

Nov. 7, 1944.

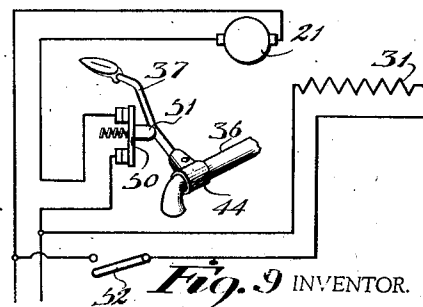
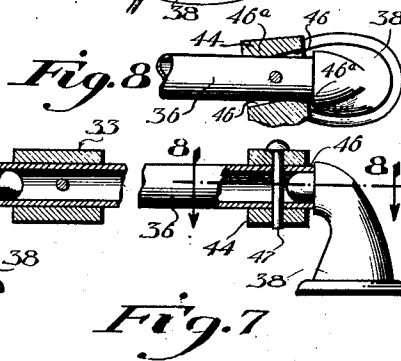
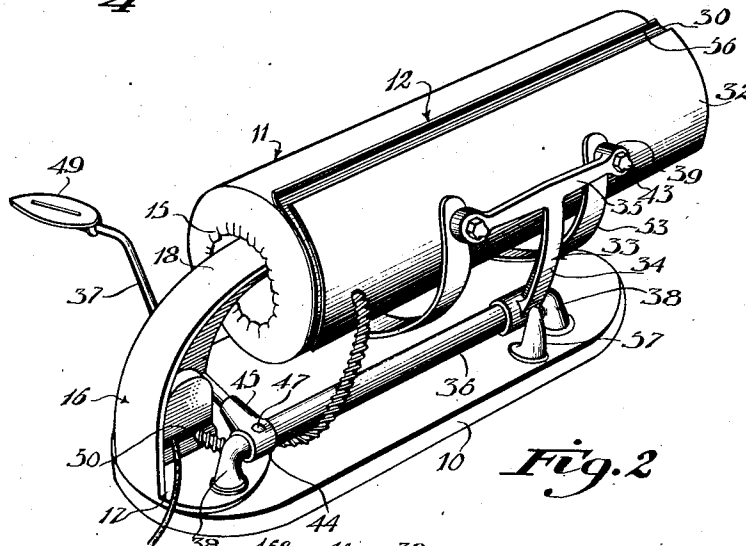
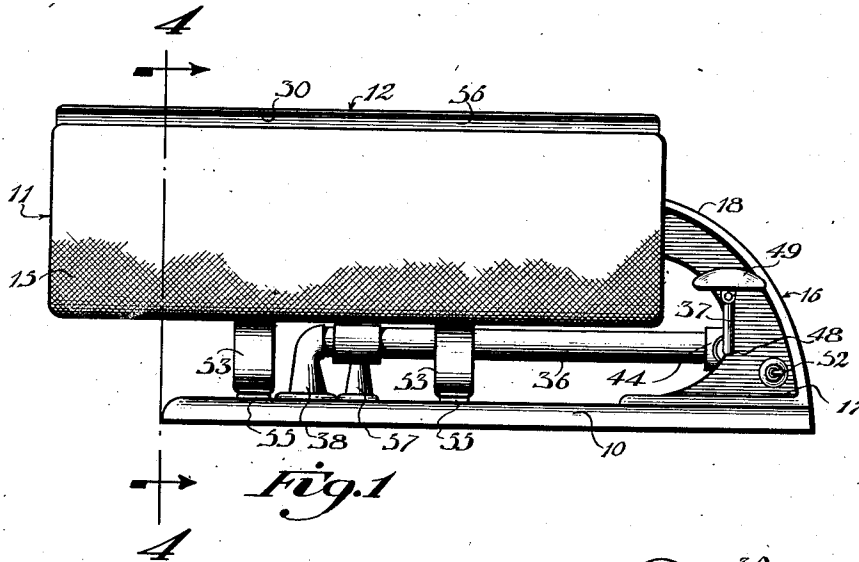
W. E. STILWELL, JR

