May 24, 1955 J. D. VOSKRESENSKI 2,708,801

ELECTRIC STEAM IRON

Filed Sept. 1, 1953

2 Sheets-Sheet 1

Fig. 1

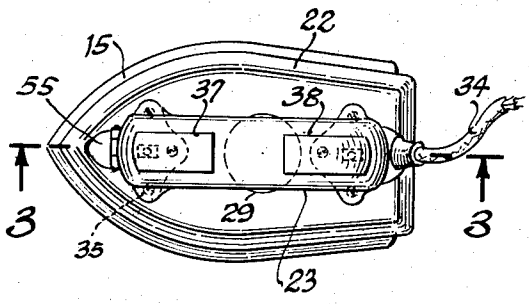


Fig. 2

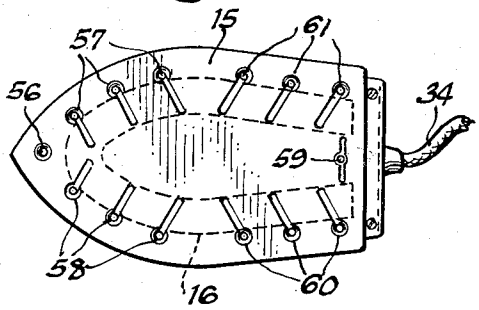


Fig. 3

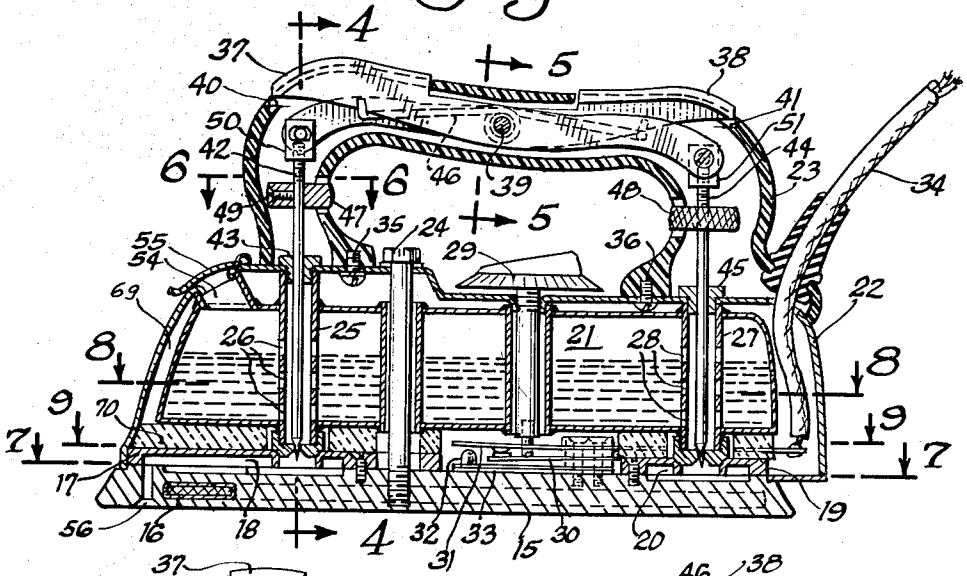
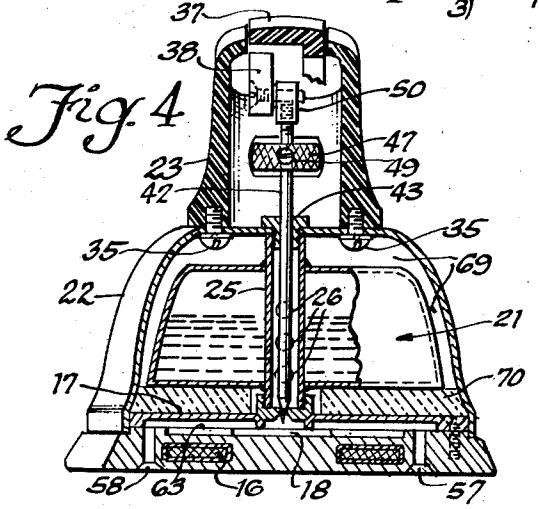


