2 Sheets—Sheet 1.

J. F. BALDWIN.

MANGLE.

No. 174,463. Patented March 7, 1876.

Fig. 1.

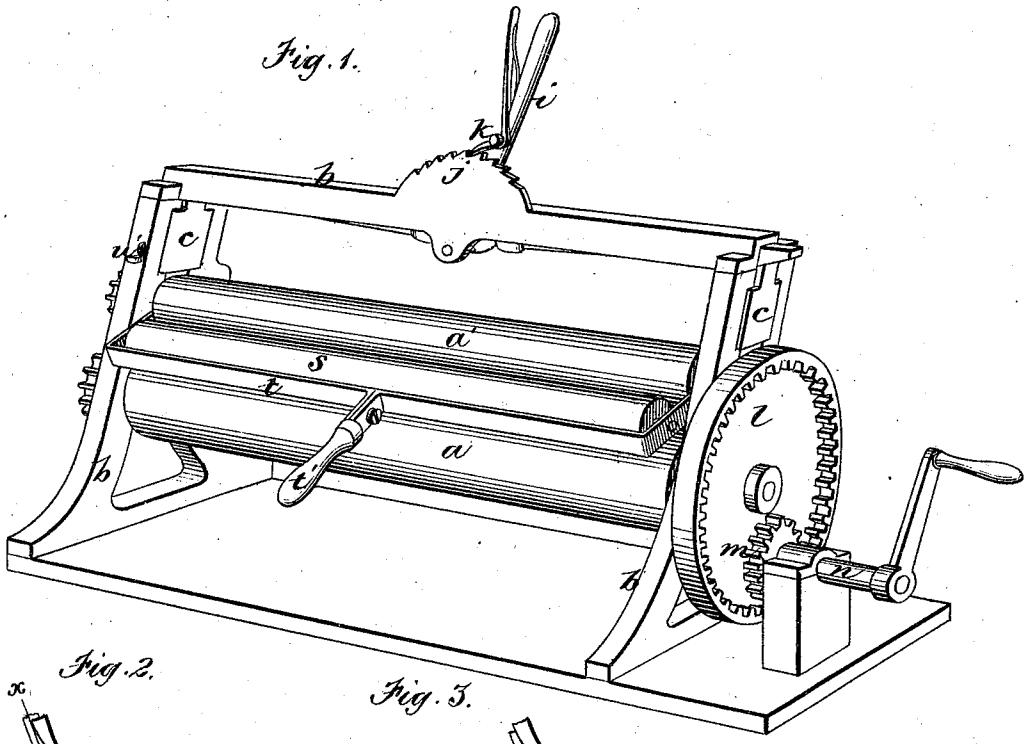


Fig. 2.

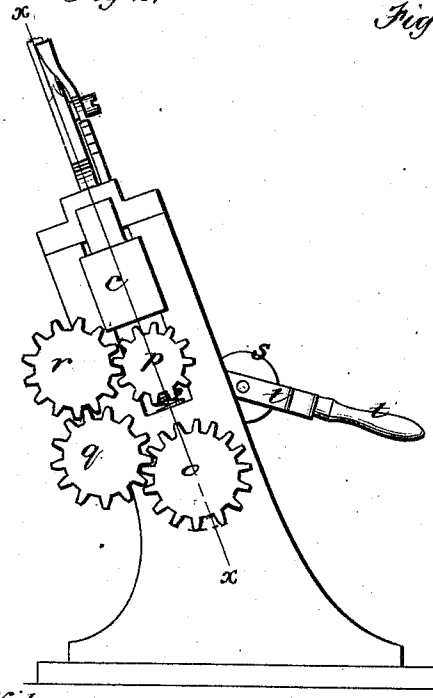
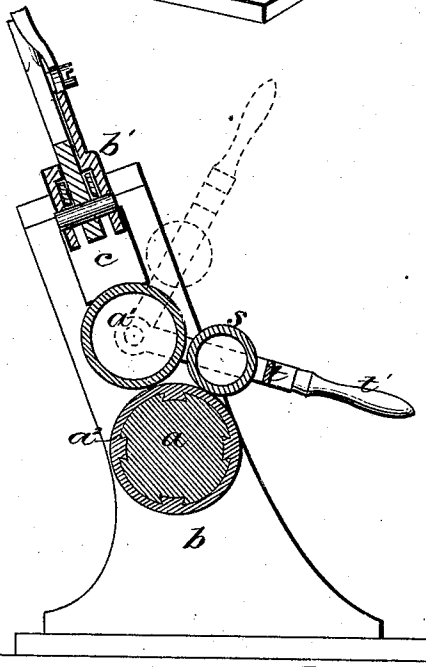


