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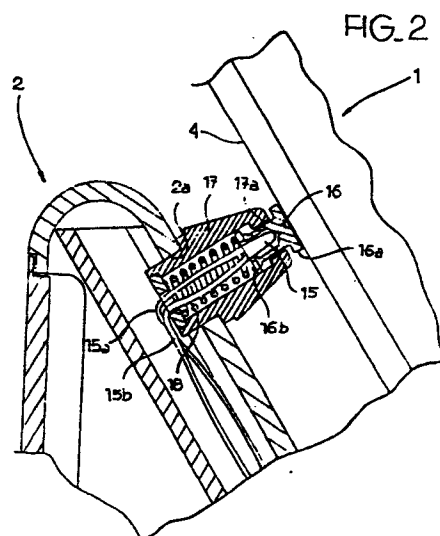
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54 An ironing apparatus comprising an electric resistance iron of the so-called cordless type.

57 An ironing apparatus comprising an electric resistance iron (1) of the so-called "cordless" type, and a rest and electric supply base (2) that can be connected to the electric supply mains and which is provided with coupling means (7) that are able to allow the electric connection to be realized of the iron (1) with the electric supply mains when the iron itself is arranged on its base (2); the apparatus also comprising thermostatic means (13-15, 19) for regulating the temperature of said iron (1), such thermostatic means including temperature sensitive means (15), said ironing apparatus being also characterized in that said temperature sensitive means also comprise a temperature sensitive device (15) assembled within said rest and electric supply base (2) in such a position as to allow said temperature sensitive device (15) to come into contact with the ironing sole or plate (4) of the iron (1) when the latter is arranged on its base (2).



AN IRONING APPARATUS COMPRISING AN ELECTRIC
RESISTANCE IRON OF THE SO-CALLED CORDLESS TYPE

The present invention relates to an ironing apparatus comprising an electric resistance iron of the so-called cordless type and a rest and electrical supply base, which base
5 can be connected to the electric supply mains and is provided with coupling means which are able to allow the electrical connection of the iron with the supply mains to be realized when the iron is placed on the base; said apparatus also com-
10 prising thermostatic means for the regulation of the iron temperature, said regulation means also including temperature sensitive means.

In apparatuses for performing the ironing operation of such a type, the very flatiron is electrically supplied and
15 heated when it is arranged on the base during pauses in the ironing.

The ironing apparatuses of such type have a number of advantages.

First, the employment of the flatiron is extremely easier
20 and more comfortable than the employment of flatirons provided with an electric supply cord according to the traditional art. Moreover, cordless irons are safer in use because during use the flatiron is not connected to the electric supply mains.

25 In flatirons already known of the cordless type, the temperature sensitive means are arranged in the flatiron at a given distance from the ironing sole or plate. When the flatiron is placed on the electric supply base and the iron resistor receives electrical power, the iron temperature in-
30 creases. When the temperature detected by the temperature sensitive means reaches an upper pre-established value, electrical power supply is cut off: from that moment on, usually

the effective temperature of the ironing plate keeps increasing for a few instants as an effect of thermal inertia and then it starts decreasing. If the flatiron in that condition is removed from its base and is employed for the ironing operation, the ironing sole or plate decreases in temperature. The temperature decrease of the ironing sole is much quicker than the temperature decrease inside the flatiron, where the sensitive means of the thermostatic circuit are arranged. Accordingly, the flatiron sole may happen to be already quite cold when said flatiron is placed again on its electric supply base, and at the same time the temperature detected by the temperature sensitive means may happen to be higher than the minimum value previously set for supplying again the flatiron with current. Under such conditions, when the flatiron is placed again on its base, it is not supplied again immediately with electric current. Thus, if the iron is removed again from its base for the ironing operation before the electric power supply has been started again, the effective temperature of the ironing sole or plate will decrease further. As a consequence, the ironing operation occurs in such conditions in a very unsatisfying way, as the ironing sole or plate has decreased in temperature below the temperature range established.

