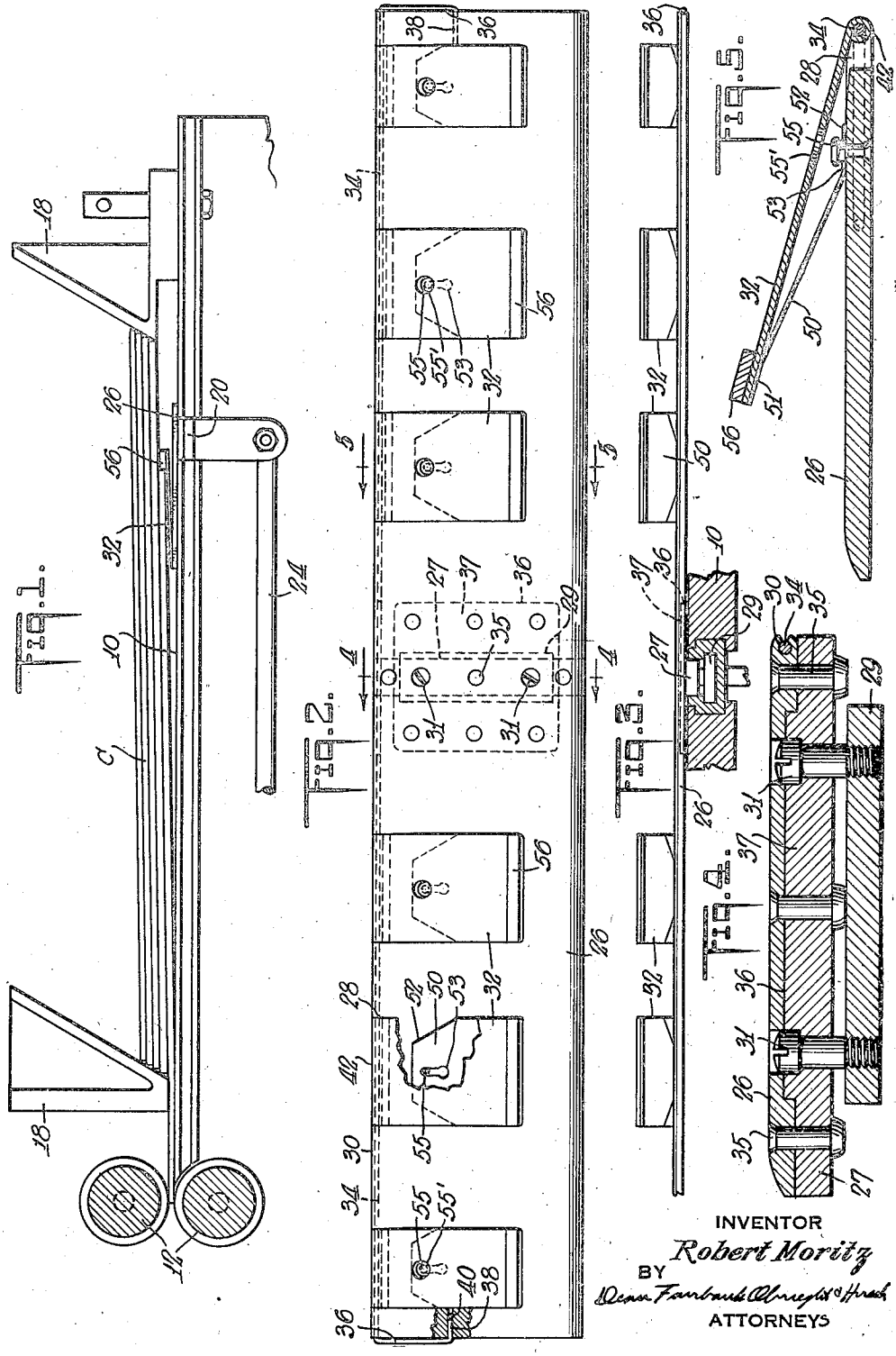
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SHEET FEEDING DEVICE

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INVENTOR
Robert Moritz
BY
Dean Fairbank Albright & Hirsch
ATTORNEYS

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ROBERT MORITZ, OF CAMDEN, NEW JERSEY, ASSIGNOR TO SAMUEL M. LANGSTON COMPANY, OF CAMDEN, NEW JERSEY, A CORPORATION OF NEW JERSEY

