July 7, 1942. R. S. BRADLEY 2,288,778

IRONER

Filed July 1, 1939

FIG. 1

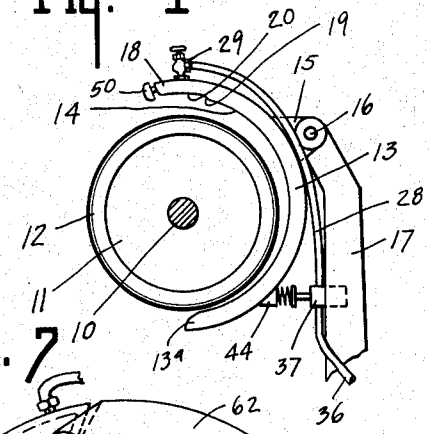


FIG. 2

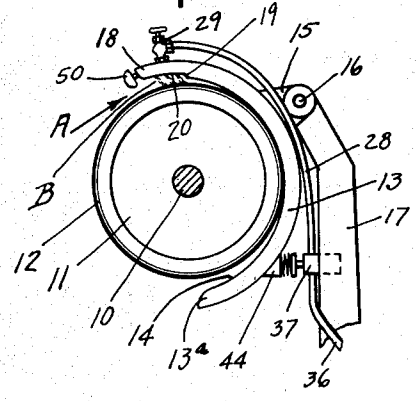


FIG. 7

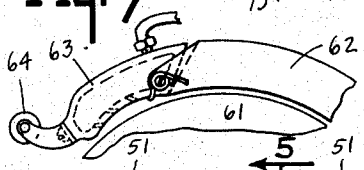


FIG. 3

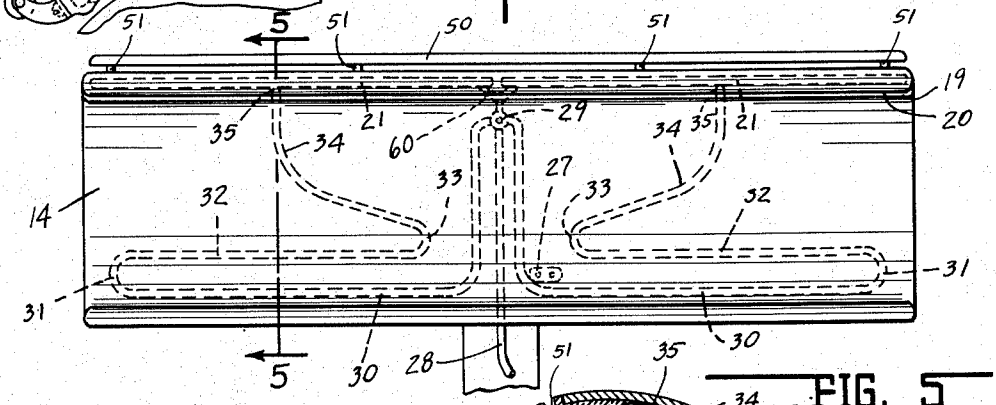


FIG. 5

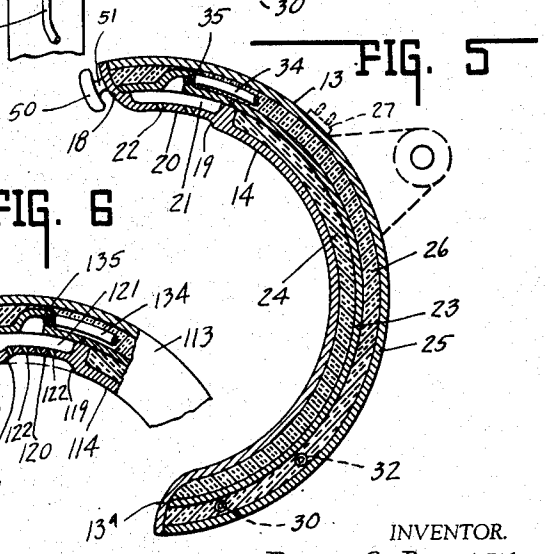


FIG. 4

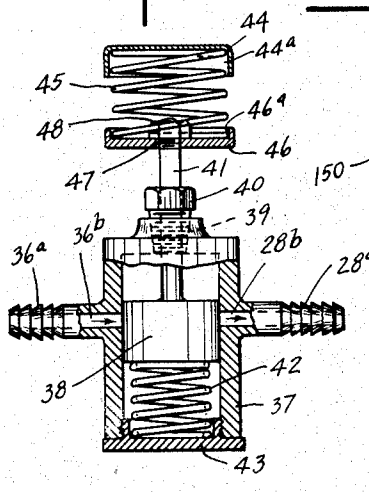


FIG. 6

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IRONER

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Application July 1, 1939, Serial No. 282,348

3 Claims. (Cl. 38—14)

This invention relates to an ironer and one including an ironing roll and an adjacent ironing shoe structure.

