May 13, 1930. A. LANGSNER 1,758,612

ATTACHMENT FOR PRINTING MACHINES

Filed Oct. 17, 1928 2 Sheets-Sheet 1

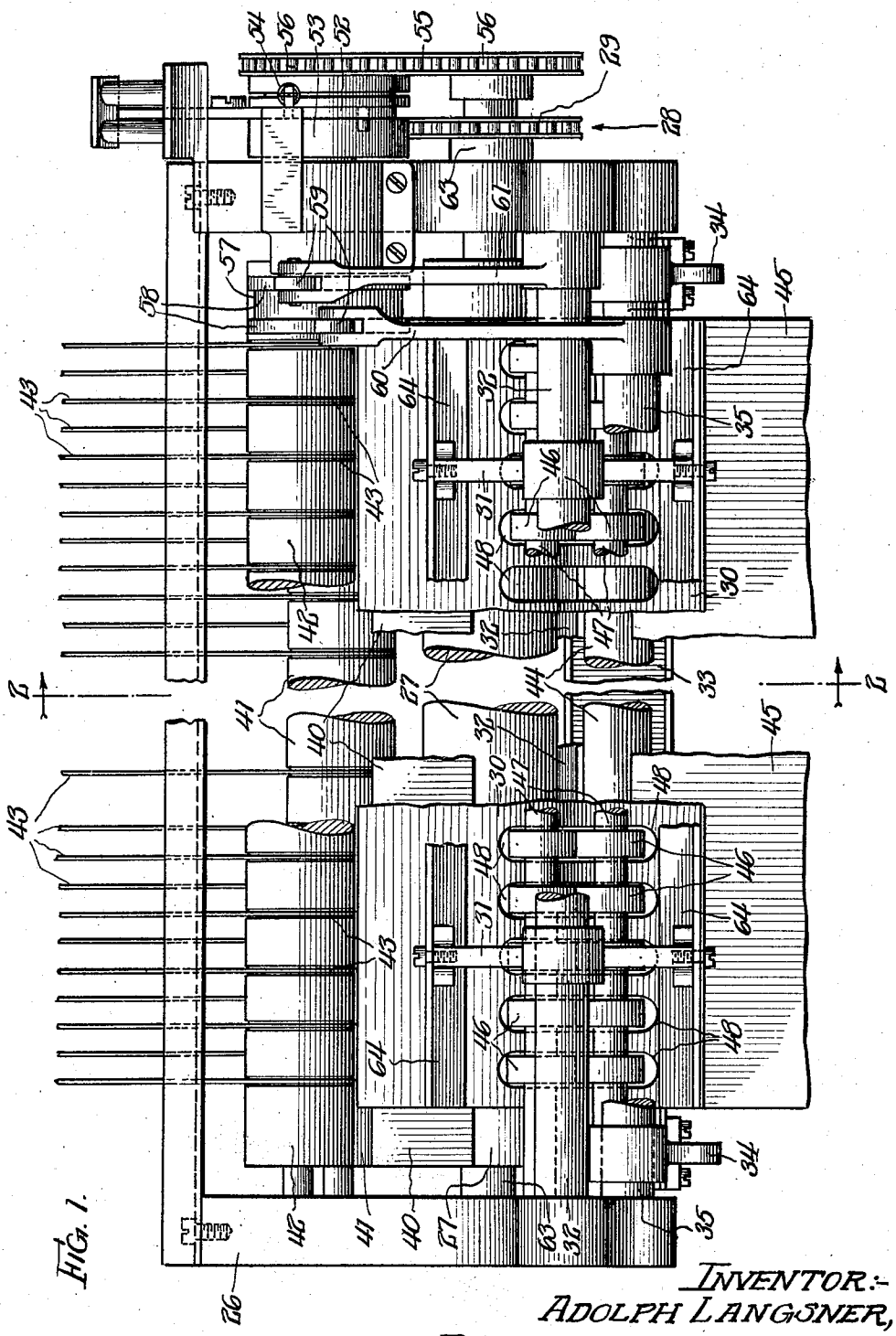


FIG. 1.

INVENTOR:-
ADOLPH LANGSNER,
BY:- Cheever & Cox ATTYS.