2,362,322

IRONER

Original Filed Feb. 14, 1938

2 Sheets-Sheet 1



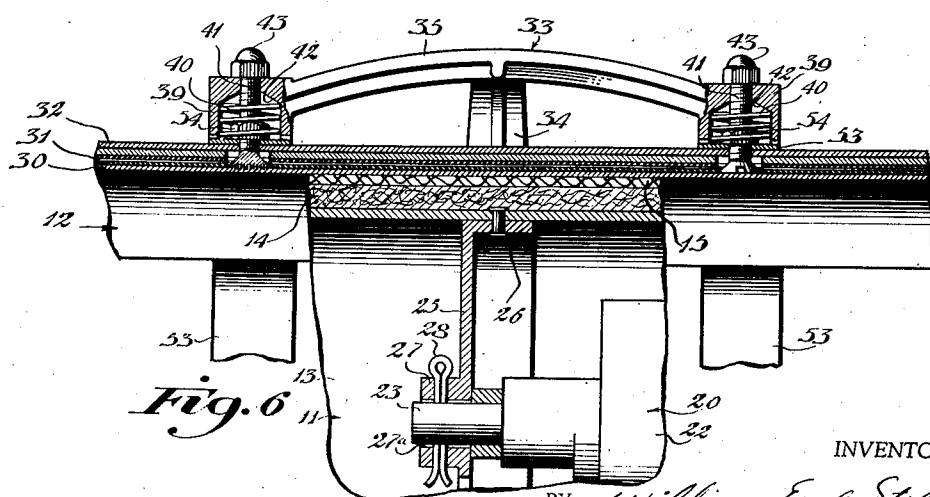
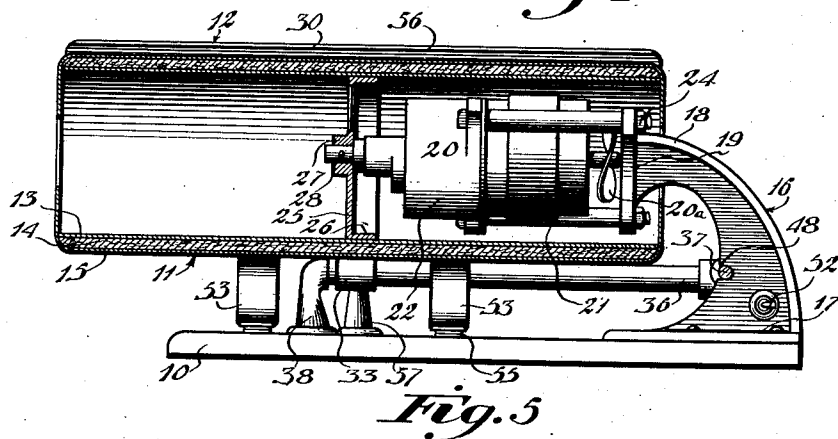
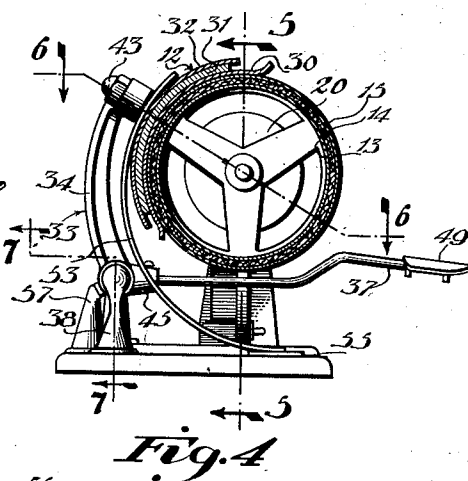
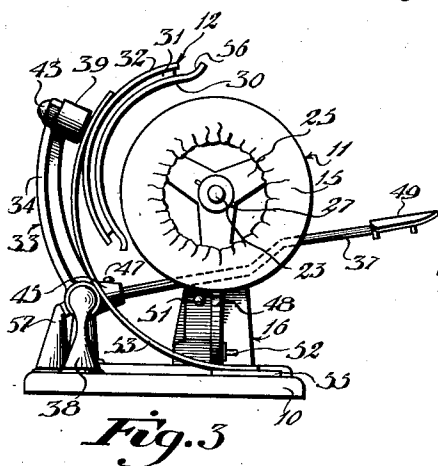
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IRONER

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2 Sheets-Sheet 2



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2,362,322

# UNITED STATES PATENT OFFICE

2,362,322

## IRONER

William E. Stilwell, Jr., Cincinnati, Ohio, assignor  
to Empire Ironer, Inc., Cincinnati, Ohio, a corporation of Ohio

Original application February 14, 1938, Serial No.  
190,370. Divided and this application March 2,  
1939, Serial No. 259,396

9 Claims. (Cl. 38—60)

This invention relates to power driven ironing machines and is particularly directed to a machine of the type employing a rotating roll and a heated ironing shoe adapted to be engaged with the roll. More particularly, the invention resides in a machine which is portable.

