

May 9, 1950

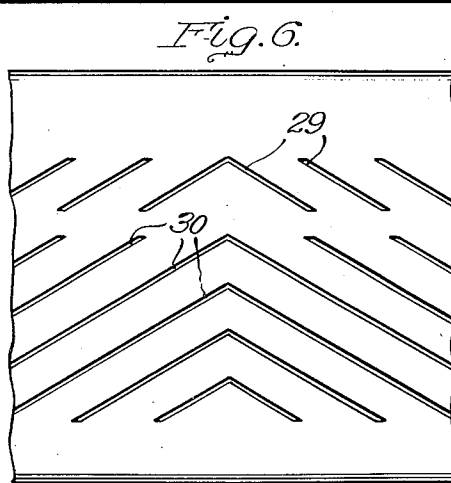
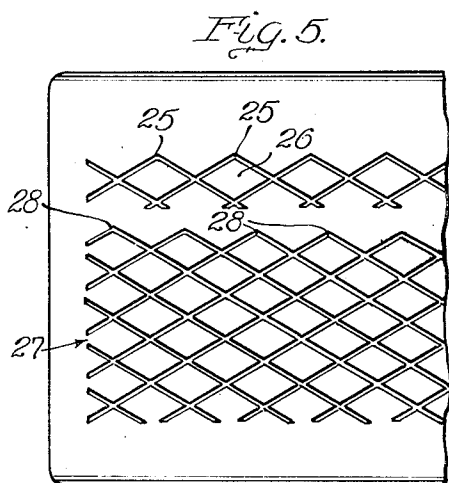
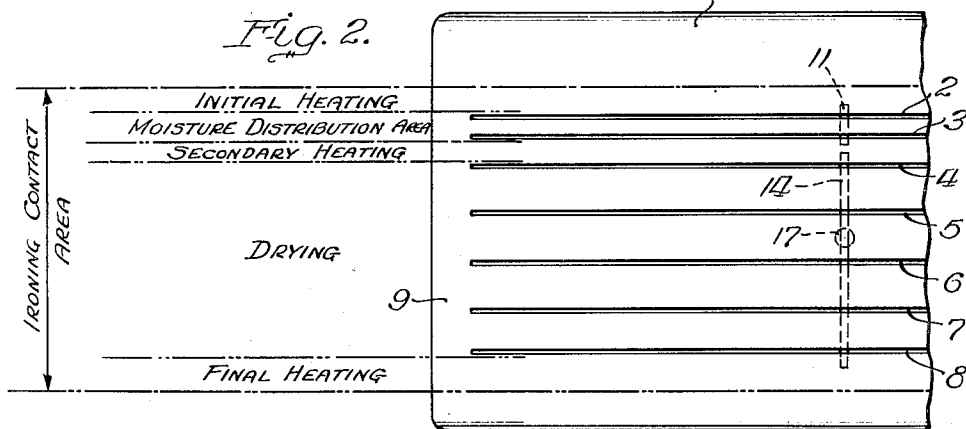
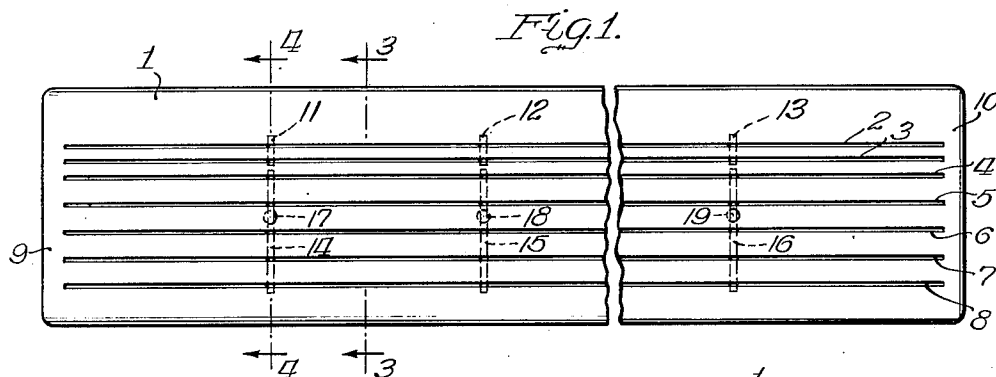
D. A. LUNDY

2,507,029

VENTILATED IRONING SHOE

Filed April 10, 1946

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 3.

