Sept. 21, 1926. 1,600,959

C. HENDERSON

PLURAL SHEET DETECTOR

Filed Feb. 1, 1922 3 Sheets-Sheet 1

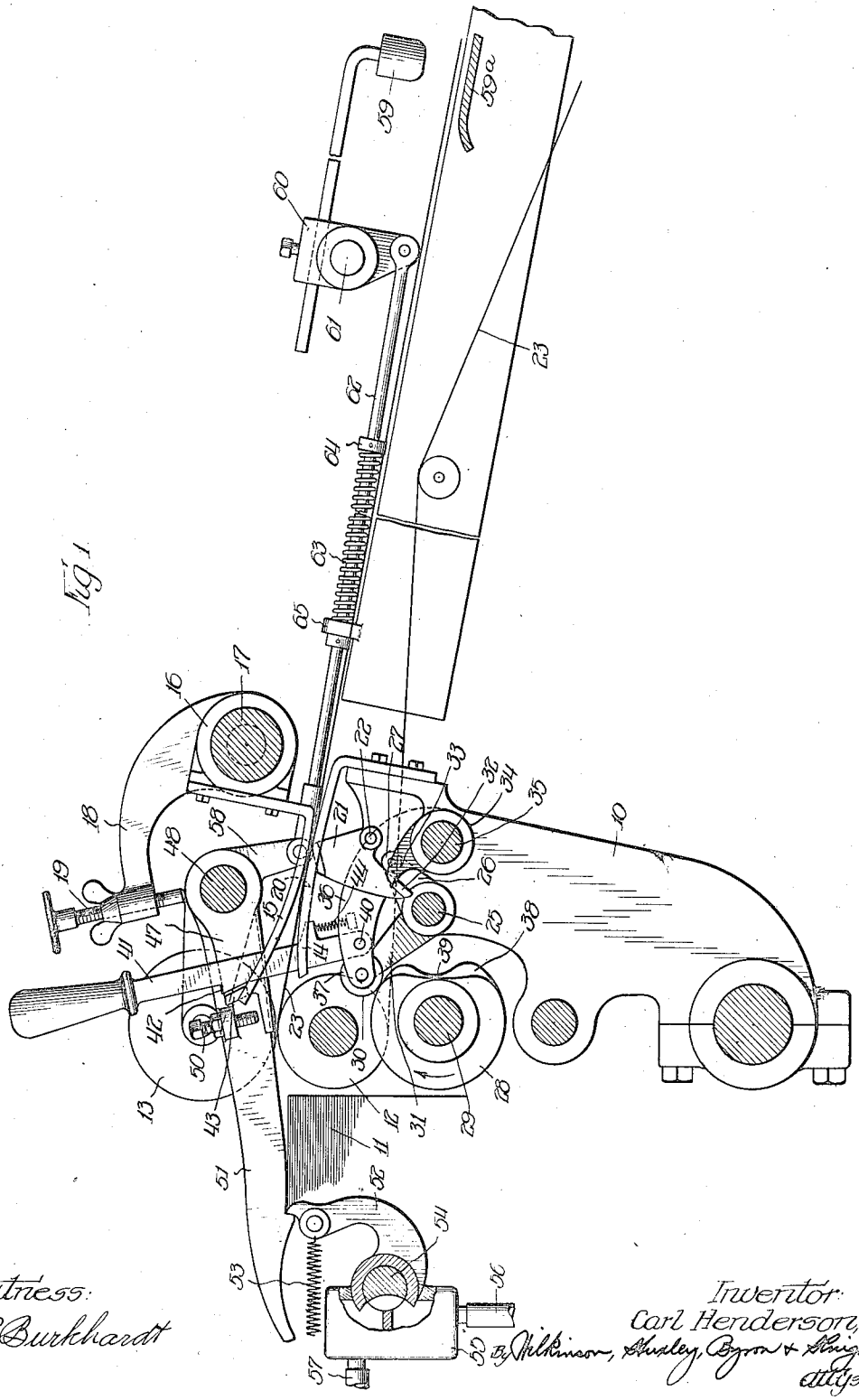


Fig 1

Witness:
R Burkhardt

Inventor
Carl Henderson,
By Wilkinson, Huxley, Byron & Knight
attys

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C. HENDERSON

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Filed Feb. 1, 1922 3 Sheets-Sheet 2

