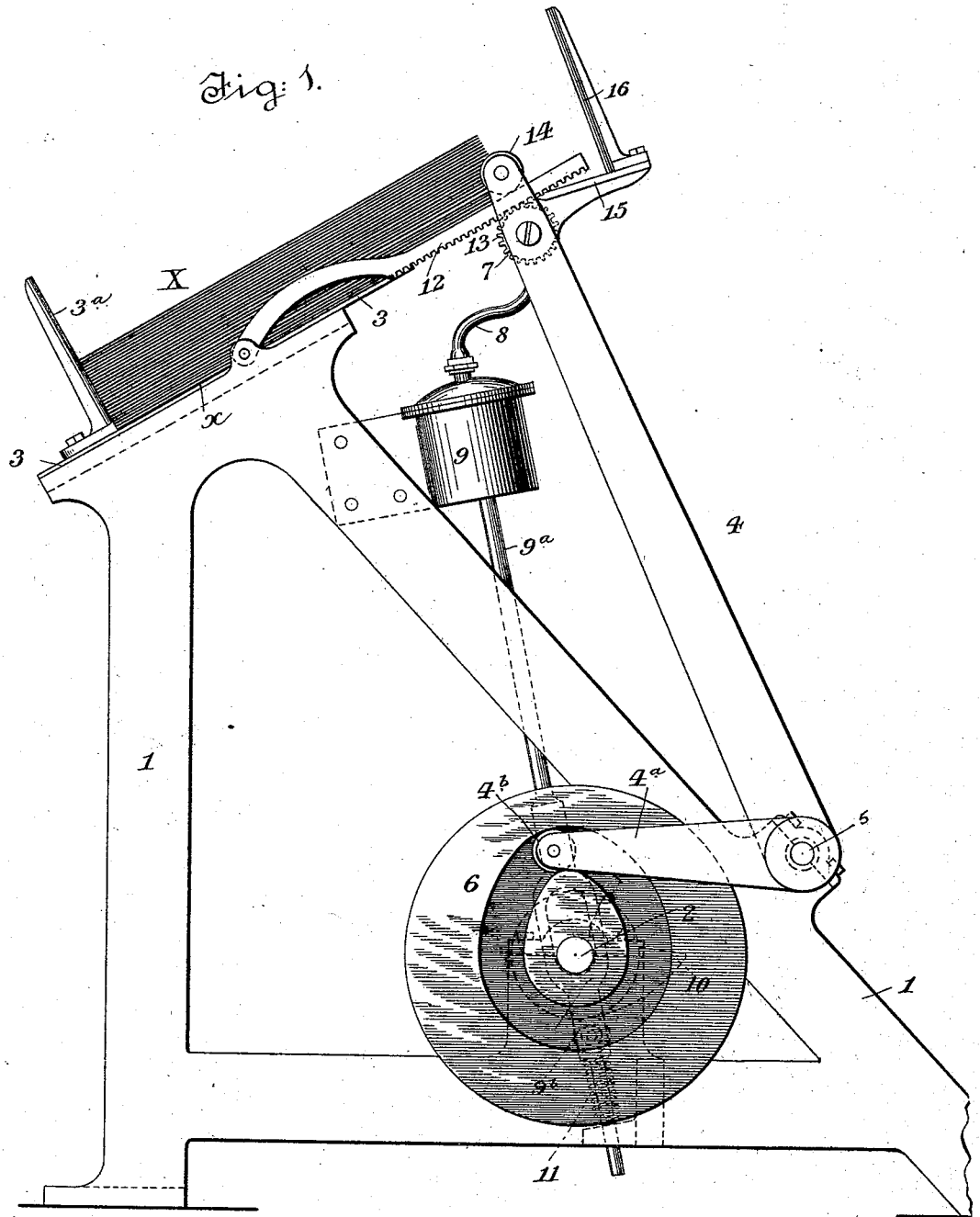
(No Model.) 3 Sheets—Sheet 1.

G. R. CLARKE

SHEET FEEDER.

No. 524,309. Patented Aug. 14, 1894.

Fig: 1.



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(No Model.) 3 Sheets—Sheet 2.

