

(No Model.)

2 Sheets—Sheet 1.

E. HURLBURT.
STARCHING MACHINE.

No. 499,228.

Patented June 13, 1893.

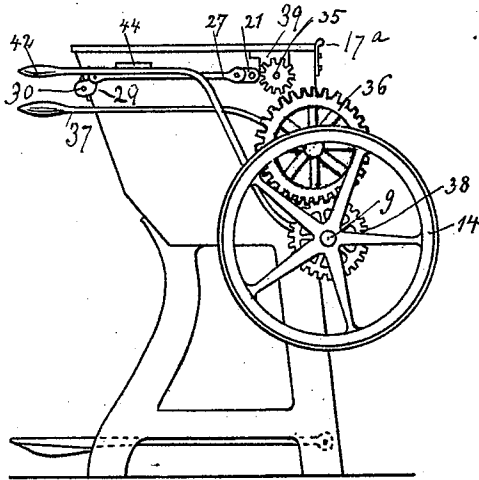


Fig. 1.

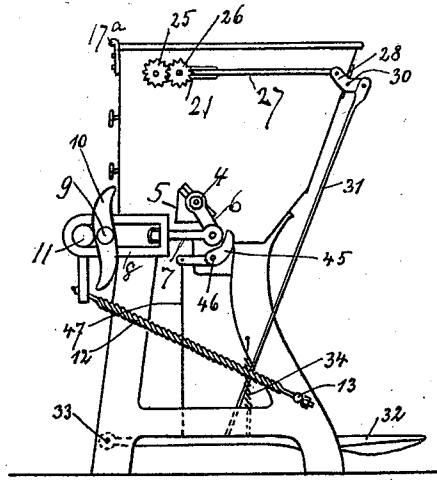


Fig. 2.

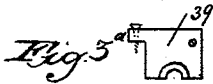


Fig. 3.

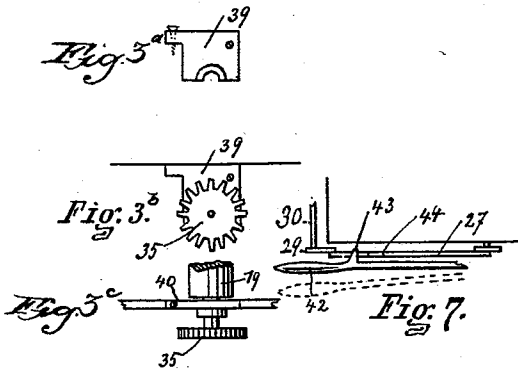


Fig. 4.

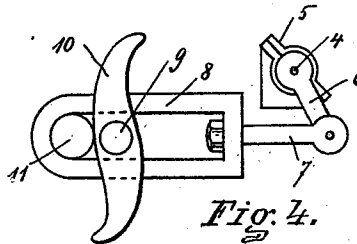


Fig. 5.

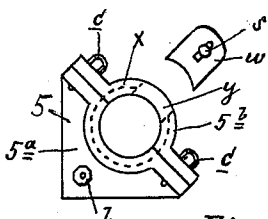


Fig. 6.

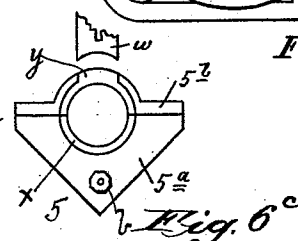


Fig. 6^a.

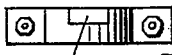


Fig. 6^b.

