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DUPLICATOR

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Fig. 1

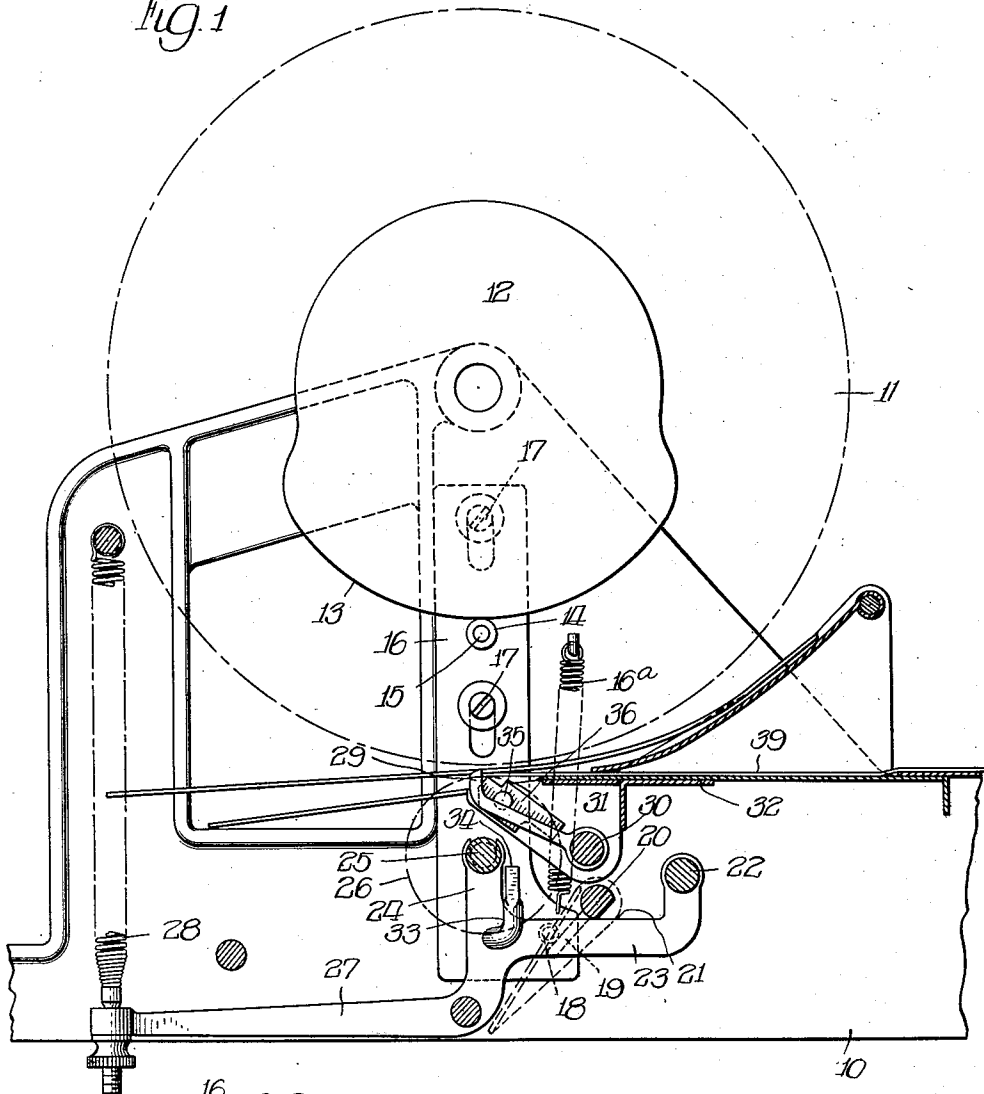
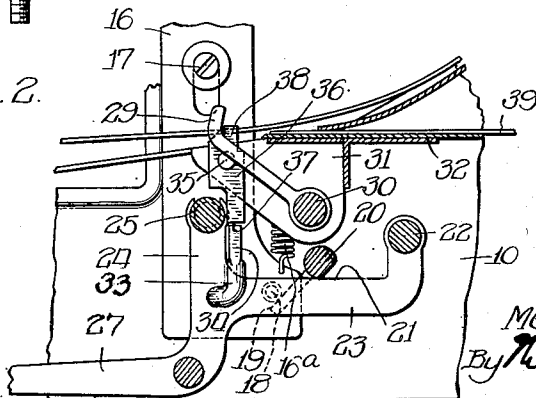


Fig. 2



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## UNITED STATES PATENT OFFICE

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## DUPLICATOR

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3 Claims. (Cl. 101-118)

My invention relates to duplicators and particularly to an improvement in the feeding mechanism thereof.

It is common in automatic feed duplicators to experience instances where a sheet is not fed to the machine with the result that an impression is made on the pressure roller. This brings about the smutting or offsetting of the backs of a number of succeeding sheets that are fed to the machine, and these must be discarded.

It is an object of my invention to provide an automatic detecting finger operated solely by the mass of the sheet of paper that is being fed and that co-acts with the pressure roller in such manner as to prevent its advance into contact with the cylinder whenever a sheet is not in the machine. A construction has been designed in which the desired result is brought about by the use of a very light weight latch that is easily moved by a sheet of light weight paper.

The invention will be more readily understood by reference to the accompanying drawing, in which:

Fig. 1 is a side elevation, partly in section, through a duplicator of well-known construction to which my improvement has been applied and,

Fig. 2 is a fragmentary view of the parts in a position in which the roller is held inactive.