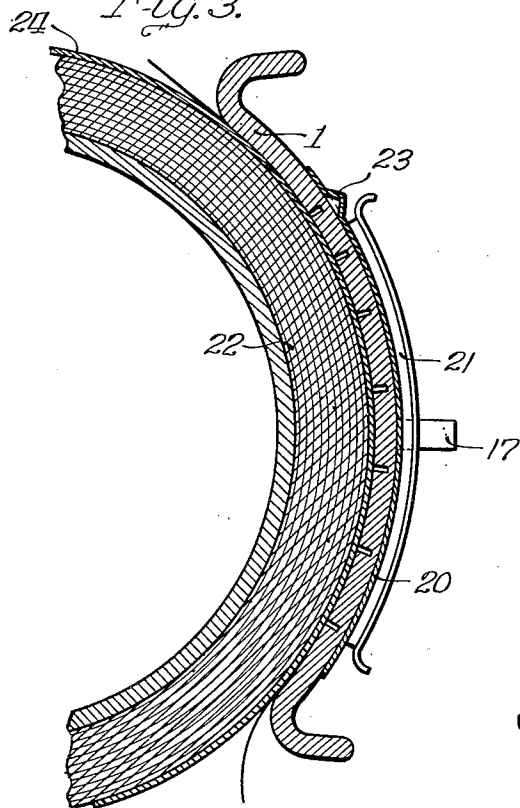


Fig. 4.

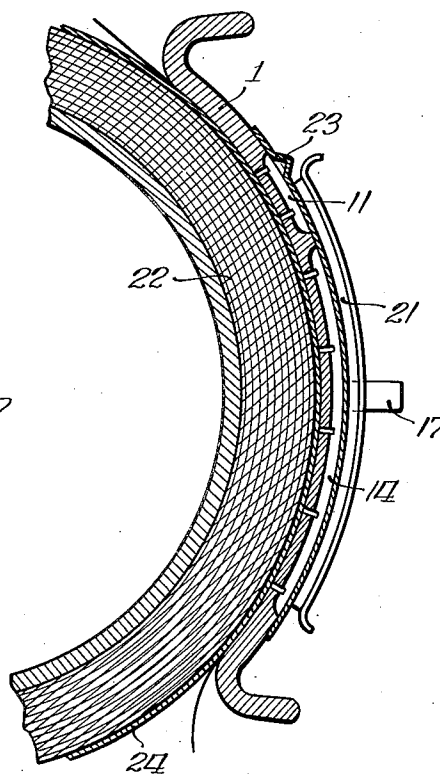


Fig. 7.

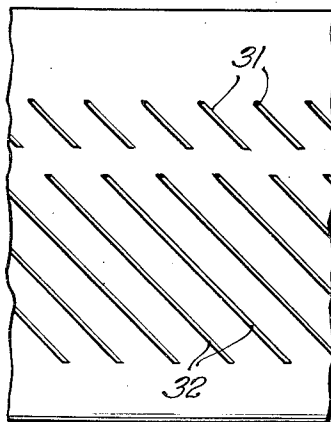


Fig. 8.

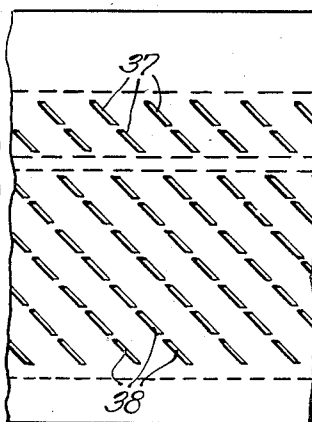
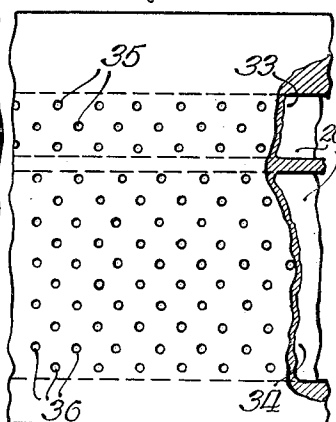


Fig. 9.



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UNITED STATES PATENT OFFICE

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VENTILATED IRONING SHOE

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5 Claims. (Cl. 38—66)

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This invention relates to a shoe and roll combination in an ironing machine wherein the steam created in drying the fabrics during the ironing operation is vented through the shoe in such a manner as to render the ironing operation more efficient and effective.

Heretofore, in ironing fabrics it has been the custom to vent and dissipate the steam through the padding on an ironing roll or through the padding of a buck of a press ironing machine. With this method of ironing, the fibers of the pads are also softened as well as the fabrics through the steaming of the moisture in the fabrics and the heat from the shoe drives such moisture directly into the pad. While such pad is also under pressure through the force exerted by the ironing shoe, such pads also become compacted and ironed, so to speak, so that these pads eventually lose their resiliency and should be replaced for the purpose of maintaining the proper ironing efficiency and effectiveness.