WITNESSES.
Rich. A. George.
M. E. Robinson

INVENTOR.
E. Hurlburt
By R. L. Perry
att'y

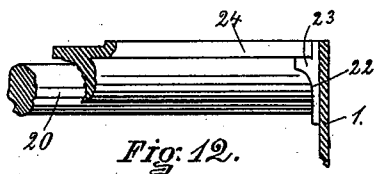
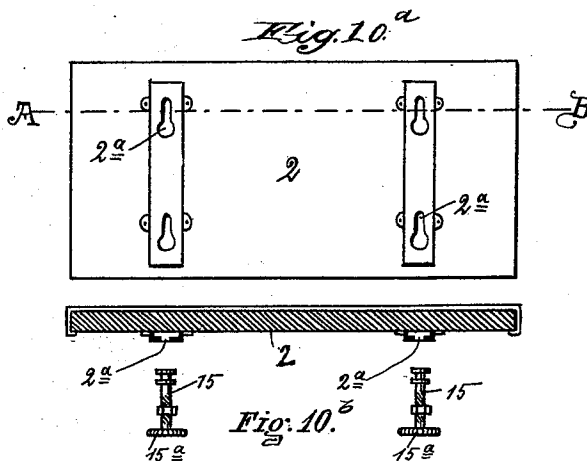
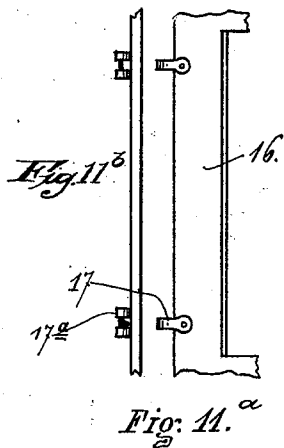
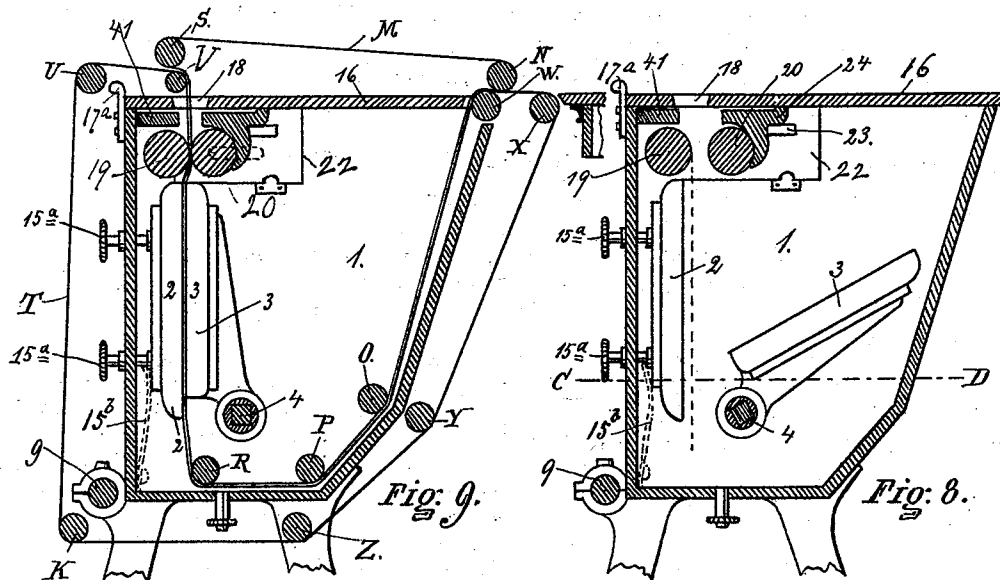
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2 Sheets—Sheet 2.

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STARCHING MACHINE.

No. 499,228.

Patented June 13, 1893.



WITNESSES.

Rich. A. George.

McRobinson

INVENTOR.

E. Hurlburt
By Hurlburt & Perry
Atty's

UNITED STATES PATENT OFFICE.

EDWARD HURLBURT, OF UTICA, NEW YORK.

STARCHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 499,228, dated June 13, 1893.

Application filed January 23, 1892. Serial No. 419,084. (No model.)

To all whom it may concern:

Be it known that I, EDWARD HURLBURT, of Utica, in the county of Oneida and State of New York, have invented certain new and useful Improvements in Starching-Machines; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and numerals of reference marked thereon, which form part of this specification.

My invention relates to an improvement in starching machines.

In the drawings which accompany and form a part of this specification and in which similar letters and numerals of reference refer to corresponding parts in the several views, Figure 1 shows an end elevation of the machine. Fig. 2 shows the opposite end elevation. Figs. 3^a, 3^b and 3^c show details relating to a removable box of a wringer roller. Fig. 4 shows a paddle operating cam and connections. Fig. 5 shows the same in changed position. Figs. 6^a, 6^b and 6^c show details of a packing box. Fig. 7 shows details relating to levers for controlling the machine. Fig. 8 shows a cross section of a starch tank and wringer rollers together with the starch introducing device in open position. Fig. 9 shows as a modified form the same wringer rollers and paddle in closed position and a pair of carrier belts introduced together with suitable guide rollers therefor. Figs. 10^a and 10^b show the back and a section of the stationary plate or operating surface and also the bolts for securing the same, the section being on the line A, B, Fig. 10^a. Figs. 11^a and 11^b show the detachable hinge used for securing the tank cover. Fig. 12 shows a portion of a wringer roller and a portion of the "stripper" used in connection therewith.

