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Electric steam iron

The invention relates to an electric steam iron with an electric switch and a valve.

A steam iron according to the preamble is known from EP-PS 0 117 852. This known iron possesses a pump which feeds water out of a water tank through a supply line into the evaporation chamber. The inflow into the evaporation chamber is controlled by means of a valve. An electric switch is disposed in the handle of the iron, which switches the pump on and off. Inside the valve a spring-loaded slide is disposed, which is displaceable vertically by means of a manually operated pushbutton and a slide rod. To operate the valve, the slide is moved vertically by means of the pushbutton, wherein the electric switch comes into contact with the pushbutton and switches the pump on and off.

A disadvantage with this apparatus is its multipart construction, as a result of which assembly is extremely complicated, since the switch has to be additionally adjusted after its assembly. The adjustment is very difficult, since the slide must execute only a very small movement to control the valve and the pump feed has to be in operation before the slide is located in the appropriate position. In addition, the switch is not protected against humidity and consequently does not meet the specified standard for electrically heated steam irons.

The object of the invention is to create a valve unit with pushbutton switch for an electric steam iron which does not possess the disadvantages set out above, wherein said valve unit can be assembled simply and without special adjustment

in the handle of the iron and the electric pushbutton switch is reliably protected against humidity.

This object is achieved by the characterising features of claim 1.

It is brought about by the latter that, as a result of the axial alignment according to the invention of pushbutton switch and valve, the valve is operated simultaneously with the actuation of the electric pushbutton switch. The pushbutton switch is disposed moisture-proof in a housing. The pushbutton switch is actuated by means of an elastically deformable membrane, which simultaneously seals the switch housing tightly in an outward direction. The valve housing is sealed tightly by an elastically deformable membrane, wherein the membrane is in operative connection with the switch housing. Between the membrane and the valve cone is disposed a plunger movable freely vertically or else attached firmly to the membrane. On the actuation of the electric pushbutton switch an electric pulse is generated, which controls the electric pump by means of electronics. At the same time the switch housing moves vertically downwards. The valve cone is thereby removed from its seat by means of the membrane and the mobile plunger and consequently the inflow across the valve to the consumers is controlled. The return movement of the valve unit with pushbutton switch into the starting position takes place by means of pressure spring. Owing to the construction according to the invention of the membranes, which are both elastically deformable, and of the plunger disposed so as to be moveable inside the valve, only a small pressure load is required for the actuation of the valve unit with pushbutton switch, since friction loads caused by sliding seals do not occur. Since the actuating load for actuating the pushbutton switch is smaller than the load for actuating the valve, with advantage the electric pulse for the pump is first of all triggered and

then the valve actuated. Pushbutton switch and valve are with advantage constructed as an interrelated unit which can be incorporated in an iron without any problem or be replaced when required.

An embodiment of the invention is shown in the drawing and will be described in detail below.

The electric valve unit with switch 1 shown consists of an electric pushbutton switch 3 and a valve 2, which are disposed axially behind one another. The pushbutton switch 3 is disposed in a housing 6 consisting of bottom part 4 and top part 5, which housing 6 is sealed tightly in an outward direction by an elastically deformable membrane 7. The switch housing 6 is disposed axially displaceable on the valve housing 8. The valve housing 8 comprises valve inlets 9 and a valve outlet 10. An insert 11 is provided inside the valve housing 8, in which a valve plunger 12 is movably accommodated. The insert 11 comprises a valve seat 14 for a spring-loaded valve cone 13. The insert 11 comprises an annular groove 20, as a result of which the valve outlet 10 can be provided at any point whatever on the periphery of the valve housing 8. One or more nozzle-type valve inlets 9 are provided on the valve housing bottom 21. It is also possible, however, for a plurality of valve units with pushbutton switch 1 to be installed on a valve housing bottom 21, which comprise a common valve inlet 9, but separate valve outlets 10, or for further nozzle-type outlets to be provided together with the valve inlet 9 on the housing bottom 21, in order to permit the supply of a plurality of units with pushbutton switch 1 in series. The valve housing 8 is sealed tightly by an elastically deformable membrane 15. There is formed integral with the switch housing bottom part 4 a pressure nozzle 17 which is in operative connection with the membrane 15 of the valve housing 8. The valve unit with pushbutton switch 1 is supported in an iron housing 18.

If slight axial pressure is exerted on the actuating knob 19 by hand, the pushbutton switch 3 generates an electric pulse which controls an electric pump (not shown) by means of electronics (not shown). The pushbutton switch housing 6 moves downwards simultaneously in the process. This vertical reciprocating movement is transferred via the pressure nozzle 17 to the membrane 15 and via the mobile plunger 12 to the valve cone 13. The valve cone 13 therefore lifts off from the valve seat 14 and unblocks the valve outlet 10 to the supply lines (not shown) of the consumers. If the load on the actuating knob 19 is reduced as a result of the axial pressure, the valve unit with pushbutton switch is brought into its starting position by means of pressure spring 16, restoring forces of the membranes 7 and 15 and the restoring force of the pushbutton switch 3.



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Claims

1. Electric steam iron with an electric switch and a valve, characterised in that the electric switch (3) and the valve (2) are disposed axially above one another, switch (3) and valve (2) are in operative connection with one another, wherein switch (3) and valve (2) require different actuating loads.
2. Steam iron according to claim 1, characterised in that the electric switch (3) is disposed humidity-proof in a switch housing (6) consisting of bottom part (4) and top part (5) and the switch housing (6) is disposed axially displaceable in the valve housing (8).
3. Steam iron according to claims 1 and 2, characterised in that the valve housing (8) is sealed tightly by an elastic membrane (15) and a valve plunger (12) is disposed so as to be movable axially between valve cone (13) and membrane (15).
4. Steam iron according to claims 1 and 3, characterised in that an insert (11) is disposed in the valve housing (8), in which the valve plunger (12) is accommodated and the valve seat (14) for the spring-loaded valve cone (13) is provided.
5. Steam iron according to claims 1 to 4, characterised in that the insert (11) comprises an annular groove (20) which is in connection with the valve outlet (10).

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Reference symbols

- 1 = valve unit with switch
- 2 = valve
- 3 = pushbutton switch
- 4 = housing bottom part
- 5 = housing top part
- 6 = switch housing
- 7 = membrane
- 8 = valve housing
- 9 = valve inlet
- 10 = valve outlet
- 11 = insert
- 12 = valve plunger
- 13 = valve cone
- 14 = valve seat
- 15 = membrane
- 16 = pressure spring
- 17 = pressure nozzle
- 18 = iron housing
- 19 = actuating knob
- 20 = groove
- 21 = valve housing bottom