Fig. 4



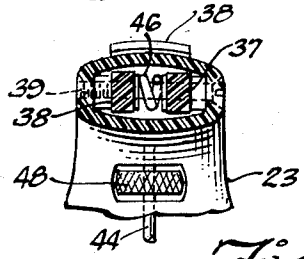


Fig. 5

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2 Sheets-Sheet 2

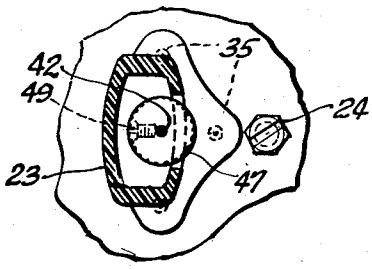


Fig. 6

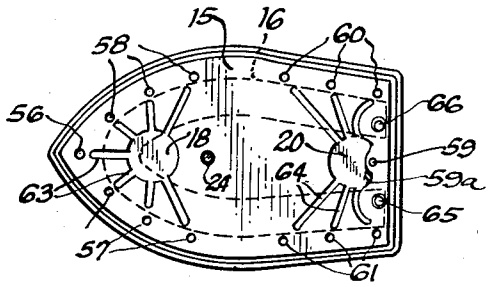


Fig. 7

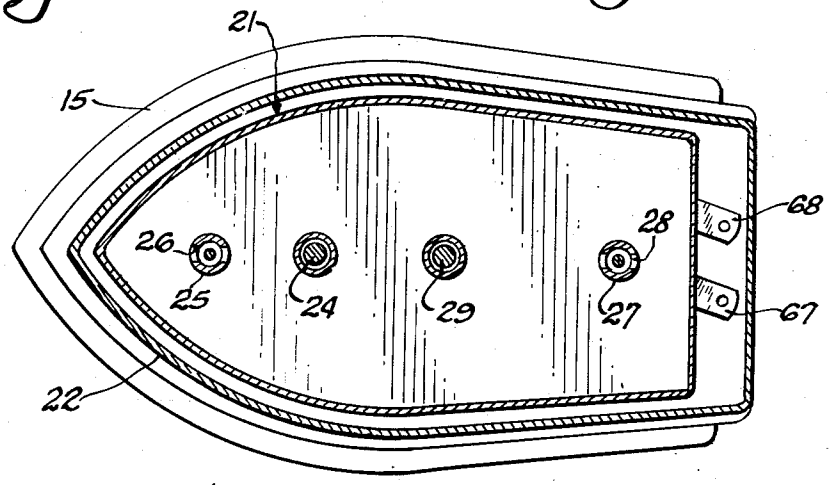


Fig. 8

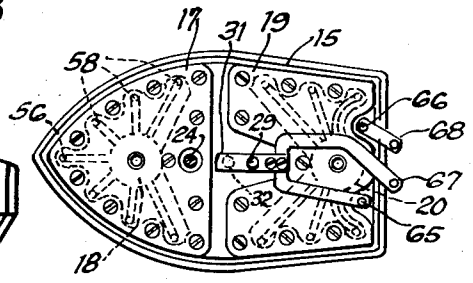


Fig. 9

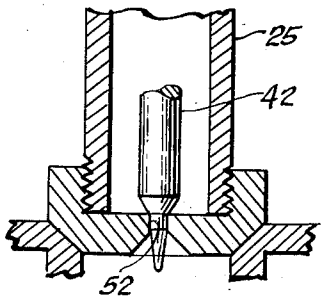


Fig. 10

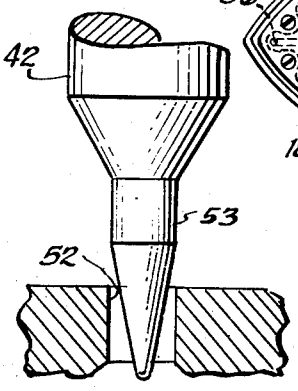


Fig. 11

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ELECTRIC STEAM IRON

Jacob D. Voskresenski, Chicago, Ill.