Referring to the reference numerals and letters in a more particular description of the machine: 1, indicates a starch tank which is mounted on a suitable support and which is provided with a stationary beating surface or plate 2 against which is adapted to operate a movable beating paddle or starch introducing device 3 mounted on a rock shaft 4 which shaft is mounted in bearings 5 at each end of the

tank. On the end of shaft 4 is provided a crank 6 which is connected by rod 7 to yoke 8 which surrounds the driving shaft 9. On shaft 9, at the point where it is surrounded by yoke 3 is a double cam 10 which acts against the roller 11, in the end of the yoke and operates to swing the crank 6 from the position shown in Fig. 4 to that shown in Fig. 5.

Connected to the yoke 8, on a downwardly projection therefrom, is a spring 12 which is connected at the opposite end at 13 to the support of the machine and is tensioned to return the yoke and crank 6 from the position shown in Fig. 5 to that shown in Fig. 4, when the cam has passed the center. The shaft 9 is driven by the band wheel 14 or power may be applied in any other convenient manner.

The plate or adjustable operating surface 2 is provided with slots 2^a having an enlarged opening at the lower end in which engage the headed ends of the screws 15 which run in nuts in the wall of the tank and are provided with a suitable hand wheel 15^a on the outside for adjusting the screws. By means of the several screws, four in number, in the device shown, the stationary plate 2 may be adjusted, as hereinafter set forth.

The tank 1 is provided with a suitable cover 16 secured at one side by interlocking detachable hinges composed of parts 17 and 17^a. The cover may be secured at the opposite side.

In the cover 16 is provided an opening 18 through which the goods to be operated on by the machine are inserted, or through which the carriers pass. Immediately beneath this opening is provided a pair of wringer rollers 19 and 20; the wringer roller 19 is in stationary bearings and the roller 20 is in movable sliding bearings 21. The shaft of the roller moves along a slot in the tank. Over the slot is provided a sliding plate 22 for keeping the slot closed and having a projecting ear 23 on which is mounted roller "stripper" 24 which spans the tank from end to end and is held in close proximity to or contact with the roller 20 and operates to scrape the wringer roller 20 and close the space between it and the top of the tank. On the same end of the wringer rollers and at one end of the machine is provided a pair of

intermeshing cog gears 25 and 26 adapted to cause the wringer rollers to rotate together when the gears are meshed.

Attached to the movable bearings 21 at either side of the machine are rods 27 which extend at one side of the machine to arm 29 and at the other end of the machine to bell crank 28 both of which are mounted on the shaft 30 running across the front side of the machine. To one end of the bell crank 28 is connected rod 31 which extends down to and is connected with treadle 32 which treadle is pivoted at 33 and is elevated by spring 34.

On one end of the stationary wringer roller 19 is provided a gear 35 which is adapted to mesh the gear 36 mounted on pivoted arm 37, which arm is pivoted on shaft 9 or adjacent thereto and gear 36 is driven by gear 38 on the hub of band wheel 14.

The bearing of the shaft roller 19 which is provided in the walls of the tank is provided with a removable piece 39, as shown in Fig. 3^a, which piece also furnishes a portion of the wall of the tank and is secured in place by screw 40. By removing the piece 39 and the cover and splasher bar, the rear wringer roller can be taken out. Also spanning the tank from end to end adjacent to the rear wall of the tank and directly over the space between the roller 19 and the wall of the tank is a splasher bar 41. The shaft 9 is not driven directly by the hand wheel 14 but there is an intermediate clutch which is not shown and which is controlled by lever handle 42. On lever handle 42 is provided a projection 43 which in certain positions is liable to become engaged with the projecting web 44 on the rod 27 of the same end of the machine with the clutch lever.

In Fig. 6^a is shown a packing and bearing box used in the shaft 4 at each end of the tank. The bearing portion of the box is in the wall of the tank. The box consists in sections 5^a adapted to be secured on the side of the tank by bolt *b*. To this section is secured a section 5^b which is secured to the sections 5^a by bolts *c c*. The two sections in connection contain a packing recess, as shown in the dotted lines at *x*. Extending from the outside of the box from said recess, is a recess adapted to receive packing forcing piece *w* which piece *w* is secured on the side of the tank by set screw *s* passing through a slot in the piece *w*.

In packing, the bearing recesses *x* and *y* are filled with suitable packing material and to compensate for the wear the piece *w* is driven into the recess *y* crowding up the packing and is secured by set screw *s*. It will be observed that the face of plate or operating surface 2 is back of the vertical line at the surface of the stationary wringer roller, the vertical line being shown by the dotted line in Fig. 8.

Adjacent to the swinging end of crank 6 is provided a lever 45 pivoted to the frame at 46 and having an arm from which extends

connection 47 to the treadle 32. The arm of lever 45 is adapted to engage against the swinging end of crank 6 or the end of the connecting rod 7.

