S. PAYNE AND E. STOTT.

MEANS FOR FEEDING SHEETS OF PAPER.

APPLICATION FILED APR. 4, 1921.

1,391,271.

Patented Sept. 20, 1921.

4 SHEETS—SHEET 1.

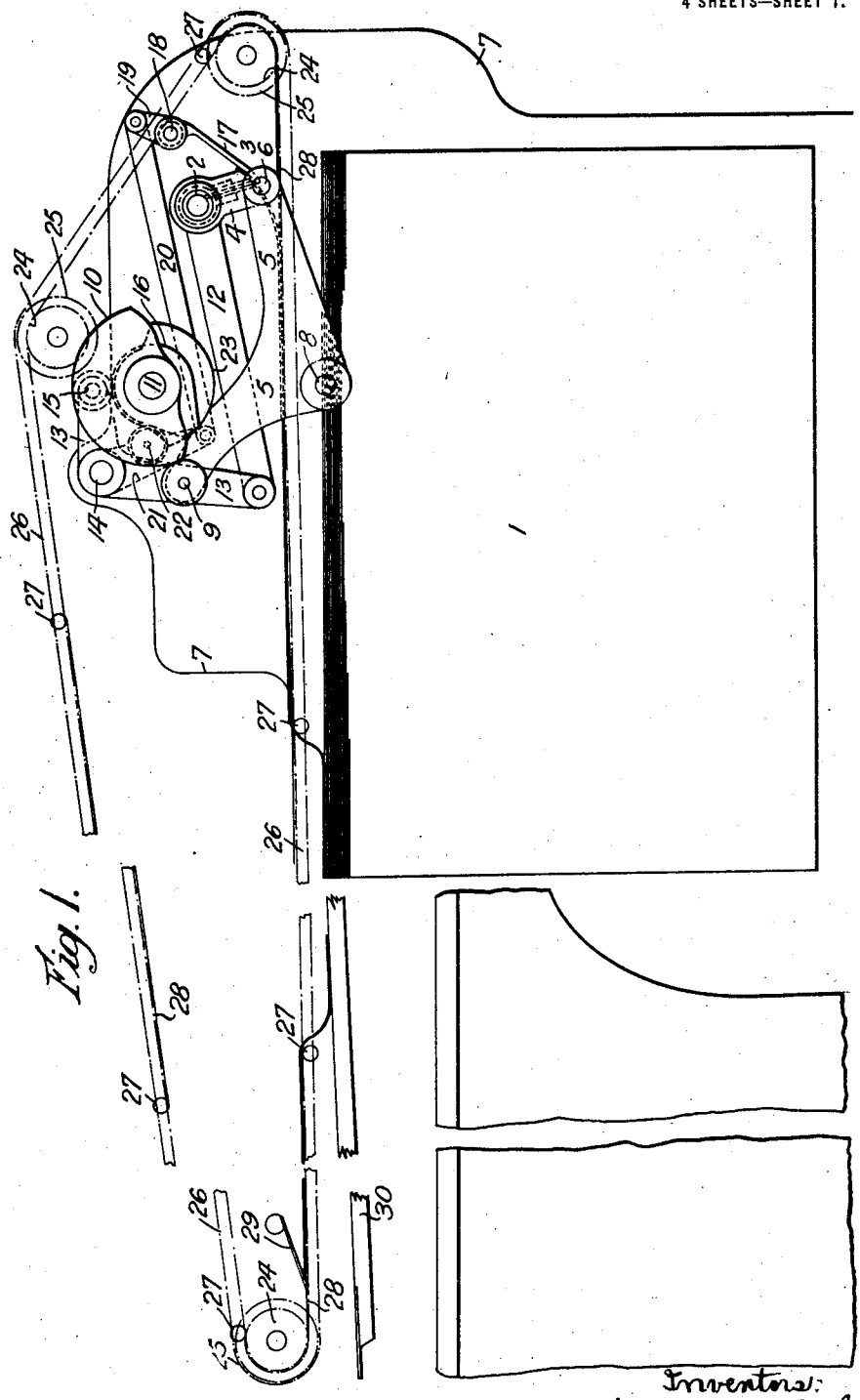


Fig. 1.

