June 14, 1960 I. JEPSON 2,940,195

SADIRON

Filed Sept. 30, 1957

Fig. 1.

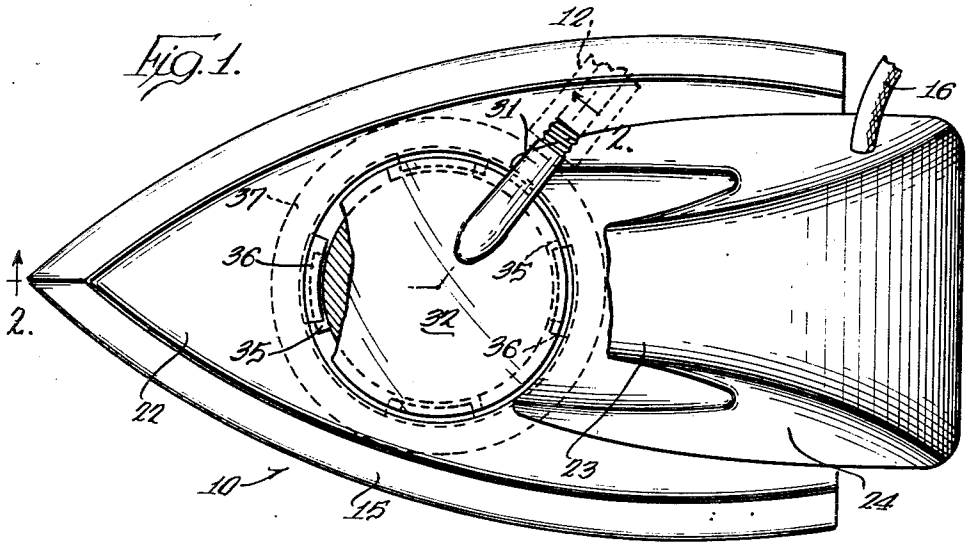


Fig. 2.

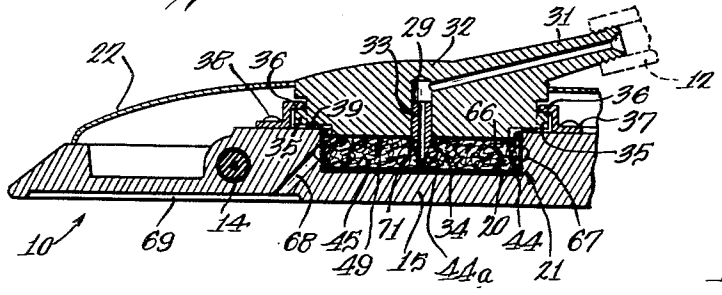


Fig. 3.

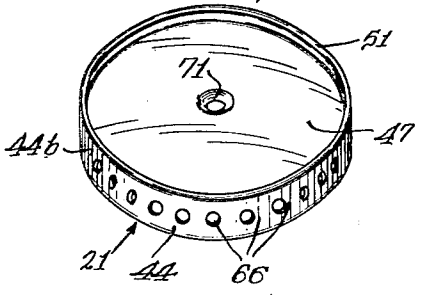
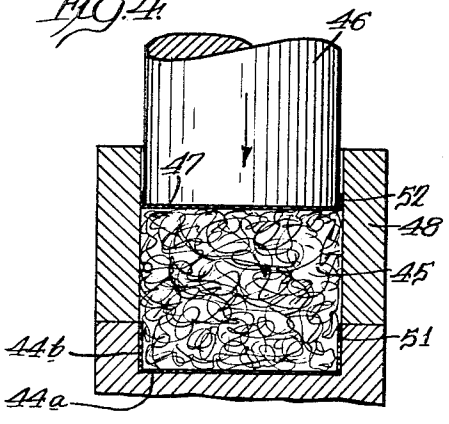


Fig. 4.



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United States Patent Office 2,940,195
Patented June 14, 1960

2,940,195

SADIRON

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Filed Sept. 30, 1957, Ser. No. 687,030

6 Claims. (Cl. 38—77)

This invention relates to sadirons, and more particularly to steam irons which may be used with tap water.

