March 7, 1950 E. RAKOS 2,499,835

STEAM IRON

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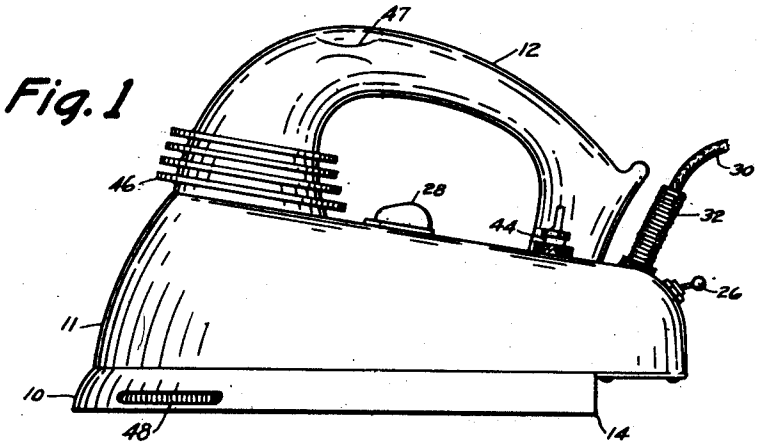
Fig. 1



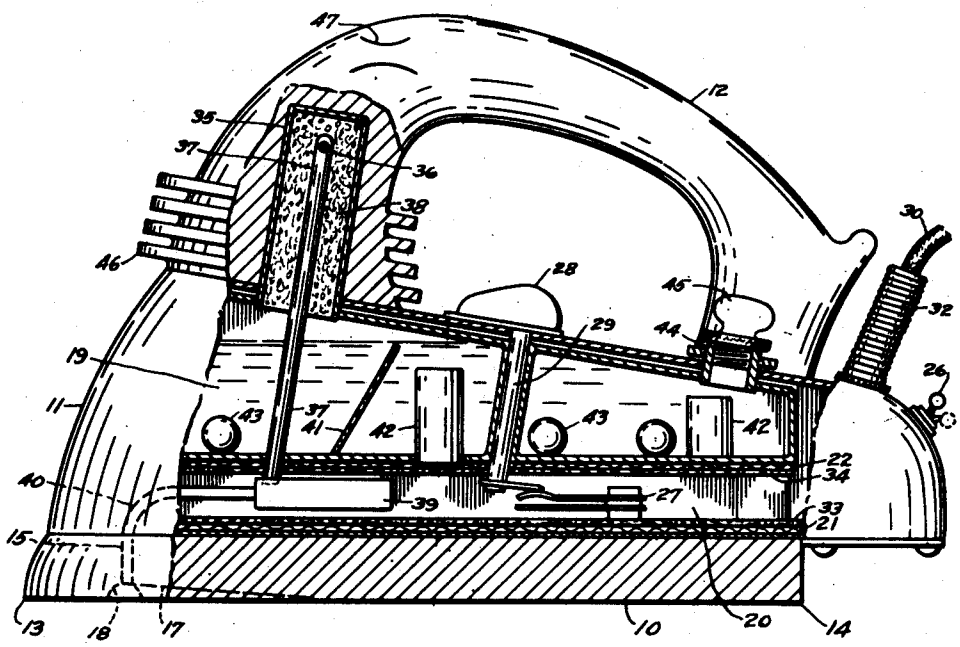




Fig. 2

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STEAM IRON

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Fig. 3

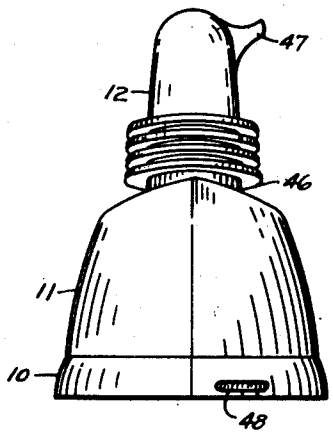



Fig. 4

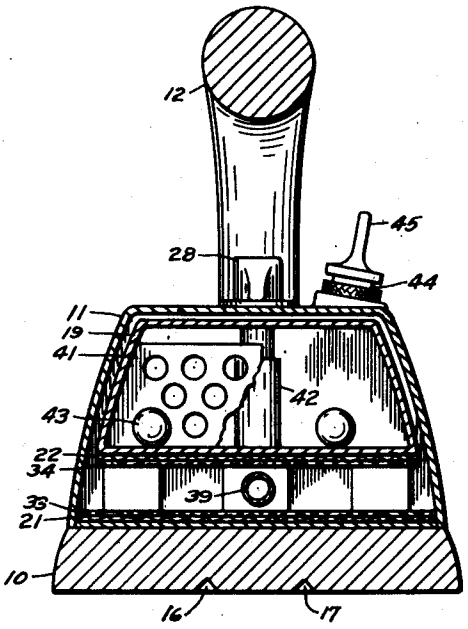
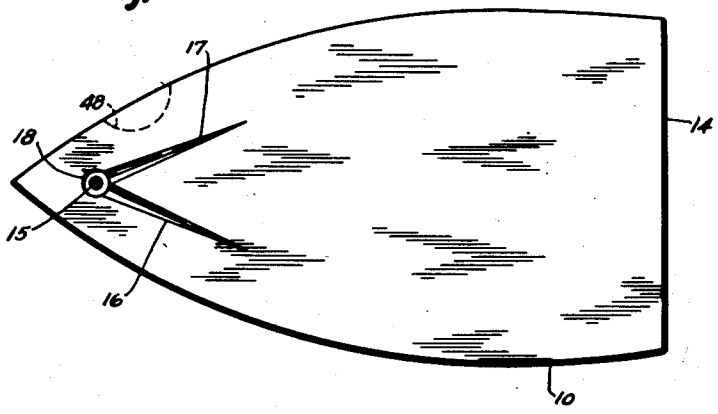



Fig. 5

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STEAM IRON

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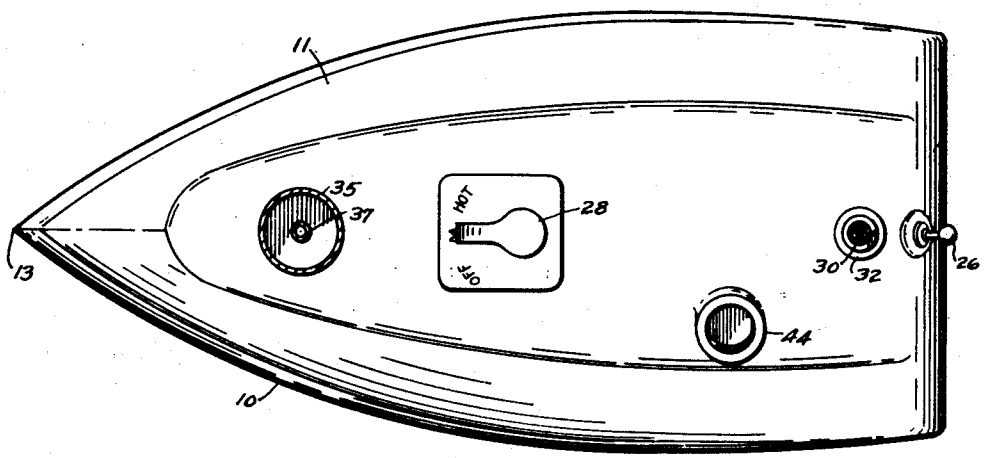
Fig. 6



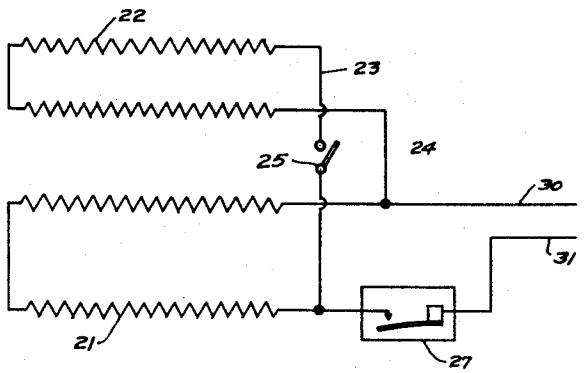




Fig. 7

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# UNITED STATES PATENT OFFICE

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## STEAM IRON

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3 Claims. (Cl. 38—77)

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This invention relates to electric irons and particularly the combination of means in an electric iron for supplying steam, and especially dry steam, to materials being ironed.

Irons of this type are generally known as steam irons, although electricity is used as the heating agent, however, the electricity is considered a minor element, as steam is sometimes supplied by other means.

