Dec. 20, 1955 J. E. VANCE 2,727,320

ELECTRIC STEAM IRONS

Filed Sept. 23, 1952

2 Sheets-Sheet 1

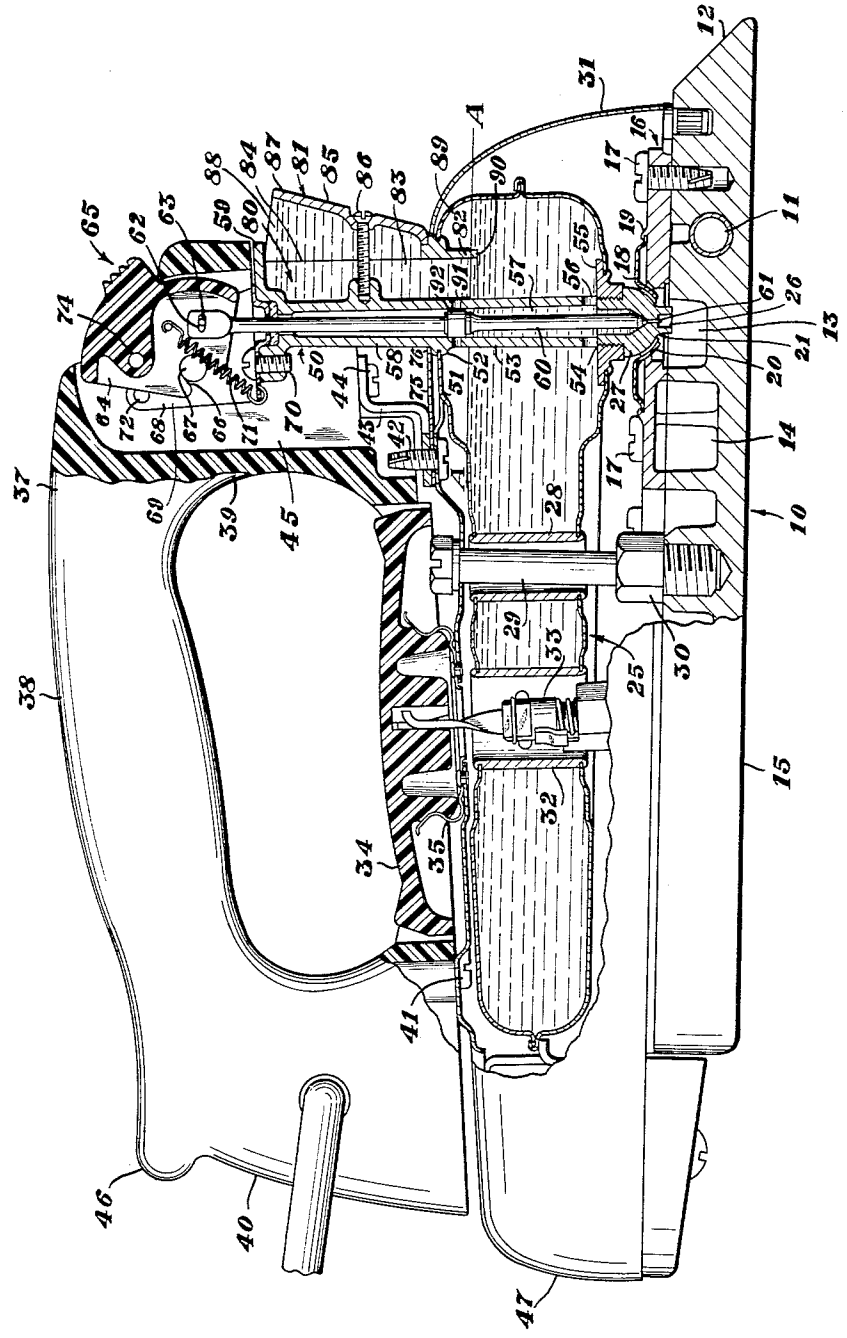


Fig. 1

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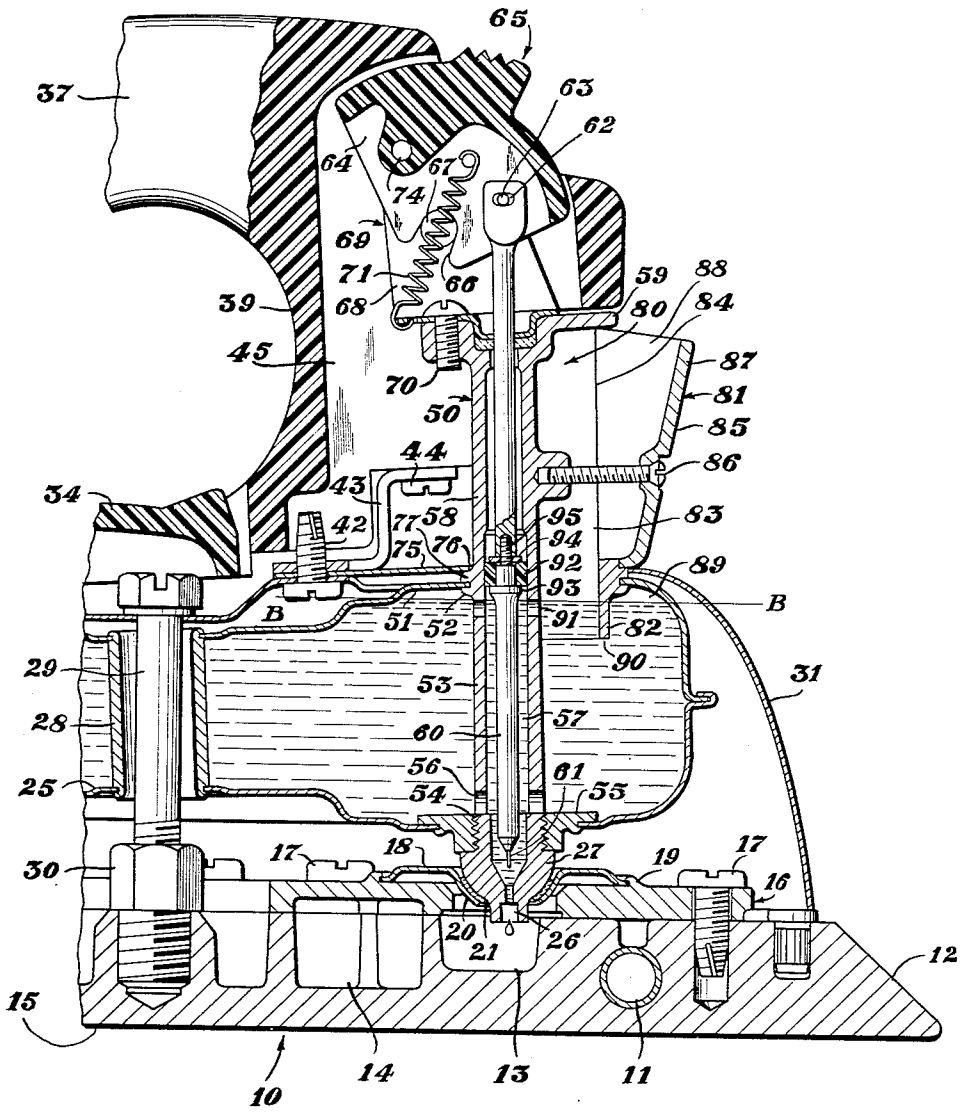


Fig. 2

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United States Patent Office 2,727,320 Patented Dec. 20, 1955

2,727,320

ELECTRIC STEAM IRONS

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Application September 23, 1952, Serial No. 311,045

6 Claims. (Cl. 38—77)

The present invention relates to steam irons and more particularly to filling the water reservoir to its full capacity.

An object of the invention is to provide a steam iron having a water reservoir which can be filled to its maximum capacity. Another object is to provide a steam iron wherein the reservoir can be filled to its full capacity while the iron rests upon the ironing surface of the sole plate. Another object is to provide a water reservoir having an air trap which can be vented to permit water in a fill tube to enter the reservoir and completely fill the latter while the iron rests upon the sole plate ironing surface. Other objects and advantages of the invention will become apparent from the following description and drawings, wherein:

Figure 1 is a side view of the iron, partly in section, resting on its sole plate and showing the reservoir partly filled with water, and the air trap preventing water in the fill tube from entering the reservoir, and

Figure 2 is a front sectional view of the iron resting on its sole plate and showing the air trap vented and the water in the fill tube discharged into the reservoir to completely fill the latter.

The embodiment of the invention herein disclosed comprises a sole plate 10, having a U-shaped heating element 11 with its bight toward the toe 12 of the sole plate, and an open top steam generating chamber 13 from which extends suitable passageways 14 to conduct steam to unshown outlets in the face 15 of the sole plate 10 for treating the fabrics to be ironed. A cover 16 is removably attached by screws 17 to the sole plate 10 and includes a member 18 staked at 19 to the cover and provided with an annular flange 20 defining an opening 21 overlying the steam generating chamber 13.

