a water supply tube depending therefrom and communicating at its lower end with a flash boiler provided in the sole plate from which the steam is delivered during the ironing operation to the underside of the sole plate through one or more openings therein.

The primary object of this invention is to provide an improved construction in which the water flows evenly from the water supply tube to the boiler instead of falling intermittently in drops, thereby avoiding intermittent delivery of the steam in the form of puffs and providing instead a substantialy even flow of the steam during ironing.

Other objects of the invention will become apparent from the following description in the drawings accompanying which:

Figure 1 is a cross sectional view of an electric smoothing iron constructed in accordance with the present invention.

Figure 2 is a cross sectional plan view of the central part of the sole plate of the construction shown in Figure 1.

Figure 3 is a detailed perspective view of part of the same construction illustrating one form of upstanding member for ensuring even flow of the water as above described.

Figure 4 is a detailed cross sectional view on the line 4—4 of Figure 1.

The smoothing iron shown in the drawing comprises a sole plate 10 carrying on its upper face a conventional form of electric resistance element indicated at 11 and secured to the sole plate by a clamping plate 12. Disposed above the latter is a known type of thermally responsive switch indicated generally at 13, controlled by a bi-metal strip 14, the switch serving in the known way to cut off the current to the resistance element 11 when the sole plate attains a given temperature which can be regulated in the known way from the control knob 15.

The mechanism so far described is enclosed within a cover 16 having dependent walls 17 which extend around an upstanding flange 18 formed on the upper face of the sole plate adjacent the periphery thereof, which flange serves to prevent water passing on to the upper part of the sole plate and into the space beneath the cover in the event, for example, of water being spilled on to the iron during the operation of filling the water reservoir.

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This water reservoir is indicated at 19 in the drawing and is provided by the interior of the handle 20 of the iron which is made hollow and conveniently formed in a plastic material as shown or, if desired, in metal and provided near the forward end of the iron and in its upper part with a water filling opening, closed by a removable screwed plug 21.

Extended vertically through the rear part of the reservoir and projecting beyond the upper wall thereof is a water supply tube 22 formed of metal and provided adjacent to the bottom of the reservoir with a radial hole 23, and above this hole the tube is threaded internally and working within this threaded part and in the upper portion of the tube is a correspondingly threaded valve stem 24 formed at its lower end with a conical valve member 25 which co-operates with a seating 26 provided within the tube below the hole 23 by forming the tube at this position of reduced cross section.

The stem 24 projects above the upper end of the tube and carries an operating knob 27 so that by turning the latter the stem is advanced axially of the tube to cut off the water flow entirely or to regulate the rate of flow of the water from the reservoir into the lower part of the tube as desired.

The lower part of the tube projects beneath the reservoir and terminates in a threaded end 28 which screws into a hollow boss 29 formed integrally with the sole plate and projecting above the rear end thereof, the boss being disposed on the longitudinal centre line of the sole plate.

In order to reduce transmission of heat from the sole plate to the reservoir along the lower part of the tube, the latter is formed with a number of vertically spaced heat radiating fins 30, so that substantial heating of the water within the reservoir as a result of such heat transference is avoided.

The boss 29 is of increased internal diameter in its lower portion and has removably mounted therein a metal plug 31 shown in Figure 3 which is screwed into position from the underside of the sole plate, the plug on its upper face being formed centrally with an upstanding conical member 32 which projects into the lower end of the water supply tube 22 and serves to collect thereon the water which flows down the tube from the reservoir 19 and by capillary action causes the water to flow from the lower end of the tube continuously and evenly when the valve 25 is open instead of falling intermittently in drops as would be the case if such member were not provided.

The plug 31 is formed on opposite sides with a flat 33 so as to provide between each side of the plug and the adjacent threaded interior of the boss a vertical pasage 34 and which passages communicate at their lower ends with an annular groove 35 provided around the plug by forming the latter below the threaded part with part-circular peripheral grooves 36 and by forming the adjacent interior of the boss with an annular recess 37.