Application September 1, 1953, Serial No. 377,859

8 Claims. (Cl. 38—77)

This invention relates to manually operated ironing and pressing devices.

In particular this invention relates to ironing devices in which water is changed to steam and the steam is controllably distributed to the garment being ironed.

This application is an improvement over my co-pending application, Serial Number 242,294, now U. S. Patent Number 2,664,653, filed August 17, 1951.

An object of the invention is to provide a manually operated combination steam and dry iron in which water is changed to steam and the steam is controllably distributed, in the direction of the movement of the iron, to the garment being ironed.

A special object of the invention is to provide both a method and means of distributing steam and controllably delivering the steam to the leading edge of the hand operated ironing device.

Another object of the invention is to provide both a method and means for distributing and controlling the supply of steam to the leading edge of a hand operated electric steam iron by utilizing the natural and normal motion of the arm and hand of the operator to accomplish such distribution of the steam.

These and other objects are accomplished in my invention as will be apparent from the following description and claims read in connection with the accompanying drawings, in which:

Fig. 1 is a horizontal view looking down on the top of my electric steam iron.

Fig. 2 is a horizontal view looking up to the bottom surface of the ironing plate.

Fig. 3 is a vertical sectional view of my iron along line 3—3 of Fig. 1 but drawn to a much larger scale.

Fig. 4 is a vertical sectional view along line 4—4 of Fig. 3 drawn to the same larger scale.

Fig. 5 is a slightly inclined sectional view along line 5—5 of Fig. 3.

Fig. 6 is a horizontal sectional view along line 6—6 of Fig. 3.

Fig. 7 is a horizontal view along line 7—7 of Fig. 3 but drawn to the prior smaller scale.

Fig. 8 is a horizontal sectional view along line 8—8 of Fig. 3 and drawn to the larger scale of Fig. 3.

Fig. 9 is a horizontal sectional view along line 9—9 of Fig. 3 but drawn to the smaller scale of prior Figs. 1, 2 and 7.

Fig. 10 is a fragmentary sectional view of the valve for controlling passage of water into the area for making steam as shown in Figs. 3 and 4 but to a much larger scale.

Fig. 11 is a still larger fragmentary sectional view of the same valve.

Referring to the drawings, a preferred embodiment of the device of my invention, which utilizes my method of controlling and distributing steam to the leading edge of said device, includes an ironing base 15, sometimes called a soleplate, containing an electric heating element 16, a cover plate 17 to the front steam chamber 18 and

another cover plate 19 to the rear steam chamber 20, an insulated water chamber 21, a housing or casing 22 enveloping said water and said steam chambers and joined to said ironing base, and a hollow handle 23 having movable sections connected to said housing.

In addition to the aforesaid basic elements my invention also includes a long bolt-like means 24 for holding the housing 22, the water chamber 21, and soleplate 15 together, as best seen in Fig. 3. More details of construction are best illustrated in the same sectional view, such as, the front water-well 25 with the series of circular holes 26 in the walls of the well to permit the passage of water from chamber 21 into water-well 25, and the rear water-well 27 with circular holes 28 in its wall. Thermostat control dial 29 when turned separates copper lead 30 from copper lead 31. A ceramic peg 32 is located near the free end of a bi-metallic strip 33 which curves upward under the influence of heat from the soleplate 15. The two copper leads 30 and 31 are connected to two electrical wires which are represented by 34.

The handle assembly is fastened to the top of casing 22 by front bolts 35 and rear bolts 36. The feature of the handle is two similar levers 37 and 38 which are oppositely disposed in hollow handle 23 and capable of rocking up and down on pin 39. The rocking motion of the levers is limited by ledges 40 and 41 carved in the top wall of the hollow handle 23. The opposite ends of the levers are suitably connected as shown to elongated spindle-like rod 42 which extends through packing stopper 43 located at the top of the front well 25, and spindle-like rod 44 which extends through packing stopper 45 located at the top of the rear well 27. A strong steel spring wire 46 is wound around pin 39 and the turned up ends of the spring 46 engage the bottom and side of the levers 37 and 38 that have contoured surfaces to match the curvature of the hollow handle 23. The steel wire spring 46 is designed to raise the upper surfaces of levers 37 and 38 slightly above the upper surface of the hollow handle as shown in Fig. 3.

