

March 27, 1928.

1,664,057

A. BROADMEYER
SHEET DETECTOR AND STOP

Filed Dec. 27, 1922

3 Sheets-Sheet 1

Fig. 1.

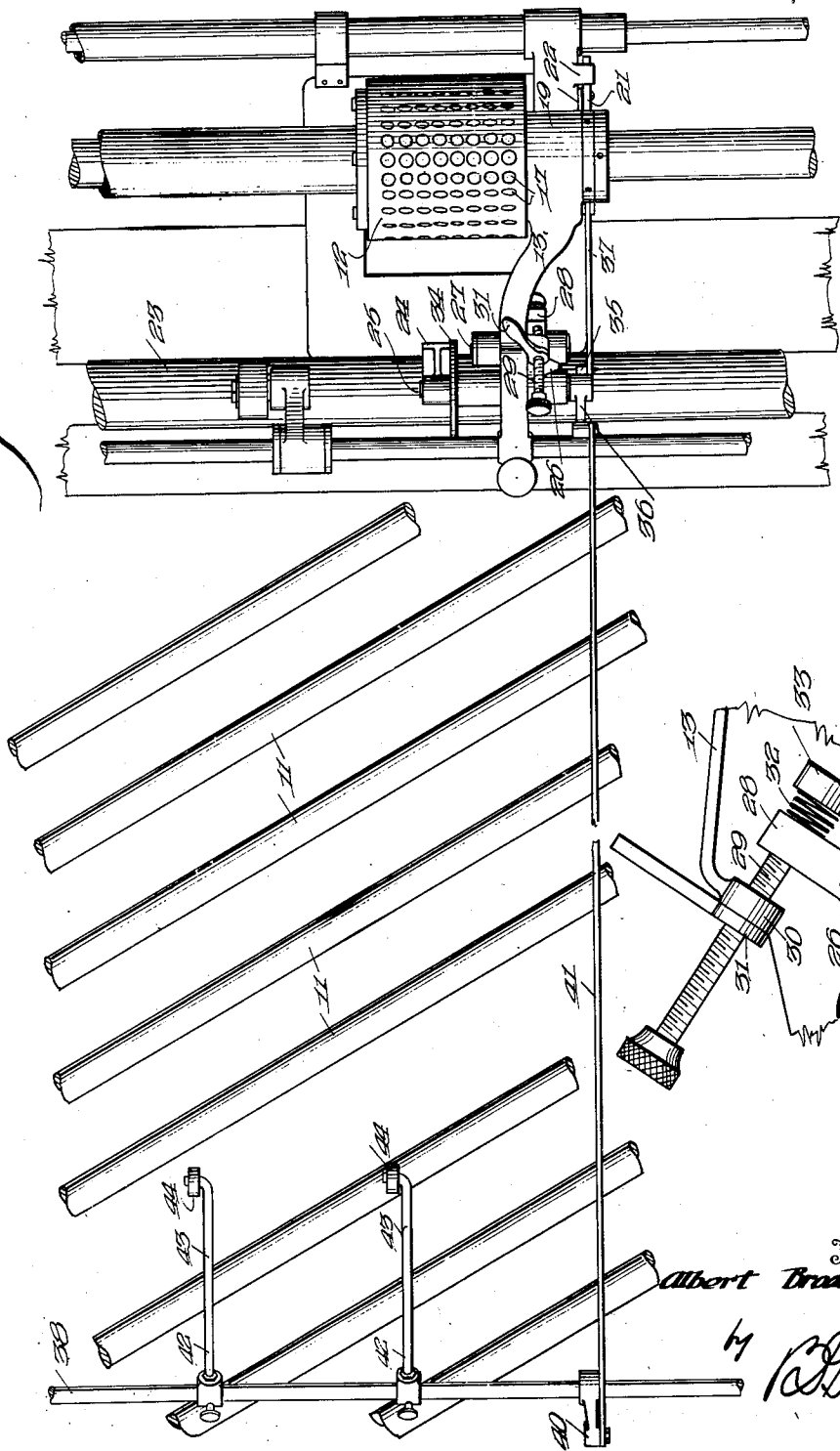
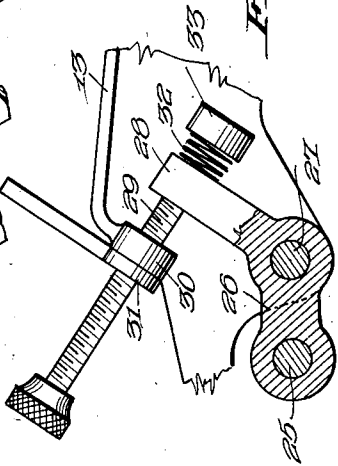


Fig. 2.



