STEAM IRON AND SUPPORT

René Praud, Tangier, Morocco, assignor to "Société Industrielle pour le perfectionnement des appareils Menagers" (S. I. P. A. M.), Tangier, Morocco, a company

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This invention relates to a steam projecting apparatus, preferably for the treatment of surfaces, especially for ironing, said apparatus self-producing its vapour.

The known apparatus of that type allow a limited number of operations only due to the fact that the apparatus can only be used in a determined position if the steam production must occur normally. This invention has for its object to obviate this drawback.

For this purpose, the apparatus according to the invention is arranged, both inside and outside, to be usable in its normal position or one the other hand in its upside down position. It is thus possible to use the apparatus according to the invention for various purposes. One of the most interesting is the ironing. The invention therefore relates especially to steam ironing machines and flat irons. But it is also possible to use the apparatus according to the invention, for example, for quilting wallpaper, for projecting, as a vapour, some determined product on a surface. Along these lines, it is possible, when ironing to starch or to waterproof a cloth. The apparatus according to the invention may also be used for other purposes than the treatment of surfaces, for example for air conditioning.

In an advantageous embodiment, the apparatus comprises a steam-generating chamber all the walls of which are very near the heat source, one or a plurality of small diameter flanged holes being provided in the bottom of said steam-generating chamber so as to set the latter in communication with an overheating chamber, a wall of which comprises at least part of the apparatus sole, holes being provided therein for steam escape.

In another particular embodiment, the steam-generating chamber is supplied in liquid, with adjustable pressure, through at least one very small diameter calibrated opening, by a liquid tank independent of the apparatus.

When it happens to be a flat iron, in a particular embodiment, the iron handle includes means enabling to put the iron, in an upside-down condition, on a stand and to set it on said stand with various tilts.

Other details and features of the invention will appear from the description of the accompanying drawings which show, by way of non-limitative example, a particular embodiment of a flat iron according to the invention.

Figure 1 is an elevation view, in cross-section, of a flat iron. Figure 2 is a view from above of the iron of Figure 1. Figures 3, 4 and 5 show the iron of Figures 1 and 2, set on a stand and placed in various positions.

In the various figures, similar reference numerals pertain to similar elements.

The flat iron shown comprises a heating casing 1 made up of two shells 2 and 3, the latter one forming the iron sole or bed plate. The two shells join along their bevelled edge 4. The shell 3 or iron sole has a particular shape very different of one of known irons. Its flat surface is indeed raised, along its complete periphery, by a very gentle curving. Moreover, it is shown in Figure 2 that both ends of the sole or bed plate are rounded, one end being substantially wider than the other.

For the escape of steam, the shell 3 is provided with holes, such as 5, arranged on its entire surface. Said shell is topped by a partition 6 which fits narrowly inside the heating casing and which is hard-soldered along its contact line with said inside surface.

To the partition 6 is attached a cup 7 in the bottom of which are provided flanged holes 8. The cup 7 forms with the corresponding part of the partition 6 a steam-generating chamber 9. Said chamber is supplied by a small rigid pipe 10 which ends, on its upper part, with a calibrated opening 11. The pipe 10 goes freely through the shell 2 and is soldered to the partition 6. The small pipe 10 is supplied by a flexible tube 12 bringing cold water from a tank not shown. The water let in by the opening 11 enters in the steam-generating chamber 9. The steam generated goes through the holes 8 and flows in an overheating chamber 13 bounded on the other hand by the sole or bed plate 3 and on the other hand by the partition 6. The steam then escapes through the holes 5.

The partition 6 and the shell 2 are joined by two tubes indicated by 14 and 15. The tube 14, which is threaded, is screwed, on the one hand in a tapped hole in the partition 6 and goes freely through the shell 2, insuring the attachment of the latter by means of a nut 20. The tube 14 is closed by a screw plug 16 with a sealing joint 17.

The tube 15 is curved at its upper part so as to form the armature of the iron handle 18. Said handle is made up of two shells of molded insulating material, such as 19, joined by a plurality of sunk screws. The lower end of the tube 15 is screwed in a nut 21 soldered to the partition 6. A nut 21 is used, as the nut 20, for insuring the clamping of the shell 2 against the shell 3, all along the bevelled edge 4.

Two heating resistors 22 and 38, connected in parallel, are housed between the partition 6 and the shell 2. Said resistors are insulated and the conductors forming them end up at two terminals 23 located under an insulating cover 24. The insulated resistor 38 is arranged against the partition 6, opposite the steam-generating chamber 9; the resistor 22 reaches from one end to the other of the heating casing 1, along the partition 6. The circuit of the resistor 22 includes an adjustable thermostat and a lighted signal, for example a signal lamp, not shown in the drawings. The supply to the resistors 22 and 38 is made through an electric cable 25 protected as it leaves the handle by a semi-flexible sleeve 26. The flexible pipe 12, insuring the water supply, follows the cable 25 and goes through the sleeve 26 with it to end with the rigid pipe 10. An obturation knob 27, with pressure screw, enables the operator to close or to open at will the water supply. The tank containing water, which is not shown in the drawings, is a small jar or tank which may be attached, at an adjustable height, adjacent the plug, for example by moving it along a vertical strip or slider. The flexible pipe 12 ends somewhat above the tank bottom.

