Sept. 27, 1966 C. S. ABRAHAM 3,274,714

STEAM IRON

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FIG. 1

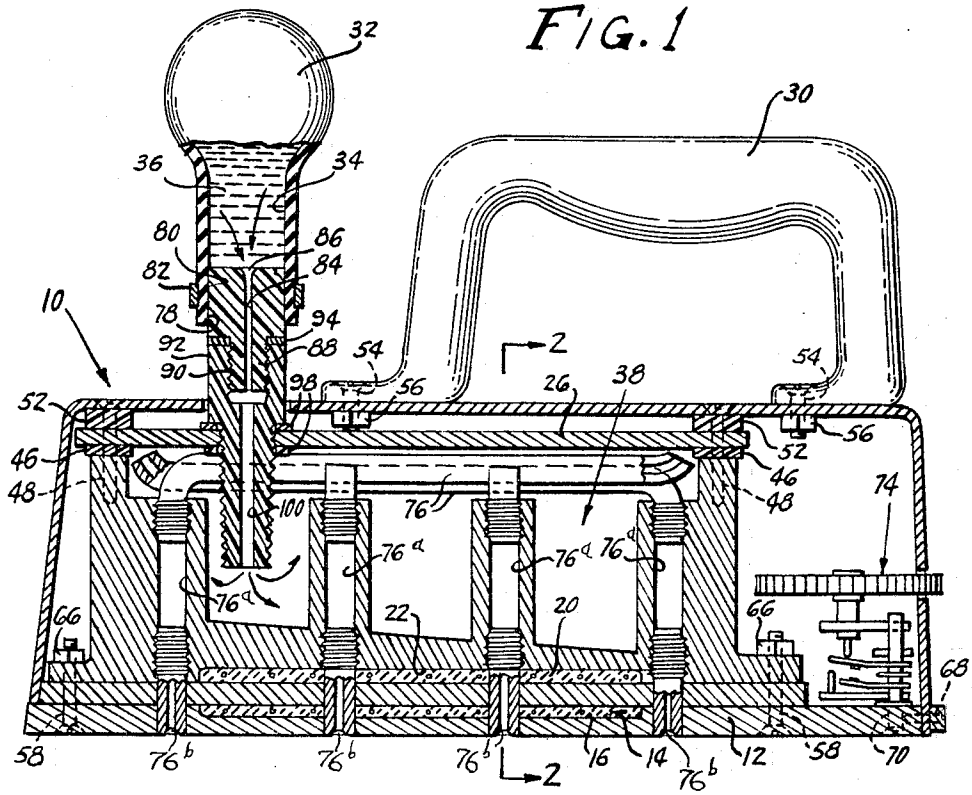
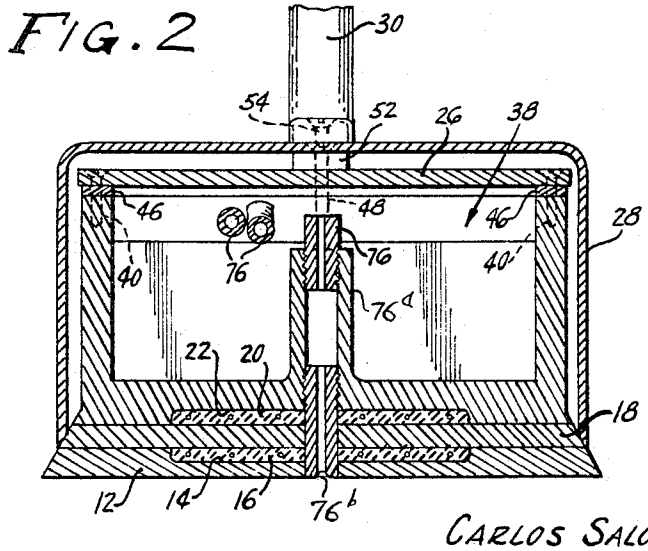



