Sept. 30, 1958 Z. A. M. BURRESON 2,853,813

COMBINATION STEAM AND DRY IRON

Filed Dec. 1, 1953 2 Sheets-Sheet 1

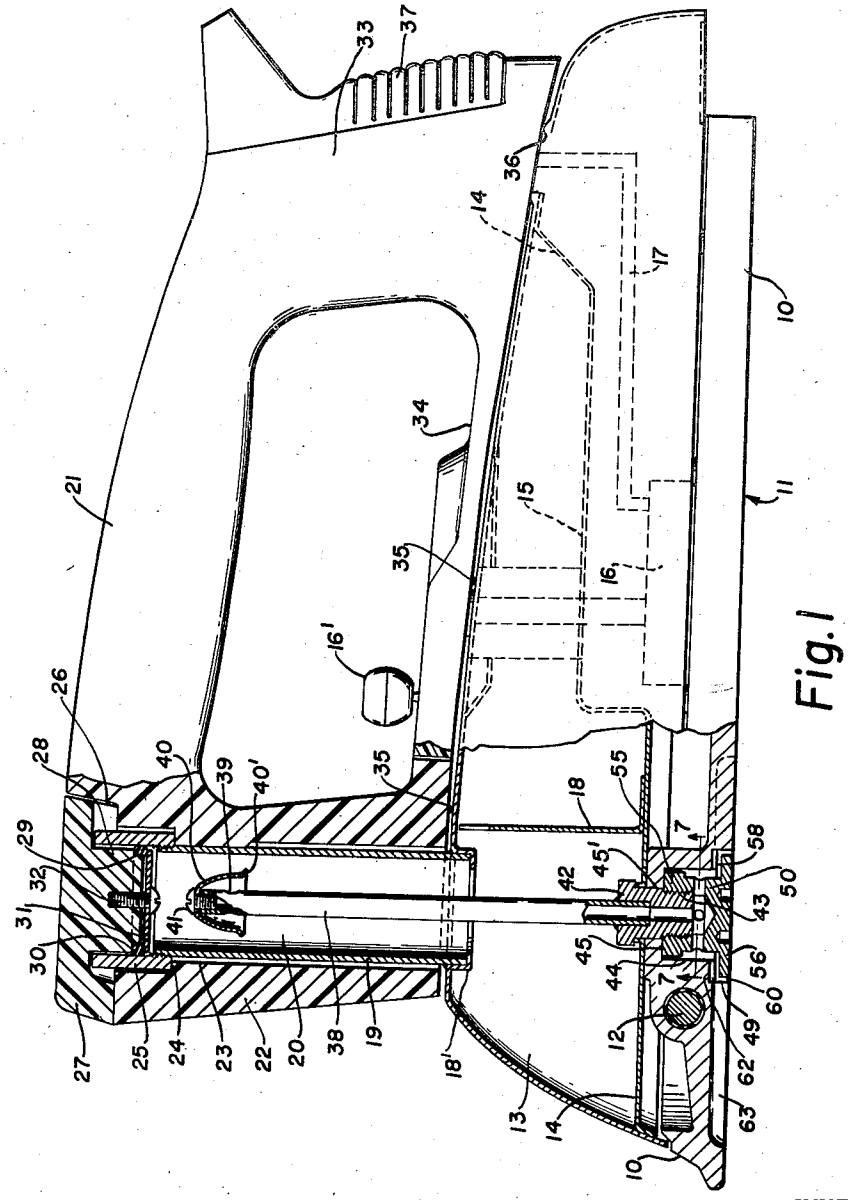


Fig. 1

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Fig.2

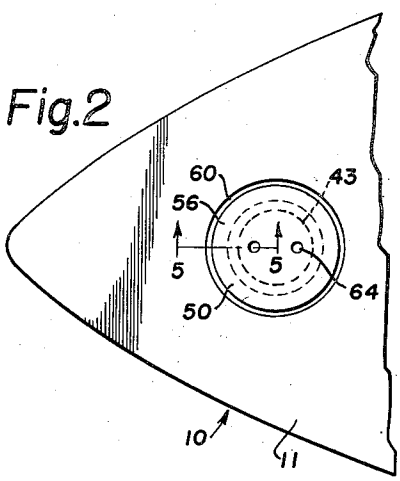


Fig.5

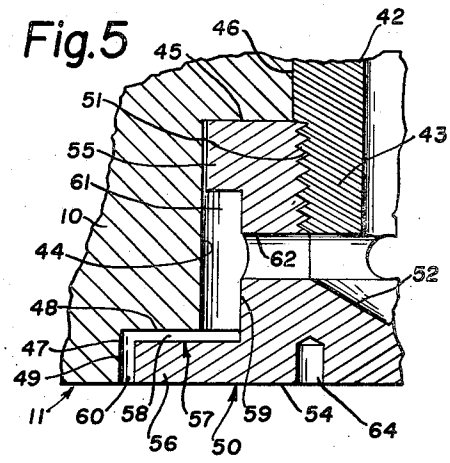


Fig.6

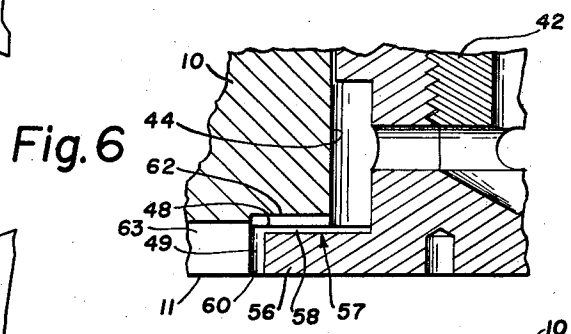
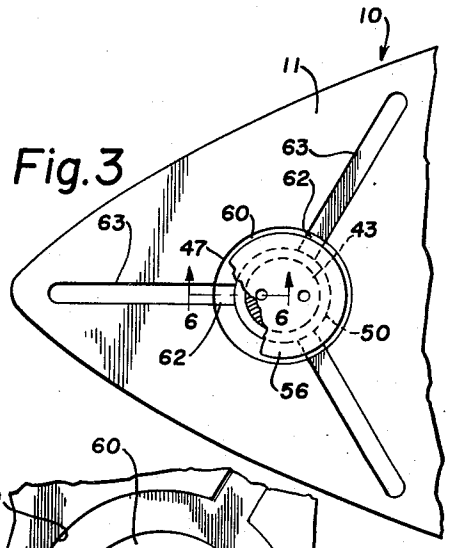


Fig.3



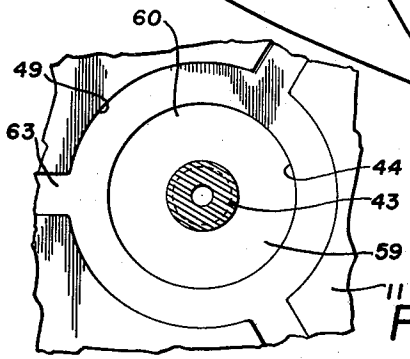


Fig.4

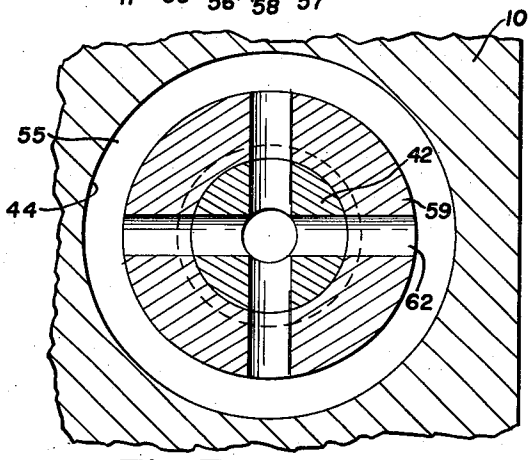


Fig.7

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United States Patent Office 2,853,813
Patented Sept. 30, 1958

2,853,813

COMBINATION STEAM AND DRY IRON

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Application December 1, 1953, Serial No. 395,410

5 Claims. (Cl. 38—77)

This invention relates to combination steam and dry pressing irons. Such irons eject steam from the ironing surface or sole plate thereof to dampen the work being ironed.

