United States Patent [19]

Flowers

[11] **3,820,259**

[45] **June 28, 1974**

[54] **ELECTRIC STEAM IRON**

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[73] Assignee: **Scovill Manufacturing Company,** Waterbury, Conn.

[22] Filed: **Jan. 2, 1973**

[21] Appl. No.: **320,444**

[52] **U.S. Cl.** **38/77.5,** 38/77.83

[51] **Int. Cl.** **D06f 75/05**

[58] **Field of Search** 38/77.83, 77.5, 77.8

[56] **References Cited**

UNITED STATES PATENTS

3,407,522	10/1968	Jepson et al.	38/77.5
3,599,357	8/1971	Gronwick	38/77.5
3,711,972	1/1973	Risacher	38/77.83

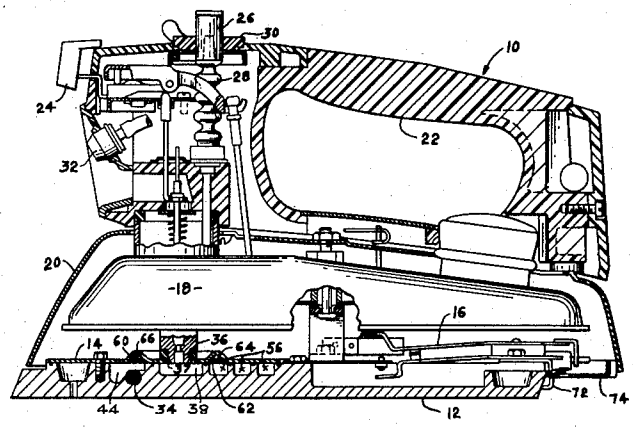
Primary Examiner—Patrick D. Lawson

Attorney, Agent, or Firm—Dallett Hoopes

[57] **ABSTRACT**

Steam iron is equipped with second steam-generating chamber capable of generating a blast of steam which is communicated to steam channel at toe of iron to focus blast for better directing by housewife. Unpluggable vents at rear end of steam channel permit flushing of lint and dirt out heel of iron to keep them off sole plate ironing surface.

5 Claims, 9 Drawing Figures



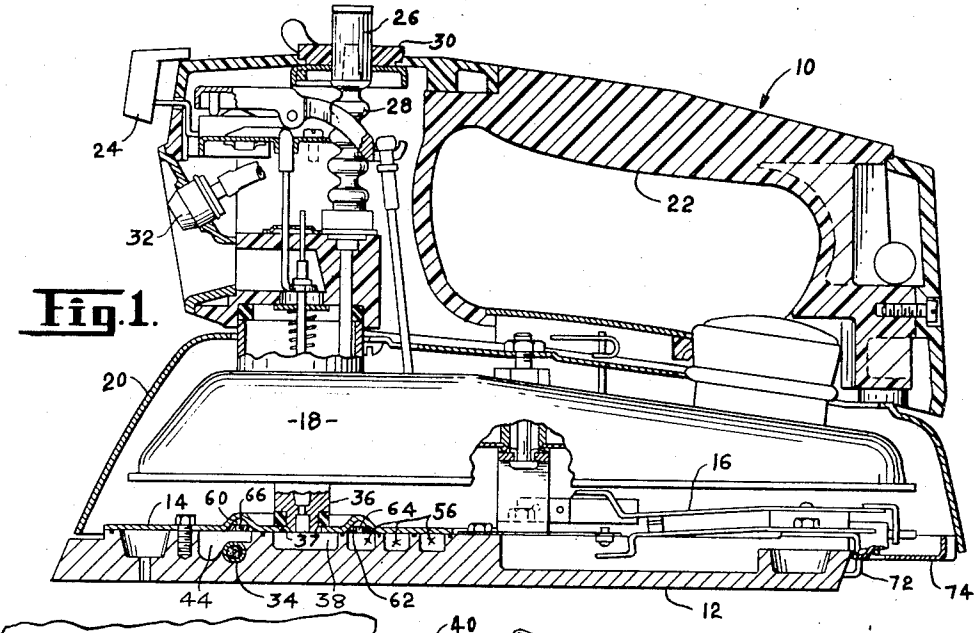


Fig.1.

