(No Model.) 2 Sheets—Sheet 1.

G. B. WHEELER.

STARCHING MACHINE.

No. 552,024. Patented Dec. 24, 1895.

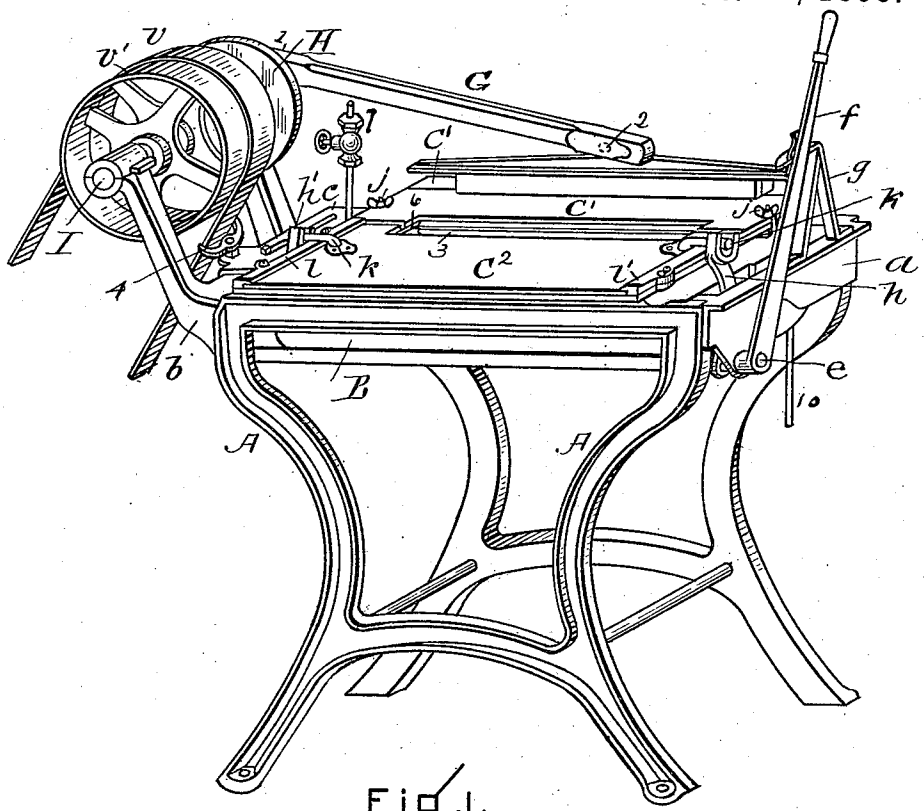

Fig. 1.

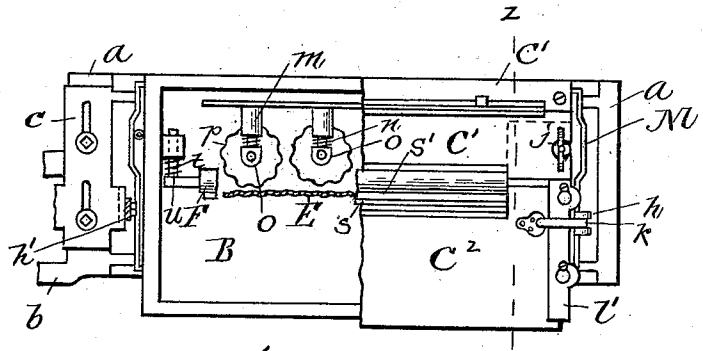

Fig. 3.

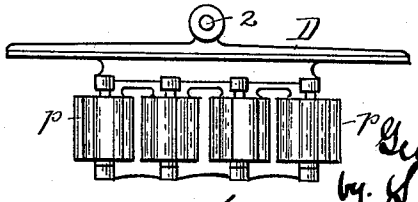

Fig. 2.

WITNESSES

G. M. Sharp

E. F. Knoll

INVENTOR

George B. Wheeler

by Langer Roberts

his attys

(No Model.) 2 Sheets—Sheet 2.

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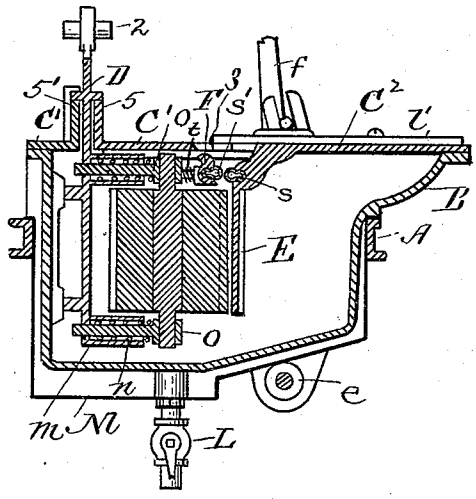

Fig. 4.

