June 28, 1966 J. H. COHEN 3,257,746

HEAT RESISTANT STEAM IRON SHOES

Filed Dec. 30, 1963 3 Sheets-Sheet 1

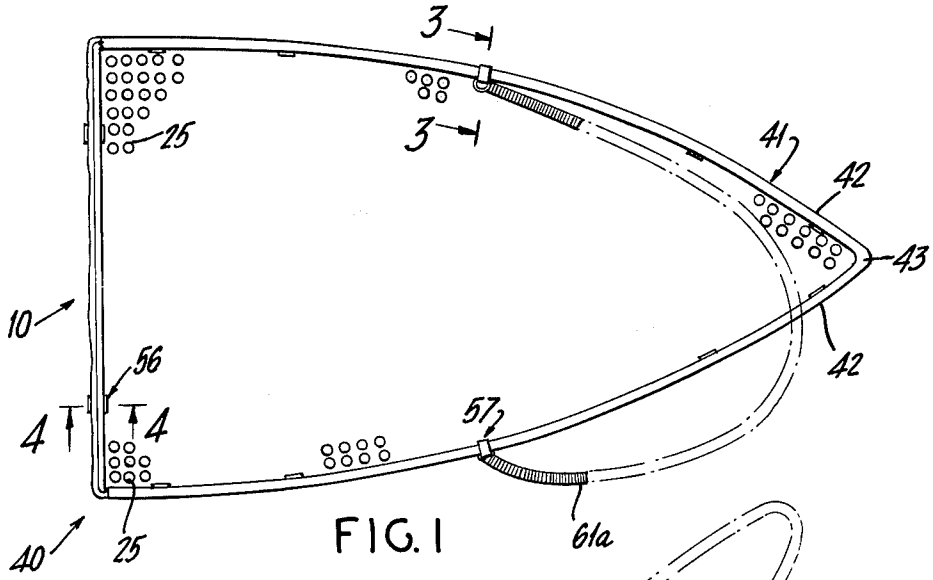


FIG. 1

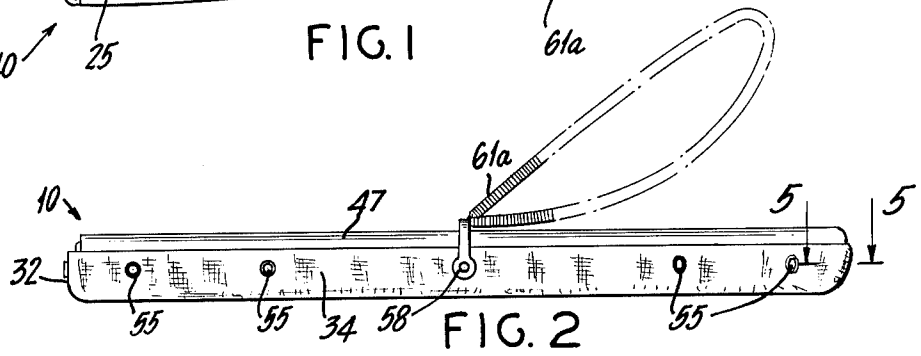


FIG. 2

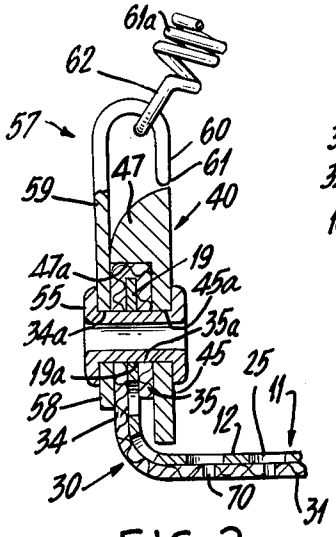


FIG. 3

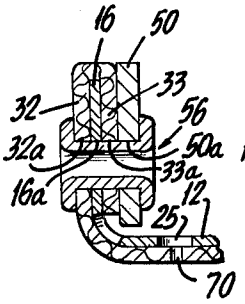


FIG. 4

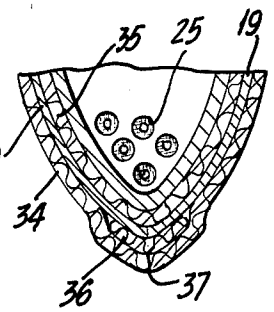


FIG. 5

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June 28, 1966 J. H. COHEN 3,257,746

