2 Sheets—Sheet 1.

T. S. WILES.

Ironing Machine.

No. 200,419. Patented Feb. 19, 1878.

FIG. 1.

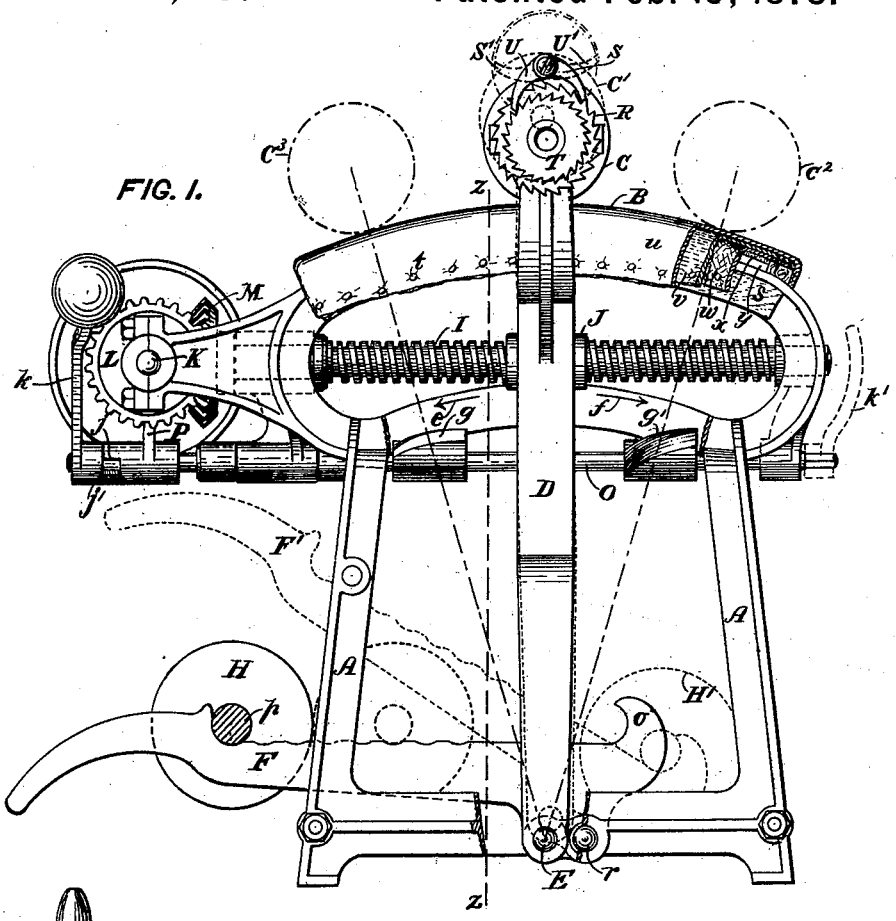
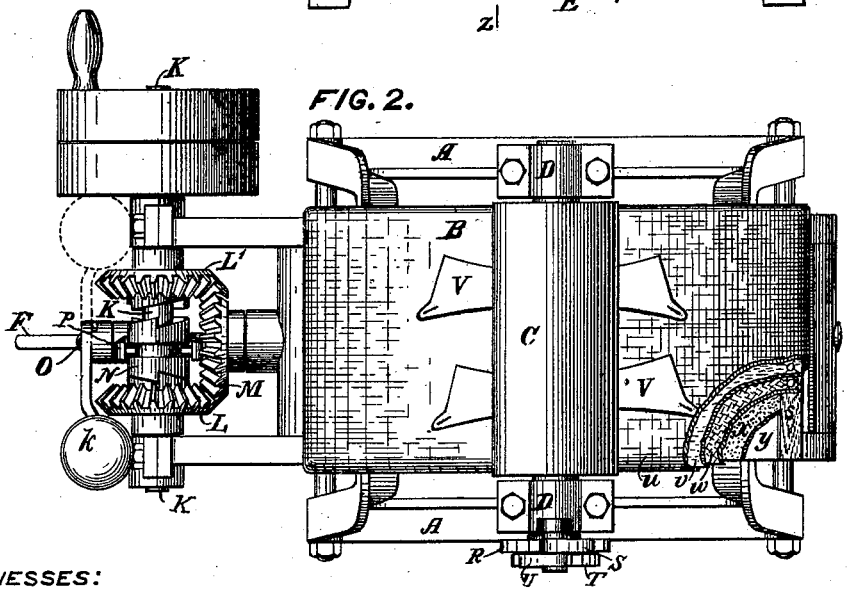


FIG. 2.