In structures of this general class, it is to be understood the roll may be suitably heated and is suitably rotated. It is also to be understood that the shoe is heated and has an inner and ironing surface conformation that conforms to the roll and nests a portion thereof when the two are associated together for ironing purposes. All three of these types of operations are equivalents and are well known in the art, although certain of them have advantages, to wit, the shoe by treadle action may be caused to move into ironing position more readily than the roll because the rotating roll, if it be moved, requires additional mechanism and arrangement over and above that required to move the roll, to wit, flexible connections to the motive means for rotating the roll and to the heating means for heating the roll. Therefore, it is usually more desirable to move only the shoe relative to the roll rather than move the roll relative to the shoe or both relative to each other. Herein the invention is illustrated as embodying any form of movement described, this being optional.

The chief object of this invention is to provide a shoe structure which will first steam the article to be ironed and then dry iron the same.

Another object of the invention is to so arrange the presteaming structure that presteaming of the article only is insured and the hands of the operator are protected.

Another object of the invention is to insure that steam and steam only is supplied to the article immediately prior to ironing of the same.

One chief feature of the invention consists in providing a unitary shoe structure whereby the aforesaid objects are accomplished.

Another feature of the invention is to provide a control for the steam supply to the shoe whereby steam will be automatically supplied thereto whenever the shoe and roll are in ironing relation and steam will not be supplied thereto when the parts are not in said relation.

Other objects and features of the invention will be set forth more fully hereinafter, such as the steam superheating feature.

The full nature of the invention will be understood from the accompanying drawing and the following description and claims:

In the drawing Fig. 1 is an end elevation, somewhat diagrammatic in form, of an ironer embodying the invention, the roll and shoe being shown in the non-steaming and non-ironing position.

Fig. 2 is a similar view of the same, the parts being shown in the steaming and ironing position.

Fig. 3 is a top plan view of the ironing shoe.

Fig. 4 is an enlarged sectional view of the automatic valve structure controlling the steam supply to the steaming portion of the shoe.

Fig. 5 is a transverse sectional view taken on line 5—5 in Fig. 3 and in the direction of the arrows.

Fig. 6 is a view similar to Fig. 5 and of a modified form of shoe arrangement and especially the presteaming portion thereof.

Fig. 7 is an end view of a modified form of ironing and steaming shoe.

In Figs. 1 and 2 of the drawing, there is more or less diagrammatically illustrated the general form of ironer embodying the invention. Herein the numeral 10 indicates a shaft structure on which is mounted an ironing roll 11 suitably padded as at 12. This roll structure is of cylindrical character as shown.

Adjacent thereto as an arcuately outlined shoe structure indicated generally by the numeral 13 and having an inner arcuate ironing face 14 which is substantially smooth and of polished metal. The shoe structure is provided with a pair of ears 15 which are pivotally supported as at 16 upon a standard structure 17. This standard structure, for example, may be suitably pivoted at its lower end and associated with a treadle so that it is caused to move from the position shown in Fig. 1 to the position shown in Fig. 2. This nests the roll in the shoe.

Upon examining Fig. 2, it will be noted if an article is fed in at the top, as indicated by the arrow and the letter A, the shoe will tilt slightly clockwise upon the pivot 16 and this will bring the lower end 13a of the shoe closer to the roll and space the forward and upper end 18 of the shoe farther away from the roll. Rotation of the roll will carry the article clockwise and discharge the same at the end 13a of the shoe and in a dry and ironed condition. The mouth arrangement at A is somewhat wedge-shape in appearance and the roll is nested substantially in the shoe in initial position for article reception as well as when ironing the article.

Reference now will be had to Figs. 3 and 5. In said figures the inside face of the shoe, indicated by the numeral 14, is offset at its forward portion as at 19 and the surface is continued as indicated at 20. The forward end thereof may be rounded as indicated at 18.

Extending longitudinally along the shoe and near the forward edge thereof and within the

shoe, is the chamber 21 and herein the chamber 21 discharges steam by means of ports 22 toward the roll. Herein, also preferably, the ports 22 are directed so as to discharge toward the ironing portion 14 of the shoe and thus away from the entrance or receiving portion of the shoe.