HEAT RESISTANT STEAM IRON SHOES

Filed Dec. 30, 1963 3 Sheets-Sheet 2

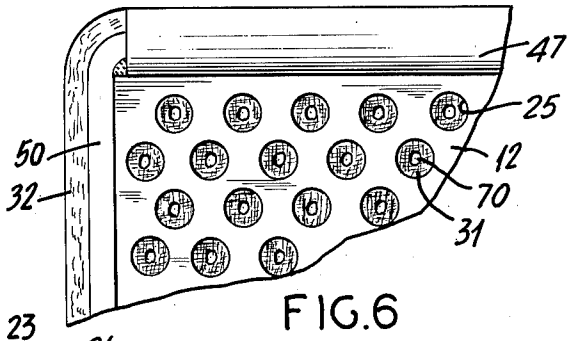


FIG.6

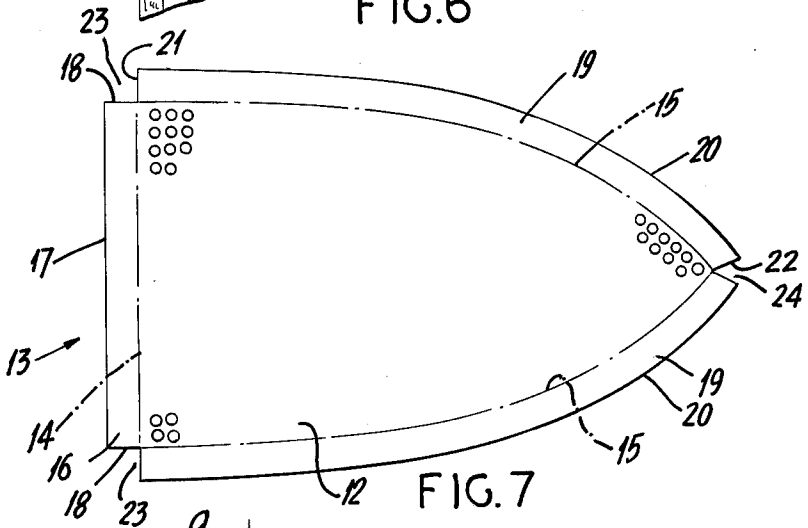


FIG.7

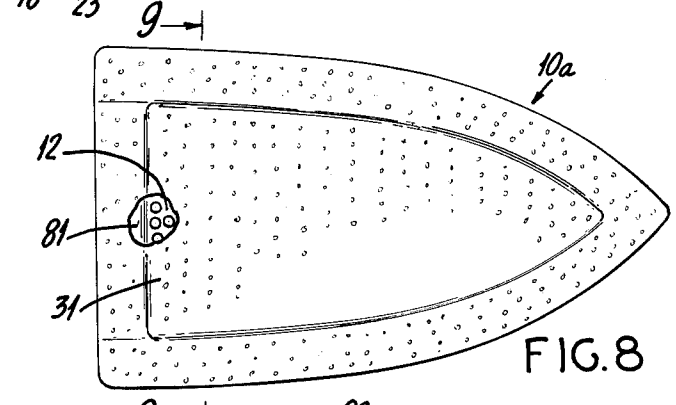


FIG.8

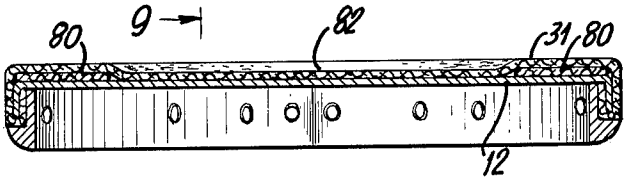


FIG.9

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June 28, 1966 J. H. COHEN 3,257,746