Steam irons originated in the garment industry where comparatively large irons are used continuously and some are directly connected to steam generating boilers whereas others have boilers incorporated therein to which water is supplied from time to time as the water is depleted.

Steam irons have many advantages because the danger of extreme heat is eliminated and in addition a very slight degree of moisture may be supplied to the materials being ironed obviating the necessity of sprinkling.

At the present time there is an increased demand for steam irons, particularly in the garment trade, because a large portion of garments now in use are made wholly or at least partly of synthetic materials, which are readily damaged by extreme temperatures. However, as the use of synthetic materials is becoming universal, the use of steam irons is also spreading to the home where a comparatively small moist or dry steam iron, which approaches the efficiency of the steam irons used commercially, is desired.

It has been found that with an iron which produces moist steam, without water or condensation, it is not necessary to sprinkle garments before ironing, although with too much moisture in the steam materials may be damaged.

This invention, therefore, particularly relates to an iron having a steam generating chamber from which the steam may be injected into grooves in the ironing face of the iron through an evaporator in which excess moisture or any condensation in the connection is removed.

The invention also contemplates the combination, in a steam iron, of means readily turning the steam heating agent on and off at will whereby steam is generated only as desired, and also automatic means for turning the said heating agent off when use of the iron is discontinued.

The invention also involves the combination

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of the usual main heating element, having a thermostat for controlling the heat of the sole plate, and an auxiliary heating element for the steam chamber which is provided with suitable controls whereby the steam chamber element may or may not be used as desired.

The life of steam irons is normally limited because scale formations in the steam chamber reduce the area thereof and as scale formations are poor conductors of heat they cause inefficiency in heating; and therefore in this invention means for substantially eliminating scale is provided.

Steam irons have also been found objectionable because the steam connection is taken directly from the steam generating chamber and water in the chamber splashes out through the connection and is ejected with the steam, and for this reason this invention contemplates the use of a steam dome from which the steam connection is taken and in which the dome is packed with glass wool or the like to prevent water splashing into the said steam connection.

Steam irons have also been found objectionable because operators forget to turn off the steam heating element, which causes the water to boil out and the iron to burn, and this invention includes the use of a button for automatically turning off the steam generating element when use of the iron is discontinued and the iron is placed in a stand or the like, the button being so positioned that it will be engaged and operated to break the circuit when the iron is stood on end.

The purpose of this invention is to provide a combination electric and steam iron of the type normally used commercially in which means is incorporated for controlling the moisture of the steam and for turning off the steam generating means as desired and when the iron is not in use, thereby making the iron adapted for domestic or household use.

The iron includes the usual domestic iron thermostat by which the heat of the sole plate may be controlled to provide different degrees of heat and which will shut off when the temperature exceeds a predetermined degree, and also independent means in the electric circuit for turning the heating agent of the steam chamber on and off at will.

One of the objectionable features of steam

irons, which prevents their use in the home, is the size of the steam chamber. This is generally packed with glass wool or the like and necessarily relatively small so that it must be filled quite frequently. In the iron of this invention, the steam chamber is relatively large and substantially open the glass wool being only in a dome above the boiler, whereby the internal area may be considerably increased and the periodic filling time materially lengthened. Providing means for turning the steam generating agent on and off at will also extends the time before refilling the steam chamber is required because steam is only generated and used when the iron is in use.

Another objection to steam irons is that the filling opening is located at the highest point of the steam chamber so that the entire chamber is filled with water and the water splashes into the outlet causing wet steam. In the iron of this invention, the upper side of the steam chamber slopes and the filling point is located at a low point whereby the water will overflow therefrom before the chamber is completely filled, thereby preventing completely filling the boiler, and eliminating the danger of water entering and being discharged through the steam connection.

The steam generating chambers of steam irons are so arranged that the heat is applied at the base and when the water is low violent boiling occurs. To prevent this, the iron of this invention has incorporated therein heating elements which convey the heat from the base upward into the water thereby providing uniform heating.

Various devices have been provided for indicating from the exterior of steam irons the amount of water in the steam chamber and, as water gauges are expensive and therefore objectionable for irons of this type, thermostatic elements are usually provided, which burn out and break the circuit when the water is depleted, and replacing these elements, which are usually located at some inconvenient point, is very objectionable. The steam iron of this invention, therefore, contemplates the use of rollers in the steam chamber which perform a double purpose in that when the chamber contains water they will roll silently but when the water is depleted they will cause a rattling sound, thereby warning the operator that the water has been used. These rollers also, by their movement in and around the boiler, tend to dislodge scale formations, preventing accumulation thereof on the inner boiler surfaces.