The lower end 38 of the plug is of frusto-conical form and when the plug is in position engages tightly with a corresponding seating 39 formed in the base of the sole plate so that a water and steam tight joint is obtained between the lower end of the plug and the sole plate, this lower end having on its underface a screw-driver slot or other means to enable the plug to be removed.

Extending longitudinally of the sole plate on one side of the longitudinal centre line thereof, the plate has formed therein a horizontal steam passage 40 which extends tangentially with respect to the annular recess 37 so as to be in communication with the annular groove 35, the rear end of the passage terminating at the rear edge of the sole plate and being closed by the removable plug 41.

This steam passage terminates towards the front end of the sole plate in a circular steam distribution opening 42 formed in the underside of the plate, and communicating with the lower end of this opening the sole plate has formed on its underside a number of channels 43 along which the steam can pass from the opening 42 and by which channels the steam is delivered to the articles which are being ironed.

Passage of the steam from the opening 42 to the channels 43 is ensured by providing the opening with a removable cylindrical distribution plug 44 of a diameter less than the diameter of the opening, the plug being formed at its lower end with a frusto-conical part 45, the peripheral lip 46 of which engages with the periphery of the lower end of the opening 42 when the plug is in position, thus ensuring that the steam passes to the channels 43 as will be apparent from Figure 1.

Conveniently the steam passage 40 is formed of two diameters so as to provide a portion 47 of larger cross section which is in communication with the annular groove 35, and a second portion 48 of reduced cross section in alignment with the portion 47 and terminating in the steam distribution opening.

Such a configuration of the steam passage 40 facilitates its formation by a drilling operation, while the formation of the inner portion 48 thereof of the lesser diameter provides in the passage a shoulder 49 which forms a barrier to prevent any water which may be present in the bottom of the outer portion 47 of the passage 40 from passing to the inner portion thereof and hence to the channels 43. Such water flow might occur in the absence of such a barrier in the event of the valve member 25 being opened into a position giving an excessive water flow.

With the above described construction when the sole plate is heated by the electric resistance element 11, the water flowing from the lower end of the supply tube 22 is rapidly raised in temperature in the vicinity of the removable plug 31 owing to the heat transmitted thereto from the sole plate and is converted into steam at this position if the rate of flow is relatively small,

and any water not converted into steam in the vicinity of the plug 31 is turned into steam in the steam passage 40, which together with the openings or passages in the vicinity of the plug serves as a flash boiler for rapidly converting into steam the whole of the water flowing from the supply tube 22. If the rate of water flow is high a greater proportion of the water is converted into steam within the passage 40.

By providing the lower end of the water supply tube with the upstanding member 32 as above described an even continuous flow of the water at the plug 33 is ensured so that the steam flows substantially evenly to the channels 43 by which it is delivered to the underside of the sole plate. Thus the steam is delivered at a substantially uniform rate to the articles to be ironed whereby the satisfactory ironing thereof is facilitated. Furthermore, there is no likelihood of the steam being emitted intermittently in the form of puffs which might alarm the user and which would occur in the absence of the upstanding member 32.

In addition, by mounting the upstanding member 32 upon a plug which is removable from the sole plate as described, the plug may be detached for cleaning purposes and any scale forming thereon or within the boss 29 may be removed, such scale being liable to form at this position if the water is hard.

By arranging for the steam passage 40 to terminate at the rear end of the sole plate, the opening being closed by the removable plug 41, the latter may be detached and the steam passage cleaned in the event of scale similarly forming therein.

The handle 20 of the iron which forms the water reservoir, may be made of transparent or translucent material or alternatively where opaque, may be provided with a transparent or translucent window so that the level of the water within the reservoir can be readily ascertained and the reservoir refilled as and when necessary.

Instead of forming the flats 33 at both sides of the plug 31, a single flat may be formed on one side only of the plug, while instead of providing a plurality of channels 43 on the underside of the sole plate, a single channel might be provided on the underside for delivering the steam to the articles to be ironed.