When an ironing shoe is removed from any part of the pad, the steam condenses and moistens the pad thereby interfering with subsequent ironing and drying of fabrics. Such a dampened pad takes additional heat each time it is brought into contact with the shoe, consuming heat that is needed for ironing new fabrics. Furthermore, the maximum temperature of a shoe in an ironing machine is limited to the maximum current available and usable for heating domestic ironers and such limits depend upon the maximum current output which may be drawn from a standard outlet in a home.

During the ironing in a conventional shoe construction with a padded roll, the steam escapes from under the edges of the shoe, falling for the most part, either on already ironed fabrics where it resoftens the same, or the steam moves to unironed fabrics where it adds excessive moisture requiring more heating than is sometimes available from the width of the ironing shoe. The portion of the steam escaping towards the operator offers real danger from steam burns under conditions where the moisture is too excessive while under the influence of the shoe pressure while ironing.

Certain extreme conditions may also exist in the conventional ironing machine wherein the steam is driven downward into the padding or must escape under the ironing shoe. When a pad becomes packed or in the case of the use of a vapor proof pad or cover, the steam formed under the central portion of the shoe cannot escape with ease into the well packed pad nor at all in the vapor proof pad. Through the absorption of further heat from the shoe, this steam becomes superheated to a point where it overcomes the downward pressure of the shoe and necessarily escapes sideways by momentarily raising the shoe.

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While so raised, the fabric beneath the shoe is apt to be forced into a wrinkled state which is immediately pressed under the action of the shoe pressure.

It is one of the main objects of the shoe and roll construction in the present invention to provide an ironing means which will overcome all of the foregoing objections and which will efficiently and effectively iron fabrics due to the proper distribution and dissipation of the steam that is created by the shoe from the fabrics under ironing conditions.

With the use of the shoe of the present invention, it is possible to use a shoe of less width than the conventional ironing shoes for the simple reason that the moisture is more quickly withdrawn from the fabrics and dissipated, drying such fabrics under a shorter effective ironing contact area. This permits the use of a smaller shoe, and obviously, of a smaller diameter roll which lessens the cost of an ironing machine and which may also be mounted to occupy less head room making such an ironing machine of smaller overall dimensions as a direct result of the smaller shoe and roll. As a word of explanation, it should be noted that ironing is accomplished by first softening the fibers in the fabrics and then by holding the same under pressure as by use of an ironing shoe, until all of the moisture is driven out of the fabrics and the fibers thereof at which time such fabrics assume the smooth and flattened ironed condition. For this reason, the ironing rolls of the present conventional design are all of excessive width as far as ironing contacting surface is concerned to insure a thorough drying of the fabrics. Also, in direct connection with the conventional ironing shoe and roll, it is sometimes necessary to obtain the proper drying and ironing results in machines wherein the pad has become compact to iron a second time to successfully dissipate the moisture or steam generated through the action of the hot shoe.

Another object of the present invention is to provide means for steaming or venting directing vapors in guided relation to the surface of the fabric and in a predetermined propagating manner to either collect and redistribute or to definitely dispense the water vapors. Further, such a means acts to systematically direct the vaporization action of the shoe in a predetermined pattern effectively acting upon the entire width of the fabric subjected to the ironing action of the shoe.

It is a further object of the present invention to provide the ironing surface or face of the shoe with indentations or grooves that are arranged to provide venting means and which can be placed upon the surface of the shoe in a predetermined pattern that will automatically act to spread fabric beneath the shoe or to stretch the

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same, thereby eliminating wrinkles from the fabric while it is moving beneath the shoe.

Another object of the present invention is to provide a combination of vented shoe and padded roll wherein the covering material of the roll is resilient but impervious to moisture absorption so that the entire steaming of the fabrics within the ironing contact area shall be taken out of the fabric through the venting means incorporated in this shoe to be properly dissipated and in a direction away from the operator eliminating steam vapor from rising towards the operator and thus rendering the ironing operation more comfortable and less tedious.

All other objects and advantages relating to the present invention shall hereinafter appear in the following detailed description having reference to the accompanying drawings forming a part of this specification.