An important object of the invention is to provide the ironing surface with steam ejection porting which improves steam distribution to the ironing surface, and increases the continuity of this surface.

Another object is to provide improved means for connecting the sole plate with the steam chamber of the iron, and which cooperate in providing the ironing surface with endless steam ejection porting which opens throughout its entire length into this surface with a minimum interruption in the continuity of this smooth ironing surface.

Another object is to increase the steam ejection area of the ironing surface and to provide this surface with steam ejection porting of various shapes and areas in different portions thereof.

Still another object is to provide the steam ejection tube with means for preventing water from being ejected therethrough along with the steam.

A further object is to provide the water filler cap with improved sealing means.

Other objects and a fuller understanding of this invention may be had by referring to the following description and claims, taken in conjunction with the accompanying drawings, in which:

Figure 1 is a side elevation of the iron with the forward end thereof shown in vertical section;

Figure 2 is a bottom plan of the toe end of the ironing surface provided with one form of steam ejection porting;

Figure 3 is a similar view illustrating another form of steam ejection porting;

Figure 4 is a bottom elevation of a portion of the ironing surface, illustrating a modification of the porting shown in Figure 3 and with the plug removed;

Figure 5 is an enlarged fragmentary vertical sectional view through a portion of the sole plate taken on the line 5—5 of Figure 2;

Figure 6 is a similar view taken on the line 6—6 of Figure 3; and

Figure 7 is an enlarged horizontal section taken through the sole plate, taken on the line 7—7 of Figure 1.

The present invention can be applied to any type of steam iron and includes a sole plate **10** having a smooth bottom ironing surface **11** and an upper ribbed surface with which is associated an electrical heating element **12** embedded within the sole plate during casting thereof. A liquid-tight tank or reservoir **13** in the form of a hollow casing has a closed bottom **14** brazed or otherwise secured thereto and is formed with ribs to engage the ribbed surface of the sole plate to conduct heat from the heating element to water in the reservoir and convert it into steam. The bottom **14** is recessed as at **15** to enclose a conventional adjustable thermostat **16** and the

usual electrical leads or wires **17** for the iron. The iron is provided with the conventional heat regulating control knob **16'** by which the thermostat may be set to control the temperature of the iron. The container or casing **13** forms a water tank or reservoir and has a vertical water baffle **18** therein to prevent excessive movement of the water back and forth during ironing operations. The top of the container **13** near its toe end has a circular recess **18'** having an opening in its bottom wall to permit the escape of steam generated above the body of water in the reservoir. Seated and brazed within this recess is the lower end of a substantially vertical water-filling tube **19** which also forms a steam chamber **20**, and the upper end of this tube is externally screw threaded, as illustrated.

A plastic or composition heat insulating handle **21** has a forward pedestal end **22** provided with a bore **23**, the upper end of which is enlarged to provide a recess and shoulder **24**. The handle **21** is assembled with the iron by passing this forward end **22** down over the tube **19** after which a sleeve nut **25** is screwed upon the upper threaded end of the tube **19** until the sleeve bottoms upon the shoulder **24** to securely fasten the handle in place. It will be noted that the upper end of this sleeve nut projects slightly above the top surface of the pedestal portion **22** of the handle. The forward end of the handle is recessed, as at **26**, to receive a filler cap **27** having a contour to conform with the general shape of the forward end of the handle. This filler cap is provided with a depending circular stud **28**, which is freely slidable into the sleeve nut **25**, and is provided with a reduced end providing a shoulder **29** against which is seated an elastic O-ring **30**. A metal washer **31** larger in diameter than this reduced end is mounted on the end of the stud by means of a screw **32** and forms an outer retaining wall to prevent displacement of the O-ring. By tightening the screw **32**, the washer **31** will be forced against the O-ring to compress it to the desired degree against the shoulder **29** and cause it to expand variable distances beyond the periphery of the stud **28** to fit tightly within the sleeve nut **25** and form a steam seal therewith.

