T. C. DEXTER & G. A. MARTIN.

SLOW DOWN AND SHEET STRAIGHTENER.

APPLICATION FILED MAR. 10, 1916.

1,289,697.

Patented Dec. 31, 1918.

3 SHEETS—SHEET 1.

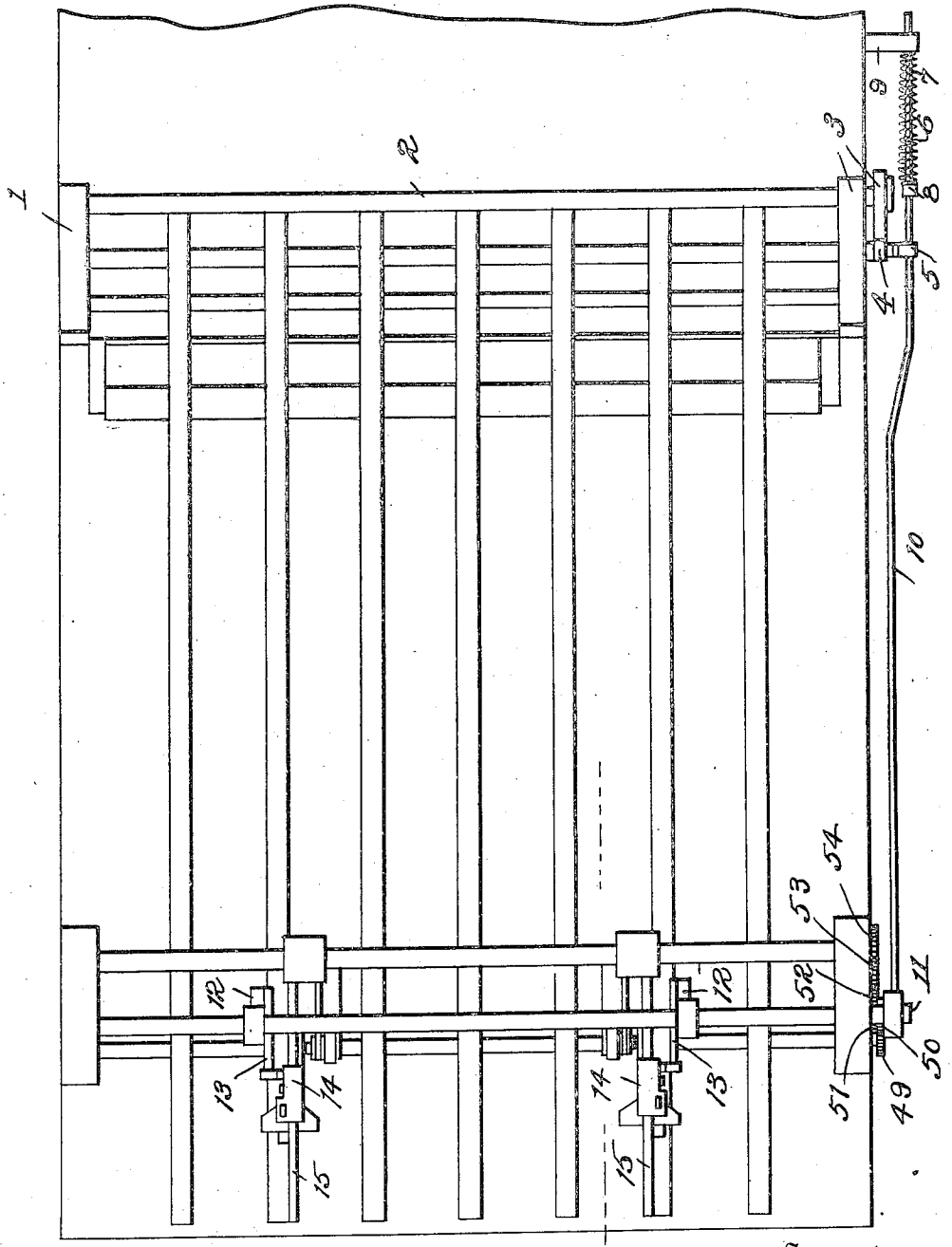


Fig. 1.