The aim of the present invention is that of realizing an ironing apparatus allowing the drawback mentioned above to be overcome.

Such object is realized according to the present invention through an ironing apparatus of the type specified above, whose main feature consists in that the temperature sensitive means mentioned above comprise a temperature sensitive means assembled within the rest and electric supply base in such a position as to allow said temperature sensitive means to contact the iron sole or plate when the iron

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itself is arranged on said base.

Further features and advantages of the ironing apparatus according to the present invention will be evident from the detailed disclosure given below, with reference to the enclosed drawings, which are supplied just for exemplification and not for limitative purposes, wherein:

Figure 1 is a perspective view showing an ironing apparatus according to the present invention,

Figure 2 is a view, drawn at a higher scale, of a cross section along the line II-II of Figure 1, and

Figure 3 is a block electrical diagram of the ironing apparatus according to the present invention.

With reference now to Figure 1, the ironing apparatus according to the present invention comprises a very flat iron pointed out by the reference number 1, and a rest and electrical supply base pointed out by the reference number 2. The latter comprises a body, which is made up for instance of a plastic material and is substantially in the shape of an L, such body being suitable for connection to the electric supply mains through a supply cord or cable 3.

The flatiron 1 is free from electric supply cord or "cordless" and it comprises an ironing sole or plate 4 and a plastic material body which is pointed out as a whole by the reference number 5.

The iron 1 is provided in a way already known per se with an electric connection device in the shape of a multipolar electrical plug not shown in Figures 1 and 2, said device being pointed out schematically by the reference number 6 in Figure 3. Said base 2 is correspondingly provided in a way already known per se with an electric connection device in the shape of a current tap not shown in Figures 1 and 2 but schematically pointed out by the reference number 7 in Figure 3.

When the flatiron 1 is correctly arranged on its base 2, the heating resistor (pointed out by the reference number 8 in Figure 3) of the iron 1, following the connection of the iron connection device with the corresponding device of the base, can be connected to the electric supply mains, as will be evident more clearly in the following.

As shown in the diagram of Figure 3, some control circuits and devices for the operation of the iron 1 are housed within said base 2. Such devices include a potential divider 10, to whose outlet a rectifier device 11 is connected, said rectifier consisting for example in a Graetz bridge circuit. A voltage stabilizer 12 is coupled to such circuit, said stabilizer comprising for instance a Zener diode and a filtering capacitor. Said devices 10-12 form as a whole a stabilized voltage supply unit, from which the direct voltages are obtained for supplying the other electrical circuits and components. More particularly, a potentiometer 13 is connected to the stabilizing circuit 12, the slider of said potentiometer being suitable for actuation on the part of the user through a rotatable knob 13a (Figure 1) assembled in the base 2. The slider of said potentiometer is connected to a first input of a comparison circuit 14 which is embodied for instance as an operational amplifier. A temperature sensitive electric device is connected to the other input of said circuit, said device consisting for instance of a negative temperature coefficient resistor (NTC resistor) pointed out with 15.

As shown in particular in Figure 2, the temperature sensitive device 15 is assembled within a cavity of a small head 16 which is made up of a heat conducting material. Said small head 16 is substantially in the shape of a cylinder and is assembled so that it can be axially translated within

an opening whose end is pointed out by 17a of a bush 17 fastened within an opening 2a of said base 2. The bush 17 faces towards the ironing sole or plate 4 of the iron 1 when said iron is correctly arranged on said rest and electrical supply base 2.

The head 16 has two projections whose ends are 16a and 16b, which limit the possibility of axial shift with respect to the bush 17. Inside said bush a helical spring 18 is assembled which tends to push the head 16 towards the outside of said bush 17.

The temperature sensitive device 15 is fastened within the cavity of the head 16, for instance by means of a silicone sealant, and its connection conducting wires 15a and 15b (Figure 2) extend through said bush 17 inside the helical spring 18.

