No. 759,211. PATENTED MAY 3, 1904.

T. C. DEXTER.

SHEET CONVEYING MACHINE.

APPLICATION FILED OCT. 25, 1902.

NO MODEL. 3 SHEETS—SHEET 1.

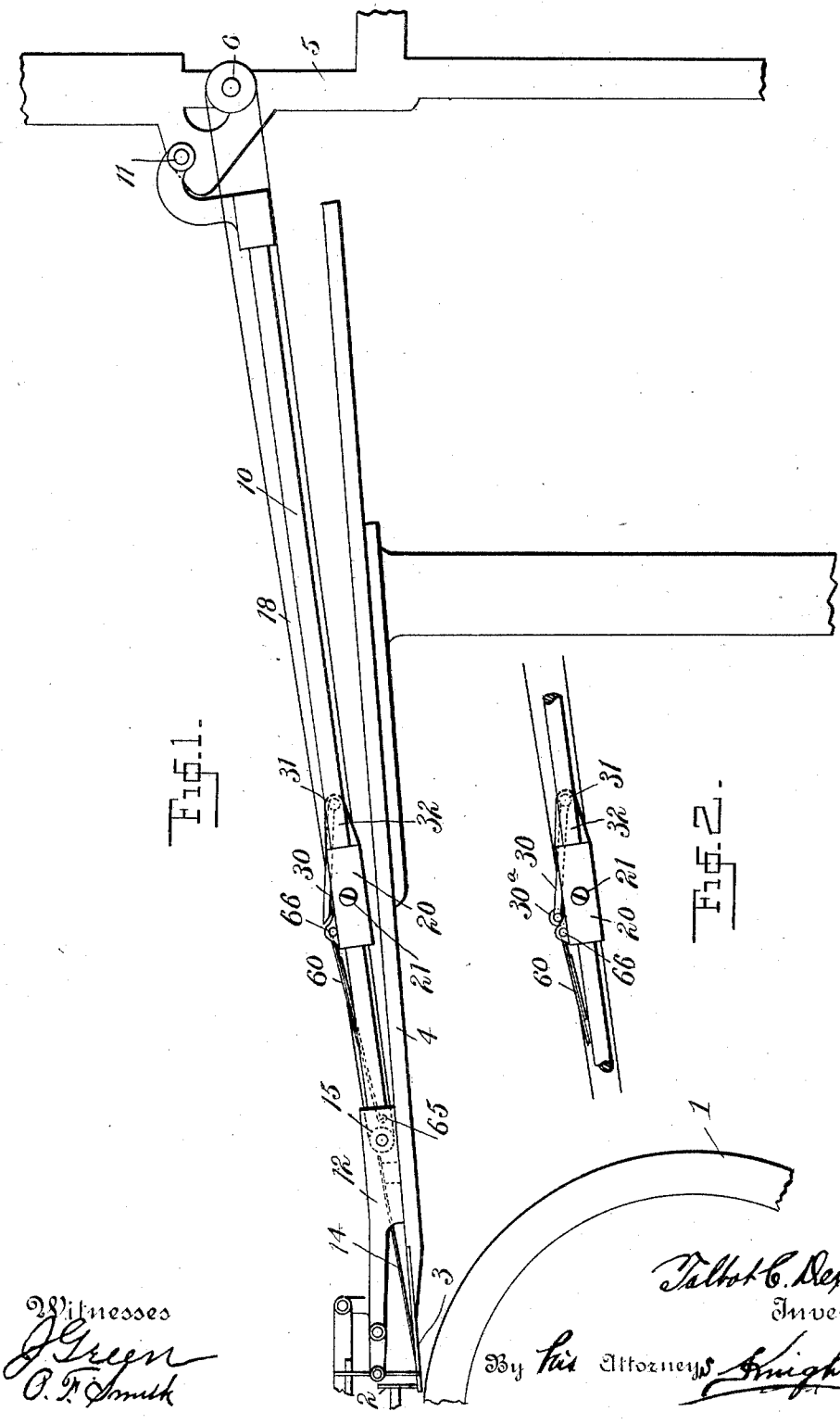


FIG. 1.




FIG. 2.

Witnesses
J. Green
C. F. Smith

Talbot C. Dexter
Inventor,
By his Attorneys Knight Bros.