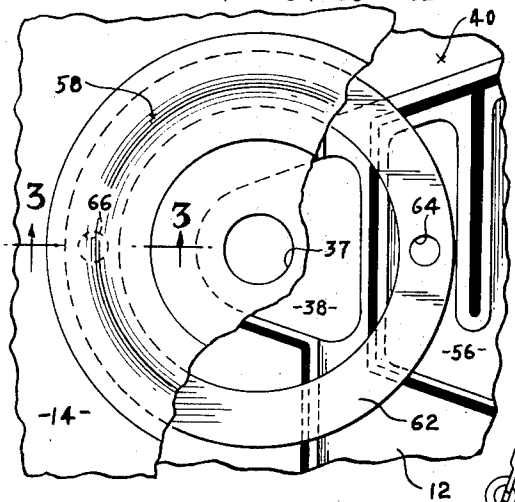


Fig.2.

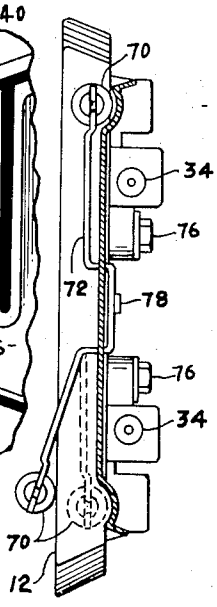


Fig.5.

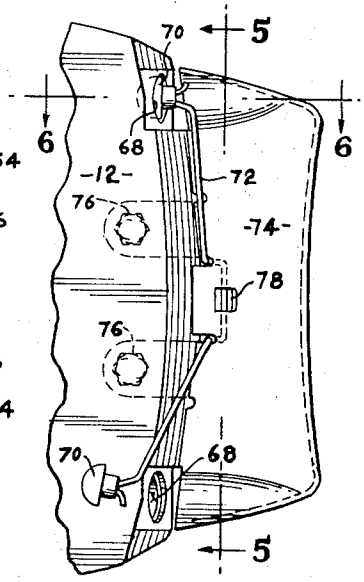


Fig.4.

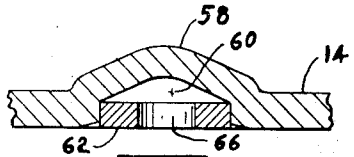


Fig.3.

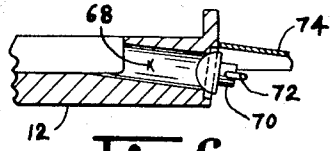


Fig.6.

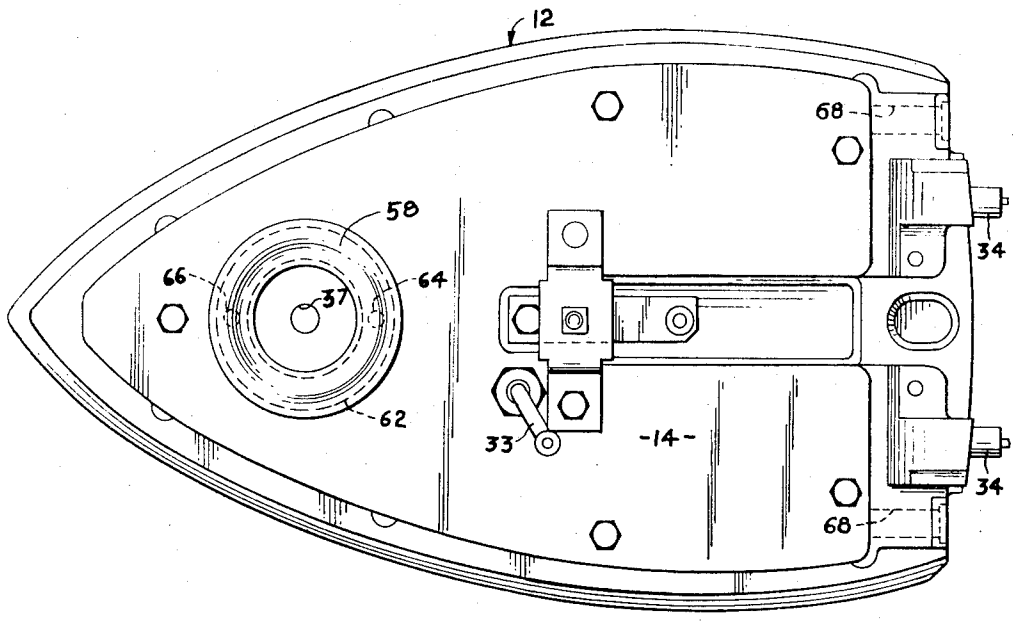


Fig. 7.

