Dec. 30, 1947. W. C. HUME 2,433,556

STEAM IRON

Filed June 30, 1944

Fig. 3.

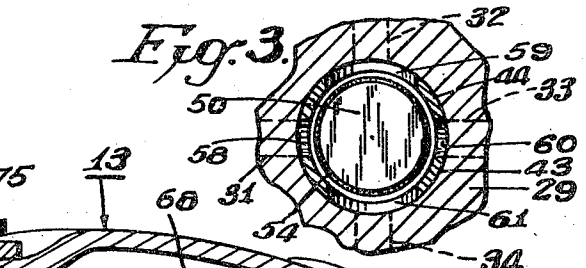
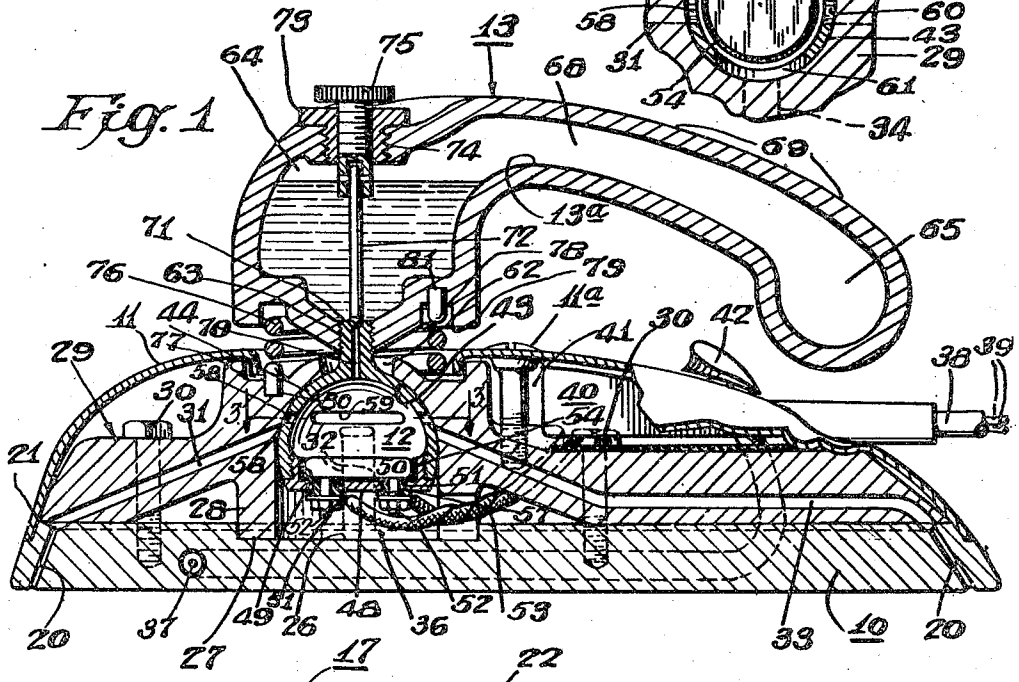


Fig. 1



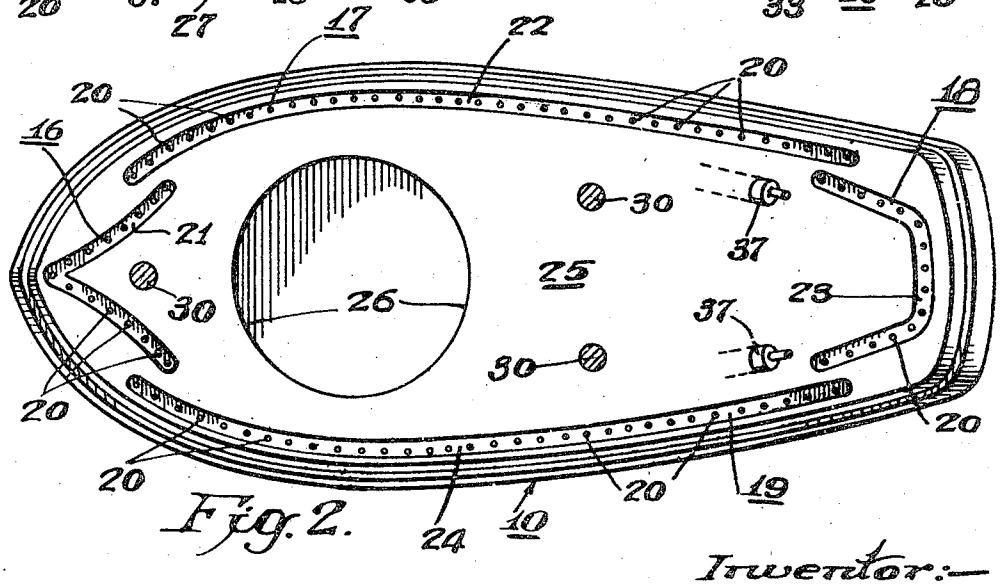


Fig. 2.

