(No Model.) 2 Sheets—Sheet 1.

C. O. WHITE.

STARCHING MACHINE.

No. 524,431. Patented Aug. 14, 1894.

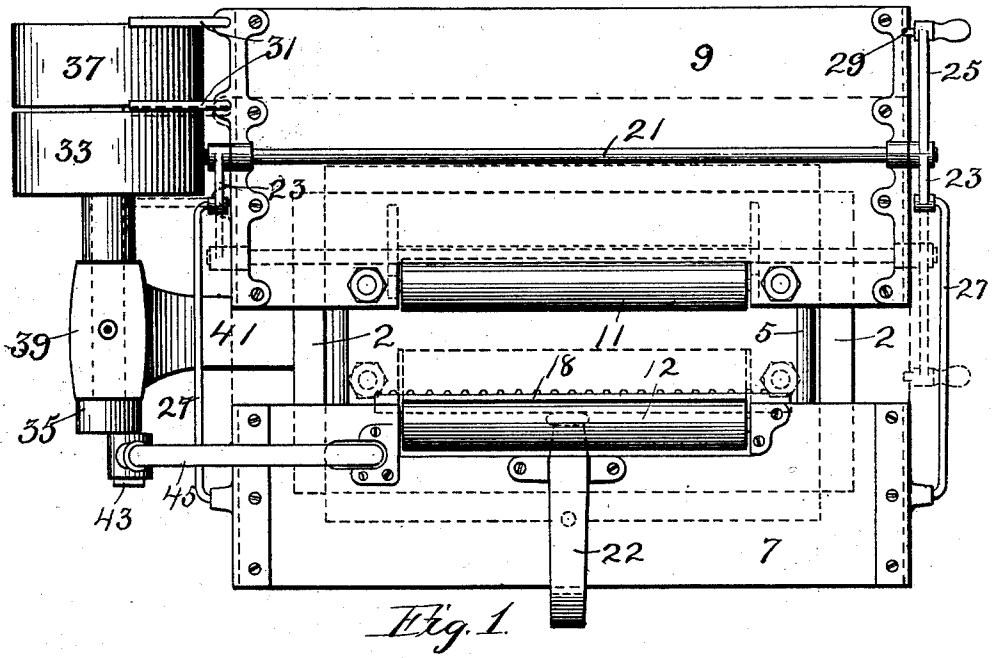

Fig. 1.

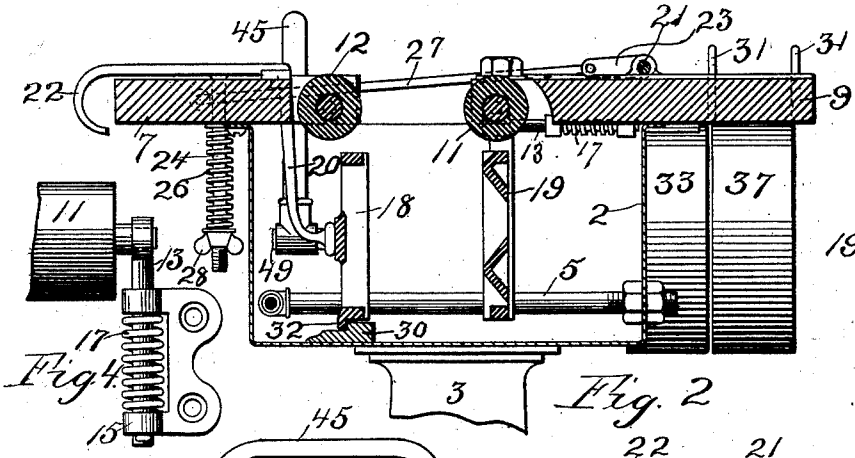

Fig. 2.

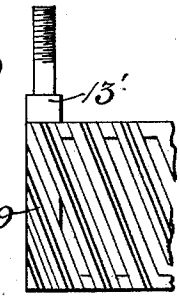

Fig. 5.

Fig. 4.

Fig. 3.

Witnesses
G. E. Pruple
F. S. Lyon

Inventor
Clarence O. White
By Paul & Hawley
Attys.

(No Model.) 2 Sheets—Sheet 2.

C. O. WHITE.

STARCHING MACHINE.

