

PATENT SPECIFICATION

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COMPLETE SPECIFICATION

Improvements relating to Hand Irons

We, HOOVER LIMITED, a Company registered under the Laws of Great Britain, of Perivale, Greenford, Middlesex, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to hand irons and an object of the invention is to facilitate and/or expedite the ironing operation.

The present invention consists in the combination with a hand iron including a sole plate having one or more openings in it, of means for supplying air to the iron and delivering it through the opening or openings to the ironing surface under sufficient pressure to produce a cushion of air which will substantially support the weight of the iron. The ironing surface may be of slightly concave form.

In one form of the invention the sole plate is electrically heated and means is provided for passing the air through a passage or chamber in heat exchange relationship with it to take up heat before being delivered through the opening or openings to the ironing surface.

Conveniently the means for supplying air comprise a flexible pipe for connection to a source of air under pressure external to the iron.

The or each opening through the sole plate may open into a recess in the ironing surface to distribute the air.

The flow of air may be controlled by a valve, which may be provided with means for automatically closing it when the iron is upended on to its heel.

The invention provides a cushion of air under the sole plate upon which a substantial part of the weight of the iron is substantially supported thereby greatly reducing the effort required to move the iron over the surface being ironed. In addition the air, especially

if it is heated, serves to carry away moisture in the form of water vapour from the fabric under the sole plate, thereby accelerating the ironing process.

The invention may be carried into practice in various ways but one specific embodiment will be described by way of example with reference to the accompanying drawings, in which:—

Fig. 1 is a side elevation, partly in section, of an iron embodying the invention;

Fig. 2 is an under-plan view of the iron; and

Fig. 3 is a section on the line 3-3 of Fig. 2.

The iron comprises a sole plate 10, preferably of cast aluminium, having an ironing surface 11, which is preferably slightly concave as shown in Fig. 3, but if preferred may be flat. Embedded in the sole plate is an electric heating element 12 of well-known type, which is of U-shape having its bight or nexus adjacent the toe of the iron and its limbs extending back along the sides.

The sole plate is surmounted by a cover shell 14 and a handle 15. Electric current is supplied to the heating element through a cable 16 extending through the side of the rear handle pillar 17, connected in series with a thermostatic switch (not shown) controlled by a control dial 18.

In the centre of the ironing surface 11 of the sole plate is an elongated groove 20 communicating through an opening 21 in the sole plate with an air chamber 22 situated within the bight of the heating element 12 where it will be subject to concentrated heating. The air chamber 22 is closed by a cover plate 23 of material such as stainless steel of poor heat conductivity, which is staked to the sole plate 10 as shown at 24.

One end of a tube 25 opens through the cover plate 23 to which it is soldered or otherwise secured, whilst its other end opens into a valve body 26 which also communicates with an inlet tube 27 which extends up

through the hollow rear handle pillar 17 and is connected to a flexible tube 28 leading to a source of air under pressure. The valve body 26 has in it a seating 30 co-operating with a conical valve plug 31 carried by a stem 32 which extends through a rear closure 33 of the valve body 26. The valve is biased towards its open position by a helical compression spring 34 interposed between the closure 33 and a button 35 which projects through a hole in the rear wall 36 of the cover shell 14. The rear wall 36 of the cover shell and a projection 37 at the rear end of the handle are designed to support the iron in an upended position, and the valve plug 31 and button 35 and associated parts are designed so that when the iron is in this position the pressure of the supporting surface on the button 35 will automatically close the valve.

The bottom of the cover shell 14 to the rear of the sole plate 10 is closed by a closure plate 38.

The supply of air to which the flexible tube 28 is connected may conveniently be provided with a valve independent of the valve 31. While the invention has been shown as applied to a dry iron, it may also be applied to a steam iron or to a steam-or-dry iron of any suitable or known construction.

In operation the electric current is switched on in the ordinary way, and, when the iron has heated up, the air is also switched on, the rate of flow of air being adjusted either automatically by a pressure reducing valve or manually by adjustment of a suitable control valve. The air pressure and air flow required will depend upon the weight of the iron and sole plate area and to some extent upon the type of fabric being ironed. It has, however, been found that with a 4 lb. iron having a 30 square inch sole plate a pressure in the neighbourhood of 10 lbs. per square inch is suitable with an air flow of from 5 to 8 cubic feet per minute. Under these conditions it has been found that the pushing effort required is reduced to about one fourth of that required with an ordinary iron of that size.