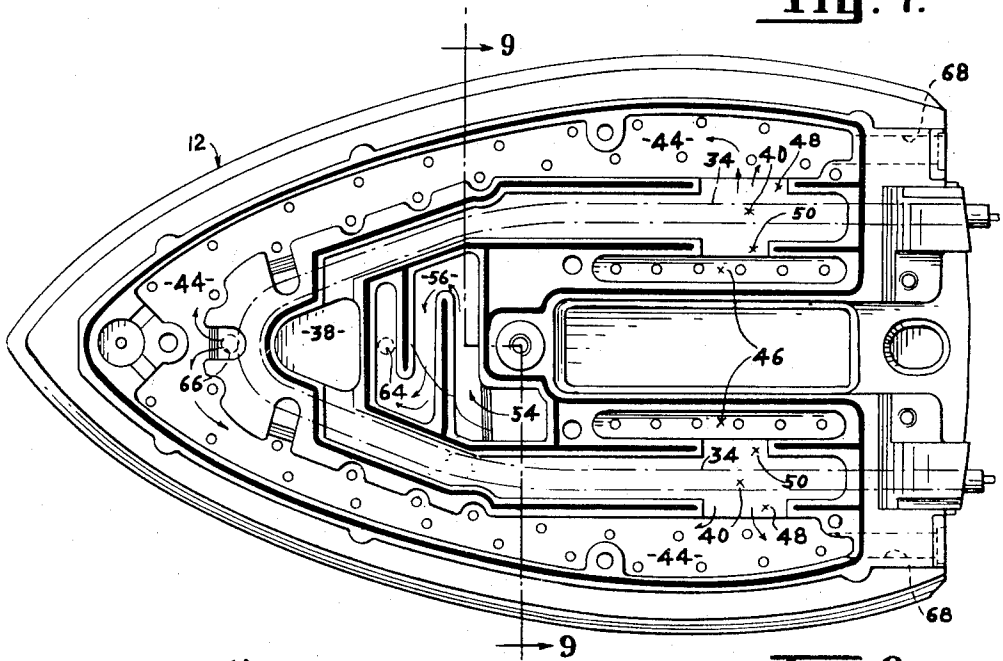


Fig. 8.

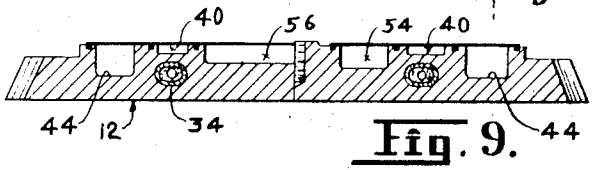


Fig. 9.

ELECTRIC STEAM IRON

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to an electric steam iron. More specifically, this invention relates to an electric steam iron having a conventional steam supply and also means for supplying to the sole plate a quantity of steam substantially greater in rate but of shorter duration than the steam supplied conventionally. In a preferred embodiment, the invention also includes means to use such a blast to clean the iron.

2. Description of the Prior Art

In the prior art, several steam irons have been provided with special auxiliary steam-generating chambers and means, when properly actuated by the operator, to inject a quantity of water into the auxiliary chamber to produce a blast of steam of short duration but of greater volume per unit time than the steam normally produced by the iron in the primary steam-generating chamber. Examples of such iron are disclosed in U.S. Pat. No. 3,599,357 to Gronwick et al. and also the presently pending patent application, Ser. No. 195,927, filed on Nov. 5, 1971, now U.S. Pat. No. 3,711,972 and assigned to my assignee by mesne assignment.

In the prior construction of such irons, the steam from the auxiliary or second-generating chamber has blended with the steam from the primary steam-generating chamber and has travelled through passages to be delivered to the steam-distributing channels at a position towards the heel of the sole plate. This has meant that the steam blast of short duration has not been focused at the toe or the iron but rather at the heel. Additionally, in some cases, because the blast in its path toward the ports in the sole plate has passed by or near the inlet of water to the primary steam-generating chamber, there has been a forcing of such steam up through the supply nozzle to the primary steam-generating chamber, reducing the amount of steam that has reached the ports of the sole plate. It has, in addition, caused distracting gurgling sounds.

The piror art has also included a number of provisions for cleaning of the steam distribution channels and passageways in the sole plate. One such provision, for instance, has involved opening a large valve in the water tank to flush the remaining water at the end of the ironing operation into the sole plate generating chambers and consequently exploding steam through the various ports and channels for cleaning purposes.

Prior art cleaning arrangements have had the disadvantage that they have used the steam ports on the bottom of the sole plate for the cleaning operation leaving residue on the sole plate of the iron, especially when the iron is subsequently upturned in its conventional rest position. Such residue has found its way onto freshly washed clothes in the next ironing session and has been a source of distress and irritation for the housewife.

