March 24, 1959 E. R. BURMEISTER ET AL 2,878,600

STEAM IRON WITH PARTITIONED TANK

Filed Feb. 12, 1954 2 Sheets-Sheet 1

Fig 1

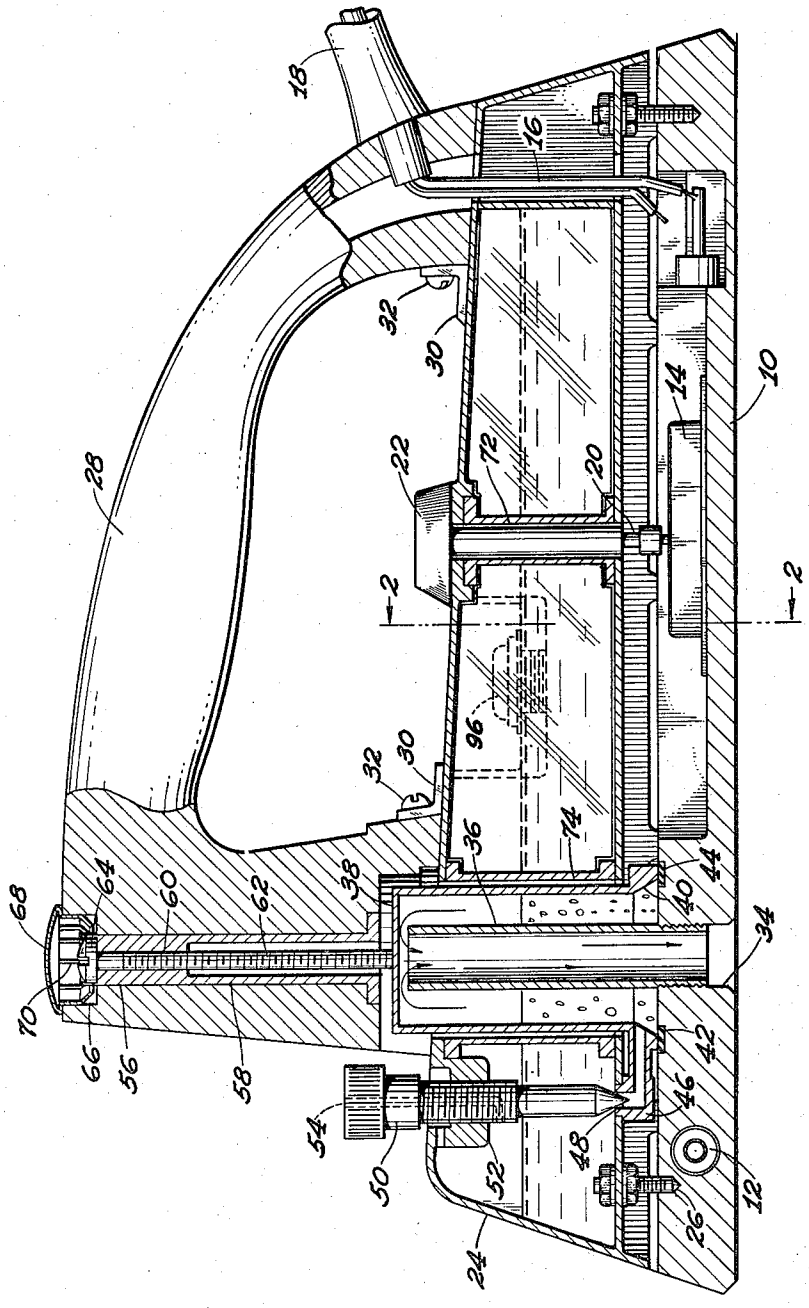

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Fig 4

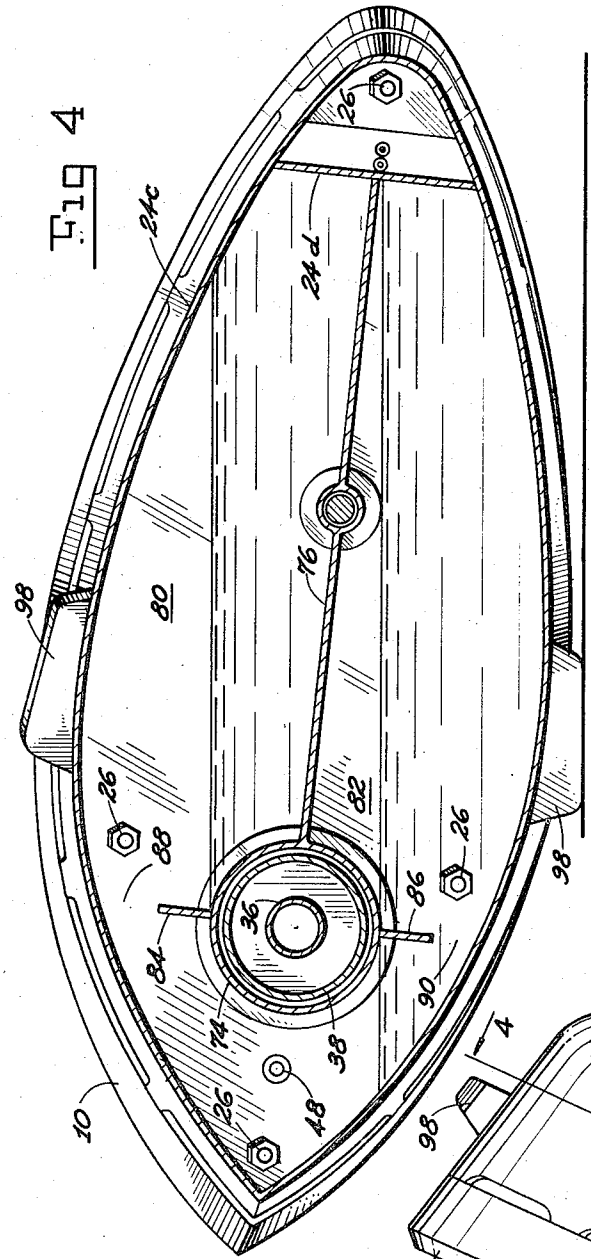


Fig 2

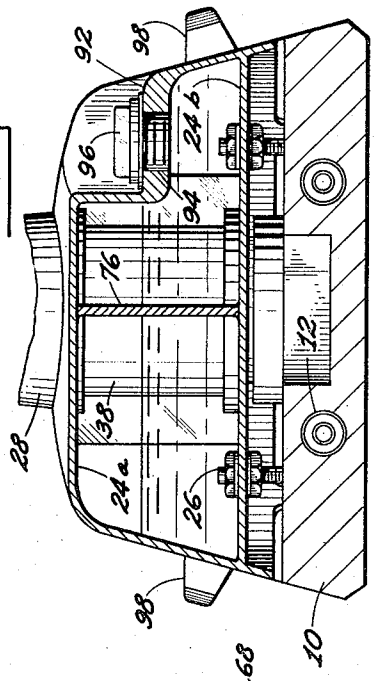
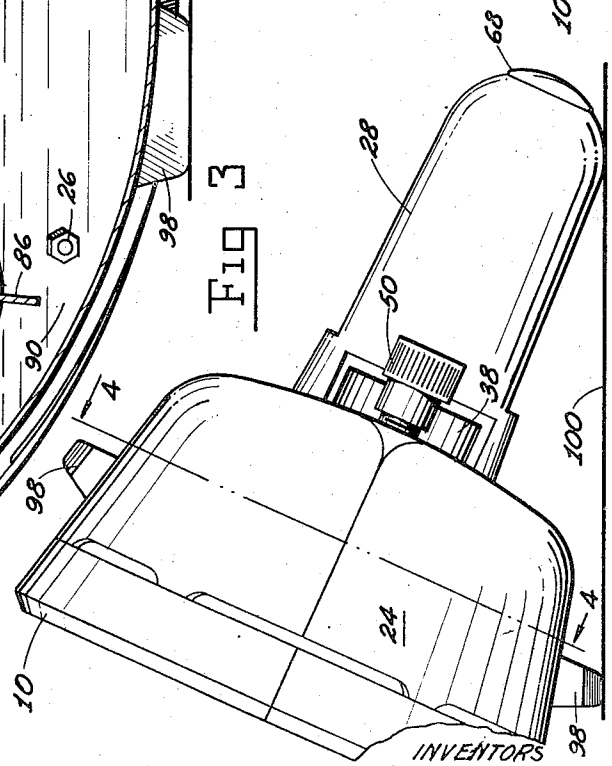


Fig 3



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STEAM IRON WITH PARTITIONED TANK

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9 Claims. (Cl. 38—77)

This invention relates to steam irons of the household variety, and pertains more particularly to a steam iron of this general character that may be rested on either of its sides between ironing strokes with a concomitant automatic interruption of steam generation.