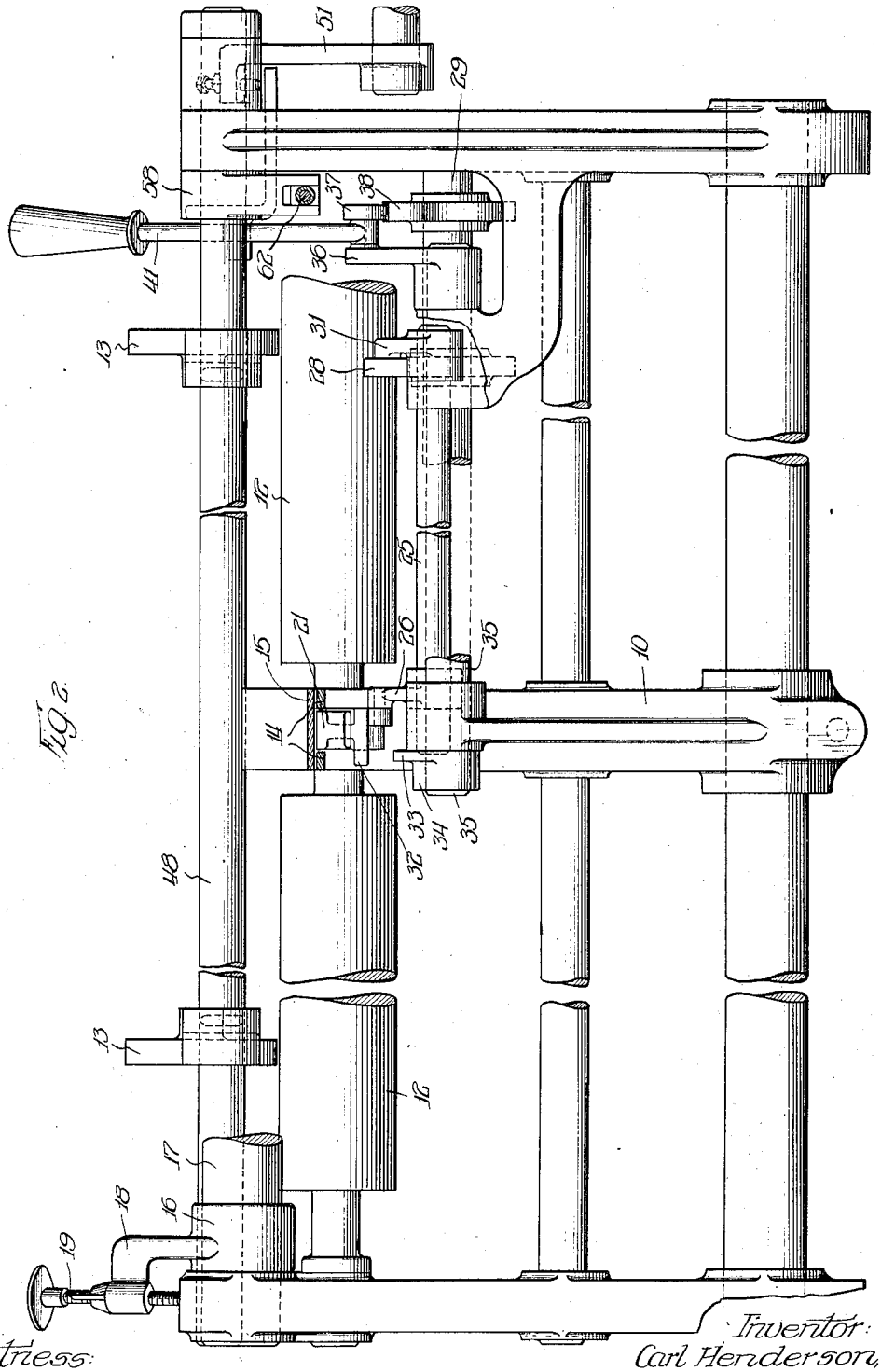


Fig 2.

Witness:
R Burkhardt

Inventor:
Carl Henderson,
By Wilkinson, Huxley, Byron & Knight
Attys.