HEAT RESISTANT STEAM IRON SHOES

Filed Dec. 30, 1963 3 Sheets-Sheet 3

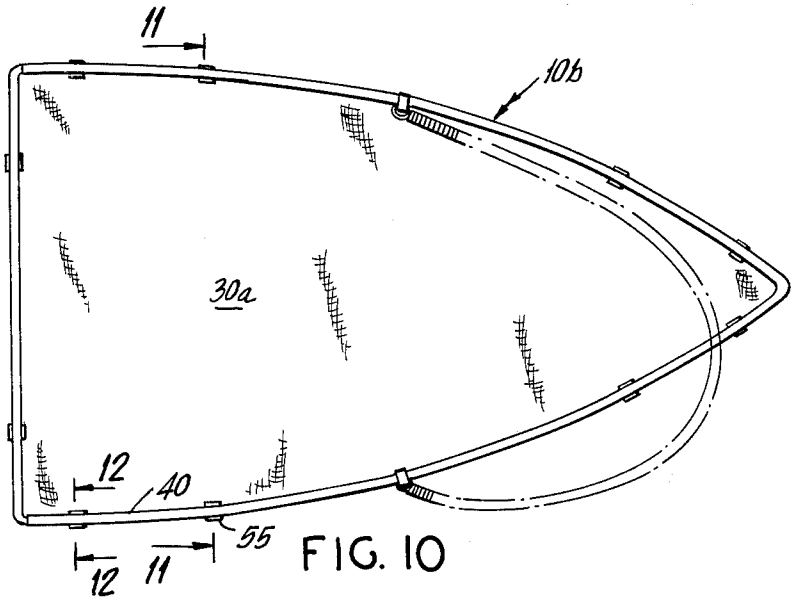


FIG. 10

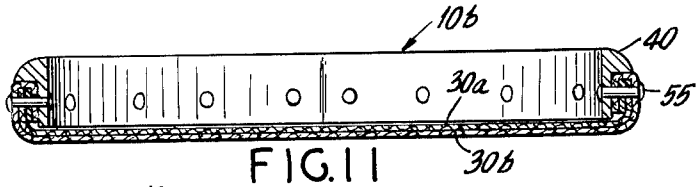


FIG. 11

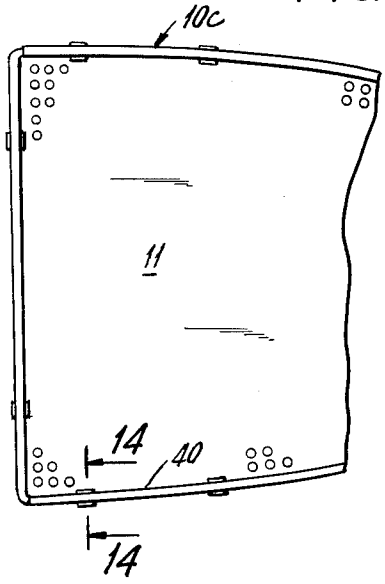


FIG. 13

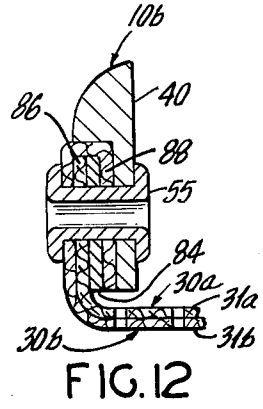


FIG. 12

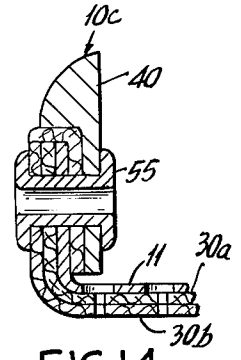


FIG. 14

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HEAT RESISTANT STEAM IRON SHOES

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Filed Dec. 30, 1963, Ser. No. 334,377
19 Claims. (Cl. 38—97)

This invention relates to steam iron shoes.

An object of this invention is to provide a highly improved device of the character described which shall have great dimensional stability so as to prevent pouching and provide for flatter pressing and drier steam from the steam iron.

Another object of this invention is to provide a shoe of the character described comprising a perforated metal liner and an undercover therefor which shall have great tear resistance, which will not buckle or wrap in use, but will lay flat against a backing liner, and which is so constructed as to permit use of a hotter iron, and which can readily be perforated all over with relatively large holes so as to provide for pressing with dry steam.

Yet a further object of this invention is to provide in a device of the character described, an undercover for a shoe liner which comprises a woven heat-resistant fibrous material or fabric embedded in a heat-resistant plastic material, said undercovering being perforated in registry with the perforations in the liner, to facilitate passage of steam therethrough.

Still another object of this invention is to provide in a shoe of the character described having a steel perforated liner with upstanding flanges, an undercovering of heat resistant material at the underside of the liner and upfolded against the outside of said flanges and folded over the upper edge of said flanges and downfolded against the inside of said flanges, a frame contacting the downfolded portion, highly improved means for attaching said flanges, heat resistant material and frame together, said attaching means being such as to permit its removal without destroying the liner or frame, whereby to allow replacing of the heat resistant material, and hence re-use of the frame and liner, should said material be worn out.

