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SIGNATURE GATHERING MACHINE.

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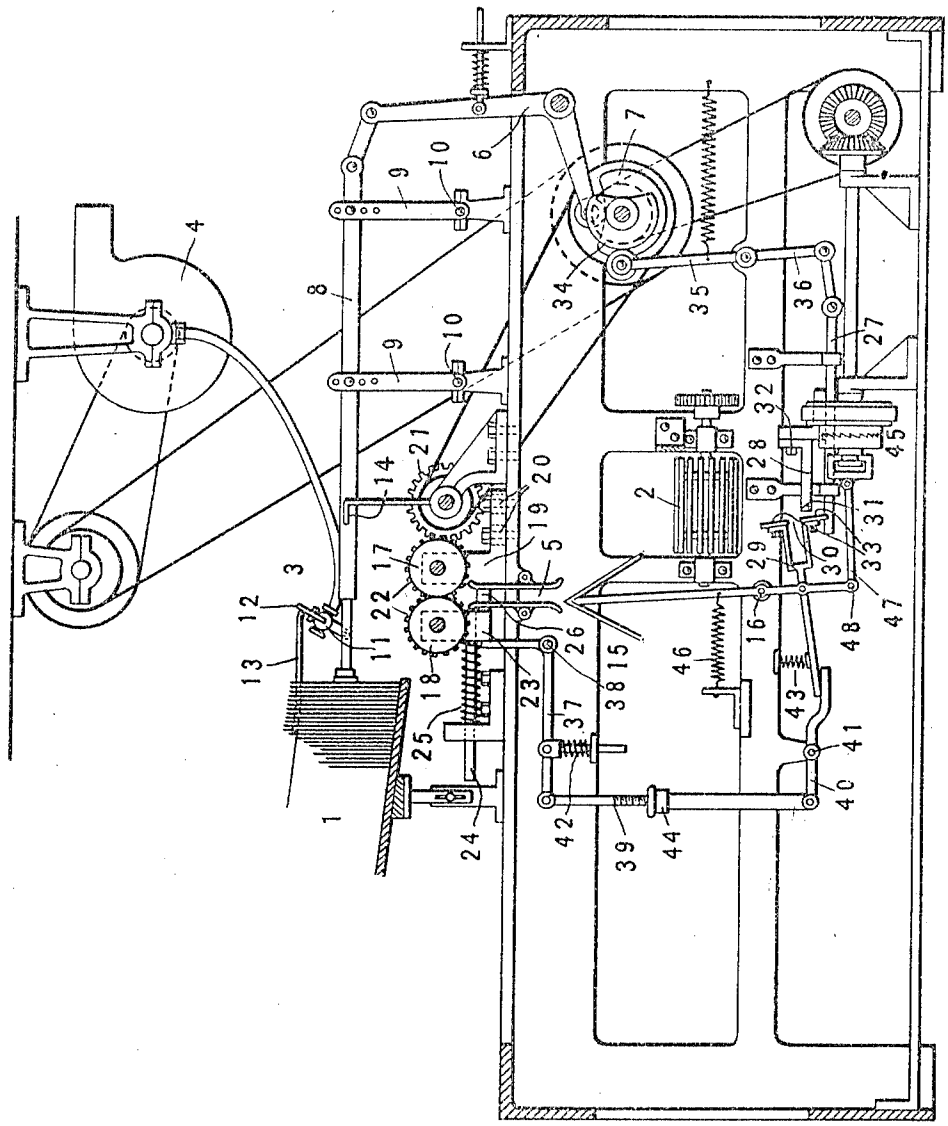
1,040,689. Patented Oct. 8, 1912.



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SIGNATURE-GATHERING MACHINE.

1,040,689. Specification of Letters Patent. Patented Oct. 8, 1912.

Application filed December 16, 1908. Serial No. 467,736.

To all whom it may concern:

Be it known that I, CHARLES A. JUENGST, a citizen of the United States, and resident of Croton Falls, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Signature-Gathering Machines, of which the following is a specification.

My invention relates to improvements in signature gathering machines, and has as its primary object to more readily detect any variations or imperfections in the signatures or sheets handled by the machine. And by this I mean also to detect when signatures are missed or too many signatures are taken, so the words "imperfections" and "imperfect" are to be understood in this broad light.

With this end in view the invention consists primarily of a calipering device interposed in the signature path of the machine and adapted to measure the thickness of the signatures handled by the machine, a switch also interposed in the signature path, a switch throwing device and connections between the calipering mechanism and the switch throwing device, whereby when the signatures are of improper thickness the switch throwing device will be rendered operative to throw the switch and direct the imperfect signatures out of the normal signature path.