May 13, 1930. A. LANGSNER 1,758,612

ATTACHMENT FOR PRINTING MACHINES

Filed Oct. 17, 1928 2 Sheets-Sheet 2

FIG. 2.

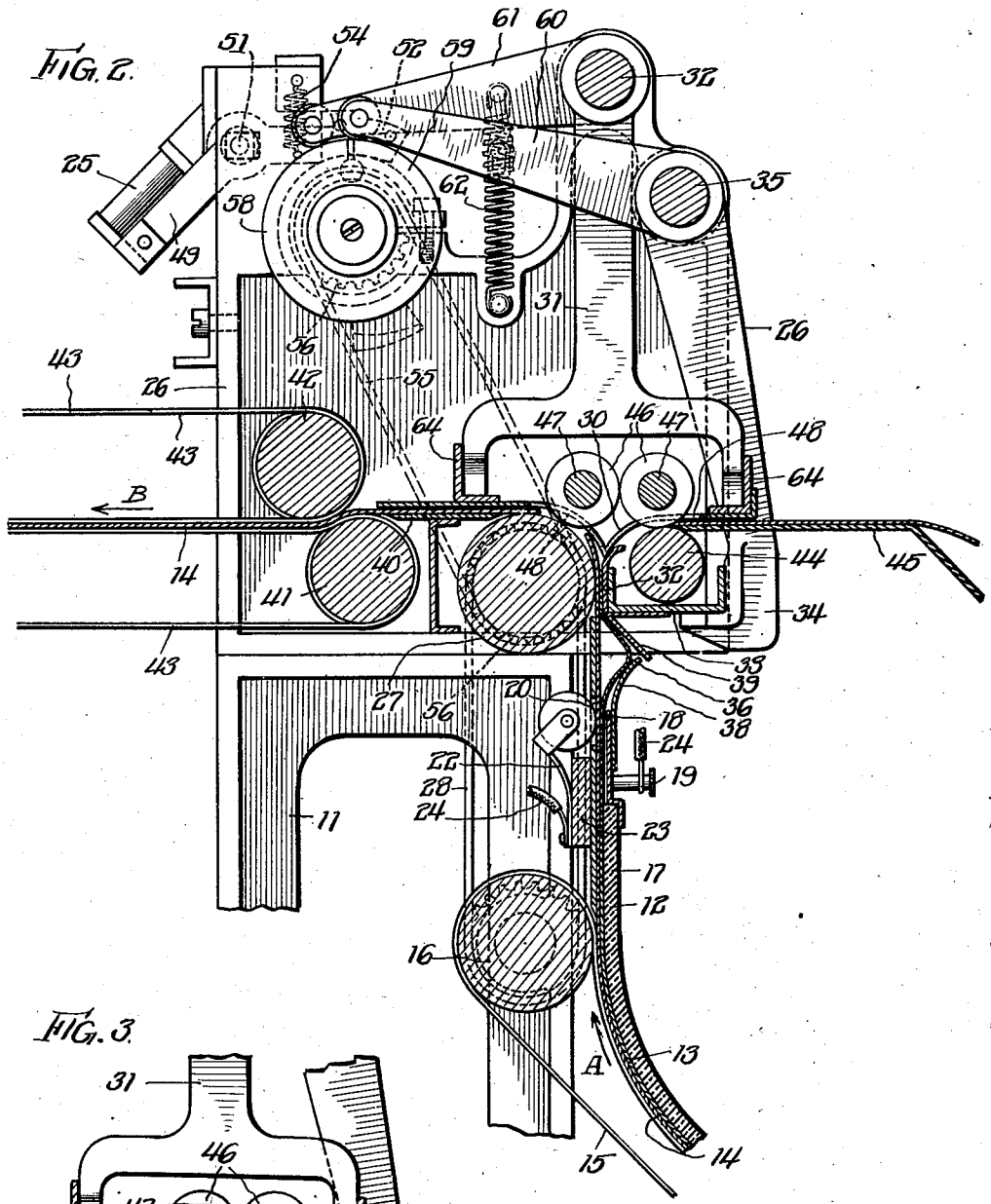
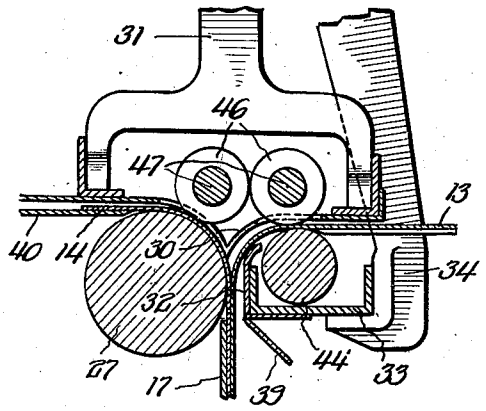


FIG. 3.



