

Steam Iron

5 The present invention relates to steam irons and in particular to such irons having a water tank, a controllable electric pump connected to the water tank as well as an evaporation chamber fed by valve-controllable supply lines, the water being delivered
10 from the water tank to the evaporation chamber via the pump.

 In most electric steam irons of this kind the water supply from the water tank to the evaporation chamber is carried out via a dripfeed valve, which enables the
15 water to flow in a controlled manner into the evaporation chamber. Piston pumps, which may be actuated by buttons projecting from the iron handle (DE-OS 24 42 126), are provided for producing a steam jet and for spraying water. The disadvantage in these
20 irons, however, is that the dripfeed valves are very susceptible to calcination which leads to a narrowing of the extremely small water port. The actuation of the piston pumps requires, moreover, additional strength which a woman's hand cannot be expected to have. In
25 order to overcome this disadvantage, it is known in steam irons that the water may be supplied from the water tank into the evaporation chamber via an electrically controlled pump (DE-AS 11 60 399). Steam irons equipped with electrically controlled pumps and
30 provided with an additional spray device are also known (DE-GM 90 00 917). In these irons, the pump is connected to the evaporation chamber and the spray device via a pipe system and valves.

 These known steam irons have the disadvantage that
35 after the switching-on of the pump, it takes a certain time for the user to have enough water with the required water pressure and for the actuated pump to operate

continuously, so that it is not possible to feed a quantitatively regulated amount of water into the evaporation chamber which is required for producing a steam jet.

5 According to one aspect of the invention, there is provided a steam iron comprising a water tank, a controllable electric pump connected to the water tank as well as an evaporation chamber supplied via valve-controllable supply lines, the water supply from the
10 water tank to the evaporation chamber being effected by the pump, wherein at least one pressure reservoir having a pressure source is disposed between the pump and the evaporation chamber, and wherein an electric switch is in operative connection with the pressure reservoir, the
15 electric switch switching the pump on or off as a function of the level of filling of the pressure reservoir.

 According to another aspect of the invention, there is provided a steam iron comprising a water tank, an
20 evaporation chamber, a pump for supplying water from the water tank to the evaporation chamber, and a pressure reservoir having a pressure source and being provided between the pump and the evaporation chamber, operation of the pump being controllable between on and off modes
25 as a function of the amount of water in the pressure reservoir.

 At least in the preferred embodiments the invention provides a steam iron in which, when the pump is switched on, the user has immediately sufficient water
30 with the necessary water pressure, and it is possible, when required, to supply an accurately measured amount of water to the evaporation chamber for producing a vapour jet.

 At least in the preferred embodiments of the
35 invention, it is achieved that in the operating condition, there is always a substantially constant pressure in the entire pipe system as a result of the pressure reservoir, that the operation of the pump is interrupted by the pump switch as soon as the pressure

reservoir has reached its maximum level, and that the pump only restarts its operation when the amount of water in the pressure reservoir falls below a predetermined level. In this way the user is
5 immediately supplied with sufficient water at the required pressure, since, when the steam iron is switched on, the entire system has the necessary operating pressure so that operation may be started immediately without any delay via the appropriate valves
10 and an accurately measured amount of water may be supplied to the evaporation chamber.

An embodiment of the invention will now be described by way of example and with reference to the accompanying drawing, which shows schematically a side
15 view of the iron according to the present invention.

The steam iron shown has a water tank 1, an electric pump 2, a pressure reservoir 3 and a spray device 4. The cylindrical pressure reservoir 3 is in the form of a pressure-loaded water reservoir. A piston
20 6 displaceable by the pressure of a spring 5 is arranged inside the pressure reservoir 3, the piston rod 7 of the piston 6 being in operative connection with an electric switch. The pump 2 and the pressure reservoir 3 are connected, via supply lines 9 and cutout valves 10, 11
25 and 12, to the evaporation chamber 13, the auxiliary steam chamber 14 and the spray device 4. The actuation of the cutout valves, 10, 11, and 12 is effected manually via manual actuation members 17, 18, and 19, the valves 11 and 12 being electrically coupled to an
30 electronic pulse circuit 20 via electric switches 15 and 16. Upon reaching the maximum capacity of the pressure reservoir 3, the switch 8 is actuated by the piston rod 7 and the pump 2 is switched off. If the water level in the pressure reservoir 3 falls below a certain level,
35 the pump 2 is switched on again via the switch 8. Pump 2 and pressure reservoir 3 thus form a control circuit which ensures that there is always sufficient water at