The spindle-like rods 42 and 44 have adjusting wheels 47 and 48 respectively fastened thereon by set screws, such as 49, whereby the rods can be screwed into and out of members 50 and 51 respectively, which had been previously drilled, tapped and internally threaded. The bottom of wells 25 and 27 have circular openings, 52 in Fig. 11, into which the tapered ends of rods 42 and 44 respectively pass. The lower ends of the spindle-like rods are shaped as shown in Fig. 10 and the very much enlarged view of Fig. 11. The ends have two collar sections tapered at different angles on either side of a collar section 53 which has sides that are vertical and parallel to the sides of the vertical rods. When the rods 42 and 44 are in their normal positions under the control of steel spring 46, the vertical collar sections 53 fittingly close the circular openings 52 in the bottom of both water wells 25 and 27. This adjustment of elements is illustrated in Fig. 10. When lever 38 is depressed by the ironer, spindle rod 42 will be raised so that the vertical collar section 53 is lifted out of the hole or circular opening 52. This movement of rod 42 will permit water that has passed from chamber 21 through openings 26 into water-well 25 to flow through opening 52 into front steam chamber 18 where it is changed to steam. Similarly when lever 37 is depressed by the operator spindle rod 44 will be raised so that the vertical collar section 53 near the end of rod 44 will be lifted out of hole 52. Thus water that has passed from chamber 21 through openings 28 into water-well 27 will flow through opening 52 into rear steam chamber 20 where it is changed into steam. These latter arrangements of elements are illustrated in Fig. 11.

It should be clear to all that because of the tapered end section of the spindle rod the more it is lifted out of open-

ing 52 the larger will be the valve opening and the more water will be supplied to the steam-forming chambers 18 and 20 from wells 25 and 27 respectively. The regulation of the delivery of water from chamber 21 through the water-wells 25 and 27 into the steam chambers 18 and 20 respectively is accomplished by turning the adjusting wheels 47 and 48 so as to lengthen or shorten the effective lengths of rods 42 and 44 respectively, thereby lessening or increasing the valve openings at 52 and likewise lessening or increasing the water passing into said steam chambers respectively. Water is supplied to chamber 21 through channel 54 which is closed by a spring-hinged covering element 55.

In Fig. 2 is shown the bottom of the ironing base 15 with the multiple series of steam ports and their dispensing grooves. As will be explained later herein when the iron is moved forward steam flows through port 56 and the two forward series of ports 57 and 58. No steam flows through the other ports during the forward motion. When the iron is moved backward steam flows through the rear port 59 and the rear series of ports 60 and 61. In such backward motion no steam flows out through the other ports. The grooves help to distribute the steam from the port holes over the surface of the material being pressed. Port 59 has grooves extending from the port in opposite directions toward the sides of the sole plate 15 so as to better distribute the steam on the material being pressed.

Fig. 7 is a top view of the sole plate 15 only and shows the location of the steam forming chambers 18 in the front and 20 in the rear of the iron. The multiple channels 63 assist the steam to flow from front chamber 18 to the forward port 56 and series of ports 57 and 58. The multiple channels 64 assist the steam to flow from rear chamber 20 to rear series of ports 60 and 61. There is no channel provided for port 59 but there is a raised barrier 59*a* around it which is designed to allow steam to pass over it to the port hole 59 but which also holds back any water from the rear chamber 20 passing to the port hole. For the same reason none of the channels of frontal group 63 or rear group 64 are shown connecting with the actual steam ports. The wall of metal between each channel and its corresponding port hole holds back any condensate or unevaporated water from passing out the port holes. Nevertheless, the steam vapor passes freely over the walls of metal by reason of the space provided by the steam cover plates described later herein.

Also clearly shown in Fig. 7 and Fig. 2 in dotted outline is the approximate horse-shoe shaped electric heating element 16. The electrical wiring posts for the heating element are shown in Fig. 7 as 65 and 66.