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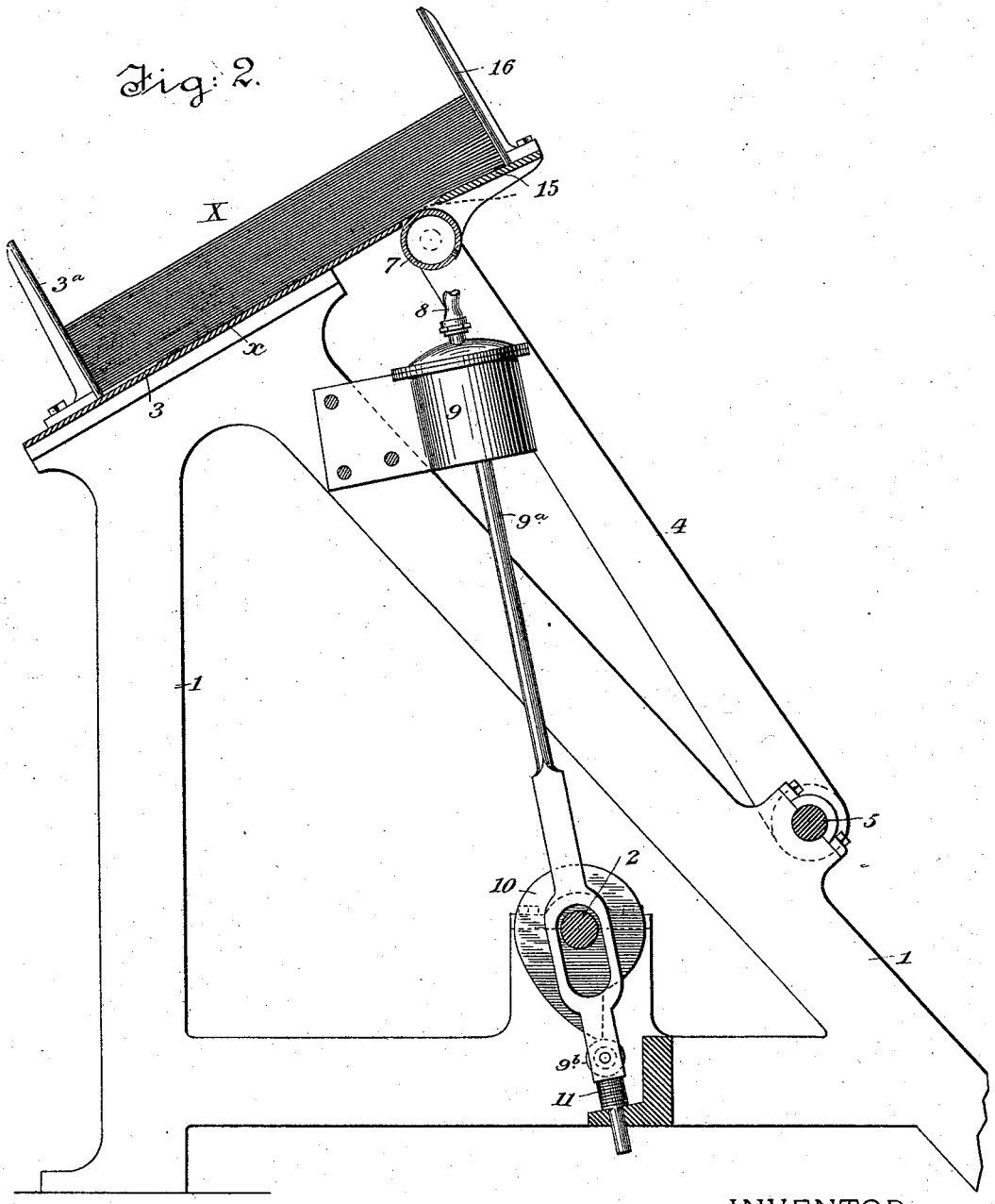
No. 524,309. Patented Aug. 14, 1894.

Fig. 2.



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(No Model.)