Laboratory conducted tests have shown that less overall ironing effort is involved where the iron can be rested on its side rather than upending it each time a pause in ironing in contemplated. Since the ordinary dry type electric iron contains no liquid, no particular problem is presented in designing an iron of the side rest type. With steam irons, however, a serious problem is encountered in stopping the flow of water to the steam generating chamber without having to close a valve each time the iron is rested on its side, for when the tank or reservoir is nearly full the tilting of the iron onto its side will not raise the tank outlet above the water level. The problem is aggravated further when it is realized that a side rest iron should be capable of being placed on either side and not just one side.

It is, therefore, an important object of the invention to provide a steam iron that may be rested on either side with an accompanying automatic stoppage of water flow to the steam generating chamber. In this connection it is an aim of the invention to provide suitable partition walls within the reservoir, forming in effect a double pocket, so that an appreciable amount of water will be retained in that half which is uppermost when the iron is on either side. It is also within the purview of the invention in carrying out the general purpose thereof, to preclude the filling of the reservoir above an amount determined by the retention capacity of the partition means, together with the volume of water that can be accommodated in the lower half of the reservoir, without escape of any of the liquid through the outlet.

Another object of the invention is to provide an iron in which the reservoir may be inexpensively fabricated and the net weight of which will not be noticeably increased. Actually, it is contemplated that the partition means will so reinforce the tank structure that lighter gauge sheet metal may be used in the manufacture of the tank than would otherwise be found practical.

Other objects will be in part obvious, and in part pointed out more in detail hereinafter.

The invention accordingly consists in the features of the construction, a combination of elements and arrangement of parts which will be exemplified in the construction hereafter set forth and the scope of the application of which will be indicated in the appended claims.

In the drawings:

Figure 1 is a longitudinal sectional view taken substantially through the center of the steam iron forming the subject matter of the instant invention;

Fig. 2 is a sectional view taken in the direction of line 2—2 of Fig. 1;

Fig. 3 is a front view of the iron showing it in one of its side rest positions, and

Fig. 4 is a sectional view taken in the direction of 4—4 of Fig. 3.

Referring now in detail to the drawings, the steam iron there selected for the purpose of illustrating the invention includes a soleplate **10** having embedded therein an electric heating unit **12**, the heating unit being in circuit with a thermostat **14** and a pair of conductors **16**, which conductors enter the iron by way of a conventional electric cord labeled **18**. Extending upwardly from the thermostat **14** is a control shaft **20** equipped at its upper extremity with an adjusting knob **22** by which the thermostat may be set for a preferred operating temperature. In this way, the heat of the iron may be regulated within the desired temperature limits just as any ordinary electric iron is controlled.

Surmounting the soleplate **10** is a tank or reservoir **24** in which the water to be converted to steam is contained, the reservoir comprising a top **24***a*, bottom **24***b*, sides **24***c* converging together at the front and a transverse rear wall **24***d*. A plurality of studs **26** have been shown as the supporting means for the reservoir **24**. Attached to the upper surface of the reservoir is a handle **28**, brackets **30** being spot welded to the reservoir and apertured for the accommodation of screws **32** which threadedly engage portions of the handle itself.