Inventor
Albert Broadmeyer

by *W. J. Miller*

Attorney

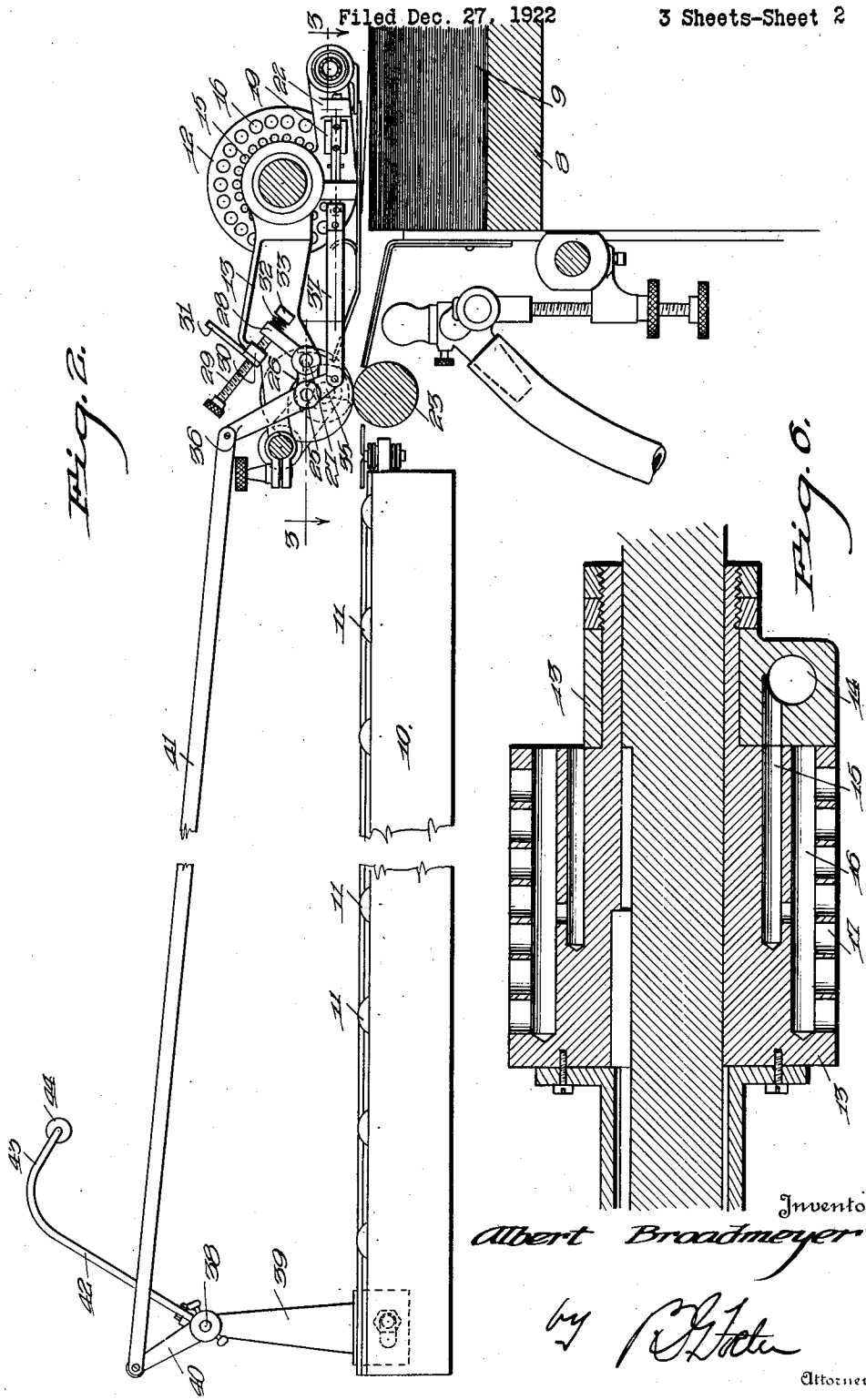
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3 Sheets-Sheet 2