WITNESSES:

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James A. Slade.

INVENTOR:

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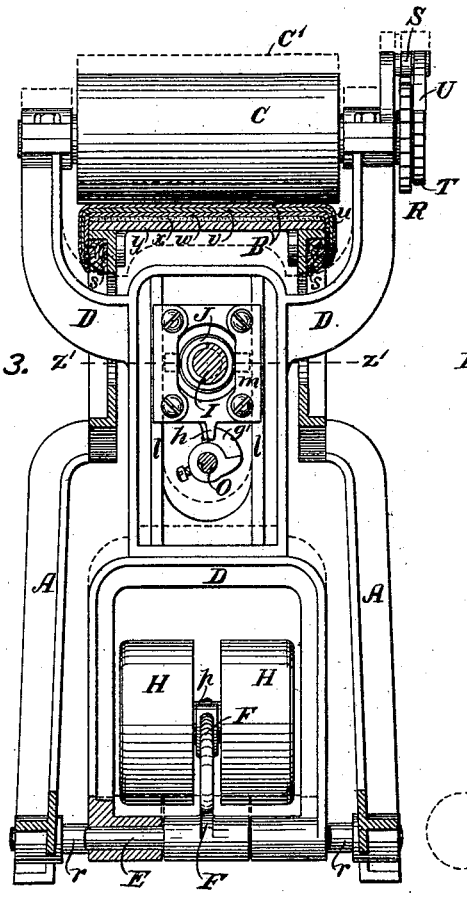
2 Sheets—Sheet 2.

T. S. WILES.
Ironing Machine.

No. 200,419. Patented Feb. 19, 1878.

FIG. 3.



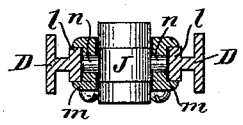


FIG. 7.

FIG. 6.

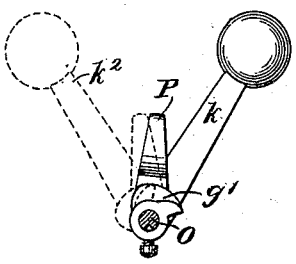


FIG. 4.

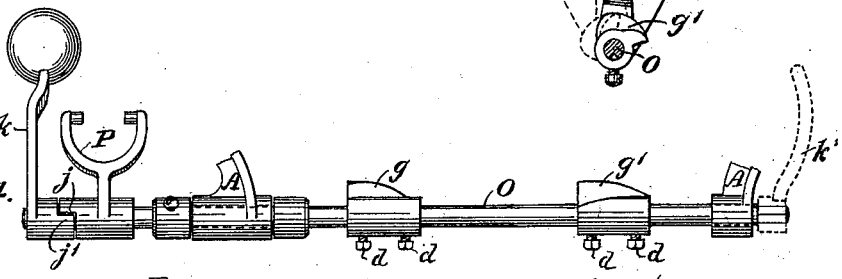
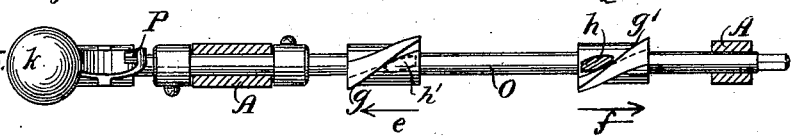


FIG. 5.



WITNESSES:

William A. Rousseau
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INVENTOR:

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UNITED STATES PATENT OFFICE.

THOMAS S. WILES, OF ALBANY, NEW YORK.

IMPROVEMENT IN IRONING-MACHINES.

Specification forming part of Letters Patent No. **200,419**, dated February 19, 1878; application filed May 4, 1877.

To all whom it may concern:

Be it known that I, THOMAS S. WILES, of the city of Albany, in the county of Albany and State of New York, have invented certain new and useful Improvements in Ironing-Machines, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation, partly in section, and Fig. 2 is a plan, some parts being broken out, of a machine which embodies the principle of this invention. Fig. 3 is an elevation, showing a section of the same machine at or about the plane *z z*, Fig. 1; and Fig. 4 is a side view, Fig. 5 a top view, and Fig. 6 an end view, of a part of the same. Fig. 7 is a section of a part at the plane *z' z'*, Fig. 3.

Like letters indicate similar parts in the different figures.

The general object of this invention is to produce a very compact and convenient machine having a reciprocating smoothing-iron, by which, collars, cuffs, and similar articles of cloth can be easily, quickly, and nicely ironed on a curved form.

