(No Model.)

J. G. CRAWFORD.

STARCHING MACHINE.

No. 409,019. Patented Aug. 13, 1889.

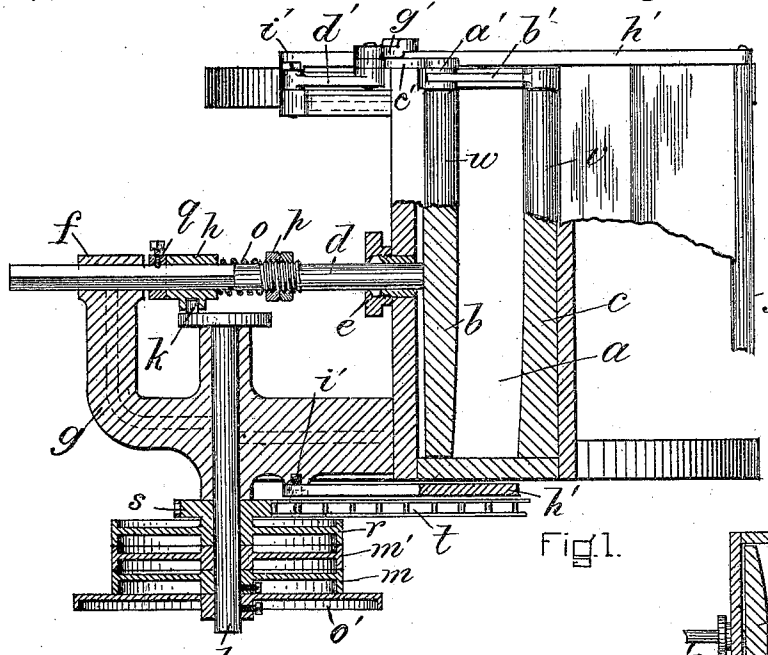

Fig. 1.

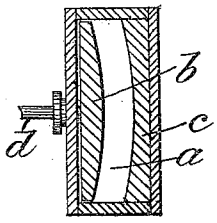

Fig. 4.

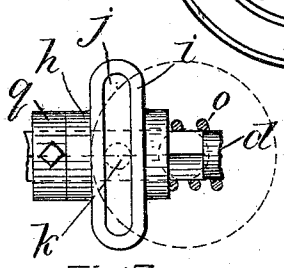

Fig. 3.

Fig. 2.

WITNESSES.
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JAMES G. CRAWFORD, OF BOSTON, MASSACHUSETTS.

STARCHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 409,019, dated August 13, 1889.

Application filed May 28, 1888. Serial No. 275,288. (No model.)

To all whom it may concern:

Be it known that I, JAMES G. CRAWFORD, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Starching-Machines, of which the following is a specification.

This invention has for its object to provide a simple and easily-operated machine, whereby the operations of saturating garments or other goods of textile fabric with starch and of squeezing out the surplus starch from said goods may be expeditiously performed; and it consists in the improvements which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a top view of my improved starching-machine, showing the same partly in section. Fig. 2 represents an end elevation of the machine. Fig. 3 represents a detached view of a part of the machine. Fig. 4 represents a longitudinal section of the starch-box and the plunger therein.

The same letters of reference indicate the same parts in all the figures.

In the drawings, *a* represents the starch box or receptacle, within which is the movable plunger *b*. Said plunger is adapted to be reciprocated crosswise of the starch-box and to press the goods in the box against the fixed side piece *c* in said box. The plunger is provided with a rod *d*, which extends from its rear side through a stuffing-box *e* in one side of the starch-box and through a fixed guide *f* on a frame or bracket *g*, attached to the starch-box or other fixed part of the machine. On said rod is a sleeve *h*, having an enlargement *i*, in which is a vertical slot *j*, which receives an eccentric wrist-pin *k* on a disk affixed to a shaft *l*. Said shaft is journaled in a bearing in the frame or bracket *g*, and is driven by a belt running on a pulley *m*, affixed to said shaft. The rotation of the shaft *l* causes the eccentric-pin *k* to reciprocate the sleeve *h*, and through the latter the rod *d* and plunger *b*. The sleeve *h* is adapted to slide on the rod *d*, and in moving forward it imparts motion to the rod through a spring *o*, interposed between the sleeve and a nut or enlargement *p* on the rod. Said spring enables the plunger to yield when it comes to a bearing on the goods in the box *a*, the sleeve moving on independently of the plunger and rod and compressing the spring after the movement of the plunger is stopped by the goods against which it bears. The plunger is thus enabled to conform automatically to the thickness of the goods. When the sleeve *h* is moving in the opposite direction, it bears against a collar *q*, attached to the rod *d*.

r represents a loose pulley mounted on the shaft *l*, and having a sprocket-wheel *s* attached to its hub. Said wheel is connected by a sprocket-chain *t* with a sprocket-wheel *u* on the axle of a wringer-roll *v*, which is journaled in fixed bearings on the ends of the box *a*, and is located over the fixed side *c* of said box.

w represents a wringer-roll, which is journaled in bearings *a' a'*, adapted to move in fixed guides *b' b'* toward and from the roll *v*.

