

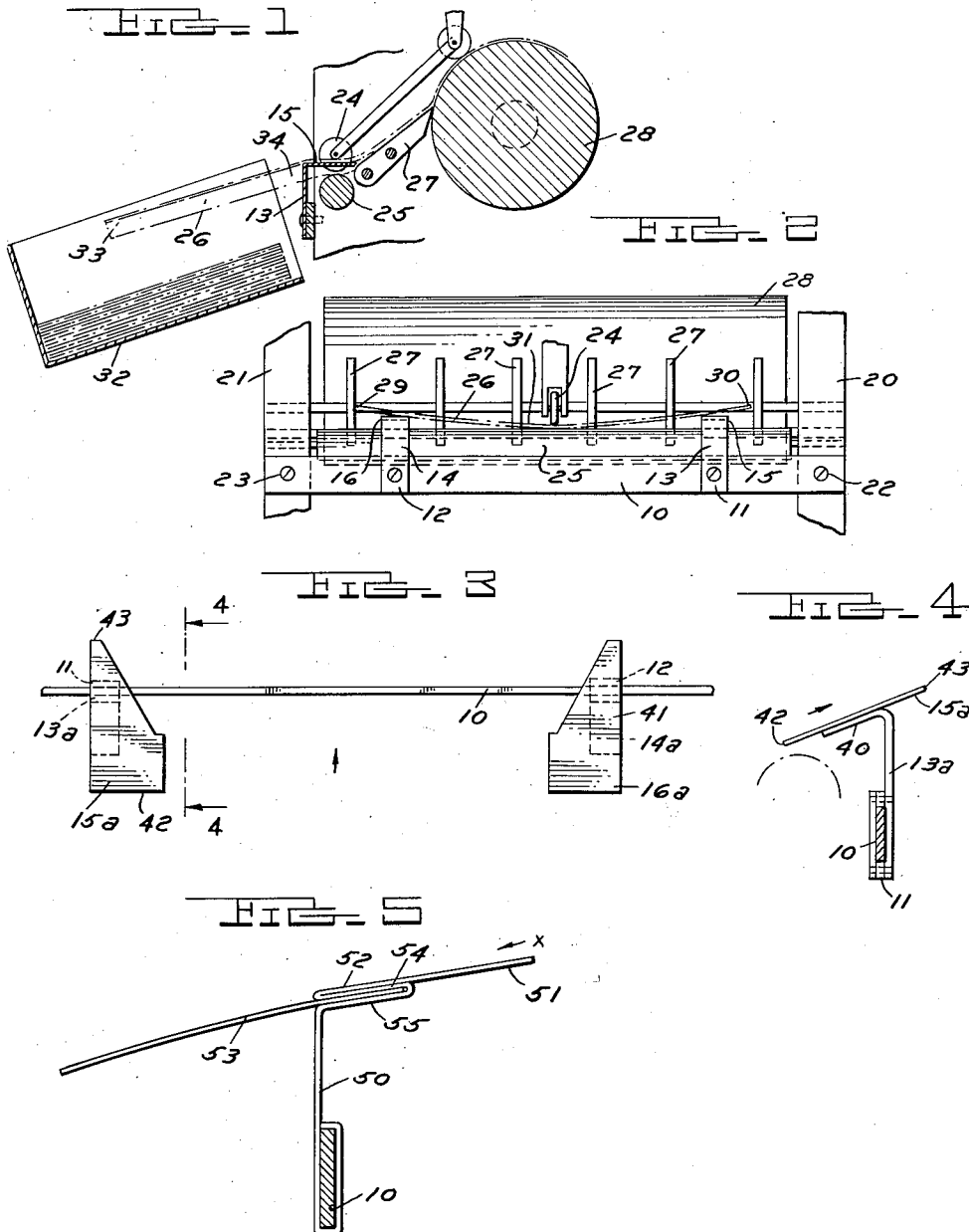
June 18, 1957

B. C. FAWCETT

2,796,259

SHEET TRAVELLING AND HANDLING DEVICE

Filed Nov. 3, 1954



INVENTOR.
BEECHER C. FAWCETT

BY
Killian P. Sevald
ATTORNEY

1

2,796,259

SHEET TRAVELLING AND HANDLING DEVICE

Beecher C. Fawcett, Drayton Plains, Mich.

Application November 3, 1954, Serial No. 466,547

6 Claims. (Cl. 271—86)

This invention relates to a sheet delivery device adapted to be easily mounted on a high speed sheet handling machine such as printing and duplicating machines.