SHEET-FEEDING DEVICE

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This invention relates to certain improvements in mechanism for feeding comparatively stiff sheet material, such for instance as double faced corrugated board, to machines for printing, slotting, scoring, or otherwise operating upon the sheets. It relates more particularly to that type of mechanism illustrated in the Langston Patents Nos. 1,107,971, issued August 18, 1914, and 1,150,210, issued August 17, 1915. In the specific forms of feeding mechanism illustrated in said patents, there is provided a suitable support in the form of a table or platform for a column or stack of sheets to be fed. Guides engage the edges of the sheets in the stack or column to hold the latter in position as the sheets are fed singly from the bottom thereof. A feeder head movable back and forth along the support engages with the rear edge of the bottom sheet to slide the latter out from under the remaining sheets of the stack or column and beneath one of said guides. In the device illustrated in said Patent 1,150,210 the sheet engaging members include rearwardly and upwardly inclined resilient fingers for direct engagement with the sheet to be fed. These are flexible throughout their lengths and have bent ends forming integral hooks for catching the edge of the sheet. Although these usually operate satisfactorily they are not ideal and are open to some objections. If these members be rigidly secured at their front ends they may, under some conditions of use, bow under the weight of the sheets so that the hook ends are not forced upwardly to properly engage the sheet edge at the back end of the stroke, or may slip under the sheet during the feeding movement. Repeated bending may develop a fracture if the members are not properly tempered. The removal of broken or defective members is difficult.

One object of the present invention is to provide an improved construction which insures at all times proper feeding of the sheet engaging members with the sheet to be fed.

A further object is to provide a construction having greater strength and durability.

A further object is to construct and arrange the sheet engaging members so that they may be readily removable for the purpose of repair or replacement.

In the accompanying drawings, there is illutrated only one embodiment of the invention, but it is to be understood that the invention is not limited to this form and that other forms may be designed which fall within the scope of the appended claims and the spirit of my invention.

In these drawings:

Fig. 1 is a longitudinal sectional view illustrating a part of an apparatus having my improved feeding means for removing sheets in succession from the bottom of a stack or column.

Fig. 2 is a top plan view of a feeding head on a larger scale.

Fig. 3 is an edge view of said head, and

Figs. 4 and 5 are transverse sectional views taken on the lines 4—4 and 5—5 respectively of Fig. 2.

The details of the machine in connection with which the feeding mechanism is employed, forms no part of the present invention. A table or platform 10 supports a pile or stack of sheets C from the bottom of which it is desired to feed the sheets singly to the machine. The feeding mechanism delivers to a pair of driven rollers 12 which may be provided with suitable friction surfaces to insure a feeding grip of the rollers upon the sheets. These rollers may be disposed adjacent to one edge of the table.

Suitable inclined guides 18 are employed for the front and rear edges of the stack and other guides, not shown, may be employed for the side edges. The sheets C are fed singly and in succession from the bottom of the stack and along the support 10 by a feeder head upon the upper face of the support and clamped to a slide 20 mounted to reciprocate in the slot in the support. The slide is connected to and operated by a rod 24 which in turn may be pulled and pushed by any suitable mechanism, as for example, that illustrated in either of the two prior patents above mentioned.

The feeder head as illustrated includes a rectangular plate 26 provided with a plurality of sheet engaging members 32. The under

face of the plate 26 is provided with a recess 36 receiving a plate 37 secured in place by fastenings 35. The plate 37 is formed with a rib 27 to which is secured, by means of cap screws or the like 31, a second plate 29 which is disposed in the enlarged part of the groove in the slide 20. As illustrated in Fig. 3, the plate 29 is of slightly greater width than the rib 27. By tightening the screws 31, the plate 29 is drawn toward the rib 27 and the head and slide are firmly clamped together, but with the head at any desired position along the slide depending on the width of the sheets to be fed.

As the main feature of the present invention, there are provided a plurality of plates 32 of stiff metal pivotally mounted upon the forward edge of the feeder head plate 26. This edge is preferably formed with a plurality of inwardly extending recesses or notches 28 in which the sheet engaging members are pivotally mounted. Those portions of the front edge of the feeder head plate 26 between the recesses or notches 28, are formed to provide bearings 30 in which pintle members 24 for the sheet engaging members are mounted.

There are two of these pintle members 34 which extend along the forward edge of the feeder head from opposite ends to a point adjacent to the center of said feeder head. The outer end of each member 34 is bent to lie along its respective end of the feeder head 26 as at 36 and its extremity is formed with an angular portion 38 adapted for reception in a recess 40 in the feeder head 26. Thus they are frictionally retained, but may be readily pulled out.

The forward end of each sheet engaging member may be bent to provide a bearing 42 through which the pintle 34 may extend when the sheet engaging member is positioned in its slot 28. Thus each sheet engaging member has free pivotal movement at its front end about the pintle 34 and is held against lateral movement. The parts are preferably so proportioned that the front ends of the sheet engaging members are substantially in line with the front face of the feeder head to make a straight front edge.

