

Nov. 29, 1927.

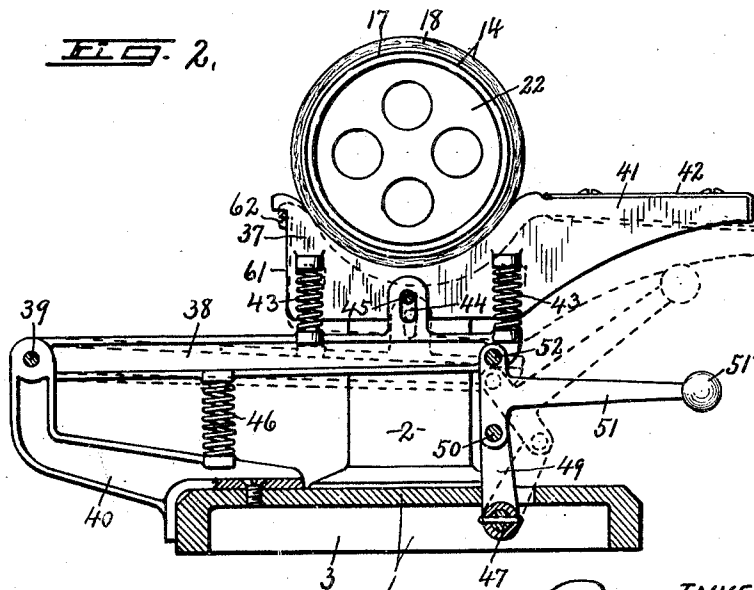
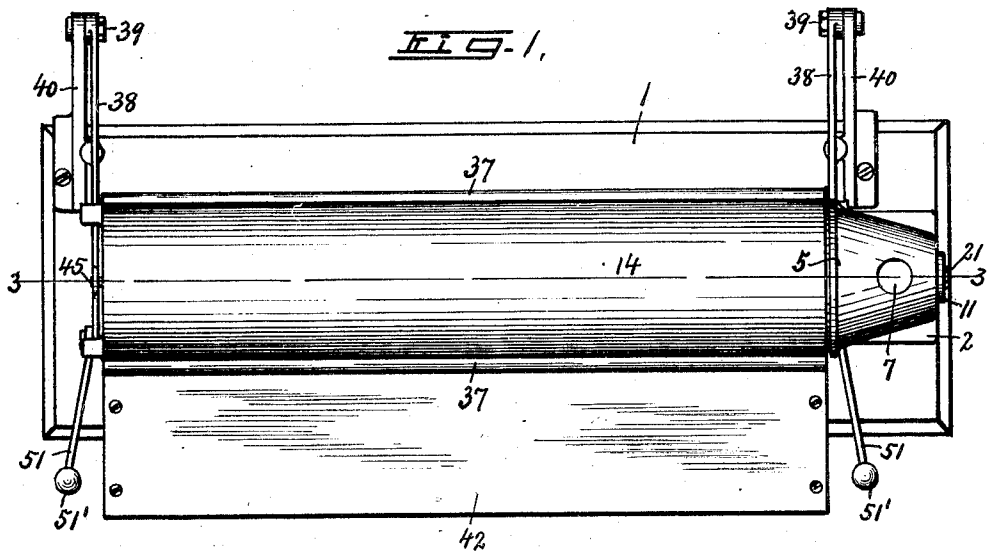
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P. E. GELDHOF

IRONING MACHINE

Filed Jan. 19, 1926

3 Sheets-Sheet 1



WITNESS
H. H. H. H.

INVENTOR
P. E. Geldhof
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ATTORNEYS