No. 524,431. Patented Aug. 14, 1894.

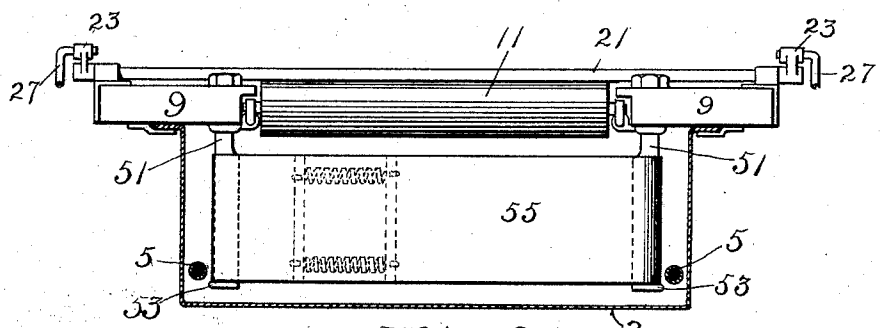

Fig. 6

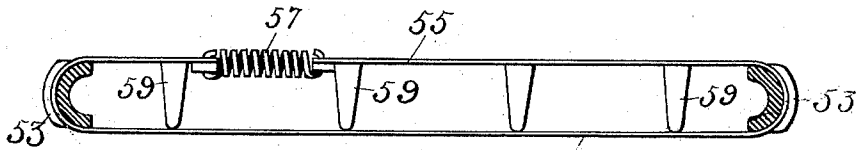

Fig. 7.

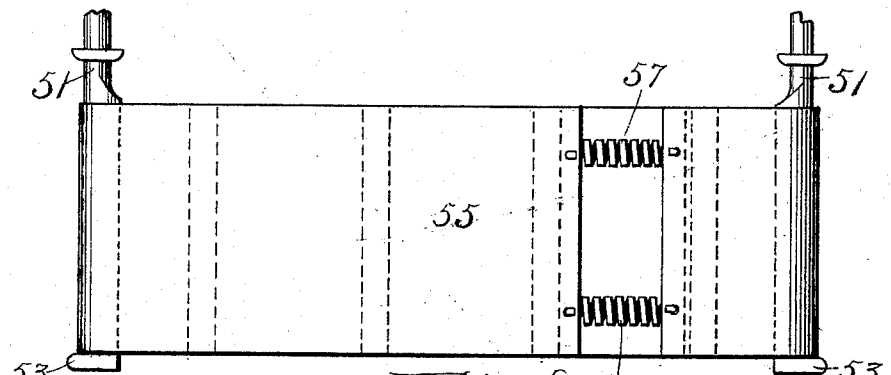

Fig. 8.

Witnesses
G. E. Purple
F. D. Lyon

Inventor
Clarence O. White
By Paul & Hawley Atty's.

UNITED STATES PATENT OFFICE.

CLARENCE O. WHITE, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR TO THE WHITE MANUFACTURING COMPANY, OF SAME PLACE.

STARCHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 524,431, dated August 14, 1894.

Application filed June 12, 1893. Serial No. 477,286. (No model.)

To all whom it may concern:

Be it known that I, CLARENCE O. WHITE, of the city of Minneapolis, county of Hennepin, State of Minnesota, have invented certain new and useful Improvements in Starching-Machines, of which the following is a specification.

This invention relates to improvements in starching machines designed particularly for use in starching shirts, though capable of being used for starching any articles of clothing.

The invention, consists, generally, in the constructions and combinations hereinafter described and particularly pointed out in the claims, and will be more readily understood by reference to the accompanying drawings, in which—

Figure 1 is a plan view of my improved machine. Fig. 2 is a transverse section of the same. Fig. 3 is a longitudinal section. Fig. 4 is an enlarged plan detail showing the spring mount of one of the stripping rolls. Fig. 5 is an elevation showing one end of the stationary rubbing plate. Fig. 6 is a longitudinal vertical section showing a modified form of stationary rubbing plate. Fig. 7 is an enlarged plan view of the modified form of the rubbing plate with the supporting studs shown in section. Fig. 8 is a rear elevation thereof.