From Fig. 1 it can be seen that the soleplate **10** is provided with an aperture or passage **34** extending therethrough. The upper portion of this passage is tapped for the threaded reception of the lower end of a steam delivery tube **36**. Concentrically spaced from the tube **36** is a generally cylindrical steam dome **38** equipped at its lower end with means providing a steam generating chamber labeled **40**. To provide a vapor-tight seal, the upper surface of the soleplate is provided with an annular groove **42** and this groove contains a gasket member **44**. Also, adjacent to the lower end of the steam dome **38** is a radially extending passage means **46** which has communication with an outlet **48** substantially on the longitudinal center line of the bottom of the reservoir. Cooperating with the outlet **48** and disposed immediately thereabove is a valve **50** which is threadedly carried by a bracket member **52** connected to the under side of the top of the reservoir. Further, in the exemplified version of the invention, the valve **50** has a vent passage **54** extending partially therethrough by which the interior of the reservoir is vented to atmosphere. It might be explained at this time that the express purpose of the valve **50** is to close the outlet **48** when it is desired to use the iron as a dry type iron; of course, when the valve is open then the iron functions as a steam iron.

The handle **28** has a vertically directed bore **56** extending therethrough and within this bore is inserted a bushing member **58**, the bushing having a tapped aperture **60** for the purpose of accommodating a threaded stud **62**. The stud **62** has a slotted head **64** at the upper extremity, and the stud is made sufficiently long so that it extends beneath the lower end of the bore **56** for abutting engagement with the top of the steam dome **38**. Owing to this construction, tightening of the stud **62** creates a downwardly directed pressure against the steam dome **38**, thus urging the lower end of the steam dome against the washer **44** to provide the necessary firm sealing action between the dome and soleplate. For the purpose of enhancing the general appearance of the iron, the upper end of the bore **56** is counterbored at **66** and within the circular confines of the counterbore is placed a button element **68** equipped with downwardly extending resilient fingers **70** so that the head **64** of the stud is completely concealed once the component parts of the iron have been assembled.

Up to this point the reservoir **24** has only been generally described. However, since the interior construc-

tion of the reservoir plays such an important role in the design of the steam iron forming the subject matter of this invention, the reservoir will now be described with greater particularity. For the sake of producing a compact steam iron it is to be noted that a bushing **72** circumscribes the adjusting shaft **20** and a bushing **74** similarly encircles the steam dome **38**, both of these bushings being suitably welded to the top and bottom of the reservoir.

As best viewed in Fig. 4, a vertical partition wall **76** extends rearwardly from the bushing **74** to the rear wall **24***d* of the reservoir. The wall **76** extends from the bottom **24***b* of the reservoir to the top **24***a* thereof and is in a sealing relation with both the top and bottom. Since the bushing **74** extends laterally from the longitudinal center line of the iron and since the rear wall **24***d* also extends laterally from either side of the center line, it will be observed from Fig. 4 that a pair of oppositely directed pockets **80** and **82** are formed. If desired, the volumetric capacity of each of these pockets **80** and **82** may be increased by means of laterally directed flanges **84** and **86**, these flanges being secured to the bushing **74** and also extending from the bottom to the top of the reservoir. Because of this construction, it should be noted that communication between the pockets **80** and **82** is only by way of ports **88** and **90** formed by extending the flanges **84** and **86** only part way to the sidewalls of the reservoir.

In order to permit the reservoir to be filled, as best seen from Fig. 2, the casing of the reservoir is somewhat depressed and thickened in the region designated by the numeral **92** and this thickened portion is apertured to form a filling opening **94**. A filler plug **96** is intended to be screwed into the opening **94** after the water has been introduced into the reservoir. The elevation of the filling opening **94** is important, as this elevation must be interrelated with the volumetric capacity of each of the pockets **80** and **82** and governs the amount of water that may be poured into the reservoir. If the pockets are not formed with the flanges **84** and **86**, their capacity is correspondingly reduced and the opening **94** will then have to be at a fairly low elevation, such as that actually pictured in Fig. 2. On the other hand, if the flanges **84** and **86** are provided, as shown in Fig. 4, then the level or elevation of the opening **94** can be raised somewhat from its illustrated position and will then permit filling of the reservoir **24** to a greater degree. The addition of the flanges **84** and **86** is a simple and effective means for increasing the volumetric capacity of the pockets **80** and **82**. However, these flanges should not be of such large dimensions that the ports **88** and **90** are inadequate to accommodate the passage of air therethrough with a resultant approximate equalization of water levels fore and aft of whichever flange is extending downward. From Fig. 4 it can be seen that the water level on each side of the flange **86** has been equalized and that such level is well below the outlet **48**. However, whether precise equalization takes place depends upon several design factors, namely, the size of the ports **88** and **90**, the quantity of water to be accommodated plus the proportional volumetric capacities of the several tank sections or compartments. Of course, exact equalization is not required, it being only necessary that the level forward of either flange **84** and **86** be below the outlet **48**. Stated otherwise, some air can be entrapped between the wall **76** and the level of the bottom water, but not so much as to raise the water level forward of the flanges **84** and **86** up to the outlet **48**.