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3 SHEETS—SHEET 2.

Fig. 2.

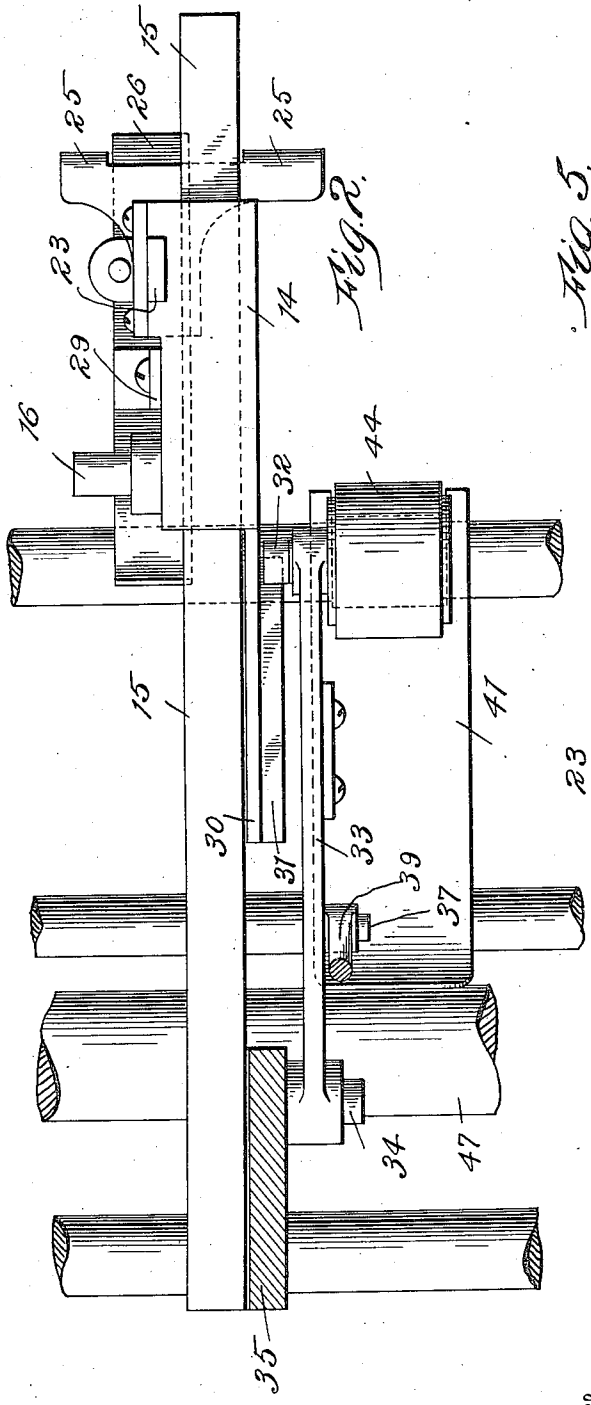
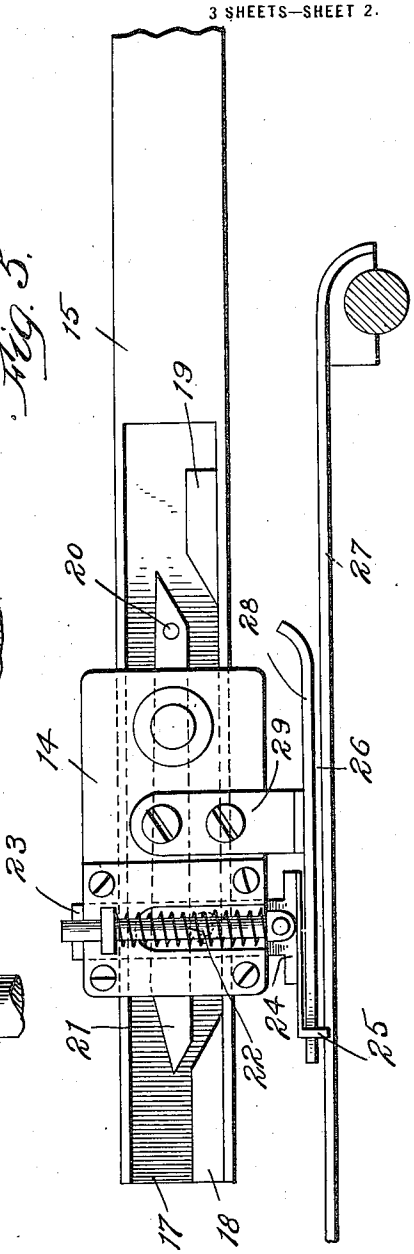


