June 8, 1954 B. F. PARR 2,680,312

STEAM IRON

Filed July 13, 1951

FIG. 1.

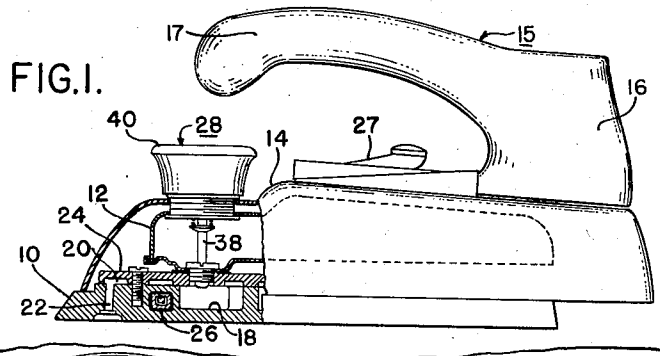
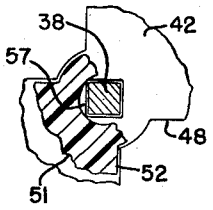


FIG. 6.



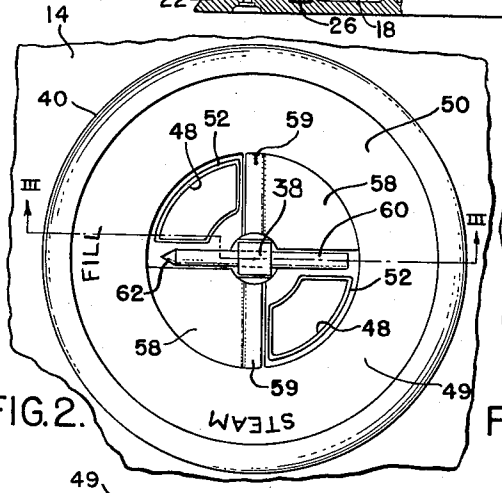


FIG. 2.

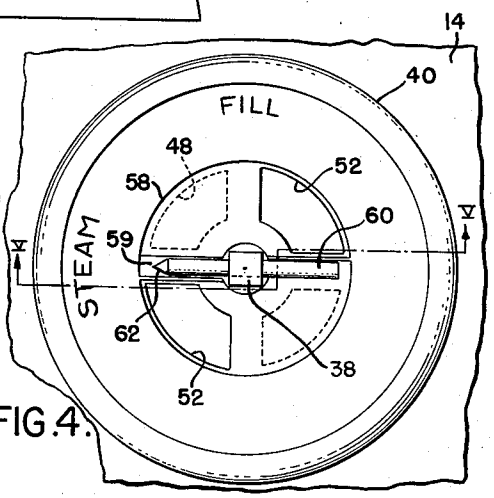


FIG. 4.

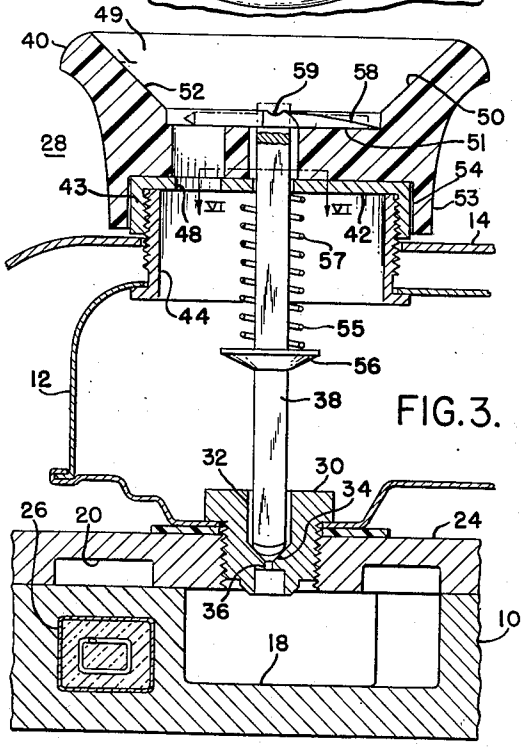


FIG. 3.

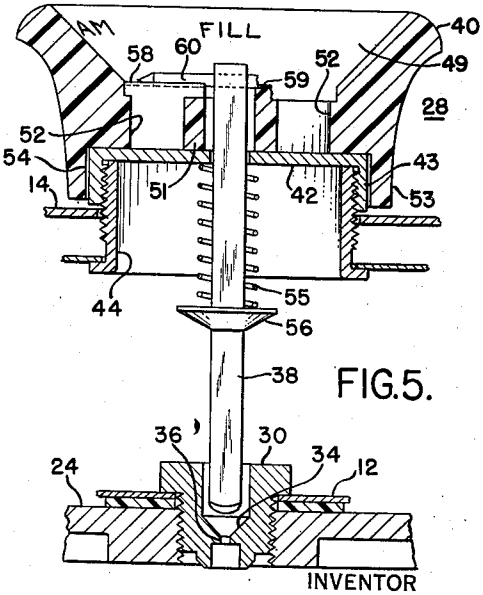


FIG. 5.

