

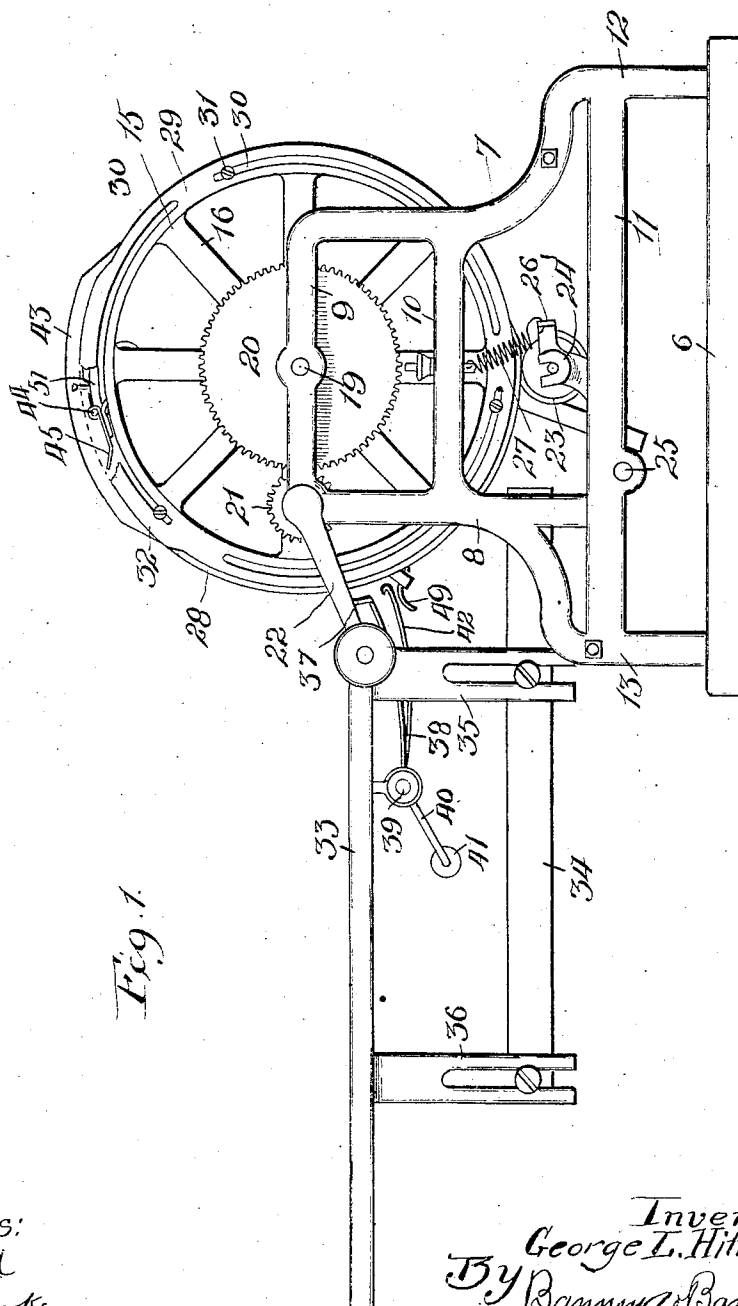
No. 854,499.

PATENTED MAY 21, 1907.

G. L. HILLIKER.
ROTARY DUPLICATING MACHINE.

APPLICATION FILED JULY 5, 1906.

