No. 752,380. PATENTED FEB. 16, 1904.

T. C. DEXTER.

SHEET CONVEYING MACHINE.

APPLICATION FILED OCT. 25, 1902.

NO MODEL. 3 SHEETS—SHEET 1.

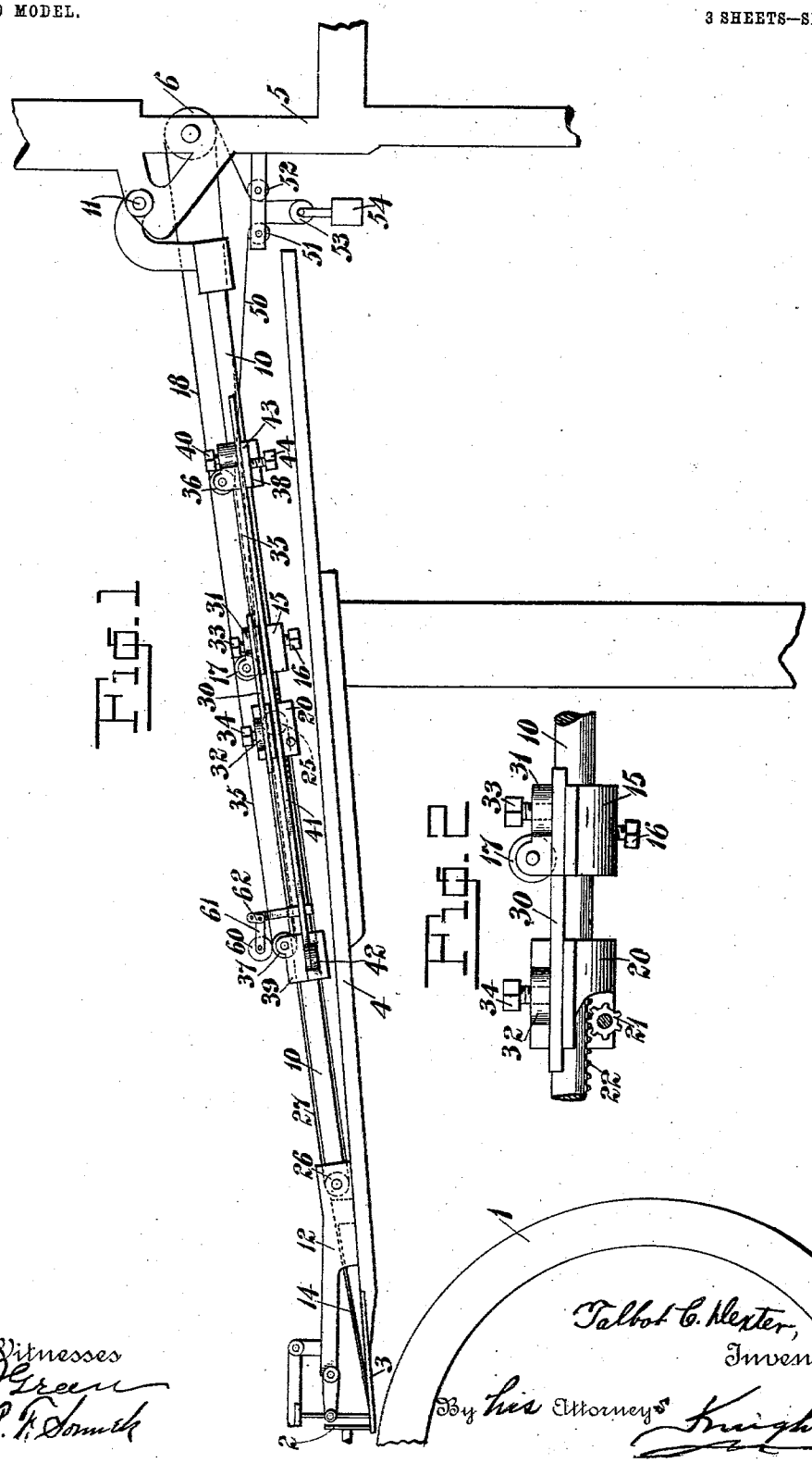

Fig. 1

Fig. 2

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By his Attorneys