In order to properly support the iron in a side rest position, the reservoir **24** is equipped at each side with a side rest foot **98**, as clearly shown in Fig. 3, either of of the feet **98** supporting the soleplate **10** in a raised position from the surface **100**, the handle **28** aiding in such support. When tilted into the position illustrated in Figs. 3 and 4, it can be appreciated from an inspection of Fig. 4 that the pocket **80** will retain some of the reservoir's liquid contents in an elevated condition so that only a portion of the contents will be retained in that half of the reservoir which is lowermost, owing to the fact that an appreciable amount of water has been retained in an elevated condition and the water in the lower half is well below the outlet **48**, and there can be no escape of water through the outlet even though the valve **50** is open. In this way, the flow of liquid from the reservoir immediately ceases when the iron is turned to either of its sides, since the pockets **80** and **82** are of equal capacity with either of them being effective when facing upwardly to retain the appropriate amount of water. The volumetric capacity of the pockets **80** and **82** will depend upon the radius of the bushing **74** and also whether the flanges **84** and **86** are employed. Thus, the particular elevation of the filler opening **94** is influenced by the particular construction decided upon in the making of the pockets **80** and **82**.

As many changes could be made in the above construction, and many apparently widely different embodiments of the invention could be made without departing from the scope thereabove, it is intended that all matter contained in the above description and shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the language used in the following claims is intended to cover all of the generic and specific features of the invention herein described and all statements of the scope of the invention which the matter of language might be said to fall therebetween.

We claim:

1. In a steam iron, a soleplate, a reservoir surmounting the soleplate provided with an outlet located substantially on the longitudinal center line of the bottom thereof and including oppositely facing respective pocket means spaced from said outlet and formed on each side of said center line so that the upper one of said pocket means will always be facing upwardly when the iron is resting on either of its sides, each pocket means including wall means extending from the bottom of the reservoir to the top thereof and having end portions spaced far enough apart to provide sufficient volumetric capacity so that the particular pocket means facing upwardly will hold enough water to maintain the water level in the lower half of the reservoir below said outlet, each pocket means having an opening in the forward end portion thereof and adjacent the sides of said reservoir, and steam generating means having communication with said outlet and the pressing face of said soleplate.

2. In a steam iron, a soleplate, a reservoir surmounting the soleplate provided with an outlet located substantially on the longitudinal center line of the bottom thereof and nearer the forward end of the iron, the reservoir including a pocket on each side of said center line nearer the rear end of the iron facing in opposite directions so that the upper one of said pockets will always be facing upwardly when the iron is resting on either of its sides, each pocket having wall means extending from the bottom of the reservoir to the top thereof and having end portions spaced far enough apart to provide sufficient volumetric capacity so that the particular pocket facing upwardly will hold enough water to maintain the water level in the lower half of the reservoir below said outlet, there being communication between the pockets only in the neighborhood of said outlet and adjacent the sides of said reservoir, and steam generating means having communication with said outlet and the pressing face of said soleplate.

3. In a steam iron, a soleplate, a reservoir surmounting the soleplate provided with an outlet located substantially on the longitudinal center line of the bottom thereof and nearer the forward end of the iron, the reservoir including a partition member extending from the top to bottom of the reservoir from a locus rearwardly of said outlet to

the rear end of said reservoir substantially along said center line and oppositely projecting lateral wall means adjacent said outlet also extending from the top to bottom of the reservoir but terminating in a spaced relation with respect to the sides of said reservoir to form an upwardly directed pocket on the upper side of said center line when the iron is resting on either of its sides and the forward end is at an elevated position relative the rear end, each pocket having its ends spaced far enough apart to provide sufficient volumetric capacity so that the upwardly directed pocket will hold enough water to maintain the water level in the lower half of the reservoir below said outlet when the iron is in a side rest position, and steam generating means having communication with said outlet and the pressing face of said soleplate.