Fig. 5.



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3 SHEETS—SHEET 3.

Fig. 4.

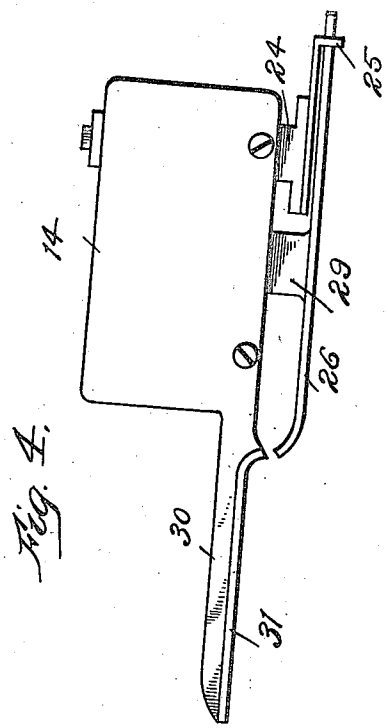


Fig. 3.

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UNITED STATES PATENT OFFICE.

TALBOT C. DEXTER AND GEORGE A. MARTIN, OF PEARL RIVER, NEW YORK, ASSIGNORS TO DEXTER FOLDER COMPANY, OF PEARL RIVER, NEW YORK, A CORPORATION OF NEW YORK.

SLOW-DOWN AND SHEET-STRAIGHTENER.

1,289,697. Specification of Letters Patent. Patented Dec. 31, 1918.

Application filed March 10, 1916. Serial No. 83,309.

To all whom it may concern:

Be it known that we, TALBOT C. DEXTER and GEORGE A. MARTIN, citizens of the United States, residing at Pearl River, in the county of Rockland and State of New York, have invented certain new and useful Improvements in Slow-Downs and Sheet-Straighteners, of which the following is a specification.

This invention relates to slow down and sheet straightening machines in which sheets are fed at relatively high rates of speed up to within a predetermined distance of the position in which it is seized by the grippers of another machine, and then acted upon by slow down mechanism after which it is again released to the sheet-feeding means for a relatively short period of travel to move it into said position. In machines of this general character, it has been customary to have slow down mechanisms act upon the rear edges of the sheets. In consequence it frequently happened that when a sheet was fed in a crooked manner to laterally spaced slow down mechanisms, the lateral edge of the sheet which was in advance would be released from the slow down before the opposite lateral edge so that the tendency was to further displace the sheet from the desired position. The present invention contemplates the arrangement of the slow down instrumentalities in such positions that they will act upon the leading edge of an advancing sheet so that the more advanced corner of a sheet will be first engaged by the slow down and thus serve to effect a preliminary sheet-straightening movement. Preferably the slow down mechanism includes a drop roller which is down when the forward edge of the sheet reaches it. One of the objects of the present invention is to provide a slow down which is automatically operated by a sheet gage. It thus becomes possible to feed a sheet rapidly to within a very short distance of the sheet gages, slow it down within a very brief interval and straighten it against the front gages. Other and further objects will appear in the specification and be pointed out in the appended claims, reference being had to the accompanying drawings which represent our invention as applied to that type of machine shown and described in the copending application of Breen and Martin, Serial No. 71,250, filed January 10, 1916.

In the drawings:

Figure 1 is a top plan view of one embodiment of our invention;

Fig. 2 is a top plan view on an enlarged scale of one of the units of our invention, parts being broken away and parts being shown in section;

Fig. 3 is a side elevation of the same;

Fig. 4 is a detail of same in elevation;

Fig. 5 is a fragmentary side elevation from the opposite side of Fig. 3.