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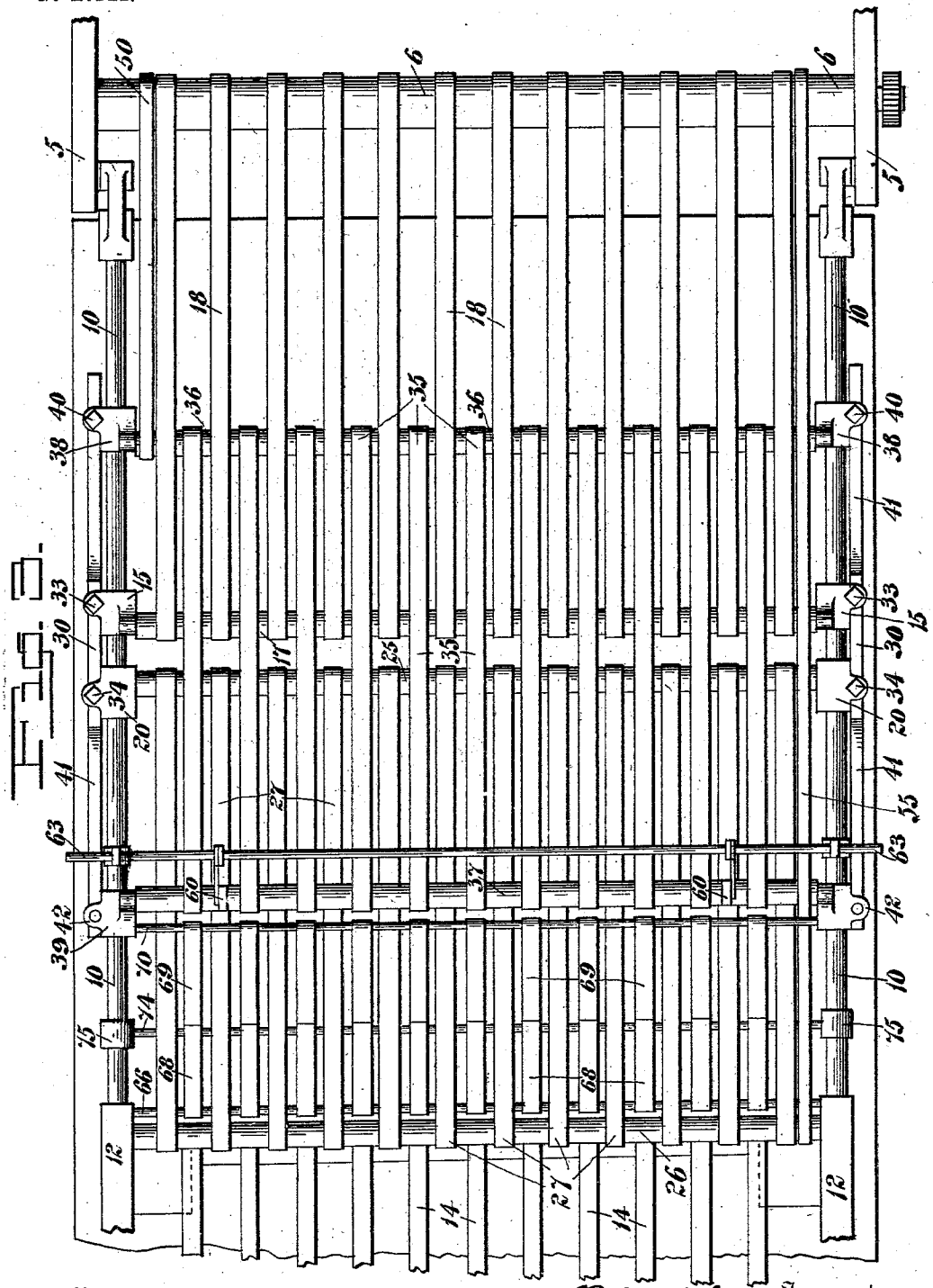
NO MODEL. 3 SHEETS—SHEET 2.



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NO MODEL. 3 SHEETS—SHEET 3.

Fig. 4.