Inventors:
S. Payne and E. Stott
By their Attorneys
Baldwin Wight

S. PAYNE AND E. STOTT.

MEANS FOR FEEDING SHEETS OF PAPER.

APPLICATION FILED APR. 4, 1921.

1,391,271.

Patented Sept. 20, 1921.

4 SHEETS—SHEET 2.

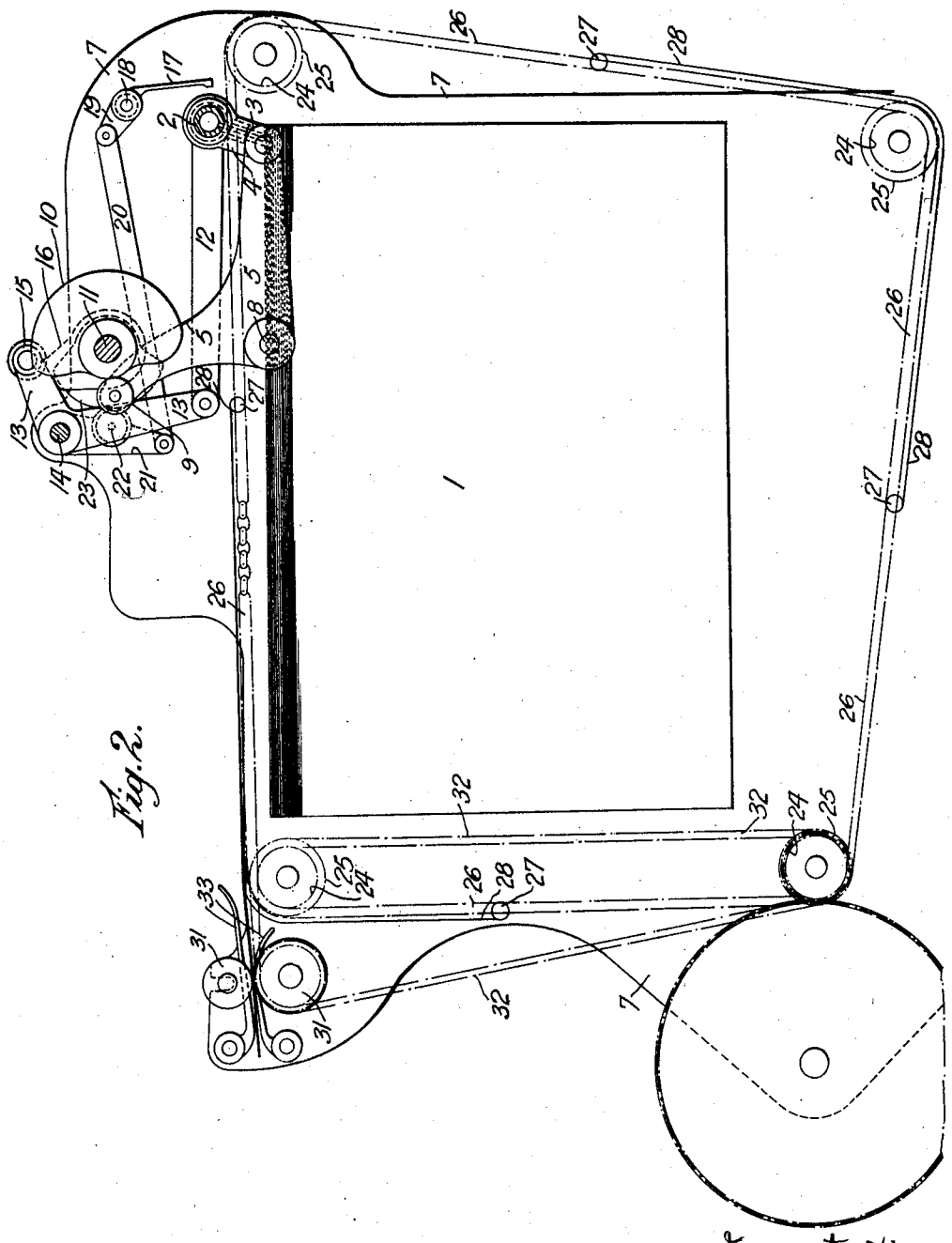


Fig. 2.

