





# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN IRONING-MACHINES.

Specification forming part of Letters Patent No. **209,494**, dated October 29, 1878; application filed March 27, 1878.

*To all whom it may concern:*

Be it known that I, JOSHUA MASON, of Paterson, in the county of Passaic and State of New Jersey, have invented certain new and useful Improvements in Ironing-Machines, of which the following is a description, reference being had to the accompanying drawing, forming part of this specification.

This invention more particularly relates to machines for ironing shirts and other articles, in which one or more heated rollers or irons are used in combination with a reciprocating ironing-table.

The invention consists in a combination, with either ironing-roller or upper ironing device, of a removable close furnace of novel construction, and adapted to the burning of anthracite or other cheap fuel, for the purpose of heating said roller or ironing device; likewise, in a combination, with one or more ironing-rollers and its or their furnaces, of a rocking yoke or frame for independently supporting said ironing and heating devices.

Furthermore, the invention consists in a combination, with either ironing body or roller having a furnace within it, of means for preventing the escape of soot or dirt therefrom onto the ironing-table; likewise, means for automatically holding the ironing roller or rollers raised when not in use, in combination with the main frame, a rocking yoke or frame, carrying said roller or rollers, and a treadle for controlling the pressure of the latter on the work; also, means for giving an undulatory motion to the ironing-surface of the table, or of a goods-holder carried by the table, for operation in connection with one or more ironing-rollers or bodies.

In the accompanying drawing, Figure 1 represents a partly-sectional front-side elevation of an ironing-machine constructed in accordance with my elevation; Fig. 2, a plan of the same, and Fig. 3 a partly-sectional rear-side elevation thereof. Fig. 4 is a plan view of certain tripping mechanism for controlling the motion of the reciprocating ironing-table and ironing-rollers. Fig. 5 is a transverse section of the machine, upon a larger scale, through the line *x x* in Fig. 1. Fig. 6 is a transverse section through one of the ironing-

rollers on the line *y y* in Fig. 5, and Fig. 7 a transverse section of the same on the line *z z*. Fig. 8 is a plan of a frame used in connection with the ironing-table for holding the goods, and Fig. 9 a section of the same on the line *w w*.

A is the main frame of the machine, which frame may be of any suitable general construction. B is the ironing bed or table, arranged to reciprocate in a straight course in direction of its length; and C C are a pair of rotating ironing-rollers, arranged over one end portion of the table, and with their axes in a transverse relation to the motion of the table. Between these rollers, which are heated, and the ironing-table the goods to be ironed are passed, said goods being carried to and fro by the table beneath the heated rotating rollers.

In some cases, when the goods are light, a single rotating roller, C, will suffice, inasmuch as duplicate heated rollers would be apt to produce a too rapid drying, which would spoil the gloss. In other cases, however, when the goods are heavy, duplicate rollers, as here shown, may be used without injury to the gloss. For some goods, too, or certain portions of the same goods, a flat-iron is preferable to the rollers, as will be hereinafter more particularly specified. Both rollers C C are similar, and are heated internally by a furnace of peculiar construction, as hereinafter described, which furnace is also applicable to a flat-iron, when the latter is used.

The reciprocating ironing-table B works in suitable ways or on rollers across a center portion or wing, A', of the frame A, in order that the ironing end portions of said table may be more accessible to the operator on all sides, free from interference by the main frame. The ironing-rollers or their upper ironing-bodies are also similarly exposed to a greater or less extent. This facilitates the operator getting round or to different sides of the goods while being glossed.

The table B is moved forward and backward by means of one or more racks, *b*, on its under side and automatic reversing-gear or mechanism connected therewith. Thus, D is a horizontal driving-shaft, to which rotary motion is alternately communicated in opposite direc-

tions by one or other of two loose pulleys, E E<sup>1</sup>, on said shaft, accordingly as a friction-clutch, F, is thrown into driving-contact with either of said pulleys, that are driven to rotate in opposite directions, the one, say, by a straight belt, and the other by a cross-belt, from pulleys on a counter or main driving-shaft. The friction-clutch F is fitted to slide longitudinally on the shaft D, but so as to turn with it, to insure for the shaft D its necessary driving action alternately in opposite directions, accordingly as driving-friction is established between the friction-clutch F and either of the reversely-rotating pulleys E E<sup>1</sup>. From this alternately reversely-moving shaft D motion is communicated by bevel-gears *c c* to an upright shaft, G, which, in its turn, serves, by means of bevel-gears *d d*, to operate a lower cross horizontal shaft, H, that, by means of one or more sets of gears, *e f*, communicates the requisite reciprocating travel to the table B.