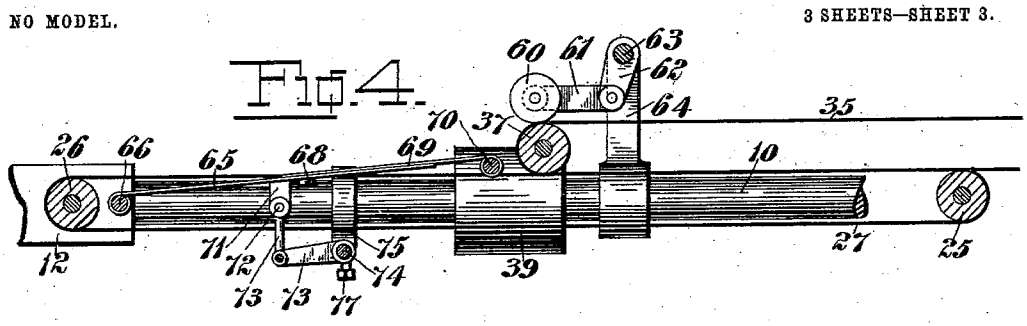


Fig. 5.

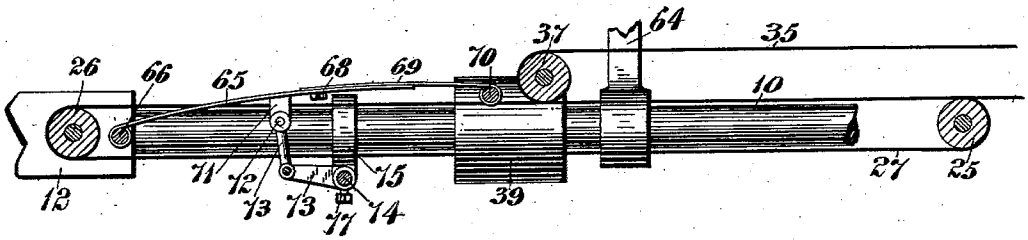
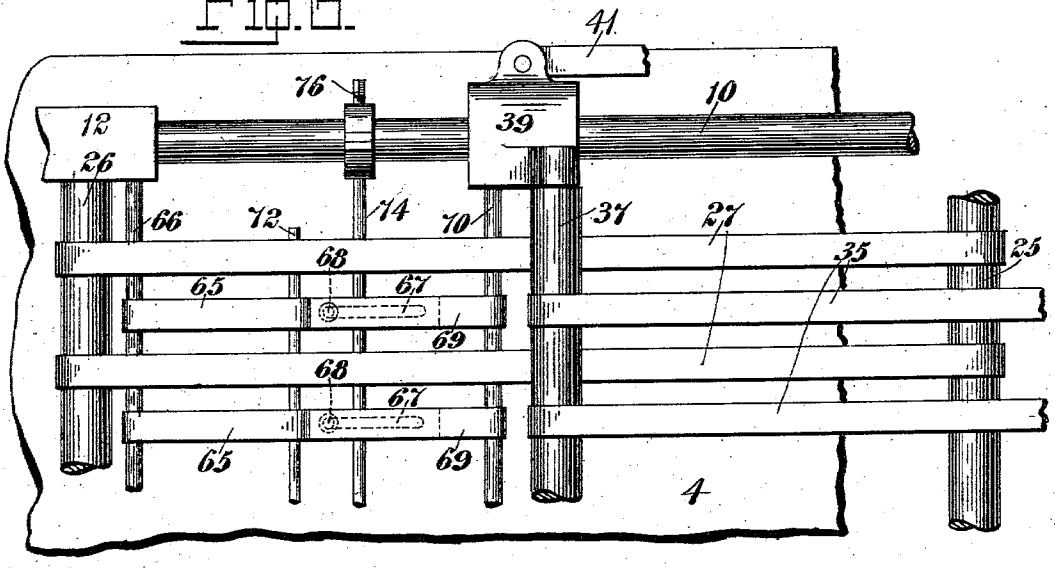


Fig. 6.



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Talbot C. Dexter,
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No. 752,380. Patented February 16, 1904.

UNITED STATES PATENT OFFICE.

TALBOT C. DEXTER, OF PEARL RIVER, NEW YORK.

SHEET-CONVEYING MACHINE.

SPECIFICATION forming part of Letters Patent No. 752,380, dated February 16, 1904.

Application filed October 25, 1902. Serial No. 128,711. (No model.)

To all whom it may concern:

Be it known that I, TALBOT C. DEXTER, a citizen 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 Sheet-Conveying Machines, of which the following is a specification.

The present invention relates to improvements in the sheet-feeding mechanism for conveying successive sheets of paper from an automatic paper-feeding machine to a printing-press, folding-machine, ruling-machine, or other machine designed to operate upon sheets of paper.