Inventor:—
William C. Hume
by his Attorneys
Howson & Howson

Patented Dec. 30, 1947

2,433,556

UNITED STATES PATENT OFFICE

2,433,556

STEAM IRON

William C. Hume, Willow Grove, Pa., assignor, by mesne assignments, to Philco Corporation, Philadelphia, Pa., a corporation of Pennsylvania

Application June 30, 1944, Serial No. 542,882

5 Claims. (Cl. 38—77)

1

A primary object of the present invention is to provide a steam iron having a novel and improved water supply reservoir.

More specifically an object of the invention is to incorporate the function of said reservoir in the handle of the iron in a manner to afford withdrawal of the water from connection with the steam generating chamber of the iron when the latter is made to assume a predetermined abnormal position.

Still more specifically an object of the invention is to provide a handle for irons of the stated type having therein two water-retaining chambers, one only of which is immediately connected with the steam generating chamber, said water chambers being connected in a manner to afford in the normal position of the iron, and by momentary movement of the iron to an abnormal position, a selective use of the chambers for holding the water supply.

The invention further resides in the structural details hereinafter described and illustrated in the attached drawings, wherein:

Figure 1 is a longitudinal vertical sectional view of an iron having a handle constructed in accordance with the invention, said sectional view taken substantially on the center line of the iron.

Figure 2 is a top plan view of the sole plate removed from the iron; and

Figure 3 is a fragmentary sectional view on the line 3—3, Figure 1.

For the purpose of description, the present invention is illustrated and described in connection with a steam iron of the type disclosed in the copending application of William C. Hume, Serial No. 542,883, filed June 30, 1944, now Patent No. 2,418,511, issued April 8, 1947, and assigned to the assignee of the present application.

With reference to Figure 1 of the drawings, the embodiment of the iron therein illustrated comprises generally, a base member or soleplate 10, a cover 11 suitably secured to the soleplate, as by screw 11a, a valve structure 12, the function of which will be hereinafter described, and a handle 13 attached to the valve.

The soleplate, as illustrated in Figure 2, is of conventional configuration and is provided with a plurality of discharge outlets, or jet groups 16, 17, 18 and 19, which together substantially surround the major portion of the soleplate. Each jet group comprises a plurality of steam discharge apertures or jets 20 having communication with channels 21, 22, 23 and 24, respectively, formed in the upper surface 25 of the soleplate.

2

A circular recess 26, also formed in the upper surface of the soleplate, is adapted to receive the lower end 27 of a hollow tubular extension 28 of a member 29 mounted upon the soleplate, which member is securely attached to the soleplate, as by screws 30. Member 29 is substantially coextensive with soleplate 10 and serves to cover the channels 21, 22, 23 and 24 in said soleplate to form thereof enclosed passages or manifold conduits for the jets. Passages or conduits 31, 32, 33 and 34 (Figure 3) are provided in member 29, which passages afford communication between channels 21, 22, 23 and 24 and the chamber 36 within the hollow extension 28 of said member.

The soleplate 10 is preferably provided with an armored electrical heater element 37 of well-known construction, to which electrical energy for heating the iron is supplied through a cord 38 of the usual type. This cord comprises conductors 39 connected to the heating element 37 and to a manually adjustable thermostat 40 which is mounted in a recess 41 beneath cover 11. A knob 42 is provided for manual adjustment of the thermostat which is connected in series with and controls the flow of current to the heating element.

The upper surface of the inner walls of chamber 36 converge to form an inverted substantially hemispherical valve seat 43 upon which is seated a hollow substantially spherical valve member 44. The valve member has threaded in the bottom thereof a plug 48 which is provided with a recess 49 for reception of an electrical heater element or steam generator 50. The heater element may be of conventional construction well known in the art. The interior of the valve member is thus formed into a steam generating chamber, the operation of which will be more fully described hereinafter.