INVENTOR:-
ADOLPH LANGSNER
BY:- Cheever & Cox ATTYS.

Patented May 13, 1930 1,758,612

UNITED STATES PATENT OFFICE

ADOLPH LANGSNER, OF CHICAGO, ILLINOIS, ASSIGNOR TO EUGENE DIETZGEN CO., OF CHICAGO, ILLINOIS, A CORPORATION OF DELAWARE

ATTACHMENT FOR PRINTING MACHINES

Application filed October 17, 1928. Serial No. 312,958.

My present invention relates in general to printing apparatus and has more particular reference to a device for separating negatives and prints as they are discharged from a printing machine, for instance a blue printing machine.

In printing machines heretofore provided, the negatives or tracings from which the prints are made, are peeled off by an operator as the prints and tracing emerge from the printing machine. Where it is necessary to print specifications and the like comprising a number of sheets in chronological order, the operator must stack the tracings carefully in order that the proper sequence may be maintained when another print of the specifications is made. The operator also transfers the printed sheet to a developing apparatus where the print is fixed, that is to say, rendered permanent. There are certain advantages involved in printing the various sheets of specification papers on one strip of paper. By so printing, the print may be fed immediately and directly into a developer without necessitating the manual transfer of prints from the printing machine to the developer by the operator, who may devote himself to sorting the negatives or tracings. It will also be obvious that the provision of a mechanical means for stripping the negatives from the print and stacking the same, will eliminate all possibility of disturbing the sequence of negatives comprising a series to be printed in chronological order through the mistakes of an operator. The provision of a mechanical stripper and stacker also eliminates the necessity of employing an operator to separate and stack the sheets so that printing may take place at a maximum speed limited only by the capacity of the printing and developing machine and not by the speed of an operator in sorting and stacking the negatives.

An important object of my invention is to provide a simple, compact device for stripping off negatives from the prints as they are ejected together from a printing machine.

Another important object of my invention is to provide a print separator of rugged construction which may be conveniently built into a printing machine so that prints may be produced in the printer and fed automatically into a developer without necessitating the presence of an attendant to strip off the negatives.

Still another object of my invention is to provide a print separator adapted for use between a printing machine and a developer whereby the printing and developing operation may occur as a continuous operation.

Another important object of my invention is to provide a print separator having a negative retarder whereby the edge of the negative may be held back until the edge of the print has projected past a print separating element which is movable between two positions, in one of which it may deflect the print along one path, and in another of which it deflects the negative along another path.

Numerous other objects and advantages will be apparent as the invention is more fully understood from the following description which, taken in connection with the accompanying drawings, discloses a preferred embodiment of the invention.

Referring to the drawings:

Figure 1 is a top plan view of a print separator embodying my invention, parts of the device being broken away to reveal details of construction;

Figure 2 is a vertical cross section taken substantially along the line 2—2 in Figure 1 showing the print separating element in one of its two operating positions; and

Figure 3 is a detail of a portion of Figure 2 showing the print separating element in the other of its two operating positions.

To illustrate my invention I have shown on the drawings a negative stripping attachment for a printing machine. The printing machine includes a frame 11, a guide 12, comprising a continuation of the transparent guide behind which a negative 13 and light sensitive paper 14 on which the print is made, may be passed during the printing operation, being carried along by means of an endless conveyor which may be of any type but which preferably comprises a construction wherein a plurality of endless strings 15 traveling

