Aug. 15, 1967 J. L. VIECELI 3,335,507

HEATING AND STEAM GENERATING SUBASSEMBLY FOR A PRESSING IRON

Filed Dec. 22, 1965 2 Sheets-Sheet 1

FIG. 1

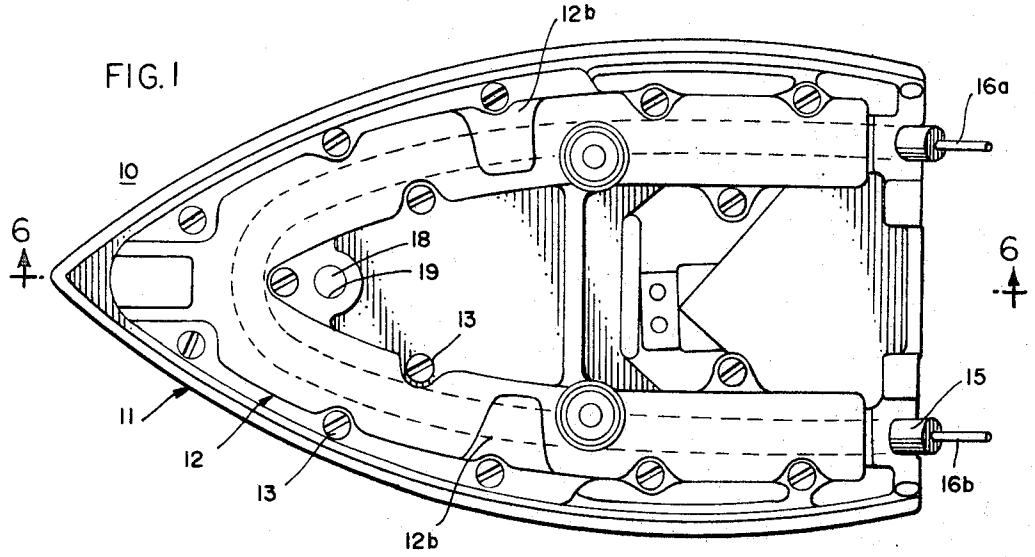


FIG. 2

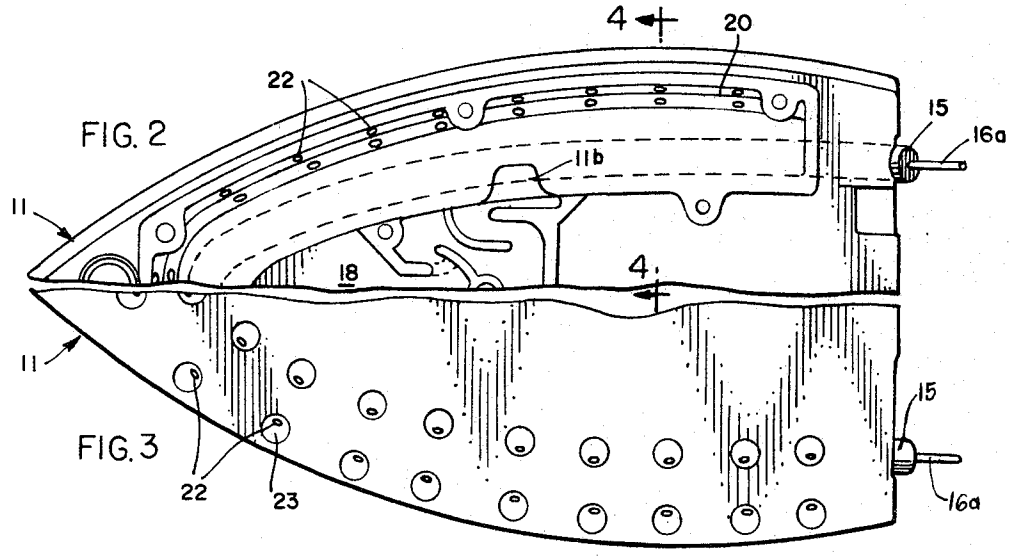


FIG. 3

FIG. 5

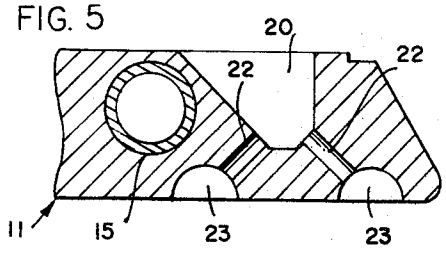
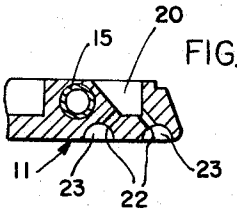