3 SHEETS—SHEET 1.



Witnesses:
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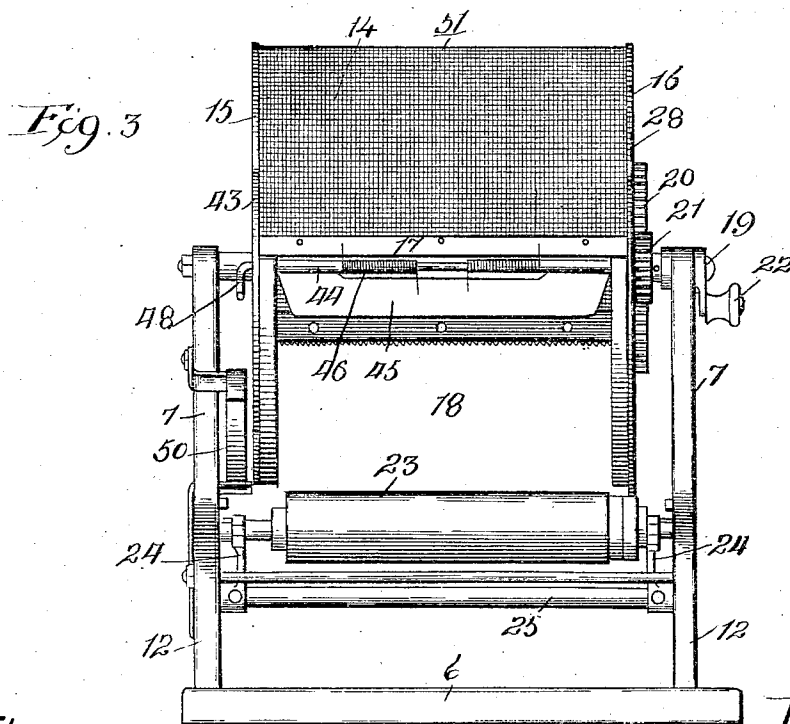
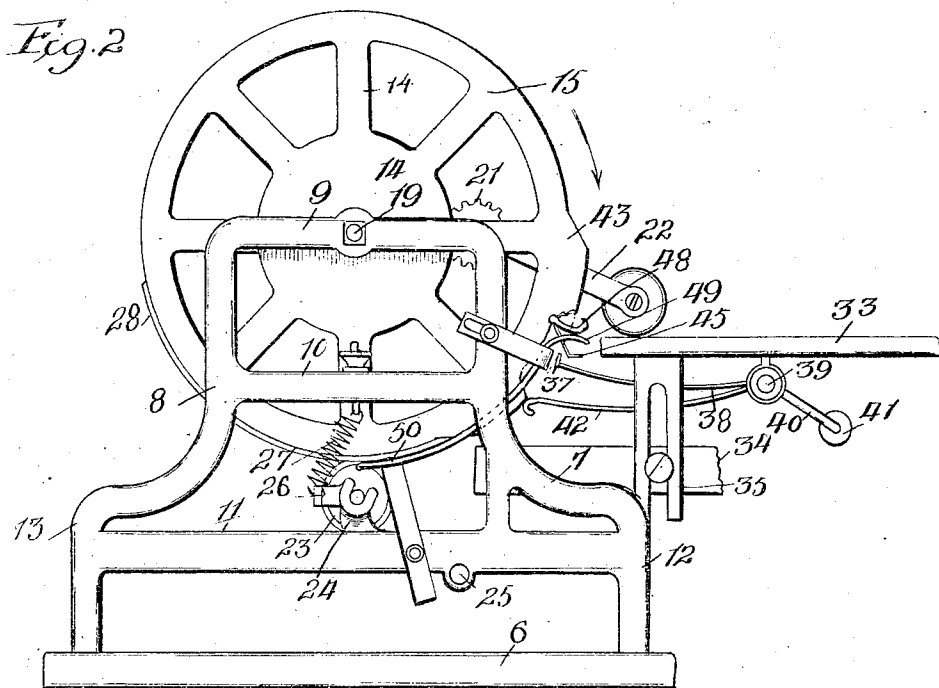
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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