The bottom wall of the plug 48 is provided with a pair of apertures 51 through which the ends 52 of the resistance element of the heater 50 may pass to be connected to the ends of power supply wires 53, these wires being connected in series with wires 39 of cord 38. The heater 50 is suitably insulated from the plug 48 by a gasket 54 and the ends 52 of the resistance element are insulated from contact with the plug by insulating grommets 57.

The valve 44 normally closes the ends of conduits 31, 32, 33 and 34 in member 29, but is provided with outlet ports 58, 59, 60 and 61 arranged to register with the ends of these conduits for emitting steam therefrom, selectively, when the

valve is rotated in the manner now to be described.

The upper portion of valve seat 43 is provided with an aperture 62 through which passes an extension 63 of valve member 44 for threaded attachment to handle 13. Aperture 62 is of greater diameter than extension 63 to permit limited rotational or angular movement of the valve on its seat of a character to bring the ports 58, 59, 60 and 61 selectively into registration with the ends of the conduits 31, 32, 33 and 34.

In accordance with the present invention, the handle 13 is hollow and is shaped to provide therein forward and rearward water supply chambers or reservoirs 64 and 65 connected by a passage 68 which extends through the mid- or grip-portion 69 of the handle. The reservoirs 64 and 65, while in open communication with each other, are separated when the iron is in the normal position as shown in Figure 1 by the high mid-portion 13a of the handle so that water may be carried in one or other of the chambers independently of the other. This is illustrated in Figure 1 of the drawings wherein the chamber 64 is shown as substantially full of water while the chamber 65 is entirely empty. It is apparent that by tilting the iron upwardly at the front from the said normal position the water in the chamber 64 may be caused to flow into the chamber 65 with the result that when the iron is again returned to normal position the water being maintained in the chamber 65 will be prevented from passing to the steam generating chamber. By tilting the iron in the forward direction the water may be caused again to flow to the chamber 64.

As previously stated, the forward chamber 64 is in communication with the interior of the valve member 44 through a narrow passage 70 in the extension 63 which passage is provided at its upper extremity with a valve seat 71 adapted to receive the tip of a needle valve 72 for regulating the rate of flow of the water through the passage to the generator within the valve. The needle valve has threaded connection with a flanged sleeve 73 threaded into the handle, as at 74, and a knob 75 is provided for turning the valve to adjust it with relation to the valve seat for regulating the flow of water through passage 70 to the steam generator. Filling of the reservoir may be accomplished by removing the needle valve assembly from the handle and using the resultant aperture as a filler opening; or a separate filler opening may be provided.

The handle 13 and valve member 44 form a rigid unit which is held in position in the member 29 and against the valve seat 43 by a coil spring 76. The lower end of the spring is anchored within a recess 77 formed about the aperture 62 in member 29, and the top of the spring is anchored in a recess 78 formed in the bottom wall 79 of handle 13. Anchoring the spring prevents objectionable horizontal rotational movement and angular displacement of the handle with relation to the longitudinal axis of the iron, and such anchoring may be accomplished by having the lower end of the spring turned downwardly, as indicated at 80, into a recess in member 29, and its upper end turned upwardly into a recess in the bottom wall of the handle, as indicated at 81.

The steam generator is of the "flash" type; i. e., water from the reservoir flows through passage 70 into contact with the hot heater element 50 and is immediately flashed into steam.

Operation of the device is as follows:

Assume the chambers or reservoirs 64 and 65 of the handle to be filled with water, needle valve 72 fixed with respect to passage 70 so as to permit the water to pass therethrough at proper rate to the generator, and thermostat 40 set for the degree of heat necessary for the particular material to be pressed. The iron is moved over the work material by applying force to the handle in the direction desired. This force initially effects a slight rocking movement of the handle with relation to the body of the iron in the direction of applied force and about the center of valve member 44, thus establishing communication, through one or more of the ports 58, 59, 60 and 61, between the steam chamber and one or more of the discharge apertures or jet groups 18, 19, 20 and 21, depending upon the direction in which the handle is tilted.

More specifically, when force is exerted on the handle to move the iron in a forward direction, the handle will rock forwardly relative to the body of the iron and will move the valve member 44 so as to register port 58 with passage 31, thereby permitting steam from the generating chamber to pass to the forward jet group 16. Such action is counter to the pressure of spring 76 which normally exerts its force to maintain the handle and the valve member 44 in a neutral position relative to the series of ports, as illustrated in Figure 1.