Yet a further object of this invention is to provide a device of the character described having a central recessed portion at its underside for use when pressing velvets to allow the nap of the velvet to raise as the pressing operation proceeds.

Still a further object of this invention is to provide a shoe device of the character described having a highly improved reinforced toe portion.

Another object is to provide a shoe without a metal liner but including a double layer of woven heat-resistant fibrous material or fabric.

A further object is to provide a shoe without a metal liner but having a double layer of woven heat-resistant fibrous material or fabric with a metal reinforcing member extending longitudinally between vertical portions of the layers of material.

Another object is to provide a shoe with a metal liner and a double layer of woven heat-resistant fibrous material.

Yet another object of this invention is to provide a strong and durable device of the character described which shall be relatively inexpensive to manufacture, and which shall yet be practical and efficient in use.

Other objects of this invention will in part be obvious and in part hereinafter pointed out.

The invention accordingly consists in the features of construction, combinations of elements and arrangement of parts which will be exemplified in the construction hereinafter described, and of which the scope of invention will be indicated in the following claims.

In the accompanying drawings in which is shown an illustrative embodiment of this invention,

FIG. 1 is a top plan view of a steam iron shoe embodying the invention;

FIG. 2 is a side elevational view thereof;

FIG. 3 is an enlarged cross-sectional view taken on line 3—3 of FIG. 1;

FIG. 4 is an enlarged cross-sectional view taken on line 4—4 of FIG. 1;

FIG. 5 is an enlarged cross-sectional view taken on line 5—5 of FIG. 2;

FIG. 6 is a partial, enlarged top plan view of a rear end corner of said shoe;

FIG. 7 is a top plan view of a blank from which the liner is made;

FIG. 8 is a bottom plan view of a shoe embodying the invention and illustrating a modified construction;

FIG. 9 is an enlarged cross-sectional view taken on line 9—9 of FIG. 8;

FIG. 10 is a top plan view of a shoe according to another modification of the invention;

FIG. 11 is a cross section taken on line 11—11 of FIG. 10;

FIG. 12 is a sectional view, on a larger scale, taken on line 12—12 of FIG. 10;

FIG. 13 is a top plan view of part of a shoe in accordance with a still further modification of the invention; and

FIG. 14 is a sectional view on a larger scale, taken on line 14—14 of FIG. 13.

Referring now in detail to the drawing and particularly to FIGS. 1–7 thereof, 10 designates a steam iron shoe embodying the invention. The same comprises a liner or backing member 11 which may be made of stainless steel or other rigid preferably non-rusting, non-corroding metal or other material. Said liner 11 comprises a section 12 having the shape of the underside of a steam iron, with a straight transverse wide rear end and curved converging sides terminating in a front toe or apex. A blank 13 for making said liner is shown at FIG. 7. Said blank 13 has the section or portion 12 which becomes the bottom wall of the liner when the flanges extend up. Said section 12 is bounded by a straight rear end indicated by a dot-dash line 14 on FIG. 7, and a pair of symmetrical side curved converging portions indicated by dot-dash lines 15. Extending rearwardly of line 14 is a rectangular section 16 having a transverse edge 17 parallel to line 14 and side edges 18 forming rear extensions of lines 15. Extending from lines 15 are curved converging sections 19 of uniform width similar to the width of section 16. Sections 19 have outer curved converging edges 20, rear edges 21 and forwardly divergent front edges 22. Thus, right angular corner notches 23 are formed at the rear corners of the blank, and a wedge-shaped notch 24 is formed at the front end of the blank. These sections 16 and 19 are bent upwardly to vertical positions to bring edges 18 and 21 together and edges 22 together and providing a rear flange 16 for the liner and side flanges 19 for the liner, said flanges then being in vertical relation at right angles to the bottom section or wall 12 of the liner. Said liner may be perforated as shown at 25. The perforations or openings 25 may be about one-eight inch in diameter and arranged in parallel rows with the holes in each row spaced about three-sixteenths of an inch, between centers, and the holes of one row staggered with respect to holes in adjacent rows. The corners where the flanges 16 and 19 are bent up, are preferably curved, as shown in FIG. 3 of the drawing.