Fig. 3.



Witnesses.
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2 Sheets—Sheet 2.

J. F. BALDWIN.

MANGLE.

No. 174,463. Patented March 7, 1876.

Fig. 4.

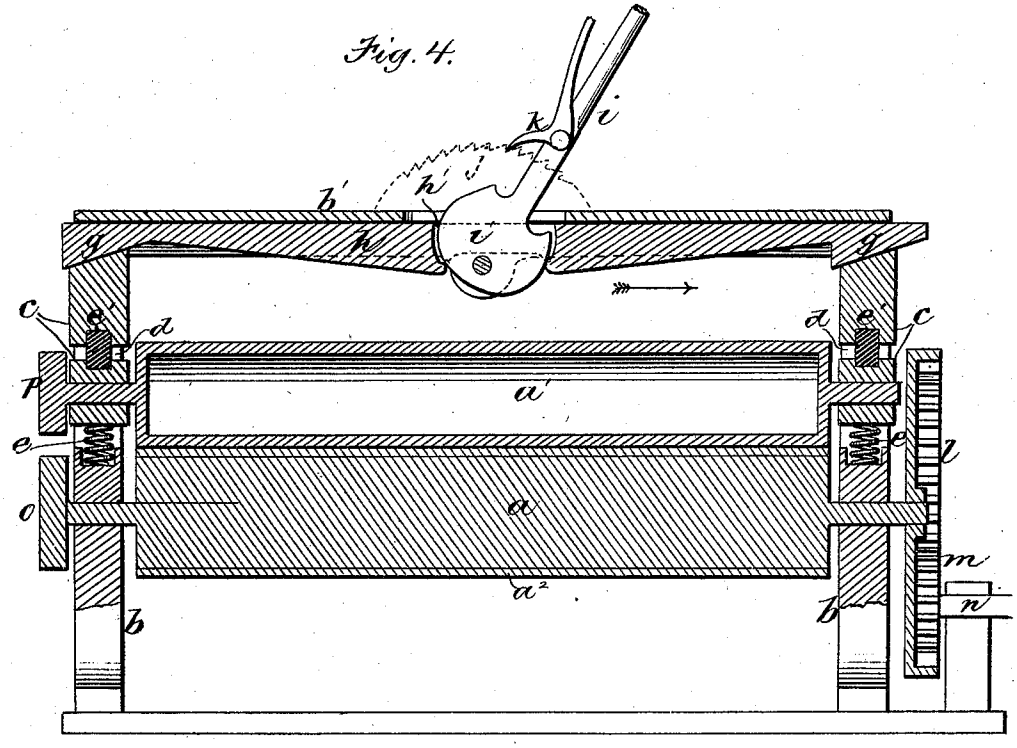


Fig. 5.

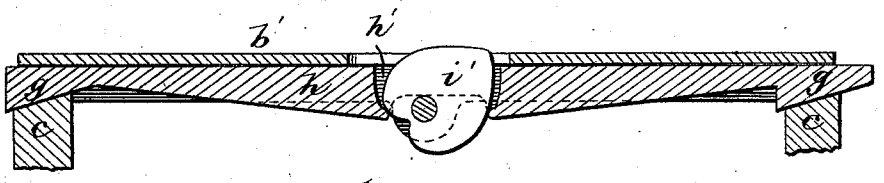


Fig. 6.