The sheet engaging members are normally upwardly inclined rearwardly in respect to the top face of the feeder head, and are so held by resilient means in the form of a flat spring 50 disposed therebeneath. Each spring engages the plate 26 and the member 32 and is secured in any desired manner at one end, preferably to its respective sheet engaging member as at 51. The lower end of each spring 50 is formed to provide an angular portion 52 which has a slot 53 preferably of the keyhole type with its enlarged portion positioned at the rear end of the slot, to receive the head of a stud 55. The engagement of the smaller or body portion of the stud 55 in the slot 53 provides a guide for the lower end of the spring 50, and at the same time the upwardly swinging movement of the sheet engaging members under the influence of their spring members 50, is limited by the engagement of the stud 55 and the end of the slot.

Each member 32 has at the lower free end thereof and secured thereto transversely extending bars or lugs 56 of a thickness approximating, but not exceeding the thickness of the sheet C and presenting a shoulder at its edge for engaging the edge of the sheet. The upper surface is wide so that it will not cut into the sheet while sliding therebeneath.

I have illustrated the plate 26 as provided with six of these members 32 and their associated parts, but it will be obvious that the number may be increased or decreased depending on the width of the sheet which the device can handle. The members 32 may be wider or narrower and each may have two or more springs, if desired.

In operation the feeder head moves rearwardly to such an extent that the lugs 56 of the sheet engaging members come out from beneath the column or stack of sheets to be fed and immediately spring upwardly, or the column drops slightly. The inclination, spacing and resilient mounting of the sheet engaging members positively insures engagement of the shoulders formed by the lugs 56 with the edge of the sheet, even though the latter be warped or curved out of a straight line. In this position, the sheet engaging members lie substantially flat or parallel with the upper face of the feeder head, with the studs 55 lying within openings 55′ in the sheet engaging members. Upon movement of the feeder head in the forward direction, the sheet engaged by the lugs of sheet engaging members, will be advanced to a position where it will be picked up by the feeding rollers 12 at which time or shortly thereafter, the feeder head returns to position where the lugs 56 are beyond the rear edge of the bottom sheet of the stack and in position to feed the next sheet forward upon forward movement of the feeder head.

While the lugs 56 of the sheet engaging members are moving beneath the column or stack of sheets, the sheet engaging members will be yieldingly depressed to a position substantially in parallelism with the top face of the feeder head, but if the sheet be warped each member may occupy a position in which it has proper pulling engagement with the sheet edge.

Inasmuch as the sheet engaging members may support a portion of the weight of the stack of sheets, the spring members 50 may be relatively stiff or strong. In some instances, for example, where the sheets are very light or there be but a few sheets in

the stack, the spring members 50 might be of sufficient strength to elevate the sheet engaging members to too great an extent. Such movement is prevented by the limiting engagement of the forward end of the slot 53 with the stud 55.

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

1. In a sheet feeding mechanism, a feeding head, a sheet engaging member pivotally mounted upon the forward edge of said feeding head, and inclined upwardly and rearwardly therefrom, a leaf spring secured to the under side of said member for yieldingly supporting the same in said inclined position, and means for limiting the movement of said member.

2. In a sheet feeding mechanism, a feeding head, including a slidable plate having recesses in its front edge, a plurality of sheet engaging members independently pivoted in separate recesses and inclined upwardly and rearwardly, a resilient member carried by each sheet engaging member and having sliding engagement with said feeding head, and means for limiting the sliding movement of said resilient member relative to the feeding head, thereby to limit the movement of the sheet engaging members.

3. In a sheet feeding mechanism, a feeding head, including a slidable plate, a plurality of sheet feeding members pivotally mounted upon the forward edge of said plate, a leaf spring carried by each of said members for yieldingly supporting the rear end of the member, each of said springs having a slotted lower end for sliding engagement with the upper face of said plate, and a stud engaging in the slot of each of said springs for limiting the sliding movement thereof, and thereby limit in one direction, the pivotal movement of its respective member.

4. A sheet feeding device, including a stack support, a plate slidable thereon, a substantially inflexible flat finger pivoted to the front edge of said plate and having a transverse lug on the upper surface at the free end and presenting a flat upper surface for sliding engagement with the under surface of a stack of sheets, and a shoulder for engagement with one edge of the bottom sheet, and a spring for yieldingly supporting the last mentioned end of said finger.

5. A sheet feeding mechanism, including a horizontal stack support for superposed sheets, a feeding head movable back and forth over said support, a plurality of sheet engaging members pivotally mounted upon the forward edge of said feeding head and inclined upwardly and rearwardly therefrom, and each having a hook part upon the rear end for engagement with the bottom sheet of the stack, and a spring supporting the rear end of said member.

Signed at Camden, in the county of Camden and State of New Jersey, this 2nd day of Nov., A. D. 1929.

ROBERT MORITZ.