The handle portion **21** of the iron integrally connects its forward end **22** to a hollow standard **33**, which encloses part of the electrical wiring or leads **17**; and this standard is also integrally connected with the forward pedestal of the handle by a bridge portion **34** which has small nibs **35** on its bottom surface to slightly space the handle above the top of the casing **13** for heat insulation purposes. The rear portion of this handle is also secured to the sole plate **10** by means of a screw, not shown, which passes through a boss **36** projecting into the top of the heel portion of the casing **13**. The rear standard **33** of the handle is hollowed out for the passage of the electrical lead wires, and this cavity is closed by a removable back cover **37** fastened to the handle by a screw, not shown.

Steam accumulation of the top of reservoir **13** and in the chamber **20** of the filling tube **19** is directed to the sole plate **10** by an open ended steam tube **38** having its upper end internally threaded and provided with lateral ports **39**. A bell-shaped shield **40** is secured to the upper end of the tube **38** by means of a screw **41**, and it will be noted that the skirt of this bell-shaped shield flares outwardly into a lip **40'** which is arranged below the lateral ports **39** to prevent any water from entering the steam tube **38** when the reservoir is being filled and the iron is heated from previous use. Without this shield or deflector **40**, it has been found that when the iron is hot from previous use and water is poured into the filler tube **19** to replenish water in the reservoir **13**, this enter-

ing water will flow down in contact with the steam tube 38 and will be sucked into the same through the ports 39, due to the syphoning action set up in the tube 38 by the residual heat in the iron. The outwardly flared deflector 40 deflects the water being poured into the filler tube 19 away from the steam ports 39 to prevent the water from being sucked into the steam tube 38 and from running out through the steam porting in the sole plate 11. Furthermore, this baffle 40 covers the upper end of the steam tube 38 to shed any drops of condensed steam away from the lateral steam ports 39 during the normal operation of the iron. The steam tube 38 is arranged concentric within the filling tube 19, and its lower end is brazed into a fitting 42, which in turn is brazed in an opening in the bottom 14 of the reservoir. The fitting 42 extends below the bottom of the reservoir to terminate in a lower externally threaded end 43.

To increase the steam ejection area of the ironing surface 11 of the sole plate with minimum interruption of this smooth ironing surface, the following construction is provided. Broadly, this is accomplished by providing the ironing surface with endless porting which opens throughout the entire length of the porting into the ironing surface and increases the continuity of the porting and the ironing surface. The sole plate 10 is provided with a recess or cavity 44, which opens out into the ironing surface 11. This recess is provided with a flat bottom wall 45 parallel with the ironing surface 11, and this bottom wall is provided with an opening 45' adapted to receive the projecting portion of the fitting 42 when the sole plate is assembled with the casing 13. The lower end of the steam recess or cavity 44 is enlarged as at 47, to open out into the smooth ironing surface 11. This enlargement 47 may be referred to as a circular depression surrounding the lower open end of this recess 44. This enlarged end 47 or depression provides the recess or cavity with an annular flat wall 48, which is parallel with the ironing surface. It also provides the recess with an annular vertical wall 49, which surrounds the recess 44 to form in effect the annular depression just referred to.