To use the iron described for the usual ironing, that is to say, one acts as follows: the water supply being closed by the knob 27, the iron is plugged in the electric current supply. When the iron reaches the suitable temperature, which may be signalled by the putting out of the lighted signal, the current being cut-off in the circuit of the resistor 22 by the thermostat, the water supply is opened in 27. The resistor 38, which is still energized, insures the vaporization of the water. The flow of water is determined by the size of the calibrated opening 11 and by the height the jar forming the water
tank is attached at. The vaporization is nearly instantaneous in the steam-generating chamber 9. The steam flows in the overheating chamber 13, where it is overheated, then it escapes, under pressure, through the holes 5.  The steam pressure cannot go beyond a certain limit value, as the water supply is stopped when the steam pressure reaches the water column pressure. The steam flow is increased by raising the tank. It is possible to stop completely the steam flow by locating the tank at a level below the apparatus one. It is to be noted that said apparatus insures by itself the safety, without the help of any safety valve.

By breaking out the plug 16, it is possible to clean and to scale the apparatus.

A thermostat may also be added for closing the liquid supply, as long as the adequate temperature has not been reached, either by squeezing on a point of the water supply pipe 12, or by acting on a small valve located in the rigid pipe 18.

The great advantage of the iron described is that it may be used not only for ordinary flat ironing, but also as a shell iron or heating steam sleeve-iron. For this purpose, a stand 28 is associated with the iron, stand which is made up of two legs 29 and 30 having wide bases 31 and 32, which may include rubberized ends, insuring a better seating, particularly in the case when the table is not absolutely level. The legs 29 and 30 are linked with one another, the end of the leg 30 abutting the leg 29, in the use position, that is in the position of maximum spacing. The leg 29 is longer than the leg 30 and extends at its upper end to form a vertical upright 33 which may be engaged in either one of the three housings 34, 35 and 36 provided in the handle 18 of the iron. Said housings have a section which is not circular. The direction of the housings 34, 35 and 36 is chosen so that three different positions may be given to the iron. It is seen that, in the position of Figure 3, the upright 33 being thus engaged in the housing 34, it is possible to iron over the big end of the iron. In Figure 4, the upright 33 being engaged in the housing 35, it is possible to iron on the iron sole or bedplate. Finally in Figure 5, the upright 33 being engaged in the housing 36, it is possible to iron over the small end of the iron.

When the stand is not used, the legs 29 and 30 may be folded against one another. The stand 28 being thus folded, for using it, it is held in one hand, the upright 33 is engaged in the chosen housing, the whole set is turned over and the legs 29 and 30 are spread by setting them on a table. It is to be noticed that the arrangement chosen for the steam generating chamber 9 and especially the provision of the flanged holes 8 prevents flowing of the small amount of water contained in the cup 7 when the iron is turned upside down.

Thanks to the arrangement of the iron described, a much larger use of said iron is attained, the steam projection preventing us to now turining over the iron. It must be understood that the invention is in no way limited to the embodiment described and that many changes may be brought thereto without departing from the scope of this specification.

The overheating and steam-generating chambers may, for example, for helping to scale the apparatus, be made removable. For this purpose, the two tubes 14 and 15, instead of being screwed in the partition 6, will be screwed in the bottom of the shell 3 and will go through the partition 6, with a sealing joint. The sealing will similarly be insured all along the joint of the partition 6 with the shell 3. As to the steam-generating chamber, the cup comprising it will be attached to the partition 6 with screws and a sealing joint.

Other embodiments may be provided to enable the use of the iron in a plurality of different angular positions, for example through a link or a swivel joint arranged either in the apparatus itself, in its stand, or between the apparatus and its stand, along with locking means for said joint.

The invention may have various applications. Thus, most of the arrangements described for steam projection may be applied to an ironing machine. The invention is not limited to the production of water vapours, but on the contrary another liquid may be used, for example to treat a fabric in various operations. The iron or the ironing machine may be supplied with combustible gas, replacing the electric current supply described.

I claim:
1. Steam flat iron, which comprises a handle, a sole with an absolutely flat ironing area raised along all of its periphery by a very gentle curving and having, as seen from below, a very narrow rounded off forward end and a very wide backward end, supporting means cooperating with said handle, means for interlocking said handle and supporting means said interlocking means being carried by the supporting means, a plurality of angularly related openings provided in said handle, and means for supplying the iron with liquid from an outside source thereof, each said opening being arranged to receive said interlocking means, the relative position of said support and handle being different from one opening to another, so as to give the iron, turned over on its support several working positions in each one of which the flat surface of the sole has a different angularity.

2. Steam flat iron as claimed in claim 1, which comprises a plate-like partition provided a slight distance away from said sole, a very flat overheating chamber formed between said sole and said partition, a cup located against said partition and said sole in order to form against said partition a very flat steam generating chamber covering a part of said partition only, a pipe connecting said steam-generating chamber with the means provided for supplying the iron with liquid, an electric heater resistor extending along that face of said partition which is opposite the sole, an auxiliary heater resistor provided on that part of said partition facing the steam-generating chamber, and a thermostatic cut in the circuit of said first-named resistor provided for heating the overheating chamber, said pipe comprising a calibrated part with a very small inside diameter, flanged holes being provided in said cup for connecting said steam-generating chamber with said overheating chamber, openings being provided in said sole for the passage of the steam.

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