April 8, 1947. W. C. HUME 2,418,511

STEAM ELECTRIC IRON

Filed June 30, 1944

Fig. 3

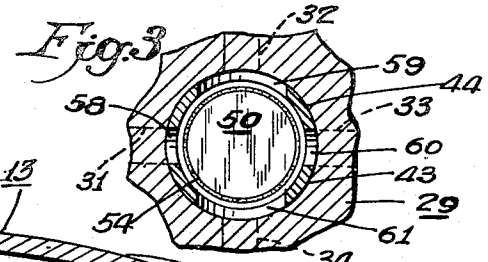
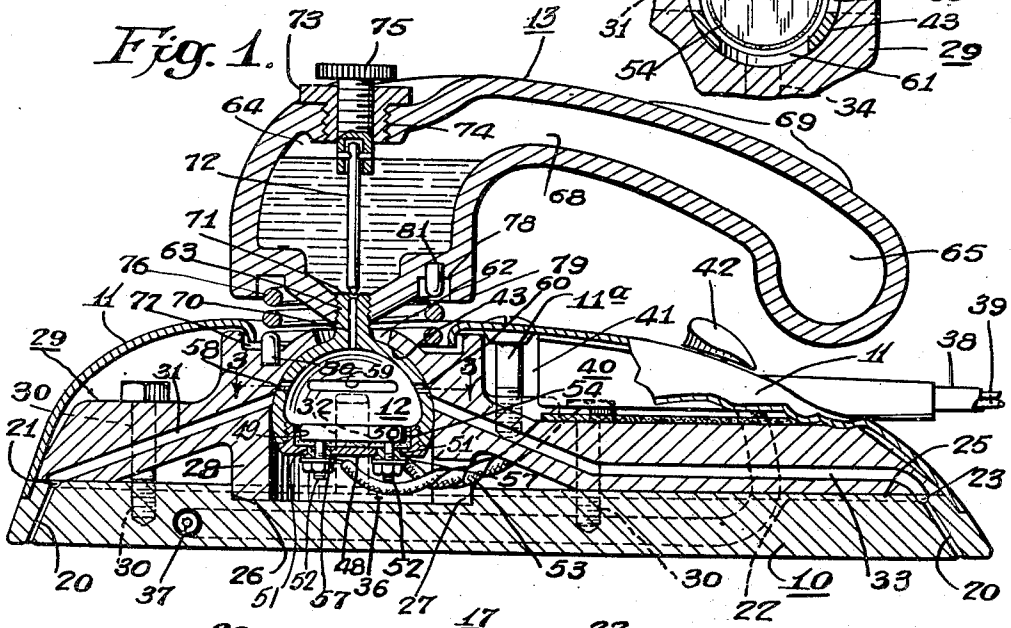


Fig. 1.



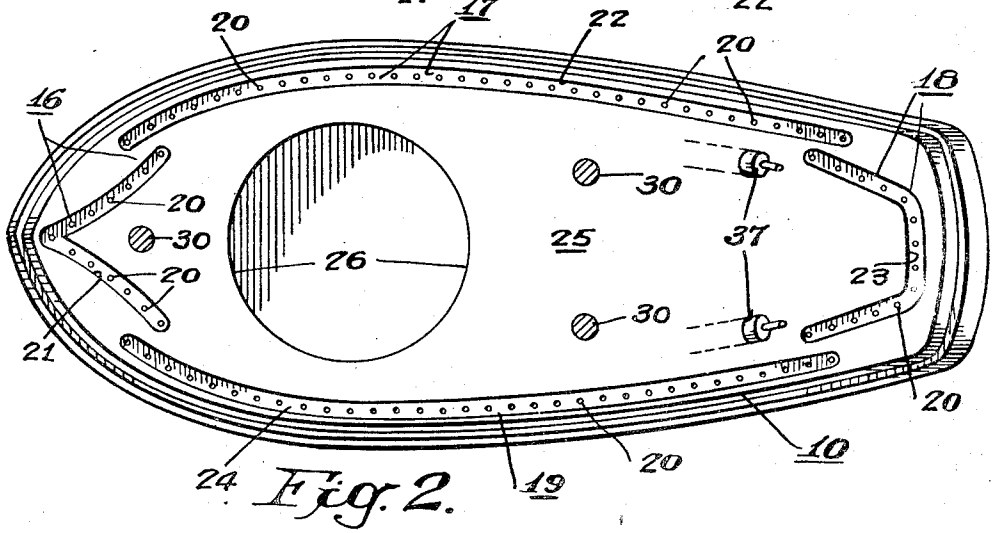


Fig. 2.