To the ends of the axle of the movable roll *w* are connected links *c' c'*, each constituting a member of a toggle-joint, the other link *d'* of which is pivoted at *e'* to a fixed arm or bracket *f'*. The meeting ends of said links are connected by rods *g'* with levers *h'*, the rear ends of which are pivoted to fixed supports at *i' i'*, their forward ends being connected by a cross-bar or handle *j'*. By depressing the levers *h' h'*, as indicated in dotted lines in Fig. 2, the toggle-joints *c' d'* are straightened and caused to hold the roll *w* against the roll *v* or against the goods which may be interposed between said rolls. When the rolls *w v* are thus brought together and the roll *v* is rotated by the shifting of the driving-belt onto the pulley *r*, the goods in the box *a* may be withdrawn therefrom and at the same time deprived of the surplus starch which they have absorbed by the action of the rolls *w v*. When the levers *h' h'* are raised, the links of the toggle-joints are thrown out of alignment, and are thus caused to draw the roll *w* away from the roll *v*, as indicated by full lines in Fig. 2. The parts may be held in the position last described by a swinging latch *k'* engaging the handle or cross-bar *j'*.

An idle-pulley *m'* is placed on the shaft *l* between the fast pulley *m* and wringer-oper-

ating pulley r, and a balance-wheel o' is affixed to said shaft, said wheel having an indicator p', which shows by its position the position of the plunger b with relation to the side c of the starch-box, and indicates whether the plunger is holding the goods against said side or not, so that the operator can avoid operating the wringer-rolls when the goods are thus held, it being obvious that if the wringer-rolls were operated to withdraw the goods from the box while said goods are clamped by the plunger against the side of the box serious damage might be inflicted to the goods.

The operation of the machine is as follows: The driving-belt being placed on the fast pulley m, the plunger is reciprocated by the resulting rotation of the shaft l until the starch is sufficiently pressed into the meshes of the goods in the starch-box. The operation of the machine is then stopped by shipping the belt to the idle-pulley m' until the operator shifts the belt to the pulley r, and thus causes the rotation of the wringer-roll v. The movable roll w being then moved to position to co-operate with the rotated roll v, the goods may be withdrawn from the starch-box and squeezed by said rolls. When the operation of the machine is to be discontinued, the belt is shifted to the idle-pulley m'.

It will be seen that the machine is simple and easily controlled by the operator.

I claim—

1. The combination of a starch-box, a plunger therein, a rod d, affixed to the plunger, fixed guides for said rod, shoulders or stops affixed to the rod, a sleeve adapted to move on said rod between said shoulders, a spring interposed between said sleeve and one of said shoulders, and means for reciprocating said sleeve, as set forth.

2. The combination of the starch-box, the plunger b therein, having a rod d, the roll mounted in fixed bearings over said box, the driving-shaft l, having the fast pulley m and the idle-pulley m', a connection between said shaft and the rod d, whereby said rod and plunger are reciprocated, the loose pulley r on said shaft, having the sprocket-wheel s attached to its hub, a sprocket-wheel u, attached to the roll v, the chain t, connecting the wheels u s, the movable loose roll w, and means, substantially as described, whereby said roll may be held in operative relation to the roll v, as set forth.

3. The combination of the starch-box, the plunger b therein, having a rod d, the roll v, mounted in fixed bearings over said box, the driving-shaft l, having the fast pulley m and the idle-pulley m', a connection between said shaft and the rod d, whereby said rod and plunger are reciprocated, the loose pulley r on said shaft, having the sprocket-wheel s attached to its hub, a sprocket-wheel u, attached to the roll v, the chain t, connecting the wheels u s, the movable loose roll w, means, substantially as described, for moving the roll toward and from the roll v, and the indicator p', attached to the driving-shaft l, whereby the position of the plunger is indicated, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 25th day of May, A. D. 1888.

JAMES G. CRAWFORD.

Witnesses:

C. F. BROWN,

A. D. HARRISON.