

July 11, 1944.

K. L. WOODMAN

2,353,425

STEAM IRON

Filed March 11, 1941

2 Sheets-Sheet 1

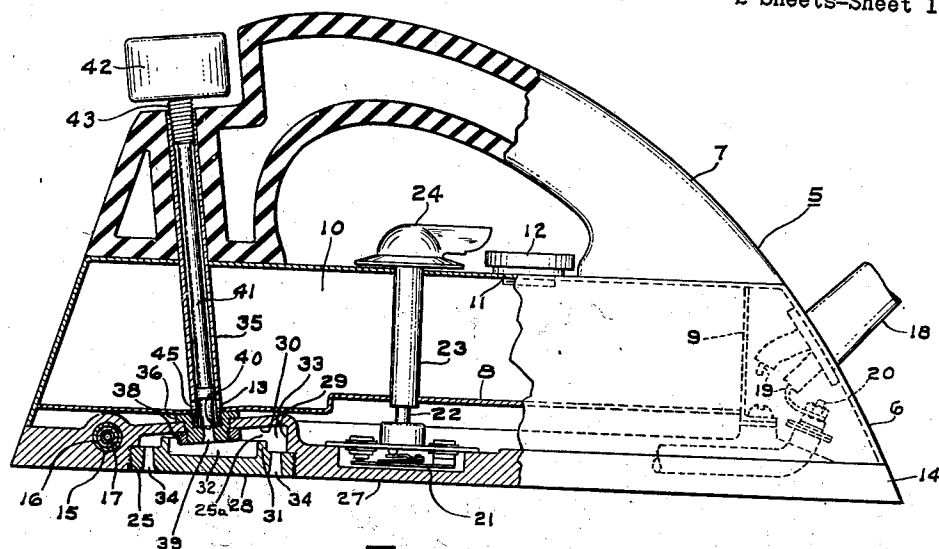


FIG. 1.

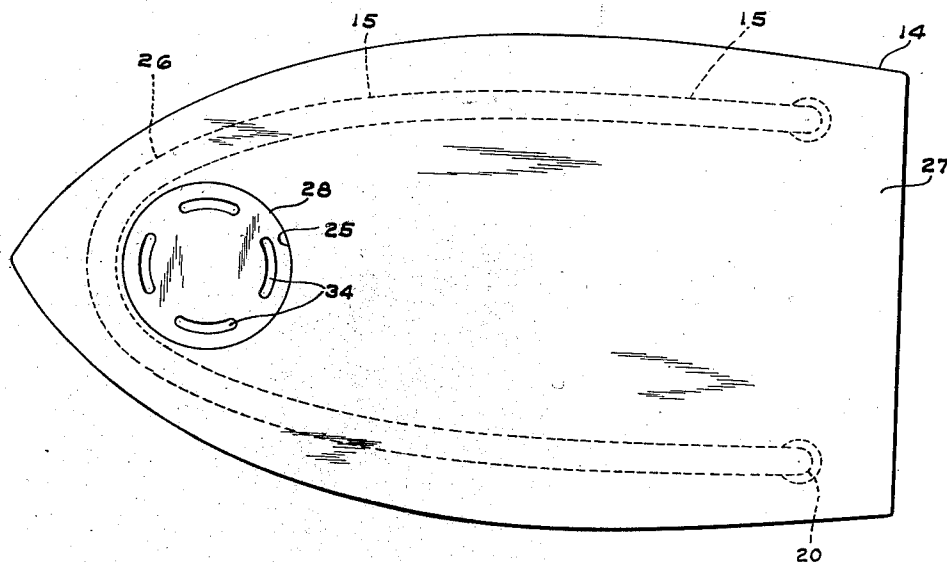


FIG. 2.

WITNESSES:

K. E. Enwall
E. Lutz

INVENTOR
KENNETH L. WOODMAN.

BY *Watt*
ATTORNEY

July 11, 1944.