Inventors:
S. Payne and E. Stott
By their Attorneys,
Baldwin Wright

S. PAYNE AND E. STOTT.

MEANS FOR FEEDING SHEETS OF PAPER.

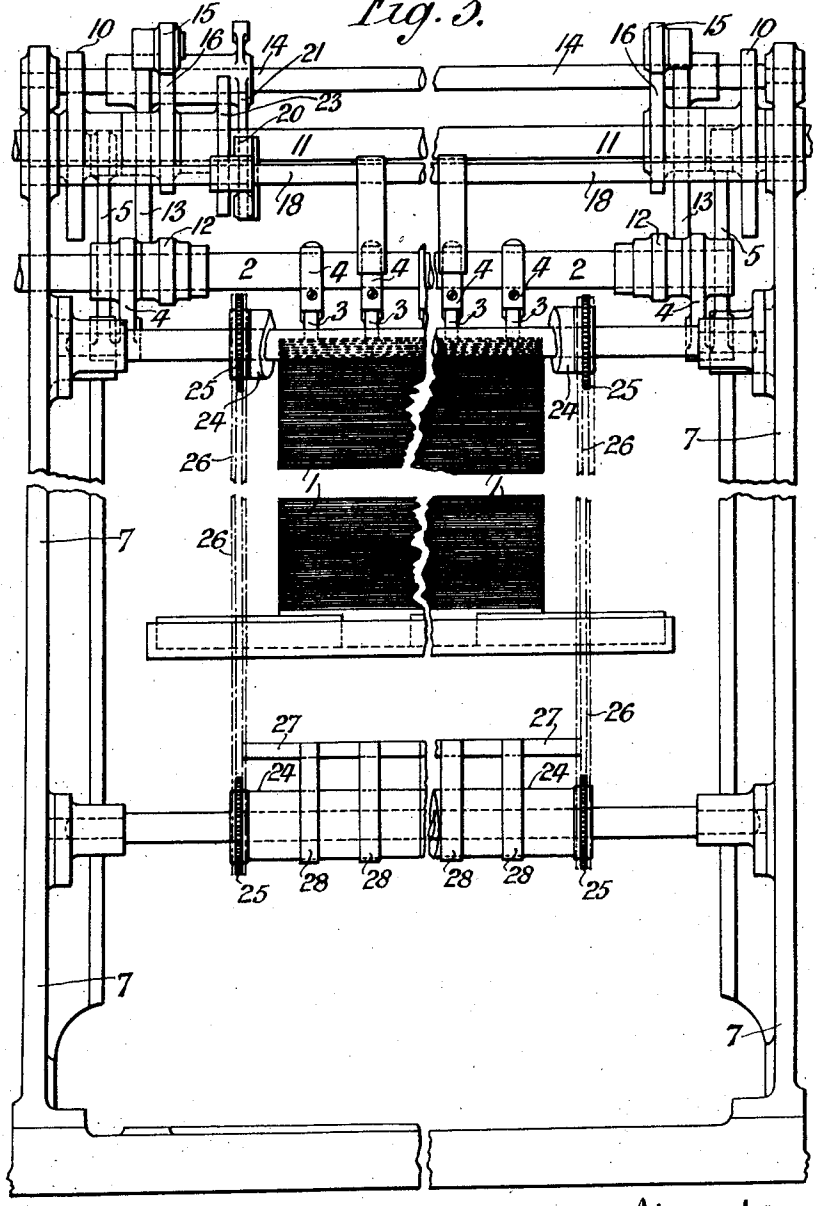
APPLICATION FILED APR. 4, 1921.

1,391,271.

Patented Sept. 20, 1921.

4 SHEETS—SHEET 3.

Fig. 3.



Inventors:
S. Payne and E. Stott
By their Attorneys,
Baldwin Wright

S. PAYNE AND E. STOTT.

MEANS FOR FEEDING SHEETS OF PAPER.

APPLICATION FILED APR. 4, 1921.

1,391,271.

Patented Sept. 20, 1921.

4 SHEETS—SHEET 4.

Fig. 4.