In use the air flows through the valve 26 and the pipe 25 thence through the chamber 22 and out through the opening 21 and groove 20 to the concave ironing surface. As it passes through the chamber 22 the air will be heated, and its pressure on the ironing surface will tend to raise the iron on a cushion of air and thus make the iron more easy to manipu-

late, in addition to facilitating the evaporation of water in the fabric being ironed, both by applying heat, and by carrying away the evaporated moisture. This is the case whether the fabric is dampened beforehand, or whether the invention is applied to a steam iron. With ordinary irons it has been found that the evaporated moisture tends to be trapped beneath the sole plate and not to escape until the iron is moved away from the area upon which the iron is then resting. Thus the present invention increases the speed of ironing.

When the iron is not in use it is upended on its heel thereby pressing in the operating button 35 and shutting off the supply of air.

What we claim is:—

1. The combination with a hand iron including a sole plate having one or more openings in it, of means for supplying air to the iron and delivering it through the opening or openings to the ironing surface under sufficient pressure to produce a cushion of air which will substantially support the weight of the iron.

2. The combination as claimed in Claim 1 in which the ironing surface is of concave form.

3. The combination as claimed in Claim 1 or Claim 2 in which the sole plate is electrically heated and means is provided for passing the air through a passage or chamber in heat exchange relationship with it to take up heat before being delivered through the opening or openings to the ironing surface.

4. The combination as claimed in any one of the preceding claims in which the means for supplying air comprise a flexible pipe for connection to a source of air under pressure external to the iron.

5. The combination as claimed in any one of the preceding claims in which the or each opening through the sole plate opens into a recess in the ironing surface of the sole plate to distribute the air.

6. The combination as claimed in any one of the preceding claims including a valve for controlling the flow of the air.

7. The combination as claimed in Claim 6 including means for automatically closing the valve when the iron is up-ended on to its heel.

8. The combination of an iron and means for delivering air under pressure to its ironing surface as specifically described herein with reference to the accompanying drawings.

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The bottom of the cover shell 14 to the rear of the sole plate 10 is closed by a closure plate 38.

The supply of air to which the flexible tube 28 is connected may conveniently be provided with a valve independent of the valve 31. While the invention has been shown as applied to a dry iron, it may also be applied to a steam iron or to a steam-dry iron of any suitable or known construction.

In operation the electric current is switched on in the ordinary way, and, when the iron has heated up, the air is also switched on, the rate of flow of air being adjusted either automatically by a pressure reducing valve or manually by adjustment of a suitable control valve. The air pressure and air flow required will depend upon the weight of the iron and sole plate area and to some extent upon the type of fabric being ironed. It has, however, been found that with a 4 lb. iron having a 30 square inch sole plate a pressure in the neighbourhood of 10 lbs. per square inch is suitable with an air flow of from 5 to 8 cubic feet per minute. Under these conditions it has been found that the pushing effort required is reduced to about one fourth of that required with an ordinary iron of that size.

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When the iron is not in use it is upended on its heel thereby pressing in the operating button 35 and shutting off the supply of air.

What we claim is:—

1. The combination with a hand iron including a sole plate having one or more openings in it, of means for supplying air to the iron and delivering it through the opening or openings to the ironing surface under sufficient pressure to produce a cushion of air which will substantially support the weight of the iron.

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3. The combination as claimed in Claim 1 or Claim 2 in which the sole plate is electrically heated and means is provided for passing the air through a passage or chamber in heat exchange relationship with it to take up heat before being delivered through the opening or openings to the ironing surface.

4. The combination as claimed in any one of the preceding claims in which the means for supplying air comprise a flexible pipe for connection to a source of air under pressure external to the iron.

5. The combination as claimed in any one of the preceding claims in which the or each opening through the sole plate opens into a recess in the ironing surface of the sole plate to distribute the air.

6. The combination as claimed in any one of the preceding claims including a valve for controlling the flow of the air.

7. The combination as claimed in Claim 6 including means for automatically closing the valve when the iron is up-ended on to its heel.

8. The combination of an iron and means for delivering air under pressure to its ironing surface as specifically described herein with reference to the accompanying drawings.

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