Within the ironing portion of the shoe, there is provided a suitable heating ararngement, and herein the same is indicated generally by the numeral 23. It is substantially coincident with the heating portion. It is suitably insulated from the ironing surface by a relatively thin layer of asbestos 24. This heating element also is insulated from the outer cover portion 25 as by rockwool and asbestos insulation 26, the wool being provided to force the heat created by the heating element 23, to the ironing surface 14 for a continuous supply of heat thereto for ironing purposes. A terminal structure 27 is conventionally indicated and illustrated in Fig. 3. In other words, the heating element may be of electrical character. It may be, if desired, of other character.

Herein—see Figs. 1 to 3 inclusive—a steam supply line 28 is connected at one end to a regulating valve 29 and this regulating valve controls the supply of steam to the two branches 30, each of which extends oppositely from the valve and toward the adjacent end of the shoe and then reverses at 31 and continues as the extended portion 32 approximately parallel to the portion 30 and then adjacent the valve 29 as at 33 is directed forwardly as at 34 and enters the appropriately outlined steam chamber 21 at 35. The purpose of this positioning of the respective conduit portions 30, 31, 32, 33 and 34 is to utilize heat that normally escapes through the insulation 26 and to the cover portion 25 for superheating the steam supplied by line 28.

Reference now will be had more particularly to Figs. 1, 2 and 3. In said figures the numeral 36 indicates a line which is connected to a source of steam supply. Mounted on the arm upright or standard 17 is a valve structure. It includes a housing 37 in the form of a cylinder and mounted therein is a piston 38.

The head of the cylinder is apertured as at 39 to receive a packing structure 40 that surrounds and slidably supports and seals a stem 41 which within the cylinder mounts the piston 38. The cylinder is provided with the passages 36*b* formed in the extension 36*a* to which the conduit or supply line 36 is connected, and the passage 28*b* in the portion 28*a* to which the conduit 28 is connected. The piston 38 is normally constrained by the spring 42 to a position wherein it prevents communication between ports 36*b* and 28*b* so that when positioned as shown in Fig. 4, and this corresponds to the position of the parts shown in Fig. 1, steam is not supplied to the shoe. The spring 42 is retained in the cylinder by means of the member 43. As stated, the cylinder 37 is suitably supported by the standard structure 17, it being understood this usually is a pair of standards or uprights spaced apart and the valve arrangement therefor is positioned therebetween.

The shoe adjacent the portion 13*a* is provided with a lug structure 44 and the same is recessed as at 44*a* to nest one end of the spring 45. The other end of the spring is nested as at 46*a* by a member 46 carried by the stem 41 as at 47 and secured thereto by the nut 48.

When the shoe and roll approach each other, the valve 38 is caused to move from the position shown in Fig. 6 so that ports or passages 36*b* and 28*b* communicate with each other through the cylinder, thus supplying steam from the source of steam supply to the shoe. In other words, only during the ironing operation is the shoe supplied with steam.

Interposed between the steam supply and the control valve structure, shown in Fig. 4, there may be included, as is common in the industry, a water or moisture separator so that substantially dry steam is supplied to the valve. Such a moisture or water separator would be connected to line 36 and then the separator would be connected to the steam supply. Since inclusion of such a separator is old and notorious in the art, illustration thereof is intentionally omitted for the invention disclosed is concerned with that which is downstream of line 36, to wit: valve 37, line 28, etc. Therefore, dry steam is superheated by the arrangement shown in Fig. 3 by means of heat derived from the h ating means for heating the ironing surface of th hoe.

In the several figures, it will be noted that a suitable guard structure 50 is suitably secured at spaced portions 51 to the forward end 18 of the shoe. This connection preferably is of heat insulating character and the guard structure may be relatively rigid, although it may be of semi-flexible character. It insures that the operator's fingers engage said guard structure in the operation of the machine prior to being accidentally fed into the machine between the roll and the shoe, thereby warning the operator to remove the hands from the vicinity of the intake or receiving portion of the ironer.

As previously pointed out, preferably the ports 22 are directed rearwardly—that is, toward the ironing surface 14—so that, as shown by the dotted lines in Fig. 2 and indicated by the letter B therein, the steam supplied to the article prior to ironing is directed away from the operator's hands.

From the foregoing, therefore, it is apparent that the portion 20 is spaced from the roll so that as the articles are fed in between the roll and the shoe, said articles will continuously receive a supply of dry steam, thus steaming or preconditioning the article to be ironed. The steamed article then passes to the ironing portion and it is ironed dry so that when it leaves the cooperating ironing portions at the end 13*a* of the shoe, the article is dry and is fully ironed.