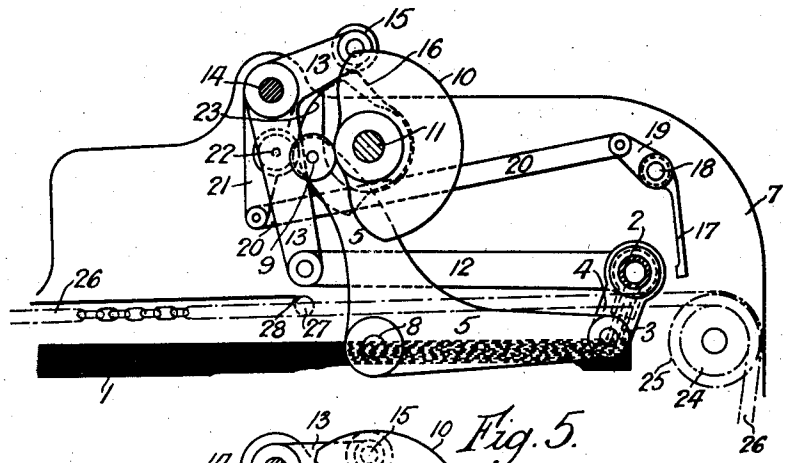


Fig. 5.

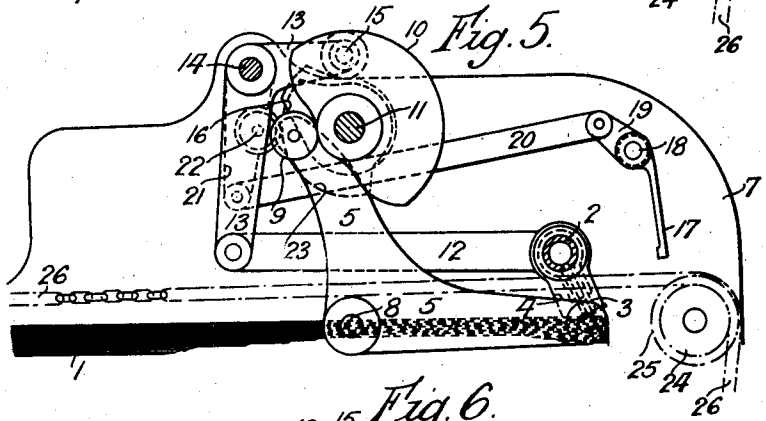
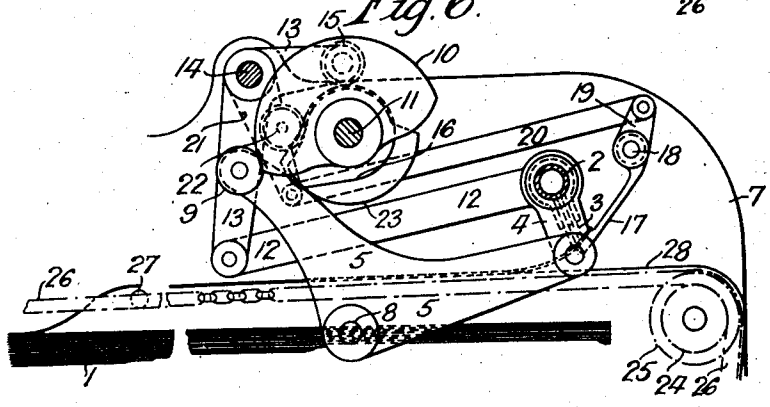


Fig. 6.



Inventors:
S. Payne & E. Stott
By their Attorneys,
Baldwin Wiglet

UNITED STATES PATENT OFFICE.

SYDNEY PAYNE AND ELKANAH STOTT, OF OTLEY, ENGLAND, ASSIGNORS TO PAYNE & SONS (OTLEY) LIMITED, AND WILLIAM DAWSON & SONS (OTLEY) LIMITED, OF OTLEY, YORKSHIRE, ENGLAND.

MEANS FOR FEEDING SHEETS OF PAPER.

1,391,271. Specification of Letters Patent. Patented Sept. 20, 1921.

Application filed April 4, 1921. Serial No. 458,458.

To all whom it may concern:

Be it known that we, SYDNEY PAYNE and ELKANAH STOTT, subjects of the King of Great Britain, residing at Otley, Yorkshire, England, have invented new and useful Improved Means for Feeding Sheets of Paper, of which the following is a specification.