Sheet handling devices or ejection and handling mechanisms have been employed heretofore to facilitate the delivery of a travelling sheet such as a sheet of paper from a printing or duplicating machine into a hopper or trough adjacent the delivery end of the machine, however, the several devices of the prior art have not proven entirely satisfactory inasmuch as they are complicated in design, and construction, expensive to manufacture, difficult to use, and unsatisfactory in performance especially in conjunction with thin and flimsy sheets such as onion skin which has a high electro-static charge thereon and which does not have sufficient body to support itself during the time it is emitted or ejected from the machine until it is received in the hopper portion.

Prior art devices have also encountered an extreme difficulty in handling flimsy sheets charged with electro-static charges in that these sheets have a tendency to deposit themselves and stick to the point or spot or article upon which it is deposited so that the sheets pile in a very uneven pile in the hopper portion of the machine and due to the fact that they are very hard to handle, it is practically impossible for the operator to hand-stack the sheets without individually positioning and locating each thin flimsy sheet, due to the fact that the sheet edges will not support the sheet of paper in conjunction with edge-wise stacking of the pile on the table or platen due to the fact that the sheets' edges collapse and do not straighten the sheets in the pile.

With the foregoing in view, the primary object of the invention is to provide a sheet handling device which is simple in design and construction, inexpensive to manufacture, easy to use, easy to remove, and which will operate efficiently to evenly channel and stack very thin and flimsy sheets of paper regardless of whether they carry electro-static charges or not.

An object of the invention is to provide a sheet delivery device which can be manufactured very inexpensively as the component parts are easily made and the assembly of the parts can be readily accomplished.

An object of the invention is to provide a sheet delivery stacking device which can be operated and installed with ease by either a professional machine operator or an amateur.

An object of the invention is to provide a sheet delivery device which can be fitted to all sizes of machines without changes in the assembly of the machine's parts or the arrangement of the parts of the device.

An object of the invention is to provide a sheet delivery device which produces a truss-like cross-sectional bend in the delivered sheet from the area of the delivery rollers of the machine into the area of the hopper area of the machine.

An object of the invention is to provide a sheet delivery device which has flexible members extending into

2

the trough or hopper area of the machine so that the curved cross-wise bend longitudinally effected in the delivered sheet is preserved well into the trough or hopper area of the machine.

5 These and other objects of the invention will become apparent by reference to the following description of a sheet delivery and handling device embodying the invention taken in connection with the accompanying drawing in which:

10 Fig. 1 is a cross-sectional view of a portion of a delivery end of the duplicating or printing machine showing the inventive device in cross-section.

Fig. 2 is an end elevational view of the device seen in Fig. 1.

15 Fig. 3 is a top elevational view of a modification of the inventive device.

Fig. 4 is a side elevational view of the device as seen in Fig. 3 taken on the line 4—4 thereof; and

20 Fig. 5 is a side elevational view of a further modification of the inventive device.

Referring now to the drawing wherein like numerals refer to like and corresponding parts throughout the several views, the sheet handling and delivery device such disclosed therein to illustrate the invention comprises a support slide bar 10 adapted to fit on the delivery end of the machine, like side clips 11 and 12 adapted to frictionally slide on the bar 10, like riser portions 13 and 14 adapted to rise above the clip portions 11 and 12, and tongue portions 15 and 16 adapted to extend into the sheet delivery area of the machine to support an ejected sheet along its longitudinal edges as the sheet travels thereover.