In case of the use of belts for carrying the goods through the machine, shown in Fig. 9, I provide a belt *M*, passing around the rollers N, O, P, R and S and between the paddle and operating plate or surface and between the wringer rollers. I also provide a belt *T*, which passes around the rollers U, V, R, P, O, W, X, Y, Z and K and passes with the belt *M* between the beating paddle and operating surface and the wringer rollers.

The operation of the device is substantially as follows: The tank is filled with starch of suitable consistency up to a line substantially with line C, D, of Fig. 8. When the machine is used without carriers, the materials to be operated on are suitably folded and introduced through opening 18 in the cover, the movable wringer roller having been previously separated from the stationary wringer roller 19 by depressing the treadle 32 which operates through the connections heretofore described to produce this result and the paddle having been previously separated by the same depression of the treadle 32 through the connections 47 and the lever 45, acting against the crank 6. The opening of the paddle by the depression of the lever 32 is preferably not so great as the position of the paddle shown in Fig. 8. After the goods have been introduced the treadle 32 is released and being drawn upward by the spring 34, the wringer roller is closed against the wringer roller 19 clamping that portion of the goods between the wringer rollers and suspending the goods in front of the stationary plate or operating surface. At the same time that the treadle 32 rises, the lever 45 is moved out of the way of crank 6, and the paddle is also allowed to come in contact with the goods. The clutch lever 42 is then operated to bring the clutch into action and start the shaft 9 rotating with the wheel 14. In throwing the clutch into operation, the lever 42 is moved from the position shown in the dotted lines in Fig. 7 to that shown in the full lines in the same figure which brings the projection 43 of the lever into the line of movement of connecting rod 27 and in the line of travel of the web or plate 44 thereon; so that when the clutch is in engagement to operate the machine the wringer rollers cannot be separated or the treadle 32 depressed by reason of the plate 44 coming in contact with the projection 43, thus all danger of splashing the starch through the opening in the cover while the paddle is in operation, is obviated. When the clutch is in operation, and the shaft 9 is rotated, the cam 10 operating on the roller in the end of the yoke 8 causes the same to move from the position shown in Fig. 4 to that shown in Fig. 5, which movement rocks shaft 4 and throws the paddle open. As the point of the cam passes by the center, the yoke 8 and con-

nected parts are retracted by spring 12, which
 movement brings the paddle or starch intro-
 ducing device 3 against the plate or operat-
 ing surface 2 with a blow. As the paddle 3
 5 comes against the plate 2 the goods suspended
 in front of it are beaten against the sur-
 face thereof, and not only beaten, but the sur-
 face of the plate 2 being back of the line
 from which the goods are suspended, they are
 10 carried and drawn or stretched on the surface
 of the paddle by the blow. As the paddle 3
 by a continued movement of the machine, is
 again carried or rocked away from the sta-
 tionary paddle, the goods being operated on
 15 may swing free from the surface of the plate
 or paddle 2 and be suspended at their normal
 length in position for the succeeding blow.
 By this arrangement of the paddles, and the
 rollers the wrinkling and adhering of the
 20 goods to the surface of the paddle is obviated
 and a stretching effect on the goods, by the
 blow of the paddle is procured; a very desir-
 able result, as it removes wrinkles from the
 goods instead of tending to produce them.
 25 When the paddle 3 has beaten the goods a
 sufficient number of times the operation of
 the paddle is stopped by throwing the lever
 42 out, thus throwing the clutch out of gear.
 The goods may then be removed from the
 30 machine by operating lever 37 to throw the
 gear 36 into engagement with the gear 35, the
 wringer roller being rotated and carrying the
 goods out of the machine and at the same
 time wringing them. As the wringer rollers
 35 rotate, the stripper 24 operates to remove the
 starch from the surface of the wringer roller
 and also answers the purpose of preventing
 the starch from splashing around the roller
 and out of the opening 18. When the piece
 40 of goods has been removed the motion of the
 wringer rollers is stopped by throwing the
 gears 35 and 36 out of engagement and an-
 other piece may be inserted in the machine,
 after opening the wringer rollers and paddle
 45 by means of the treadle as before described.
 The position of the stationary plate 2 with
 reference to the wringer rollers and the mov-
 able paddle, may be adjusted by means of
 screws 15, so as to bring the plate nearer or
 50 farther from the vertical line at face of the
 stationary wringer roller or so as to cause the
 paddles to come in contact with each other
 with varying degrees of force at their upper
 or lower edges. These adjustments are desir-
 55 able for varying kinds or qualities of goods
 being operated upon.