Sept. 21, 1926. 1,600,959

C. HENDERSON

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Filed Feb. 1, 1922 3 Sheets-Sheet 3

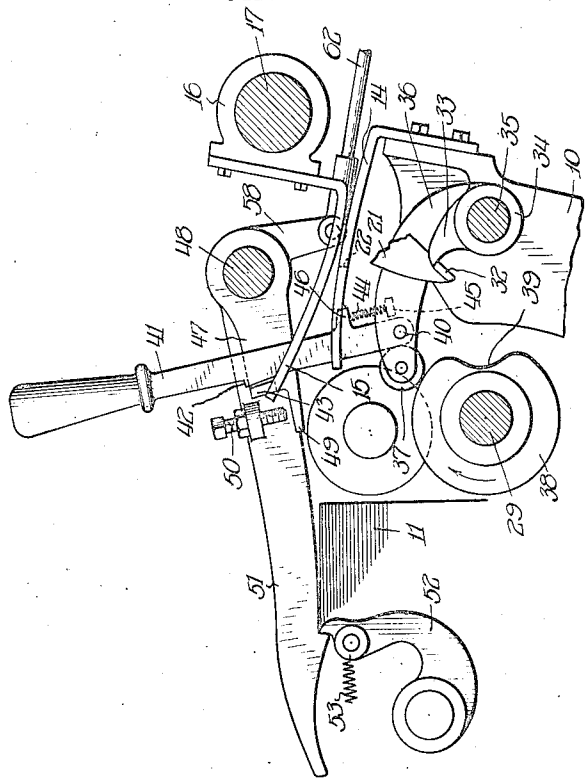


Fig. 4.

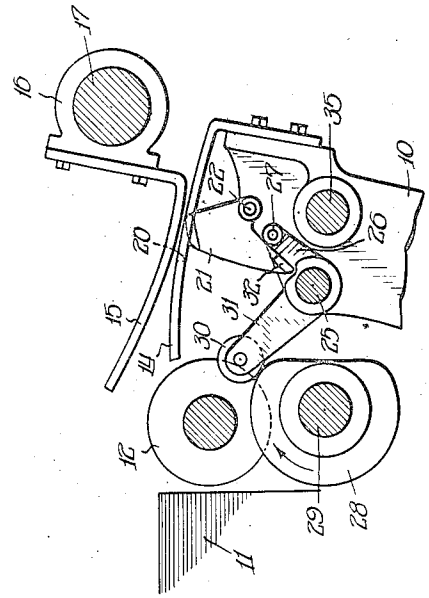


Fig. 3.

Witness:
R. Burkhardt.

Inventor:
Carl Henderson,
By Atkinson, Hurley, Byron & Knight
Attys.

Patented Sept. 21, 1926. 1,600,959

UNITED STATES PATENT OFFICE.

CARL HENDERSON, OF CHICAGO, ILLINOIS, ASSIGNOR TO MIEHLE PRINTING PRESS AND MANUFACTURING COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

PLURAL-SHEET DETECTOR.

Application filed February 1, 1922. Serial No. 533,190.

My present invention relates to printing presses, and more particularly to novel detecting means adapted to interrupt the feeding of paper whenever two or more sheets are accidentally fed.

One object of the invention is to improve plural sheet detectors, making same simple and durable in construction and efficient and reliable in operation.

Another object is to provide a simple plural sheet detector adapted to meet the various requirements of commercial operation.

These and other objects are accomplished by means of the arrangement disclosed on the accompanying sheets of drawings, in which—

Figure 1 is a fragmentary side elevation of a printing press embodying my invention;

Figure 2 is an elevational view of the same;

Figure 3 is a fragmentary side elevation of some of the parts shown in Figure 1 showing the cooperative action of certain of the detector and control elements; and,

Figure 4 is a similar view showing other of said detector and control elements.

The various novel features of the invention will be apparent from the following description and drawings and will be particularly pointed out in the appended claims.