In Fig. 8 the cross sectional view shows clearly the water-wells 25 and 27 with the indicated circular openings 26 and 28 for passage of water into said wells. Also shown are the cross sections of the bolt 24 for holding the primary elements of the steam iron together and of the thermostat stem 29. The flat copper leads 67 and 68 which are joined to the electric wires in lead wire 34, shown in detail in Fig. 3, extend under water chamber 21 and are connected to electric posts 65 and 66 respectively.

The cover plate 17 to front steam-forming chamber 18 and the other cover plate 19 to the rear steam-forming chamber 20 are shown bolted in place to the top side of the ironing base 15 in Fig. 9. Further detail of the electrical copper leads 67 and 68 are also shown in Fig. 9. The bi-metallic strip 33 under the influence of the heat imparted to it by the electrical resistance heating element 16 in the sole plate 15 arcs upward so that the porcelain post 32 raises copper lead 31 out of contact with copper lead 30 thus breaking the electrical circuit and stopping any further heating up. Regulation of the temperature resulting is possible by turning dial 29 and thereby adjusting the gap between copper lead 31 and by-metallic element 33.

Fig. 5 shows a cross section view through the top of the handle at a slight angle to a vertical plane to show the position of the steel spring wire 46 between levers 37 and 38 on pin or bolt 39.

Fig. 6 shows a cross section view through the front part of the handle looking down on the regulating wheel 47.

The steam iron is insulated by an almost continuous air space 69 which envelopes the water chamber 21 and other elements of the iron except the sole plate 15. It is within the scope of this invention to fill the air space with insulating material, such as glass wool, felt, etc. The water chamber 21 is further insulated from the hot sole plate 15 by a layer 70 of insulating material, such as felt, glass wool, etc.

In operating the electric steam iron of this invention steam is generated and delivered to the leading edge of the device whether the motion is forward in the direction in which it is pointed, or backward in the opposite direction. At the same time no steam is supplied through the ports and grooves in the other half of the ironing base to the rear of whichever end is the leading edge. This control and distribution of steam while utilizing the normal ironing motion of the operator is the feature of this invention.

Assume a right-handed operator grasps the handle of the device of this invention. In such a case the thumb and fingers of the operator would fold under handle 23, but the flesh pad where his index finger joined his hand would rest on the curved end of lever 37 while the flesh pad where his little finger joined his hand would rest on the curved end of lever 38. Looking now at Fig. 3, if the presser moves the iron forward in the direction it is pointed, that is to the left, the presser's hand, or pad of his little finger where it joins his hand, would press down on lever 38. Then the opposite end of the lever would lift spindle rod 42 in water-well 25 so as to lift collar 53 near the end of rod 42 out of the opening 52 in the bottom of well 25. Thus water from chamber 21 already in well 25 would flow down opening 52 into steam chamber 18 where the water would be vaporized. The steam thus generated by reason of heat from the electrically heated sole plate 15 would flow through all the channels 63 to the front port 56 and the front series of ports 57 and 58.

In moving the iron to the left the presser would naturally turn his right wrist slightly thus bearing down on lever 38 and removing all pressure from the front of the iron in order that the iron would slide over the material being pressed and not dig into the material. This natural motion of the operator's arm and grasping hand insures that the iron will not dig into the goods being ironed and that steam will be spread over the goods as the iron slides forward. It is almost foolproof because when the presser pushes lever 38 down then 37 is up under the pressure of steel spring 46. When lever 37 is up its opposite end is down and spindle rod 44 pushes its vertical collar 53 into opening 52 of water-well 27 so that no water is delivered to steam generating chamber 20. Thus under the normal movement of a presser's arm steam can only be delivered to the forward edge of the ironing device of this invention.

If the opertaor moves the iron backward, that is to the right when looking at Fig. 3, he would press down on lever 37 under his index finger and lift all pressure from the rear of the iron. Thus the iron would slide backward over the material being pressed, that is to the right when looking at Fig. 3, and in similar manner described above lever 37 would lift spindle rod 44 so that water which had already entered water-well 27 would flow into rear steam generating chamber 20. Steam formed therein by heat from sole plate 15 would pass through channels 64 to rear port 59 and rear series of ports 60 and 61. At the same time no water would enter steam chamber 18, hence no steam would pass through port 56 and the front series of ports 57 and 58.