the outlet of the supply line 9 and that the water always has the required water pressure since the water withdrawn from the pressure reservoir 3 is immediately replaced. The optimum operating pressure for the entire
5 water storage system is adjustable in the pressure reservoir 3. The pressure reservoir 3 shown in the drawing is only one possible exemplary embodiment of the subject of the invention.

When the iron is in the operating condition, it is
10 switched on, whereupon the pump supplying water from the water tank 1 to the pressure reservoir 3 is started simultaneously so that the required amount of water at the necessary operating pressure, supplied at the outlet of the supply lines 9, is immediately available to the
15 user. This pressure is the same in the entire system and the relevant control command by the respective user is responded to immediately, without any delay.

In order to produce normal steam, the cutout valve 11 is actuated by the manual actuation member 18 and the
20 electric switch 16 is simultaneously closed, the electronic pulse circuit 20 thus bridging the switch 8 and driving pump 2 so that a measured amount of water is supplied from the water tank 1 to the evaporation chamber 13. When normal steam is produced, the pressure
25 reservoir 3 is not in operation and the water supply to the evaporation chamber 13 is effected via the pump 2. However, since water at the required operating pressure is already available at the outlet of the supply lines 9, before the valves 10, 11 and 12 are operated, the
30 content of the pressure reservoir 3 is immediately emptied into the evaporation chamber 13 upon actuation of the cutout valve 11, thus bridging the reaction delay of the pump 2.

In order to produce additional steam, the cutout
35 valve 12 is actuated for a short period via the manual actuation member 19 as a result of which the valve is opened and the electric switch 15 is simultaneously

closed. The electric circuit to the pump 2 is thus disconnected via the electronic pulse circuit 20 and the contents of the pressure reservoir 3 are fed to the auxiliary steam chamber 14, thus producing a burst of steam. If the actuation of the cutout valve 12 is interrupted, the pump 2 restarts its operation and fills the pressure reservoir 3. A burst of steam may be produced several times in succession, if it should be necessary.

10 In order to spray the items to be ironed beforehand in the region surrounding the iron, the cutout valve 10 is opened via the manual actuation member 17 and water from the water tank 1 is sprayed onto the items, by means of the pump 2 and the spray device 4. The
15 spraying is carried out until the cutout valve 10 is activated.

 The cutout valves used may also be solenoid-operated valves which may be actuated via sensors and a suitable electronic circuit.



Claims

1. A steam iron comprising a water tank, a controllable electric pump connected to the water tank as well as an evaporation chamber supplied via valve-controllable supply lines, the water supply from the water tank to the evaporation chamber being effected by the pump, wherein at least one pressure reservoir having a pressure source is disposed between the pump and the evaporation chamber, and wherein an electric switch is in operative connection with the pressure reservoir, the electric switch switching the pump on or off as a function of the level of filling of the pressure reservoir.
2. A steam iron as claimed in claim 1, comprising a spray device which may be activated by a manual actuation member as well as controlled via a first cutout valve.
3. A steam iron as claimed in claim 1 or 2, wherein the water tank, the pump and the pressure reservoir are connected to the evaporation chamber, an auxiliary steam chamber and/or the spray device via a centrally connected system of supply lines.
4. A steam iron as claimed in claim 1, 2 or 3, wherein the quantitative measuring of the amount of steam is effected by driving the pump via an electronic pulse circuit.
5. A steam iron comprising a water tank, an evaporation chamber, a pump for supplying water from the water tank to the evaporation chamber, and a pressure reservoir having a pressure source and being provided between the pump and the evaporation chamber, operation of the pump being controllable between on and off modes as a function of the amount of water in the pressure reservoir.



6. A steam iron substantially as hereinbefore described with reference to the accompanying drawing.