A water reservoir 25 overlies the sole plate 10 and is provided with an outlet 26 in a projecting boss 27 seated in the annular flange 20 for admitting water to the steam generating chamber 13. Extending through the reservoir 25 is a tube 28 which receives a bolt 29 threaded into a nut 30 anchored to the sole plate 10 to removably secure a cover shell 31 to the sole plate. Another tube 32 also extends through the reservoir 25 and receives in spaced relation a stem 33 of an unshown thermostat positioned below the reservoir to control the temperature of the sole plate 10. A dial 34 is removably secured to the upper end of the stem 33 and is detachably connected to the cover shell 31 by spaced springs 35 riveted to the shell 31.

A handle 37 is provided with a hand grip 38 and front and rear supporting legs 39 and 40 respectively. The rear leg 40 is secured to the cover shell 31 by a screw 41, and the front leg by a screw 42 attached to a bracket 43 which extends upwardly into and is secured by a screw 44 to a hollow portion 45 of the leg 39. At the rear end of the handle 37 is a projection 46 which cooperates with the rear end 47 of the shell 31 to support the iron in upended rest position.

A tubular valve housing 50 is permanently attached to the reservoir 25 by being staked to the top wall 51 of the

latter as indicated at 52. The lower portion 53 of the valve housing is disposed inwardly of the reservoir 25 and its inner end 54 rests upon the bottom 55 of the reservoir, and is provided with a plurality of marginal slots 56 for entrance of water within the bore 57 of the housing 50 and to the outlet 26. A portion 58 of the valve housing extends above the reservoir 25 into the hollow section 45 of the handle front leg 39 and terminates in a rectangular shaped flange 59. A valve stem 60 is slideably mounted in the bore 57 of the housing 50 and is provided at its lower end with a needle valve 61 to control the outlet 26 and thus flow of water to the steam generating chamber 13. The upper end of the valve stem 60 projects beyond the flange 59 and is provided with an elongated opening 62 receiving a pin 63 mounted in spaced walls 64—64 of a valve actuator 65. Each of the spaced walls 64 of the actuator has a marginal slot 66 for rotation on a pin 67 supported in spaced legs 68—68 of a U-shaped bracket 69 secured to the flange 59 by a screw 70. A tension spring 71 is connected to the bracket 69 and the actuator 65 and passes substantially through the pivot pin 67 of the actuator when the valve 61 is open as shown in Figure 2. A detent 72 on each of the bracket legs 68 cooperates with an opening 74 in the actuator 65 to hold the latter and the valve 61 in the position shown in Figure 2 against the bias of the spring 71. When the actuator 65 is moved clockwise from the position in Figure 2 the spring 71 snaps the valve stem 60 downwardly in the housing 50 and seats the valve 61 in the outlet 26 to close the latter.

A leaf spring 75 is secured at one end to the cover shell 31 by the screw 42 and the opposite end has a U-shaped marginal recess 76 which rests against the staked rib 77 to urge the boss 27 into seating engagement with the flange 20 when the cover shell 31 is attached to the sole plate 10 by the bolt 29.

Formed integrally with the valve housing 50 is a portion 80 of a fill tube 81 and includes a tubular section 82 and a U-shaped section 83, the latter extending upwardly from the tubular section 82 to the flange 59 and forwardly of the valve housing 50 to the line 84. The upper portion of the fill tube 81 is completed by a U-shaped member 85 removably secured by a screw 86 threaded into the valve housing 50. The upper end 87 of the member 85 projects forwardly of the flange 59 to form a top opening 88 for pouring water into the fill tube. The tubular portion 82 of the fill tube extends into the reservoir to the line A—A to limit the level of water initially poured into the reservoir by forming an air pocket 89 between the lower end 90 of the fill tube and the top wall 51 of the reservoir as shown in Figure 1.

A plurality of spaced vent ports 91 are provided in the valve housing 50 above the initial water level line A—A and communicate with the air pocket 89, bore 57 and the fill tube 81. An annular valve 92 controls the vent ports 91 and is secured to the valve stem 60 between a rib 93 and a washer 94, the latter being held in place by the threaded connection 95 of the two parts of the valve stem 60. The valve 92 is operated by the actuator 65 simultaneously with the needle valve 61. The full water capacity of the reservoir 25 is determined by the upper marginal walls of the vent ports 91 indicated by the capacity level line B—B.