In the drawings:

Fig. 1 is a front elevational view of the ironing face of an ironing shoe incorporating the principles set forth by the present invention;

Fig. 2 is a fragmentary view of the shoe in Fig. 1 on an enlarged scale and designating the various zones or areas of the shoe in the language of the functions performed by such various consecutive areas of the ironing shoe of the present invention;

Fig. 3 is a vertical transverse cross sectional view through the shoe substantially as indicated by the line 3—3 in Fig. 1 with the addition of the ironing roll illustrated in ironing combination;

Fig. 4 is a similar transverse cross sectional view like Fig. 3 but taken substantially along the plane of the line 4—4 in Fig. 1 illustrating certain other details of construction;

Figs. 5, 6 and 7 illustrate fragmentary portions of ironing shoes utilizing different surface patterns for venting the steam and distributing the same during the ironing of the fabrics;

Figs. 8 and 9 illustrate still further modified arrangements of steam venting means in the surface of the ironing shoe wherein such vents are not continuous but are interrupted as shown.

Referring now to Figs. 1 to 4 inclusive, the preferred construction of ironing shoe comprises the plate 1 having an ironing surface provided with suitable narrow saw cuts or grooves 2, 3, 4, 5, 6, 7 and 8 which run throughout the length of the shoe plate and terminate short of the ends thereof to provide smooth ironing edges 9 and 10 at the ends of the shoe.

As shown in Figs. 1 and 4, vertical connecting cross ducts or vents are shown at intervals across the length of the shoe. These vents are divided into certain connecting groups for the purpose of joining certain of the grooves that extend across the shoe. A plurality of short vertical vents 11, 12 and 13 connect the grooves 2 and 3 at certain intervals to cause a distribution of the steam generated and dispersed through such vents during the ironing operation. Additional vertical vents 14, 15 and 16 connect the cross grooves 4, 5, 6, 7 and 8 while each of such vents are connected with suitable discharge conduits or pipes 17, 18 and 19 respectively, these latter conduits dispensing the vapor or steam generated under the ironing shoe into the atmosphere and to the rear of the entire structure and in a direction away from the operator.

The rear surface of the shoe plate 1 is provided with a cover 20 tightly secured to this back surface of the shoe to enclose the transverse vents

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just described, such cover 20 being best illustrated in Figs. 3 and 4. The electrical heating element 21 is mounted directly upon the cover 20 to transmit heat by conduction directly through the cover 20 into the shoe plate 1 and, of course, directly into the fabric confined between the shoe 1 and the ironing roll 22 shown in conjunction with the shoe.

In addition to the foregoing transverse vents, it should be noted that the cover 20 is provided with the embossed longitudinal duct 23 which extends between the outer cross vents 11 and 13 of the shoe as indicated in Fig. 1. It is to be noted that no atmospheric or other discharge vent is provided for the first two venting grooves 2 and 3, and the cross vents 11, 12 and 13 so that the embossed vent 23 of the cover 20 provides a distribution of the moisture and steam of a greater capacity across the back of the shoe connecting the various transverse vents 11, 12 and 13.

By using an ironing shoe of the kind described, the ironing roll 22 is of the conventional padded construction but is covered with a resilient moisture impervious fabric 24 which protects the padding of the roll 22 and also together with the shoe and its venting grooves traps the steam generated through the heating of the moistened fabric and makes such steam travel in the only possible means of escape which is through the ventilated shoe either for redistribution or for dispersion into the atmosphere.

It should be noted that the shoe of the present construction embodies additional radiation surface by reason of the grooved face thereof providing a greater effective surface for the purpose of dissipating and transferring heat in conjunction with the normal heat dissipating surface area on the contact portion of the ironing shoe 1.

Various arrangements of venting means provided in the surface or face of the shoe may be employed. Referring to Fig. 2, illustrating the preferred construction of cross venting and moisture dissipation in an ironing arrangement as described, this view illustrates the various zones or areas of the shoe which have been arranged to carry out certain functions during the ironing operation. The legends in Fig. 2 substantially explain the purposes of the successive areas of the ironing contacting portion of the shoe which are substantially self explanatory. Obviously, from this view it is seen that the cross grooves 2 and 3 having their confined cross venting means and the longitudinal connecting duct means 23 provide an enclosed means for redistribution of the vapor or moisture that comes out of the fabric after the initial heating thereof for the purpose of resoftening certain portions of the fabric which may not have had the same moisture content. Immediately after such resoftening operation, a secondary heating zone is encountered followed by the larger drying area and a final heating zone as shown in Fig. 2. This general scheme of ironing and the initial redistribution and transfer of moisture across the entire surface of the fabric is carried out throughout the modified constructions illustrated as well as the final heating and drying areas.