Steam irons have been used for a considerable period of time and their use is increasing at a rapid rate. With steam irons known hitherto it has been essential to use distilled water so that the steam passages do not become fouled and clogged with deposits of lime and other incrustations, which occur whenever tap water is used. It has been very difficult to clean these past known irons and remove the deposits therefrom. Two types of steam irons known in the past have been in widespread use, the self-contained reservoir type and the convertible type. The self-contained reservoir iron includes a sole plate having a heater located near the upper face thereof with a labyrinth steam-generating chamber formed in the upper face thereof. A sealing plate is fastened by several screws to the sole plate to cover the steam chamber, and a water reservoir is fastened securely to the sole plate and feeds water to the steam-generating chamber where it is flashed into steam which flows through an exit port to the bottom of the sole plate and onto the work to be ironed. There also is a shell covering the reservoir. If distilled water is not used, minerals are deposited in hard incrustations throughout the steam-generating chamber and the ports leading to and from the chamber and interfere with heat transfer and rapidly clog the ports. To remove the deposits, it is necessary to substantially completely dismantle the iron. The convertible type iron has an external reservoir remote from the sole plate and has a sealing plate secured by several screws to the sole plate and a shell covering the entire sole plate. While it is, of course, not necessary to remove the reservoir to clean the steam-generating chamber of the convertible iron, the iron must be disassembled substantially completely and, as with the reservoir type, it is very difficult to remove the hard incrustations from the chamber and ports.

It is accordingly an object of this invention to provide a steam iron having a replaceable lining for the steam-generating chamber thereof.

Another object of the invention is to provide a steam iron having a steam-generating chamber formed in the upper portion thereof into which fits a readily removable cartridge for collecting all deposits from tap water used with the iron.

A further object of the invention is to provide a steam iron having a sole plate provided with a socket in the upper face thereof serving to receive a chamber having stainless steel wool therein for generating steam from tap water. A low melting point solder which will not alloy with either or both the sole plate or the chamber transfers heat therebeween.

Other objects and features of the invention will become apparent as the following description proceeds and the features of novelty which characterize the invention will be pointed out with particularity in the claims annexed to and forming a part of this specification.

For a better understanding of the present invention reference may be had to the accompanying drawings, in which:

Fig. 1 is a top plan view of a steam iron forming one embodiment of the present invention;

Fig. 2 is a fragmentary longitudinal vertical section of the iron shown in Fig. 1 taken along line 2—2 of Fig. 1;

Fig. 3 is a perspective view of a removable cartridge of the iron shown in Fig. 1; and

Fig. 4 is a fragmentary vertical section of a press forming the cartridge shown in Fig. 3.

The present invention provides a steam iron having a steam generating chamber formed by a readily removable and replaceable cartridge. The iron sole plate is provided with a socket in the upper face thereof into which fits a shell or cartridge containing stainless steel wool. A cap locks the cartridge in the socket and carries a spout supplying tap water to the cartridge. This water is flashed into steam in the cartridge and travels from the cartridge through a passage to the bottom of the sole plate for steaming a fabric. The bottom wall of the cartridge is very thin, and the stainless steel wool is packed under compression in the cartridge to press the thin-walled bottom of the cartridge against the bottom of the socket over the entire surface thereof to provide excellent heat transfer from the sole plate to the cartridge. A disc of tin solder melting at less than the boiling point of water may be positioned between the cartridge and the bottom of the socket to provide excellent heat transfer between the cartridge and the sole plate, or this may be effected by coating the bottom of the cartridge with a thin layer of the solder. The composition of the solder is such that it will not alloy with the sole plate so that the cartridge may be easily removed from the socket.