The shaft D not only serves as a driver of the table B, but also as a driver, by means of bevel-wheels *g g* and spur-gears *h i k*, of the ironing-rollers C C; and the several wheels and gears are so proportioned relatively to the outer or acting surface of the rollers that the speed of said rollers on their ironing-surface is somewhat greater than the speed of the ironing-table, both the rollers and table, however, moving in the same direction as regards their contiguous surfaces. The shaft D also forms the center of motion about or round which, by means of a free yoke or frame, I, the rollers C C, with their furnaces and other appendages, may be rocked or tilted to lift the rollers from the table when it is required to introduce or remove the goods and to bring down the rollers with more or less pressure on the goods. Both rollers C C are tilted with similar shafts *l*, which have their bearing in the rocking yoke or frame I, the wheel *k* of the train of gear *h i k* being fast on the shaft of the outer roller. These rollers may be raised when required, or their pressure on the goods regulated, by means of a treadle, J, connected with the rear end of the yoke I by a rod, *m*. On relieving the foot from pressure on the treadle the full weight of the rollers, together with their furnaces and other appendages, is brought down upon the goods and an increased weight or pressure is communicated when necessary to the rollers by means of an adjustable weight, *n*, on a lever, K, connected by a rod, *o*, and saddle *p* with the shafts *l l* of the ironing-rollers on the forward side of the free or swinging yoke I. The action of this weighted lever K, too, is also controlled by the treadle J.

Pivoted to the main frame, at *r*, is a self-acting catch or bell-crank lever, L, the handle and heavier arm of which act as a weight to throw the other or lighter arm under the forward end of the yoke or frame I when the rollers C C are raised by the treadle J, for the purpose of automatically holding said rollers

raised till it is required to lower them again, when the handle-arm of the lever L is raised to pass its other arm from under the yoke I.

As it is very important, to avoid scorching of the goods, that when the machine is in operation there should be as little as possible or no pause in the action of the ironing-table B and rollers C when the reversal in the motion of these devices takes place, and that said reversal should be an automatic one, the reciprocating table B is constructed or provided with stops *s s*, that, as the table approaches the ends of its stroke, respectively and successively shift, first to one side and then to the other, a reversing-lever, M, attached to a rock-shaft, N, which has connected with it tripping mechanism that alternately puts the friction-clutch F in driving contact with either one of the reversely-moving pulleys E E<sup>1</sup>, and so reverses the motion of the ironing-table and ironing-rollers, as required.

Each of the rollers C C is similarly heated by a furnace, B<sup>1</sup>, arranged to fit within it and removable from the front end of the roller. Said furnace, which is generally of a close cylindrical construction, is of such size and shape that when inserted in the roller it leaves a clear space all around it and at its back for the circulation of the gaseous products of combustion, or for a current of cooling air, as may be desired, between it and the interior surfaces of the ironing-roller. Said furnace, which is constructed to burn anthracite coal or other cheap fuel, has its fire-box *r'* and ash-pit *s'* all in one, *t'* being the grate-bars, so that all fuel and ash are kept out of the roller.