In the drawing I have illustrated a frame 10 in which a cylinder 11 is journaled, the cylinder carrying the inked stencil in the well-known manner. Secured to one end of the cylinder is a cam 12, the high part 13 of which co-acts with a roller 14 mounted on a pin 15, fixed to a slide 16 that is guided on pins 17, fixed to the frame of the machine. A tension spring 16a tends to move the slide upwardly to maintain the roller 14 in contact with the face of the cam 12. At its lower end the slide carries a pin 18 that lies above an arm 19, fixed to a shaft 20, mounted in the frame of the machine. The shaft 20 is flattened at its ends to form, in effect, a cam for engagement with the top surface 21 of a rocker mounted on the pin 22 fixed to the frame 10 of the machine. The rocker has the arm 23 and an upward extension 24 therefrom that contains a seat for the over-hung end 25 of the pressure roller 26. It will be understood that the rocker is duplicated at each side of the machine and that the pressure roller is supported at its two ends. An extension 27 of the rocker is engaged at its outer end by a tension spring 28 that tends to move the pressure roll upward and to press a sheet into cooperative engagement with the inked cylinder.

An automatic paper stop is shown consisting of the finger 29 mounted to oscillate with a shaft 30 that is carried in a bracket 31 fixed to the bed 32 of the machine. The shaft 30, and consequently the stop finger 29 is operated in properly timed relation by mechanism not shown, so that the portion of the stop finger that projects into the path of the paper is lowered just as the cam 13 causes the pressure roller to rise and grasp the paper. It is important to note that the stop, which is duplicated at both sides of the machine, is located substantially exactly at the point of peripheral engagement of the cylinder and pressure roll; thus the paper may be fed into its correct position where it is then ready for delivery to the feed roll.

Fixed to the rocker at the end of the arm 23 is a projection 33 that is bent to extend upwardly and to provide a stop member 34. Pivoted on a pin 35 in the bracket 31 is a latch or dog 36 having a downwardly extending portion 37 that may engage with the stop 34 and an upwardly projecting portion 38 that lies in the path of the paper indicated at 39 in Fig. 1. The latch is of considerable weight and is unbalanced as indicated so that it tends to be held by gravity in the position shown in Fig. 2 with its upper end extending into the path of the paper as it is brought up against the stop 29. By reason of the light weight of the dog it is moved solely by the mass of the paper to the position of Fig. 1 in which there is no interference with the upward movement of the pressure roll such as occurs during normal operation. If, however, a cycle of operation occurs with no paper being fed, the latch will assume the position of Fig. 2 and the pressure roll cannot move upward. Thus there is no impression on or inking of the pressure roll even though a sheet is not delivered to the machine. It will be noted that due to the pendulous character of the latch, the thrust of the roller and its spring is directed parallel to a vertical line through the pivot of the latch. Thus it may be of very light weight and still have requisite resistance.

While during a part of the cycle of the machine there is considerable pressure exerted on the latch so that it could not be moved by a sheet of paper yet during the part of the cycle when a sheet is properly fed the pressure roller is held down and there is no contact between the stop 34 and the lower end 37 of the latch. Inasmuch as the edge of the paper is, at the point of contact with the latch, being held by the spring fingers and as the speed of travel of the paper will be considerable, the mass of even a thin sheet is ample to

swing the latch or trigger into its proper position.

It is important that the latch be located as indicated, that is, closely adjacent to the stop 5 29. Thus the leading edge of the paper as it is thrust toward the stop must contact and displace the stop before it comes to a position of rest against the stop. This simplifies greatly the matter of feeding, as the operator need have no 10 concern as to when the sheet is fed relative to the operation of the machine, nor as to the placing of the sheet. He need only be sure that the sheet is up against the stops at the two sides of the machine; if it is not in that position, or if it 15 is against only one of the two stops, the impression will not be made as the pressure roll will not be released unless the paper is in proper position and both latches are released.

It is obvious that modifications may be made 20 in the construction shown and I do not wish to be limited except as in the appended claims.

I claim:

1. In combination, a cylinder, a pressure roller, 25 means for effecting the advancing and retracting of the roller in timed relation to the rotation of the cylinder, a stop finger located at the point of contact of the cylinder and roller, means for automatically retracting the stop in timed relation, a latch located immediately in front of said 30 stop, said latch normally preventing advancement of the roller, a part of said latch projecting

into the path of a sheet of paper as it is being fed and said latch being movable to inoperative position solely by said paper.

2. In a duplicator, the combination of a cylinder, a feed roller, a cam connected to the cylinder for advancing and retracting the feed roller, 5 a paper stop projecting into the path of the paper and located substantially exactly at the point of contact between the cylinder and roller, said stop being automatically retracted to permit the paper 10 to be fed forward, and a gravity actuated dog, likewise located at the point of engagement of the cylinder and roller and immediately in front of said stop, whereby the paper must first move 15 said dog before contacting the stop, said dog preventing coaction of the roller and cylinder when a sheet of paper is not in position against said stop.

3. The combination with the cylinder and feed roll of a duplicator of means for advancing and 20 retracting said feed roller, a stop finger movable into and out of the path of paper being advanced by said feed roller, a gravity actuated dog pivoted to lie with a portion projecting into the path of 25 paper at a point immediately adjacent to said stop finger, said latch in the absence of a sheet of paper acting as a stop to prevent the operation of the said roller.

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