One part of this invention consists in the combination of a stationary arched bed, having an elastic covering, with a surface of muslin or other suitable fabric which will absorb and discharge moisture, and to which damp collars or cuffs pressed thereon will adhere in being ironed thereon, a hollow smoothing-iron, arranged over and capable of being suitably heated on the bed, and a carrier, mounted on an axis below the stationary bed and secured to the smoothing-iron, and by which the latter can be moved to and fro over and in forced contact with the curved upper surface of the elastic bed, substantially as hereinafter set forth.

Another part consists in the combination of a stationary arched ironing-bed, a smoothing-iron adapted to be heated on the bed, and a carrier supporting the smoothing-iron, and having its axis of vibration below the bed, and movable upward and downward, and weighted, so that thereby the smoothing-iron, in its to-and-fro movements, is made to conform to variations from the proper arc of a circle in the surface of the bed, and is forced with a regulated yielding pressure upon articles of varying thickness being ironed on the bed.

Another part consists in the combination, with the stationary arched ironing-bed, smoothing-iron, and its carrier, of a lever, having a movable weight thereon, and constructed and connected with the axis of the carrier of the smoothing-iron, so that the latter can be thereby easily and quickly raised and retained away from the ironing-bed and returned thereto.

Another part consists in the combination, with a stationary ironing-bed, smoothing-iron, and carrier of the smoothing-iron, of a screw mounted to turn in opposite directions in a constant position, and a nut adapted to be moved forward and backward by the screw, and having a self-adjusting connection with the carrier of the smoothing-iron, whereby the latter is moved to and fro over the bed at a nearly uniform rate of speed from end to end of each to or fro movement.

Another part consists in the combination, with a stationary ironing-bed, smoothing-iron and its carrier, rotary screw and its nut, connected with the carrier, of a rotary driving-shaft, bevel-wheels, clutch, and clutch-shifter, all constructed and arranged substantially as hereinafter described, whereby the rotation of the screw can be reversed and to-and-fro motion given to the smoothing-iron on the bed from the one driving-shaft, turning in only one direction.

Another part consists in the combination, with the reciprocating or vibrating carrier of the smoothing-iron and the reversible driving mechanism, of an automatic shifting mechanism, substantially such as hereinafter described, for controlling the to-and-fro movements of the carrier of the smoothing-iron.

In the aforesaid drawings, A is a frame, which supports the other parts of the machine. B is a stationary ironing-bed, in the form of an arch, and having an elastic covering, with an outer surface which will absorb and discharge moisture, and to which damp starched collars, cuffs, and similar articles of cloth will adhere sufficiently to remain in place while being ironed on the bed. This curved bed is

to consist of any suitable materials. I commonly prefer to have its base *y* of cast-iron, with a layer thereon of elastic vulcanized india-rubber, *x*, which will resist moisture and considerable heat, and to have the india-rubber covered by an elastic layer or layers of felt or woolen fabric, *w*, which is a good non-conductor of heat, with a layer or layers of Canton flannel, *v*, above, and a layer or layers, *u*, of smooth cotton cloth or muslin on the outside. The layer of india-rubber can be cemented, vulcanized, or otherwise secured to the base *y*, and the fibrous coverings can be secured thereon by tacks *t* driven through the fabrics and into strips of wood *s*, or by other suitable means.

C is a hollow smoothing-iron, of cast-iron or other suitable material, and capable of being heated by burning jets of mixed air and gas therein, or by other suitable means. This smoothing-iron is mounted in a carrier, D, which is mounted on an axis or pivot of vibration, E, located under the bed and at the center of the circular curve of the upper surface of the bed, as represented in Fig. 1, so as to thereby insure the to-and-fro movements of the smoothing-iron in forced contact with the elastic bed, and at the same time avoid the greater friction and constraint attending the use of curved ways or guides for the carrier of the smoothing-iron to slide on.

By means of this combination of the stationary arched ironing-bed B, smoothing-iron C, adapted to be heated internally on the bed, and the carrier D of the smoothing-iron, mounted to vibrate to and fro on an axis and in forced contact with the curved surface of the elastic bed, as hereinbefore described, collars and cuffs can be thereby ironed and simultaneously shaped into a curved form approaching that in which such articles are worn in use, and in which they are commonly transported and sold in market, and which cannot be produced by a smoothing-iron reciprocating over a flat ironing-bed; and at the same time this combination of the fixed arched elastic bed, smoothing-iron, and vibrating carrier of the smoothing-iron requires far less room for its operation in ironing articles and is much more convenient for a person to adjust the articles upon the ironing-bed and remove them therefrom than the combination of a smoothing-iron in a constant position and an arched ironing-bed mounted to vibrate to and fro under the smoothing-iron.