The object of my invention is to provide an improved construction of such sheet-conveying mechanism which can readily be adjusted to suit different sizes of sheets which are to be fed to the press or other machine and which has means for regulating the propelling force of the conveyer-tapes upon the sheet for carrying the successive sheets into registered position against the front guides of the press or other machine with just sufficient force to insure the proper registry of the sheets, so as to avoid the rebounding of the sheets from the front guides or the injury of the leading edge of the sheet. In accomplishing these objects I provide a plurality of sets of sheet-conveying tapes which are arranged to act upon the sheets successively in carrying them from the feeding-machine to the front guides of the press or other machine. One set of the conveying-tapes which receives the sheets from the feeding-machine is arranged above the plane of another set of conveying-tapes which delivers the sheets to the printing-press, and a third or intermediate set of conveying-tapes is arranged to operate in the plane of the receiving or feeding machine tapes and interlaps with said receiving-tapes and is adjustable in the plane of feed with relation to the delivery-tapes. These receiving and intermediate sets of tapes being in a higher plane than the delivery-tapes afford a drop from the delivery-roller of the intermediate tapes to the carrying portion of the delivery-tapes for the purpose of allowing each sheet to partially overlap the one which precedes it to facilitate rapid feeding. When a sheet is in registered position against the front gages, it rests upon the delivery-tapes with its rear edge a little in advance of the delivery-roller of the intermediate tapes. By adjusting the intermediate set of tapes in the plane of feed its delivery end is brought nearer to or farther away from the front gages of the press, and thereby enables the operator to expose a larger or smaller part of the delivery-tapes to accomdate the machine to any size of sheets.

To regulate the propelling force of the delivery set of tapes in moving the sheets into registered position against the front gages of the press, I provide a series of friction plates or bars, which are extensible in the direction of feed and are adjustable to cause them to project more or less above the surface of the carrying portion of the delivery-tapes to relieve the sheets of more or less of the propelling force of said tapes.

In order that my invention may be more fully understood, I will first describe the same with reference to the accompanying drawings and afterward point out the novelty more particularly in the annexed claims.

Figure 1 is a detail side elevation of my improved sheet feeding or conveying mechanism. Fig. 2 is a detail elevation, partly broken away, illustrating the means for adjusting the inner tape-rollers of the receiving and delivery sets of tapes. Fig. 3 is a plan view of my sheet-conveying mechanism. Figs. 4 and 5 are detail longitudinal sectional views illustrating the means for regulating the propelling force of the delivery-tapes upon the sheets. Fig. 6 is a detail plan view of the same.

1 represents the impression-cylinder, 2 the front gage, 3 an under guide, and 4 the feed-board, of a printing-press.

5 represents part of the frame of an automatic paper-feeding machine.

6 is the feeding-machine tape-roller, driven by a part of the feeding-machine in a manner well understood.

10 represents the side bars of the frame which supports the sheet-conveying mechanism which carries the successive sheets from the feeding-machine to the printing-press or other machine. These bars 10 are pivotally mounted upon the feeding-machine frame at 11

and carry upon their forward ends the side brackets 12, upon which are mounted the side-registering mechanism (not shown) and the press-controlling devices, which are partly indicated, but not described in detail, since they do not form any part of my present invention. These side brackets 12 rest upon the feed-board 4 and also carry the metal plates or bars 14, which form an incline leading from the delivery-tapes to the gage end of the feed-board.

15 indicates one of a pair of adjustable brackets or carriages which are mounted upon the side bars 10 and are provided with set-screws 16 for clamping them in the desired adjusted position upon the side bars. Freely journaled in these brackets or carriages 15 and extending from side to side of the machine is a tape-roller 17. The receiving conveyer-tapes 18 pass around the feeder tape-roller 6 and the inner adjustable tape-roller 17.

20 is one of another pair of brackets or carriages adjustably mounted upon the side bars 10 of the supporting-frame, said brackets or carriages 20 having rotatable pinions 21, which mesh with the rack-teeth 22, formed on the side bars 10. These brackets or carriages 20 have freely journaled in them and extending from side to side of the machine a tape-roller 25. A delivery-tape roller 26 is freely journaled in the brackets 12 and extends from side to side of the machine. The delivery conveyer-tapes 27 are supported upon the tape-rollers 25 and 26, the upper or carrying portion of the tapes 27 being arranged in a lower plane than the upper or carrying portion of the tapes 18 and the intermediate tapes presently to be described.