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STEAM IRON

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Application July 13, 1951, Serial No. 236,625

7 Claims. (Cl. 38—77)

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This invention relates to a steam iron of the flash type, particularly to a filling arrangement for a flash-type steam iron.

Steam irons of the flash type in popular use today are provided with a built-in water tank having a fill opening to permit filling the tank with water for steam pressing. The opening is usually closed by a removable cap or the like. Such steam irons are also provided with valves, connecting the water tank with a steam-generating chamber disposed in the soleplate, for regulating the rate of steaming.

When filling the conventional flash-type steam iron, the water valve must be closed to prevent water from flowing into the steam-generating chamber and flooding the same. This precaution is especially desirable if the steam iron is designed to be filled while resting on its soleplate in normal ironing position.

In view of the above, it is an object of the present invention to provide, in a flash-type steam iron, an arrangement whereby, when the fill cap is moved to "Open" position, the water valve is automatically moved to "Closed" position.

It is another object to provide, in a flash-type steam iron which may be filled with water while resting on its soleplate, an arrangement whereby water is prevented from flooding the steam-generating chamber while the water tank is being filled.

It is still another object to provide an arrangement whereby the fill opening is automatically closed when the water valve is in "Open" position.

A more specific object is to provide, in a steam iron which may be filled while resting on its soleplate, a filling arrangement which is easily operated, completely accessible and yet of reduced height and bulk.

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 of a flash-type steam iron incorporating my invention, portions being shown in section;

Fig. 2 is a plan, with portions of the steam iron cut away for clarity, showing the combination fill and valve arrangement in the "Fill" position;

Fig. 3 is a vertical section taken on line III—III of Fig. 2 with portions broken away for clarity;

Fig. 4 is a plan, similar to Fig. 2, but showing

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the combination fill and valve arrangement in the "Steam" position;

Fig. 5 is a vertical section taken on line V—V of Fig. 4 with portions broken away or omitted; and

Fig. 6 is a fragmentary section taken on line VI—VI of Fig. 3.

Referring to the drawings in detail, especially Figs. 1 and 3, there is shown an electric steam iron of the flash type, having a soleplate 10, a water tank 12 disposed above the soleplate, a shell 14 and a manipulating handle 15. The handle 15 is of the cantilever type and is provided with a rear depending portion 16 anchored to the rear portion of the shell 14 and has a horizontal portion 17 extending forwardly to a free end.

The soleplate is provided with a steam-generating chamber 18 which is connected by passages 20 to a plurality of steam exhaust apertures 22 (only one shown) directed downwardly through the soleplate. A cover plate 24 is clamped to the upper surface of the soleplate and acts as the upper wall of the steam-generating chamber 18 and the passages 20. An electrical heating element 26, preferably of the sheathed type, is embedded in the soleplate 10 and serves to heat the soleplate for steam or dry pressing of textiles, as is well understood in the art. The temperature of the soleplate may be adjusted by a rotatable knob 27 disposed below the manipulating handle 15 and connected to a thermostat (not shown).

The water tank 12 extends horizontally, substantially from the front to the rear of the iron, and is provided at the front end with my improved combination fill and water valve arrangement 28. The combination fill and valve arrangement 28 is located below the open front end of the handle 15 in a position normally occupied by the front anchoring portion of a conventional handle having both front and rear anchoring portions.

As shown in Figs. 2 and 3, the combination fill and water valve arrangement 28 includes a water valve having a threaded ferrule 30 passing through the lower wall of the tank 12 and received in threaded engagement with the cover plate 24, thereby clamping the water tank to the cover plate. The threaded ferrule 30 has an axially disposed bore 32 which is beveled at its lower end to provide a valve seat 34. Below the valve seat there is provided a valve orifice 36 of somewhat smaller diameter than the bore 32. An axially movable valve stem 38 for con-

trolling the valve orifice is received within the bore 32 and cooperates with the valve seat 34 and the orifice to form the water valve. Thus, when the valve stem 38 is raised, water will flow from the tank 12 through the bore 32, through the valve orifice 36 to the steam-generating chamber 18.