Inventor
Albert Broadmeyer
by *R. G. H. H.*
Attorney

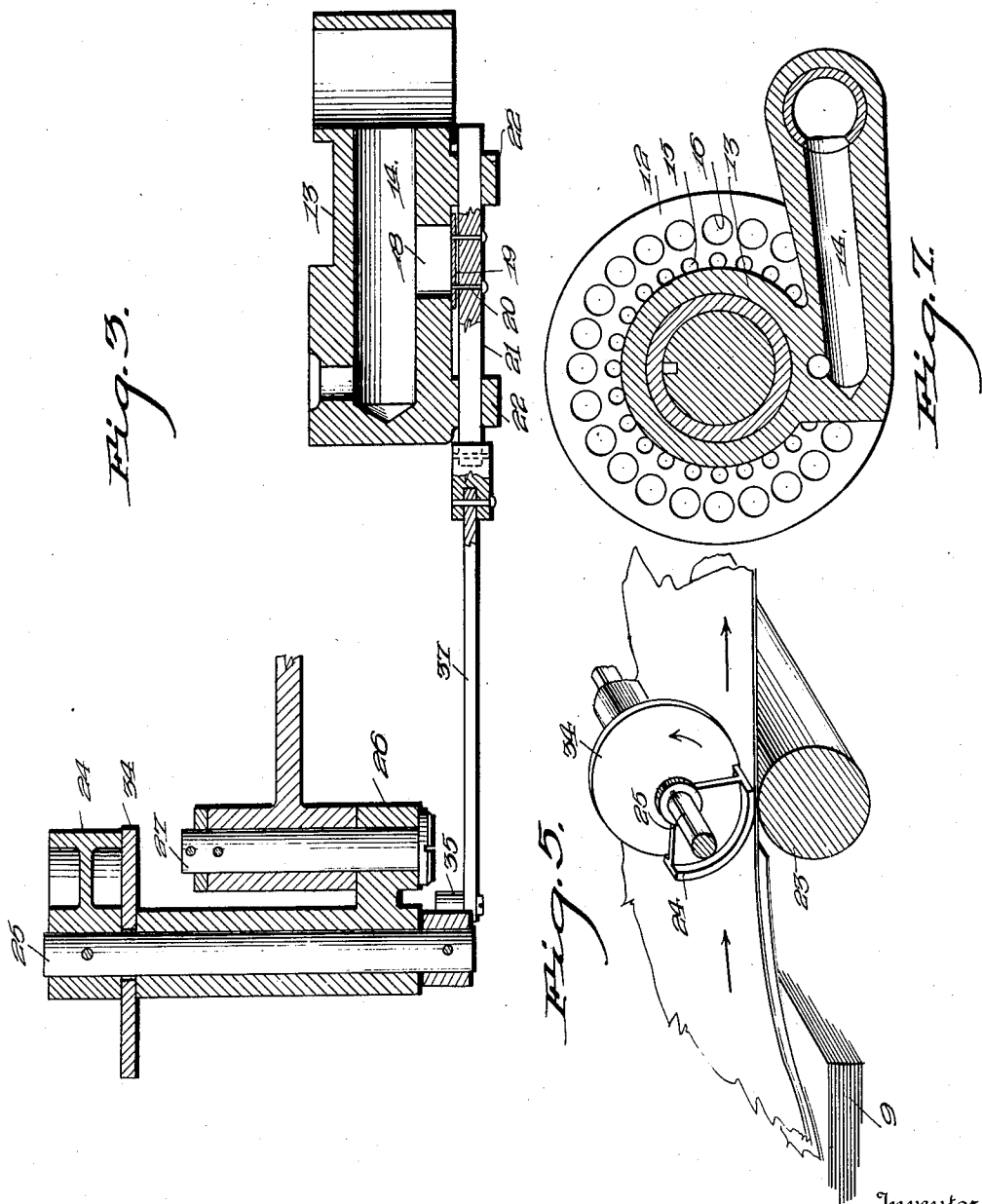
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3 Sheets-Sheet 3



Inventor
Albert Broadmeyer

By *R. J. H. H.*
Attorney

UNITED STATES PATENT OFFICE.