FIG. 4



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Aug. 15, 1967 J. L. VIECELI 3,335,507

HEATING AND STEAM GENERATING SUBASSEMBLY FOR A PRESSING IRON

Filed Dec. 22, 1965 2 Sheets-Sheet 2

FIG. 6

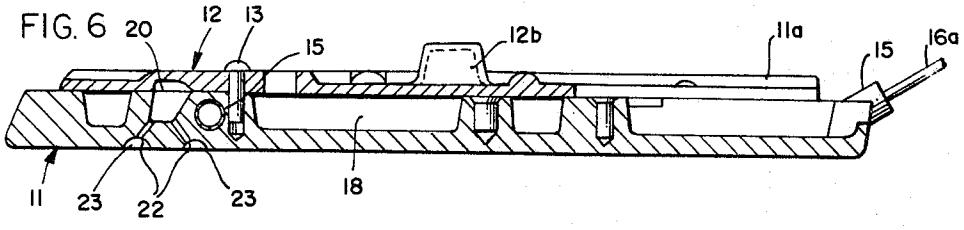


FIG. 8

FIG. 7

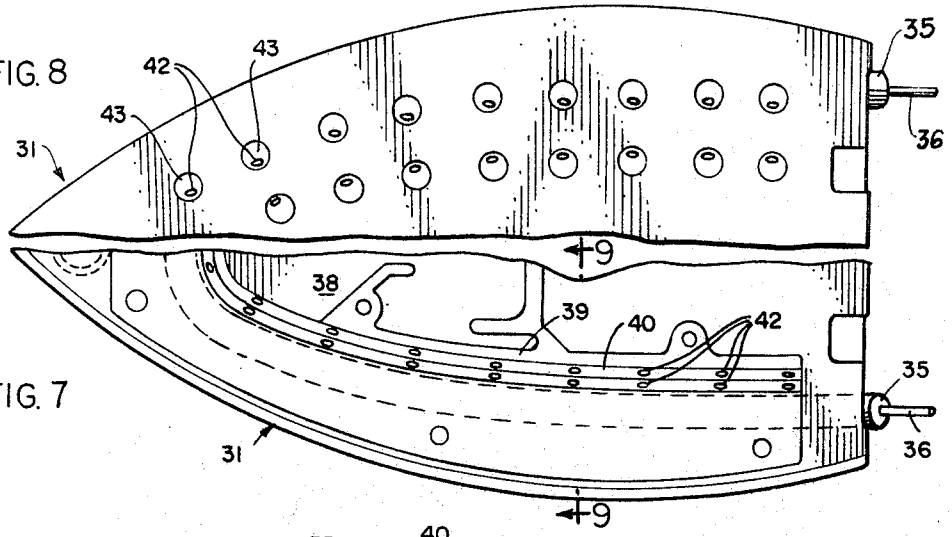


FIG. 10

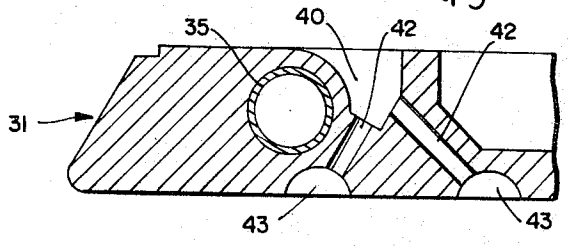


FIG. 9

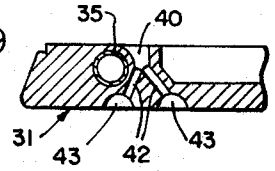


FIG. 11

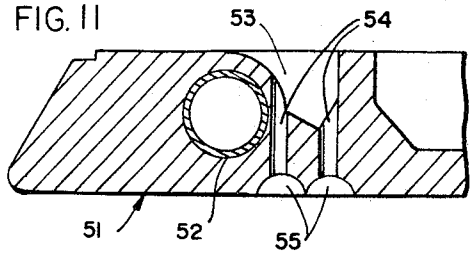
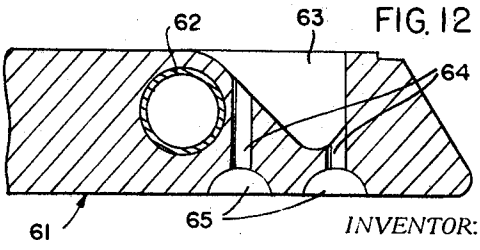