The fill and valve arrangement 28 further includes a fill cap 40 rotatably supported above the shell 14 by a stationary plate member 42 having a depending circular flange 43. The tank is provided with a nipple 44 which extends upwardly through aligned openings in the tank and the shell and is threadedly engaged by the flange of the plate member 42. Two diametrically opposed stationary arcuate ports 48 are provided in the plate member 42.

The fill cap 40 is provided with a substantially funnel-shaped recess 49, which recess is formed by an annular inclined surface 50 encompassing a bottom wall portion 51. Two diametrically opposed arcuate ports 52 of substantially the same angular extent as the ports 48 are provided in the bottom wall portion 51 and are in communication with the recess 49. The fill cap 40 has a lower depending skirt 53 defining a circular bore 54 within which the stationary plate member 42 is nested. As thus far described, it may be seen that by rotating the fill cap 40, the ports 52 may be moved into or out of registry with the ports 48. Also, the fill cap 40 is guided during its rotational movement by the bearing action of the plate flange 43 within the bore 54 of the fill cap.

The valve stem 38 is biased downwardly toward closed position by a helical spring 55 compressed between the plate member 42 and a collar 56 fastened to the valve stem. Although the valve stem 38 is movable axially, it is of square cross section, as best shown in Fig. 6, and passes through a square opening 57 provided in the stationary plate member 42, which opening prevents rotation of the valve stem.

The fill cap 40 is provided with two cam portions 58 disposed in diametrically opposed relation between the arcuate ports 52. The valve stem 38 is provided with a transverse pin 60 disposed in such a manner as to be engaged and lifted by the cam portions 58 when the ports 52 are rotated out of registry with the stationary ports 48. This position is clearly shown in Figs. 4 and 5.

The fill cap is appropriately inscribed with the legends "Steam" and "Fill," while the pin 60 may have a pointed end portion 62 for purposes of indicating the position of the fill and valve arrangement 28.

As shown in Figs. 2 and 3, the fill and valve structure is in the "Fill" position, as indicated by the alignment of the pointed end portion 62 with the legend "Fill" on the fill cap. The ports 52 are in registry with the stationary ports 48, while the valve stem 38 is in the lower position against the valve seat 34. With the iron resting on its soleplate, the tank may be filled by pouring water into the recess 49 in the fill cap. The water will flow freely through the aligned ports 52 and 48 into the tank 12, but will be prevented from flowing into the steam-generating chamber 18, since the valve orifice 36 is obstructed by the valve stem 38.

When it is desired to operate the iron as a steam iron, the fill cap is rotated clockwise (as seen in Figs. 2 and 4) to the position shown in Figs. 4 and 5. Such rotation will cause the cam surfaces 58 to bear against the pin 60 and lift the valve stem to the position shown, against the bias of the spring 55. Each of the cam surfaces 58 is provided with a radial groove 59 for receiving the pin 60 and to act as an index for the fill cap in the "Steam" position. With the valve stem in its upper position, the orifice 36 will be unobstructed and water will flow from the tank, through the office into the steam-generating chamber 18, where it is quickly turned into steam. As the fill cap is rotated, the valve stem is lifted and the ports 52 are moved out of registry with the stationary ports 48, thereby closing the fill cap and preventing egress of water from the tank which might otherwise occur during normal movement of the iron by the operator.

The water tank may be filled at any time, whether hot or cold by rotating the fill cap to the "Fill" position, without flooding the steam-generating chamber and consequent spitting of unvaporized water through the steam exhaust apertures 22 in the soleplate.

It will be noted that the fill cap is held snugly against the plate member 42 by the action of the spring 55, thereby preventing egress of water between the abutting surfaces of the fill cap and the plate member 42 when the fill and valve arrangement 28 is in the "Steam" position.

Filling a steam iron with water is greatly facilitated with my combination fill and valve arrangement. The fill cap fits snugly on the shell 14 and although funnel-shaped, it is nevertheless of reduced height and its location adjacent the free end of the handle 15 renders it easily accessible for receiving water without spillage.

Also, danger of filling the tank while the valve is in open position is eliminated. Operation of the steam iron is simplified, since only one member need be manipulated by the operator.

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

What I claim is:

1. A steam iron having a soleplate provided with a vaporizing chamber and an aperture for emitting steam from the chamber, a water tank disposed above said soleplate, means including a valve for controlling flow of water from the tank to said chamber, means for filling said tank, said filling means including a rotatable fill cap having a bottom wall and an outer wall encompassing said bottom wall, said outer wall forming a funnel-shaped recess in said fill cap, said fill cap having a depending flange defining a circular bore, a stationary plate carried by said tank and disposed below said fill cap in abutting relation with said bottom wall and supporting said fill cap and locking means for securing said stationary plate, said locking means including a circular depending flange disposed within said circular bore and acting as a bearing for said fill cap, said bottom wall having a port, and said stationary plate having a port in registry with said tank, said fill cap being rotatable to a first position in which said ports are in registry with each other and permit entry of water to said tank, said fill cap being rotatable to a second position in which said ports are out of registry with each other and prevent loss of water from said tank through said fill cap, and means actuated by rotary movement of the fill cap for opening and closing said valve.