The small head 16 can be made up of silver or its alloys, or of aluminum or copper or alloys of the same, and in that case the end face of the head which must contact the iron sole 4 is preferably provided with a coating of silver or of an alloy of the same.

The check and guide bush is realized with a plastic material, for instance a thermosetting polyester resin.

As shown in Figure 3, a power switching device 19 is assembled within the base 2, said device controlling the connection between the interconnection device 7 and the electric supply cord 3. The device 19 may include for instance a relay whose energization is controlled through a piloting stage which is controlled through a control signal supplied by the output of said comparison circuit 14.

Finally a timer 20 can be arranged within said base 2, said timer also being connected with a control input of said power switching device 19.

The ironing apparatus disclosed above works as follows. Suppose that the iron 1 has been correctly arranged on its rest and electric supply base 2, and consequently that the electric interconnection devices 6 and 7 have been coupled with one another. The user of the iron sets by the knob 13a the desired working temperature range of the iron, so that a corresponding reference signal is supplied to an input of the comparison circuit 14. The ironing sole or plate 4 of the iron 1 is in contact with the small head 16 so that it is in thermal contact with the temperature sensitive device 15 carried by the base itself. At the beginning the temperature of the iron sole 4 of the iron 1 is lower than the value set by the user so that the comparison circuit 14 supplies a control signal to the power switching device 19, which signal allows the connection to occur of the heating resistor 8 to the electric supply mains. The iron temperature and more particularly the temperature of the ironing sole 4 starts increasing. When said temperature reaches the value set by the user the comparison circuit 14 causes another switching action of the device 19, so that the heating resistor 8 is disconnected from the electric supply mains.

The flatiron 1 can be employed for ironing, and when it is next placed again on its base 2, the temperature sensitive device 15 detects the effective temperature reached by the iron sole 4 in a very quick way and if necessary the comparison circuit 14 causes electric current to be supplied again to the heating resistor 8.

The drawback disclosed above can thus be removed thanks to the fact that the temperature sensitive device 15 detects the effective iron temperature in correspondence of the ironing sole or plate.

The timer 20 causes the disconnection to occur of the

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heating resistor 8 of the iron 1 from the electric supply
mains if the iron has been kept with no interruption con-
nected to the electric supply base 2 for a time longer than
a pre-established value, for instance for a time of 10 min-
5 utes. Thanks to such feature the current consumption as well
as all potential dangers due to a possible forgetting the
flatiron 1 on its supply base 2 are limited.

Obviously, the present invention comprises all embodi-
ments within the spirit and scope of the disclosure given
10 above.

1. An ironing apparatus comprising an electric resistance iron (1) of the so-called cordless type, and a rest and electric supply base (2) which base can be connected to the electric supply mains and is provided with coupling means (7) suitable for electrically connecting the iron (1) to the supply mains when the iron is arranged on the base (2); the apparatus comprising thermostatic means (13-15, 19) for regulating the temperature of said iron (1), which means include temperature sensitive means (15), said ironing apparatus being characterized in that said temperature sensitive means comprise a temperature sensitive device (15) assembled in said rest and electric supply base (2), in such a position as to allow said temperature sensitive device (15) to contact the ironing sole or plate (4) of the iron (1) when the latter is arranged on the base (2).

2. An ironing apparatus according to claim 1, wherein said temperature regulation thermostatic means for regulating the temperature of the iron (1) comprise setting means (13, 13a) which are manually actuated, and comparison means (14) which are able to allow the iron (1) to be electrically supplied only when the temperature detected by the sensitive means (15) is lower than a predetermined value through said setting means (13, 13a), said ironing apparatus being characterized in that said comparison means comprise a comparison circuit (14) assembled in said rest and electric supply base (2) and also characterized in that said setting means comprise a potentiometer (13) assembled in said base (2) electrically connected to an input of said comparison circuit (14) and provided with a setting member (13a) which can be actuated manually.

3. An ironing apparatus according to claims 1 or 2,

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characterized in that said temperature sensitive device comprises a negative temperature coefficient resistor (NTC resistor) (15).