The object of this invention is, therefore, to provide a steam iron, such as is normally used commercially, for domestic use in which the size of the iron is reduced and at the same time the area of the steam heating chamber increased.

Another object of this invention is to provide in a combination electric and steam iron means for breaking the circuit to the steam generating means when use of the iron is discontinued.

Another object of the invention is to provide means for removing excess moisture from the steam as it is used.

A further object of the invention is to provide a steam outlet connection from the steam chamber in which means is provided for preventing water splashing into the said connection.

A still further object is to provide in a steam chamber for irons and the like a filling opening located below the high point of the chamber through which water will overflow, preventing filling the steam chamber completely.

With these and other objects in view, the invention embodies a steam iron, having a base or sole plate, a steam chamber above and spaced from the said sole plate having a sloping upper surface, heating elements for said base and steam chamber, means controlling the heat to the said heating elements, a steam connection from a steam dome of the steam chamber to grooves in the face of the sole plate, an evaporator in said steam connection, an auxiliary switch adapted to break the circuit to the steam chamber heating element as desired and when use of the iron is discontinued, means conveying heat upward through the interior of the steam chamber, and means preventing scale and the like forming on the inner surfaces of the said steam chamber.



Various other more detailed objects and advantages of the invention, such as arise in connection with carrying out the above noted objects in a practical embodiment, will in part become apparent and in part be hereinafter stated as a description of the invention proceeds.

For a full and more complete understanding of the invention, reference may be had to the following description and accompanying drawings, wherein:

Figure 1 is a view showing a side elevation of the iron.

Figure 2 is a similar view with parts broken away showing the interior construction of the iron.

Figure 3 is a front elevation of the iron showing a thumb rest on the forward part of the handle.

Figure 4 is a cross section through the iron with part of a baffle plate therein broken away.

Figure 5 is a plan view showing the steam grooves in the face of the sole plate of the iron.

Figure 6 is an upper plan view of the iron with the handle removed.

Figure 7 is a wiring diagram showing the combination circuits in the iron.

Referring now to the drawings wherein like reference characters denote corresponding parts, the iron is formed with a sole plate 10, a shell 11 and a handle 12.

The sole plate 10 is of the usual type, having a point 13 in the front and a straight edge or heel 14 at the rear and in the forward part is an opening 15, communicating with V-shaped grooves 16 and 17 as shown in Figures 2 and 5. Dry steam is supplied to the opening 15 and from a recess 18 at the lower end thereof the steam is distributed to the grooves 16 and 17 and from these to the material being ironed.

The steam is generated in a boiler or steam chamber 19 in the upper part of the shell 11, and this chamber may be of any shape or design and incorporated in the iron in any manner. In the design shown, it is spaced from the sole plate 10, providing an open air chamber 20 between the sole plate and steam chamber, and in this opening and directly associated with the sole plate 10 is the main heating element 21, which corresponds with the usual heating element of an electric iron and which is connected across the power lines 30 and 31. Above this element and closely associated with the base of the steam chamber 19 is the steam generating element 22, which as illustrated in Figure 7, is also connected across the power lines 30 and 31 through wires 23 and 24. The wire 23 is provided with a switch 25 adapted to be operated by a button 26 at the back of the iron as shown in Figures 1 and 2.

The circuit of the element 21 is provided with the usual thermostatic element 27, which may be set to provide different temperatures by an indicator 28 positioned on the upper surface of

the shell 11 and connected to the element 27 through a post 29. The elements 21 and 22 may be connected through wires 30 and 31 to any suitable source of electric current, the wires extending outward from the shell through the usual coil connection 32. The elements 21 and 22 may be covered with layers 33 and 34 of insulating material as shown in Figure 2.

Steam generated in the chamber 19 passes upward into a steam dome 35 and through an opening 36 in a tube 37. The tube which may be surrounded by glass wool 38, or the like, to prevent water splashing into the opening extends downward to an evaporator 39, which, being positioned between the two heating elements, is relatively hot and condensation dropping therein from the tube will be readily evaporated. The dry steam from the evaporator will then pass through a connection 40 to the opening 18 in the sole plate from which it will be distributed to the grooves 16 and 17 as described.