The relief arrangement shown in the drawing and provided by reason of the offsetting of the steaming portion of the shoe also has another advantage in that it permits the article to be straightened while supported on the roll and while in juxtaposition to the shoe but prior to actual contact with the shoe for ironing. It will be observed also that substantially half of the roll surface in effect is an ironing surface, see more particularly Fig. 2.

In Fig. 6 there is illustrated a modified form of the receiving and presteaming portion of the shoe. Numerals of the one hundred series indicate like or comparable parts. In this form, it will be observed that the immediate forward end of the steaming portion, as indicated at 100, is coincident as it were, with an arc that includes the ironing surface 114 and that the steaming portion 120 is offset therefrom, as indicated at 119 and 119*a*, forming, as it were, an offset steaming space, steam being supplied by the rearwardly directed ports 122 discharging from the chamber 121.

This form has certain advantages, while the form shown in Fig. 5 has certain advantages. With the form shown in Fig. 6 the forward portion 100 serves as a positive guard to prevent steam escaping and also serves as a gauge to indicate to the operator whether or not too much of the article, so far as thickness is concerned, is being supplied thereto for ironing.

It will be apparent if the shoe shown in Fig. 6 is juxtapositioned relative to the roll, as shown in Fig. 2, and with the article included therebetween, that the escape of steam forwardly for contact with the hands of the operator is substantially prevented. To positively insure such absence of contact or exposure to steam, as stated, the ports 122 may also be rearwardly directed but this is not in this form of the invention essential.

As shown in Fig. 3, there is provided a pair of conduits 60 each communicating at one end with the adjacent steam chest 21. The valve 29 is of three-way character and controls the opposite ends. This valve may be entirely closed to prevent steam supply to the chests 21, positioned to connect line 28 to lines 30 for supplying the chests with superheated steam, or positioned to connect lines 60 to line 28 to supply the chests 21 with raw steam. Heavy articles require heavy steaming, others require dry steaming, et cetera.

In Fig. 7 there is illustrated a modified form of shoe structure. Herein 61 indicates the adjacent roll, 62 the adjacent heated ironing portion of the shoe and 63 the steaming portion thereof. Herein portion 63 is pivoted on portion 62 in such a manner that it normally moves therewith and assumes the position shown in Figs. 1 and 2. However, the pivotal connection is of such character that when the extended hand guard portion 64 is engaged and held down toward roll 61, the steaming structure moves closer to the roll so that steam is poured into the garment and since the shoe is pivoted on the uprights 17 at 16, the initial ironing of necessity becomes a pressure ironing or pressing operation, the remainder of the ironing portion 62 of the shoe constituting an ironing smoothing, polishing and drying portion.

While the invention has been illustrated and described in great detail in the drawing and foregoing description, the same is to be considered as illustrative and not restrictive in character.

The several modifications described herein as well as others which will readily suggest themselves to persons skilled in this art, all are considered to be within the broad scope of the invention, reference being had to the appended claims.

The invention claimed is:

1. In an ironer of the character described, a unitary ironing shoe including a presteaming portion and a subsequent ironing portion, the steaming portion including a plurality of steam discharging ports and a steam receiving chamber communicating therewith, the ironing portion including a heating means for maintaining the ironing surface in ironing condition, steam supply means discharging to the chamber and juxtapositioned to the heating means for superheating the steam prior to chamber reception, and a forward finger guard carried by the presteaming portion.

2. In an ironer of the character described, a unitary ironing shoe including, a presteaming portion and a subsequent ironing portion immediately contiguous thereto, said portions having arcuate work engaging faces, the steaming portion including a plurality of steam discharging ports, means movably connecting the steaming portion to the ironing portion and constraining the steaming portion away from the work, the steaming portion being movable with and carried by the ironing portion, and movable independently of the ironing portion for work engagement, and means carried by the presteaming portion operable in opposition to the constraint.

3. In an ironer of the character described, a unitary ironing shoe including a presteaming portion and a subsequent ironing portion, the steaming portion including a plurality of steam discharging ports and a steam receiving chamber communicating therewith, the ironing portion including a heating means for maintaining the ironing surface in ironing condition, steam supply means discharging to the chamber and juxtapositioned to the heating means for superheating the steam prior to chamber reception, valve means in the steam supply means ahead of the superheating portion thereof, and other means connecting the steam supply means to the chamber and to the valve for bypassing the supreheating portion, said valve means selectively controlling the steam supply to said chamber.

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