(No Model.) 2 Sheets—Sheet 1.

W. C. WENDTÉ.

CONSTRUCTION OF GRIPPERS FOR PRINTING PRESSES, &c.

No. 549,283. Patented Nov. 5, 1895.

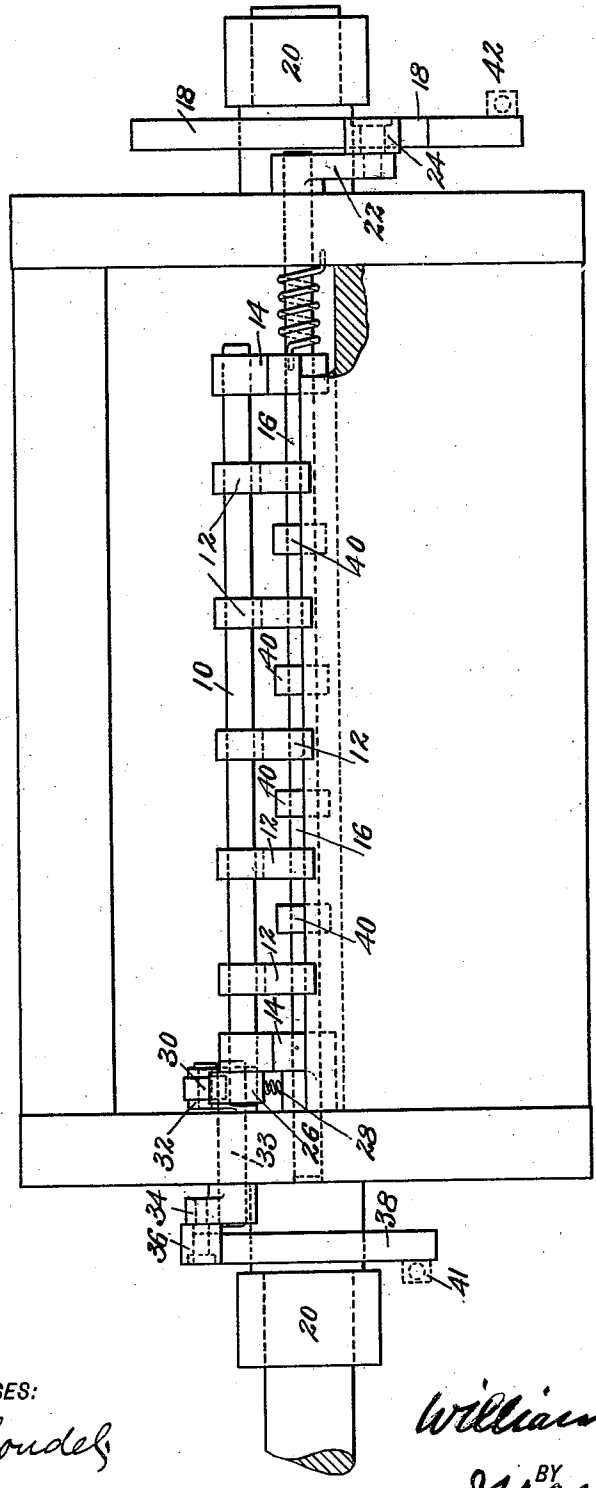

Fig. 1.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

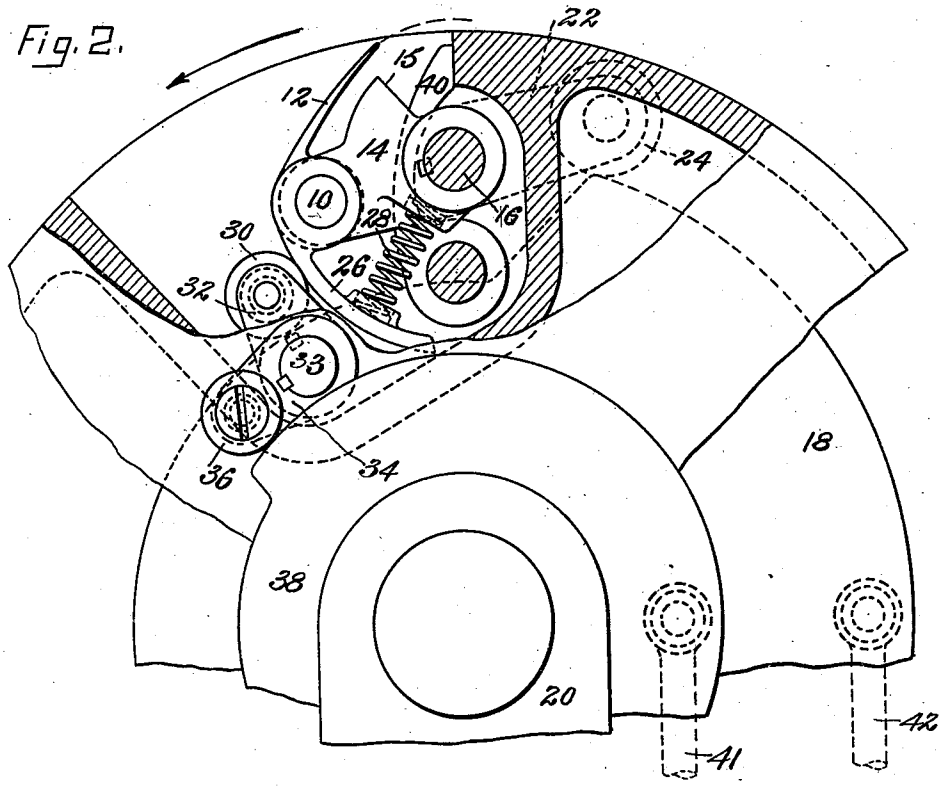
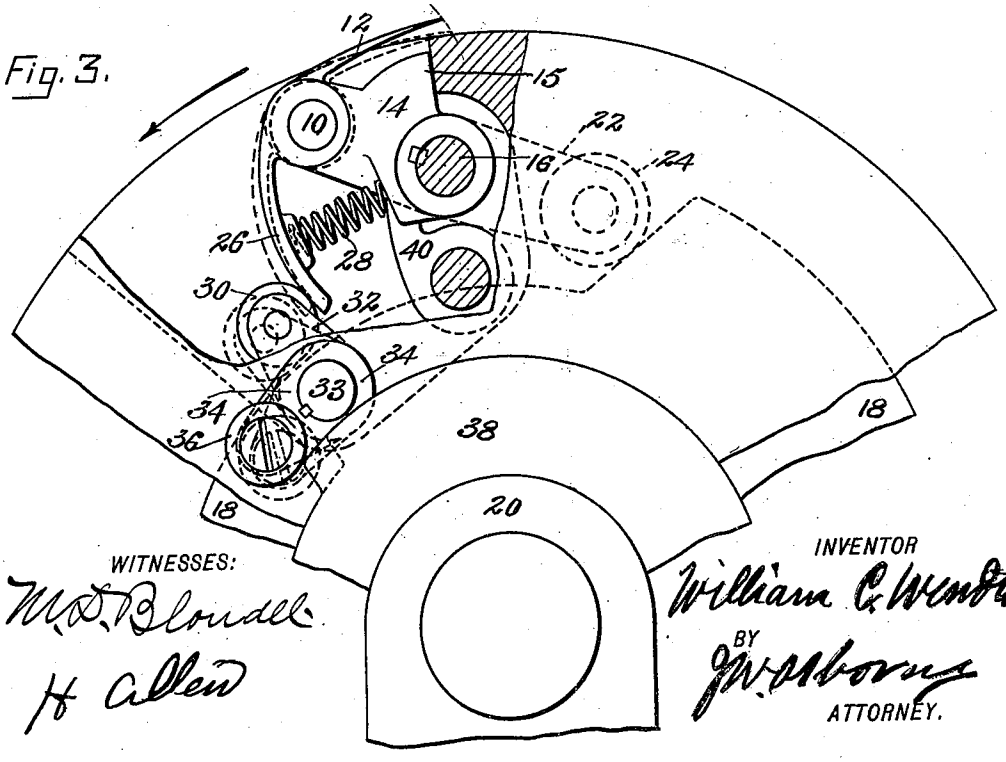


Fig. 3.



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CONSTRUCTION OF GRIPPERS FOR PRINTING-PRESSES, &c.

SPECIFICATION forming part of Letters Patent No. 549,283, dated November 5, 1895.

Application filed July 24, 1895. Serial No. 557,025. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM C. WENDTÈ, a citizen of the United States, and a resident of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in the Construction of Grippers for Printing-Presses and Like Machines, (Case K,) of which the following is a specification.