We claim:

1. In an electric smoothing iron of the kind having means for delivering steam to the underside of the sole plate comprising, a water reservoir disposed above the sole plate, a flash boiler provided in the sole plate and a water supply tube depending from the water reservoir and communicating at its lower end with the flash boiler, an upstanding member carried by the part of the sole plate in which is provided the flash boiler, whcih member projects into the lower end of the dependent water supply tube, said projecting member having a diameter less than the internal diameter of the lower end of the tube to provide an annular space around said member through which the water can flow to the flash boiler.

2. In an electric smoothing iron of the kind having means for delivering steam to the underside of the sole plate comprising, a water reservoir disposed above the sole plate, a flash boiler provided in the sole plate and a water supply tube depending from the water reservoir and communicating at its lower end with the flash boiler; a sole plate having an opening therein

beneath the lower end of the dependent water supply tube, a plug mounted removably in said opening, said plug forming part of the flash boiler and having an upstanding part which projects into the lower end of said dependent water supply tube, said projecting part having a diameter less than the internal diameter of the lower end of the tube to provide an annular space around said part through which the water can flow to the flash boiler.

3. In an electric smoothing iron of the kind having means for delivering steam to the underside of the sole plate comprising, a water reservoir disposed above the sole plate, a flash boiler provided in the sole plate and a water supply tube depending from the water reservoir and communicating at its lower end with the flash boiler; a sole plate having a threaded hole thereing beneath the lower end of the dependent water supply tube, a threaded plug mounted removably in said threaded hole, said plug forming part of the flash boiler and having an upstanding part which projects into the lower end of said dependent water supply tube, said projecting part having a diameter less than the internal diameter of the lower end of the tube to provide an annular space around said part through which the water can flow to the flash boiler.

4. In an electric smoothing iron of the kind having means for delivering steam to the underside of the sole plate comprising, a water reservoir disposed above the sole plate, a flash boiler provided in the sole plate and a water supply tube depending from the water reservoir and communicating at its lower end with the flash boiler; a sole plate having a threaded hole therein beneath the lower end of the dependent water supply tube, a threaded plug mounted removably in said threaded hole, said plug forming part of the flash boiler and having an upstanding part which projects into the lower end of said dependent water supply tube, said projecting part having a diameter less than the internal diameter of the lower end of the tube to provide an annular space around said part, said sole plate and plug having an annular groove therebetween surrounding said plug, said plug having a recess on one side thereof providing a communication from said annular space to said annular groove the flash boiler being of tubular form communicating at one end with said annular groove, and said sole plate having also steam distribution channels on its under-side communicating with said flash boiler.

5. In an electric smoothing iron of the kind having means for delivering steam to the underside of the sole plate comprising, a water reservoir disposed above the sole plate, a flash boiler provided in the sole plate and a water supply tube depending from the water reservoir and communicating at its lower end with the flash boiler; the provision of an upstanding member which forms part of the flash boiler and which

projects into the lower end of the dependent water supply tube, said projecting member having a diameter less than the internal diameter of the lower end of the tube to provide an annular space around said member, the flash boiler being of tubular form comprising two aligned bores of different diameters, said sole plate having a passage connecting said annular space to said larger bore and said sole plate having also steam distribution channels on its underside communicating with said smaller bore.

6. In an electric smoothing iron of the kind having means for delivering steam to the underside of the sole plate comprising, a water reservoir disposed above the sole plate, a flash boiler provided in the sole plate and a water supply tube depending from the water reservoir and communicating at its lower end with the flash boiler; the provision of an upstanding conical member which forms part of the flash boiler and which projects into the lower end of the dependent water supply tube, said projecting member having a diameter less than the internal diameter of the lower end of the tube to provide an annular space around said member through which the water can flow to the flash boiler.

7. In an electric smoothing iron of the kind having means for delivering steam to the underside of the sole plate comprising, a water reservoir disposed above the sole plate, a flash boiler provided in the sole plate and a water supply tube depending from the water reservoir and communicating at its lower end with the flash boiler; a sole plate having an opening therein beneath the lower end of the dependent water supply tube, a plug which forms part of the flash boiler mounted removably in said opening, said plug having an upstanding conical part which projects into the lower end of said dependent water supply tube, said projecting part having a diameter less than the internal diameter of the lower end of the tube to provide an annular space around said part through which the water can flow to the flash boiler.

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