FIG. 2




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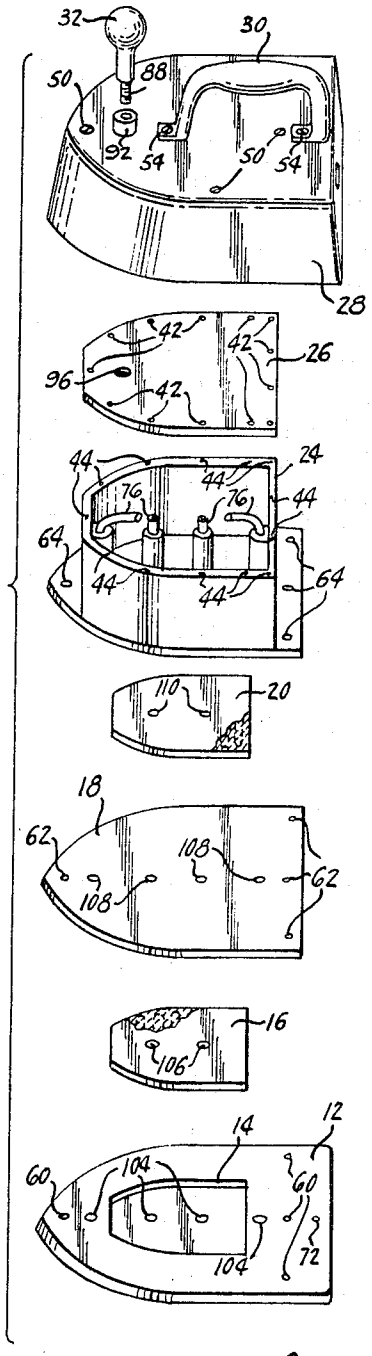



FIG. 3

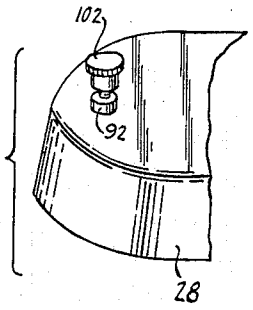



FIG. 5

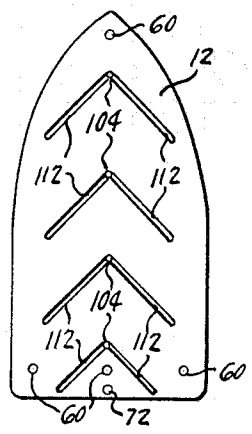



FIG. 4

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3,274,714

# STEAM IRON

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3 Claims. (Cl. 38—77)

This invention relates to a steam iron and more particularly to an iron having special means for the insertion of water to be vaporized for the formation of steam.

As conducive to a better understanding of the instant invention it should be understood that most steam irons currently on the market provide a highly complex structure for the manufacture of steam to be utilized in certain ironing techniques. Further, the steam produced by prior art devices is difficult to control by the operator of the iron and is frequently provided in insufficient or excess quantities. Also, steam irons known heretofore are difficult to fill and empty, the latter procedure being complicated by the necessity of handling hot water contained within the iron.

It is a primary object of the instant invention to provide a steam iron which is free from the foregoing and other disadvantages.

It is another object of this invention to provide an iron in which the steam may be produced in an amount and at such times as the operator desires.

Yet another object of the instant invention is the provision of a steam iron, the water reservoir of which is easy to fill and readily emptied.

A further object of this invention is to provide an iron which may be readily converted to a steam iron when desired.

A still further object of the instant invention is the provision of a device of the character described which may produce either discrete quantities of steam at the whim of the operator or a continuous flow of steam.

An additional object of this invention is the provision of a steam iron having means to distribute steam over substantially its entire sole plate.

Another object of the instant invention is to provide a steam iron designed to preclude accidental discharge of water when its vaporizing chamber has not yet come up to vaporizing temperature.

A further object of this invention is to provide a steam iron which is sturdy and durable in construction, efficient and reliable in operation, and relatively simple and inexpensive to manufacture, utilize, and maintain.

Other and further objects reside in the combination of elements, arrangement of parts, and features of construction.

Still other objects will in part be obvious and in part be pointed out as the description of the invention proceeds and as shown in the accompanying drawings wherein:

FIGURE 1 is a side view partly in elevation and partly in section of a steam iron in accordance with the instant inventive concept;

FIGURE 2 is a transverse cross-sectional view taken substantially on line 2—2 of FIGURE 1;

FIGURE 3 is an exploded view to a smaller scale of the individual components of the instant steam iron;

FIGURE 4 is a bottom plan view to a smaller scale of the sole plate; and

FIGURE 5 is a fragmentary exploded view showing the plug means used when the iron is desired to be utilized without steam.

Similar reference characters refer to similar parts throughout the several views of the drawings.

Referring now to the drawing in general, a steam iron in accordance with the instant inventive concept is designated generally by the reference numeral **10** and as seen particularly in FIGURE 3, is comprised basically of a sole plate **12** including means defining a recess **14** therein for removably receiving a first heating element **16**, a barrier plate **18** to be interposed between the first heating element **16** and a second heating element **20** removably received in a recess **22** (see FIGS. 1 and 2) defined in the bottom portion of a structural means **24** having a cover member **26**, and a casing means **28** with handle means **30** secured to the top thereof and a bulbous container **32**, the interior of which defines a reservoir means **34** for receiving a quantity of water **36** (note FIG. 1) in a manner and for a purpose to be more fully described hereinafter.