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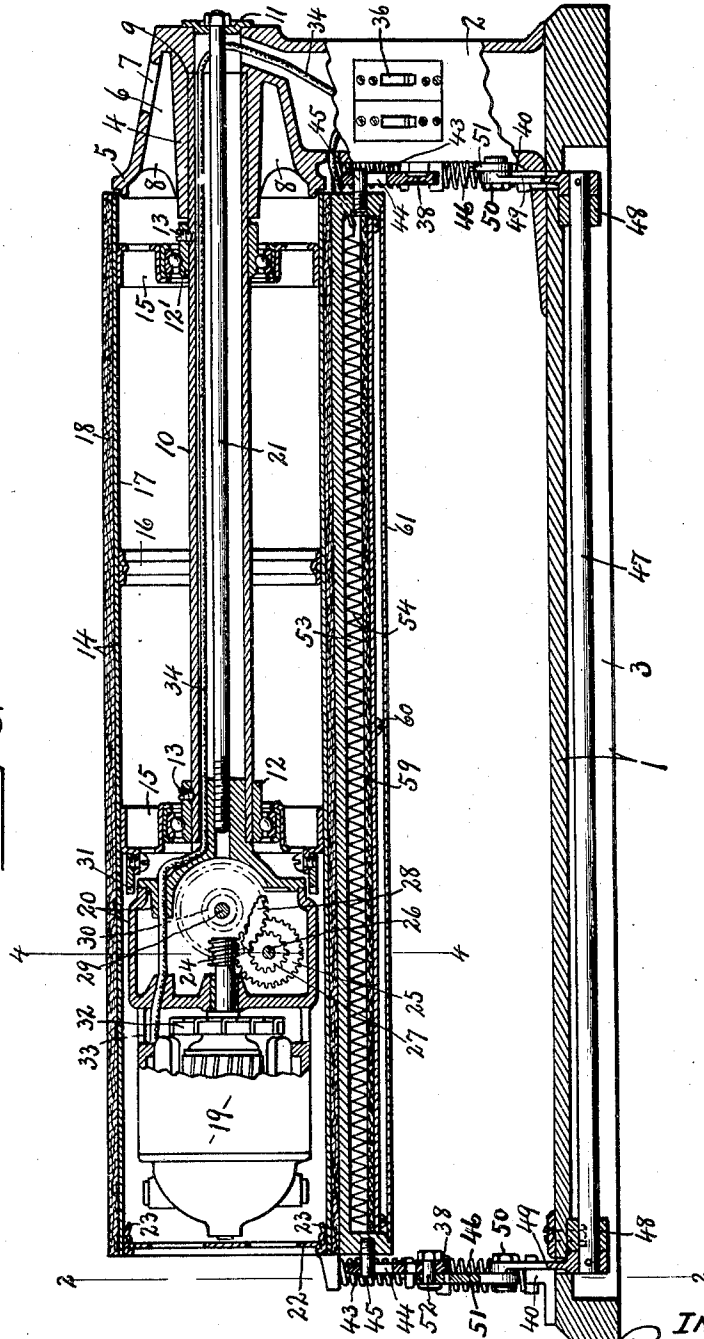
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FIG. 3.



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FIG. 4,

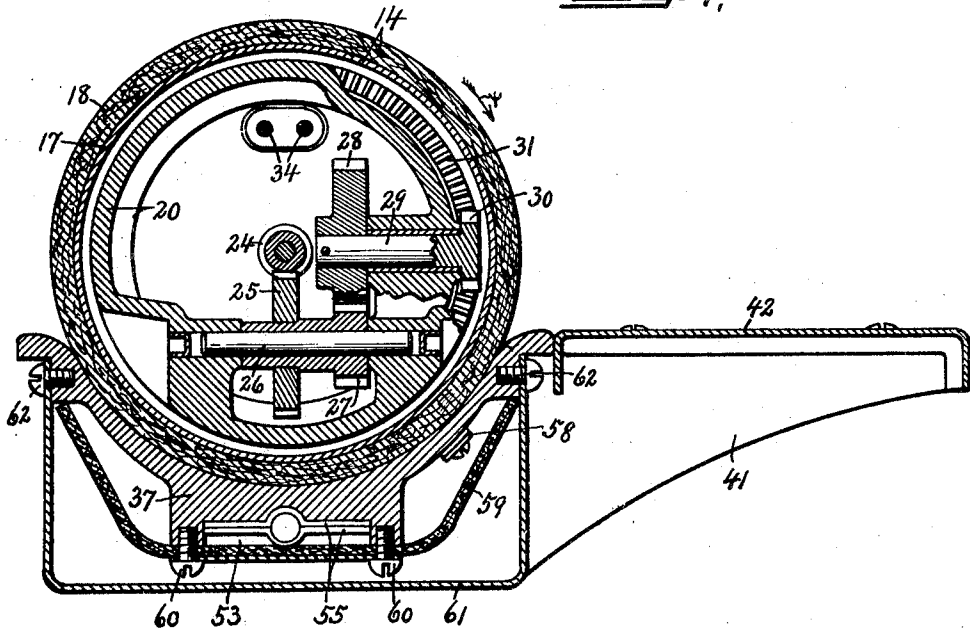
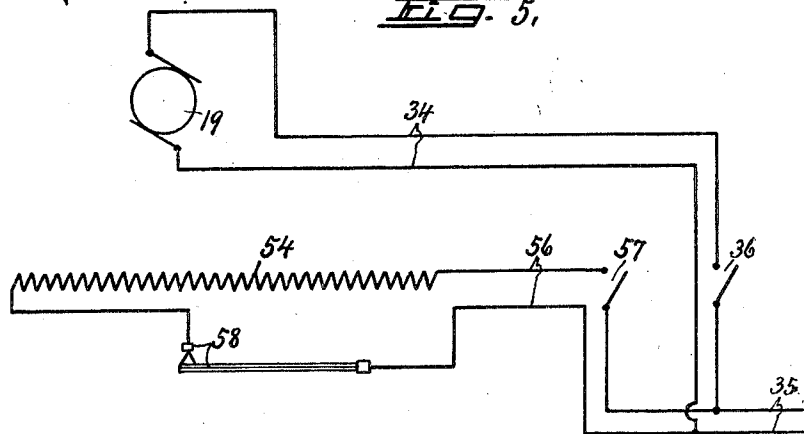