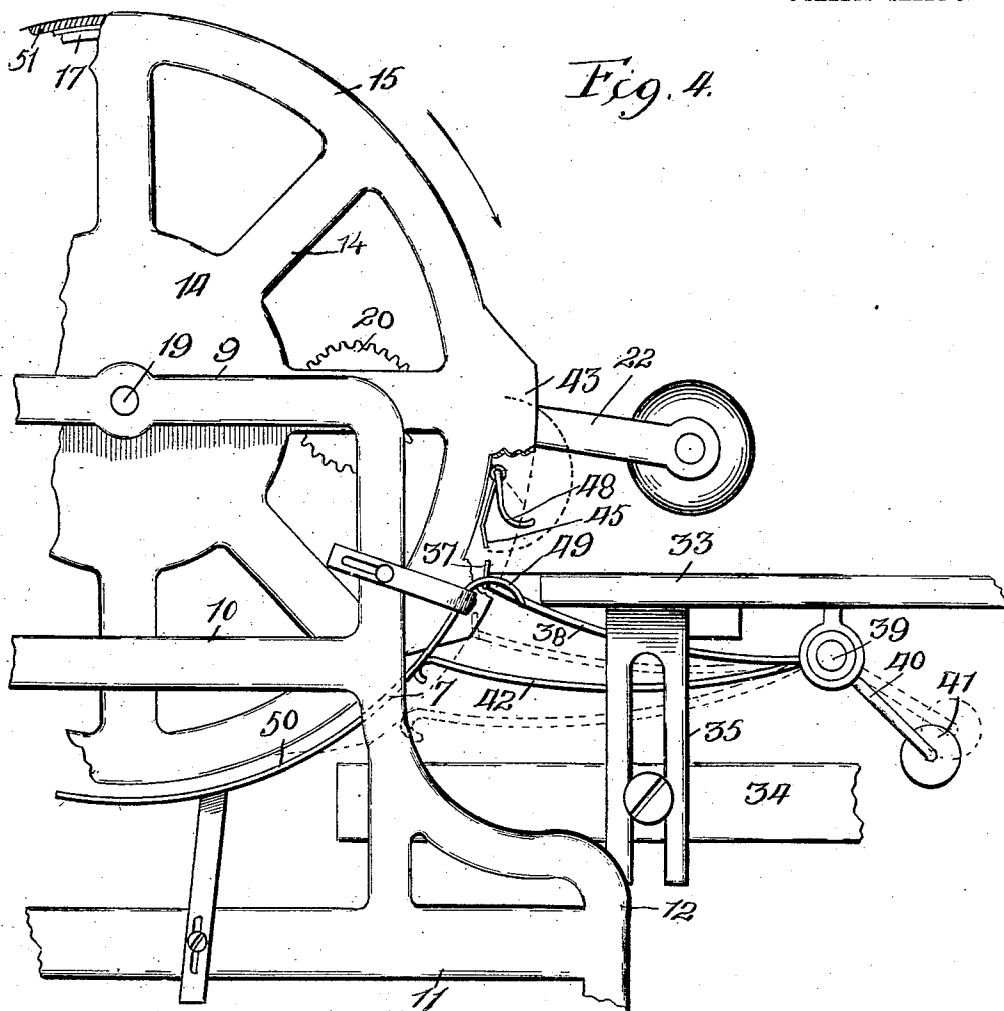
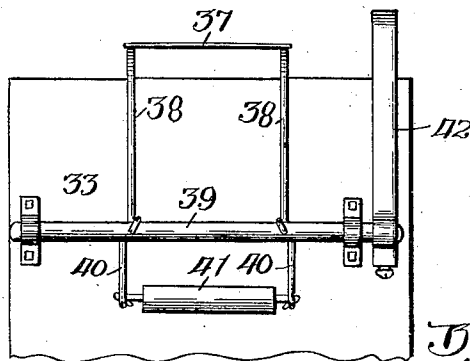


Fig. 5



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UNITED STATES PATENT OFFICE.

GEORGE L. HILLIKER, OF CHICAGO, ILLINOIS, ASSIGNOR TO ALRITE DUPLICATING SUPPLY COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

ROTARY DUPLICATING-MACHINE.