The adjustments of brackets or carriages 15 and 20 are for the purpose of maintaining taut the conveyer-tapes 18 and 27. In addition to these adjustments I prefer to provide connecting rods or bars 30, which rest in sockets 31 and 32 of the brackets or carriages 15 and 20 and are engaged by set-screws 33 and 34 upon said carriages. By means of these adjustable connections I securely lock the carriages 15 and 20 in the desired adjusted position and am enabled to more readily effect the tightening and loosening of the tapes 18 and 27.

An intermediate and adjustable set of conveyer-tapes is provided for transferring sheets from the receiving-tapes 18 to the delivery-tapes 27. These intermediate tapes 35 are supported upon tape-rollers 36 and 37, which are freely journaled, respectively, in adjustable brackets or carriages 38 39. These brackets or carriages 38 and 39 are mounted upon the side bars 10 of the conveyer-frame, the set-screws 40 being threaded into carriages 38 to engage the side bars 10 for holding said carriages in the desired adjusted position, and connecting-bars 41 being pivotally mounted upon ears 42 of carriages 39 and adjustably held in sockets 43 by set-screws 44 on carriages 38. By adjusting connecting-rods 41 the tape-rollers 36 and 37 can be moved toward or away from each other for tightening or loosening the intermediate tapes 35. By the adjusting-screw 40 both sets of carriages 38 and 39 can be adjusted upon the side bars for adjusting the intermediate tapes 35 in the plane of feed with relation to the delivery-tapes 27 and front gages of the press or other machine.

The tape-roller 36 is driven by a band or tape 50, passing around roller 36, roller 6, intermediate pulleys 51 52, and belt-tightening pulley 53, carrying the weight 54. The delivery-tapes 27 are driven by a band or tape 55, which passes from feed-machine roller 6 around the delivery-tape roller 26.

Friction-rollers 60, journaled in pivoted arms 61, mounted on rock-arm 62, extending from an adjustable rock-shaft 63, which is supported in bracket-arms 64, extending up from the side bars 10, are arranged above the delivery-tape roller 37 of the intermediate tapes to confine the sheets as they pass from the intermediate tapes to the delivery-tapes. By adjusting the shaft 63 the friction-rollers 60 may be moved forwardly or backwardly upon the tape-roller 37 to cause the leading edge of the sheets to be deflected more or less toward the delivery-tapes.

Supported between the individual tapes of the delivery-tape mechanism are the adjustable and extensible frictional plates or bars for regulating the propelling force of the delivery-tapes upon the sheets. These plates or bars are preferably made flat, of springy sheet metal, as shown, and to enable them to be extended or contracted in the direction of feed they are made in sections. Each frictional plate or bar consists of a plate-section 65, mounted at its end upon a rod 66, supported in the brackets 12 and formed with a longitudinal slot 67, in which engages a screw 68, threaded into the second plate-section 69, which is mounted at its end upon a rod 70, supported in the adjustable brackets or carriages 39 of the intermediate-tape mechanism. Depending from each plate-section 65 is a lug 71, in which is mounted a rod 72, connected through links 72^a with two or more rock-arms 73, mounted on a rock-shaft 74, journaled in brackets 75, supported on the side bars 10. This shaft 74 is adjusted in its supporting-brackets 75 in any suitable manner, so as to adjust the amount of projection of frictional plates 69 65 above the delivery-tapes 27. I have shown the shaft 74 with a squared end 76 for the engagement of a wrench and a set-screw 77, threaded into one of the brackets 75 and engaging the shaft 74, for holding it in the desired adjusted position.

Sheets fed from the feeding-machine are carried by the receiving-tapes 18 and deposited upon the intermediate tapes 35, which in

turn deposit them upon the delivery-tapes 27, which carry them forward into gaged position. The intermediate tapes 35 interlap or are telescoped with the receiving-tapes 18, so as to allow for the adjustment of the intermediate tapes with relation to the delivery-tapes. As the tape-roller 37 of the intermediate tapes is in a higher plane than the tape-rollers 25 and 26 of the delivery-tapes, it will be observed that there is a drop or depression between the intermediate tapes and the carrying portion of the delivery-tapes, so as to allow the leading edge of each sheet to pass freely over the rear edge of the sheet which has preceded it. This is for the purpose of allowing ample time for side registering the successive sheets and maintaining at the same time a rapid feed of sheets to the press.