In the art of signature gathering, the size or thickness of the signatures varies quite frequently. For instance, the signature might be a four page thickness for one job and on the next job the signature might be a sixteen page thickness. Therefore, in order to be practicable the signature gathering machine must be capable of adjustment to handle these signatures of different thickness. For this reason I make the detector mechanism of my machine adjustable to suit signatures of different thickness. This adjustment might be and preferably is accomplished by means of an adjustable link or part in the connection between the calipering device and the tripping mechanism. This adjustment could, however, be made in the detector part of the mechanism, that is, in the detector member which is adapted to pass through a detector gate, or in the gate itself.

The calipering members preferably consist of a pair of feed rolls located in the signature path of the machine, between which the signatures pass in transit to the carrier or conveyer of the machine. One of these rollers is preferably fixed or non-yielding and the other is adapted to yield. By "fixed" or "non-yielding" is meant, that the roller or other member is relatively fixed at the moment of calibration, for it may be and it preferably is mounted so as to be capable of a certain adjustment with respect to the yielding member of the calibrating pair.

In the drawings is illustrated a preferred embodiment of the invention but various changes may be made in the construction and arrangement of the parts without departing from the spirit and scope of the invention.

In the said drawings: the figure is a longitudinal sectional view of a signature gathering machine embodying my invention with the detector parts shown in elevation.

In the drawings only one of the signature hoppers is shown, and this is designated by the numeral 1. The signatures are taken from this hopper and conveyed to a traveling carrier or conveyer 2. Any means may be utilized for separating or conveying the signatures from the hoppers to this conveyer, but for this purpose I prefer to use a suction device 3, of a well known type. This suction device is connected with a suitable exhaust fan or like device 4. The suction or delivery device is reciprocated between the hopper and the plane of the guides 5, by any suitable means such as a bell crank 6, engaging at the one end with the cam 7, and connected at the other end by a link 8, to the delivery device, the whole device being supported on the posts 9, which are pivoted on the centers 10. The delivery device is timed so as to accord with the action of the gathering carrier, that is, so that as the carrier travels the signatures will be deposited in piles thereon, in the manner well known in the art of signature gathering. The delivery device is actuated to seize the outermost signature, withdraw the same from the signature hopper and deposit it between the guides leading to the carrier. This seizing and releasing action of the delivery device may be accomplished by means of a valve 11, the valve having an actuating stem 12, to be engaged by the stops 13 and 14, in its reciprocatory movement. The stop 13 acts on the valve to render the same active and the signature is seized and car-

ried over to the point where the valve is acted upon by the stop 14. This last stop sets the valve so as to release the signature, and the signature is dropped between the guides of the signature path. This seizing and releasing action of the delivery means might be accomplished in other ways, and other forms of delivery devices or sheet separating devices might be employed.

A switch 15, is pivoted at the point 16, and is adapted to be positioned to direct the signatures either toward or away from the carrier according as the signatures are of the proper size or are defective in some way. For the purpose of measuring the signatures to determine whether they are of the proper size, a relatively fixed roll 17, and a relatively movable roll 18, coöperating therewith, are interposed in the signature path. The relatively fixed calipering roll is journaled in a non-yielding or fixed bracket 19. This bracket is non-yielding at the time of calibration but as for certain purposes it might be desirable to adjust it toward or away from the yielding roll, the bracket is preferably adjustably mounted on the machine as by means of the bolt and slotted connection 20. These rolls may be actuated by the gear 21, and intermeshing pinions 22. The yielding roll is journaled in a bracket 23, which is slidably carried by a rod or other support 24, and the yielding roll is normally held in contact with the fixed roll by means of a spring 25. A stop 26, may be interposed between the two rolls to limit the inward movement of the yielding roll.

Normally-inoperative switch-throwing means are provided, and such means would preferably take the shape of a reciprocating bar 27, carrying a rigid detector arm or member 28, and a gate member 29, carried by the switch and provided with a gate or opening 30, through which the detector finger 31, of the detector member, is adapted to pass under normal conditions. The detector member and gate member might be non-adjustable but I prefer to make these parts adjustable, as shown in the drawings, in which the detector member is adjustably secured to the reciprocating bar by means of a bolt 32, so as to be capable of adjustment with respect to the detector gate, also the size and position of the gate may be regulated by means of the pair of adjustable plates 33, adjustably secured on the end of the bifurcated gate member. The reciprocating bar may be actuated by any suitable means such as the cam 34, and the lever and link connection 35 and 36.

Suitable connections between the calipering or measuring means, and the detector and switch throwing parts, are provided. Such connections would preferably take the form of a bell crank 37, pivoted at the point 38, engaging at its one end with the bearing of the yielding roller so as to be positioned by said roller, and having connected to its other end the link 39, the link in turn having connection with the lever 40, pivoted on the center 41, and adapted to position the gate member of the detector. A spring 42, would preferably be used to hold the end of the bell crank in proper engagement with the yielding roller, and a spring 43, would be employed to hold the gate member and positioning lever in proper engagement. The connecting link 39, is preferably made longitudinally adjustable. This may be accomplished by making the link in telescoping parts, as shown, the relation of which parts is regulated by a screw nut 44. This link of course might otherwise be made adjustable.