K. L. WOODMAN

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2 Sheets-Sheet 2

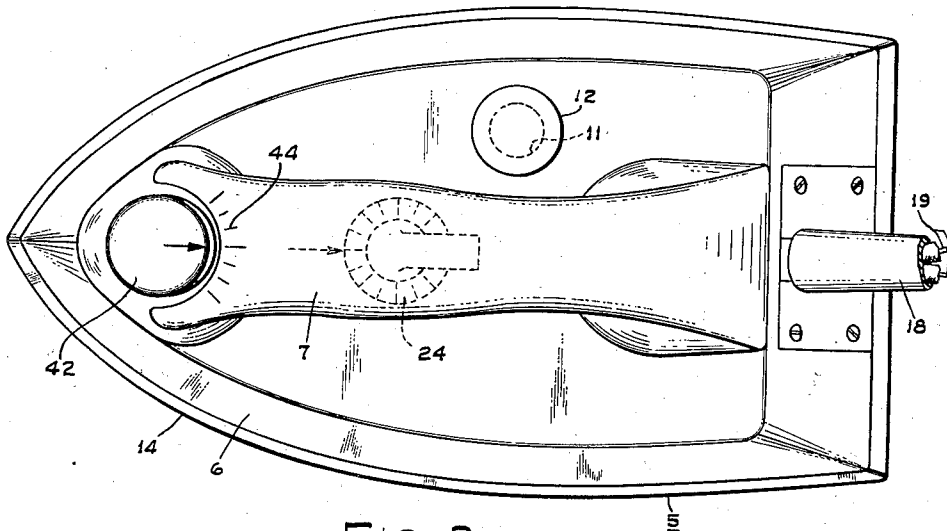


FIG. 3.

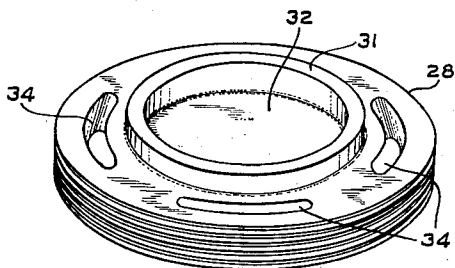


FIG. 4

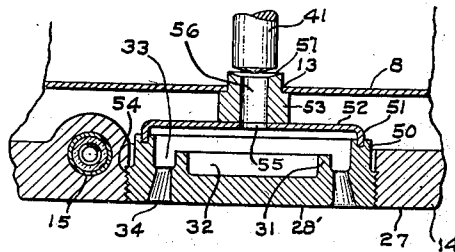


FIG. 5.

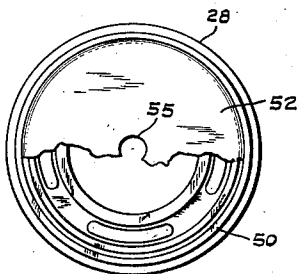


FIG. 6.

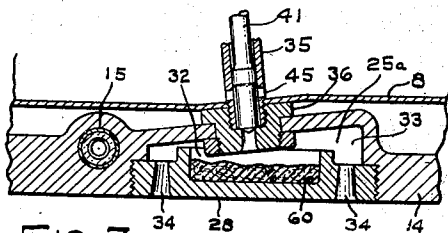


FIG. 7

INVENTOR
KENNETH L. WOODMAN.

BY *Wattigan*
ATTORNEY

UNITED STATES PATENT OFFICE

2,353,425

STEAM IRON

Kenneth L. Woodman, Mansfield, Ohio, assignor
to Westinghouse Electric & Manufacturing
Company, East Pittsburgh, Pa., a corporation
of Pennsylvania

Application March 11, 1941, Serial No. 382,679

4 Claims. (Cl. 32-77)

This invention relates to steam irons and more particularly to that class of steam irons which continually flash small quantities of water into steam and discharge the steam to the ironing surface, and it has for an object to provide an improved steam iron of the character set forth.

The steam iron of the present invention preferably comprises a water-storage chamber or reservoir located within the cover of the iron and thermally isolated from the heating element. A small steam-generating chamber located in the base of the iron closely adjacent the heating element is readily accessible for cleaning. The water from the storage chamber, under the control of a valve, is fed to the steam-generating chamber where it flashes into steam. The steam escapes through ports leading to the ironing surface.