FIG. 5,



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UNITED STATES PATENT OFFICE.

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IRONING MACHINE.

Application filed January 19, 1926. Serial No. 82,252.

This invention relates to ironing machines in which a heated ironing shoe or pressing element is supported in pressing relation to a power driven rotary feed roll for feeding the articles to be ironed transversely across the face of the heated pressing element but it will be evident that both the feeding element and ironing element may be used for some purposes without rotating the feeding element.

The broad object of the invention is to incorporate the motive power for rotating the feed roll wholly within said feed roll where it is concealed from view and protected from the elements and enables the machine to be made in a more compact form than has heretofore been practised.

Another object is to provide for the circulation of air through the feeding element for cooling the motor and bearings for the feed roller.

A further object is to provide the ironing element with an electric heater extending substantially the entire length thereof so as to establish uniform heat at all portions of the ironing surface.

Another object is to provide a more convenient and efficient means for moving the ironing element toward and from the feed roller and at the same time to enable said ironing element to yield in different directions under pressure of varying thicknesses of articles to be ironed at different points along the contact surfaces of the roller and ironing element.

Other objects and uses relating to specific parts will be brought out in the following description.

In the drawings:

Figure 1 is a top plan of an ironing machine embodying the various features of my invention.

Figure 2 is an enlarged end view, partly in section, of the same machine taken in the plane of line 2—2, Figure 3.

Figure 3 is a longitudinal vertical sectional view (enlarged) taken on line 3—3, Figure 1.

Figure 4 is an enlarged transverse vertical

sectional view taken in the plane of line 4—4, Figure 3.

Figure 5 is a diagrammatic view of the electric heater and motor circuits showing the thermostatic switch for controlling the heating circuit.

As illustrated, this machine is adapted to be used more particularly for ironing small articles and for this purpose is made easily portable and adapted to be placed upon a table or other available support in the laundry or kitchen when in use or may be stored in compact space out of the way when not in use.

It consists of a substantially flat rectangular base —1— elongated in one direction and carrying at one end a hollow upright bracket —2— rigid therewith, the base —1— being provided in its lower side with a lengthwise chamber —3— for receiving certain parts of the operating mechanism ironing shoe, presently described.

The upper portion of the bracket —2— is provided with a hollow base or hub —4— and an annular flange —5— projecting inwardly from the outer end of the bracket in concentric relation, the major portion of the flange —5— being arranged in spaced relation to the hub —4— to form an intervening air chamber —6— which communicates with the atmosphere through one or more openings —7—.

The flange —5— is somewhat conical and flared inwardly from its outer end and is connected to the hub —4— by webs —8— arranged in circumferentially spaced relation to allow circulation of air between them.

The hub —4— is provided with a cylindrical socket —9— extending from its inner end the major portion of the length thereof for receiving and supporting one end of a cylindrical tubular shaft —10— which is co-axial with the axis of the hub —4— and flange —5—.