When force is exerted on the handle to move the iron in a sidewise direction (away from the viewer, say, in Figure 1) the handle is rocked so as to bring the port 59 into registry with passage 32, steam there emitting from jet group 17. Similarly, when the force is exerted in a rearward direction port 60 registers with passage 33 to emit steam from the jet group 18; and sidewise movement (toward the viewer in Figure 1) registers port 61 with passage 34 to emit steam from jet group 19. In each instance, steam is discharged from the jets which at the moment are on the leading edge of the iron, in accordance with the principle set forth in the aforesaid copending application, to which reference may be had for a more detailed description of this phase of operation.

By combining in one element the functions of the handle and reservoir it is possible to reduce to a minimum the size of the body of the iron while utilizing to advantage the normally wasted space taken up by the handle posts; and the provision in the reservoir of two interconnected chambers enables the operator to change over from steam ironing to dry ironing, and vice versa, at will, as explained below. Thus assuming that the reservoir chambers 64 and 65 are of substantially equal capacity, and that with the forward chamber filled with water and the rear chamber empty, the iron is being used in steam ironing. If now it is desired to iron dry, the iron is simply uptilted at the front to an extent permitting the water to flow from the forward chamber into the rear chamber, thus shutting off the water supply to the steam generator chamber so that the iron is conditioned for dry ironing. By reverse tilting, the water may be returned to the forward chamber and steam pressing restored.

When it is desired to use the iron for steam ironing only, both reservoirs may be filled with water, and when the forward chamber runs dry it may be replenished with the water from the rear chamber by tilting the iron as described.

Thus a supply of water sufficient for a protracted period of steam ironing may be stored in the iron.

I claim:

1. In a steam iron comprising a steam generator, a handle including a pair of individual water-supply reservoirs each arranged to retain water independently of the other when the iron occupies a normal operative position with respect to a substantially horizontal ironing surface, means for establishing direct communication between an individual one of said reservoirs and the generator, and means providing for transfer of water from each of said reservoirs to the other selectively.

2. In a steam iron comprising a steam generator, a handle extending generally parallel to the working face of the iron, said handle having hollow terminal portions forming individual water-supply reservoirs and a relatively elevated intermediate hollow portion forming a conduit between the tops of said reservoirs for transfer of water selectively from each of said reservoirs to the other, said reservoirs being arranged so that each may retain water independently of the other when the iron occupies a normal operative position with respect to a substantially horizontal ironing surface, and a port connecting one of said reservoirs with the generator, the other of said reservoirs constituting a means operative by transfer thereto of the water content of the first-named reservoir for excluding said water from the generator while maintaining an available supply of water in the iron.

3. In a steam iron, a handle including a pair of water-supply reservoirs each arranged so as to gravitationally retain its water content independently of the other when the iron occupies a normal operative position with respect to a substantially horizontal ironing surface, a connecting duct operative when the iron is tilted from the said normal position in a manner to elevate one of the reservoirs above the other to direct a gravity flow of the water from the higher to the lower of said reservoirs, a steam generator, and a port connecting one of said reservoirs with the generator, the other of said reservoirs constituting a means operative by transfer thereto of the water content of the first-named reservoir for excluding the said water from the generator while maintaining an available supply of water in the iron.

4. In a steam iron having a steam generator, a handle including a pair of interconnected water-supply reservoirs operative selectively and while the iron is in a normal operative position with respect to a substantially horizontal ironing surface to retain the water content of the handle, one of said reservoirs having a direct connection with said generator, which connection constitutes a means for supplying water to the generator from both of the reservoirs, and means responsive to change in position of the iron about a transverse axis through the latter for effecting transfer of the water from each of the reservoirs selectively to the other.

5. A steam iron including a steam generator, a steam discharge aperture, a pair of water-supply reservoirs each capable when the iron is in a normal operative position with respect to a substantially horizontal ironing surface of retaining its water content against passage to the other, means for effecting gravity flow of water from each to the other of said reservoirs selectively by tilting the iron from said normal position, means for connecting one of said reserovirs to the said generator as a means for supplying water from both of the reservoirs to the generator, and means for connecting the generator with the said aperture.

WILLIAM C. HUME.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,521,058	Walker	Dec. 30, 1924
2,271,686	Fitzgerald	Feb. 3, 1942
2,302,476	Rubinstein	Nov. 17, 1942
2,109,326	Tricomi et al.	Feb. 22, 1938
2,313,382	Kistner	Mar. 9, 1943
1,965,746	Matveyeff	July 10, 1934

FOREIGN PATENTS

Number	Country	Date
203,410	Great Britain	Sept. 10, 1923