There is shown in the drawings a steam iron **10** to be used with a water reservoir (not shown) of a known type supplying water to the iron **10** through a hose **12** and being mounted on an ironing board (not shown). The iron includes an electric resistance heating element **14** (Fig. 2) embedded in a cast aluminum sole plate **15** and supplied with power from an electric cord **16** to heat the sole plate **15** to the desired temperature. The heating element **14** is disposed on the sole plate in the form of a U or loop as is well known in the sadiron art. The sole plate is provided with a socket **20** near to and surrounded on three sides by the loop of the element **14**. The socket **20** is designed to receive a cartridge or shell **21**, and the sadiron also has a thermostat (not shown) for controlling the temperature of the iron mounted thereon behind the socket. A cover **22** fits over the upper portion of the sole plate **15** to enclose the thermostat, insulate the hand of the user from the sole plate, and present an attractive appearance for the upper portion of the iron. An open front handle **23** supported solely by a rear post **24** is secured to the cover **22**. The handle **23** carries a temperature control knob (not shown) of a known type at its forward end, and is provided with suitable known means extending through the interior thereof to control the thermostat thereby controlling the temperaure of the iron.

Tap water in the reservoir is supplied by the hose **12** to connector tube **31** communicating with a bore **29** in cap **32**. A heavy walled tube **33** having a tapered nose **34** is drive fitted into the bore **29**. The cap **32** has cam lugs **35** therein over which cam lugs **36** of a ring **37** fit and press the cap **32** downwardly. The ring **37** is fastened to the sole plate **15** by members **38**, which may be rivets or cap screws. The cap **32** is designed to fit

over the socket **20** and be easily removed therefrom, and is sealed thereto by a gasket **39** of silicone rubber.

The steam-generating cartridge **21** (Fig. 3) fits closely and removably in the socket **20**. The cartridge includes a thin-walled bottom cup **44** filled with wool **45** of a non-staining metal of a type which retains its resiliency even after being heated to maximum temperatures of the iron, such as stainless steel, for example, packed therein by a ram **46** and a split die **48** (Fig. 4) pressing a cover **47** against the wool to compress it highly. Known techniques are used to crimp the rim **51** of the cup **44** over a short rim **52** of the cover **47** while the steel wool is highly compressed. The cartridge, when unrestrained, bulges out slightly at the top and bottom, which causes wall **44***b* to pull slightly inward to facilitate insertion and removal of the cartridge in the socket **20** while providing a close fit when the cover **47** is pressed by the cap **32** to a nearly planar condition.

Bottom portion **44***a* of the cup **44**, which preferably is composed of copper or steel of about 3 to 4 thousandths of an inch thickness, substantially foil, preferably is covered with a layer **49** of tin solder of a well known type melting at less than 212° F. The solder will not alloy with the aluminum sole plate **15** but intimately contacts the bottom of the socket when melted to transfer heat very effectively from the sole plate to the cartridge. This transfer of heat is aided by the spring action of the stainless steel wool which presses the thin bottom **44***a* of the cup **44** into close conforming contact with the bottom of the socket **20**. Instead of the exterior of the bottom cup **44** being coated with the tin solder, the layer **49** may be a separate disc of the solder of the thickness of foil, the disc preferably being of about the same diameter as that of the socket. The cartridge cup **44** has peripheral ports **66** spaced from a discharge passage **68** connected to an annular groove **67**. The discharge passage **68** extends to one or more distributing grooves **69** formed in the bottom of the sole plate. The ports **66** are all located a substantial distance from the passage **68** so that if water not generated into steam should overflow into the groove **67**, it is converted into steam by virtue of the elevated temperature of the sole plate before reaching the bottom of the passage **68**. Preferably the ports **66** are located in about one-half the circle of the cartridge and are spaced on the opposite side of the cartridge from the passage **68**.