More particularly, the inventive device comprises a slide bar 10 adapted to be secured to the end stanchions or case 20 and 21 of the machine such as by the machine screws 22 and 23 and it is to be noted that the slide bar 10 is positioned outwardly and below the point of contact between the idler roller 24 and the delivery roller 25 so that the sheet 26 delivered from the machine is delivered at a point above the bar 10 so that the central portion of the sheet can drop down in the area immediately above the bar 10. It is to be noted that the riser portions 13 and 14 rise above the plane of the bar 10 and extend above the point of contact between the idler roller 24 and the delivery roller 25 and that the tongue portions 15 and 16 are directed inwardly towards the machine and extend to a point inbetween the stripper fingers 27 which are adapted to strip the sheet 26 from the print roller 28 so that when a sheet 26, the path of which is shown by dotted lines in Fig. 1, travels over the print roller 28 and is removed therefrom by the stripper fingers 27, it travels down the stripper fingers and first contacts the tongue portions 15 and 16 of the inventive device which lift the longitudinal edges 29 and 30 upwardly while the idler roller 24 depresses the central area 31 of the sheet downwardly so that the sheet 26 is emitted from the machine longitudinally and depressed centrally downwardly and longitudinally lifted upwardly at the longitudinal edges thereby giving the sheet a cross-wise or cross-sectional curved or bend relative to its length thereby increasing the resistance of the sheet to bend intermediate its longitudinal ends due to the fact that the upwardly curved sides of the sheet give the sheet a truss-like structure preventing it from bending longitudinally as the sheet moves from the stripper fingers 27. The longitudinal bend is also effected in the sheet after it passes the idler roller 24 due to the weight of the sheet itself as it passes over the tongues 15 and 16 which hold the sheet up on its longitudinal edges so that the sheet is allowed to drop in the center area which preserved the truss or trussed construction which prevents the

3

outward end 33 of the sheet from bending downwardly into the hopper area before its rearward end 34 is released from the idler roller 24. When the end of the sheet is released from the idler roller 24, the central weight of the sheet between the tongues 15 and 16 is sufficient to hold the curved bend of the sheet as it travels outwardly and into the hopper 32.

Referring to the modification of the device tongue portions seen in Figs. 3 and 4, it will be noted that the tongues 13A and 14A are equipped with upwardly inclined tab portions 40 and 41 so that the tongue portions 15A and 16A are reversely inclined relative to the travel of the paper which reverse inclination tends to increase the bend in the sheet by moving the edges longitudinally higher as the sheet moves outwardly of the machine. In other words, the tongue end 42 is disposed between the stripper fingers 27 and the higher tongue end 43 is disposed outwardly so that as the sheet travels outwardly, its edge is progressively elevated thereby increasing the curved formation of the sheet.

Referring now to the modification of the device seen in Fig. 5, it will be noted that the riser portion 50 is formed integral with the tongue portion 51 and that they are connected by a reverse bend area 52 with a flexible strip 53 inserted between the bends 54 and 55 so that as the sheet travels in the direction of the arrow X, the sheet moves out of the area of the idler roller and slides outwardly so that the edges rest on the flexible strips 53 allowing the center portion of the sheet to drop of its own weight so that the curved truss-like formation of the sheet is held far into the hopper area. This particular modification of the device has been found particularly suitable for use in conjunction with coated enamel stock or very thin, flimsy onion skin due to the fact that air resistance on such types of paper causes it to deform in flight and arrive in the hopper area in a very haphazard and difficult condition to handle. With the use of the flexible fingers 53, the very flimsy, difficult to handle sheet is more or less travelled into the area of the hopper with the center of the sheet dropping between the flexible fingers 53 which are used in pairs so that the trussed area of the very flimsy sheet is positively preserved longer and, when the sheet moves off the ends of the strips 53, it is already substantially accurately positioned in the hopper before it drops therein.

It is also to be particularly noted in all modifications of the device seen in the drawing, that the leading end of the tongues are located inwardly of the area of the stripper fingers so that the edges of the sheet emitting from the machine is picked up from the stripper fingers on the tongues at the edges of the sheet during jamming which completely eliminates this and delivery is a smooth and continuous feeding of sheets from the machine.

The tongues in the modified devices are shown to be inclined downwardly-outwardly; upwardly-outwardly and also on a straight horizontal plane and it has been found that this angle can be varied to more suitably handle various sizes and weights of stock due to the fact that some sheets need to have more bend or arc induced in them to enable them to be handled properly and stacked accurately. It is within the purview of the invention to use the flexible strips 53 in conjunction with any of the forms of the tongues shown due to the fact that the flexible strip provides a suitable medium for travelling very flimsy sheets from any of the forms of the tongue shown.

It is understood that the device can easily be mounted on any type of machine and the necessary adaptations for placing the slide bar or equivalent on the machine is considered to be within the scope of the invention.

The inventive sheet delivery device with the features described constitutes a compact, durable, simple, and neat appearing mechanism easily installed and easily operated to facilitate the delivery and stacking of sheets in

4

conjunction with a rapidly operated machine which delivers the ejected sheets at a high rate per minute.

Although but a single embodiment of the invention has been shown and described in detail in conjunction with three modifications, it is obvious that many changes may be made in the size, shape, detail, and arrangements of the various elements in the invention within the scope of the appended claims. For example, two idler rollers 24 can be used instead of one shown with the rollers positioned more closely to the tongue portions of the inventive device.