Connected with the forward end of the furnace by an arm or bracket are duplicate upper rods, C<sup>1</sup> C<sup>1</sup>, which pass back through guides *u'* in the yoke or frame I, and serve not only to support the furnace independently of the roller, but also to provide for its being slid in and out of the roller. The furnace, which is drawn out of the roller for charging and cleaning purposes, is provided with a sliding cover or top portion, *a*<sup>2</sup>, which is opened when lighting the fire, and is afterward closed. When the cover *a*<sup>2</sup> is closed and the furnace in its place within the roller, the gaseous products of combustion are allowed to escape through a series of perforations, *b*<sup>2</sup>, in the cover *a*<sup>2</sup>, to the interior of the roller around the furnace, and from thence through apertures *c*<sup>2</sup> in the back-end portion of the roller, to a smoke-box, *d*<sup>2</sup>, which the rear end of the roller is arranged to receive concentrically within it, and which has branching up from it the smoke-pipe *e*<sup>2</sup>. The front end of the furnace is fitted with an ash-pit door, *e*<sup>2</sup>, and with an upper door or door-s, *f*<sup>2</sup>, which latter control a cold-air passage, *g*<sup>2</sup>, that, by means of apertures *h*<sup>2</sup>, serves to pass cold air to or around the outside of the furnace within the roller, for the purpose of regulating the temperature of the roller.

The head or front end of either roller is fitted with an entering and removable ring, D', which turns with the roller, and is construct-

ed to overlap the outer margin of the front end or head of the furnace, which is stationary within the roller. The object of this ring is to prevent ash and dust or dirt from passing out through the front end of the roller. A trough-like shield, E<sup>2</sup>, which serves as a receptacle for soot or dirt from the furnace, is also arranged at the rear end of the roller, said shield being fast to, and receiving within it, the smoke-box, and having its forward end turned over, so as to enter an annular crease, i<sup>2</sup>, in a reduced back peripheral portion of the roller. Thus the rotating ring D' and the stationary shield E<sup>2</sup> protect the goods under operation from being soiled.

When ironing the bosoms of shirts, a more perfect gloss is obtained and the work generally is better done by means of the rollers C C, working in connection with the reciprocating ironing-table, than if a flat-iron were used in place of the rollers; but when it is required to iron the bodies and sleeves of said garments, then rollers are not suitable, and a reversible flat-iron, G', is used instead. This reversible flat-iron is arranged over the opposite end of the reciprocating ironing-table B to that which is occupied by the rollers, and is heated by an interior furnace, which is constructed like the furnaces in the rollers, the interior of the reversible flat-iron being cylindrical, to correspond with the circular furnace, and the latter being supported in position by rods C' C', passing through guides w' w', also being removable, when required, on taking out the ring D' in the front end of the iron. Said flat-iron is not only reversible around or about its inclosed furnace, but is hung so as to be capable of manipulation in all necessary directions, certain means for accomplishing which and for providing for the escape of the smoke from the furnace it is not necessary here to describe, as it is my intention to make them the subject of a separate application for Letters Patent, and other means might be employed.

To iron shirt-bosoms having plaits or other articles or portions of articles which present a varying thickness at different points, I construct the ironing-surface beneath the rollers C C, so that while firm to resist pressure, it has an undulatory motion in a transverse direction to the reciprocating course of the table B, whereby the whole weight or pressure of the ironing-rollers is applied at varied points successively in said transverse direction according to the varying thickness of material in the shirt-bosom by reason of its plaits or other article of varying thickness. This may be done either by constructing the reciprocating table B with a series of independent rigid bars, arranged side by side, and made to successively rise and fall, or by means of a shirt-bosom or goods holder similarly constructed and placed on the table, or by the combination of such a holder with a table constructed as described, which latter is the arrangement I prefer. Thus the reciprocating table B has

its end portion which works under the rollers C C provided with a series of parallel rigid bars, a<sup>3</sup> a<sup>3</sup>, arranged lengthwise of said table and fitted to independently rise and fall within the table. These bars are successively raised during the reciprocating motion of the table, or, in other words, have an undulatory motion communicated to them by means of two rotating cams, A<sup>2</sup> A<sup>2</sup>, of a semi-spiral configuration in direction of their length, and arranged transversely across the under side of the table. Said cams may be rotated by means of bevel-gears b<sup>2</sup> c<sup>2</sup> from a shaft, B<sup>2</sup>, carried by the table, and fitted with a driving-pulley, d<sup>2</sup>, through which said shaft is free to slide by means of a feather.