I generally prefer to have the axis E of the carrier D secured to a lever, F, which has a weight, H, thereon, or is weighted, and has its fulcrum *r* in the frame A, so that the axis E and carrier D are movable up and down with the lever F.

By the combination of the stationary arched ironing-bed B, smoothing-iron C, and carrier D, secured to an axis, E, movable upward and downward, and weighted, as above specified, the smoothing-iron, in its to-and-fro movements, is made to conform to the surface of the ironing-bed, even though the latter shall vary considerably from the proper arc of a circle, and the smoothing-iron is at the same time pressed by a regulated yielding force upon articles being ironed on the bed, however different and variable such articles shall be in thickness.

The weight H may have any suitable construction; but I commonly prefer to have it made with a central neck or small cylindrical part, *p*, which bears on the lever F, so that the weight can be easily moved or rolled and adjusted on the lever. The lever F has a short arm extending past the fulcrum *r*, and having a stop, *o*, so that by rolling or moving the weight H on the lever to that stop, the lever can then be easily turned into the position indicated by the dotted lines F′ in Fig. 1, and will thereby elevate the carrier D and raise the smoothing-iron off from the bed B, as indicated by dotted lines at C′. The carrier and smoothing-iron will be retained in that elevated position by the weight H when in the position on the lever indicated by dotted lines H′ in Fig. 1, so as to prevent the scorching of the covering of the bed by the heated smoothing-iron when the reciprocating movement of the latter is stopped, or when articles are not being ironed on the bed. The smoothing-iron can be easily lowered onto the bed by pressing down the long arm of the lever F into its position (shown in full lines in Fig. 1,) and in that position the weight H can be readily moved back and adjusted on the long arm of the lever, so as to press the smoothing-iron against the bed with the proper yielding force.

I have a screw, I, mounted below and lengthwise of the stationary bed, and so as to turn in either direction in stationary bearings, and have on this screw a traversing nut, J, which is secured by pivots or trunnions *n n*, Fig. 7, to a slide, *m*, Fig. 3, which is fitted to move up and down on ways *l l* on the carrier. The nut J is thus secured to the carrier D by a connection which is self-adjusting, while the carrier is moved to and fro with the smoothing-iron on the bed at a nearly uniform rate of speed throughout each forward and backward movement, so as to dry and iron articles evenly on the bed, and also while the carrier is elevated with the smoothing-iron away from the bed, the screw I being uniformly turned in opposite directions alternately by any suitable means.

K is a primary driving-shaft, having thereon two reversely-arranged loose bevel-gear wheels, L L′, both engaged with a bevel-gear wheel, M, fast on the shaft of the screw I. The inner ends of the hubs of the wheels L and L′ have clutches, between which, on the shaft K, is a corresponding double clutch, N, fitted to be turned with and by that shaft, and to be slid thereon by a shifter, P, so as to engage with and cause the rotation of either

the wheel L, as shown in Fig. 2, or the wheel L′, and thus cause the wheel M and screw I to be revolved to the right and to the left alternately, at a uniform rate of speed, from the one driving-shaft K turning in one direction only.

The clutch-shifter P is mounted on a rock-shaft, O, on which is a lever-arm, *k* or *k*¹, by which a person attending the machine can conveniently operate that clutch-shifter.

By the combination of the driving-shaft K, bevel-wheels L L′ M, clutch N, and shifter P with the screw I, nut J, carrier D, smoothing-iron C, and stationary ironing-bed B the machine is rendered very compact, and the smoothing-iron can be moved to and fro on the bed at a nearly uniform rate of speed from the shaft K, which is at right angles to the lengthwise direction of the bed, so that a series of the machines can be placed and conveniently used side by side in a row, and all driven by belts running directly from pulleys on one main rotary shaft arranged lengthwise with the row of machines.