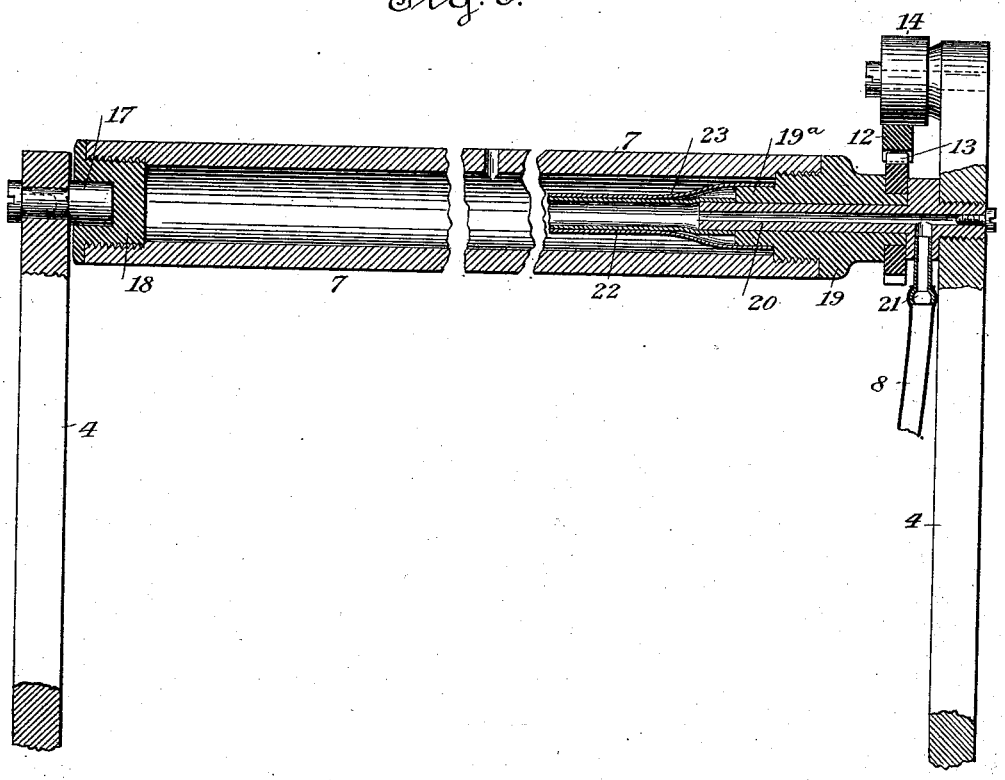
3 Sheets—Sheet 3.

G. R. CLARKE.

SHEET FEEDER.

No. 524,309. Patented Aug. 14, 1894.

Fig. 3.



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UNITED STATES PATENT OFFICE.

GEORGE R. CLARKE, OF MONTEL, TEXAS.

SHEET-FEEDER.

SPECIFICATION forming part of Letters Patent No. 524,309, dated August 14, 1894.

Application filed January 8, 1891. Renewed January 9, 1894. Serial No. 496,324. (No model.)

To all whom it may concern:

Be it known that I, GEORGE R. CLARKE, a citizen of the United States, residing at Montel, Uvalde county, Texas, have invented certain Improvements in Sheet-Feeders, of which the following is a specification.

My invention relates to that class of mechanical devices to be employed in connection with printing presses, ruling machines, envelope machines, &c., for the purpose of segregating and individualizing the sheets so that they may be fed one at a time, from a pile. In such devices it has been a common practice to employ a suction-roller to seize the sheet, wrap it upon itself, and thus draw the sheet in between said suction roller and a bearing roller in contact therewith; and my present invention relates to an improvement in this variety of feeders.

My present invention has for its object to simplify the construction, and it has in view only the segregation of the sheet from the other sheets in the pile so that it may be seized by any suitable grippers and drawn out from the pile. Such grippers, or rather mechanical means of grasping the sheet, form no part of my present invention; they will form, instead a part of the machine to which my invention will be applied.

The invention comprises a suitable stationary platform or support for the pile of sheets, which latter will rest, at the back, against uprights which keep the pile evened. The sheets will project at the front beyond the edge of the platform. A swinging or reciprocating frame is arranged below the platform and this frame carries at its upper part a suction roller, which is rotatively mounted and has its periphery in contact or nearly so, with the bottom sheet of the pile where it projects beyond the platform. This roller has a small hole or holes at the point where it is to seize the sheet, and its hollow interior is connected with any suitable air-exhauster. When the air is exhausted and the sheet thus caused to attach itself to the suction-roller, the roller moves back under the pile, turning axially, as though rolling on the pile, at the same time, this movement being imparted by a rack on the sheet-platform which gears with a toothed wheel on the suction-roller. As the roller rolls back, the bottom sheet, adhering thereto, is wrapped about it, and a segregating bar, carried by the same frame in which the suction-roller is mounted, moves back under the front edge of the pile of sheets and above the sheet wrapped on the roller. The exhaust is now broken and the end of the sheet released from the roller, and the elasticity or resiliency of the sheet would allow it to resume its first position if it were not for the interposed segregating bar. The roller and bar stand in this retracted position until the segregated sheet has been seized and drawn out from the pile, when they advance to their first positions ready to segregate the next sheet.