The object of this invention is to provide improved means for feeding sheets of paper one at a time from a pile, and is especially suitable for use in conjunction with printing or other similar machines.

According to this invention we provide a pair of endless chains or the equivalent furnished with one or more pairs of cross bars, between which is stretched flexible material or a series of tapes or the like which forms with the cross bars a tray which can be moved across a table adapted to support a pile of sheets of paper; the top sheet of the pile to be fed is separated by any suitable means, and is then raised upward vertically or slightly backward or forward or the rest of the pile is dropped away from the sheet until a suitable distance is left between the uppermost sheet and the rest of the pile. When the tray has moved sufficiently far under the sheet, the mechanism which has held the sheet in its altered position is released so that the paper falls upon the tray and is carried forward by it to the desired position when it is controlled by any other suitable means.

Preferably we mount on two arms which can be rocked about an axis at right angles to the direction of movement of the tray over the table a sucker bar so that when he arms are down the bar can suck up that edge of the top sheet of the pile which lies toward the leading edge of the tray as it advances toward the pile. When the arms rock on their axis with the edge of the sheet adhering to the bar the sheet is bent up so that the tray can enter between it and the second sheet of the pile, and when the tray has moved sufficiently far beneath the sheet the sucker bar releases the paper which falls upon the tray and is carried forward by it to the desired position.

The sucker bar is preferably so mounted in the arms as to be capable of rotation therein about its own axis, so that the edge of the paper is first bent up by the rotation of the bar in its arms before the sheet is bent by the rocking of the arms about their axis.

In some cases we may provide a sucker bar with grippers to hold the edge of the sheet of paper positively to the sucker bar.

In a modification the endless chains or their equivalent are adapted to travel around the pile of sheets so that the tray carried by the said chains passes in its travel over and under the pile of sheets. The top sheet is stripped from the pile in the same manner as previously described and when released falls upon the tray when it is on the upper portion of the endless chains. The sheet is then carried forward and is fed between two rotating rollers mounted adjacent to a roller over which the chains and tray pass, the sheet being compelled if necessary to follow its original or any suitable path by means of fingers or the like, while the chains and tray descend and travel around the pile and receive another sheet.

Alternatively the sheet may be paid off the tray on to another set of moving trays, tapes or other conveying means.

In the accompanying drawings which illustrate our invention Figure 1 is a side elevation.

Fig. 2 is a side elevation of a modification and Fig. 3 is an end elevation thereof.

Figs. 4, 5 and 6 are detail views showing the operation of the mechanism.

Referring more particularly to Figs. 1, 4, 5 and 6, 1 is a pile of sheets which may be retained in position by side guides (not shown). 2 is a tubular suction bar coupled to a flexible suction tube (not shown) and fitted with nozzles 3; the suction bar is carried by a pair of rocking arms 4, pivoted to levers 5 by means of studs 6. The levers 5 are pivoted to frame sides 7, by means of studs 8 and are fitted with bowls and studs 9 and actuated by cams 10 mounted on a shaft 11 driven by any suitable means.

The suction bar 2 is connected by rods 12 to levers 13 mounted on a shaft 14 carried by the frame sides 7, and are fitted with bowls and studs 15, and actuated by cams 16, mounted on the shaft 11.

17 are grippers mounted on a shaft 18 and actuated by an arm 19, connecting rod 20, cam lever 21, fitted with bowl and stud 22, and operated by a cam 23 mounted on the shaft 11.

It will be seen that each cam 10, 16 and 23 imparts movement in one direction only, the return movement of the parts being obtained in any convenient manner as by springs (not shown).

24 are rollers carried by the frame sides 7; these are fitted with sprocket wheels 25. On the sprocket wheels two endless chains 26 are mounted and driven at a suitable continuous or intermittent speed by any convenient means.

The endless chains 26 carry cross bars 27 to which are fixed flexible tapes 28 of steel or other suitable flexible material, forming platforms or trays. Between each platform an open space is provided to allow time for a sheet to be raised from the pile as will be described later. 29 are stops and 30 is a machine table.