The outer end of the socket —9— is slightly reduced in diameter to form an abutting shoulder for the adjacent end of the tube —10— but is normally closed by a cap or washer —11—, Figure 3.

The outer end of the shaft —10— is tightly fitted in the hub —4— and is, therefore, stationary and extends from said hub toward the opposite end of the frame a distance sufficiently less than the length of the frame to permit the motor power to be installed within the feed roll between the inner end of the tube and the corresponding end of said feed roll as will be heretofore more fully explained.

A pair of sleeves or bearing members —12— and —12'— are secured by set screws —13— to and upon the periphery of the stationary tubular shaft —10— in longitudinally spaced relation, one of said bearings as —12'— being located near the inner end of the hub —4— while the other bearing is located near the inner end of the tubular shaft.

A feed roller —14— is provided with suitable bearings —15— journaled upon the periphery of the bearing members —12— and —12'— concentric with the tubular shaft —10—, said feed roller —14— being extended from the inner end of the flange —5— approximately the entire length of the remaining portion of the frame or base —1— and some distance beyond the inner end of the tubular shaft —10—.

The interior diameter of the cylinder is considerably greater than the external diameter of the shaft —10— to allow ample space for the circulation of air through the feed roll from end to end thereof, said feed roll being reenforced substantially midway between the bearings by an annular ring —16— secured to the inner periphery thereof.

As illustrated, the feed roller comprises an inner tube —17— of light but rigid metal and an outer covering —18— of one or more thicknesses to form a cylindrical pad extending from end to end of the inner shell —17—.

The flange —5— on the upper end of the bracket —2— extends a relatively short distance into the adjacent end of the feed roll —14— in close proximity to the inner peripheral surface of the tubular shell —17— to form a guard for preventing the entrance of portions of the articles operated upon and other external objects into the adjacent end of the feed roll and also to impart a more pleasing appearance to that portion of the machine.

Motive power.

As previously stated the feed roller —14— extends some distance beyond the inner end of the tubular shaft —10— for receiving the motor power for rotating the feed roller which motive power comprises an electric motor —19— mounted on one end of a gear case —20— co-axial with the axis of the

feed roller —14—. The other end of the gear case is tightly secured to and within the inner end of the stationary tubular shaft —10— by means of a clamping bolt —21— which extends centrally through the tubular shaft —10— and has its inner end threaded and engaged with a threaded aperture in the adjacent end of the gear case —20— and its outer end engaged with the cap or washer —11—, Figure 3, thus permitting the motor and gear case to be removed or replaced endwise through the adjacent end of the feed roll by simply loosening or tightening the clamping bolt —21—.

A cap plate —22— is inserted in the end of the feed roll —14— at the outer end of the motor —19— and is frictionally held in place by spring members —23— so that it may be removed when it is desired to remove the motor and gear case as a unit.

The armature shaft of the motor —19— is journaled in the outer end of the gear case —20— and is provided with a worm —24— meshing with a worm gear —25— which is secured to a cross shaft —26—, the latter being journaled in opposite walls of the gear case —20—.

This cross shaft is also provided with a tight pinion —27— meshing with a gear —28— on another cross shaft —29— which is journaled in one side of the gear case —20— radial to the axis of the armature shaft and at the inner end of the worm —24—.

This cross shaft —29— is provided with a pinion —30— meshing with a crown gear ring —31— which is secured to the outer end face of the adjacent bearing —15— of the feed roll concentric with the axis thereof.

A suitable fan —32— is secured to the armature shaft of the motor between the outer end of the gear case —20— and armature for circulating air through openings —33— in the peripheral walls of the motor case to prevent overheating of the motor and other parts inclosed within the feed roll —14—, the end partition bearings —15— being provided with openings therethrough to permit the circulation of air from the openings —7— through the feed roller from end to end thereof.

The electric motor —19— is connected by a cable —34— to an electric circuit —35— deriving current from any available source of electric energy not shown, the motor circuit being provided with a switch —36— for controlling the operation of the motor, said switch being preferably mounted on the bracket —2— of the main supporting frame where it is most convenient for the operator.

The cable —34— is preferably extended through suitable openings in the gear case —20— and also through the tubular shaft

to the interior of the hollow standard or bracket —2— and thence to the main circuit —35— through the switch —36—.