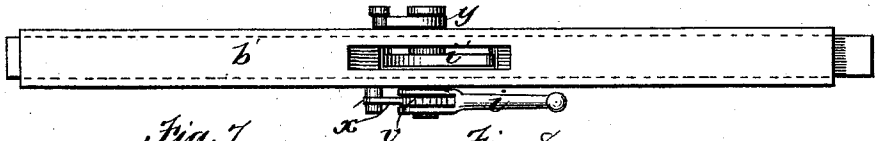


Fig. 7.

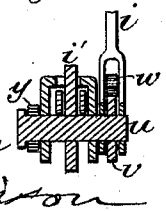
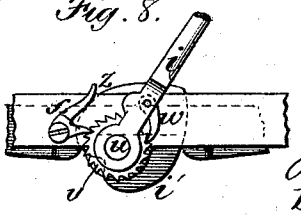


Fig. 8.



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UNITED STATES PATENT OFFICE.

JOSEPH F. BALDWIN, OF CHELSEA, MASSACHUSETTS.

IMPROVEMENT IN MANGLES.

Specification forming part of Letters Patent No. **174,463**, dated March 7, 1876; application filed December 21, 1875.

To all whom it may concern:

Be it known that I, JOSEPH F. BALDWIN, of Chelsea, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Mangles, of which the following is a specification:

In the accompanying drawings, forming a part of this specification, Figure 1 represents a perspective view of my improved mangle. Fig. 2 represents an end elevation of the same. Fig. 3 represents a transverse vertical section. Fig. 4 represents a longitudinal section on the plane of line *x-x*, Fig. 2. Figs. 5, 6, 7, and 8 are detail views of a modification of the mechanism for operating the wedge-bar.

My invention consists, first, in the combination, in a mangle, of two pressure-rolls, one having a hard polished periphery, and the other a rigid core or body with a somewhat elastic periphery of vulcanized rubber, and one having yielding bearings, which adapt it to yield bodily to a slight degree, and the other having fixed or unyielding bearings, thereby dividing the elasticity between the elastic bearings and the elastic surface, and enabling the latter to be made with the minimum of elasticity, and preventing it from becoming readily distorted. Secondly, in the combination, with a wedge-bar adapted to exert pressure simultaneously at two or more points by its longitudinal motion, of a cam and lever adapted to effect the longitudinal motion of the wedge-bar in a positive and expeditious manner. Thirdly, in the combination, with the sliding bearing-blocks of the adjustable or yielding roll, in a pair of pressure rolls, of supporting-springs adapted to force said adjustable roll away from its companion, and a wedge or pressure-bar adapted to expeditiously exert any desired degree of pressure simultaneously, and in the same degree, upon the sliding bearing-blocks against the force of the supporting-springs, and to as expeditiously release said blocks and allow them to be raised by their springs, the adjustable roll being thus adapted to be quickly pressed against or separated from its companion, and being kept parallel with the same meanwhile. Fourthly, in the combination, with a two-rolled mangle, of an auxiliary roll, adapted to co-operate with the pressure-rolls, all of which I will now proceed to describe, and point out in my claims.