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STEAM ELECTRIC IRON

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15 Claims. (Cl. 38—77)

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This invention relates to steam irons.

More particularly, the invention has reference to a steam iron of the type disclosed in the co-pending application of H. Walter Clum, Serial Number 538,022, filed May 30, 1944, and assigned to the assignee of the present application. The aforesaid co-pending application discloses an iron wherein steam may be emitted from any one of a plurality of discharge outlets or jet groups, selectively, as determined by the direction, relative to the iron itself, in which force is applied to move the iron with respect to the work. The present invention has especial reference to certain novel structural features of particular utility in irons of this type.

An important object of the invention is to provide a steam iron having improved means for generating steam and for controlling the emission thereof from the iron.

Another object of the invention is to provide a steam iron of the aforesaid type wherein the several essential elements are constructed and arranged so as to form an efficient, compact and lightweight unit.

In the drawings:

Figure 1 is a longitudinal vertical sectional view taken substantially along the center line of the iron;

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

Figure 3 is a fragmentary sectional view taken along line 3—3 of Figure 1.

With reference to Fig. 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.

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

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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 hemi-spherical 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.

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 grip portion 69. The function of these reservoirs is more fully described in my copending application Serial Number 542,882, filed June 30, 1944. The forward chamber 64 is in communication with the interior of 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 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 in any convenient manner and in the present instance by removing the needle valve assembly from the handle and using the resultant aperture as a filler opening.

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 aforesaid co-pending application, to which reference may be had for a more detailed description of this phase of operation.

I claim:

1. A steam iron comprising a body portion having a steam discharge aperture, a valve seat having a port connected with said aperture, a steam delivery valve secured for limited movement in said body with a surface thereof in engagement with said seat and normally closing said port, said valve having a delivery port adapted when the valve is moved from said normal position to register with the first named port for admission of steam to said aperture, and a handle rigidly secured to the valve and connected solely by way of the valve to the said iron body, said handle thereby constituting a common means for manipulating both the valve and the iron.

2. A steam iron comprising a body portion having a steam discharge aperture, a valve seat having a port connected with said aperture, a steam delivery valve secured for limited movement in said body with a surface thereof in engagement with said seat and normally closing said port, said valve having a delivery port adapted when the valve is moved from said normal position to register with the first named port for admission of steam to said aperture, a handle rigidly secured to the valve and connected solely by way of the valve to the said iron body, said handle thereby constituting a common means for manipulating both the valve and the iron, and resilient means tending to retain the handle and valve in the said normal position closing the first-named port.

3. A steam iron comprising a body portion having a plurality of steam discharge apertures, a spherical valve seat having a plurality of ports connected respectively with said apertures, a steam delivery valve secured in said body for limited movements about the geometrical center of said spherical seat and having a spherical surface engaging said seat and normally closing said ports, said valve having a plurality of delivery ports arranged to register respectively with the first named ports in the different selective angular positions of the valve for admission of steam to said apertures, a handle rigidly secured to the valve and connected solely by way of the valve to the said iron body, said handle thereby constituting a common means for manipulating both the valve and the iron, and resilient means engaged with the handle and exerting pressure tending to hold the valve firmly on its seat in the said normal port-closing position.

4. A steam iron comprising a body portion having a plurality of steam discharge apertures, a spherical valve seat in said body having a plurality of ports, means connecting said ports respectively with said apertures, and means for admitting steam to said ports selectively, said means including a steam delivery valve having a spherical surface engaging said seat and normally closing said ports, said valve having a plurality of delivery ports arranged for registration respectively with the ports first-named in different selective angular positions of said valve, and means for manually moving said valve into said positions.

5. A steam iron comprising a body portion having a plurality of steam discharge apertures, a spherical valve seat having a plurality of ports connected respectively with said apertures, a steam delivery valve having a spherical surface engaging said seat and normally closing said ports, said valve having a plurality of delivery ports arranged for registration respectively with the ports first-named in different selective angular positions of said valve, and means for moving said valve into said positions, said means comprising a handle for manipulating the iron connected to the valve and pivotally movable in the said iron body about the geometrical center of the spherical seat.

6. A steam iron comprising a body portion having a plurality of steam discharge apertures, a spherical valve seat having a plurality of ports connected respectively with said apertures, a steam delivery valve having a spherical surface engaging said seat and normally closing said ports, said valve having a plurality of delivery ports arranged for registration respectively with the ports first-named in different selective angular positions of said valve, and means for moving said valve into said positions, said means comprising a handle for manipulating the iron connected to the valve and pivotally movable in the said iron body about the geometrical center of the spherical seat, and resilient means for normally retaining the valve in the said normal port-closing position.