5 *Ironing shoe.*

An ironing shoe —37— extends lengthwise of and beneath the feed roll —14— the entire length thereof and is yieldingly supported at both ends upon a pair of vertically movable arms —38— extending transversely thereof and having their rear ends pivoted at —39— to a pair of brackets —40— which are secured to the base —1— near the ends of the base, said ironing shoe being provided near its ends with forwardly projecting brackets —41— upon which is mounted a feeding table or shelf —42— across which the articles to be ironed are fed between the adjacent surfaces of the feed roller —14— and ironing shoe —37—.

The opposite ends of the ironing shoe are yieldingly supported upon the rearwardly projecting arms —38— through the medium of coiled springs —43— which are arranged at the front and rear of the longitudinal center of the ironing shoe equal distances from said center to allow longitudinal and transverse tilting movement of the ironing shoe relatively to the feed roll and thereby to compensate for varying thicknesses of different portions of the articles passing between the feed roll and ironing shoe.

The arms —38— are provided with vertical guide slots —44— for receiving guide pins —45— on the adjacent ends of the ironing shoe, said slots and pins being preferably located in the vertical plane of the axis of the feed roll —14— for guiding the ironing shoe in its vertical movements and holding it against forward or rearward displacement relatively to the feed roll and the supporting arms —38—.

The intermediate portions of the arms —38— are yieldingly supported upon the brackets —40— by means of coiled springs —46— which assist in returning the arms —38— and parts carried thereby upwardly after being depressed in a manner herein-after described.

A rock shaft —47— extends lengthwise of and within the chamber —3— in the base —1— and has its opposite ends journaled in suitable bearings —48— on said base and provided with a pair of crank arms —49— which, in turn, are pivoted at —50— to a pair of bell crank levers —51—.

These levers —51— are pivoted at —52— to the front ends of the arms —38—, Figure 2, and together with the crank arms —49— constitute toggle connection between the arms —38— and rock shaft —47— for raising and lowering the front ends of the rock arms and thereby effecting a similar raising and lowering of the shoe —37— to-

ward and from the underside of the feed roller —14—.

The upper face of the ironing shoe is concaved transversely to conform to the transverse curvature of the periphery of the feed roller —14— and is preferably smooth for imparting the desired finish to the work operated upon.

The levers —51— extend forwardly some distance beyond the front ends of the arms —38— and preferably between the upper face of the base —1— and feed table —42— for convenience of operation and are provided at their front ends with handles —51'— by which they may be operated for raising and lowering the ironing shoe toward and from the feed roller.

Electric heater.

The central portion of the underside of the ironing shoe —37— is provided with a lengthwise recess —53— throughout the major portion of its length for receiving an electric heater —54— which is held in place by insulating plates —55— and is connected by wires —56— to the main line circuit —35—, the heater circuit being controlled by a switch —57—, Figure 5.

A thermostatic switch —58— is connected in the heater circuit in series with the heater —54— for automatically controlling the heat of the ironing shoe —37— and for this purpose is secured to the ironing shoe preferably near the front thereof as shown in Figure 4.

A protective hood —59— of asbestos or equivalent non-heat-conducting material is secured by screws —60— to the underside of the ironing shoe —37— to extend across the underside of the heating chamber —53— and heater —54— and also upwardly across the underside of the front and rear portions of the ironing shoe as shown in Figure 4.

A sheet metal shield —61— is secured by screws —62— to the front and rear sides of the ironing shoe to extend the entire length thereof and around the bottom, front and rear of the protective member —59— for protecting said member against contact with external objects.

Operation.

When it is desired to use the machine for ironing purposes the heater switch —57— is first closed to direct the current through the heater coil —54— and thermostatic switch —58— which, in a relatively short period of time, heats the iron —37— to the required temperature whereupon the electric switch —36— may be closed to cause the operation of the motor —19— and resultant rotation of the feed roller —14— through the medium of the gear train between the worm —24— and gear ring —31—.

One or the other or both of the levers

—51— are then operated at will to move the ironing shoe against the underside of the feed roll —14— or from the position indicated by dotted lines to the position indicated by full lines in Figure 2.