In the drawings, *a* a^1 represent parallel pressure-rolls, of metal or other suitable material, having their bearings in a suitable frame, *b*, the lower roll *a* being located in fixed bearings, and the upper roll a^1 in yielding or adjustable blocks *c*, which are preferably made in two parts. The blocks *c* are adapted to slide in slots *d* in the frame *b*, and are provided with pressure devices, hereinafter described, for depressing said rolls and springs, for raising the roll when the pressure is removed. One of the pressure-rolls (preferably the lower one) is provided with a coating of vulcanized rubber, a^2, of suitable thickness. This coating is preferably applied to the roll while soft, and is then vulcanized to a considerable degree of hardness, leaving it slightly elastic, the roll being provided with dovetail grooves which hold the rubber in place. The other pressure-roll has a smoothly-polished metal surface, and may be adapted to be heated by steam, or otherwise, if desired. *e e* represent springs, of any suitable construction and material, which support the bearing-blocks *c* of the upper roll a^1, and are adapted to raise said roll under certain conditions, as will be presently described. *e e'* represent springs, or elastic blocks interposed preferably between the two parts of the block *c*, these elastic blocks permitting the upper roll to yield or rise bodily to a slight extent, for the purpose of dividing the elasticity, as described hereinafter.

The upper surfaces of both the pressure-blocks *c* are preferably inclined, as shown in Fig. 4, and upon these inclined surfaces bear the inclines or wedges *g g* of the horizontal wedge-bar *h*, the latter being adapted to slide horizontally in a groove in the horizontal portion or cross-bar *b'* of the frame *b*, its wedges being caused to exert a downward pressure on the blocks *c* by this motion. The sliding of the bar *h* and its wedges in the direction of the arrow, Fig. 4, causes the wedges to depress the bearing-blocks *c* and the pressure-roll a^1 against the pressure of the springs *e*, as will be readily understood. This motion of the bar *h* is effected by a cam, *i'*, operated by a

lever, *i*, the cam being pivoted to the cross-bar *b'* and entering a slot or camway, *h'*, in the middle of the wedge-bar *h*, and bearing against the ends of the slot in such manner as (when turned on its pivots) to force said bar in one direction or the other, according to the direction in which it is turned. The cam is of such width as to nearly fill the slot or camway *h'*; consequently its edges are always close to the ends of the slot, and the wedge-bar responds readily to every movement of the cam, which is so formed as to impart a rapid movement to the wedge-bar when it is turned by its lever. Pressure is thus exerted quickly, and in the same degree, on each of the sliding blocks of the roll a^1, and the latter is expeditiously raised and lowered, and is kept in a position parallel with that of the roll *a*.

j represents a stationary segmental ratchet located on the cross-bar *b'* of the frame in such position as to engage a spring-pawl, *k*, on the lever *i*, and hold the latter in any desired position within the arc of its movement, thus enabling different degrees of pressure to be applied to the roll a^1 and maintained.

This part of my invention, viz., the wedge-bar and its operating cam, may be applied to any mechanism in which it is desirable to exert pressure simultaneously, and in the same degree, at two or more points.

In a small mangle, or whenever a limited movement of the object on which the pressure is exerted is necessary, the lever *i* may be rigidly attached to the cam *i'*, as shown in Fig. 4; but when a greater degree of adjustment is desired than can be conveniently obtained by a single movement of the lever in an arc of moderate length, the cam and lever may be made in two parts, as shown in Figs. 5, 6, 7, and 8.

In this construction, one of the trunnions, *u*, of the cam projects beyond the cross-piece *b'*, and is provided with a ratchet, *v*, which is rigidly affixed thereto. The lever *i* is pivoted to the trunnion *u* of the cam or otherwise, so as to swing independently of the cam, and is provided with a pawl, *w*, which engages with the teeth of the ratchet *v*. *x* represents a pawl, which holds the ratchet *v* against the tension of a spring, *y*, which tends to force the wedge-bar back and release the pressure it exerts, when the ratchet *v* is released, said spring being applied in such manner as to partially rotate the cam, or to draw the wedge-bar.

This construction enables a series of short vibrations of the lever to effect the desired movement of the wedge-bar by means of the pawl *w* and ratchet *v*, the cam being turned intermittently until the desired degree of pressure is obtained.