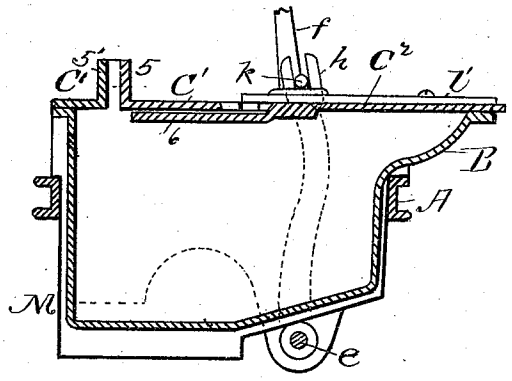

Fig. 5.

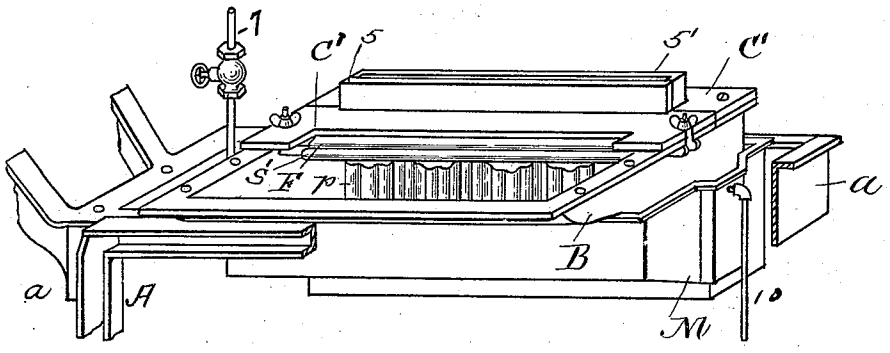

Fig. 6.

WITNESSES

J. M. Shaw.

C. F. v. Groll

INVENTOR

George B. Wheeler.

by Lange & Roberts

his Attys.

UNITED STATES PATENT OFFICE.

GEORGE B. WHEELER, OF BELLOWS FALLS, VERMONT.

STARCHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 552,024, dated December 24, 1895.

Application filed June 22, 1894. Serial No. 515,433. (No model.)

To all whom it may concern:

Be it known that I, GEORGE B. WHEELER, of Bellows Falls, in the county of Windham and State of Vermont, have invented an Improvement in Starching-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention pertains to that class of starching-machines designed more particularly for starching the bosom and cuffs of shirts, and in which the starch is carried in bulk in a trough and the article to be starched is submerged in the starch and subjected to the action of a rub-board and a series of rolls to thoroughly incorporate the starch into the body of the material.

In this class of machines it is customary to fold the shirt-bosom once lengthwise upon itself and to lay the cuffs of the shirt upon this fold and insert the three parts through an opening in the trough and submerge it in the starch between the rub-board and rolls. In such cases those parts to be starched present an uneven mass or body to the rolls, and it is of great importance that the action of the rolls should be such as to thoroughly incorporate the starch into the material and at the same time prevent unnecessary wear, tearing, or abrading of the cloth. Again, it is important that all splashing of the starch from the trough should be avoided, and especially that the starch should be prevented from splashing over those portions of the article which are not intended to be starched.

It is the object of my invention to provide a simple, compact starching-machine which shall secure these results, and to provide simple and efficient means for securing relative adjustment between the rolls and rub-board and to start and stop the machine with a minimum amount of labor.

To these ends my invention is fully described and pointed out in the following description and claims.

Figure 1 is an isometric view of the machine with the parts shown in working position with the driving-belt on the fast pulley. Fig. 2 shows in elevation the roll-carrier with its rolls mounted in the movable bearings. Fig. 3 is a detail, partly in section and partly in plan, showing more clearly the relative arrangement of the rub-board and rolls and the journals for the latter, as well as the guard in the opening to be referred to. Fig. 4 is a central transverse vertical section of the machine. Fig. 5 is a detail section on line *z z* of Fig. 3 to show more clearly the relative arrangement of the sectional cover at the ends of the opening in said cover. Fig. 6 is a detail showing in part the starch-trough, its heating-pan, the rolls disposed within the trough, the movable cover-section being removed from the trough, while the stationary cover-section is shown in position.

I provide a suitable frame having legs A and cross-rails *a* to support the heating-pan M (shown more clearly in Fig. 5) and the starch-trough B, the latter depending within the former, substantially as shown in Fig. 5. The heating-pan M may be supplied with water, and steam may be passed into it at the pipe 7 to supply the heating medium, while, as shown in Fig. 4, a pipe extends from the bottom of the trough B through the pan M, and is provided with a cock L, whereby, when desired, the starch may be discharged from the trough. 10 is an overflow-pipe for the pan M.