The chamber 19 is provided with a transverse baffle 41 having openings therethrough, which prevents swishing of water in the chamber backward and forward as the iron is used. The chamber is also provided with heat-radiating elements 42, which may be located at various points in the boiler, and being positioned with their lower ends closely associated with the heating element will convey heat upward through the water providing even distribution thereof and thereby preventing violent boiling of the water when the water is low in the boiler. Rollers or balls 43 are also provided in the boiler which are free to roll back and forth to break scale formations, and these are also used to provide a rattle with the backward and forward motion of the iron to indicate that water in the boiler has been depleted.

The chamber 19 is also provided with a filling opening 44, having a plug 45 therein that may be removed to fill or drain the boiler.

The handle 12 may be of any type or design and the forward end may be formed with cooling fins 46 and on the upper part is a thumb rest 47 as shown in Figures 1 and 3. The rear end of the handle is provided with a projection, as shown, which cooperating with the end of the body of the iron provides a rest so that when not in use the iron may be stood on end with the forward end extending upward. When the iron is placed in this position, the button 26, associated with the heating element of the boiler will strike a surface upon which the iron is placed and the surface will cause the button to move from the position shown in dotted lines of the drawing to that shown in full lines which movement will turn off the circuit and thereby break the circuit of the heating element 22.

The sole plate 10 of the iron may be formed with a small button opening 48 in the forward part to expedite ironing around buttons and the like.

The construction and general arrangement of the iron will be readily understood from the description. In use the iron may be provided as shown and described, and with water in the boiler the current may be turned on to heat the sole plate and generate steam and the steam will pass upward through the glass wool in the dome where it will enter the connection 37 and pass downward through the connection to the evaporator. Any moisture in the steam will be removed by the evaporator and the dry steam will then pass downward to the grooves in the face of the sole plate from which it will be applied in vapor form to materials being ironed. While in use, the button 26 may be in the downward position shown in Figure 1, and when less steam is desired, this may be snapped upward to the position shown in Figure 2 to break the circuit to the steam heating element, or, should the iron be stood on the end, or in a stand with the projection at the lower end of the handle and the back of the body of the iron resting upon a flat surface, the surface upon which it is placed will engage the button 26 and automatically snap it upward and break the circuit to the heating element of the steam chamber. The iron may be shaken or moved backward and forward rapidly at intervals to determine whether or not the boiler contains water and should the water be depleted the rollers in the boiler will cause a rattle. The iron may also be used as an electric iron without the boiler by breaking the circuit to the steam heating element with the button 26.



While a preferred specific embodiment of the invention is hereinbefore set forth, it is to be clearly understood that the invention is not to be limited to the exact construction illustrated and described because various modifications of these details may be provided in putting the invention into practice within the purview of the appended claims.

What is claimed is:

1. In a combination electric and steam iron, comprising a sole plate, a heating element immediately adjacent the inner face of said sole plate, a steam boiler spaced from said sole plate and a heating element immediately adjacent the underside of the bottom of said steam boiler, the heating elements for said sole plate and boiler being spaced apart, means conveying steam from the said steam boiler to the face of the sole plate said means controlling the moisture of the steam said last-mentioned means including an evaporating chamber arranged between said heating elements and included in said steam conveying means.

2. In a combination electric and steam iron, comprising a sole plate, a heating element immediately adjacent the inner face of said sole plate, a steam boiler spaced from said sole plate and a heating element immediately adjacent the underside of the bottom of said steam boiler, the heating elements for said sole plate and boiler being spaced apart, means conveying steam from the said steam boiler to distributing grooves in the face of the sole plate, and means evaporating condensation in the said steam said last-mentioned means including an evaporating chamber included in said steam conveying means and arranged between and receiving heat from said heating elements.

3. A steam iron comprising a sole plate, a heating element associated with the sole plate, a steam generating boiler spaced from the said sole plate, a heating element associated with the said boiler, a housing enclosing said boiler and heating elements, a handle on said housing, a thermostatic heat control switch connected to said first-mentioned heating element and adjustably regulated by a button on said housing, and a control switch independently associated with the boiler heating element and effective with the thermostatic heat control switch to complete a circuit through both of said elements, said boiler characterized by means including radiators for distributing heat

to the upper part of the interior thereof said radiators being positioned with their lower ends in juxtaposition with the boiler heating element.

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