4. In a steam iron, a soleplate, means supporting said iron in a side rest position with one end of the iron's longitudinal axis higher than the other, a reservoir surmounting the soleplate having an outlet adjacent the higher end and a partition and wall means providing two oppositely facing chambers adjacent the other end having their end portions spaced far enough apart to provide sufficient volumetric capacity so that the particular chamber facing upwardly will hold enough water to maintain the water in the lower half of the reservoir below said outlet, said partition and wall means extending from the top to bottom of the reservoir and the chambers formed by said partition and wall means being in communication with said outlet only adjacent the sides of said reservoir, and steam generating means connecting with said outlet and the pressing face of said soleplate, whereby liquid within said reservoir will not flow through said outlet when said iron is resting on either of its sides.

5. In a steam iron, a soleplate, a reservoir having wall means extending from the top to bottom thereof and forming an outlet chamber adjacent one end and a pair of chambers side by side toward the other end with communicating openings from said outlet chamber to each of said other chambers, at least one opening being spaced laterally from the longitudinal axis of the iron and located adjacent one side of the reservoir, the chamber associated with said one opening having its end portions spaced far enough apart to provide sufficient volumetric capacity so that this particular chamber when facing upwardly will hold enough water to maintain the water in the lower half of the reservoir below said outlet and steam generating means having communication with said outlet chamber and the pressing face of said soleplate.

6. In a steam iron, a soleplate, a reservoir surmounting the soleplate provided with an outlet located substantially on the longitudinal center line of the bottom thereof and nearer the forward end of the iron, the reservoir including a partition member extending from the top to bottom of the reservoir from a locus rearwardly of said outlet to the rear end of said reservoir substantially along said center line and top to bottom wall means extending laterally from said center line toward either side of the reservoir to form an oppositely directed pocket on each side of said center line so that one of said pockets will always be facing upwardly when the iron is resting on either of its sides, each pocket having sufficient volumetric capacity so that the particular pocket facing upwardly will hold enough water to maintain the water level in the lower half of the reservoir below said outlet, and steam generating means having communication with said outlet and the pressing face of said soleplate.

7. In a steam iron, a soleplate, a generating chamber associated with the soleplate, said chamber being substantially on the longitudinal center line of said soleplate and disposed nearer one end than the other, upstanding means on the soleplate for conducting steam from said chamber to the pressing face of said soleplate, a reservoir surmounting the soleplate containing interior wall means extending from the top to bottom of said reservoir and part way toward either side of said reservoir and additional top to bottom means extending from said first wall means substantially along the longitudinal center line of the reservoir to the further end thereof, said reservoir having an outlet disposed substantially on its longitudinal center line and between said first wall means and the nearer end of said reservoir which outlet is in communication with the steam generating chamber, whereby when a predetermined quantity of water is contained in said reservoir the resting of the iron on either side will cause some of the water to be confined in an elevated position by a pocket including said first additional wall means with the accompanying result that the surface of the remaining water will be below said outlet.

8. In a steam iron, a soleplate, a steam generating chamber associated with the soleplate, said chamber being substantially on the longitudinal center line of said soleplate and disposed nearer one end thereof than the other, upstanding means on the soleplate for conducting steam from the chamber to the pressing face of said soleplate, a reservoir surmounting the soleplate containing interior wall means surrounding said upstanding means, said wall means extending from the top to the bottom of said reservoir and part way toward either side of said reservoir and additional top to bottom wall means extending from said first wall means substantially along the longitudinal center line of the reservoir to the further end thereof, said reservoir having an outlet disposed substantially on its longitudinal center line and between said first wall means and the nearer end of said reservoir which outlet is in communication with said steam generating chamber, whereby when a predetermined quantity of water is contained in said reservoir the resting of the iron on either side will cause some of the water to be confined in an elevated position by a pocket including said first and additional wall means with the accompanying result that the surface of the remaining water will be below said outlet.

9. The structure claimed in claim 8 in which said first mentioned wall means is cylindrical and has connected thereto laterally extending flanges.

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