This operation of the levers —51— causes a straightening of the toggles and consequent locking of the arms —38— in their elevated positions to yieldingly hold the iron against the underside of the feed roll through the medium of the springs —43—.

The articles to be ironed are then fed across the table —42— between the contiguous faces of the ironing shoe and feed roll and are carried downwardly and rearwardly by the rotation of said feed roll in the direction indicated by arrow —x—, Figure 4.

This feeding of the articles between the ironing shoe and feed roll causes more or less depression of the ironing shoe against the action of the springs —43— without affecting the position of the arms —38— but if different portions of the articles or different articles are of unequal thickness at different points of contact of the feed roll and ironing shoe, said ironing shoe will be free to yield longitudinally, or transversely to compensate for such varying thickness.

In case the ironing shoe should become heated above a safe temperature the thermostatic switch —58— will automatically open to break the heater circuit but will also automatically close as soon as the temperature of the iron drops below the working temperature.

If, for any reason, it is desired to withdraw the ironing shoe from the feed roller as, for example, when the machine is not in use, the levers —51— may be rocked upwardly to the position indicated by dotted lines in Figure 2 thereby effecting a downward movement of the arms —38— and ironing shoe carried thereby against the action of the springs —46—, the tension of which is just sufficient to partially support the arms —38— and parts carried thereby without forcing them to their operating positions but merely to assist the raising of those parts by the levers —51— and also to prevent shock to those parts when released from their operative positions.

During the operation of the motor the rotation of the fan —32— causes a circulation of air lengthwise through the feed roller and around the gear case, motor and bearings for the feed roll to prevent overheating of those parts.

The mechanism described is particularly simple, compact and highly efficient but it is evident that various changes may be made in the detailed construction without departing from the spirit of the invention and, therefore, I do not wish to limit myself to the exact construction shown and described.

What I claim is:

1. In an ironing machine of the character described, a feed roller, an ironing shoe co-operating therewith, a relatively stationary shaft co-axial with the roller and upon which said roller is journaled, means including an electric motor carried by said shaft within the feed roller, and means extending through the shaft for clamping the motor thereto.

2. In an ironing machine of the character described, a main supporting base, arms pivotally mounted upon the base for vertical rocking movement, yielding connections between said arms and base, an ironing shoe yieldingly mounted upon said arms, and a feed roller rotatably supported above the ironing shoe.

3. In an ironing machine of the character described, a supporting base, a feed roll, an ironing shoe, a swinging support for the ironing shoe, yielding connections between the swinging support and base, means including a toggle operable at will for moving the support and ironing shoe toward and from the feed roll, and yielding connections between the ironing shoe and the swinging support.

4. In an ironing machine of the character described, a base having a chamber in its underside, a rock shaft journaled on the base within said chamber, a swinging support hinged to the base, toggle connections between the rock shaft and the swinging support and operable at will for moving said swinging support in opposite directions, an ironing shoe yieldingly mounted on the swinging support, and a feed roll cooperating with the ironing shoe.

5. In an ironing machine, cooperative pressing elements, one of which is movable toward and from the other, means for heating one of said elements, a swinging support for the heated element, yielding connections between the heated element and swinging support, a main supporting base, yielding connections between the swinging support and base, and means including a toggle operable at will for moving said swinging support and the heated element toward and from the other pressing element.

6. In an ironing machine of the character described, a main supporting frame, cooperative horizontal pressing elements, one above the other, the upper pressing element being mounted on the frame, a swinging support for the lower pressing element hinged to the frame, means including a toggle operable at will for rocking said swinging support, and yielding connections between the lower pressing element and the swinging support.

7. In an ironing machine, a stationary shaft, means for supporting the shaft at one end only, a feed roller journaled on the shaft beyond said supporting means, an iron-

ing shoe cooperating with the roller, and means mounted on the other end of the shaft for rotating the roller.

5 8. An ironing machine as in claim 7 in which the roller is provided with an interior chamber and the means for rotating the roller is arranged within said chamber.

9. In an ironing machine having an ironing shoe, and means for feeding the material

to be ironed across the surface of said shoe 10 in combination with a lever hinged to swing toward and from the feeding means, and spring-pressed toward said feeding means, and resilient connections between said lever and ironing shoe. 15

In witness whereof I have hereunto set my hand this 8th day of January, 1926.

PETER E. GELDHOF.