7. A steam iron comprising a body portion having a steam discharge aperture, a spherical valve seat having a port connected with said aperture, a steam delivery valve in the form of a hollow member having an outer spherical surface engaging said seat and adapted in a given angular position of the valve on the seat to close said port, said valve having in the wall thereof a delivery port arranged to register with the first-named port in another angular position of the valve, a steam generator in the interior of the hollow valve member, means for admitting water to said interior, and means for angularly moving said valve into the aforesaid positions.

8. A steam iron comprising a body portion having a plurality of steam discharge apertures, a spherical valve seat having a plurality of ports connected respectively with said apertures, a steam delivery valve in the form of a hollow member having an outer spherical surface engaging said seat and adapted in a given angular position of the valve on the seat to close said ports, said valve having in the wall thereof a plurality of delivery ports arranged to register respectively with the first-named ports in other and differing angular positions of the valve, a steam generator in the interior of the hollow valve member, means for admitting water to said

interior, and means for angularly moving said valve selectively into the aforesaid positions.

9. A steam iron comprising a discharge aperture, a spherical valve seat having a port connected with said aperture, a steam delivery valve in the form of a hollow member having an outer spherical surface engaging said seat and adapted in a given angular position of the valve on the seat to close said port, said valve having in the wall thereof a delivery port arranged to register with the first-named port in another angular position of the valve, a steam generator in the interior of the hollow valve member, a handle connected with said member and constituting a common means for manipulating the iron and for angularly moving said valve into the aforesaid positions, and a water supply reservoir in said handle in communication with the interior of the valve member.

10. A steam iron comprising a plurality of discharge apertures, a spherical valve seat having a plurality of ports connected respectively with said apertures, a steam delivery valve in the form of a hollow member having an outer spherical surface engaging said seat and adapted in a given angular position of the valve on the seat to close said ports, said valve having in the wall thereof a plurality of delivery ports arranged to register respectively with the first-named ports in other and differing angular positions of the valve, a steam generator in the interior of the hollow valve member, a handle connected with said member and constituting a common means for manipulating the iron and for angularly moving said valve selectively into the aforesaid positions, and a water supply reservoir in said handle in communication with the interior of the valve member.

11. A steam iron including a steam discharge aperture, a reservoir, a steam generator having a normally closed port adapted for registry with said aperture, means for feeding water from said reservoir to said generator to form steam, and means for moving said generator to register the said port with said discharge aperture for delivery of the steam to the latter, said generator thereby constituting a valve controlling discharge of steam from said aperture.

12. A steam iron including a plurality of discharge apertures, a reservoir, a steam generator having a plurality of normally closed ports adapted for registry with said discharge apertures, means for feeding water from said reservoir to the generator to form steam, and means for moving said generator to selectively register the ports with said apertures, said generator thereby constituting a valve controlling discharge of steam from said apertures.

13. The combination in a steam iron of a plurality of steam-emitting jet groups, a handle for said iron, a reservoir, a steam generator having a plurality of outlet ports adapted for connection respectively with said jet groups, means for feeding water from said reservoir into the generator to form steam, and means connecting said handle to said generator whereby predetermined movements of said handle relative to the iron will effect movements of said generator connecting said ports selectively with said jet groups.

14. The combination in a steam iron of a soleplate having a plurality of steam-emitting jet groups, a handle for the body of said iron and adapted for movement relative to said iron body, said handle being hollow and forming a water-supply reservoir, a steam generator having a plu-

rality of outlet ports adapted for connection respectively and selectively with said jet groups, means for feeding water from said reservoir to said generator to form steam, and means connecting said handle to the generator, said connecting means being constructed and arranged so that predetermined movements of the handle relative to said iron body will move the generator to selectively connect said ports with the jet groups.

15. In a steam iron, the combination with a soleplate having a plurality of steam-outlet jet groups, of a member forming a chamber having an interior valve seat, conduit means intersecting said seat and connecting said chamber to said jet groups to afford communication therebetween, steam generating means in said chamber, a hollow valve member in said chamber adapted to receive steam from said generator, a handle for said iron, a reservoir, means for feeding water from said reservoir to said generator to form steam, means for connecting said handle rigidly with said valve, resilient means for movably supporting said handle in a manner permitting movement of said handle relative to the iron and urging the valve member against said seat

so as to close said conduits, and ports in said valve arranged so that in different positions of the valve the said jet groups may be selectively connected to the said generator, whereby forces exerted upon the handle to move said iron may initially effect an adjustment of the valve on its seat establishing communication between one of said jet groups and the generator depending upon the direction in which said force is exerted.

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