The ironing machines manufactured heretofore, for use in the laundry of the home, have been relatively expensive and quite heavy. The weight and size of these machines have confined their use to the basement of the home, with the result that the housewife has found their use inconvenient and has preferred to use the conventional electric hand iron. Particularly has this been the case when the family resides in an apartment. Accordingly, it has been the object of the present inventor to provide a machine of extremely low cost and one which is of the utmost simplicity. More particularly, it has been the object to provide a machine which is truly portable and can be carried about the apartment or home by the housewife and placed on a bridge table. In other words, the power driven ironing machine of this invention is so constituted that it may be used around the house or apartment with substantially the same facility as an electric hand iron.

It has been a further object of the present inventor to provide a machine of this character which includes an improved control which greatly simplifies the operation of the machine. The control mechanism permits the operator to engage the shoe with the roll without causing rotation of the roll. A further movement of the control mechanism starts rotation of the roll and locks the lever in roll driving position. Through the means provided, the operating lever is greatly simplified and enables the housewife to operate the control by engaging the lever with her forearm. Accordingly, it has been an object of the invention to place the lever in position for this convenient operation. The housewife may then control the lever while her hands are on the roll adjusting the material being ironed.

Still another distinct advantage of this arrangement resides in the ability of the housewife to disconnect the power and release the shoe quickly in case her hands get under the hot shoe or if she desires disconnection for any other reason. In fact, with the arrangement disclosed, the stopping of the power and release of the shoe is virtually involuntary, accomplished merely by the act of bumping the arm against the lever.

It is a further object to provide an improved mounting for the roll wherein the motor is housed within the roll and the same means which connects the roll to the motor for power purposes also supports the roll and holds it in position. Accordingly, it is a comparatively simple matter to

disconnect the roll, involving, in fact, the detachment of one point of connection.

This application is divisional of copending application, Serial Number 190,370, filed February 14, 1938, Patent No. 2,157,086.

Other objects and certain advantages will be more fully apparent in a description of the accompanying drawings in which:

Figure 1 is a front view of the improved ironing machine.

Figure 2 is a perspective view of the same.

Figure 3 is an end view of the ironer.

Figure 4 is a sectional view taken on line 4—4, Figure 1, showing the ironer shoe against the roll in the position of use.

Figure 5 is a longitudinal sectional view taken on line 5—5, Figure 4.

Figure 6 is an enlarged, fragmentary, sectional view taken on line 6—6, Figure 4, detailing the shoe and roller structures and mountings.

Figure 7 is a sectional view taken on line 7—7, Figure 4.

Figure 8 is a sectional view taken on line 8—8, Figure 7.

Figure 9 is a wiring diagram of the electrical circuit of the ironer.

Referring specifically to the drawings, the base of the machine is indicated at 10, the feeding roll generally at 11, and the ironer shoe at 12. The feeding roll consists of an open cylindrical drum 13 having a padded periphery typical of such ironer rolls. In this instance, the padding is made up of a layer of fibrous material 14, such as cotton or felt fibers, and a cloth covering 15.

The roll is mounted and driven centrally of its length and is clear of obstructions at the ends, so as to permit the operator to iron successive widths of a piece, the total width of which may be greater than the width of the ironing element.

As shown in Figure 5 of the drawings, the roll is supported from one end only. The support means consist of a cantilever bracket 16, having a pedestal portion 17 secured to the base of the machine. The upper portion 18 of the bracket extends horizontally and parallel with the base, and projects into the open end of the feeding roll. The inner extremity of this projected portion of the bracket includes a flange 19, to which is secured the power unit 20.

The power unit 20 consists of a motor 21 and a speed reducing unit 22. The motor end of the power unit includes a fan 20a adapted to cool the motor. A roll driving shaft 23 projects from the inner end of the power unit and is disposed co-axially of the feeding roll. The power unit is attached to the flange 19 of the bracket by means of bolts 24, and acts as an extension of the bracket. The unit is of small diameter and fits within the roll cylinder with ample clearance remaining to permit rocking of the cylinder.