I claim:

1. A sheet delivery device adapted for easy mounting on high speed sheet handling machines such as printing and duplicating machines having a print roll and stripper fingers for removing the sheets from the print roll and for sending the sheets between a delivery roll and a central idler roller riding thereon comprising a bar mounted on the machine stanchions rearwardly outwardly and below the path of the sheets emitting from the machine delivery roll, paired side-wise adjustable slides on said bar, spaced substantially vertical riser portions on said slides on said bar leading upwardly to a point above the point of contact between the idler roller delivery roller point of contact, and substantially horizontal tongue portions emitting from said riser portions leading over the delivery roll extending inwardly-forwardly into the area of the stripper fingers so that a sheet ejected from the machine is simultaneously centrally longitudinally depressed by the idler roller and longitudinally lifted at its edges by said tongue portions to give the sheet a transverse arcuate cross-section so that the sheet is thereby trussed against intermediate longitudinal bending after it leaves the machine.

2. In a device as set forth in claim 1, flexible strips cantilevered outwardly from said tongues extending into the hopper area adapted to support an ejected sheet after it leaves the machine at its longitudinal edges to allow the sheet to sag longitudinally intermediate said strips to preserve the arcuate truss-like formation in the emitted sheet after it has left the area of the delivery roll and the tongue portions until the sheet is well within the receiving hopper of the machine.

3. A sheet delivery device adapted for easy mounting on high speed sheet handling machines such as printing and duplicating machines having a print roll and stripper fingers for removing the sheets from the print roll and for sending the sheets between a delivery roll and a central idler roller riding thereon comprising a bar mounted on the machine stanchions rearwardly outwardly and below the path of the sheets emitting from the machine delivery roll, paired side-wise adjustable slides on said bar, spaced substantially vertical riser portions on said slides leading upwardly to a point above the point of contact between the idler roller delivery roller point of contact and outwardly-upwardly inclined tongue portions emitting from said riser portions leading over said delivery roll extending inwardly-forwardly into the area of the stripper fingers so that a sheet ejected from the machine is simultaneously centrally longitudinally depressed by the idler roller and longitudinally increasingly lifted at its edges by said tongue portions to give the sheet a transverse arcuate cross-section so that the sheet is thereby trussed against intermediate longitudinal bending after it leaves the machine.

4. In a device as set forth in claim 3, flexible strips cantilevered outwardly from said tongues extending into the hopper area adapted to support an ejected sheet after it leaves the machine at its longitudinal edges to allow the sheet to sag longitudinally intermediate said strips to preserve the arcuate truss-like formation in the emitted sheet after it has left the area of the delivery roll and the tongue portions until the sheet is well within the receiving hopper of the machine.

5. A sheet delivery device adapted for mounting on

5

high speed sheet handling machines such as printing and duplicating machines having a print roll and stripper fingers for removing the sheets from the print roll and for sending the sheets between a delivery roll and a central idler roller riding thereon comprising a bar mounted on the machine stanchions rearwardly outwardly and below the path of the sheets emitting from the machine delivery roll, paired linearly adjustable slides on said bar, spaced substantially vertical riser portions on said slides leading upwardly to a point above the point of contact between the idler roller delivery roller point of contact, and downwardly-outwardly inclined tongue portions emitting from said riser portions leading over said delivery roll extending inwardly-forwardly into the area of the stripper fingers so that a sheet ejected from the machine is simultaneously centrally longitudinally depressed by the idler roller and longitudinally decreasingly lifted at its edges by said tongue portions to give the sheet a transverse arcuate cross-section so that the sheet

6

is thereby trussed against intermediate longitudinal bending after it leaves the machine.

6. In a device as set forth in claim 5, flexible strips cantilevered outwardly from said tongues extending into the hopper area adapted to support an ejected sheet after it leaves the machine at its longitudinal edges to allow the sheet to sag longitudinally intermediate said strips to preserve the arcuate truss-like formation in the emitted sheet after it has left the area of the delivery roll and the tongue portions until the sheet is well within the receiving hopper of the machine.

References Cited in the file of this patent

UNITED STATES PATENTS

746,930	Dick	Dec. 15, 1903
1,210,465	Gubelman	Jan. 2, 1917
1,758,134	Weingartner	May 13, 1930
1,933,712	Creed	Nov. 7, 1933