My invention is related to many machines adapted for seizing and conveying paper sheets; and it is especially designed to supply for printing-presses a gripper which shall fall very nearly perpendicularly upon the leading edge of the sheet, so as not to disturb the same and injure its register, and which shall, when out of use, disappear into the gap and project but little beyond the cylinder-surface in doing so.

In the drawings which form part of this specification, Figure 1 represents a plan view of my grippers as seen from above. Fig. 2 is a side elevation and partial section of the gap. Fig. 3 is also a partial section and elevation in the gap with the gripper nearly closed.

In the drawings, 10 represents the gripper-shaft, carrying on it the fingers 12, the contact extremities of which descend upon and hold the paper down upon the gripper edge 13 of the cylinder. This shaft is wholly within the gap and is journaled in the arms 14, which are fast upon the long rock-shaft 16, the bearings for which are in the cylinder ends. This rock-shaft is caused to oscillate by the fixed cam 18 on the frame 20, the outside arm 22, provided with the antifriction-roller 24, traversing the face of said cam as the cylinder revolves. By this means the gripper-shaft 10, passing through a small arc, may be lifted periodically close to the cylinder-surface and the points of the gripper-fingers to a position over the leading edge of the paper and but slightly above it, in which position the stop at 15 strikes the edge of the gap. The guiding tailpiece or cam-surface 26 is also attached rigidly to the gripper-shaft 10. It is forced outward from the long rock-shaft by means of the strong spring 28, and is caused thereby to bear continuously against the antifriction-roller 30 on the short arm 32. This arm is attached to a little rock-shaft 33, which passes through the end of the gap. Outside, this short shaft has an arm 34, which carries an antifriction-roller 36, that traverses the fixed cam 38.

Figs. 2 and 3, which are views from the near side of the press, illustrate clearly the working of the parts I have described. In the first of these the gripper-shaft 10 is at its lowest position, with the arm 22 at the off side about to descend the incline on the cam 18. This descent, causing the partial rotation of the rock-shaft 16, throws up the gripper-shaft to the position shown in Fig. 3. In making this movement the tailpiece, acting as a lever on the shaft 10, bears strongly against the roller 30 under the influence of the strong spring 28 and follows said roller when it falls away to the dotted position shown in Fig. 3, which results in the instantaneous closing of the contact ends of the fingers upon the sheet. In Fig. 3 the drawing represents the state of things the moment before the antifriction-roller on the arm 34 runs down the incline upon the cam-face, which drop necessitates the shift of the inside arm 32 and antifriction-roller 30 thereon to the dotted position, and thereby trips the tailpiece 26, which causes the sudden closing of the fingers 12 and the almost perpendicular descent of their contact ends upon the gripper edge of the gap 13. In these drawings the clamp 40 holds the blanket in place upon the cylinder in the usual way.

As has been shown and explained in the foregoing, the cams 18 and 38 determine and control the oscillations of the shafts 16 and 10, respectively, at the proper times. In theory all that is needed is accomplished when each of these cams is made fast to the frame of the printing-machine; but in practice when great suddenness of movement is required in place of giving the face of the cam the extreme abruptness necessary I prefer to modify the way in which such cams are supported by putting them not upon the frame but free upon the cylinder-shaft or upon some concentric support and holding them fast, as before, during the greater part of the revolution of the cylinder, while at the proper times they are given an angular impulse opposite in direction to that in which the antifriction-roller traverses each cam.

In the drawings, 41 and 42 indicate such impulse-rods, coming from any convenient cam or eccentric on a shaft below. Actuated by one of these rods the incline upon a cam down which the antifriction-roller is about to run is simultaneously pulled from under the same, so that its fall is accelerated and the most prompt control of the oscillating shaft in the gap established. In Figs. 1 and 2 the impulse-rods 41 and 42 are shown in dotted lines to indicate that they may or may not be used, according to the quickness required.

It will be seen that the action of the gripper mechanism I have invented is very rapid—that is, its completion is possible within a very small angular movement of the cylinder, a circumstance which is often of great importance in designing the arrangement of printing mechanism; and it is also true that the fingers at no time extend beyond the cylinder-surface more than is barely sufficient to get above and seize the paper with their contact ends. This great advantage is due, essentially, to the fact that the gripper-shaft travels in the arc of a circle in bringing up the fingers ready for the impetus that causes them to drop and that the center of motion for that arc is practically under the gripper edge of the gap, so that the concave aspect of the path traveled is always toward the gripper edge. When the gripper has reached its highest position, it is rotated with the help of the tailpiece 26, and the fingers fall almost flat with no disturbing inclination at the moment of their contact.