2. A flash-type steam iron having a soleplate,

a steam-generating chamber in said soleplate, a water tank disposed above said soleplate, a valve for controlling flow of water from said water tank to said steam-generating chamber for steaming purposes, and means for filling said tank, said means including a funnel-shaped rotatable fill cap having a port and a stationary member having a port, said fill cap being rotatable to a first position in which said ports are in registry and to a second position in which said ports are out of registry, said valve being movable axially in one direction to a closed position and in the opposite direction to an open position; and means interposed between said valve and said fill cap and operable by said fill cap for moving said valve to said closed position when said fill cap is rotated to said first position, and for moving said valve to said open position when said fill cap is rotated to said second position.

3. A flash-type steam iron having a soleplate, a steam-generating chamber in said soleplate, a water tank disposed above said soleplate, a valve for controlling flow of water from said water tank to said steam-generating chamber for steaming purposes, and filling means for said tank; said filling means including a rotatable fill cap having a port and a stationary member having a port, said fill cap being rotatable to a first position in which said ports are in registry and to a second position in which said ports are out of registry, said valve comprising an orifice disposed at the bottom of the tank and a valve stem cooperating with said orifice, said valve stem being movable axially in one direction to a closed position and in the opposite direction to an open position, and means on said fill cap for moving said valve stem to said closed position when said fill cap is rotated to said first position, to prevent dripping of water from said tank into said steam-generating chamber while water is being introduced into said water tank.

4. A flash-type steam iron having a soleplate, means for heating said soleplate, a steam-generating chamber in said soleplate, a water tank disposed on said soleplate, a valve for transmitting water from said water tank to said steam-generating chamber for steaming purposes, and means for filling said tank, said means including a funnel-shaped rotatable fill cap having a port and a stationary member having a port, said fill cap being rotatable about an axis to a first position in which said ports are in registry and to a second position in which said ports are out of registry, said valve including an orifice disposed at the bottom of the tank and a valve stem cooperating with said orifice, said valve stem being movable axially in one direction to a closed position and in the opposite direction to an open position, the axes of said valve stem and said fill cap being substantially coincident, and means for moving said valve stem to said closed position when said fill cap is rotated to said first position, and for moving said valve stem to said open position when said fill cap is rotated to said second position.

5. A flash-type steam iron having a soleplate, a steam-generating chamber in said soleplate,

means for heating said soleplate and said steam-generating chamber, a water tank disposed above said soleplate, a valve for controlling flow of water from said water tank to said steam-generating chamber for steaming purposes, and filling means for said tank, said filling means including a rotatable fill cap having a port and a stationary member having a port, said valve being biased to a closed position and movable axially to an open position, said fill cap being rotatable to a first position in which said ports are in registry with each other and to a second position in which said ports are out of registry, and means interposed between said valve and said fill cap and operable by said fill cap when the same is rotated to said second position to move said valve to said open position, said means further including a member for holding said valve in said open position against the action of the bias, whereby water is permitted to flow from said tank to said steam-generating chamber for steaming purposes.

6. The structure recited in claim 5 in which said iron is provided with a manipulating handle, said handle having a rear anchoring portion and having an unanchored front portion, said filling means and said valve being arranged coaxially with respect to each other and being disposed below said front portion and spaced therefrom, said filling means being disposed to permit admission of water to said tank when said device is in the normal ironing position.

7. A steam iron including a soleplate provided with a vaporization chamber and an aperture for emitting steam from the vaporization chamber, a water tank disposed above said soleplate, means for conveying water from the tank to the vaporization chamber and including a valve, means for filling said tank, said filling means including a rotatable fill cap having a bottom wall and an outer wall encompassing said bottom wall, said outer wall forming a funnel shaped recess in said fill cap, a stationary plate carried by said tank and disposed below said fill cap in abutting relation with said bottom wall and supporting said fill cap, said bottom wall having a port and said stationary plate having a port communicating with said tank, said fill cap being rotatable to one position wherein said ports are in registry for permitting entry of water to said tank, said fill cap being rotatable to a second position wherein said ports are out of registry and wherein the loss of water from the tank is prevented, and means connecting the fill cap and said valve and actuated by rotary movement of the fill cap for opening and closing the valve.

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