Referring to the figures of the drawings, it will be noted that I have disclosed my invention in connection with a printing press which may be represented by the frame 10, to the rear of which is located a stack or supply 11 of sheets to be fed to the press for receiving an impression. For the proper and successful operation of a press it is necessary that but one sheet of material be fed at a time, and if more than one sheet is fed at a time an interruption in the feeding of such sheets should be caused immediately. In the present arrangement sheet material is fed from the stack 11 by any suitable mechanism, such as the well known suction feed grippers, not shown, said sheets being advanced between an under roll 12 and a drop roll 13, and between cooperating flared guide members 14 and 15, the former preferably being stationary and secured to the frame member 10; the latter preferably being secured to a bracket 16 adjustably mounted on a shaft 17, said bracket having an arm 18 through which an adjusting screw 19 passes for varying the distance between said guides 14 and 15, depending upon the thickness of the sheets to be fed.

Extending upwardly through a slot 20 in the stationary guide member 14 is the under sheet engaging portion of a plural sheet detector 21, which is pivotally mounted at 22 on a portion of the frame 10. This plural sheet detector 21 under normal operating conditions is oscillated back and forth in the path of movement of the fed sheets which pass over tapes 23, passing around the under roll 12. If only one sheet of material is fed at a time, the detector 21 will continue its normal oscillatory movement. However, if more than one sheet is fed at a time, the detector will discontinue its movement, causing a tripping of mechanism for interrupting the further feeding of sheets. The plural detector oscillates to the left about its pivotal point 22, as viewed in Figures 1 and 3, under the influence of its own weight, but it is returned or oscillated to the right, as shown in said figures, by a lever 26 mounted on a shaft 25, having a roller 27 which underlies the detector member 21. The lever 26 is operated in accordance with the operation of a cam 28 mounted on a shaft 29, which cam is engaged by a roller 30 mounted in the end of the lever 31. Assuming that the cam 28 is rotating in a clockwise direction, as viewed in Figures 1 and 3, it will be appreciated that when the low part of the cam is presented to the roller 30 the levers 26 and 31 will have rotated in a counter-clockwise direction for oscillating the plural detector member 21 in a clockwise direction to its other extreme position preparatory to the feeding of the next sheet of material. As the roller 30 moves from the lowest position on the cam 28 toward the highest position on the same cam, the plural sheet detector 21 will oscillate in a counter-clockwise direction following the lowering movement of roller 27, providing the sheet engaging surface of the detector 21 passes freely under the sheet as the latter is being fed between the guides 14 and 15 progressively in the press. In this connection it will be noted that detector 21, in its detecting movement, moves in a direction opposite to the feed of the sheets, thereby preventing an excessive jambing action if more than one sheet is fed at a time. Assuming that a single sheet of

material has been fed between the guides 14 and 15 and that the detector has continued its normal movement in a counter-clockwise direction, the detector under these normal operating conditions will pass into a limiting position wherein a laterally extending projection 32 passes under a finger 33 for holding the control parts in a non-tripping position to permit a continued feeding of sheets by connections hereinafter described. The finger 33, referring now particularly to Figure 4, is integrally formed with a hub 34 secured to a shaft 35, on the other end of which is mounted an arm 36, at the end of which is provided a roller 37 cooperating with a cam 38 mounted on shaft 29. Under normal feeding conditions the arm 36 and roller 37 are held in raised position by the projection 32 of detector member 21 so that the roller 37 does not pass into the low portion 39 of the cam 38. Pivotally connected to the arm 36 at 40 is a lever 41 having a shoulder portion 42 which under abnormal feeding conditions is forced under a projection 43 on an arm 47 by the action of a spring 44 interposed between projections 45 and 46 on the arm 36 and lever 41, respectively, when the roller 37 is permitted to pass into the lower portion 39 of cam 38, that is to say, when the plural sheet detector 21 is not permitted to move into a position to retain the finger 33 and therefore the arm 36 in elevated position. Let it be assumed, therefore, that more than one sheet of material has been fed. Under such conditions the plurality of fed sheets is sufficiently thick to prevent the plural sheet detector 21 from continuing its counter-clockwise movement, it being understood that the sheets are frictionally gripped between the upper guide member 15 and detector 21. Accordingly, the detector 21, not being able to move into its limiting rearward position, its projection 32 does not reach the finger 33 and accordingly the roller 37 is permitted to pass into the lower portion 39 of the cam 38, which carries with it the lever 41, and as a result thereof its shoulder 42 under the influence of spring 44 passes under the projection 43 of arm 47, which arm is moved upwardly as the cam lifts the roller 37 upwardly. The arm 47, which is fixed to the shaft 48, has a finger 49 which in its upward movement passes into engagement with an adjustable stud 50 carried in an arm 51 loosely mounted on the shaft 48 for, in turn, raising the arm 51 out of operative engagement with a lever 52 which, under the influence of a spring 53, is moved to the left, as viewed in Figures 1 and 4, for closing a suction control valve 54 and thereby interrupting further feeding of sheets. It is understood that the suction extends to the valve casing 55 through any suitable connection 56 and under normal conditions extends through a connection 57 to the suction sheet feeding mechanism. As shown in Figures 1 and 4, the valve is in open position. When the arms 47 and 51 are raised the valve 54 is tripped or closed thereby causing an interruption in the feeding of sheets.

