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HEAT-RESISTANT FLASH CHAMBER COATINGS
AND METHOD FOR APPLYING SAME
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Fig. 1

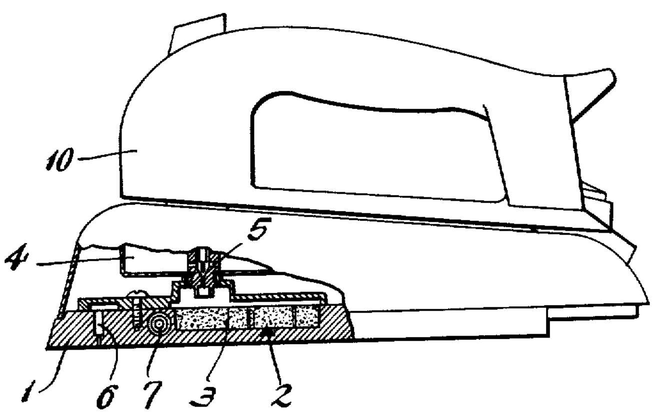
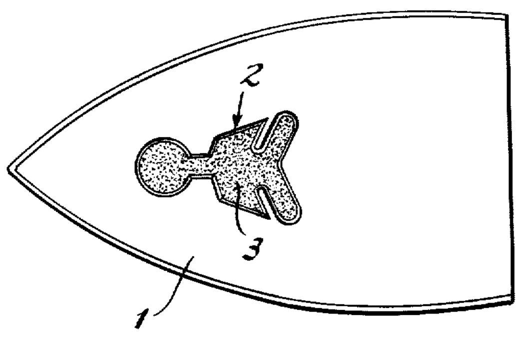


Fig. 2



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HEAT-RESISTANT FLASH CHAMBER COATINGS AND METHOD FOR APPLYING SAME

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This invention relates to novel heat-resisting coatings for the flash chamber or boiler of steam irons, and to the method for applying the same.

In the operation of conventional steam irons, the object is to have the iron emit an uniform flow of steam during the ironing operation. To acomplish this object, the iron is provided with a water reservoir, a flash chamber for converting the water into steam, and a series of steam ports or outlets located on the underside of the heated soleplate.

The water is released from the reservoir and drops into the flash chamber which is generally located in the heated soleplate and which has a surface temperature in excess of the boiling temperature of water. The water is converted to steam and emitted from the steam ports during the ironing operation.

Among the disadvantages encountered with conventional flash type steam irons is their failure to emit the steam as a uniform flow and their tendency to "spit" or periodically eject water from the steam ports. These problems arise from the very nature of the water-steam conversion system used in steam irons. When the water leaves the reservoir, it drips onto the hot surface of the flash chamber in the soleplate. The abrupt change in temperature causes the water droplets to bounce around in the flash chamber so vigorously that portions of each droplet escape along with the steam which is formed, thereby causing the iron to "spit" and "sputter" and stain the material being ironed.

Several attempts have been made to overcome these problems by coating the inner surface of the flash chamber of the iron with materials which for one reason or another have either failed to overcome the problems and/or have given rise to new problems. Most of these materials merely provide a new surface upon which the water droplets bounce in the same manner as they would on the metallic flash chamber surface itself. Other materials are water-soluble to one degree or another and are attacked by the steam, thereby causing clogging of the steam ports and/or staining of the material being ironed. Still other materials, while not water-soluble per se, require the presence of alkali stabilizing additives which are soluble and/or decompose in the presence of steam so as to result in deterioration of the coating material, clogging of the steam ports and/or staining of the material being ironed.

It is an object of the present invention to provide flash chamber coatings which are based upon completely water-insoluble materials having excellent affinity for the metallic surface of the chamber.

It is another object of this invention to provide coatings of the aforesaid type which act as a water droplet-dispersing heat barrier layer covering at least one surface of the flash chamber in steam irons.

It is still another object to provide steam iron flash chambers with a porous heat barrier layer which has the ability of dispersing water droplets evenly across the coating so as to provide even steam generation.

These and other objects and advantages are accomplished as more fully set forth in the accompanying specification and drawing in which:

FIGURE 1 is a side elevation view, partly broken

away, of a steam iron having a flash chamber coating according to the present invention.

FIG. 2 is a perspective view of a soleplate having a flash chamber coating according to the present invention.

The objects of the present invention are accomplished by coating at least the bottom surface of the flash chamber of the soleplate of a flash type steam iron with a water-insoluble droplet-dispersing heat barrier layer comprising aluminum oxide, titanium dioxide or mixtures thereof.

It has been found that coatings applied from molten compositions comprising at least a major amount by weight of either of the aforesaid oxides are completely insoluble in steam, heat-resistant and have an excellent affinity for metals, particularly aluminum and its alloys, from which most soleplates are currently produced.

Best results are accomplished when the present coating compositions contain only aluminum oxide and/or titanium dioxide, the preferred compositions consisting of a major amount by weight of aluminum oxide and a minor amount of weight of titanium dioxide.

The following example is set forth by way of illustration and should not be considered as limitative.