In cleaning the machine the cover 16 is re-
 moved and the wringer roller 19 may be re-
 moved by removing portions 39 of the bear-
 60 ings and the splasher bar 41. The piece 24 is
 removed out of position. By slightly open-
 ing the paddles by means of the treadle, the
 plate 2 may be raised up until the ends of the
 screws 15 are in the large ends of the slots 2^a
 65 when the paddle may be removed and the ma-
 chine then is in such a state that access can
 be had to all portions which are liable to fur-

nish lodgment for putrid starch and the ma-
 chine may then be thoroughly cleaned. The
 width of paddle or plate 2 is preferable a lit-
 70 tle more than the width of paddle 3, so that
 the lower edge will dip farther into the starch
 contained in the tank, which facilitates the
 working of the starch onto the plate and into
 the fabric. The wringer rollers also perform
 75 the office of a holding device and are herein-
 after also termed holders.

When the starcher is used with the carrier
 belts M and T the goods are placed on the
 portion of the belt T between the rollers W
 80 and X, and there may be provided to facili-
 tate that, a table, a small portion of which is
 shown near the roller X in Fig. 9. As the
 belts move in their travel the goods pass be-
 tween the paddles and the wringer rollers, in
 85 which case the wringer rollers perform the
 additional function of giving motion to the
 carrier belts. After the goods have passed
 through the tank of the machine and between
 the paddles and the wringer rollers, they may
 90 be removed from the belt on the horizontal
 portion thereof between the rollers U and V
 or they may be allowed to fall from the car-
 rier belt as it passes over the roller U. It
 will be observed in Fig. 9 that the face of the
 95 stationary surface or paddle is back of a di-
 rect line between the roller R and the wringer
 rollers. This, however, is not necessary, al-
 though desirable. The stationary surface or
 plate 2 may be adjusted up to the direct line
 100 between the faces of the wringer rollers and
 the face of the guide roller R. The lower edge
 of the stationary operating surface or plate 2
 might be mounted on springs as shown in dot-
 ted lines at 15^b in connection with screws 15^a
 105 at the upper edge of plate so as to throw the
 lower edge nearer to the vertical line, and
 which springs would yield as the paddle came
 into contact with the plate at their lower edges
 until the upper edges of the paddle and plate
 110 come into contact, which arrangement would
 produce a greater stretching of the goods on
 the surface of the stationary paddle than the
 other construction shown and described.

Other modifications and alterations may be
 115 made in and to the construction described
 without departing from the equivalents of my
 invention.

What I claim as new, and desire to secure
 by Letters Patent, is—

1. The combination in a starching machine
 of a tank, a stationary plate secured on the
 wall of the tank, a movable beating paddle, a
 cam for opening and releasing the paddle and
 a spring for bringing the paddle against the
 125 plate with a blow, substantially as set forth.

2. In a starching machine a starch tank a
 stationary plate or operating face, adjustably
 mounted on a wall of the starch tank, a pad-
 130 dle adapted to have its face brought into con-
 tact with the plate, a cam for opening and re-
 leasing the paddle and a spring for bringing
 the paddle against the plate with a blow, sub-
 stantially as set forth.

3. In a starching machine, a starch tank, a pair of rollers mounted in the upper part of the tank, an adjustable operating face, adjustable to or from a vertical line at the face
5 of the rollers, and a paddle adapted to operate upon the face, substantially as set forth.

4. In a starching machine, a tank, an operating plate removably mounted upon adjustable supports in the tank on the wall thereof,
10 a beating paddle adapted to beat against the plate, a cam for opening and releasing the paddle and a spring for bringing the paddle against the plate with a blow, substantially as set forth.

5. In a starching machine, a holding device, a stationary plate having the upper edge of its face at one side of a vertical line through the holding device, and a paddle movable from the opposite side of the vertical line against
15 the plate, substantially as set forth.

6. A tank, a pair of wringing rollers, a stationary plate located at one side of a vertical

line between the rollers and a paddle adapted to move against the plate from the opposite side of the vertical line in combination, substantially as set forth. 25

7. The combination in a starching machine of a tank, a stationary wringing and holding roller, a movable wringing and holding roller a starching plate mounted upon adjustable
20 supports below the wringing and holding rollers a beating paddle mounted on a rocking shaft, a crank for operating the rocking shaft, a cam for opening and releasing the paddle, and a spring for closing the paddle against
25 the starching plate with a blow when released, substantially as set forth.

In witness whereof I have affixed my signature in presence of two witnesses.

EDWARD HURLBURT.

Witnesses:

JOHN D. CASEY,
M. E. ROBINSON.