The carrier is operated from the main driving shaft through the medium of a clutch 45. The members of this clutch are normally held in engagement by a spring 46. This clutch is automatically disengaged so as to stop the carrier when an imperfect signature is detected. This is preferably accomplished by means of a clutch rod 47, engaging with one of the clutch members at one end and connected at its opposite end to the depending extension of the switch at the point 48.

The operation of the machine is as follows: The signatures are taken from the hoppers by means of the delivery mechanism, and deposited between the measuring rolls which automatically separate according to the thickness of the signature. The position of the yielding roll is therefore determined by the thickness of the signature. By means of the bell crank, link and lever connections, or any other suitable connections which might be employed, motion is transmitted to the detector part carried by the switch, and the detector gate is therefore positioned in accordance with the thickness of the signature. The parts are so adjusted that if the signature is of the proper thickness the gate opening exactly coincides with the position of the detector finger so that in its reciprocation this detector finger passes through the gate without affecting the position of the switch. The switch is therefore not affected at all when the signature is of the proper thickness, and the signature is directed by such switch to the carrier. If, however, the signature is too thick, the yielding roller will be displaced too far, too great a motion will be communicated to the gate member and the detector finger will strike against the upper part of the gate member, and the switch will be thrown to the right, thereby directing the signature away from the carrier or conveyer. This same movement of the switch causes the clutch parts to be disengaged and the carrier is stopped. If the

signature were too thin, the gate member would not be deflected far enough and the detector finger would engage the lower part of the gate member and the switch and clutch would be actuated in the same way as just described. The position of the detector gate and the detector member might readily be reversed as the detector gate might be carried by the reciprocating bar and the detector member by the switch. If a signature should be missed in the feeding or too many signatures be taken, the switch will be thrown and the carrier stopped in the same manner before described.

What is claimed, is:

1. In a signature gathering machine, a signature hopper, a relatively stationary calipering member, a yieldingly mounted calipering member having a movement toward and away from the stationary member, means for delivering the signatures from the hopper between the calipering members, a carrier, a switch located below the calipering members and adapted to direct the signatures toward or away from the carrier, a reciprocating member, a rigid detector member carried thereby, a coöperating detector member carried by the switch, connections from the movable calipering member to the detector member carried by the switch for positioning said detector member according to the thickness of the signature between the calipering members, and means for adjusting the said connections to shift the said detector member with respect to the reciprocating detector member whereby the parts may be adjusted for handling signatures of different thickness.

2. In a signature gathering machine, a signature hopper, a relatively fixed calipering member, a yieldingly mounted calipering member having a movement toward and away from the stationary calipering member, means for delivering the signatures from the hopper between the calipering members, a carrier, a switch located below the calipering members for directing the signatures either toward or away from the carrier, a reciprocating element, a rigid detector member on the reciprocating element, a detector member carried by the switch and arranged to coöperate with the reciprocating detector member, means for adjusting the detector member carried by the switch with respect to the rigid reciprocating detector member, connections from the yielding calipering member to the gate member for positioning the gate member according to the displacement of the yielding calipering member from the fixed calipering member, and means in the said connections for adjusting the position of the detector member carried by the switch with respect to the reciprocating detector member whereby the parts may be adjusted for handling signatures of different thickness.

3. In a signature gathering machine, a signature hopper, a stationary calipering roll, a yieldingly mounted calipering roll having a movement toward and away from the stationary roll, means for delivering the signatures from the hopper between the rolls, a carrier, a switch located below the rolls and adapted to direct the signatures toward or away from the carrier, a reciprocating member, a rigid detector finger carried thereby, a member carried by the switch having a gate opening for the passage of the detector finger therethrough, connections from the movable roll to the gate member for positioning the gate member according to the thickness of the signature between the detector rolls, and means for adjusting the said connections to shift the gate member with respect to the detector finger whereby the parts may be adjusted for handling signatures of different thickness.

4. In a signature gathering machine, a signature hopper, a pair of calipering rolls, one of said rolls being mounted on a fixed support and the other roll being mounted to have a yielding movement toward and away from the fixed roll, means for delivering the signatures from the hopper between the rolls, a carrier, a switch located below the rolls adapted to direct the signatures toward or away from the carrier, a reciprocating member, a rigid detector finger adjustably supported on said reciprocating member, a member carried by the switch having a gate opening for the passage of the detector finger therethrough, means for adjusting the size and location of the gate opening of said member, connections from the yielding roll to the gate member for positioning the gate member according to the displacement of the yielding roll from the fixed roll, and means in the said connections for adjusting the position of the gate member with respect to the detector finger whereby the parts may be adjusted for handling signatures of different thickness.

Signed at New York, borough of Manhattan, in the county of New York, and State of New York, this 15th day of December, A. D. 1908.

CHARLES A. JUENGST.

Witnesses:
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