No. 854,499.

Specification of Letters Patent.

Patented May 21, 1907.

Application filed July 5, 1906. Serial No. 324,879.

To all whom it may concern:

Be it known that I, GEORGE L. HILLIKER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Rotary Duplicating-Machines, of which the following is a specification.

The object of this invention is to dispense with the interior inking mechanism commonly found on machines of this general character, which is very unsatisfactory for several reasons, being dirty, imperfect and cumbersome.

The invention relates particularly to the stop and feed mechanism for the paper and to the method for regulating and actuating the compression roller for adjusting the machine to print on paper requiring different space for heading.

The invention consists in the features of construction and combination of parts hereinafter described and claimed.

In the drawings Figure 1 is a side elevation of the entire machine; Fig. 2 a side elevation showing the end of the machine opposite to that shown in Fig. 1; Fig. 3 a view showing the cylinder and compression roller; Fig. 4 an enlarged detail showing the stop and feeding mechanism; and Fig. 5 a view showing the under face of the feed board with the stop mechanism secured thereto.

The duplicating machine comprises a bed plate 6 having mounted thereon end standards 7 and 8, each end standard comprising upper, intermediate and lower cross rails 9, 10 and 11 respectively, which bridge the space between front and rear side rails 12 and 13 respectively. It will be understood, however, that the shape or arrangement of the end uprights can be changed or modified as desired.

The uprights serve as a mounting for a broken cylinder 14 which comprises end wheels 15 and 16 respectively, between which is secured the body 17 of the cylinder which extends around a portion only of the entire space, leaving a gap or opening 18 between the wheels, as shown in Fig. 3. In duplicating machines which are inked from the interior, it is necessary that the body of the cylinder should be of perforated formation, but in the present case the body may be

slotted, since the interior inking mechanism is dispensed with. The wheels of the cylinder are rigidly mounted upon a shaft 19, the ends of which are journaled in the upper rails 9 of the end uprights, and the shaft has mounted thereon at one end a gear wheel 20 which meshes with a small pinion 21 actuated by means of a handle 22, the rotation of which imparts a rotary movement to the cylinder. Immediately below the cylinder is located a compression roller 23 having its ends journaled within brackets 24 mounted upon a rock shaft 25, and one of the brackets has outwardly projecting therefrom an arm 26 to which is secured a spring 27 attached at its upper end to the intermediate rail of the end upright 7. The edge of the wheel 16 around the portion of its periphery which lies adjacent to the gap or opening in the cylinder body, is outwardly projected to form a cam 28 adapted to contact with the compression roller and depress the same away from the gap in the cylinder, and, in order that this depression may be continued during such period of revolution of the cylinder as may be required to bridge over the space required for the heading of the paper, a ring 29 having slots 30 is provided, which operates with the cam surface 28. The ring 29 is secured to the cam 28 by means of headed screws 31 which pass through the slots in the cam ring and permit the ring to be turned or revolved in order, if desired, to elongate the cam surface adapted to bear against the compression roller. The body portion of the adjustable ring is of uniform diameter with the cylinder wheel 16, but the ring around a portion of its periphery is provided with a widened or cam portion 32, the edge of which coincides with the edge of the fixed cam 28, and the ring as a whole, being adjustable, the widened or cam portion 32 can, when desired, be moved, by the turning of the ring, to such position as to extend beyond the fixed cam surface 28, thereby elongating the cam; or, if desired, the ring can be turned to bring the two cam surfaces into register with one another, thereby shortening the cam surface to the greatest possible extent. The fixed cam surface extends around the end of the cylinder adjacent to the gap, and the movable cam surface permits a regulation which will hold

the compression rollers out of contact with the body portion of the cylinder to a greater or less extent.