The same operations would take place if the operator

was left-handed because he would turn the iron around.

My invention of a method and means for delivering steam to the forward or leading edge of a steam iron is subject to various modifications and alternate constructions. I have shown and described a preferred embodiment but do not wish to be limited to the specific disclosures made herein. It is my intention to cover all modifications and alternative constructions falling within the spirit and scope of my invention as expressed in the following claims.

I claim as invention:

1. An ironing device comprising a water chamber communicating with a well located in the forward half of said device and with a well located in the rear half of said device, a separate steam generating chamber located beneath each of said water wells, each of said wells having a valve located centrally therein, multiple channels leading from said steam generating chambers toward multiple ports through an ironing base, said ironing base containing electric heating means to heat said base and to convert water in said steam generating chambers into steam, a handle to said device having oppositely disposed levers, and identical means connected to opposite ends of said levers for operating said valves in the bottom of said water-wells so as to deliver water into said steam generating chambers.

2. A steam iron comprising an insulated water chamber in communication with a water-well in the forward half of said iron and a second water-well in the rear half, a valve in the bottom of each water-well communicating with separate steam generating chambers located beneath each of said water-wells, multiple grooves leading from each of said generating chambers toward multiple steam ports, said multiple steam ports being grouped around the forward end and rear end of said iron, a handle having oppositely disposed levers therein which are rockable on a centrally disposed pin, spindle-like rods attached to opposite ends of said two levers, said spindle-like rods extending down through aforesaid water-wells to open and close the aforesaid valves in the bottom of said water-wells.

3. An electrically heated steam iron comprising an insulated water chamber communicating with a forward water-well and a rear water-well, each water-well having a centrally disposed valve in the bottom, said valves leading into separate steam generating chambers located below said water-wells, each of said steam generating chambers having multiple grooves leading from said chambers toward multiple ports, said multiple ports extending downward through an ironing sole plate and grouped around the forward end and rear end of said iron, said ports having grooves connecting thereto on the bottom of said sole plate for distributing steam, said steam iron being moved by means of a hollow handle, said hollow handle having two oppositely disposed levers and a steel spring mounted centrally therein, said levers having oppositely disposed free ends matching in general the contour of said handle and oppositely disposed ends to which spindle-like rods are attached, the lower ends of said spindle-like rods being tapered and shaped so as to fittingly close the openings of aforesaid valves in the bottom of aforesaid water-wells.

4. An electric steam iron comprising a water chamber with two water wells in connection therewith, one well being located below the front portion of said chamber and the other well being located below the rear portion of said chamber, each of said wells having a central valve opening in the bottom that is normally closed, when the steam iron is not in use, by a spindle-like rod that fills said opening, said spindle-like rods being connected at their upper ends to separate levers disposed in the hollow handle of said iron, said levers being oppositely disposed in said hollow handle so their free ends terminate at opposite ends thereof, said levers being movable by the hand of the operator of said steam iron when he grasps said handle in the normal movement of said iron so that any motion of said iron forward will cause the operator's hand to depress the lever terminating near the rear end of said handle and simultaneously raise the spindle-like rod out of the valve opening in the forward water well, thereby admitting water to a steam chamber located beneath said forward water well, said steam chamber being heated by an electrical element disposed in the sole plate of said iron sufficient to vaporize all water admitted thereto, said vaporized water passing from said forward steam chamber through multiple horizontal channels in said sole plate to multiple ports grouped around the front end of said sole plate.