I will now describe my invention more minutely with reference to the accompanying drawings, wherein—

Figure 1 is a side elevation of the feeder showing the roller and segregating bar in their advanced positions; and Fig. 2 is a transverse section of the roller, bar and adjacent parts, represented as in their retracted position. Fig. 3 is a view on a larger scale representing the roller in longitudinal section.

1 is a suitable frame of any kind, to support the operative mechanism, and 2 is a shaft mounted therein to supply the necessary power.

3 is a platform to support the pile of sheets, X. I prefer to set this platform in an inclined position as shown, but this is not absolutely essential. The platform will have uprights 3^a, against which the rear edges of the sheets rest. A rocking frame, 4, is attached to a rock-shaft, 5, and an arm, 4^a, on said shaft carries a roller, 4^b, which engages a cam-groove in a cam 6, on the shaft 2. This cam imparts a vibrating or reciprocating movement to the upper end of the frame 4, in which is mounted a suction-roller, 7, so set or placed that its upper face or periphery touches or nearly touches, the under face of the lower sheet, *x*, of the pile of blanks X, where the latter projects to the front over and beyond the front edge of the platform 3. This roller 7, is hollow, and the hollow within it communicates by means of a pipe or tube, 8, preferably flexible, with an air-exhauster, 9, of any kind.

As herein shown the air-exhauster com-

prises a fixed cylinder, closed at its upper end where the pipe 8 is attached, and open at its lower end. Within it is a piston, and the piston-rod, 9^a, carries on its end a roller or stud, 9^b, which engages a cam, 10, on the shaft 2. This cam draws down the rod and effects the exhaust, and when the cam passes, a spring, 11, on the rod, retracts the piston and rod and breaks the vacuum.

Fig. 1 shows the suction-roller advanced with the suction aperture therein standing directly under the front edge of the bottom sheet *x*. The exhaust now acts and causes said sheet to attach itself to the roller, and almost simultaneously therewith the frame 4, swings back, carrying the roller back under sheet *x*. As the roller moves back, it rotates in such a manner as to wrap the sheet *x*, about it; this rotation is effected by a rack, 12, pivoted, as herein shown, to the platform 3, and gearing with a pinion, 13, on the roller. The pitch-line of the rack and pinion coincides with the periphery of the roller, or substantially so, and in consequence of this the sheet is wrapped about the roller without any pull on the sheet which might detach it from the roller. The rack is, or may be, held down in mesh with the pinion by a stud or roller, 14, mounted on the frame 4 over said rack.

On the frame 4, in front of the suction-roller, is mounted the segregating bar, 15, the rear edge of which is quite close to said roller. As the roller moves back with it under the pile of sheets, and above the lower sheet *x*, wrapped on the roller. I prefer to give to this rear edge of bar 15 a V-shape, as seen in Fig. 2, so that it may be sure to enter in between the segregated sheet and the pile. Fig. 2 shows the suction-roller drawn back under the pile and the lower sheet *x*, wrapped about it. At this moment the vacuum is broken at the air-exhauster 9, and the sheet *x*, released from the suction-roller. The position of the sheet when released is indicated in dotted lines in Fig. 2.

The parts will be timed, of course, with reference to the movements of the machine to which it may be attached, but the suction-roller will stand in the position seen in Fig. 2 until the sheet *x* is seized and drawn out from under the pile.

I prefer to mount on the bar 15, or on the frame which carries said bar, one or more eveners 16, which, when the bar moves back under the pile, approach the front edge of the pile of sheets and keep the sheets pressed back against the uprights 3^a. This insures the sheets being evened up in the pile, and prevents their disarrangement by the drawing out of the bottom sheet.