SUMMARY OF THE INVENTION

Under the present invention, means are provided for delivering the steam from the second steam-generating chamber to the steam-distributing channels at a position adjacent the toe of the iron. This means that the full force of such steam is focused generally adjacent the front end of the iron so that the housewife is able better to direct such steam at the desired spot on the garment being pressed. Additionally, because such delivery means does not involve a blending of second chamber flow with flow from the primary steam-generating chamber, there is no tendency for the blast of steam to enter through the primary chamber nozzle into the water tank under usual ironing conditions.

Finally, in preferred embodiments of the invention, openings are provided adjacent the heel of the iron from the steam distribution channels which openings are normally plugged but which, at the end of the ironing session, may be unplugged to permit the egress of the blast of steam to effect the harmless discharge of foreign material in the steam distribution channels with the result that such discharge will not find its way to the bottom of the sole plate. Moreover, such openings, when the plugs are removed, permit the insertion of a cleaning tool such as a brush when desired or necessary.

BRIEF DESCRIPTION OF THE DRAWINGS

Other features and objects of the invention will be apparent from a reading of the following specification, including the drawings, all of which show non-limiting embodiments of the invention. In the drawings:

FIG. 1 is a centerline sectional view of an iron embodying the invention;

FIG. 2 is a fragmentary, greatly enlarged view of the top of the sole plate cover surrounding the water supply nozzle to the primary chamber;

FIG. 3 is a sectional view taken on the line 3—3 of FIG. 2;

FIG. 4 is a fragmentary bottom plan view of the heel of the iron showing the plug means for the cleaning ports;

FIG. 5 is a sectional view taken on the line 5—5 of FIG. 4;

FIG. 6 is a sectional view taken on the line 6—6 of FIG. 4;

FIG. 7 is a top plan view of the sole plate and cover but without the plug retaining means or plugs;

FIG. 8 is a top plan view of the sole plate uncovered; and

FIG. 9 is a sectional view on the line 9—9 of FIG. 8.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring more specifically to the drawings, an electric steam iron embodying the invention is generally designated **10** in FIG. 1. It includes a sole plate **12** having a cover **14** and conventional thermostat means **16.** Mounted above the cover is a water tank **18** over which is secured a conventional skirt **20.**

To the top of the cover is secured a handle **22** which includes thermostat control and steady steam control means **24** and pump control **26.** As shown schematically, a pump **28** is secured within the handle housing to the pump control **26** and serves, depending on the setting of control **30,** to pump water from the tank **18** either to the spray **32** or through tube **33** (FIG. 7) to the second steam-generating chamber **54** (FIG. 8). The means by which control **30** operates is not shown. A U-shaped heating element **34** is embedded in the sole plate and is delivered electricity through a cord, not shown.

A primary water outlet **36** extends downwardly from the bottom of the tank **18** and is aligned with an open-

ing 37 in cover 14, as shown in FIG. 1. A needle valve, as is conventional, is raised and lowered by the control 24 to block or permit flow drip-by-drip into the first steam-generating chamber 38 (FIG. 8). Chamber 38 has, extending rearwardly from it, a pair of fairly straight passages 40 which overlie the U-shaped heating element 34 (FIG. 8). Disposed on the outside of the passages 40 is the deep steam distributing channel 44 which is also U-shaped. Deep slots 46 are disposed inwardly of the passages 40 and slots 48 and 50 communicate steam from the passages 40 to the deep channels 44 and 46 respectively. Channels 44 and 46 carry ports to deliver steam to the bottom of the iron.

A second steam-generating chamber 54 is disposed in the sole plate adjacent the U-shaped heating element and a labyrinth or maze 56 extends therefrom forwardly. Appropriate seals outlined heavily in black in the drawings (FIG. 8), engage the cover 14 in assembly and serve to seal off the unwanted communication of steam to adjacent passages and channels. The cover 14 is secured to the sole plate by bolts, as shown.

The cover, as shown in FIG. 2, is formed in the area surrounding the outlet 36 with an annular upwardly stamped hump 58 to provide an annular recess 60 (FIG. 3). The recess is provided with an annular cover plate 62 which, as shown in FIG. 2, carries two apertures 64 and 66. The seal of the cover plate to the margins of the recess is assured by a tight press fit. Sealants may be used. The openings 66 and 64 are projected downwardly (FIG. 8) in dotted lines to show that they overlie the front of the maze 56 and channel 44 adjacent to the toe of the iron. Thus, steam generated in the second steam-generating chamber 54, flows through the maze 56, through hole 64, annular passage 60, and through the opening 66 and into channel 44 at the toe of the iron.