The trough B has a sectional cover, one part, C^2, of which I term the "movable" cover-section and the other part, C', the "stationary" cover-section. The movable cover-section C^2 is capable of a lateral reciprocation on the trough B in the ways *l l'* secured to the trough.

A fluted or corrugated rub-board E depends from the inner edge of the movable cover-section, preferably as shown in Fig. 4, and extends some distance within the trough, so that its fluted surface shall practically be submerged in the starch. A lateral reciprocation is given to this movable cover-section C^2 in the ways *l l'* by means of the handle *f* secured to the shaft *e* journaled in the frame of the machine, as more clearly indicated in Figs. 1 and 5, and provided near the ends of the movable cover-section C^2 with forked arms *h h'*, which embrace the fingers *k*, shown in Fig. 1 as secured to the top of the movable cover-section, and projecting over the ends of the said section so as to be embraced by the forked arms, as shown. Movement of the handle *f* in one direction will thus cause the mov-

able cover-section C^2 to be moved in the ways $l\,l'$ away from the stationary cover-section C', whereas movement of the handle f in an opposite direction will cause the movable cover-section to slide in the ways toward the stationary cover-section, and when at the limit of this inward movement it can be locked in that position by the handle engaging the notched bracket-arm g, as clearly shown in Fig. 1.

Supported in a bracket b attached to the frame of the machine is (shown in Fig. 1) the shaft I, carrying the fast and loose belt-pulleys $v\,v$. The shaft I carries a crank-head H, which receives one end 1 of the pitman G, the other end being suitably fastened to the pin 2 of the roll-carrier D, which slides upon the ways 5 5' secured to the stationary cover-section C'. These ways 5 5' are in effect walls surrounding the opening in the stationary cover-section, substantially as shown in Figs. 4 and 5, through which the roll-carrier D projects into the starch-trough B. Within the trough the roll-carrier D carries, in this instance, a series of four corrugated or fluted rolls p, as more clearly shown in Figs. 2 and 3. As shown in said figures and in Fig. 4, each roll-journal is mounted in a pin o, which enters a socket m and is encircled by a spring n to bear against the head of the pin, as indicated in Fig. 3, and cause the journal of said roll to be forced outwardly from the socket m and toward the rub-board E, whereby either end of a given roll will yield or give to undue pressure induced by unevenness of bulk of the article to be starched, and the rolls as a whole will bear upon the article with a yielding pressure and will accommodate themselves to the unevenness of the material while rotating on their axes and traveling over the surface of the material placed between them and the rub-board E. By this means tearing or undue wear of the material is avoided, while the starch is thoroughly worked into the material.

As understood so far, it will be seen that the rub-board E, when brought to fixed operative position by the locking of the handle f with the notched bracket g, cannot yield to undue pressure induced by any bulkiness of the article placed between said board and rolls, nor can the roll-carrier yield laterally; so it is important that the rolls should have the capacity to yield as described to obtain the desired results.

It will be observed from inspection of Figs. 1 and 4 that the part of the roll-carrier D which bears upon the ways 5 5' is so arranged as to cover the opening boxed in by said ways, to prevent possible escape of starch therethrough when the machine is in operation.

An opening 3 is provided in the cover at the junction of the movable section C^2 with the stationary section C', as more clearly shown in Fig. 4, to accommodate the article while being starched and when the movable cover-section C^2 is in "closed-in" position, as shown in said figure and in Fig. 1. To prevent the escape of starch through said opening 3 when the machine is in operation I provide a guard, which, in this instance, is composed of the rubber tube s secured, substantially as shown in Fig. 4, to the upper portion of the rub-board E, and a second tube s', arranged in a sliding bar F supported by pins t mounted in sockets attached to the stationary cover-section, as shown in Fig. 4, and encircled by the springs u, (see Fig. 3) to cause the sliding bar F to be pressed outwardly toward the rub-board E, whereby the guards, composed of the parts $s\,s'$, bear with yielding pressure against the article projected through the opening 3, notwithstanding inequalities in the bulk of such article, and prevents escape of the starch at that point.

Secured to the bracket b, as shown in Fig. 1, is a slide-bar c carrying a belt-shifter 4 and engaging the arm h' of the shaft e, so that as said arm is swung backward and forward by the handle f in moving the movable cover-section C^2 toward and from the stationary cover-section the belt-shifter 4 is likewise moved from the loose pulley v' to the fast pulley v, and back, whereby power is communicated to the roll-carrier D when the movable cover-section is moved into place with its rub-board E opposite the rolls p in the trough, and likewise power is taken from the roll-carrier and operation of the machine is stopped when the movable cover-section is moved out of operative position with relation to the stationary cover-section.