Covering the underside of the liner **11** and the flanges **16, 19** is a pad or pressing sheet **30** which contacts the fabrics to be pressed. Said sheet **30** is preferably made of woven, heat resistant fabric impregnated with a heat resistant plastic or impregnating material. The fabric may comprise woven asbestos or (HT) high temperature nylon. The bath or plastic may comprise Teflon (polytetrafluoroethylene), FEP (fluorinated-ethylene-propylene), Silicone rubber made by Dow Corning Co., Union Carbide Co. or General Electric Co. The Teflon used may be Teflon 30 or 30*a* made by Du Pont Co.

Said sheet **30** has a section **31** located at the underside of section **12**, an upturned rear flange **32** covering the outside of flange **16** and from which extends a flange **33** folded over the upper edge of said flange **16** and down against its inner surface. Section **31** comprises the buttom wall of the sheet **30**. Extending from the sides of section **31** are flanges **34** folded up against the outsides of flanges **19** and from which extend downfolded flanges **35** folded over the upper edges of said flanges **19** and against the inner surfaces thereof. The blank of which sheet **30** is made, also has corner notches and a front apex notch like the liner blank **13** of FIG. 7.

A short piece **36** of heat resistant fabric may be inserted at the toe of the shoe (FIG. 5) to undercover and span the split **37** between the flanges **34** at the apex of the shoe. Piece **36** is disposed between portions **34** and flanges **19**.

There is further provided a reinforcing frame **40** for said liner and heat resistant sheet **30**. Said frame **40** comprises a part **41** which may be in the form of a single extruded aluminum piece comprising a pair of side, curved forwardly converging portions **42** connected by a bend **43** at the apex of the shoe, and extending substantially to the rear ends of flanges **19**. Said piece **41** has a vertical wall **45** contacting the inside flanges **35**, and a top thickened outwardly extending rib or head **47**, the underside **47***a* of which overlies the top folded over portion of the heat resistant sheet in close proximity thereto.

The rear ends of portions **42** of the frame member **41** are interconnected by a rear transverse frame member or bar **50** contacting flange **33** of the impregated fabric. The outer ends of member **50** may be spot-welded or otherwise secured to said rear ends of the frame member **41**.

The flanges of frame member **41** are fixed to the flanges **19** of the liner and to portions **34** and **35** of the impregnated fabric, by means of a series of spaced, riveted eyelets **55** passing through registering openings **45***a*, **19***a*, **34***a* and **35***a* formed in said frame, flanges and portions, respectively. These openings may be punched simultaneously for accuracy.

Similar riveted eyelets **56** attach together bar **50**, flange **16** and portions **32, 33** of the impregnated fabric. Said eyelets pass through registering openings **50***a*, **16***a*, **32***a* and **33***a* of said bar, flange and portions, respectively.

There may be five eyelets at each side of the shoe and two at the rear end of the shoe.

Means is provided for removably mounting the shoe on a steam iron. To this end, one eyelet **55** at each side of the shoe, preferably the middle one, serves to attach to the shoe a hooked member **57**. Each hooked member **57** has an eye portion **58** through the hole of which passes the shank of the eyelet **55**, said portion **58** contacting the outer side of portion **34** of the impregnated fabric. Extending up from said eye portion **58** is a stem **59** from which extends an inwardly and downwardly bent hook portion **60**, the tip **61** of which contacts head **47** of the frame member **40**. A coil tension spring **61***a* has eyes **62** at the ends thereof receiving the hooks **60** for attaching the ends of the spring to the shoe.

The bottom wall or section **31** of the impregnated fabric is formed with pierced holes **70** preferably indexed with or centered with respect to the openings **25** in the liner. The piercing may be accomplished with tapered needles or prongs and without severing any of the woven threads in the fabric. Indexing openings **70** with openings **25** assures free passage of steam through all the openings **70**.

The method of making the shoe will now be described. First a sheet of woven asbestos cloth or fabrics or of high temperature (H.T.) nylon or like heat resistant fabric is impregnated with Teflon (polymerized tetrafluoroethylene), or with FEP (fluorinated-ethylene-propylene) or with silicone rubber made by Dow Corning, Union Carbide Co. or General Electric Co. or with any other high temperature resistant material, having low thermal conductivity and which is non-reactive and smooth. The impregnation dipping is made cold by dipping the cloth or fabric in a bath of impregnating material diluted with water substantially in equal amounts by weight. This dipping process may be repeated seven times. Thereafter the impregnated cloth is dried and calendered once between rollers in a dry stove so as not to close pores in the fabric. After that, the impregnated and calendered cloth is cut to size and perforated with an up and down needle or pronged member. The perforations in the impregnated fabric are not done with a cutting die but by needles or prongs, so as to spread the weave and not to cut the threads, whereby to retain the strength of the woven fabric.