around rollers, one of which is shown at 16. The strings are mounted in spaced relation in suitable grooves in the rollers and the roller 16 may be driven by any suitable mechanism. One stretch of each string extends behind the print and negative to grip and carry the same across the member 12. The direction of travel of the negative and print across the guide 12 is illustrated by an arrow A in Figure 2 of the drawings. Adjacent the upper edge of the guide 12 the print and negative disengage from the strings 15 of the conveyor and pass in front of a backing strip 17 which is spaced from the guide 12 sufficiently to provide a channel through which the print and negative may pass. The strip 17 extends upwardly of the guide 12 which is provided with an upwardly extending member 18 to which is mounted a terminal post 19. The backing strip 17 is provided with a slot 20 opposite the upper part of the member 18 and a roller 21 is mounted so that a portion of its periphery may pass through the slot 20 and engage the member 18. The roller 21 is mounted by a spring member 22 to a block 23 which is fastened to the backing member 17 adjacent the slot 20, the spring member 22 being arranged to normally urge the roller 21 through the slot 20 to engage the member 18. The member 18, the roller 21 and the spring member 22 are formed of current conducting material so that the parts comprise a means for completing a circuit, current conducting wires 24 being attached to the spring member 22 and the terminal 19. The block 23 is formed of non-conducting material to insulate the roller and spring member 22 from the backing strip 17 which may be conveniently formed of sheet metal. The wires 24 are connected to a source of electrical power and to magnet coils 25, the function of which will be hereinafter more fully described.

The roller 21 normally engages the strip 18 to complete an electric circuit for energizing the magnet coils 25 and it will be apparent that when a print 14 and a negative 13 pass upwardly between the roller 21 and the strip 18, being guided therebetween by the guide 12 and the backing member 17, the roller 21 will be raised from engagement with the member 18 so that the energizing circuit for the magnet coils 25 will be destroyed.

The negative separating device consists of a number of elements mounted in a frame 26 which in turn is mounted to the frame 11 of the printing machine. The backing strip 17 extends upwardly of the roller 21 to adjacent the periphery of a rubber roller 27 which is mounted on a shaft 63 for rotation in the frame 26, the roller 27 being driven from the roller 16 of the printing machine by means of a chain 28 extending between a sprocket 29 mounted to the shaft 63. The separation of the print and negative is accomplished by means of a V-shaped separator 30 which is carried by spaced channel irons 64 extending longitudinally of the device and mounted to the swinging end of arms 31. The arms 31 are mounted to a horizontal shaft 32 journaled in the frame 26. As the print and negative pass upwardly from the upper edge of the member 17, they pass between the rubber roller 27 and a negative guide 32 mounted to a channel shaped member 33 extending longitudinally of the device and which in turn is carried by arms 34 mounted to a horizontal shaft 35 journaled in the frame 26. The arms 31 and 34 may be swung pendulum fashion, between the positions illustrated in Figure 2 and Figure 3 of the drawings, by rotating the shafts 32 and 35. In Figure 2, the arm 34 is swung so that the guide member 32 moves toward the roller 27. The roller 27, being driven and being of rubber, grips the print 14 and urges it upwardly. The guide member 32, being stationary, grips the negative 13 and tends to hold the same stationary, with the result that the edge of the print 14 travels upwardly while the edge of the negative is retarded, the body of the negative being folded as at 36 in a compartment 37 formed by a wall member 38 carried by the member 18 and extending upwardly and outwardly thereof and a wall member 39 extending downwardly and outwardly of the guide 32. As the edge of the print 14 is thus advanced beyond the edge of the negative, the separator 30 is swung so that one side of the V may extend in the path of the upwardly advancing edge of the film and deflect the same around the roller 27 and through a guide 40 mounted to the frame 26. The guide 40 comprises a strip of sheet metal extending tangentially of the roller 27 and arranged to deliver the print to a roller 41 mounted in the frame 26. A second roller 42 is arranged in the frame 26 adjacent the roller 41 and both rollers 41 and 42 are provided with conveyor means which preferably consists of a plurality of spaced strings 43 similar to the strings 15 carried by the printer roller 16, the guide 40 being arranged to direct the print from the roller 27 between the rollers 41 and 42 and the strings 43 which preferably are arranged as a part of the conveying means of a developing apparatus (not shown), such, for instance, as the developing apparatus illustrated and described in my copending application for U. S. Letters Patent, Serial No. 252,717, filed February 8, 1928, which is characterized by the use of continuous conveying belts or strings for carrying the print to be developed through the device. The strings 43, however, may also be arranged to conduct the print to a developing apparatus of any desired form. As soon as the upper edge of the print 14 has been deflected to the left in Figure 2 by the separator 30, the arms 31 and 34 may be swung from the positions illustrated in Figure 3 of