In suitable proximity to the cylinder is located a feed table 33 which is supported by means of outwardly extending rails or bars 34 upon which the table is mounted by means of adjustable slotted brackets 35 and 36 respectively. At the inner end of the table is a stop 37 which is carried by a pair of outwardly extending rods 38 preferably formed of stiff wire, which rods are rigidly secured to a rock shaft 39 journaled beneath the feed table, and the outer ends 40 of the stop rods 38 have secured thereto a weight 41, which normally serves to hold the stop elevated above the surface of the feed table, as shown in Figs. 1 and 4. The end of the rock shaft 39 has secured thereto a rock arm 42 which extends forwardly and slightly below the level of the stop rods 38, and the end of the rock arm lies in the path of travel of a cam 43 on the periphery of the wheel 15, which, at a certain period in the revolution of the broken cylinder, contacts and depresses the rock arm and with it the paper stop, as best shown in dotted lines in Fig. 4, which period of depression is maintained only a sufficient length of time to permit the clamping mechanism, hereinafter described, to operate and grasp the edge of the projected sheet of paper.

The clamping mechanism comprises a rock shaft 44 located at the intake end of the cylinder body, adjacent to the gap, to which rock shaft is secured a clamping plate 45 which is normally held in the position shown in Fig. 3, in substantial alinement with the contour of the cylinder body, by means of springs 46 which encircle the rock shaft, and at one end the rock shaft is projected through the wall of the wheel 15 and bent to form a cam finger 48, which cam finger passes through the cam 43 and is normally held, by the spring, in the position shown in Fig. 4, which is in the direction in which the cylinder travels during the duplicating operation. The end of the cam finger is upwardly curved and is adapted to contact with the curved end 49 of a cam plate 50 which is secured to the inner face of the upright 8 between the upright and the wheel 15 and has a curve concentric with the curvature of the wheel 15. The inner or acting face of the cam 50 is in substantial alinement with the pivotal mounting for the rock shaft 44, so that as the cylinder is turned the cam finger will be thrown out of the position indicated in Fig. 4 and over into a position in which the acting edge of the clamping plate 45 will be pressed down onto the surface of the cylinder body; or in other words will be turned a distance of substantially 180° as shown in dotted lines in Fig. 4, and this position of the clamping plate will continue during about

a fifth of a revolution, or at least until the end of the paper has been caught by the compression roller and compressed against the body or face of the cylinder, after which no further clamping is necessary, and the clamping plate will be allowed to return to its initial position prior to the printing of the next sheet of paper. In using the device, a pad 51 of felt or other absorbent material is secured to the body of the cylinder, and this felt pad serves to retain the ink used in the printing operation, which may be smeared thereon by means of a brush or similar implement, and the stencil paper is mounted upon the pad in the usual manner.

In use a pile of blank sheets of paper is laid upon the feeding table and the uppermost sheet is thrust forward by the attendant in contact with the stop 37, which, in its initial position, will be projected above the surface of the feed table and the edge of the paper will outwardly project from the feed table a sufficient distance to permit the clamping plate to swing in under the paper at the proper time. As shown in Fig. 4, the cylinder has been turned to a position in which the cam 43 will immediately thereafter depress the rock arm 38, throwing down the stop out of its projected position into the position shown in Fig. 2, in which position the stop will lie immediately beneath the clamping plate, which immediately thereafter will be thrown over into clamping position by the contact of the cam finger with the cam trackway 50, and this clamping movement will be sufficiently sustained and rapid to carry with the clamping plate the projected end of the sheet of paper, which will be thus clamped and carried forward with the cylinder and between the stencil paper mounted thereon and the compression roller which will be raised into contact with the cylinder during the period required for the printing operation. As soon as the clamping plate has passed the stop, the latter will be allowed to return to normal position preparatory to a second revolution of the cylinder, so that the attendant in charge will have a considerable period of time, relatively speaking, in which to thrust forward a sheet of paper preparatory to the next operation.