An arm 58 formed integrally with the arm 47 when moved in a clockwise direction, as viewed in Figure 1, moves a rubber stopper member 59 downwardly into a position to engage part of table 59[a] and clamp the sheets which have started past the guides 14 and 15, and which caused the plural detector to operate, said rubber stopper member being mounted in a bracket 60 carried by a shaft 61, the lower end of the bracket 60 being pivotally connected to one end of a link 62, the other end of which is pivotally connected to the arm 58. As the rubber stopper 59 is forced into a sheet stopping position, a coiled spring 63 encircling the link 62 is pressed between a collar 64 on the rod and an eye member 65, on the frame so that when the lever 41 is moved to the right for permitting the arms 47 and 51 to drop, the spring 63 causes the raising of the stop member 59. At that time the valve 54 may then be opened and its lever 52 hooked in open position by the arm 51. It will be appreciated that the cams 28 and 38, which are mounted on the same shaft 29, are timed with respect to each other to function properly.

From the arrangement described it will be understood that normally the plural detector member, which is movable in the path of the fed sheets of paper, will move into a limiting position to prevent tripping of the feed mechanism, and accordingly prevent an interruption in the feeding of sheets and that if the detector 21 is prevented from continuing a normal movement such as when a plurality of sheets are fed simultaneously, the tripping parts will be permitted to function for causing an interruption of the feeding of sheets.

It is my intention to cover all modifications of the invention falling within the spirit and scope of the following claims.

I claim:

1. In a device of the class described, means movable in the path of movement of a fed sheet of material which means continues its movement if but one sheet is fed and which ceases to move and causes an interruption of the feeding of sheets if more than one sheet is fed at a time.

2. In a device of the class described, normally movable plural detector means movable in the path of movement of a fed sheet of material and opposite the direction of movement of the fed sheet during its detecting movement, which means under normal feeding conditions permits continued feeding of sheets and which under abnor-

mal feeding conditions causes an interruption of the feeding of sheets.

3. In a device of the class described, the combination of a normally movable plural sheet detector member movable in the path of movement of a fed sheet and in an opposite direction thereto during the detecting movement, and trip control means normally held in a non-tripping position by said detector member for permitting continued feeding of sheet material.

4. In a device of the class described, the combination of a plural sheet detector member which has a normal detecting movement opposite the direction of feed which is interrupted if more than one sheet is fed at a time, tripping mechanism whereby the feeding of sheets may be continued or interrupted, operating means for said tripping mechanism associated with said detector member and which is held in a non-tripping position by said sheet detector member under normal feeding conditions and which causes a tripping of the tripping mechanism under abnormal sheet feeding conditions.

5. In a device of the class described, a plural sheet detector member having a projection, tripping means whereby the feeding of sheets may be continued or interrupted, and operating means for said tripping means including a member engaging said projection for normally holding the tripping means in non-tripping position and which under abnormal sheet feeding conditions does not engage said projection whereby the tripping means functions to interrupt the feeding of sheets.

6. In a device of the class described, a detector member moving against the direction of movement of the sheet being fed, said movement of said detector member being arrested if more than one sheet is fed at a time causing an interruption of feeding mechanism.

Signed at Chicago, Illinois, this 28th day of December, 1921.

CARL HENDERSON.