5. An electric steam iron comprising a water chamber with two water wells in connection therewith, one well being located below the front portion of said chamber and the other well being located below the rear portion of said chamber, each of said wells having a central valve opening in the bottom that is normally closed, when the steam iron is not in use, by a spindle-like rod that fills said opening, said spindle-like rods being connected at their upper ends to separate levers disposed in the hollow handle of said iron, said levers being oppositely disposed in said hollow handle so their free ends terminate at opposite ends thereof, said levers being movable by the hand of the operator of said steam iron when he grasps said handle in the normal movement of said iron so that any motion of said iron forward will cause the operator's hand to depress the lever terminating near the rear end of said handle and simultaneously raise the spindle-like rod out of the valve opening in the forward water well, thereby admitting water to a steam chamber located beneath said forward water well, and any motion of said iron backward will cause the operator's hand to depress the lever terminating near the front end of said handle and simultaneously raise the spindle-like rod out of the valve opening in the rear water well, thereby admitting water to another steam chamber located beneath said rear water well, said steam chambers being heated by an electric element disposed in the sole plate of said iron capable of vaporizing all water admitted to said steam chambers, said vaporized water passing from either of said steam chambers through multiple horizontal channels in communication therewith to multiple ports grouped around the front and rear ends of said sole plate depending on which direction said iron is moving which determines in which chamber steam is then being generated.

6. An electric steam iron comprising an insulated water chamber with two identical water wells in connection therewith, one water well being centrally located in the bottom of the front portion of said water chamber, the second water well being approximately centrally located in the bottom of the rear portion of said water chamber, each of said wells having a valve opening in the center of the bottom which is normally closed when the iron is not being used as a steam iron by a spindle-like rod that is shaped at the lower end to plug and close said valve opening, the upper ends of said spindle-like rods being hingedly connected to separate levers disposed in the hollow handle of said iron, said levers being oppositely disposed in said hollow handle so their free ends terminate at opposite ends thereof, said levers being movable by the hand of the operator of said iron in the normal movement of said iron in a forward or backward direction so that any forward motion will cause the operator's hand to depress the rear lever thereby opening the valve in the forward water well and any backward motion of said iron will cause the operator's hand to depress the forward lever thereby opening the valve in the rear water well, said selective opening of said valves admitting water to separate steam chambers located beneath said water wells and in communication therewith, which water is vaporized by heat from an electric heating element disposed in the sole plate of said iron and directed through chan-

nels in communication with said steam chambers, and thence through multiple ports in communication with said channels through said sole plate onto the material being pressed, which selective opening of said valves is determined by the direction the operator moves said iron.

7. An electrically heated steam iron designed to deliver steam to its leading edge whether moved forward or backward comprising an insulated water chamber with a water well located centrally in the bottom of the front portion of said water chamber and a second water well located centrally in the bottom of the rear portion of said water chamber, each of said water wells having a central valve opening in the bottom, said central valve openings being normally closed when said steam iron is not in use as such by spindle-like rods that have their lower ends shaped to close said valve openings, said spindle-like rods extending vertically through said water wells and into separate ends of a hollow handle of said iron, said spindle-like rods being hingedly connected at their upper ends to separate levers disposed in the hollow handle of said iron, said separate levers being oppositely disposed in said hollow handle so their free ends terminate at opposite ends thereof and extend slightly above the surface of said hollow handle, said free ends of said levers having curvaceous hand rests that conform to the shape of said handle, said free ends of said levers being selectively depressed by the hand of the operator as he grasps said handle and normally moves said iron forward or backward, separate steam chambers beneath said front and rear water wells and in communication therewith through said central valve

openings, each of said steam chambers communicating with separate channels in the sole plate of said iron and radiating to multiple ports extending down through said sole plate and grouped around the front and rear ends of said plate, said sole plate containing an electric heating element capable of vaporizing all water admitted to said steam chambers, and said separate levers being so connected to said spindle-like rods that when operator moves said iron forward his hand depresses the rear lever and simultaneously raises the spindle-like rod in the front water well so that water from said well enters said front steam chamber, and when operator moves said iron backward his hand depresses the front lever and simultaneously raises the spindle-like rod in the rear water well so that water from said well enters said rear steam chamber.

8. An electrically heated steam iron which delivers steam to its leading edge whether moved forward or backward as set forth and claimed in claim 3 and also including threaded means associated with each of said spindle-like rods for regulating the effective length of each rod and thereby regulating the amount of water permitted to pass from either of said water wells to the steam chamber in communication therewith.

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