Referring more particularly to the drawings, the main frame of an automatic feeding machine serves to mount the brackets 1, in which is journaled a power driven shaft 2, to which is keyed a cam 3 which acts upon a cam roller 4 to vibrate a lever 5. Said lever has connected thereto a rod 6 which carries a spring 7 interposed between a collar 8 and a fixed abutment 9 within which the spring rod 6 reciprocates. A connecting rod 10 serves to transmit the oscillatory motion of the lever 5 to a rock shaft 11. The rock shaft 11 has keyed thereto a pair of laterally spaced lever arms 12 which are connected by rods 13 to carriages 14 which are reciprocably mounted on track bars 15. Referring now to Fig. 2, the connecting rod 13 has its forward end journaled on the laterally projecting pin or stud 16 by means of which the carriage 14 is reciprocated. In the outer face of each of the track bars 15, is a groove 17 having inset cam blocks 18 and 19 spaced longitudinally thereof. A pin 20 serves to journal the rear end of a movable cam bar 21 which provides a lower camway for a cam roller 22 during the forward movement of carriage 14 and an upper runway therefor during the return movement of said carriage. The roller 22 is journaled on a laterally projecting pin carried by a vertically arranged slide 23, said slide carrying at its lower end a foot 24 which serves to mount a sheet gage 25, said sheet gage in its lowered position serving to block the forward movement of a sheet which is being fed through the space 26 extending between the guide bar 27 and an upper guide 28 which is carried by a bar 29 secured to the lateral face of carriage 14. This portion of the mechanism is described in the application above referred to, it being sufficient for the purpose of understanding the present invention to point out that as the car-

riage 14 moves forward, the cam roller 22 travels through the lower run of the track bar 15, mounting the cam block 18 at the forward end of its movement and thus permitting the cam bar 21 to drop so that on the return movement of said carriage, the cam roller 22 travels over the upper run. It will be seen therefore, that during the forward movement of the carriage, the reciprocating sheet gage 25 will be lowered and during the backward movement of the carriage, said sheet gage will be raised. Referring now to Figs. 3, 4 and 5, the carriage 14 is provided with a rearwardly projecting arm 30, with a laterally projecting cam bar 31. At certain times during the reciprocating movements of the carriage 14, a cam roller 32 rides over the cam 31, said cam roller being journaled on the forward end of a lever arm 33, the rear end of said lever arm being journaled on a pin 34 which projects laterally from a fixed bracket 35 which also carries the track bar 15. A spring rod 36 has one end pivoted on a pin 37 projecting from the lever arm 33, the other end of said spring rod being reciprocably mounted in a movable abutment 38. A spring 39 which is interposed between the abutment 38 and a collar 40 on the rod 36, imparts a normal tendency to hold the lever 33 depressed. A guide plate 41 is provided with an upwardly extending portion 42 secured to the lateral face of the lever arm 33 and has its forward end deflected upwardly at 43. Thus as the drop roller 44 which is journaled on a pin 45 rises and falls, the guide plate 41 partakes of such upward and downward movements. Sheet feeding tapes 46 which pass around tape roller 47, serve to feed a sheet 48 forwardly to the slow down mechanism just described. Disposed below the plane of movement of this sheet, is a slow down roller 48 keyed to a shaft which is provided with a gear 49 which meshes with a gear 50, said gear 50 being in mesh with a smaller gear 51 of a compound, the larger gear 52 of which is in gear with an idler 53 which meshes with a gear 54 on the tape roller shaft 47. Preferably the slow down roller 48 is thus rotated at approximately one-half the speed of tape roller 47.