the drawings, in which position the separator 30 presses the print 14 to the roller 27 so that it may be carried along to the guide 40. The arm 34 also is moved so that the guide 32 no longer retards the negative which is released and moves upwardly, the bent portion 36 being straightened by the natural resilience of the strip. The lower edge or point of the separator 30 also is in such position that, as the released edge of the negative moves upwardly, it will engage the side of the V-shaped separator, opposite to that engaged by the print, and will be thereby deflected toward a roller 44 and thence to a discharge table 45 from which it may be transported by any suitable means to the file in which the negative or tracing is preserved. In order to draw the film and print from the printer after each has been deflected onto the rollers 27 and 44, I have provided a plurality of rubber rollers 46, arranged for rotation on shafts 47 which are journaled in the frame 26, which rollers extend through apertures 48 formed in the material of the separator 30.

I have provided a novel means for controlling the movement of the arms 31 and 34 in order that they may swing in proper sequence to separate a print and negative as the same are ejected from the printing machine. This means consists of a plurality of members arranged in the frame 26 and comprises a pair of magnet coils 25 which are normally energized through a circuit controlled by the engagement of the roller 21 and the member 18. When the magnet coils are energized, they retain an arm 49 in the position illustrated in Figure 2 of the drawings. The arm 49 is pivoted at 51 and has an extension 52 arranged to engage and hold a clutch 53 in inoperative position. As soon as the magnets 25 are de-energized by the breaking of the engagement of the roller 21 and the member 18 when a print and negative pass therebetween, the arms 49 and 52 are moved about the pivot 51 in a counter clockwise direction, viewing Figure 2 of the drawings by means of a spring 54 and the clutch 53 is released to form a driving connection for a cam member 57 which is driven by a chain 55 extending around sprockets 56 carried by the clutch 53 and the shaft 63. The clutch 53 thus released rotates the cam member 57 which has cam surfaces 58 arranged in position to engage cam following rollers 59. One of these rollers is mounted in the free end of an arm 60, the opposite end of which is secured to the shaft 35 carrying the arm 34, and the other roller 59 is mounted in the free end of an arm 61, the opposite end of which is secured to the shaft 32 to which the arm 31 is mounted. As the cam member 37 is rotated, the cam surfaces 58 operate upon the rollers 59 to raise the arms 60 and 61 in proper sequence so that the separator 30 and the guide 31 are moved to alternately grip and release the negative or tracing and to deflect the print and negative along their respective paths. The cam following rollers 59 are normally urged to engage the cam surfaces 58 by means of springs 2 extending respectively between the arms 61 and 60 and the frame 26 of the device.

As the negative and print pass between the roller 21 and the member 18, the energizing circuit of the magnet coils 25 is broken by the separation of the roller 21 and the member 18. When this occurs, the clutch 53 is released and the cam member 57 is driven by the chain 55 from the roller 27. As the cam member 57 is rotated, the arm 31 is swung first to the position illustrated in Figure 2, that is to say to the right, while the arm 31 is swung to the left. The mechanism is arranged to swing the arms 31 and 34 at the instant that the film and negative are fed between the roller 27 and the member 32.

After an interval, during which the print 14 is carried upwardly by the rubber roller 27 and deflected to the left by the separator 30 and the negative 36 is held stationary by the guide 32, the rotation of the cam member 57 operates to swing the arm 31 to the left and the arm 34 to the right, viewing Figure 2, into the relative positions illustrated in Figure 3, so that the negative may be released from the retarding action of the guide 32, move upwardly and be deflected between the rollers 44 and 46. The cam member and associated apparatus are thus calibrated, or timed, to operate the arms 31 and 34 within a definite interval after the advancing edge of the print and negative have passed between the roller 21 and the mechanism operates in a certain definite cycle, the cycle being performed each time a print passes through the machine and the cam member 58 being rotated once during each operating cycle.

It is thought that the invention and numerous of its attendant advantages will be apparent from the foregoing description, and it is obvious that numerous changes may be made in the form, construction and arrangement of the various parts without departing from the spirit or scope of the invention or sacrificing any of its advantages, the form hereinbefore described being of a preferred embodiment.

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

1. In a separator, means for advancing a plurality of stacked sheets and a shiftable member for diverting separate sheets each through a different discharge channel.