In order to provide means for attaching the toe end of the sole plate to the casing 13 and to provide the ironing surface 11 with a more extensive steam ejection area or porting, a novel plug 50 is employed. This plug is provided with a threaded bore 51 closed at its bottom near the polished ironing surface 54 of the plug. The closed end of the bore 51 terminates in a tapered cup-shape depression 52 in which any drops of moisture accidentally entering the steam tube 39 may be caught thereby and converted into steam. The upper end of the plug is provided with a circular flange 55 which seats firmly against the bottom wall 45 of the recess 44 when the plug is screwed home on the lower threaded end 43 of the fitting 42. When the parts are in this position, an outer enlarged circular flange 56 of the plug is positioned so that the ironing surface 54 of the plug is flush with or arranged slightly above the plane of the polished ironing surface 11 of the sole plate. At the same time, the upper surface 57 of the flange 56 is spaced from the flat surface 48 of the depression or enlargement 47 to provide a circular or endless steam passage 58 which communicates with the recess 44 surrounding the body portion 59 of the plug 50. It will also be observed that the diameter of this outer flange 56 is less than the diameter of the enlarged end 47 of the recess 44 to provide an endless or circular steam ejection port 60 opening into the ironing surface 11 and entirely surrounding the flange 56. The body 59 of this plug is of smaller diameter than the recess 44 to provide a steam chamber 61 therein and steam is entered therein from the fitting 42 and thence to the plug 50 after which it passes through a series of radial ports 62 into the chamber 61. The bottom polished surface 54 of the plug may be provided with spanner wrench holes 64 to facilitate its assembly in the recess 44. If desired, the plug 50 may have a central circular hole

extending from the surface 52, shown in Figure 5, to open out into the polished bottom surface 54 to provide an additional central steam ejection port.

In the modification shown in Figure 6, the flat bottom wall 48 of the enlargement or depression 47 is provided with a series of grooves 62 extending radially with respect to the recess 44 to enlarge the area of the passage 58. These grooves are not necessary in the operation of the iron and are an incident of casting the sole plate. When they are included in the casting of a sole plate, they are arranged in longitudinal alignment with a series of steam ejection grooves 63 cast in the sole plate and opening into the ironing surface 11, as shown in Figures 1 and 3. Usually, three of such straight grooves 63 are provided, one being arranged longitudinally along the center line of the sole plate and ironing surface and extending toward the toe, while the other two grooves diverge from the enlargement or depression 47 to extend laterally and rearwardly toward the sides of the ironing surface, as illustrated. When such straight grooves are employed, their inner ends communicate with the enlarged end 47 of recess 44 and with the annular steam ejection port 60. Thus, the grooves 63 are connected together by the annular ejection port 60 and their steam outlet capacity is thereby lengthened both transversely and longitudinally of the ironing surface so that there are no dead end steam passages across the entire width of the ironing surface.

The prior art has employed a plug to direct team from an annular closed recess to a series of grooves, but this plug was seated in this recess to cut off its steam ejection directly into the ironing surface except through the grooves 63. The plug of the present invention has its flange or plate 56 held spaced from the bottom 48 of the annular recess or depression 47 and thereby provides for the creation of the annular port 60 opening throughout its entire length or circuit directly into the ironing surface to eject steam thereto in a circular pattern. Such open annular port preferably has its center arranged on the longitudinal center line of the ironing surface to improve distribution of steam directly to the work being ironed. When such an open annular port 60 is used in conjunction with the conventional straight grooves 63, it not only increases the length of such grooves, both longitudinally and transversely of the ironing surface, but creates steam ejection porting having varying widths as will be appreciated from Figure 3, where the grooves 63 are shown as being much wider than the width of the annular port 60. By use of various shaped grooves or ports of different size or area, at different locations on the ironing surface, the amount of steam ejected at various locations can be nicely controlled. As stated earlier, the annular port 60 may be used to connect the various straight grooves 63 to regulate the amount of steam ejected along a center line of the ironing surface, and the relative locations and widths of these grooves and porting may be varied to give any other desired steam distribution to the ironing surface.

Although this invention has been described in its preferred form with a certain degree of particularity, it is understood that the present disclosure of the preferred form has been made only by way of example and that numerous changes in the details of construction and the combination and arrangement of parts may be resorted to without departing from the spirit and the scope of the invention as hereinafter claimed.

What is claimed is:

1. A steam iron comprising, a casing having a combined water filling tube and steam chamber therein, a sole plate for said casing having an ironing surface provided with steam ejection porting, a steam conduit extending from said porting into said combined water filling tube and steam chamber, the upper end of said steam conduit extending to the upper portion of said steam chamber and having lateral porting for the entrance of

steam into said conduit, and a bell-shaped shield secured to the upper end portion of said conduit and having an outwardly flared skirt depending below said lateral porting and terminating in an outwardly extending lip.