The operation is as follows:—

When the parts are in the position shown in Fig. 4 the edge of the top sheet of the pile 1 is caught by the suction nozzles 3. As the shaft 11 rotates, the cams 16 rock the levers 13 and through the connecting rods 12 turn the suction bar 2 about the studs 6 thereby bending up the edge of the sheet as shown in Fig. 5. As the shaft 11 continues to rotate the levers 5 are tilted by the cams 10 so that the bent up edge of the sheet is lifted up as shown in Fig. 6. At the same time the grippers 17 are rocked by the cam 23 and hold the sheet against the nozzles 3.

When the edge of the sheet is thus bent up and lifted a cross bar 27, passing beneath the lifted edge of the sheet, strips this latter from the pile of sheets 1; the grippers 17 are moved by the cam 23 to release the sheet, which rests upon the platform tapes 28. In Fig. 1 a sheet indicated by a thick black line is shown nearly stripped from the pile.

The sheet is now carried forward on the tapes 28 until it reaches the stops 29 which stop the sheet so that it falls through an open space between the cross bars 27 on to the table 30.

Referring now to the modification shown in Figs. 2 and 3, the mechanism for stripping a sheet from the pile is the same as that just described. The endless chains 26 in this case pass around the pile of sheets 1, and each sheet is deposited on to platform tapes 28 when these are on the upper portion of the endless chains 26. The sheet is then carried forward and is fed between rollers 31 driven by a chain 32 passing over sprocket wheels 25. 33 are guides or fingers which direct the sheet between the rollers 31. The sheet may be paid off to any other suitable sheet carrying mechanism.

What we claim is:—

1. In means for feeding sheets of paper one at a time from a pile, the combination of a pair of endless chains, means for imparting motion to said chains, a flexible tray carried by said chains and adapted to pass over said pile of sheets, and means for raising the leading edge of the top sheet of the pile whereby the tray is enabled to come between the top sheet and the pile.

2. In means for feeding sheets of paper one at a time from a pile, the combination of a pair of endless chains, means for imparting motion to said chains, a flexible tray carried by said chains and adapted to pass over said pile of sheets, means for bending and means for raising the leading edge of the top sheet of the pile whereby the tray is enabled to come between the top sheet and the pile.

3. In means for feeding sheets of paper one at a time from a pile, the combination of a pair of endless chains, means for imparting motion to said chains, a flexible tray carried by said chains and adapted to pass over said pile of sheets, a suction bar, and means whereby the leading edge of the top sheet of the pile is raised by said suction bar, whereby the tray is enabled to come between the top sheet and the pile.

4. In means for feeding sheets of paper one at a time from a pile, the combination of a pair of endless chains, means for imparting motion to said chains, a flexible tray carried by said chains and adapted to pass over said pile of sheets, a suction bar and means whereby the leading edge of the top sheet of the pile is first bent and is subsequently raised by said suction bar, whereby the tray is enabled to come between the top sheet and the pile.

5. In means for feeding sheets of paper one at a time from a pile, the combination of a pair of endless chains, means for imparting motion to said chains, a flexible tray carried by said chains and adapted to pass over said pile of sheets, a suction bar, means whereby the leading edge of the top sheet is first bent and subsequently raised by said suction bar, gripping devices, and means for causing said gripping devices temporarily to hold the top sheet against the suction bar whereby the tray is enabled to come between the top sheet and the pile.

6. In means for feeding sheets of paper one at a time from a pile, the combination of a pair of endless chains, means for imparting motion to said chains, a flexible tray carried by said chains and adapted to pass around said pile of sheets, and means for raising the leading edge of the top sheet of the pile whereby the tray is enabled to come between the top sheet and the pile.

7. In means for feeding sheets of paper one at a time from a pile, the combination of

a pair of endless chains, means for imparting motion to said chains, a flexible tray carried by said chains and adapted to pass around said pile of sheets, means for raising the leading edge of the top sheet of the pile whereby the tray is enabled to come between the top sheet and the pile, rollers adapted to receive the sheet from the flexible tray and means for rotating the rollers.

In testimony that we claim the foregoing as our invention we have signed our names this 23rd day of March, 1921.

SYDNEY PAYNE.
ELKANAH STOTT.