Structural means **24** together with its cover plate **26** define therebetween a vaporizing chamber **38**, a plurality of screw means **40** passing through apertures **42** in the cover plate **26** and being threadably received in tapped bores **44** in the structural means **24**, any conventional sealing or gasket means **46** being interposed to provide a fluid tight chamber. Certain screw means **48** pass through apertures **50** in the casing means **28** before being received in tapped bores **44**, additional gasket means **52** sealing the apertures **50**. Handle means **30** is secured to casing means **28** by screw means **54** and nut means **56**. Screw means **58** are passed upwardly through apertures **60** in sole plate **12**, apertures **62** in barrier plate **18**, and apertures **64** in structural means **24**, these elements being secured in related assembly by nut means **66**. Additional screw means **68** may be provided to secure the casing means **28** to the sole plate **12**. Also, a screw means **70** may extend through an aperture **72** in sole plate **12** to support a thermostatic means **74** of any conventional form, one such construction being shown in FIGURE 1 for illustrative purposes only.

A plurality of relatively rigid bosses **76***a* having open tops extend upwardly from the top surface of sole plate **12** and have individual conduit means **76** extending between the vaporizing chamber **38** and the open tops thereof. Openings are provided between the bosses and the bottom surface of the sole plate **12**. The conduit means **76** may each be formed of a single tubular or conduit member or a pair of conduit members, the bottom one of each pair being threadably received in a bore adjacent the bottom of the structural means **24**, and the top one of each pair being threadably received in the same bore adjacent the top of the structural means **24** as seen particularly in FIGURES 1 and 2. Each conduit means **76** has one end terminating adjacent to or coincident with the bottom of the sole plate **12** and its other end terminating adjacent the top of the vaporizing chamber **38** for a purpose to be described in more detail hereinafter. The portion of the structural means **24** defining the bottom of the vaporizing chamber **38** is inclined rearwardly downwardly as seen in FIGURE 1.

The heating means for the iron **10** is comprised of the heating elements **16** and **20** which may be of any conventional form such as resistance heating elements as shown and which may be connected to a source of electrical energy (not shown) in any conventional manner, the thermostatic means **74** being included in the circuit to automatically de-energize either individually or together the heating elements **16** and **20** when the sole plate **12** or the vaporizing chamber **38** reaches a predetermined temperature. The barrier plate **18** will segregate the heating elements **16** and **20** so that the temperature of the sole plate **12** and the vaporizing chamber **38** will not affect each other. Any conventional insulating means may be included to further this effect if desired.

The bulbous container **32** is preferably formed of a heat-resistant, flexible material, such as rubber or the like

and has portions defining a mouth **78** in which is secured a member **80** preferably formed of plastic or the like held in place by an adjustable strap member **82**, such as a hose clamp or the like. The member **80** has a passageway **84** defined therethrough having a lower portion dimensioned to prevent the flow of the water **36** by gravity from the reservoir means **34** and to allow the flow of the water **36** under pressure by the bulbous container **32** to decrease the internal volume of the same. The upper portion of the passageway **84** is preferably enlarged as at **86** to facilitate the flow of water. The lower end **88** of the member **80** is removably received in a threaded counterbore **90** of a second member **92**, a gasket or the like **94** being interposed for sealing contact. The second member **92** is received through an aperture in the casing means **28** and is threadably secured in an aperture **96** of the cover plate **26** of the structural means **24**, gaskets or the like **98** sealing the aperture **96**. The second member **92** has a second passageway **100** defined therethrough, the first and second passageways **84** and **100**, respectively, together forming a passageway means communicating between the reservoir means **34** and the vaporizing chamber **38**.

A plug means **102** is receivable in the counterbore **90** of the second member **92** when the member **80** is removed therefrom to seal the second passageway **100** shown particularly in FIGURE 5.

Aligned bores **104**, **106**, **108**, and **110** are defined through the sole plate **12**, the first heating element **16**, the barrier plate **18**, and the second heating element **20** for receiving the conduit means **76**.

The sole plate **12** has portions thereof defining a plurality of groove means **112** emanating from each of the apertures **104** and extending to remote portions of the bottom surface of the sole plate **12** to distribute steam flowing from the vaporizing chamber **38** through the conduit means **76**.