A soleplate **1**, such as is illustrated by FIG. 2, having a flash chamber **2** is prepared for coating by degreasing the flash chamber section and then preferably grit-blasting the same to roughen the surface and provide it with additional "tooth" or adhesion for the alumina coating to be applied.

Next the soleplate is preheated to a temperature above about 500° F. and preferably in the vicinity of about 550° F. and the molten alumina-titania coating material comprising in excess of about 90% by weight of alumina and less than about 10% by weight of titania is hot-sprayed onto the desired areas of the flash chamber. When the coating is cool, it is porous and has the nature of a ceramic. The thickness of the coating may be varied somewhat, but it is preferably in the order of about 0.008 inch.

The alumina coating is sprayed onto the flash chamber section using a suitable thermal spray device and the coating composition is heated at least sufficiently high to render it molten prior to its application to the flash chamber section.

In the operation of a steam iron **10** having a flash chamber **2** coated with a composition **3** according to the present invention, as exemplified by FIG. 1 of the drawing, water carried in reservoir **4** is metered into the boiler chamber by means of valve **5**. The water falls in the form of droplets onto the coated surface of the flash chamber which is maintained at a temperature in excess of the boiling temperature of water, and normally at a temperature within the range of from about 250° F. to about 550° F. by means of heating element **7** which is embedded in the soleplate.

It is possible to heat the present soleplate to a higher temperature than is normal for steam irons without causing "spitting" due to the heat barrier function of the alumina coating which disperses and flashes the water droplets. The temperature of the metal oxide coating is lower than the temperature of the soleplate.

As the water droplets strike the metal oxide coating **3**, they are dispersed or spread by the porous structure of the coating and distributed evenly over the surface of the flash chamber section **2**. Bouncing of the droplets followed by the attendant "spitting" of the steam iron is substantially completely eliminated.

Because of ability of the metal oxide coating to hold and evenly distribute the water droplets, substantially all of the water is evenly heated and steam is evenly generated through ports **6** located on the underside of the soleplate.

The thickness of the metal oxide coating **3** depends upon the structure of the flash chamber section and the nature of the steam iron being produced. In general, thin coatings, as indicated, are preferred. The coating may be applied to the entire surface of the flash chamber cavity although excellent results have been obtained when only the bottom of the cavity, that portion with which the water droplets first make contact, carries the coating.

Variations and modifications may be made within the scope of the claims and portions of the improvements may be used without others.

We claim:

1. The method of coating at least a portion of the flash chamber of a steam iron with a heat-resisting composition which comprises heating a metal oxide composition to render it molten and spraying onto the surface of said flash chamber said molten metal oxide composition in the form of a thin heat-resisting surface layer, said metal oxide comprising at least one material selected from the group consisting of aluminum oxide and titanium dioxide.

2. The method of coating at least a portion of the flash chamber of a steam iron with a heat-resisting composition which comprises heating a metal oxide composition to render it molten and heating said flash chamber to a temperature of above about 500° F. and spraying onto the surface thereof said molten metal oxide composition in the form of a thin heat-resisting surface layer, said metal oxide comprising at least one material selected from the group consisting of aluminum oxide and titanium dioxide.

3. The method of coating at least a portion of the flash chamber of a steam iron with a heat-resisting composition which comprises heating a metal oxide composition to render it molten and heating said flash chamber to a temperature of above about 500° F. and spraying onto the surface thereof said molten metal oxide composition comprising aluminum oxide in the form of a thin heat-resisting surface layer.

4. The method of coating at least a portion of the flash chamber of a steam iron with a heat-resisting composition which comprises heating a metal oxide composition to render it molten and heating said flash chamber to a temperature of about about 500° F. and spraying onto the

surface thereof said molten metal oxide composition comprising titanium dioxide in the form of a thin heat-resisting surface layer.

5. The method of coating at least a portion of the flash chamber of a steam iron with a heat-resisting composition which comprises heating a metal oxide composition to render it molten and heating said flash chamber to a temperature of above about 500° F. and spraying onto the surface thereof said molten metal oxide composition in the form of a thin heat-resisting surface layer, said composition comprising a major amount by weight of aluminum oxide and a minor amount of weight of titanium dioxide.

6. In a steam iron, a soleplate having a flash chamber therein for receiving water for flash conversion into steam, and an adherent heat-resistant coating consisting essentially of at least one metal oxide selected from the group consisting of aluminum oxide and titanium dioxide on at least a portion of the surface of said flash chamber.

7. In a steam iron, a soleplate having a flash chamber therein for receiving water for flash conversion into steam, and an adherent heat-resistant coating consisting essentially of aluminum oxide on at least a portion of the surface of said flash chamber.

8. In a steam iron, a soleplate having a flash chamber therein for receiving water for flash conversion into steam, and an adherent heat-resistant coating consisting essentially of titanium dioxide on at least a portion of the surface of said flash chamber.

9. In a steam iron, a soleplate having a flash chamber therein for receiving water for flash conversion into steam, and an adherent heat-resistant porous coating consisting essentially of a major amount by weight of aluminum oxide and a minor amount by weight of titanium dioxide on at least a portion of the surface of said flash chamber.

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