In the drawings, 2 represents the box or receptacle of the machine, which is preferably supported upon a suitable standard 3 and is provided with a steam pipe 5 which keeps the starch in the box hot and always ready for use. The cover of the box is preferably made in two sections, 7 and 9, the section 7 being preferably stationary and the section 9 being capable of sliding toward and from the section 7 as indicated by the full and dotted lines in Fig. 1. Each of these sections carries preferably a rubber roll and a rubbing plate or grate. One of the rolls and rubbing plates is preferably connected to and moves with the movable cover section 9, so that when the sections are separated, as shown in Fig. 2, free access is had to the interior of the box; but when the sections are brought together, as indicated by dotted lines in Fig. 1, the rubbing plates and rolls are brought into working position. The rolls and rubbing plates may be of any suitable construction, and one or the other of the rubbing plates may be made to reciprocate by the means shown.

I have here shown only one rubbing plate provided with means for reciprocation, but I have also shown one fixed and one yielding roll. As here shown, the roll 11 is mounted in bearings in the ends of the sliding rods 13, said rods being supported in brackets 15 upon the movable cover section 9 and being provided with the springs 17 by means of which the roll is held forward but is capable of yielding under sufficient pressure.

Secured to the cover section 9 by lugs 13′ is the rubbing plate 19. This plate, as here shown, does not have any reciprocating movement but it moves with the cover section 9. The cover section 9 is preferably provided with the shaft 21 extending lengthwise thereof and having secured upon each end the crank arms 23, one of said crank arms being provided with the suitable operating handle 25. The crank arms 23 are connected to the links 27, which have their opposite ends pivotally connected to the stationary section 7 of the cover. The operating handle 25 is preferably provided with the stop 29 which limits the movement of said crank arm in either direction. The movable section of the cover is also preferably provided with the two rods 31, which form a belt shifter and move the operating belt from the fixed pulley 33 on the operating shaft 35, to the loose pulley 37 on said shaft when the movable cover section is thrown back for the purpose of separating the rolls and the rubbing plates. When the rolls are brought together, the belt is shifted again from the loose pulley to the fast pulley. Said shaft 35 is mounted in a suitable bearing 39 upon a standard or bracket arm 41 fixed to the main standard of the machine. The stationary section 7 of the cover carries the fixed roll 12 and it also carries the rubbing plate 18. This plate rests against the arm 20, which passes over the top of the cover and is provided at its outer end with a handle 22. This arm is secured upon the rod 24 which passes through the cover and which carries the spring 26 and the thumb nut 28. This arm is capa-

ble of rocking so as to permit the rubbing plate 18 to yield, the movement of the arm being controlled by the spring 26. By grasping the handle 22 and lifting up thereon the rubbing plate 18 may be permitted to yield by the tension being removed from the back of the plate. The bottom of the starch box is preferably provided with the guide rail 30, and the rubbing plate 18 is provided with a flange 32 which engages therewith.

For the purpose of reciprocating the rubbing plate 18 I provide in the shaft 35 the eccentric crank pin 43, and to said crank pin connect the curved pitman or connecting rod 45 which extends over the top of the starch box and through an opening in the stationary section of the cover 7. A pin 49 on the rubbing plate 18 engages the end of the connecting rod so that said plate is reciprocated by said connecting rod, while at the same time the plate is capable of a slight transverse movement, as before described.

The operating shaft 35 is preferably arranged substantially opposite the vertical center of the rubbing plate 18 and the connecting rod 45 is preferably connected to the vertical center of said rubbing plate at one end thereof. By this means I am enabled to reciprocate the plate very rapidly, as high as three hundred and seventy-five to four hundred times per minute, and as by this construction I am enabled to dispense with any stuffing box I secure a rapid reciprocation of the plate in a perfectly noiseless machine.

The operation of the machine is as follows: When the machine is in condition for operation and the box is suitably supplied with starch, the movable cover section is thrown back so as to separate the rolls and rubbing-plates. The shirt or other article to be starched is then put into the box, into the space between the rubbing plates. The movable cover section is then moved forward, thereby bringing the rolls and rubbing plates together and at the same time shifting the driving belt from the loose pulley to the fast pulley. The rubbing plate 18 is thereupon reciprocated rapidly across the face of the rubbing plate 19. After the shirt or other article has been sufficiently starched the operator lifts upon the handle 22, thus relieving the tension or pressure upon the rubbing plate 18 and permitting the separation of the rubbing plate so as to allow the withdrawal of the shirt or other article through the rolls 11 and 12, which strip the surplus starch therefrom. The movable cover section is then thrown back and the driving belt is thereby moved from the fast to the loose pulley and the machine is then ready to receive another article.