The operation of our improved mechanism will now be readily understood and briefly described is as follows. As a sheet 48 is fed forwardly by the tapes 46, the leading edge thereof reaches the slow down rolls 48 after the drop rollers 44 have descended. After the leading edge of said sheet enters between the drop roller 44 and the slow down roller 48 the carriage 14 is some distance to the left of its position as shown in Fig. 3. As the sheet passes between said rollers, however, the carriage has already begun its forward movement so that the sheet gages 25 precede the leading edge of the sheet by a small distance until the continued forward movement of the carriage 14 brings the cam 31 under the roller 32 to elevate the drop roller 44, an operation which releases the corresponding lateral edge of the sheet 48, so that it again increases its speed under the action of fast moving tapes 46, which causes it to overtake the sheet gage 25 which determines its final position prior to the removal of the sheet to another machine. It will be seen therefore that should one lateral edge of the sheet be ahead of the other lateral edge, it will first come under the action of the slow down instrumentality on its side of the machine so as to be retarded relatively to the other side, thus effecting a preliminary straightening of the sheet. The straightening operation is perfected by the sheet gages 25 in the manner already referred to. While we have described this invention in its application to the type of machine shown and described in the above referred to application, it will be understood that our invention is equally applicable to various other types of machine.

We claim:—

1. In a machine of the character described, the combination with sheet-feeding means, of laterally spaced instrumentalities reciprocable at less speed than that of a sheet fed by said sheet-feeding means, said instrumentalities being provided with means for gaging the forward edge of said sheet, and laterally spaced slow down rollers movable into and out of position to engage said sheet.

2. In a machine of the character described, the combination with sheet-feeding means, of laterally spaced instrumentalities reciprocable at less speed than that of a sheet fed by said sheet-feeding means, said instrumentalities being provided with means for gaging the forward edge of said sheet, laterally spaced arms movable about fixed axes, slow down rollers journaled in said arms and movable into and out of position to engage said sheet, said arms being moved by the reciprocation of the first mentioned instrumentalities.

3. The combination with sheet-feeding means, of laterally spaced sheet-gaging carriages reciprocating in the direction of feed of said sheet-feeding means, means for reciprocating said carriages at a rate of speed slower than the speed of a sheet fed by said sheet-feeding means, and laterally spaced slow down rollers respectively moved by the reciprocating carriages into and out of positions for engaging said sheet, and means for rotating said rollers.

4. The combination with sheet feeding means, of laterally spaced sheet-gaging carriages reciprocable in the direction of feed of said sheet-feeding means, and a slow down

roller movable into and out of engagement with a sheet, the movement of said slow down roler being controlled by the reciprocation of said carriage.

5. In a sheet-feeding machine, the combination with sheet-feeding means, of a sheet-gage, means for moving said sheet-gage to and fro in the line of feed of said sheet-feeding means, a slow down roller, and means operated by the movement of said sheet-gage moving means for moving said slow down roller into and out of position to engage a sheet fed by said sheet-feeding means.

6. In a sheet-feeding machine, the combination with sheet-feeding tapes, of relatively slow speed, rollers journaled below the plane of feed of said tapes, drop rollers mounted above said slow speed rollers and adapted to coöperate therewith in slowing down a sheet, front gages reciprocating in the plane of feed of said tapes, and means for raising said drop rollers.

7. In a sheet-feeding machine, the combination with sheet-feeding tapes, of relatively slow speed rollers journaled below the plane of feed of said tapes, drop rollers mounted above said slow speed rollers and adapted to coöperate therewith in slowing down a sheet, front gages reciprocating in the plane of feed of said tapes, and means for raising said drop rollers, said slow down and drop rollers being arranged adjacent to said front gages.

8. In a machine of the character described, the combination with sheet-feeding means, of laterally spaced tracks, carriages reciprocable on said tracks, sheet-gages mounted on said carriages, slow down instrumentalities including laterally spaced drop rollers, and cam operated means actuated by the reciprocating movements of said carriages for raising said drop rollers.

9. In a machine of the character described, sheet-feeding means, a reciprocable sheet-gaging carriage provided with a cam, and a slow down device provided with a cam roller moved by said cam during the reciprocation of said sheet-engaging carriage.

10. In a machine of the character described, the combination with sheet feeding means, of slow down mechanism including laterally spaced drop rollers, laterally spaced reciprocating sheet gages, and means for raising said drop rollers at definite points in the travel of said sheet gages.

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