Since it is generally impractical to use distilled water in steam irons, the operator will usually employ ordinary tap water. Tap water contains varying amounts of mineral salts and the like, depending on the locality, which are precipitated when the water is converted to steam. These precipitates are deposited on the water-heating surface of the iron and, since they are poor conductors of heat, tend to thermally insulate the water from the source of heat. In the design of steam irons, it has often been the practice to provide relatively long channels or passages for generating and distributing steam to ports which discharge it on the article being pressed. These channels and ports, being of limited cross-section, tend to become clogged by the salt deposits. As the channels and ports have been difficult or impossible to clean without disassembling the iron, the iron may become useless for its intended purpose.

It is an object of the present invention to provide a construction of steam iron wherein the portion of the steam-generating chamber which receives the materials precipitated or deposited from the water as it is converted into steam is readily removable or accessible for cleaning whenever servicing is required.

It is another object of the invention to provide a construction of steam iron wherein the steam-distributing channel and the steam-discharging port or ports are easily accessible for cleaning.

It is a further object of the invention to provide a construction of steam iron wherein particles of water are prevented from being carried by the steam to the material being pressed.

These and other objects are effected by my invention as will be apparent from the following

description and claims taken in connection with the accompanying drawings, forming a part of this application, in which:

Fig. 1 is a side elevation partly in section illustrating an electrically-heated steam iron embodying the principles of the present invention;

Fig. 2 is a bottom plan view of the iron shown in Fig. 1 illustrating the location of the removable plug of the steam chamber relative to the heating element;

Fig. 3 is a top plan view of the iron shown in Fig. 1;

Fig. 4 is an enlarged perspective view of the removable plug per se;

Fig. 5 is an enlarged sectional view corresponding to a portion of Fig. 1, but illustrating a slightly modified form of the invention;

Fig. 6 is a top plan view of the removable plug shown in Fig. 5, a part of the top wall being broken away; and

Fig. 7 is an enlarged sectional view corresponding to a portion of Fig. 1 and showing a pad of water-dispersing material in the steam-generating compartment.

Referring to the drawings and particularly to Figs. 1 to 4, inclusive, there has been illustrated an electrically-heated steam iron indicated generally by the reference character 5. The iron 5 comprises a cover or shell 6 having a handle 7 secured to the top thereof in any suitable manner. The interior of the cover 6 is provided with partitions such as 8 and 9 which, together with the side and top walls of the body, define a water-storage chamber or reservoir 10. This reservoir is filled with water through an opening 11 in the top of the body 6, which opening is normally closed by the removable plug 12. This plug preferably has a vent therethrough to allow air to enter the reservoir as water is removed through the outlet opening 13 provided in the bottom of the reservoir adjacent the front thereof.

A metallic soleplate or base 14 is detachably secured in any suitable manner to the bottom of the body 6 preferably in spaced relation to the partition 8, so that the reservoir 10 is thermally isolated from the heated soleplate. This soleplate may be of conventional outline, as illustrated in Fig. 2, and is provided with a U-shaped heating element 15 secured thereto or imbedded therein as illustrated particularly in Fig. 1. This heating element may be of well-known construction and comprises an outer metallic tube 16 having a coiled resistance element 17 supported in spaced concentric relation thereto by means of

suitable heat-conducting, electrical insulating material.

Power for heating the iron is supplied to the element 15 by means of a cord 18 adapted to be connected to an electrical outlet (not shown). This cord comprises the conductors 19 connected to the ends 20 of the resistance element 17 in series with the manually-adjustable thermostat 21 supported in a recess provided in the soleplate.

The thermostat 21 may be of conventional design and is adjusted by means of a rotatable shaft 22 connected thereto and extending through the sleeve 23 brazed or soldered in fluid-tight relation in the upper and lower walls of the reservoir 10. A knob or handle 24 provided with a suitable scale to indicate various temperature settings is fixed to the upper end of the shaft 22.

The soleplate 14 is provided with a recess or hole 25 located within the loop or bight 26 of the heating element 15. This recess opens on the ironing surface 27 of the soleplate 14, and is normally closed at its lower end by means of the metallic plug 28 which is externally threaded to removably engage mating threads formed on the side walls of the recess. It will be noted that the upper surface of this plug, together with the lateral wall 29 and the upper wall 30 of the recess, defines a chamber 25a.

The chamber 25a is divided into two communicating compartments by an annular rib or baffle 31, preferably formed integral with the plug. The circular space or well within this baffle provides a steam-generating compartment 32 while the annular space between the baffle and the lateral wall 29 of the recess defines a steam-distributing compartment or channel 33. The rib or baffle 31 will normally prevent the steam generated within the compartment 32 from carrying particles of water over to the steam-distributing compartment 33. If large particles of water are emitted from ports 34 they might stain or spot certain types of fabric, such as rayons or silks.