4. An ironing apparatus according to any one of the preceding claims, characterized in that an opening (2a) is obtained in a surface of the base (2), such surface being that intended for facing the ironing sole (4) of the iron (1), said temperature sensitive device (15) being assembled within said opening in such a way as to be able to undergo a translation motion; elastic means (18) being also provided to push said temperature sensitive device (15) towards a position extracted out of said base (2) in the direction of the ironing sole (4) of the iron (1).

5. An ironing apparatus according to claim 4, characterized in that a check and guide bush (17) is connected to said opening (2a) of the base (2), said bush being made up of a heat insulating material, said apparatus being also characterized in that the temperature sensitive member is so assembled as to be able to undergo a translation motion when acted upon by a spring (18), through the end of said bush (17) facing toward the iron (1) when the latter is arranged on its base (2).

6. An ironing apparatus according to claim 5, characterized in that said temperature sensitive device (15) is assembled within a small head (16) which is made up of a heat conducting material, said small head (16) being so assembled as to be able to undergo a translation motion within said check and guide bush (17).

7. An ironing apparatus according to claim 6, characterized in that said small head (16) is realized with a material selected from the group comprising aluminium, copper, silver or alloys thereof.

8. An ironing apparatus according to claim 7, charac-

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terized in that the surface of said small head (16) intended for contacting the ironing sole or plate (4) of the iron (1) has a coating layer of silver or an alloy thereof.

5 9. An ironing apparatus according to any one of the preceding claims, characterized in that it comprises in addition a timer (20) assembled within said base (2) which is suitable to interrupt or switch off the supply of electric power to the iron (1) when said iron (1) is left on its base (2) for a period of time longer than a predetermined value.

10 10. An ironing apparatus substantially as disclosed and illustrated above and aiming at the objects specified above.