By adjusting the frictional plates 65 69 with relation to the delivery-plates 27 the frictional hold of the delivery-tapes upon the sheets can be regulated to a nicety, so as to convey the sheets to the front gages with just sufficient force to insure proper registry and with not enough force to cause the rebounding of the sheet or the injury of its leading edge. It will be observed that the adjustment of the intermediate tapes in the direction of feed causes the frictional plates 65 69 to be extended or shortened to suit the adjusted position of the intermediate tapes, the connection between plate-sections 69 and the brackets or carriages 39 automatically effecting this adjustment.

For tightening or loosening the sheet-carrying tapes 18 and 27 the inner adjustable brackets or carriages 15 and 20 are adjusted in the following manner: If the tapes 18 need tightening or loosening, the set-screws 16 are loosened up and the pinion 21 operated for moving carriages 20 and connected carriages 15 in the desired direction. After the tapes 18 have been adjusted properly set-screws 16 are again screwed into engaging position, and the set-screws 33 or 34 are loosened to enable the pinions 21 to be again operated for placing the carriages 20 in the desired adjusted position for properly tightening or loosening the tapes 27. After this adjustment the set-screws 33 or 34 are again tightened.

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

1. In a sheet-conveyer, the combination of a set of delivery sheet-carrying tapes, with a second set of sheet-carrying tapes adapted to convey sheets to the delivery-tapes and arranged with its delivery end above the carrying portion of said delivery-tapes to afford a drop from said second set of tapes to the delivery-tapes, and means for adjusting said second set of tapes in the plane of feed with relation to the delivery-tapes, substantially as and for the purpose set forth.

2. In a sheet-conveyer, the combination of a delivery set of sheet-carrying tapes, and gages for registering sheets upon said delivery-tapes, with a second set of sheet-carrying tapes adapted to convey sheets to the delivery-tapes and arranged with its delivery end above the carrying portion of the delivery-tapes, and means for adjusting said second set of tapes toward and away from said gages, substantially as set forth.

3. The combination of the receiving sheet-carrying tapes, the delivery sheet-carrying tapes, the intermediate sheet-carrying tapes arranged to take sheets from the receiving-tapes and deposit them upon the delivery-tapes, said delivery-tapes being arranged in a lower feeding plane than the receiving and intermediate tapes for the purpose of affording a drop from the intermediate tapes to the delivery-tapes, and means for adjusting said intermediate tapes in the plane of feed with relation to the delivery-tapes for exposing more or less of the carrying portion of the latter, substantially as set forth.

4. The combination of the delivery sheet-carrying tapes, and their supporting-rollers, the receiving sheet-carrying tapes, and their supporting-rollers, the intermediate sheet-carrying tapes, and their supporting-rollers, the delivery-roller of the intermediate tapes being arranged above the carrying portion of the delivery-tapes to afford a drop from the intermediate tapes to the delivery-tapes, and means for adjusting said intermediate tapes in the plane of feed with relation to the delivery-tapes for exposing more or less of the carrying portion of the latter, substantially as and for the purpose set forth.

5. The combination of the delivery sheet-carrying tapes, the receiving sheet-carrying tapes, and intermediate sheet-carrying tapes, said receiving and intermediate tapes being interlapped with each other, and said delivery-tapes being in a lower feeding plane than the receiving and intermediate tapes, and overlapped by the intermediate tapes, and means for adjusting the intermediate tapes in the plane of feed with relation to the delivery-tapes, substantially as set forth.

6. The combination, with a machine designed to operate upon sheets of paper, and gages for registering the sheets fed to said machine, of a delivery set of sheet-carrying tapes arranged to convey sheets to said gages, a receiving set of sheet-carrying tapes, an intermediate set of sheet-carrying tapes interlapped with the receiving set of tapes and having its delivery end arranged above and overlapping the carrying portion of said delivery-tapes, and means for adjusting said intermediate tapes in the plane of feed toward and away from said gages for exposing more or less of the carrying portion of the delivery-tapes, substantially as and for the purpose set forth.