ALBERT BROADMEYER, OF HARRISBURG, PENNSYLVANIA, ASSIGNOR TO W. O. HICKOK MANUFACTURING COMPANY, OF HARRISBURG, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

SHEET DETECTOR AND STOP.

Application filed December 27, 1922. Serial No. 609,241.

In apparatus for feeding sheets of paper successively to folding machines and other instrumentalities, it sometimes happens that two or more sheets, due to static electricity or other causes, will be simultaneously removed from the pile and passed together to the machine. Usually one of these sheets will drag slightly behind the other and as a consequence it will cause defective work in the apparatus, to which such sheets are fed.

It is the object of the present invention to provide detector and stop mechanism of a novel and highly effective character which will cause the initial sheet moving means to become inactive and stop the passage of duplicate sheets simultaneously over the feeding means.

In the accompanying drawings:—
Figure 1 is a plan view of the preferred embodiment of the invention.

Figure 2 is a side elevation of the same,

Figure 3 is a sectional view on the line 3—3 of Figure 2,

Figure 4 is a detail sectional view showing the mounting for the supporting arm,

Figure 5 is a perspective view of the detector or operating element,

Figure 6 is a longitudinal sectional view through the suction head or roller,

Figure 7 is a cross sectional view there-through.

In the embodiment disclosed, a support for a plurality or pile of sheets is shown at 8, and may be the well-known table that is automatically elevated as the sheets are fed therefrom, and which is well known to the art. A pile of sheets is indicated at 9 on said table. Feeding means, indicated generally at 10, is provided for delivering the sheets fed from the pile to a suitable machine, such as a folder, said feeding means including a series of rollers indicated at 11 well known in the art and driven by any suitable means.

For the purpose of moving the sheets successively from the top of the pile 9, a suction apparatus is employed, consisting of a roller 12 mounted on a swinging arm 13 and adapted to elevate the topmost sheet and move it toward the feeding means 10. While any suitable mechanism may be employed for this purpose, that disclosed in my co-pending application, Serial No. 499,

331, filed September 8, 1921, is herein illustrated. It is believed to be unnecessary to go into detail with regard thereto, except to state that a partial vacuum is formed in a passageway 14, and said passageway is successively in communication with ports 15 in the roller head 13. These ports in turn communicate with chambers 16 having ports 17 that open through the periphery of the roller. The passageway 14 is provided in one side with a vent 18 which, when open, destroys the vacuum in the passageway. The vent 18 is controlled by a closure plate 19 loosely mounted on pins 20 carried by a slide bar 21 mounted in guideways 22.

Interposed between the sheet-moving roller 12 and the feeding mechanism 10, is a roller 23 driven by any well-known means and over which the sheets pass from the table 8 to the feed rollers 11. Cooperating with said roller 23, is a segmental operating member 24, the sheets passing between the roller 23 and said actuating member 24, as illustrated in Figure 5. This member 24 is fixed to a shaft 25 journaled in one end of an arm 26 that is pivotally mounted, as shown at 27, on the supporting arm 13 of the roller head 12. The arm 26 has a lug 28 borne against by an adjusting screw 29 threaded through an ear 30 on the arm 13, and having a lock-nut 31 for securing it against accidental rotation. A spring 32, interposed between the lug 28 and an abutment 33 on the arm 13, resists the movement of the screw 29 in one direction, and consequently swings the arm when said screw is moved outwardly. Alongside the segmental actuating member 24 is a disk roller 34 that is loosely journaled on the shaft 25. The shaft 25, carrying the actuating member 24, also has fixedly mounted thereon oppositely extending arms 35 and 36. The arm 35 is relatively short and is connected by a link 37 with the slide bar 21.

Extending over the rear portion of the feed mechanism 10, is a rock shaft 38, suitably journaled in standards 39 and having a crank arm 40 that is connected to the arm 36 of the rock shaft 25 by a link 41. The rock shaft 38 is provided with one or more stop arms 42, having downturned terminals 43, preferably provided with rollers 44, which rollers are adapted to move downwardly into the path of sheets passing over

the rollers 11, or into engagement with said sheets. They have sufficient frictional bearing thereon to stop and hold the sheets.