The penetration is done with a member on which the needles are spaced similar to the centers of the openings in the stainless steel liner, whereby the penetrations in the impregnated fabric can be registered or indexed with the openings in the liner.

The impregnated cloth is then forced by pressure in a jig, onto the outside of the stainless steel liner and over the flanges of the liner, and dipped twice more in the bath, to retain the water tight integrity of the material, meaning, to make sure that the fibers are coated with the plastic throughout, and that none of the fibers are exposed. Then a hot iron is pressed against the bottom surface of the impregnated cloth to smooth said surface. Then the impregnated fabric on the liner, is cured by heat at approximately 700° F.

Now the fabric (impregnated and cured) is physically held or moulded to the stainless steel because it is folded over the top edge of the flanges of the liner.

Then the frame member **40, 50** is placed on the shoe and the frame, liner flanges and fabric, are punched and eyeleted. The spring **61** is attached to the hooks which are mounted on two of the eyelets as described above, prior to riveting these eyelets.

In FIGS. 8 and 9 there is shown a shoe **10***a* embodying the invention and illustrating a modified construction. This device **10***a* is to be used when it is desired to raise a nap, as when pressing velvets or chenilles or corduroys. Shoe **10***a* is the same as shoe **10** except that additional strips **80** of woven heat resistant fabric are placed against the upper surface of the bottom portion **31** of the impregnated fabric, at both sides, following the curved shape of the sides of the shoe. These strips **80** are located between portion **31** and the bottom wall **12** of the liner. Also a back strip **81** of woven heat-resistant fabric is placed between said portion **31** and bottom wall **12** of the liner and near the rear end of the shoe. This construction provides a central valley or recess **82** at the underside of the shoe, to allow the nap of the pressed velvet or like material to raise when pressing.

One advantage of the present construction is that the eyelets can be drilled out to permit replacing the impregnated cloth and re-eyeletting.

The woven heat resistant fabric ensures dimensional stability not obtained when a sheet of Teflon alone is used, thereby preventing pouching, buckling or warping and ensuring dry steam and allowing use of a hotter iron. The fabric itself being heat-resisting, adds to the heat resisting quality of the impregnated materials.

Also with the present device, flatter pressing can be accomplished with drier steam. The holes in the impregnated fabric can be made larger than with plain Teflon sheeting. Also the present impregnated fabric has greater tear resistance, and can be penetrated all over, and will remain close to the liner and not move away therefrom as when using Teflon sheeting alone without the fabric.

The present shoe, when attached to a steam iron will press even delicate fabrics smoothly and without scorching and without shine.

The term "heat resistant" as used herein and applied to either the fabric or the impregnating material is intended to mean that the heat resistant fabric or material will not melt or burn at temperatures less than 500° F.

Referring now to FIGS. 10 to 14, there is shown other forms of the invention in which the shoe comprises a double layer of heat-resistant fabric **30***a* and **30***b* such as fabric **30** which comprises woven asbestos impregnated with Teflon or like heat resistant plastic material, and the metal liner as described heretofore can be eliminated or not, as desired. It has been found that in addition to eliminating the metal liner, if so desired, the double fabric provides a shoe with better abrasion resistance, higher impact strength, better resistance to tearing, and glides more easily over the fabric which is being pressed.

The shoe **10***b* illustrated by FIGS. 10 to 12 is similar to shoe **10** except that liner **11** has been eliminated and a layer of fabric **30***a* has been substituted therefor. The outer layer **30***b* as well as inner layer **30***a* are the same as sheet **30**, and the bottom walls **31***a* and **31***b* of the sheets are in surface-to-surface contact. A metal reinforcing strip **84** of aluminum extends longitudinally between flanges **86** and **88** of layers **30***a* and **30***b*, respectively, and it will be noted that the marginal side edge portions of layer **30***b* extend over and in contact with the upper edges of layer **30***a* and strip **84** and down in contact with the inner side of the strip. Metal strip **84** extends transversely along the rear end of the shoe, in a similar manner as strip **50** of shoe **10** and along the converging sides of the shoe and the parts of the strip are suitably secured to each other at the corners and apex of the shoe.