2. In a separator, means for advancing a plurality of sheets edgewise and oscillating means for diverting separate sheets along di-

verging paths, whereby to strip the sheets apart.

3. In a separator, means for advancing a plurality of sheets and a movable member for diverting separate sheets along diverging paths whereby to separate and discharge the sheets at remote points.

4. In a separator, means for advancing a plurality of sheets, means for retarding one of the advancing sheets, and means for deflecting the retarded sheet along a diverging path.

5. In a separator, means for advancing a plurality of sheets, and means for retarding one of the advancing sheets and a member interposed in the path of said retarded member for deflecting it into a diverging path.

6. In a separator, means for advancing a plurality of sheets, means for retarding one of the advancing sheets and a member capable of assuming a position in which it may deflect an unretarded sheet along one path and capable of assuming another position wherein it may deflect the retarded sheet along another path.

7. In a separator, means for advancing a plurality of sheets together along a predetermined path, a member arranged in said path, said member being capable of assuming a position in which it may deflect one of said sheets along a discharge path, and being capable of assuming a second position wherein it may deflect a second sheet along a second discharge path, and means for moving said member alternately into said positions to separate said sheets and discharge them in separate paths.

8. In a separator, means for advancing a plurality of sheets, and means for retarding one of the advancing sheets and a member capable of assuming a position in which it may deflect an unretarded sheet along one path and capable of assuming another position wherein it may deflect the retarded sheet along another path, and means for moving the member alternately from one position to another to first deflect an unretarded sheet along one path and then to deflect the retarded sheet along a diverging path.

9. In a separator, means for advancing adjacent strips together, means for engaging one sheet to retard its progress relative to the other, means disposed in the path of the sheets and movable to a position in which it may deflect the unretarded sheet along one discharge path and thereafter movable to a second position in which it may deflect the retarded sheet along a second and separate discharge path.

10. In combination, a print and negative separator and means for advancing a print and negative together to the separator, the separator having a shiftable member for separating the print and negative and directing them along diverging paths.

11. In a negative separator, means for advancing the print and negative together through a printer to the negative separator, said separator having shiftable means formed and arranged therein for separating the print and negative and directing the same toward remote points.

12. In a negative separator, means for advancing a print and its corresponding negative together through a printer and into the separator, and an oscillating member formed and arranged within the separator and in the path of the advancing print and negative for deflecting the former to a developer and the latter to a remote discharge point.

13. In combination, a print and negative separator and means for advancing a print and negative together to the separator, said separator having a swinging member mounted in the path of the advancing print and negative, movable means engaging the negative to retard the same, and means for positioning the swinging member to deflect the print through a discharge channel, means for releasing the negative retarder, and means for positioning the swinging member to deflect the negative through a second discharge channel whereby the negative may be stripped from the print and discharged from the apparatus at a remote point.

14. In a separator, a deflector and means for advancing a plurality of stacked sheets edgewise to the deflector, said deflector having an edge adapted to enter between the edges of the sheets to separate the adjacent sheets and diverging sides whereby to deflect the separated sheets along separate paths.

15. In a separator, a deflector and means for advancing a plurality of stacked sheets edgewise to the deflector, said deflector having an edge adapted to enter between the edges of the sheets to separate the adjacent sheets and diverging sides whereby to deflect the separated sheets along separate paths, and means formed and arranged along said separate paths for gripping the separated sheets and conveying same along said paths.

16. In a separator, a deflector and means for advancing a plurality of stacked sheets edgewise to the deflector, said deflector having and edge adapted to enter between the edges of the sheets to separate the adjacent sheets and diverging sides whereby to deflect the separated sheets along separate paths, and means including rollers arranged along said separate paths in position to engage the sheets and carry same along the paths.

17. In a separator, a deflector and means for advancing a plurality of stacked sheets edgewise to the deflector, said deflector having an edge adapted to enter between the edges of the sheets to separate the adjacent sheets and diverging sides whereby to deflect the separated sheets along separate paths, and means including rollers arranged along said sep-

arate paths in position to engage the sheets and carry same along the paths, the diverging sides of said deflector being perforated to permit certain of said rollers to extend therethrough.

In witness whereof, I have hereunto subscribed my name.

ADOLPH LANGSNER.