The drive and support of the roll cylinder is accomplished through the medium of a spider 25 attached within the cylinder and located in a position centrally between the two ends of the cylinder and loosely secured on the roll driving shaft. Accordingly, the cylinder is supported on the roll driving shaft in a balanced condition.

The spider 25 includes a peripheral rim 26, which is rigidly secured to the inner periphery of the feed roll drum. A plurality of arms projects inwardly of this rim and terminates in a hub 27, which is secured to the roll driving shaft by means of a pin 28. It will be noted from a study of Figure 6 that the bore 27a of the hub is slightly larger than the diameter of the roll driving shaft 23. The purpose of this arrangement is to provide a loose or rocking support for the cylinder, which will permit yielding or rocking of the cylinder when unequal thicknesses of material are passed through the machine.

The ironer shoe 12 comprises an arcuate ironing element 30, a heating element 31 and a cover plate 32. The shoe is arcuate and of substantially the same radius as the roll and is mounted in cooperative relationship therewith. The shoe assembly is supported and mounted on a T-shaped support bracket 33 adapted to swing the shoe assembly against the roll when the ironer is in operation.

The T-shaped bracket consists of an upwardly extended shank member 34 and includes a cross arm 35 at its upper end. The lower end of the bracket is secured on a longitudinal rock shaft 36, which is actuated by means of an operating lever 37 projecting outwardly of the machine to one side of the roll. The operating lever 37 is removably pinned to the rock shaft and the shaft itself is rotatively mounted on each end in bearing brackets 38.

The cross arm 35 includes a pair of spring sockets 39, one socket at each end of said arm. Each socket provides a housing for a spring 40, the purpose of which is to provide a resilient mounting for the ironer shoe assembly. Each of the resilient mountings is constructed in the following manner:

A stud 41 is secured to and projects from the ironer shoe and extends axially within the socket 39. The spring is under compression between the ironer shoe and the outer wall 42 of the socket or receptacle 39. The assembly is held together by means of a nut 43, in screw-threaded engagement on the stud 41. The tension of the spring may be adjusted by means of this nut. The stud 41 loosely traverses the spring socket 39 so as to permit angular movement of the shoe. The shoe, therefore, is free to yield angularly, in any direction, and laterally, and the mounting may be described as universally resilient.

The resiliency of the mountings allows the shoe to be held against the roller under yielding spring pressure, to permit the shoe to be sprung away from the roller when unusual thicknesses of material are fed therebetween. Any irregular thickness is accommodated by the angular yielding of the shoe, so that the pressure is uniform over the entire face of the ironer shoe.

The floating mounting of the roll facilitates freedom of action of the two parts, and, moreover, greatly reduces the strain on the supporting and drive members. In other words, there can be no angular thrusts transmitted to the roll or to the supporting spider and drive shaft. Any tendency in this direction is obviated by the freedom of the roll to deflect angularly.

The control lever 37 is secured on the longitudinal rock shaft in a yoke 44. This yoke is pinned to the rock shaft and has a lateral boss 45 for mounting the control lever. The bore 46 of this yoke is oblong in a horizontal plane to permit a slight amount of horizontal swing to be imparted to the control lever.

Specifically, the bore 46 of the yoke is of substantially the same diameter as the rock shaft 36, but in addition, the periphery of the bore includes angular clearances 46a, on alternate sides slanted inwardly from each opposite end. These clearances may be formed by drilling or broaching at an angle to the bore 46 of the yoke, and they permit the yoke to be canted, as shown in Figure 8. The control lever is removably secured in the boss 45 by means of a pin 47, to facilitate disassembling of the ironer.

The bracket 16 includes along its inner edge a notch 48, which acts as a latch to hold the control lever in operative position. The outer end of the control lever includes a pad 49, adapted to be manipulated by the arm of the operator. In operating the ironing machine, the operator contacts this pad with the elbow and readily moves it downwardly. After downward motion, the lever is moved laterally, so as to latch the lever in the notch 48 of the bracket. In this manner the operator has both hands free, to guide and feed the clothing into the machine, and is free to discontinue the engagement of the ironer shoe at any desired time.

Provision is made for controlling the drive of the roll coincidentally with the movement of the shoe into engagement with the roll. This mechanism is located to one side of the bracket and consists primarily of an electric switch 50. The switch is provided with a spring pressed button 51, the outer end of which is adapted to be engaged and depressed when the control lever is moved laterally into the notch.