FIG. 2

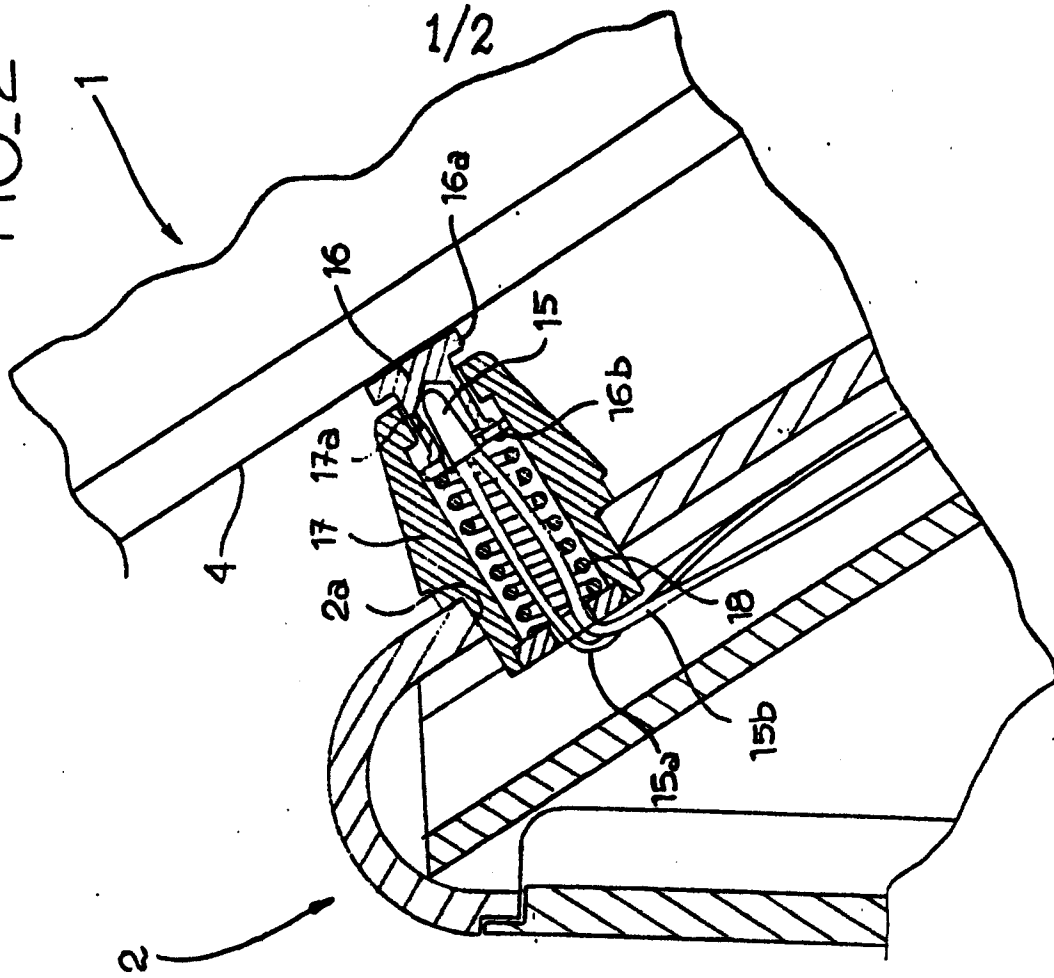


FIG. 1

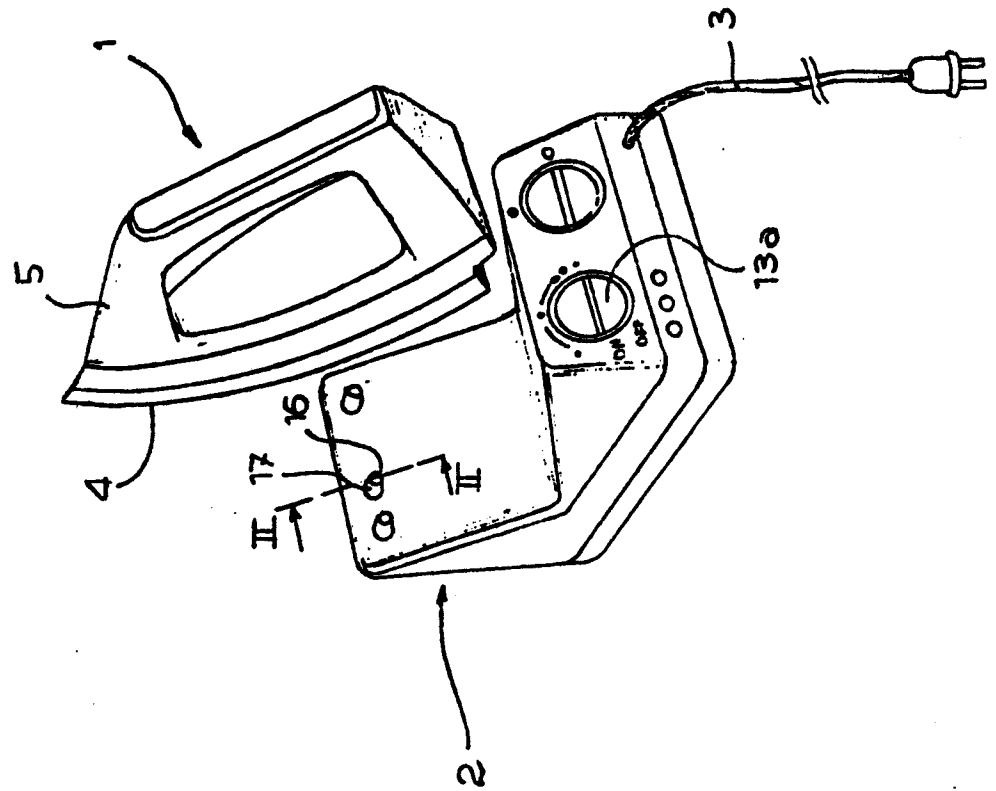


FIG. 3