Where the reciprocating frame 4 is pivoted, the suction-roller will, of course, reciprocate in a slight curve. Hence the pivoting of the rack 12 to compensate for this. If the roller reciprocated in a right line parallel with the bottom sheet, as it might, this hinging or pivoting of the rack would not be required. Where the frame 4 rocks on a center as shown, I prefer to so place the center 5, as seen in Fig. 1, that the suction-roller will be closest to the bottom of the pile when in its most advanced position.

It is important that there should be no leakage of air where the suction-roller is connected with the air-exhauster, and consequently, I prefer, in constructing and mounting this roller, to follow the mode illustrated in Fig. 3, which I will now describe. The air is exhausted from the suction-roller at the right-hand end, as herein shown (although this is not material) and at the left-hand end, said roller merely rotates on a stud, 17, set in the frame 4, at that side. This stud finds a bearing in a plug, 18, which is screwed into the end of the roller 7, and has a recess to receive the stud. At the other end of the roller 7, is a tubular plug, 19, screwed into the end of the roller, and on this plug is secured the pinion, 13, which gears with the rack 12. The plug 19 forms the bearing for the roller at this end, and a long tubular stud, 20, secured in the frame 4, fits into the bore of the plug 19, and forms the journal on which the roller turns. The tube 8, communicates with the hollow or bore of the stud 20, at the point 21, (see Fig. 3) and through it to the hollow of the roller 7.

In order to guard against air-leakage between the rotating bearing plug, 19, and the stationary stud, 20, I arrange the stud to project into the roller beyond the end of the plug and slip onto this end a piece of rubber tubing, 22; and I reduce the inner end of the plug at 19^a, and slip on this end also a piece, 23, of rubber tubing. The tubing 23 is arranged to inclose and tightly embrace the tubing 22, and form an air-tight joint.

Having thus described my invention, I claim—

1. In a sheet-feeder, the combination with a platform to support the pile of sheets, of a vibrating suction-roller, adapted to move to and fro under the pile of sheets, and substantially in contact with the bottom sheet, an air-exhauster, which exhausts the air intermittently from said suction-roller and means for imparting axial rotation to said roller as it moves back under the sheets.

2. In a sheet-feeder, the combination with a platform to support the pile of sheets, a vibrating suction-roller, adapted to move to and fro under the pile of sheets and substantially in contact with the bottom sheet, an air-exhauster, which exhausts the air intermittently from said suction-roller, means for imparting axial rotation to said roller as it moves back under the pile of sheets, and a vibrating segregating bar, adapted to move under the pile of sheets and between the sheet attached to the suction-roller, and said pile.

3. In a sheet-feeder, the combination with a platform to support the sheets, a vibrating suction-roller, adapted to move to and fro under the pile of sheets and substantially in contact with the bottom sheet, an air-ex-

hauster, which exhausts the air intermittently from said roller, a vibrating segregating bar, which moves in unison with said roller and enters between the sheet seized by the roller and the pile of sheets, means for imparting axial rotation to said roller as it moves back under the pile of sheets, and eveners, carried by said bar and adapted to keep the pile of sheets even, substantially as set forth.

4. In a sheet-feeder, the combination with a support for the pile of sheets, of a vibrating suction-roller, adapted to move to and fro under the pile of sheets and substantially in contact with the bottom sheet, a pinion carried by said roller, a rack carried by said platform and gearing with said pinion, whereby, when the roller moves back under the sheets, axial rotation will be imparted thereto, and the sheet attached will be rolled thereupon, an air-exhauster, which exhausts the air intermittently from said roller, and a segregator, which separates the sheet attached to said roller from those in the pile.

5. In a sheet-feeder, the combination with a platform to support the pile of sheets, a vibrating frame 4, a suction-roller 7, mounted rotatively in said frame and adapted to move forward and back under the front edge of the pile of sheets, means for imparting a rolling movement to said roller as it moves back under the pile, an air-exhauster, which exhausts the air from the suction-roller intermittently, a segregating bar 15, mounted on said frame 4, directly in front of said suction roller, and eveners carried by said bar, substantially as set forth.

6. The combination with the roller 7, provided with a tubular plug 19, in its end, of the tubular stud 20, and the two pieces of rubber tubing, 23 and 22, respectively on the ends of said plug and stud, said tube 23 being arranged to tightly embrace the tube 22, at its free ends, as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

GEO. R. CLARKE.

Witnesses:
JABEZ AMSBURY,
JOSEPH E. PLATT.