When it is desired to fill the reservoir the iron is placed upon its sole plate 10 in ironing position and the actuator 65 is moved to the position shown in Figure 1, whereby the valve 92 closes the vent ports 91 and the valve 61 closes the outlet 26 to the steam generating chamber 13. Water is then poured through the inlet 88 into the fill tube 81 and flows into the reservoir 25 until the water reaches the initial level line A—A, closing the inner end 90 of the fill tube 81 to form the air pocket 89. The operator con-

tinues to pour water into the fill tube until it reaches the top of the fill tube **81**, and thus the latter carries the water which is to be added to completely fill the reservoir. Thereafter the valve actuator **65** is moved to the position shown in Figure 2 to shift the valves **92** and **61** to their open positions. Movement of the valve **92** to its open position uncovers the vent ports **91** to permit the trapped air in the air pocket **89** to escape upwardly through the water in the fill tube **81**, and as the air escapes the water in the fill tube enters the reservoir and increases the quantity of the water therein to the level line B—B at the upper marginal walls of the vent ports **91**. The volume of air released through the vent ports is substantially equal to the water in the fill tube so that the latter does not retain water above the level line B—B.

Movement of the actuator **65** to the position shown in Figure 2 causes the valve **61** to uncover the outlet **26** so that water may flow into the chamber **13** where it is converted into steam and escapes through the passages **14** onto the material being ironed. When steam is no longer desired the valve **61** is closed by moving the actuator **65** forwardly and the latter is held in this position by the spring **71**.

While I have shown and described but one embodiment of my invention, it is to be understood that this embodiment is to be taken as illustrative only and not in a limiting sense. I do not wish to be limited to the particular structure shown and described but to include all equivalent variations except as limited by the scope of the claims.

I claim:

1. A steam iron comprising a steam generating chamber, a water reservoir having an outlet for feeding water into said steam generating chamber, a fill tube attached to said reservoir and having its inner end terminating below the upper wall of said reservoir thereby forming an air pocket therewith and to limit the initial quantity of water discharged into said reservoir from said fill tube to a point level with the lower end of said tube and thereafter maintain water in said fill tube, means defining vent ports leading to said air pocket, and valve means controlling said vent ports movable to a first position to close said vent ports and seal said air pocket, and movable to a second position to open said vent ports for escape of trapped air from said air pocket to permit water remaining in said fill tube to enter said reservoir and increase the quantity of water therein.

2. A steam iron as defined in claim 1 wherein said vent ports are arranged in said air pocket to limit the maximum amount of water admitted from said fill tube to said reservoir upon moving said valve means to uncover said vent ports.

3. A steam iron as defined in claim 1 and second valve means connected with said valve means for operation therewith to close said outlet to passage of water from said reservoir into said steam generating chamber when said valve means is in its said first position, and to open said outlet when said valve means is in its second position.

4. A steam iron comprising a sole plate having a pressing surface, a steam generating chamber, a water reservoir having an outlet for feeding water to said steam generating chamber, a fill tube attached to said reservoir and projecting upwardly therefrom forming a water filling opening for said reservoir when the iron rests upon said pressing surface, the inner end of said fill tube terminating below the upper wall of said reservoir thereby forming an air pocket therewith limiting the initial quantity of water discharged into said reservoir from said fill tube to a point level with the lower end of said tube and maintaining water in said fill tube above said air pocket, means defining vent ports leading to said air pocket above said level, and valve means controlling said vent ports movable to a first position to close said vent ports and seal said air pocket and movable to a second position to open said vent ports for escape of trapped air from said air pocket to permit water remaining in said fill tube to enter said reservoir and increase the quantity of water therein.

5. A steam iron as defined in claim 4 and second valve means connected with said valve means for operation therewith to close said outlet to passage of water from said reservoir into said steam generating chamber when said valve means is in its said first position, and to open said outlet when said valve means is in its said second position.

6. In a steam iron, a steam generating chamber, a water reservoir having an outlet for feeding water into said steam generator, a fill tube attached to said reservoir for entrance of water, means extending below the upper wall of said reservoir to limit the initial quantity of water discharged into said reservoir from said fill tube to a point level with the lower end of said means to thereby form an air pocket and thereafter maintain water in said fill tube, means defining vent ports leading to said air pocket above said level, and valve means controlling said vent ports movable to a first position to close said vent ports and seal said air pocket, and movable to a second position to open said vent ports for escape of trapped air from said air pocket to permit water remaining in said fill tube to enter said reservoir and increase the quantity of water therein.

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