2. In a steam iron, a casing having a reservoir, a combined water filling tube and steam chamber communicating with said reservoir, a sole plate connected to said casing and having an ironing surface with steam ejection porting, heating means for said sole plate and reservoir, a steam conduit extending from said porting into said water filling tube with its upper end arranged in said steam chamber and provided with lateral porting for the entrance of steam into said steam conduit, said steam conduit having a syphoning action on the contents of said steam chamber when the iron is heated, and a water deflector mounted by the upper end of said steam conduit and having a skirt depending below said lateral porting to deflect water entering said filling tube away from said lateral porting in said steam tube to prevent it from being sucked therein by said syphoning action of said steam tube.

3. In a steam iron, a casing having a reservoir, a combined water filling tube and steam chamber communicating with said reservoir, a sole plate connected to said casing and having an ironing surface with steam ejection porting, a water filling closure located directly above said combined water filling tube and steam chamber, heating means for said sole plate and reservoir, a steam conduit extending from said porting into said water filling tube and concentrically therewith with its upper open end arranged in said steam chamber and provided with lateral porting for the entrance of steam into the steam conduit, said steam tube having a syphoning action on the contents of said steam chamber when the iron is heated, and a water deflector having a plug inserted in said upper end of said steam conduit to close the same and having a skirt depending below said lateral porting to deflect water entering said filling tube away from said lateral porting to prevent it from being sucked therein by said syphoning action of said steam tube.

4. A steam iron including a casing forming a reservoir, a sole plate having an ironing surface, steam distributing means for distributing steam to said ironing surface, steam conduit means for transmitting steam from said reservoir to said steam distributing means, said steam distributing means comprising a circular recess wall extending from said ironing surface into said sole plate, a counterbore wall extending from said ironing surface into said sole plate and surrounding said recess wall, a plug secured within said recess wall and having a flanged lower end portion residing within said counterbore wall, a portion of said plug adjacent said recess wall being

reduced to form a circular steam chamber, the walls of said flange being spaced from said counterbore wall to form a continuous circular steam passageway from said steam chamber opening into said ironing surface, said plug having an opening communicating with said steam conduit means and having lateral porting means communicating with said steam chamber, said circular steam chamber being wider than said circular steam passageway whereby steam transmitted to said circular steam chamber tends to distribute around said circular chamber before passing through said circular steam passageway thus giving a substantially uniform passage of steam throughout the entire circular extent of said circular steam passageway.

5. A steam iron including a casing forming a reservoir, a sole plate having an ironing surface, steam distributing means for distributing steam to said ironing surface, steam conduit means for transmitting steam from said reservoir to said steam distributing means, said steam distributing means comprising an annular recess wall extending from said ironing service into said sole plate, a depression wall extending from said ironing surface into said sole plate and surrounding said recess wall, a plug secured within said recess wall and having a flanged lower end portion residing within said depression wall, a portion of said plug being reduced to form an annular steam chamber, the walls of said flange being spaced from said depression wall to form a continuous annular steam passageway from said annular steam chamber opening into said ironing surface, said plug having an opening communicating with said steam conduit means and having porting communicating with said steam chamber, means including the relative sizes of said annular steam passageway and said annular steam chamber to cause steam introduced into said steam chamber through said porting to distribute annularly around said annular steam chamber and pass through said annular steam passageway to give a substantially uniform annular pattern of steam from said ironing surface.

References Cited in the file of this patent

UNITED STATES PATENTS

1,590,245	Koenig	June 29 1926
2,368,048	Stone	Jan. 23, 1945
2,434,097	Bassett	Jan. 6, 1948
2,437,571	Waage	Mar. 9, 1948
2,441,916	Busch et al.	May 18, 1948
2,475,572	Schreyer	July 5, 1949
2,654,167	Johnson	Oct. 6, 1953
2,659,989	Cone	Nov. 24, 1953
2,662,316	Johnson	Dec. 15, 1953