During the operation of the iron, tap water is supplied to the wool-filled interior of the cartridge through the tube **33**, which fits tightly into a complementary tapered socket or passage **71** in the top **47**. The sole plate is heated by the element **14** and heats the cartridge **21** through the solder disc **49** and through the walls **44***a* and **44***b* which are pressed tightly against the walls of the socket **20** by the pressure from the cap **32**. The water is flashed into steam which travels through the ports **66**, the groove **67** and the passage **68** to the grooves **69**. The residue from the water deposits on the wool, and when the deposits become excessive, the cap **32** is turned and removed. This relieves the pressure on the cartridge **21**, and the wool **45** bulges the thin cap **47** to remove any pressure between the wall **44***b* of the cartridge up from the bottom of the socket **20**. The cartridge then may be easily removed from the sole plate and replaced with a new cartridge identical therewith. If desired, instead of the solder alloying with the cartridge cup **44**, the bottom surface of the cup may be treated by known materials so as to prevent bonding therebetween but to permit excellent thermal transfer between the solder disc, when it is molten, and the cup.

It is believed to be readily apparent that the steam iron described above can also be used as a dry iron merely by shutting off the supply of water thereto and, if desired, disconnecting the hose **12** from the connector **31**. By its cartridge-type construction, the steam generating chamber is completely removable and replaceable in a matter of seconds. The cartridge **21** is inexpensive in cost while being highly effective in operation.

While there has been illustrated and described what is at present believed to be the preferred embodiment of the present invention, numerous changes and modifications will suggest themselves to those skilled in the art, and it is intended in the appended claims to cover all such changes and modifications as fall within the true spirit and scope of this invention.

What is claimed as new and desired to be secured by Letters Patent of the United States is:

1. In a steam iron, the combination of a sole plate having a socket opening at the upper face thereof, a shell having thin walls pressed into said socket, said sole plate having an outlet passage leading from said socket to the bottom face thereof, said shell having an opening communicating with said outlet passage in said sole plate, a cap locked to said sole plate having means for supplying water to said shell, water conduit means in said cap for introducing water into the interior of said shell, a sole plate heating element in good heat transfer relation with said shell to vaporize the water introduced into said shell and breech-type locking means securing said cap to said sole plate.

2. In a steam iron having an aluminum sole plate provided with a generally cylindrical socket and a heater looped around said socket, a cartridge fitting into said socket and having inlet and outlet openings, a discharge passage in communication with said outlet openings and extending to the bottom face of said sole plate, a water passage communicating with said inlet opening to introduce water into said cartridge, and a disc of solder having a melting point lower than the boiling point of water positioned between the bottom of said cartridge and the bottom of said socket for transferring heat therebetween.

3. In a steam iron, a sole plate having a heated upper surface and a heated ironing surface, a steam-generating cartridge, means pressing said cartridge against said heated upper surface into good heat transfer relation with said sole plate, said cartridge being readily removable from said heated upper surface by releasing said pressing means, means supplying water to said cartridge, and means directing steam from said cartridge to the bottom of said sole plate.

4. In a steam iron, a sole plate having a steam generating cavity therein, a cartridge having a flexible shell filled with metallic foraminous material under compression and having a water inlet and a steam outlet, a passageway communicating with said steam outlet and extending through the bottom of said sole plate, said cartridge being insertable into and removable from said cavity, and a plug member for compressing said flexible shell to force the walls of said shell against the walls of said cavity into good heat exchange relation with said sole plate.

5. In a steam iron, a sole plate having an upwardly facing socket therein, a cartridge including a shell of flexible material and metallic foraminous material in said shell and under compression therein, said cartridge when under compression being adapted to fit tightly in said socket, a plug member adapted to close the top of said socket and compress said cartridge therein, passageway means communicating with the interior of said cartridge and extending through said sole plate to the bottom thereof and means carried by said plug member for supplying water to said cartridge.

6. In a steam iron, a sole plate having an upwardly opening steam generating chamber therein, a shell adapted to fit into said chamber in good heat transfer relation with said sole plate, metallic foraminous material in said shell, said shell having an opening in the top wall thereof, said shell having steam outlet openings in the side walls thereof, a passageway communicating with said steam outlet openings and extending to the bottom of said sole plate, cap means adapted to cover the top of said chamber, a tube carried by said cap means for en-

gaging the portion of said shell surrounding said opening, and means for supplying water to said tube.

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