A plurality of steam ports 34 extending inwardly from the outer surface of the plug communicate with the steam-distributing compartment 33 and serve to discharge steam on the material being ironed. These ports also serve as tool-receiving openings whereby a suitable tool may be inserted therein for removing the plug from the iron.

The outlet 13 of the water reservoir 10 is located above the steam-generating compartment 32 and receives the valve-stem guiding sleeve 35 which preferably projects below the lower wall 8 of the tank. This sleeve is brazed or soldered in fluid-tight relation in the upper and lower walls of the reservoir 10. The lower projecting end of this sleeve is threaded and receives the bushing member 36 inserted in an aperture provided in the upper wall 30 of the soleplate 14, and clamped to this wall by means of a nut 38 threaded thereon. This bushing is provided with a water passage 39 having a valve seat 40 formed therein.

The valve seat 40 is engageable by the lower tapered end of the valve stem 41, guided in the sleeve 35, for closing the passage 39. The upper end of the valve stem carries a knob 42 and below this knob is preferably threaded, as indicated at 43, to engage complementary threads formed in the upper end of the sleeve 35. By turning the

knob 42 in one direction or the other, the valve stem may be raised or lowered relative to the valve seat 40 to regulate the amount of water which may flow from the reservoir 10 into the steam-generating compartment 32. If desired, the knob 42 may be provided with an index arrow (Fig. 3) which cooperates with a scale 44 on the handle 7 to indicate the size of the valve opening for any given setting of the knob. It will be noted that the sleeve 35 adjacent the lower wall 8 of the tank is provided with openings 45 which permit the water to enter the sleeve.

It will be understood that when it is desired to use the iron for the purpose of steaming clothes or supplying moisture in the form of steam to an article being pressed, the operator fills the reservoir 10 with water and adjusts the thermostat 21 to maintain the iron at the proper temperature for the particular material being ironed. When the iron has reached the correct heat, the water valve controlling knob 42 may be turned to allow water to flow at a predetermined rate from the tank through the openings 45 in the sleeve 35 and into the passage 39. The water falls on the surface of the plug 28 within the baffle 31 where it is instantly flashed into steam. Any deposits of mineral salts or the like which may accumulate on the plug 28 or in the ports 34 or on the walls of the chamber 25a may be easily cleaned therefrom by removing the plug from the iron. The steam in the compartment 32 will pass over the baffle 31 and into the steam-distributing compartment 33 and then through the steam outlet ports 34 to the material being pressed. It will be understood that the plug 28, due to its metal-to-metal contact with the soleplate which carries the heating element, will be heated sufficiently to convert the water into steam. Further, by locating the plug closely adjacent the loop or bight 26 of the heating element, proper heating of the plug is insured.

In Figs. 5 and 6 there is shown a slightly modified form of the invention. In these two figures the elements which correspond to the elements of the previously-described figures have been identified by like reference characters. Referring particularly to Fig. 5, it will be noted that only a portion of the bottom wall or partition 8 of the water reservoir 10 and the portion of the soleplate 14 which carries the steam-generating unit have been shown.

The form of the invention illustrated in Figs. 5 and 6 differs from that shown in Figs. 1 to 4, inclusive, in that the removable plug or member 28' is provided with an annular wall 50 in spaced concentric relation to the rib or baffle 31. This wall is grooved to receive the depending flange 51 of the disc or cover 52, which is swedged in this groove to form a fluid-tight joint. This disc is preferably resilient so that it will be pressed in fluid-tight relation against the lower end of the bushing 53 when the plug 28' is threaded into the hole 54 provided in the soleplate. As shown, the hole or recess 54 is threaded to receive the mating threads provided on the plug. The bushing 53 may be secured in the outlet opening 13 in fluid-tight relation to the partition 8 by brazing, soldering or the like. The center of the disc 52 has an aperture 55 there-through in alignment with the water passage 39 when the parts are assembled, so that water may flow into the steam-generating compartment 32 when the valve stem 41 is raised from the valve seat 57.