Instead of using the metallic rubbing plate 19, as shown in Figs. 2, 4 and 5, I may use a flexible rubbing plate preferably at one side only, and in Figs. 6, 7 and 8 I have shown a construction that I prefer to employ for this purpose. As here shown, the cover section 9 is provided with the depending lugs 51 having the curved outer surfaces and provided with the shoulders 53 at their lower ends. A canvas or other flexible belt 55 is carried around these lugs and its ends are connected by means of suitable spiral springs 57. The back side of the belt is preferably provided with the wooden projections 59 which extend across the space between the two parts of the belt, so that any pressure applied to the front side of the belt will bring it against the front ends of these projections. By this means the front of the belt is stiffened and the strength of the two parts of the belt is thus obtained in the flexible rubbing plate.

It sometimes occurs that in putting the clothes into the starching machine they will be bunched up in one or more places, and where this construction of rubbing plate is used, it being flexible, it will yield so as to accommodate itself to the thickness at any point and thus prevent injury to the clothes or to the machine.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, with the starch box, of the cover arranged thereon and formed in two sections, the rolls mounted upon said cover sections, the rubbing plates arranged beneath and connected to said cover sections, and means for separating said cover sections and thereby separating said rolls and rubbing plates, substantially as described.

2. The combination, with the starch box and the cover sections, of the rolls provided on said sections rubbing plates arranged beneath said cover sections, means for separating said rolls and rubbing plates simultaneously, and means for reciprocating one of said rubbing plates, substantially as described.

3. The combination, with the starch box, of the cover arranged thereon, said cover being formed in sections, one of said sections being capable of moving toward or from the other, the rolls provided upon said sections rubbing plates arranged beneath said cover sections, one of said rubbing plates being capable of reciprocation, the driving shaft, means connecting said shaft with said reciprocating rubbing plate, and the belt shifter arranged upon said movable cover section, substantially as described.

4. The combination, with the starch box, of the stationary cover section 7, provided with the roll 12 and with the reciprocating plate 18, of the movable cover section 9, the roll 11, and the rubbing plate 19 mounted on yielding bearings on said cover section, means for moving said cover section, the belt shifter also secured upon said cover section, the driving shaft, and the connecting rod from said driving shaft to said reciprocating rubbing plate 18, substantially as described.

5. The combination, with the starch box provided with the rubbing plate 18, of the arm 20 bearing against the rear side of said plate

and provided with the handle 22, and the adjusting spring connected to said arm and thereby controlling the tension upon said rubbing plates, substantially as described.

6. In the starching machine, the rubbing plate, consisting of the belt 55, suitable studs supporting said belt and suitable springs connecting its ends, substantially as described.

7. In a starching machine, the rubbing plate, consisting of a suitable flexible belt, studs supporting said belt, springs connecting the ends of the belt, and suitable projections secured upon one part of the belt and extending across the space between the two parts of the belt, for the purpose specified.

8. The combination, in a starching machine, of the stationary box or reservoir, with the rubbing plates or sections vertically arranged therein, means for closing the same together, means for reciprocating one of said plates, and means for maintaining a pressure on said plates when closed together, means for separating said plates, and further and distinct means for removing said pressure without positively separating the plates, substantially as described.

9. The combination, in a starching machine, of the starch box or reservoir, with the rubbing plates vertically arranged in said box, means for opening or closing the same with respect to one another, stripping rolls arranged above said plates and parallel therewith, means for opening and closing said rolls, means for maintaining a pressure upon said plates when closed, and means for removing said pressure without separating said rolls or positively separating the plates, substantially as described and for the purpose specified.

In testimony whereof I have hereunto set my hand this 1st day of June, 1893.

CLARENCE O. WHITE.

In presence of—
F. S. LYON,
M. E. GOOLEY.