Fig. 5 depicts a shoe having a diamond shaped arrangement for moisture and steam distribution wherein the individual grooves or surface vents are disposed at 30° to the horizontal and wherein the terminal points 25 of the moisture distribution area 26 are first encountered by the moving fabric so that the diverging grooves have

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a tendency to straighten out any wrinkles in the fabric. The drying group of vents or grooves 27 also begin with the points 28 connecting adjacent grooves which further tend to spread out the fabric as the same passes between the shoe of this construction and the roll 22. Also, all of these cross grooves are interconnected on the face of the shoe and venting arrangement is provided to the rear of the shoe for the distribution and dissipation of the vaporized moisture from the fabric.

Fig. 6 shows a modified arrangement wherein the various grooves 29 of the distribution section and grooves 30 of the drying section are arranged in a herringbone pattern. The shoe in Fig. 7 merely illustrates the use of 45° arrangement of grooves shown at 31 and 32.

The modified constructions in Figs. 8 and 9 illustrate interrupted venting patterns having no connection longitudinally or vertically on the face of the shoe but wherein the rear portion of the shoe is recessed as shown in Fig. 9 at 33 and 34 to provide cross chambers at the rear of the shoe together with the cover plate 20 for venting the openings 35 and 36 respectively across the shoe. Suitable duct or vent connections such as 17 in the preferred construction are then used for venting the chamber 34 to dispense the steam or moisture withdrawn from the area occupied by the openings 36. In Fig. 8, the initial vents are shown at 37 while the drying vents are illustrated at 38.

Thus, with the foregoing description and the structure illustrated in the drawings, it is seen that the present invention involves a shoe having certain vents arranged to perform definite functions along the operative ironing contact area of the shoe adapted for the purpose of distributing moisture in fabrics and finally drying and eliminating or dispersing such moisture out of the fabric being ironed, such shoe being used in combination with a roll having a covering which is impervious to moisture. This produces a means for more quickly drying a fabric thereby requiring a smaller drying surface to carry out effective ironing and flattening operations, and more efficiently than possible with conventional arrangements of ironing shoes and rolls in present day use.

Changes and modifications are contemplated in the exact form, construction, and combination of elements described without departing from the breadth and scope of the present invention. Such changes together with substitution of equivalent mechanisms shall be governed by the language of the claims appended hereto and directed to the present invention.

What I claim is:

1. An ironing shoe comprising a plate having an ironing surface, said plate having grooves in said surface, and recesses formed in the rear surface of said plate, a cover for said plate enclosing said recesses, certain of said recesses connecting certain of said grooves for distributing vapors expelled from moistened fabrics being ironed, certain other recesses connecting other grooves for conducting vapors away from said fabrics, and atmospheric vent means connected with said certain other recesses to expel such vapors into the air and away from the ironing surface of said plate.

2. An ironing shoe comprising a plate having

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an ironing surface, said plate having narrow grooves in said surface, and recesses formed in the rear surface of said plate, a cover for said plate enclosing said recesses, certain of said recesses connecting certain of said grooves for distributing vapors expelled from moistened fabrics being ironed, certain other recesses connecting other grooves for conducting vapors away from said fabrics, and atmospheric vent means connected with said certain other recesses to expel such vapors into the air and away from the ironing surface of said plate, said cover having a portion thereof formed to provide a larger reservoir channel adapted to connect some of said plate recesses to more quickly distribute vapors longitudinally along the rear of said plate for redampening fabrics subjected to the ironing action of said plate through said adjacently connected plate recesses.

3. An ironing shoe having a plurality of longitudinally extending grooves in its ironing face, transverse ducts connecting said grooves at spaced points, said grooves being located adjacent the initial ironing portion of said shoe, a cover on the back of said shoe having a groove for receiving steam from said grooves and distributing the same over said initial ironing portion of said shoe, a plurality of longitudinally extending grooves below said first mentioned grooves, transverse ducts connecting said last mentioned grooves and having exhaust means to the atmosphere.

4. An ironing shoe having an initial ironing portion and a drying and final heating portion upon its front face, said shoe having grooves in its initial ironing portion, a cover on the rear face of the shoe having a groove for receiving steam from said grooves for distributing the same over said initial ironing portion of said shoe, said shoe having grooves in its drying portion and ducts connecting said last mentioned grooves with the atmosphere.

5. An ironing shoe having upon its front face an initial ironing portion and a drying portion, said shoe having grooves in said initial ironing portion, a cover on the rear face of said shoe having a groove for receiving steam from said grooves and distributing the same over said initial ironing portion of said shoe, and said shoe having grooves in said drying portion with means extending through the back of said shoe for exhausting steam from said last mentioned shoes to the atmosphere.

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