The button 51 projects outwardly into the path of movement of the operating lever. The button is located in alignment with the notched portion of the bracket, so that, when the operating lever is in running position, the button will be depressed. The switch is so constructed that depression of this button closes the motor circuit.

Referring to Figure 9, illustrating the electric circuit, it will be seen that the switch is in electrical connection with the driving motor 21. Therefore, when the operating lever is in running position, the button will be energized simultaneously with the engagement of the shoe and the driving roll. Upon disengagement of the lever from the notch, the motor will be de-energized. Disengagement of the shoe and the roller will occur when the lever is released.

A switch 52 is mounted on the front of the bracket 16. This switch is independently connected with the heating element of the shoe to permit control of the temperature of the shoe, independent of the operation of the motor. A thermostat may be connected in the circuit to control the temperature of the ironer shoe, if this is desired.

In order to guide the finished work as it leaves the roll, a pair of curved guide elements, in the form of leaf springs 53, is provided. These guides are attached to the back of the ironer shoe. To this end they are traversed by the studs 41 and held against the shoe by means of nuts 54. The guides are disposed, in an arc, downwardly from the shoe and curve outwardly and downwardly to the forward portion of the base.

The finished work, as it leaves the roll, drops downwardly and comes into contact with the guides and is carried forwardly by the force of gravity. The curvature of the guides is quite gradual, so that the work is not folded or wrinkled as it moves forwardly between the roll and the base member.

The guide members have the additional function of urging the shoe away from the roller. As previously mentioned, these guides are formed of leaf springs. The spring members are rigidly secured on the arm and have their lower free ends engaged against the base member under compression. A pair of contact blocks 55 is secured on the base member, upon which the ends of the spring bear. Thus, the shoe is constantly urged away from the roll, and the working engagement of the shoe is dependent upon downward actuation of the control lever.

Since the lever normally is locked in downward position in the notch, the shoe may be readily disengaged from the roll by the dislodging of the lever from the notch. The leaf spring guides, thereupon, will urge the shoe away from the roll. Thus movement of the roll is limited by the wedging engagement of the lever 37 with the curved inner edge of the bracket 16 above the notch 48. The wedging action occurs when the yoke 44 reaches its limit of horizontal pivotal movement with respect to the rock shaft 36 therewith, having taken up the clearances provided for swinging the control lever. The machine is provided with a stop member 57 to limit the rearward movement of the shoe assembly when the control lever is removed for storage or shipping.

In operation with the control lever engaged in the notch, the shoe is engaged against the roll under a predetermined pressure which is virtually constant, irrespective of the relatively minor variations in the thickness of the material being ironed. This condition is assured by the spring action of the resilient connection between the T-shaped bracket 33 and the shoe.

The angular freedom afforded the shoe is effective for permitting relative, angular motion between the roll and the shoe as the work is fed therebetween. The forward, leading edge of the shoe is flared outwardly as at 56, to facilitate entry of the edge of the material as it is started under the ironer shoe. As the leading edge of the work is presented to the roll, a slight angular tilting of the shoe will occur, especially if the work is of considerable thickness, as, for example, a blanket. As the feed progresses, the shoe will return to normal position, so that there is uniform ironing pressure throughout the entire operation.

In the event that the work is of greater thickness on one side than the other, the feed roll will tilt angularly to a slight degree from its horizontal alignment. This movement is permitted, as previously described, by the loose, centralized drive mounting. In this manner, uniform ironing pressure is assured across the entire length of the roll and shoe.

Briefly, the angular and lateral resiliency of the shoe mounting, in addition to the balanced, loose central mounting of the roller, provides a structure which will accommodate any reasonable variation in the thickness of the material being ironed. This condition provides a uniform ironing pressure across the entire length of the shoe and ensures against variations in pressure throughout the length of the piece being ironed.

The utility of the machine is greatly increased

by the cantilever bracket employed in mounting and driving the roll. The usual cross shaft and driving members and brackets are completely dispensed with, and one end of the roll is left entirely clear of obstruction. The difficulty usually encountered in handling large pieces of work is greatly reduced by the present, improved structure. Moreover, since the driving mechanism is entirely enclosed within the roll, the danger of soiling the work with oil and grease from the driving and supporting apparatus is eliminated.