To remove the pressure, the lever is swung over against a projection, *z*, on the pawl *x*, and throws the latter out of contact with the ratchet *v*, releasing the latter and allowing the spring *y* to throw back the wedge-bar.

This arrangement enables the lever to be always within convenient distance of the operator, and obviates the necessity of swinging the lever through long arcs or vibrations.

The roll *a* is preferably provided at one end with a large internal gear-wheel, *l*, which meshes with a pinion, *m*, on the crank or driving shaft *n*. *o* represents a cog-wheel on the opposite end of the axis of the lower roll *a*; and *p* represents a cog-wheel on the end of the upper roll. *q r* represent two intermediate cogs, which are journaled on the frame *b*, and mesh with each other, the cog *q* meshing also with the cog *o* on the axis of the lower roll *a*, and the cog *r* with the cog *p* on the axis of the upper roll a^1, the four cogs constituting parallel gears, whereby the positive rotation imparted to the lower roll by the prime motor is transmitted in the opposite direction to the upper roll, the latter being free to rise and fall, and its cog-wheel *p* being entirely free from the cog-wheel *o* on the axis of the lower roll. *s* represents an auxiliary roll parallel with the pressure-rolls *a* a^1. This auxiliary roll is journaled in a frame, *t*, which is pivoted to the axis of the upper roll a^1, or to the frame of the mangle, or otherwise, in such manner as to allow the auxiliary roll to be raised and lowered, and pressed when lowered against the periphery of the lower pressure-roll *a*. The frame *t* is of any suitable construction, and is provided with a handle, *t'*, for convenience of operation.

The axis of the upper pressure-roll a^1 is located on a different vertical plane from that of the lower roll *a*, the upper roll being located back of the vertical plane of the lower roll, instead of being in the same vertical plane, as is usually the case. By this arrangement the upper surface of the lower roll is exposed to a certain extent, and the goods to be pressed are enabled to be more readily presented to the action of both rolls *a* a^1. The fabric to be pressed is laid on the projecting upper surface of the lower pressure-roll *a* while the auxiliary roll is elevated, after which the auxiliary roll is lowered and pressed upon the fabric, the positive rotation of the roll *a* inducing the rotation of the auxiliary roll, which co-operates with the roll *a* in feeding the fabric along to the point where it is drawn between the rolls *a* a^1. The auxiliary roll thus acts as a feed-roll, and at the same time eradicates all wrinkles in the fabric before it is acted on by the rolls *a* a^1, and holds the lower side of the fabric in contact with a large extent of the area of the lower roll *a*, thereby enabling the latter to have a better ironing or smoothing effect, particularly if it is heated, than if the auxiliary roll were not employed.

If desired, the auxiliary roll, as well as the polished pressure-roll, may be heated by steam or otherwise, in which case I prefer to connect it to the heated pressure-roll by a flexible pipe, and use the same medium for heating both.