FIG. 12



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3,335,507

HEATING AND STEAM GENERATING SUBASSEMBLY FOR A PRESSING IRON

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Filed Dec. 22, 1965, Ser. No. 515,536
6 Claims. (Cl. 38—77)

The present invention relates to a heating and steam generating subassembly for a pressing iron, and more particularly to a new and improved sole plate for use with a pressing iron of the steam and/or spray type. The present invention is useful with pressing irons such as disclosed and claimed in copending application of Vieceli, Ser. No. 280,770, filed May 14, 1963, now Patent No. 3,264,764 and in Jepson et al. Patents Nos. 2,906,043 and 3,224,122, all assigned to the same assignee as the instant application.

In the above mentioned Jepson Patent No. 3,224,122, there is disclosed a pressing iron wherein the sole plate is provided with two separate flash type steam generators, one for generating steam to be discharged over the ironing surface as is the case with a conventional steam iron, and the second steam generating chamber for producing steam to power a spray of steam and water. The two steam generating chambers are defined primarily by portions of the sole plate and also by a suitable cover secured to the sole plate, which cover is common to both steam generating chambers. A relatively few openings are provided through the sole plate in this Jepson patent. The openings are interconnected by distribution grooves on the pressing surface. While the above described arrangement gives satisfactory steam distribution for many uses, it is desired to have improved steam distribution over the entire sole plate. Moreover the features of the present invention are also applicable to pressing irons having only a single steam generating chamber such as those disclosed in the aforementioned Jepson et al. Patent No. 2,906,043 and the copending Vieceli application.

The problem of providing steam distribution over the entire ironing surface of the sole plate is dealt with in the improved heating and steam generating subassembly for a pressing iron disclosed and claimed in Vieceli et al. application Ser. No. 299,750 filed August 5, 1963 now Patent No. 3,304,636. Therein there is disclosed and claimed a sole plate having a steam generating chamber extending over substantially the entire embedded portion of the heating element, with steam ports interconnecting the steam generating chamber with the ironing surface of the sole plate and disposed on both sides of the heating element. It has been found that the improved port arrangement has resulted in a considerably improved steam distribution providing a very desirable pressing iron.

It will be appreciated that the commercial manufacture and sale of pressing irons is highly competitive, and although the added cost of providing the improved steam distribution arrangement disclosed and claimed in the last mentioned Vieceli et al. application is not great per iron, nevertheless when large quantities of pressing irons are commercially manufactured in accordance with the teaching of the last mentioned Vieceli et al. application, the total increased cost to provide the improved steam distribution becomes significant. Moreover it has been found that the improved steam distribution can be approximated in a somewhat less expensive manner by the teachings of the present application.

Accordingly it is an object of the present invention to provide a new and improved sole plate for a pressing iron which overcomes the above mentioned difficulty and which is economical to manufacture.

A further object of the present invention is to provide a new and improved sole plate having improved means

for distributing steam for a steam iron, and which is easily and economically manufactured.

It is another object of the present invention to provide an improved sole plate and cover defining therein a steam generating chamber and distribution arrangement to provide an improved steam distribution to the ironing surface of the sole plate.

Further objects and advantages of the present invention will become apparent as the following description proceeds and the features of novelty which characterize the invention will be pointed out with particularity in the claims annexed to and forming a part of this specification.

For a better understanding of the present invention, reference may be had to the accompanying drawings in which:

FIG. 1 is a top plan view of a sole plate and steam generating chamber cover secured thereto and embodying the present invention;

FIG. 2 is a fragmentary plan view of the sole plate of FIG. 1, with the steam generating chamber cover removed;

FIG. 3 is a fragmentary bottom view of the sole plate according to the embodiment of FIG. 1;

FIG. 4 is a fragmentary cross sectional view of the sole plate of FIG. 2 taken along line 4—4 of FIG. 2;

FIG. 5 is a fragmentary enlarged sectional view of the sole plate illustrating the steam ports according to the embodiment of FIG. 1;

FIG. 6 is a cross sectional view of the sole plate and steam generating cover assembly of FIG. 1, taken along line 6—6 of FIG. 1;

FIG. 7 is a fragmentary plan view of a sole plate according to another embodiment of the present invention, and illustrated with the cover removed;

FIG. 8 is a fragmentary bottom view of the sole plate according to the embodiment of FIG. 7;

FIG. 9 is a fragmentary cross sectional view of the sole plate of FIG. 7, taken along line 9—9 of FIG. 7;

FIG. 10 is a fragmentary enlarged view of the sole plate illustrating the steam ports according to the embodiment of FIG. 7;

FIG. 11 is a fragmentary enlarged view of a sole plate illustrating the steam ports according to yet another embodiment of the present invention; and

FIG. 12 is a fragmentary enlarged view of a sole plate illustrating the steam ports according to yet another embodiment of the present invention.