In the foregoing I have described the best means known to me of giving effectiveness to my invention, but I do not wish it understood that I restrict myself to the particular means shown and described, being well aware that the principles underlying my gripper mechanism may be maintained, while the form and arrangement of the necessary devices are greatly modified. For instance, in the drawings I have shown a single tailpiece on the gripper-shaft and a short shaft 33 passing through the cylinder end and carrying an arm and antifriction-roller on its inside end as sufficient for determining the partial rotation of the gripper-shaft, but in the case of a very wide press it may be well to carry the supplemental rock-shaft 33 through the gap parallel to both the other shafts, with additional arms and antifriction-rollers thereon and tailpieces on the gripper-shaft 10 to correspond, and although the tailpiece 26, as shown in the figures, has the curve of a circle struck from the center of the long rock-shaft 16, whereby the extremity of the finger 12 also travels in a circular curve till the last moment, still if it should be desirable to compel the finger to follow any other curve or combination of curves that result may obviously be obtained by altering accordingly the cam-surface forming the tailpiece, which, being held between the spring and the anti-friction-roller, controls as a lever the oscillations of the gripper-shaft.

What I claim is—

1. A gripper mechanism for printing machines consisting of the following elements; a gripper shaft oscillating in bearings that rise and fall periodically; fingers attached to said shaft extending from it when highest to the gripper edge of the gap; a guiding tail-piece fast to the shaft; a spring to force the same backward and outward; a shifting anti-friction roller inside the gap, which receives the thrust of the tail-piece actuated by the spring and determines the angular rotation of the gripper shaft, and the consequent opening and closing of the fingers; a cam upon the press frame in operative connection with and control of the shifting anti-friction roller within the gap; and a second cam upon the press frame connected with and controlling the lift and fall of the gripper shaft bearings; substantially as described.

2. A gripper mechanism for printing machines consisting of the following elements; a gripper shaft oscillating in bearings that rise and fall periodically; fingers attached to said shaft extending from it when highest to the gripper edge of the gap; a guiding tail-piece fast to the shaft; a spring to force the same backward and outward; a shifting anti-friction roller inside the gap, which receives the thrust of the tail-piece actuated by the spring, and determines the angular rotation of the gripper shaft and the consequent opening and closing of the fingers; a cam upon the cylinder shaft in operative connection with and in control of the shifting anti-friction roller within the gap; an impulse rod attached to and holding said cam; a second cam upon the cylinder shaft in connection with and in control of the lift and fall of the gripper shaft bearings; a second impulse rod attached to and holding the second cam; and means for reciprocating the impulse rods at the proper times; substantially as described.

3. A gripper mechanism for printing presses, consisting of a gripper shaft in bearings adapted to be raised or lowered automatically within the cylinder gap, through an arc the center of which is in or near a cylinder radius passing through the gripper edge of the gap; in combination with gripper fingers on the shaft reaching to said edge; with a guiding tail-piece also attached thereto for partially rotating the shaft to close and open the fingers on the paper; and with two cams on the press frame, and connecting mechanism from them respectively adapted to determine the passage of the gripper shaft through its arc and the tripping of the tail-piece at the proper time; substantially as described.

4. In a gripper mechanism for printing presses, the combination of a gripper shaft journaled within the cylinder gap, in arms from a parallel rock-shaft passing through the gap ends below the gripper edge; with fin-

gers attached to the gripper shaft curved and adapted to reach the gripper edge on the cylinder when said shaft is raised near to the cylinder surface; with a tail-piece or guiding cam surface fast to the gripper shaft and acting as a lever for oscillating the same; with an anti-friction roller on an arm from a supplemental rock-shaft within the gap, with which the tail-piece is in operative contact; with an arm outside the gap from each rock-shaft; with two stationary cams on the press frame controlling said arms and the vibrations of their respective shafts; and with a strong spring forcing the guiding tail-piece at all times against the anti-friction roller, and the contact ends of the fingers into elastic contact with the gripper edge on the cylinder, when the gripper shaft is at its highest; whereby the fingers fall practically flat upon the leading edge of the sheet and disappear without tumbling within the gap when not in use; substantially as described.

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Witnesses:
SAMUEL JENNISON,
FRANCIS TODD.