From the foregoing, and by reference to the drawings, it will be seen that the following improvements are effected: First, a mangle is produced having two pressure-rolls, one of which has a slightly-elastic, and, therefore, yielding, periphery of vulcanized rubber, while the other has a hard polished periphery. This construction I have found to produce the best possible results, the polished roll imparting a gloss to the fabric on one side, and the vulcanized covering being sufficiently firm to have a good pressing effect, and be kept in good condition on the roll, and at the same time being sufficiently yielding to prevent the pressure of the roll *a a*^{1} from cutting the fabric when a crease occurs in the latter, which would take place if there were no elasticity. Secondly, a two-rolled mangle is produced, in which one roll has a yielding periphery, produced by the rubber coating *a*^{2}, and the other a rigid periphery, and one having bearings, which are adapted to rise or yield by means of the springs *e'*, and the other having fixed or unyielding bearings. By this construction I am enabled to divide the elasticity between the yielding bearings and the yielding surface, which permits the latter to be made less elastic than if both rolls were in fixed bearings. I am thus enabled to preserve the parallelism of the rolls more perfectly than I could if the only elasticity was that given by the rubber-surfaced roll, as in that case the rubber surface would necessarily be so elastic as to yield unequally at different points and become distorted and uneven. Thirdly, a two-rolled mangle is produced, in which the adjustable roll is adapted to have any desired degree of pressure instantly applied to or removed from its bearings, and thereby be quickly pressed against the other roll or separated from the same, an equal degree of pressure being applied to each bearing. This is accomplished by means of the cam and lever *i' i*, wedges and wedge-bar *g g h*, sliding bearing-blocks *c c*, and supporting-springs *e e*, the latter acting against the downward pressure exerted on the bearings of the roll by the wedges, and raising said bearings as the pressure is removed. I am thus enabled to facilitate the entrance of thick fabrics between the pressure-rolls by first throwing back the cam-lever, and relieving the pressure on the upper roll, which is thrown up by its supporting-springs, the rolls being thus separated. After the fabric has been inserted between the rolls a movement of the cam-lever depresses the upper roll to any desired extent, the pressure being equal in degree, and simultaneously exerted on both bearings of the roll, and maintained by the segmental ratchet *j* and pawl *k*. Fourthly, the auxiliary roll, as has been before stated, assists the lower pressure-roll in feeding the fabric to the two pressure-rolls, smooths out wrinkles in the fabric, and increases the ironing or smoothing effect of the lower roll by holding the cloth in contact with a greater extent of its surface.

I prefer to provide the frame of the mangle with a spring-catch, *w'*, adapted to automatically engage with the frame *t* of the auxiliary roll, and hold the latter in an elevated position when not in use.

If desired, the auxiliary roll may be provided with yielding bearings.

I claim as my invention—

1. In a mangle, the combination of two pressure-rolls, *a a*^{1}, one being entirely rigid, and having a smooth polished periphery, and the other having a rigid body with a coating, *a*^{2}, of slightly-elastic vulcanized rubber, and one having fixed bearings, and the other automatically-yielding bearings, which are provided with springs *e'*, substantially as described, for the purpose specified.

2. The solid or continuous wedge-bar *h*, having inclines or wedges *g g* and slot or camway *h'*, and adapted to slide longitudinally in a suitable way or guide, combined with the cam *i'*, located in said camway, and adapted to be turned therein, and thereby impart a longitudinal motion to the wedge-bar, substantially as described, for the purpose specified.

3. The sliding bearing-blocks *c* of a pressure-roll, combined with springs *e* adapted to support said bearing-blocks and exert an upward yielding pressure thereon, and a wedge-bar, *h*, adapted to simultaneously depress said bearing-blocks, substantially as described, for the purpose specified.

4. The combination of the wedge-bar *h*, having inclines or wedges *g g*, the cam *i'*, having lever *i* and pawl *k*, the stationary segmental ratchet *j*, the sliding blocks *c*, the supporting-springs *e*, and the roll *a*^{1}, all arranged and operating substantially as described.

5. The cam *i'*, having the ratchet *v*, combined with the lever *i*, having the pawl *w*, the pawl *x*, having the projection *z*, the spring *y*, and the wedge-bar *h*, all arranged and operating substantially as described.

6. The combination of the sliding bearing-blocks *c*, elastic blocks or springs *e'*, and pressure-roll *a*^{1} with the lower roll *a*, all arranged and operating substantially as described.

7. The auxiliary roll S, journaled in a pivoted frame, *t*, in combination with the pressure-rolls *a a*^{1}, all arranged and operating substantially as described.

8. The combination of the adjustable roll *a*^{1}, sliding bearings *c'*, supporting-springs *e*, elastic blocks or springs *e'*, wedge-bar *h*, and cam *i'* with the frame *b* and non-adjustable roll *a*, all arranged and operating substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOSEPH F. BALDWIN.

Witnesses:
A. E. DENISON,
C. F. BROWN.