Briefly, the present invention is concerned with a sole plate having a steam generating and distributing system defined at least in part in the sole plate for use in a pressing iron for producing steam and for better distribution of it to the underside of the sole plate wherein the sole plate may be readily and economically manufactured at a minimum cost consistent with the improved quality of steam distribution. Specifically, the steam is distributed on the underside of the sole plate over a substantial area thereof through rows of ports which are disposed along one side of the heating element and closely adjacent thereto, communicating between the pressing surface of the sole plate and the steam distributing arrangement.

Referring now to the drawings, and particularly to the embodiment of FIGS. 1 through 6, there is illustrated in FIG. 1 a subassembly generally designated as **10** comprising a sole plate **11** and a cover **12** which is secured to the sole plate **11** in any suitable manner as by fastening means **13**, thereby to define two independent steam generating chambers. The subassembly **10** can be used with the pressing iron of the type shown in the above mentioned Jepson et al. Patent No. 3,224,122 as well as with the steam and spray iron disclosed and claimed in Jepson and Vieceli application, Ser. No. 203,500, filed June 19, 1962, now abandoned, and also assigned to the same assignee as the instant application. The sole plate

11 is preferably constructed of a lightweight cast metal, such as aluminum or the like, and is heated in a conventional manner by an electric heating element 15 of the sheathed type, well known in the art. Such sheathed heating element generally comprises a helical resistance conductor centrally disposed within an outer sheath and supported in spaced relationship with respect to such sheath by an electrical insulating material which is also a good heat conductor. The sheathed heating element 15 has a generally U-shaped configuration and is embedded within the sole plate of the iron. Projecting from the ends of the sheathed heating element 15 are electrical terminals 16*a* and 16*b*, FIGS. 1, 2, and 6, which are electrically connected through the resistance heating element within the sheath of the heating element 15.

For the purpose of producing steam on the flash principle, which steam is supplied beneath the sole plate 11 of the subassembly 10, there is provided a steam generating chamber 18, FIGS. 2 and 6, which is defined by the sole plate 11 and the cover 12. The particular configuration of the steam generating chamber 18, which includes many elaborate passageways and extensions, is best fragmentarily shown in FIG. 2. To provide water to the steam generating chamber 18 there is provided an opening 19 in the cover 12 which is disposed within the confines of the heating element 15 and adjacent to the bight portion thereof, as is best shown in FIG. 1 of the drawings. The water which is supplied through the opening 19 of the steam generating chamber 18 will move rearwardly. The sole plate 11 is provided with suitable raised projections which cooperate to define suitable tortuous paths whereby water or steam flowing rearwardly must pass through suitable narrow portions of the steam generating chamber as determined by the projections defining the tortuous path.

The steam, when reaching the rearward portion of the steam generating chamber 18, flows outwardly over the heating element 15 through a recessed portion 11*b* in the sole plate 11 and an aligned elevated passageway 12*b* in the cover 12 so that the steam may then pass forwardly or rearwardly through a generally U-shaped steam channel 20, as best illustrated in FIGS. 2, 4, 5, and 6, and located outwardly of the heating element 15. The steam channel 20 is in close proximity to the heating element 15 and hence the steam becomes highly heated in this area.

In accordance with the present invention, a plurality of passageways or steam discharge ports 22 are provided which extend from the steam channel to the ironing surface of the sole plate. To provide for distributing the steam over a larger area of the ironing surface without the necessity of distributing grooves on the underside of the sole plate, the steam discharge ports 22 are disposed along opposite sides of the steam channel 20 in two lateral rows distributed along the entire length of the steam channel and on the same side of the heating element 15. In the embodiment of FIGS. 1 through 6, the steam discharge ports 22 are disposed generally outwardly of the heating element 15. Each of the ports 22 terminates in a slight semispherical counterbore 23 on the ironing surface of the sole plate. The steam discharge ports 22 extend from the respective rows of counterbores 23 in converging relationship for connection to the steam channel 20. In this way a substantial lateral spread of the rows of counterbores 23 is obtained.