The clutch-shifter P has on and independently of the shaft O a short rocking movement, limited by a projection, *j*, on the loose sleeve of the shifter, and another, *j*′, fast on the rock-shaft. On the under side of the slide *m* of the carrier D is a lug, *h*, Fig. 3, and fast on the shaft O, and in the path of the to-and-fro movements of the lug *h*, are two stops or cams *g*, and *g*′, arranged so that as the carrier D approaches the end of its allotted movement in the direction indicated by the arrow *f* in Figs. 1 and 5 the lug *h* will bear against the cam *g*′, as indicated in full lines in Fig. 5, and thereby turn the rock-shaft O and the weighted lever *k* from its inclined position, in full lines in Fig. 6 and in dotted lines in Fig. 2, to and a little past a vertical position over the rock-shaft, as in Fig. 5, whereupon the weighted lever *k* will fall into the inclined position indicated by dotted lines at *k*² in Fig. 6 and in full lines in Fig. 2, and will thereby move the shifter P, so as to disengage the clutch N from the wheel L′ and engage it with the wheel L, as shown in Fig. 2, and thereby automatically reverse the rotation of the screw I, and the consequent transverse movement of the carrier D and smoothing-iron; also, as the carrier D approaches the end of its assigned movement in the direction pointed by the arrow *e*, Figs. 1 and 5, the lug *h* will bear against the stop *g*, as indicated by dotted lines at *h*′ in Fig. 5, and will turn that stop and the shaft O, with the weighted lever *k*, so that the latter will fall back into the inclined position represented by full lines in Fig. 6 and dotted lines in Fig. 2, and thereby move the shifter P, so as to disengage the clutch N from the wheel L and engage it with the wheel L′, and thus automatically reverse the motion of the screw I and carrier D of the smoothing-iron. The cams or stops *g* and *g*′ can be secured by screws *d d* at different distances apart and in various positions on the shaft O, so as to thereby give longer or shorter to-and-fro movements to the smoothing-iron, as shall be desirable in ironing collars, cuffs, and other articles of different lengths.

The smoothing-iron C, which I generally prefer, is cylindrical, and has at its ends hollow journals, fitted to turn in boxes in the carrier D. Two reversely-arranged ratchet-wheels, R and T, are fast on the shaft of the smoothing-iron, and are furnished with pawls S and U, which can be separately engaged with the ratchet-wheels, as shown in full lines in Fig. 1, and can be separately disengaged therefrom, as indicated by dotted lines at S′ and U′. The one ratchet-wheel R and its pawl S, arranged as represented in the drawings, are all that are commonly necessary to make the smoothing-iron produce either a polish ironed surface or a lusterless finish on the articles ironed thereby.

In using the machine, the person attending it will generally be seated near the end of the bed farthest from the gear-wheels, and while the smoothing-iron is suitably heated and moved to and fro between the positions indicated by dotted lines at *c*² and *c*³, Fig. 1, will place the damp articles or collars V, Fig. 2, on the bed when the smoothing-iron is away at *c*³, and will let the articles be there ironed on one side, and will turn them over and replace them on the bed, so as to cause the other side to be ironed, if necessary, and will next remove them from the bed and place others thereon.

What I claim as my invention is—

1. The combination of the supporting-frame A, arched ironing-bed B, stationary on the supporting-frame, vibrating carrier D, mounted on an axis, E, below the stationary bed, and the smoothing-iron C, secured to the vibrating carrier, and thereby moved to and fro along and in forced contact with the stationary arched bed, substantially as described.

2. The combination of the stationary curved ironing-bed B, smoothing-iron C, and carrier D, having its axis of vibration below the bed, and movable upward and downward, and weighted, so that the smoothing-iron, in its to and fro movements, shall conform to variations in the surface of the bed, and be pressed with a regulating yielding force upon articles of various thickness being ironed on the bed, substantially as described.

3. In combination with the stationary arched bed B, smoothing-iron C, and carrier D of the smoothing-iron, the lever F, connected with the axis E of the carrier, and having an adjustable weight, H, whereby the smoothing-iron can be elevated and retained away from the bed, and returned thereto, substantially as set forth.

4. In combination with the stationary ironing-bed B, smoothing-iron C, and carrier D, the screw I, mounted to turn in opposite directions, and the traversing nut J, having a self-adjust-

ing connection with the carrier, substantially as described.

5. The combination, with the stationary ironing-bed, smoothing-iron and its carrier, screw I, and nut J, connected with the carrier, of the driving-shaft K, bevel-gears L L′ M, clutch N, and clutch-shifter P, all constructed and arranged substantially as described.

6. The combination of the stationary ironing-bed, smoothing-iron and its carrier, screw I, nut J, reversible gearing for turning the screw in opposite directions, rock-shaft O, inclines *g g′*, finger *h*, shifter P, and weighted rocking lever *k*, adapted to fall on opposite sides of the rock-shaft and thereby actuate the shifter, substantially as described.

In testimony whereof I hereunto set my hand in the presence of two subscribing witnesses this 30th day of April, 1877.

THOMAS S. WILES.

Witnesses:
WILLIAM A. ROUSSEAU,
JAMES H. SLADE.