The stationary cover-section C' is made in two parts, the front portion of which is removably secured in position by the swing thumb-screws j, as shown in Fig. 1, so that upon loosening said screws that portion of the cover can be readily removed from the machine to enable the operator to inspect the rolls when desired, and also to permit the removal of the rolls and its carrier D from the trough when desired, because it will be observed that the portion 5 of the ways upon which the roll-carrier D slides is attached to the front part of said stationary cover-section.

Shown in dotted lines in Fig. 3 and in full lines in Figs. 1 and 5 is a pair of plates 6, attached to the movable cover-section C^2, whose ends overlap the joint, at the under side, between the stationary cover-section and the movable cover-section, at either end of the opening 3, to prevent splashing of the starch at those points. The plate l' of the pair of plates $l\,l'$ which are secured to the trough to form ways in which the movable cover-section C^2 slides is removably held in place by bolts which pass through the keyhole-slots (shown more clearly in Figs. 1 and 3) to readily permit the removal of the movable cover-section, with its rub-board, from the machine when desired. In such instance the front part of the stationary cover-section must first be removed, since the inner ends of the plates 6

extend beneath said part to prevent splashing of the starch at these points, as before described.

The operation of my machine is as follows: Assuming the parts to be in the position shown in Fig. 1, with the belt upon the fast pulley *v* and the movable cover-section C^2 in operative position, with its rub-board E opposite the rolls *p*, carried by the roll-carrier D, which is the operative position of the parts, the operator releases the handle from the notched bracket *g* and moves said handle toward the front of the machine away from the bracket, whereby through the shaft *e*, the bifurcated arms *h h*,' and the fingers *k k* the movable cover-section C^2, carrying the rub-board E, is moved in the ways *l l'* toward the front of the machine and away from the stationary cover-section, during which time the belt-shifter 4, connected as described with the bifurcated arm *h'*, carries the belt from the fast pulley *v* to the loose pulley *v'*, whereupon the reciprocation of the roll-carrier D is stopped. This movement of the movable cover-section away from the stationary cover-section separates, as is obvious, the rub-board E from the rolls *p* and allows the operator to place between them the folded shirt-bosom and cuffs, while the remainder of the shirt rests upon the movable cover-section C^2. Thereupon the handle *f* is moved in the opposite direction and engaged with the notched bracket *g*, thus carrying the rub-board toward the rolls and likewise shifting the belt from the loose pulley *v'* to the fast pulley *v*, whereupon the roll-carrier D is reciprocated, and the rolls *p*, bearing upon the material between them and the rub-board, roll over its surface and thoroughly incorporate the starch therein. Any unevenness in the thickness of the material placed between the rub-board and rolls is accommodated by reason of the capability of each roll-journal for independent movement in the roll-carrier, as described. When the article is thus placed between the rub-board and rolls, and is being acted upon by them for starching purposes, the guards composed of the pipes *s s'* bear upon either side of the article and efficiently close the opening 3 against the escape of starch.

In practice the body of liquid-starch in the trough is of a depth to submerge the rolls.

I claim—

1. A starch trough, a cover therefor having an opening and slide ways disposed about said opening for the roll-carrier, a roll-carrier capable of lateral reciprocation on said ways, and extending, through said opening, into the trough, a series of rolls mounted in the roll-carrier alongside of one another in substantially the same vertical plane and having journals in said roll-carrier movable independently one with relation to another, and a rub-board arranged within the trough to coact with said rolls substantially as described.

2. A starch trough, a sectional cover therefor, one section of said cover capable of lateral reciprocation on said trough and having a rub-board depending therefrom and extending within said trough, a reciprocating roll-carrier sliding in ways in another section of the cover and provided with a series of rolls disposed within the trough opposite the rub-board, each journal of each roll having a spring-governed in and out movement in said roll-carrier independent of the movement of any other journal, in combination, substantially as described.

3. A starch trough, a sectional cover therefor, one section of said cover capable of lateral reciprocation on the trough and having a depending rub-board extending within the trough, a stationary cover-section provided with ways, a reciprocating roll-carrier sliding on said ways, extending within the trough, and carrying a series of rolls disposed within the trough opposite said rub-board, the said sectional cover provided with an opening at the junction of the movable and stationary sections to permit the article to be starched to project within the trough between the rub-board and rolls when the movable section is closed in, and a guard for said opening to bear against said article and to prevent the escape of starch, substantially as described.

GEORGE B. WHEELER.

Witnesses:
CHAS. W. OSGOOD,
LOWELL H. STEARNS.