It will be appreciated that since the steam channel 20 is closely adjacent the sheathed heating element 15, the steam passing through the ports 22 from the steam generator 18 and through the steam channel 20 will be maintained in a dry condition. Moreover, no distributing grooves on the underside of the iron are necessary.

FIGS. 7, 8, 9, and 10 illustrate an embodiment of the invention wherein the steam discharge ports are generally disposed inwardly of the heating element. More specifically, referring now to FIGS. 7, 8, 9, and 10, there is disclosed a sole plate 31, similar to the sole plate 11, except for the relocation of the steam channel and steam ports. The sole plate 31 includes an embedded sheathed heating element 35 generally of U-shape and having external terminals 36, FIGS. 7 and 8. The sole plate, along with its cover (not shown) defines a steam generating chamber 38, FIG. 7, which communicates with a generally U-shaped steam channel 40 through a suitable steam passageway 39 at the rearward edge of the steam generating chamber 38. As heretofore described, the steam generating chamber 38 is provided with projections formed in the sole plate 31 defining a tortuous path for the water and steam admitted into the steam generating chamber 38. The steam channel 40 is in close proximity to the heating element 35 and just inwardly thereof so as to provide good heat transfer through the sole plate.

In accordance with the present invention there is provided a plurality of the steam discharge ports 42 in two laterally spaced rows in the sole plate 31 and communicating between the ironing surface of the sole plate 31 and the steam channel 40. In the embodiment of FIGS. 7, 8, 9, and 10, the steam discharge ports 42 are arranged in opposite angular directions relative to the steam channel 40 to provide for distribution of the steam over a greater area of the sole plate. Each of the steam discharge ports 40 terminates on the ironing surface in a small counterbore 43 to provide for distribution of the steam.

Manufacturing of the sole plate may be somewhat simplified by providing for the two rows of steam discharge ports to extend in spaced parallel relationship, in a direction perpendicular to the ironing surface. FIG. 11 fragmentarily illustrates a sole plate 51 having a conventionally embedded sheathed heating element 52 outboard of a steam channel 53. A plurality of steam discharge ports 54 extend perpendicular to the ironing surface of the sole plate 51 in two laterally spaced rows parallel to each other. Each of the steam discharge ports terminates in the ironing surface in a counterbore 55. As a consequence of the limited area in which to space adjacent rows of holes, it is desirable to stagger the holes in the inner and outer rows in this embodiment.

FIG. 12 illustrates yet another embodiment of a sole plate, fragmentarily illustrated, including a sole plate 61 containing an embedded sheathed heating element 62 inwardly of a steam channel 63. Two rows of parallel steam discharge ports 64 are provided, communicating between the steam channel 63 and the ironing surface of the sole plate 61 and extending perpendicularly to the ironing surface of the sole plate. Each of the steam discharge ports 64 terminates in a counterbore 65 on the ironing surface of the sole plate.

Although the present invention has been described by reference to several embodiments thereof, it will be apparent that numerous other modifications and embodiments may be devised by those skilled in the art and it is intended by the appended claims to cover all modifications and embodiments which will fall within the true spirit and scope of the present invention.

What is claimed as new and desired to be secured by Letters Patent of the United States is:

1. For use with a pressing iron, means defining a sole plate, a heating element embedded in said sole plate, a steam generating chamber, means defining a cover for said steam generating chamber, a steam channel defined in at least one of said means extending adjacent substantially the entire embedded portion of said heating element and in communication with said steam generating chamber, and a plurality of ports in said sole plate communicating with said channel thereby interconnecting said steam generating chamber with the ironing surface of said sole plate, said ports being disposed along opposite sides of said steam channel and substantially on the same side of said heating element.

2. The subassembly of claim 1 wherein said ports are disposed in two rows distributed along almost the entire length of said steam channel.

3. The subassembly of claim 2 wherein said rows of ports extend from said ironing surface in opposite angular directions to said steam channel.

4. The subassembly of claim 2 wherein said rows of ports extend from said ironing surface in parallel relation to each other.

5. The subassembly of claim 2 wherein said heating element is on the inside of said steam channel.

6. The subassembly of claim 2 wherein said heating element is on the outside of said steam channel.

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PATRICK D. LAWSON, *Primary Examiner.*