In the preferred embodiment shown, means are provided to clean the deep channels 44 using the steam generated in the second steam-generating chamber 54. These means include the generally horizontal ports 68 (FIG. 8) which extend through the rear wall of the sole plate and communicate from the rear ends of the channel 44 to the outside of the iron. The horizontal ports are of ample dimension, greater in diameter than the ports from the channel 44 to the bottom surface of the sole plate, for instance. As a result, on the occurrence of the blast, if the ports 68 are unplugged as will be described and if the bottom of the sole plate is covered, the steam moves rapidly down the legs of channel 44 and out the ports 68.

Plug means are provided for the ports 68. As shown in FIGS. 4 and 5, they preferably comprise mushroom-shaped metal elements 70, the domes of which rest against the outer openings of the ports 68 respectively. Each of the plugs is secured by a spring wire element 72 which is fastened at its center at the rear of the iron almost on a centerline thereof. As shown, the stamped sheet metal shelf 74 has integral hangers bolted to the sole plate as at 76. The spring wire is deformed upward through notches in the shelf and a stamped tongue 78 is crimped inwardly over the center of the wire. The spring wire is prestressed to keep a compressive force holding the plugs 70 against the openings of the ports 68 respectively. As shown in the left-hand side of FIG. 4, to open the ports the plugs may be pulled rearwardly and deflected downward.

OPERATION

In the usual operation for providing steady steam and with the control 24 set for steam, water drips through the outlet 36 to the first steam-generating chamber 38 (FIG. 8). The water, transformed into steam, travels rearwardly into passages 40 to outlets 48 and 50 to provide steam for the ports in the slots 46 and the deep channel 44. Thus, the steady steam is delivered to the rear of the iron first and travels forwardly in the channels 44. The blast of steam, on the other hand, is delivered from chamber 54 through recess 60 to the very toe of the iron at port 66 (FIG. 8).

Usually, some of the steam entering the channel 44 at slots 48 finds its way forward to some of the more forward ports. Upon the entrance into channel 44 of a blast of steam at port 66, the blast moves from the toe rearwardly to force the steady steam/blast steam interface to retreat. Thus, as a matter of interest, the steam from the second steam-generating chamber 54 does not flow contemporaneously through the same sole plate ports as the steam generated in the chamber 38. The two steam systems are indeed totally independent.

In the cleaning operation, with the plugs 70 moved to the position shown in FIG. 4, water is injected by the actuation of the control 26 into the second steam-generating chamber 54 causing steam to travel as described through the opening 66 and into the forward end of the channels 44. Moving rapidly through the channels 44, the steam rushes out through the openings 68. Bits of scorched lint and other foreign materials which might cause a stain in the next ironing operation are carried out the openings 68.

The benefits of this structure described will be apparent and need not be reiterated. It should be understood that with the structure described, it is possible not only to achieve a better focused discharge of high volume steam, but a reduction of steam noise, and easy means for cleaning the iron when desired or necessary. It will be understood that the ports 68 also allow access to the channels 44 for insertion of a tool, such as a brush, to remove lint therefrom.

The invention has been described as a single embodiment but it should be understood that many variations are possible, all falling within the scope of the following claim language:

I claim:

1. An electric steam iron having independent steam-generating systems comprising:

a. a sole plate having a U-shaped heating element embedded therein, a first steam-generating chamber adapted to receive water from a tank disposed in the iron, a deep U-shaped channel in the sole plate on the outside of the U-shaped heater and steam ports extending from the U-shaped channel to the undersurface of the sole plate, passageways disposed along the top of the U-shaped element connecting the first steam-generating chamber and the U-shaped channel adjacent the heel of the iron, and a second steam-generating chamber in the sole plate adapted to also receive water from a tank disposed in the iron;

b. cover plate means engaging the top surface of the sole plate to close off said chambers, passageway and channel, the cover plate means having conduit means adapted to connect the second steam-

generating chamber and the U-shaped channel at the toe of the iron.

2. An electric steam iron as claimed in claim 1 wherein the passage comprises an annular recess extending upward in the cover plate means sealed by an annular plate, the annular plate having ports disposed one above and in communication with the second steam-generating chamber and one above the toe of the U-shaped channel.

3. An electric steam iron as claimed in claim 1 wherein substantially horizontal apertures are formed in the heel of the sole plate at the distal ends of the deep U-shaped channel, and removable plug means are usually installed blocking the apertures respectively whereby the plug means may be removed to permit exit of steam from the passage to clean the channel.

4. An electric steam iron as claimed in claim 3 wherein the plugs are held respectively over the apertures by a pair of spring cantilevered arms, the arms being both secured to the rear of the iron adjacent the centerline thereof and extending outward therefrom.

5. An electric steam iron as claimed in claim 4 wherein the distal ends of the arms are secured to the plugs.

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