The use and operation of the steam iron of the instant invention will now be apparent. The bulbous container **32** is readily filled by simply squeezing the same to decrease the interior volume of the reservoir means **34** and dipping the end **88** into a glass or the like of water, the vacuum caused by releasing the bulbous container **32**, sucking water through the first passageway **84**. The member **80** is then secured to the second member **92** with the first and second passageways **84** and **100**, respectively, being aligned. The heating elements **16** and **20** are energized in any conventional manner and the ironing procedure is begun. Whenever steam is desired, the operator need only squeeze the bulbous container **32** to eject a desired quantity of water **36** through the passageway means into the vaporizing chamber **38** where it will almost instantaneously be transformed into steam to flow through the conduit means **76** to the bottom surface of the sole plate **12**. Thus, steam may be supplied only when necessary and in desired quantities, the operator gripping the handle means with the right hand and operating the bulbous container **32** with the left hand. Of course, the reverse would be true if the operator were left handed. If a continuous supply of steam is desired, a relatively large quantity of water **36** may be squeezed into the vaporizing chamber **38**. Emptying of the water is easily accomplished by merely unscrewing the member **80** from the second member **92** and squeezing the remaining water **36** from the reservoir means **34**. Any water left in the vaporizing chamber **38** may be poured through the second passageway **100** by inverting the iron **10**, but this is seldom necessary since water is not normally injected into the vaporizing chamber **38** unless it is to be immediately transformed into steam for use.

It will be seen that the bulbous container **32** acts as a valve means that lets water either dropwise or in small jets into the vaporizing chamber **38** at the operator's will. This replaces the normally complex valve means in prior art steam irons. The bulbous container **32** does not get hot since it is formed of a heat-resistant material and since it is spaced from the heating means externally of the casing **28**. When empty, it may be readily filled or replaced with an auxiliary bulbous container which has been prefilled with water.



Since the bulbous container **32** is readily removable, it may be replaced by a plug means such as **102** when the iron **10** is not to be used as a steam iron.

In the event that the first passageway **84** becomes obstructed, it may be easily cleaned by insertion of a small wire or pin; however, this is seldom necessary, since the water **36** is forced therethrough under pressure thereby providing a self cleaning action. Because of the simplicity of cleaning, it is not necessary to use distilled water with the steam iron of the instant invention as is conventional with prior art devices.

In certain steam irons used heretofore water is dripped into a vaporizing chamber by gravity, but since a high pressure of steam builds up in the vaporizing chamber, additional water does not drip thereinto until the chamber is dry. However, since the water **36** in the device of the instant invention is injected under pressure, additional water may be provided to the vaporizing chamber **38** before that chamber becomes dry.

Each conduit means **76** extends to adjacent the top of the vaporizing chamber **38** to preclude water in its liquid form from flowing to the sole plate **12** in the event that the water is inserted before the vaporizing chamber **38** has been heated sufficiently to form steam. If the water does not evaporate instantaneously it will flow down the inclined bottom surface of the vaporizing chamber and will accumulate until the iron is fully heated, the steam eventually being formed rising in the chamber **38** and passing through the conduit means **76** to the bottom surface of the sole plate **12**.

The dual heating elements allow the sole plate **12** to be raised to an ironing temperature even though the vaporizing chamber **38** is filled with water and the temperature therein is consequently reduced.

When the iron **10** is leaned back in a substantially vertical position as is conventional in use, the water **36** ceases to be converted into steam and the iron may be utilized for an extended period of time without consuming the water.

The assembly of the components of the iron **10** is quick and simple and each element may be separately replaced if necessary without harming the entire iron.

It will now be seen that there is herein provided an improved steam iron which satisfies all the objectives of the instant invention and others, including many advantages of great practical utility and commercial importance.

Since many embodiments may be made of the instant inventive concept, and since many modifications may be made of the embodiments hereinbefore shown and described, it is to be understood that all matter herein is to be interpreted merely as illustrative, and not in a limiting sense.

I claim:

**1.** An iron comprising casing means having a top and a bottom, a sole plate secured to said bottom of said casing means and having a top surface and a bottom surface adapted for ironing, handle means secured to said top of said casing means, structural means defining a vaporizing chamber within said casing means above said sole plate, hollow open topped bosses extending upwardly from said sole plate and having means opening through said sole plate at their lower ends, said bosses extending into said vaporizing chamber, said vaporizing chamber having a bottom and a top, open-ended upwardly directed conduit means communicating between spaced points in said vaporizing chamber and the open tops of said bosses, reservoir means adapted to contain a quantity of water, means mounting said reservoir means externally of said casing, passageway means communicating between said

reservoir means and said vaporizing chamber, heating means to heat said sole plate to an ironing temperature and said vaporizing chamber to a water vaporizing temperature, said heating means including a first heating unit juxtaposed to said sole plate, a second heating unit, juxtaposed to said bottom of said vaporizing chamber, and a barrier plate interposed between said first and second heating elements.

2. The structure of claim 1 wherein said sole plate is provided with a recess, and said first heating element is removably positioned in said recess of said sole plate.

3. The structure of claim 2 wherein said structural means is provided with a recess below said bottom of said vaporizing chamber, and said second heating element is removably positioned in said recess of said structural means.



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