Briefly described the operation of the apparatus is as follows: The supporting arm 26 is adjusted by the micrometer screw 29, so that the segmental operating member 24 will be spaced from the roller 23 a sufficient distance to just permit the passage of a single sheet from the pile without causing the member 24 to move, and this adjustment obviously can be made to accommodate sheets of different thicknesses. As long therefore as the suction head 12 picks up a single sheet and passes it over the roller 23, the parts will be in the position illustrated in Figure 2. In other words, the stop arms 42 will be elevated and the closure plate 19 will be over the vent port 18 of the suction apparatus. If, however, two sheets adhere, as illustrated in Figure 5, as soon as the two thicknesses pass between the roller 23 and the actuating member 24, there will be a sufficient wedging action to cause the segmental member 24 to turn, or in other words, its peripheral surface will travel with the sheets. This causes a partial rotation of the rock shaft 25, and when said rock shaft is turned the arms 35 and 36 will be swung. This will withdraw the closure plate from over the vent 18 and destroy the vacuum in the suction head or roller 12. As a consequence said head will stop functioning. This may stop a further movement of the simultaneously moving superposed sheets, and certainly will prevent others following, but if the sheets have passed to the point where they are moved by the feeding rollers 11, the stop arms 42 being depressed and the sheets coming into contact therewith will be stopped and their introduction into the folding machine or other instrumentality prevented.

Upon the removal of the improperly related sheets the controlling apparatus is returned to its inactive position and the sheet delivering and feeding mechanism will again properly function.

From the foregoing, it is thought that the construction, operation and many advantages of the herein described invention will be apparent to those skilled in the art, without further description, and it will be understood that various changes in the size, shape, proportion and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is:—

1. In apparatus of the character set forth, the combination with a sheet carrying member, of means for feeding sheets successively thereto, a device for governing the oper-

ation of the sheet feeding means, a controlling member associated with the sheet carrying member and moved by an excessive number of sheets on the sheet carrying member, and an operating device directly connected to the controlling member and to the governing device for the sheet feeding means to cause the operation of the latter on the movement of the controlling member.

2. In apparatus of the character set forth, the combination with a sheet carrying member of a suction roller for feeding sheets successively thereto, means for creating a vacuum in said roller, said means having a vent and a valve for said vent, a rotary sheet-engaged controlling member associated with said sheet carrying member, and a link having one end connected to the member to be directly operated thereby and its other end connected to the valve to operate the same when the controlling member is actuated by an excessive number of sheets.

3. In apparatus of the character set forth, the combination with a sheet carrying member, of a vacuum feed roller for delivering sheets to said carrying member, an adjustably mounted bracket, a sheet engaged detecting element journaled on the bracket, a vent controlling valve for said feed roller, and a link pivoted to said detecting element and adjustable therewith, said link having a connection with the valve.

4. In apparatus of the character set forth, the combination with a sheet carrying member, of means for feeding sheets successively thereto, a controlling member associated with the sheet carrying member and engaged and operated by an excessive number of sheets thereon, a normally inactive sheet stop, a link pivoted directly to the sheet stop and having connection with the controlling member for operating the former when the latter is actuated by an excessive number of sheets, and means for adjustably supporting the controlling member and the portion of the link connected thereto.

5. In apparatus of the character set forth, the combination with a sheet carrying member, of means for feeding sheets successively thereto, a rotary controlling member coacting with the sheet carrying member and engaged and operated by an excessive number of sheets thereon, a swinging sheet stop movable into the path of the sheets, and a link pivoted directly to the stop and to the controlling member to cause the controlling member to operate the stop.

6. In apparatus of the character set forth, the combination with a sheet carrying member, of means for feeding sheets successively thereto, a rotary controlling member coacting with the sheet carrying member and operated by an excessive number of sheets thereon, a swinging sheet stop movable into the path of the sheets, a governing device

for the sheet feeding means, and links pivoted directly to the controlling member and connected respectively to the stop and to the governing device for moving them when the
5 controlling member is actuated by an excessive number of sheets.

7. In apparatus of the character set forth, the combination with a sheet carrying roller, of an adjustable bracket having a portion
10 overhanging the same, a shaft journaled on said portion, a controlling device fixed to

the shaft and located above the roller, oppositely extending arms also fixed to the shaft, a vacuum feed roller, an exhaust conduit connected to the feed roller and having a
15 vent, a valve controlling the vent, a link between one of the arms and the valve, a swinging sheet stop, and a link between said stop and the other arm.

In testimony whereof I affix my signature.

ALBERT BROADMEYER.