7. In a sheet-conveyer, the combination of

the delivery-tapes and their supporting-rollers, the receiving-tapes and their supporting-rollers, the supporting frame-bars 10, the adjustable brackets or carriages 15, 20, mounted upon said bars 10, and supporting the inner tape-rollers of the delivery or receiving tapes, connecting-rods 30 adjustably connecting the carriages 15 and 20, means for clamping carriages 15 upon bars 10, and means for moving the carriages 20 upon said bars 10, substantially as set forth.

8. In a sheet-conveyer, the combination of the delivery-tapes 27 supported by stationary tape-roller 26 and adjustable tape-roller 25, the receiving-tapes 18 supported by stationary roller 6 and adjustable roller 17, the supporting-bars 10, the brackets or carriages 20 adjustably mounted upon bars 10 and supporting the tape-roller 25, pinions 21 mounted in carriages 20 and engaging rack-teeth 22 upon bars 10, connecting-rods 30, set-screws 31 upon carriages 20 engaging connecting-bars 30, brackets or carriages 15 adjustably mounted upon the bars 10 and supporting the tape-roller 17, set-screws 16 securing carriages 15 in the desired adjusted position, and set-screws 33 upon carriages 15 engaging the connecting-rods 30, substantially as set forth.

9. In a sheet-conveyer, the combination of a set of sheet-carrying tapes, with extensible friction plates or bars arranged between said tapes and adapted to project above the carrying portion of said tapes, with adjustable carriages to which said extensible friction-plates are connected and by which they are adjusted, substantially as set forth.

10. In a sheet-conveyer, the combination of a set of sheet-carrying tapes, with extensible friction plates or bars arranged between said tapes, each friction plate or bar comprising a section 65 connected to a stationary part of the machine and formed with a longitudinal slot 67, and a section 69 carrying a screw 68 which operates in said slot 67, and an adjustable carriage to which said sections 69 are connected, substantially as set forth.

11. In a sheet-conveyer, the combination of a set of sheet-carrying tapes with extensible friction plates or bars formed of springy sheet metal and supported at their ends between the said tapes, and adjustable means connected with said friction plates or bars and adapted to project them more or less above the carrying portion of said tapes, substantially as set forth.

12. In a sheet-conveyer, the combination of a delivery set of sheet-carrying tapes, a second set of sheet-carrying tapes overlapping said delivery-tapes, and means for adjusting said second set of tapes in the plane of feed with relation to the delivery-tapes for exposing more or less of the carrying portion of said delivery-tapes, with friction plates or bars arranged between the delivery-tapes and projecting above the carrying portion of said tapes, substantially as set forth.

13. In a sheet-conveyer, the combination of a set of sheet-carrying tapes, with elastic friction plates or bars supported at their ends and adapted to be bowed upwardly between said tapes to project above the carrying portion of the tapes, substantially as set forth.

14. In a sheet-conveyer, the combination of a set of sheet-carrying tapes, with a series of elastic friction plates or bars arranged between the tapes and supported at their ends, and adjustable means engaging said friction-plates from beneath at points between their ends and adapted to bow said plates upwardly to cause them to project more or less above the carrying portion of said plates, substantially as set forth.

15. In a sheet-conveyer, the combination of a set of sheet-carrying tapes, with a series of friction plates or bars supported between said tapes at their ends, an adjustable shaft, means for securing said shaft in the desired adjusted position, and connections between said shaft and said friction plates or bars, whereby said plates or bars may be projected more or less above the carrying portion of said tapes, substantially as set forth.

16. The combination of a delivery set of sheet-carrying tapes and a second set of sheet-carrying tapes arranged to convey sheets to the delivery-tapes, with extensible friction plates or bars arranged between the delivery-tapes and adapted to project above the carrying portion of said tapes, with means for simultaneously adjusting said second set of tapes and extending or contracting said friction plates or bars, substantially as set forth.

17. The combination of a delivery set of carrying-tapes and their supporting tape-rollers, a second set of sheet-carrying tapes adapted to convey sheets to the delivery-tapes, tape-rollers supporting said second set of tapes, adjustable brackets or carriages supporting the tape-rollers of said second set of tapes whereby said second set of tapes may be adjusted with relation to the delivery-tapes for exposing more or less of the carrying portion of said delivery-tapes, and extensible friction plates or bars arranged between the delivery-tapes and connected at one end with a stationary part of the machine and at the opposite end with one of the adjustable carriages of said second set of tapes, substantially as and for the purpose set forth.

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Witnesses:
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