Except for the structure specifically described above, the remainder of the modified iron may be the same as the iron illustrated in Figs. 1 and 4 and the operation thereof will be identical.

When it is desired to replace the plug 28' or to clean the deposits which may accumulate thereon, it is only necessary to insert a suitable tool in the steam ports 34 and remove the plug from the soleplate. A suitable scraping tool or cleaning compound may be inserted through the aperture 55 to remove the deposits from the upper surface of the plug.

Steam irons which are designed to continually flash small quantities of water into steam tend to emit small particles of water or sputter at the higher soleplate temperatures. This sputtering may occur when the water dropping into the steam-generating chamber does not have a chance to spread out and wet the surfaces of the chamber. Since only the water in direct contact with the hot surfaces of the steam-generating chamber is flashed into steam, the generated steam may pick up small particles of water and carry them through the steam ports.

While the baffle 31 will ordinarily prevent water from being carried out by the steam, as an added precaution the steam chamber 32 (Figs. 1 and 5) may be provided with water-dispersing means 60 (see Fig. 7). This water-dispersing means may comprise a pad or loose mass of interlaced filament-like or stranded material such as asbestos, glass or aluminum wool, or equivalent porous and preferably substantially non-corrosive material capable of withstanding high temperatures.

The porous material 60 tends to break up the droplets of water entering the steam chamber and also permits them to come in contact with the hot surfaces of the chamber at a more uniform rate than when the water is directly dropped on these hot surfaces. The porous material also tends to pick up any small particles of water being carried by steam toward the steam ports 34.

The porous material 60 has the added function of accumulating a high percentage of the mineral deposits that may form within the steam chamber, so that servicing of the iron is facilitated. It will be understood that when it is desired to clean or replace the porous material, it is only necessary to remove the plug 28 from the soleplate. While the opening 55 in the cover of the plug 28' is large enough to permit the porous material 60 to be withdrawn and replaced, it may be desirable to replace the plug 28' when the steam chamber of this plug requires cleaning.

The specific form of my invention illustrated in Figs. 1 to 4, inclusive, incorporates certain improvements in construction which are the inventions of Roy H. Edwards and are disclosed and claimed in his patent application, Serial No. 404,590, filed July 30, 1941.

While I have shown my invention in several forms, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various other changes and modifications without departing from the spirit thereof, and I desire, 65

therefore, that only such limitations shall be placed thereupon as are specifically set forth in the appended claims.

What I claim is:

1. A steam iron comprising a body having a liquid storage chamber therein, a soleplate carried by said body, said soleplate having an opening therein, a member removably secured in said opening for closing the same, a cover member carried by said member and defining therewith a chamber, a baffle disposed within said chamber and dividing the same into a plurality of communicating compartments, said storage chamber having an outlet communicating with one of said compartments, said member having at least one steam port therethrough communicating with another of said compartments for delivering steam to the material to be pressed, and means for heating said soleplate and member.

2. A member adapted to be removably secured in a hole opening on the ironing surface of the base of a steam iron comprising a disc-like element, a cover member secured in fluid-tight relation to one side of said disc, said disc and cover defining a chamber, and a baffle dividing said chamber into a plurality of communicating compartments, said cover member having an aperture therein opening into one of said compartments, said element having at least one opening therethrough communicating with another of said compartments.

3. A member adapted to be removably secured in a hole opening on the ironing surface of the base of a steam iron comprising a disc-like element, spaced inner and outer concentric annular ribs projecting from one side of said element, and a cover member secured in fluid-tight relation to the outer annular rib and with said element defining a chamber, said inner annular rib dividing said chamber into communicating compartments, said cover member having an aperture therein opening into one of said compartments, said element having at least one opening therethrough communicating with the other of said compartments.

4. A steam iron comprising a soleplate having an ironing surface, said soleplate having a hole therein opening on said ironing surface, a plug member removably secured in said opening for closing the same, a cover member carried by said member and defining therewith a steam generating chamber, means including a conduit opening through said cover member for supplying a liquid to said chamber for conversion into steam, means carried by said soleplate and spaced from said cover member for heating said soleplate and said plug member, said cover member being substantially thinner than said plug member and limiting the conduction of heat from said heating means to said conduit, and means for discharging steam generated within said chamber to the material to be pressed.

KENNETH L. WOODMAN.