The adjustable cam ring 29 permits a considerable adjustment in the action of the compression roller, so that the paper will not be compressed against the stencil until immediately before the point at which the stencil is cut, which is an easy and convenient means of regulating this portion of the mechanism. The stop and feeding mechanism is so adjusted that the two cams actuating the respective mechanisms will operate at the proper times to permit the necessary clearance between the stop and the clamping plate so that the paper will not be interfered with during the clamping operation.

By positioning the feed table at the point indicated, and by having it extend at an abrupt angle with respect to the surface of the cylinder rather than in tangential relation thereto as has previously been the general practice, the operator is enabled to get an unobstructed view of the point on the cylinder to which the paper is fed which is impossible in previous constructions in which the paper was fed at a point below the cylinder and in tangential relation to its surface. By elevating the feed table and feeding at an abrupt angle to the cylinder surface the operator can feed the sheets of paper with much greater certainty, rapidity and accuracy than is possible in previous constructions. In view of the fact, however, that the sheets of paper are fed at an abrupt angle, it is necessary for the clamping plate to have a very wide swing, substantially through 180 degrees, in order that the projecting edge of the paper may be seized from beneath and clamped during the rapid operation of the machine. For this reason a sudden and swift clamping action is requisite, which is supplied by the cam track which serves to throw the clamping plate from open to closed position with sufficient suddenness to clamp the projecting edge of the paper during the fraction of time that the cylinder is passing the feeding point. It will thus be seen that with the co-operation of the feed table set at the angle indicated the abruptly operated clamping plate is one which enables a much more rapid and satisfactory feeding than is possible in ordinary constructions.

What I regard as new and desire to secure by Letters Patent is:

1. In a duplicating machine, the combination of a revoluble cylinder, a feed table set at an abrupt angle with respect to the surface of the cylinder, a hinged clamping plate extending transversely to the cylinder, an outwardly projecting cam finger for swinging the clamping plate in a direction opposite to the travel of the cylinder for seizing the projecting end of the sheet of paper from beneath, and an elongated cam track having a curvature concentric with the cylinder, substantially as described.

2. In a duplicating machine, the combination of a revoluble cylinder, a feed table set at an abrupt angle with respect to the surface of the cylinder, a hinged clamping plate

extending transversely to the cylinder, an outwardly projecting cam finger for swinging the clamping plate in a direction opposite to the travel of the cylinder for seizing the projecting end of the sheet of paper from beneath, an elongated cam track for actuating the cam finger, a stop normally projecting above the end of the feed table, an arm connected with the stop, and a cam on the cylinder adapted to contact the arm for automatically lowering the stop to permit the forward projection of a sheet of paper prior to the clamping operation, substantially as described.

3. In a duplicating machine, the combination of a revoluble cylinder, a feed table set at an abrupt angle with respect to the surface of the cylinder, a hinged clamping plate extending transversely to the cylinder, an outwardly projecting cam finger for swinging the clamping plate in a direction opposite to the travel of the cylinder for seizing the projecting end of the sheet of paper from beneath, an elongated cam track having a curvature concentric with the cylinder, a stop normally projecting above the end of the feed table, and means for automatically lowering the stop to permit the forward projection of a sheet of paper prior to the clamping operation, substantially as described.

4. In a duplicating machine, the combination of a revoluble cylinder, a feed table set at an abrupt angle with respect to the surface of the cylinder, a hinged clamping plate extending transversely of the cylinder, means for swinging the clamping plate in a direction opposite to the travel of the cylinder for seizing the projecting end of a sheet of paper from beneath, a rock shaft journaled to the under side of the feed table, arms forwardly projecting from the rock shaft, a stop secured to the arms and normally projecting above the forward edge of the feed table, an operating arm rigidly secured to and forwardly extending from the rock shaft, and a cam on the periphery of the cylinder adapted, at the proper time, to depress the actuating arm and retract the stop prior to the clamping operation, substantially as described.

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Witnesses:

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