The shoe **10***c* illustrated by FIGS. 13 and 14 is similar to shoe **10***b* except that the reinforcing strip **84** has been eliminated and the metal liner **11** has been added. In fact shoe **10***c* is identical to shoe **10** except for the additional layer of fabric **30***a*.

It will thus be seen that there is provided an article, apparatus and method in which the several objects of this invention are achieved, and which is well adapted to meet the conditions of practical use.

As possible embodiments might be made of the above invention, and as various changes might be made in the embodiment above set forth, it is to be understood that all matters herein set forth or shown in the accompanying drawings, is to be interpreted as illustrative and not in a limiting sense.

I claim:

1. A shoe for a steam iron comprising a rigid frame having upstanding flanges, a pad for said frame having a bottom portion disposed at the underside of said frame, and having portions extending upwardly in contact with the outer sides of said flanges, portions folded over the upper edges of said flanges and portions extending downwardly against the inner surfaces of said flanges, said pad comprising a heat resistant fabric impregnated with heat resistant plastic material comprising one of the group consisting of polytetrafluoroethylene and fluorinated-ethylene-propylene.

2. The combination of claim **1**, and means extending through said flanges and through said upwardly extending and said downwardly extending portions of the pad, to fasten said frame and pad together.

3. The combination of claim **2**, said fastening means comprising rivets passing through registering openings in said flanges and said upwardly extending and said downwardly extending portions.

4. The combination of claim **3**, said rivets comprising eyelets.

5. The combination of claim **1**, said fabric comprising asbestos.

6. The combination of claim **1**, said frame having a bottom wall formed with perforations, said bottom portion of said pad having perforations indexed with the perforations in said bottom wall of said frame.

7. The combination of claim **6**, said frame comprising non-corroding metal.

8. A shoe for a steam iron comprising a perforated sheet of heat resistant fabric impregnated with a heat resistant plastic comprising one of the group consisting of polytetrafluoroethylene and fluorinated-ethylene-propylene and comprising a bottom horizontal wall and vertical portions, a frame, and means to attach said vertical portions of said impregnated fabric to said frame.

9. The combination of claim **8**, said fabric comprising asbestos.

10. The combination of claim **8**, and a liner for said sheet having a perforated bottom wall contacting the upper surface of said bottom wall of said sheet, and upwardly extending flanges attached to said frame and to said portions by said attaching means.

11. The combination of claim **1**, said shoe having a front toe end and a rear wide end, and a strip of heat resistant fabric interposed between the upwardly extending portions of the pad and the adjacent portions of said flanges, and located at the toe end of said shoe.

12. The combination of claim **6**, and strips of heat resistant fabric interposed between the bottom portion of said pad and the bottom wall of said frame and located adjacent the sides and rear of said shoe, leaving a depression at the middle of the bottom of said shoe.

13. A shoe as defined in claim **8**, and a second sheet of heat resistant fabric impregnated with a heat resistant plastic and contacting the first sheet and having a horizontal bottom wall and vertical portions, said attaching means including means to attach said vertical portions of said second sheet to said frame.

14. A shoe as defined in claim **13**, and a metal reinforcing member extending longitudinally between the vertical portions of said sheets.

15. A shoe as defined in claim **13**, and a metal liner having a bottom wall contacting the bottom wall of said first sheet, and portions extending upwardly from the periphery of said bottom wall, said attaching means including means to attach said upwardly extending portions of said liner to said frame.

16. A shoe for a steam ironing device comprising a liner having a bottom wall formed with perforations and having flanges extending upwardly from the periphery of said bottom wall, a pad made of a sheet of woven heat resistant material impregnated with a heat resistant plastic, said pad having a bottom wall underlying the bottom wall of said liner, said pad having first vertical portions disposed outwardly of said liner flanges and second vertical portions extending from the upper ends of said first vertical portions and contacting the inside of said liner flanges, a frame comprising vertical portions contacting the inside of said second vertical portions of said pad, and means to join said liner flanges and said pad and frame vertical portions together.

17. The combination of claim **16**, a second sheet of said impregnated material having a bottom wall and vertical portions extending therefrom, said bottom wall of said second sheet being between said pad bottom wall and said liner bottom wall, and said vertical portions of said second sheet being interposed between said first vertical portions of said pad and said liner flanges, and said joining means also joining said second sheet vertical portions.

18. The combination of claim **1**, said fabric comprising nylon.

19. The combination of claim 8, said fabric comprising nylon.

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