Having described my invention, I claim:

1. In an ironing machine of the type including a hollow roll and a cooperating shoe; a mounting and driving means for supporting said roll from one end only comprising, a cantilever support bracket, an electric motor mounted on the outer end of said bracket, a roll driving shaft driven by the motor and extending from the motor in a direction opposite to that of the cantilever bracket, said electric motor being within said hollow roll, a roll support and driving hub within said roll, said hub being positioned substantially medially the length of said roll, said hub being mounted directly on said roll driving shaft and providing the supporting means for the roll.

2. In an ironing machine of the type including, a motor driven roll and an ironing shoe and means for moving said shoe into and out of engagement with said roll, a motor for rotating said roll, a switch for energizing said motor, and a control lever for said shoe actuating means, said switch mounted adjacent to said control lever, but not within that path of movement of the control lever which is effective for engaging the shoe with the roll, and means whereby, upon further actuation of said control lever out of its aforesaid path of movement, the switch is actuated to energize said motor.

3. In an ironer of the type including, a base, a roll and a shoe; a roll support mounted on the base and extending into the end of the roll, a driving means for the roll mounted on said support within the roll, and a cross plate secured internally of the roll intermediate its length, said roll driving means being loosely connected to said plate axially of the roll whereby the roll is yieldable radially for the accommodation of materials of unequal thickness passing through the ironer.

4. A portable ironing machine of the type including an ironing roll and a shoe adapted to be moved toward and from the roll and comprising a base, a bracket at one end of the base, said bracket being of angular form with the upper portion projecting parallel with the base, an electric motor supported at the free end of said bracket, a motor driven power shaft extending from the motor end which is opposite to the bracket and having its axis disposed parallel with the base, said ironing roll supported on said shaft in driving connection therewith, and said motor being disposed within the roll.

5. A portable ironer of the type including a roll and a shoe movable toward the roll and comprising; a base, said roll rotatably supported on the base, an electric motor for driving said roll, a switch for said motor, said ironer shoe disposed adjacent to said roll, a shaft supporting said ironer shoe, a lever fixed to said shaft for rocking the same to move the shoe into and out of contact with the roll, said lever being constructed and arranged relative to the shaft to permit lateral movement, and said switch being disposed in the path of lateral movement of the lever for operation thereby.

6. A portable ironer of the type including a roll and a shoe movable relative to the roll and comprising a base, a roll supporting bracket, said roll supported on said bracket, a rock shaft journaled on said base, said ironer shoe carried by said shaft and adapted for movement toward and from the roll, a lever, means attaching said lever to said shaft, said means permitting horizontal movement of the lever, said bracket including a notch for receiving and for locking the lever, said notch being disposed adjacent the horizontal plane of the lever when the shoe is in contact with the roll, and a switch for controlling the power for the roll, said switch being disposed in the horizontal plane of the notch and being operated by the lever when the lever is engaged in the notch.

7. A portable ironer of the type including a roll and a shoe movable toward said roll, comprising a base, means rotatably supporting said roll above the base, an electric motor for driving said roll, a switch for said motor, means supporting said shoe for movement into and out of pressing engagement with the roll, a lever mounted for movement in paths transverse to each other, means connecting the lever to the shoe whereby movement of the lever in one of its paths will move the shoe relative to the roll, and said switch being disposed in the other path of movement of the lever for operation thereby.

8. An ironing machine of the type including a motor driven roll and a shoe and comprising; a base, a bracket extending up from the base opposite one end of said roll, said bracket having an extension lying within and supporting the roll, a rock shaft supported on the base in the rear of a vertical axial plane of the roll, and parallel with the roll axis, an arm connecting said shoe with the rock shaft, an arm connected with the rock shaft and extending towards the front of the machine, said arm coacting with means on the bracket for determining the position of the shoe in relation to the shoe, said arm being operable for moving the shoe, substantially as described.

9. In an ironing machine of the type including a motor driven roll and an ironing shoe; means supporting said shoe for effecting movement of the shoe toward and from the roll, a motor for driving said roll, control means for said motor, a control lever mounted for operation in two paths of movement and connected to said shoe for moving the same toward and from the roll when the lever is operated back and forth in one path of movement, said control means being disposed in the other path for causing actuation of the control means when the lever is moved in the other of said paths.

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