C<sup>2</sup> is a shirt-bosom or goods holder, formed in part of an independent frame, which is constructed to slide or fit within ways in the table B over the portion thereof having the bars a<sup>3</sup> a<sup>3</sup> in it. The head of said frame has a knot or projection, e<sup>2</sup>, over which the neck of a shirt to be ironed is passed, while the body of the shirt, immediately below its bosom f<sup>2</sup>, after the latter has been stretched on or over the frame, is secured by a key, g<sup>2</sup>, beveled on its upper edge and entered by creasing the shirt down within a transverse sloping groove, h<sup>2</sup>, in the holder C<sup>2</sup>, and so that the beveled edge of the key locks under a shoulder, i<sup>2</sup>, of the groove h<sup>2</sup>. This gives a firm hold of the shirt-bosom on the frame C<sup>2</sup>, secure from all interference with its stretch by the ironing operation; but on lifting the tail or body end of the shirt the key g<sup>2</sup> is readily lifted out from under the shoulder i<sup>2</sup> of the groove h<sup>2</sup> to remove the shirt after its bosom has been ironed.

The main body or portion of the goods-holding frame C<sup>2</sup> is fitted or provided with a series of parallel loose or independent rigid bars, k<sup>2</sup>, arranged over the bars a<sup>3</sup> and running in the same direction as the latter, so that said bars k<sup>2</sup> have the same undulatory motion by the action of the cams A<sup>2</sup> A<sup>2</sup> as the bars a<sup>3</sup> a<sup>3</sup>, subject, however, to a certain elastic action by means of the interposition between the bars a<sup>3</sup> and k<sup>2</sup> of any number of india-rubber or other yielding cross-strips l<sup>2</sup>. The undulatory motion of the rigid bars k<sup>2</sup> provides for the same firm pressing action on the shirt-bosom as if the latter were directly subjected to pressure on the bars a<sup>3</sup>; but the interposed rubber strips l<sup>2</sup> prevent the sharp edges of the bars k<sup>2</sup> from marking the bosom, and give a certain yielding action for said bars, which, however, by their rigidity have a greatly improved glossing effect or action to what could possibly be attained by a wholly flexible under ironing surface.

I claim—

1. The combination, with the rocking yoke or frame I and one or more ironing-rollers carried by said rocking yoke or frame, of a removable furnace arranged within each of said rollers and independently carried by the said yoke or frame, essentially as described.

2. In an ironing-machine, the combination, with the ironing roller or device, of an inclosed

furnace, B<sup>1</sup>, of cylindrical construction, provided with an opening and closing perforated cover, a<sup>2</sup>, also with a cold-air regulating passage, g<sup>2</sup>, and distributing-apertures h<sup>2</sup>, whereby the ironing roller or device is capable of movement around the furnace, and facilities are afforded for regulating the temperature of the ironing roller or device by the admission of cold air between it and the furnace, substantially as specified.

3. The combination, with the furnace B<sup>1</sup>, of the overlapping ring D' and an ironing roller or device arranged to rotate around said furnace, essentially as described.

4. The trough-like shield E<sup>2</sup>, in combination with one or more rotating ironing-rollers, C, and one or more furnaces, B<sup>1</sup>, arranged within said rollers, and having smoke-boxes d<sup>2</sup> in rear of the rollers, substantially as specified.

5. The self-acting catch or bell-crank lever L, in combination with the main frame A, the rocking yoke or frame I, one or more ironing-rollers, C, carried by said yoke or frame, and the treadle J, substantially as specified.

6. The reciprocating ironing-table B, provided with a series of rising and falling loose parallel bars, a<sup>3</sup>, on its upper surface, in combination with one or more ironing-rollers or upper ironing devices, and means for successively lifting said bars to give an undulatory ironing-surface to the table, essentially as described.

7. The goods-holder C<sup>2</sup>, fitted with a series of loose parallel bars, k<sup>3</sup>, in combination with the reciprocating table B, having also a series of loose parallel bars, l<sup>3</sup>, the interposed elastic strips l<sup>3</sup>, and means for communicating an undulatory motion to the bars a<sup>3</sup> k<sup>3</sup>, substantially as specified.

8. The partially-spiral rotating cams A<sup>3</sup>, in combination with the reciprocating ironing-table B, having loose parallel rising and falling bars a<sup>3</sup> in or on its upper surface, substantially as specified.

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Witnesses:

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