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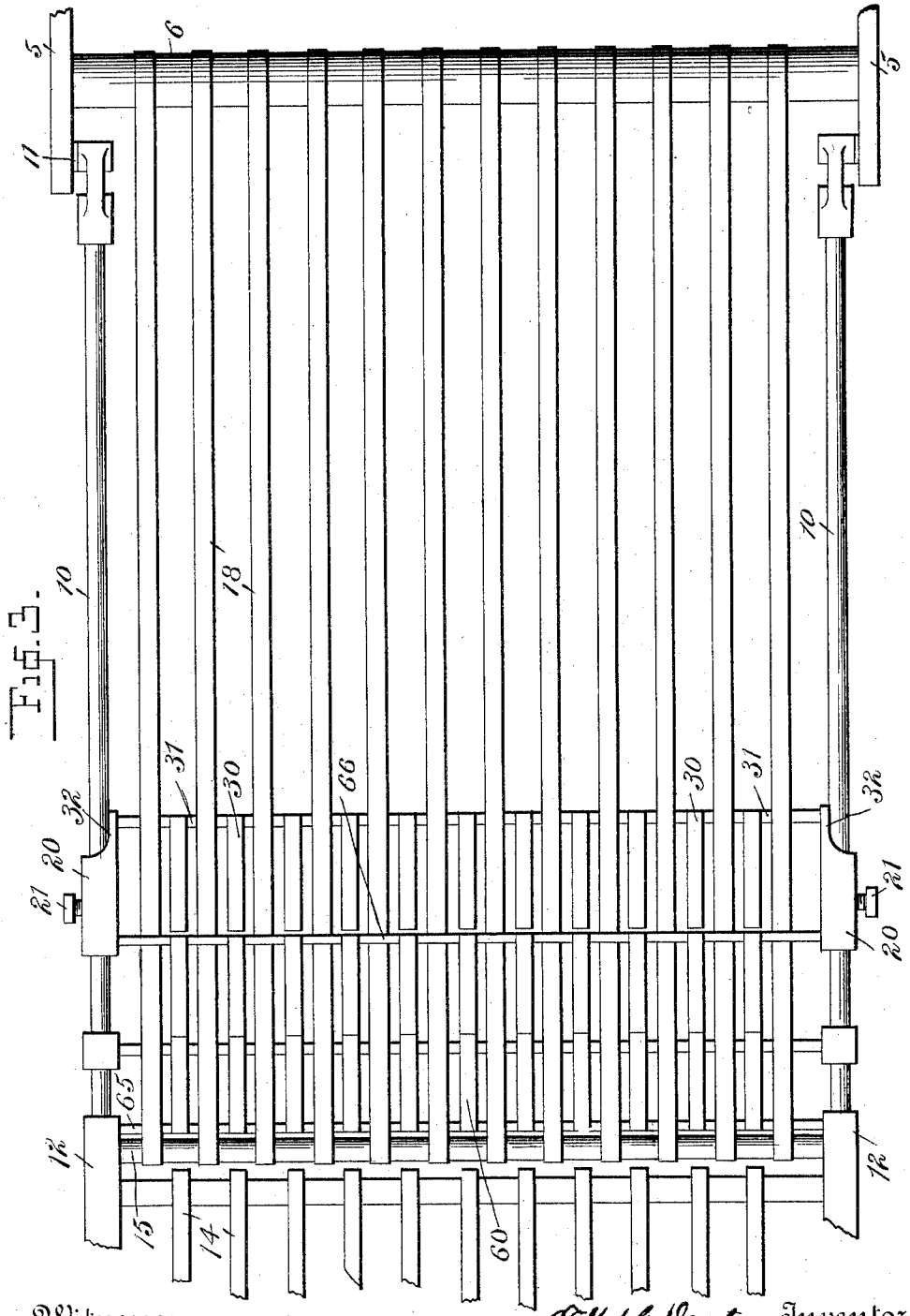
NO MODEL. 3 SHEETS—SHEET 2.

FIG. 3.




Witnesses
J. Greer
P. F. Smith

Talbot C. Dexter Inventor,
By his Attorneys Knight Bros.

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NO MODEL. 3 SHEETS—SHEET 3.

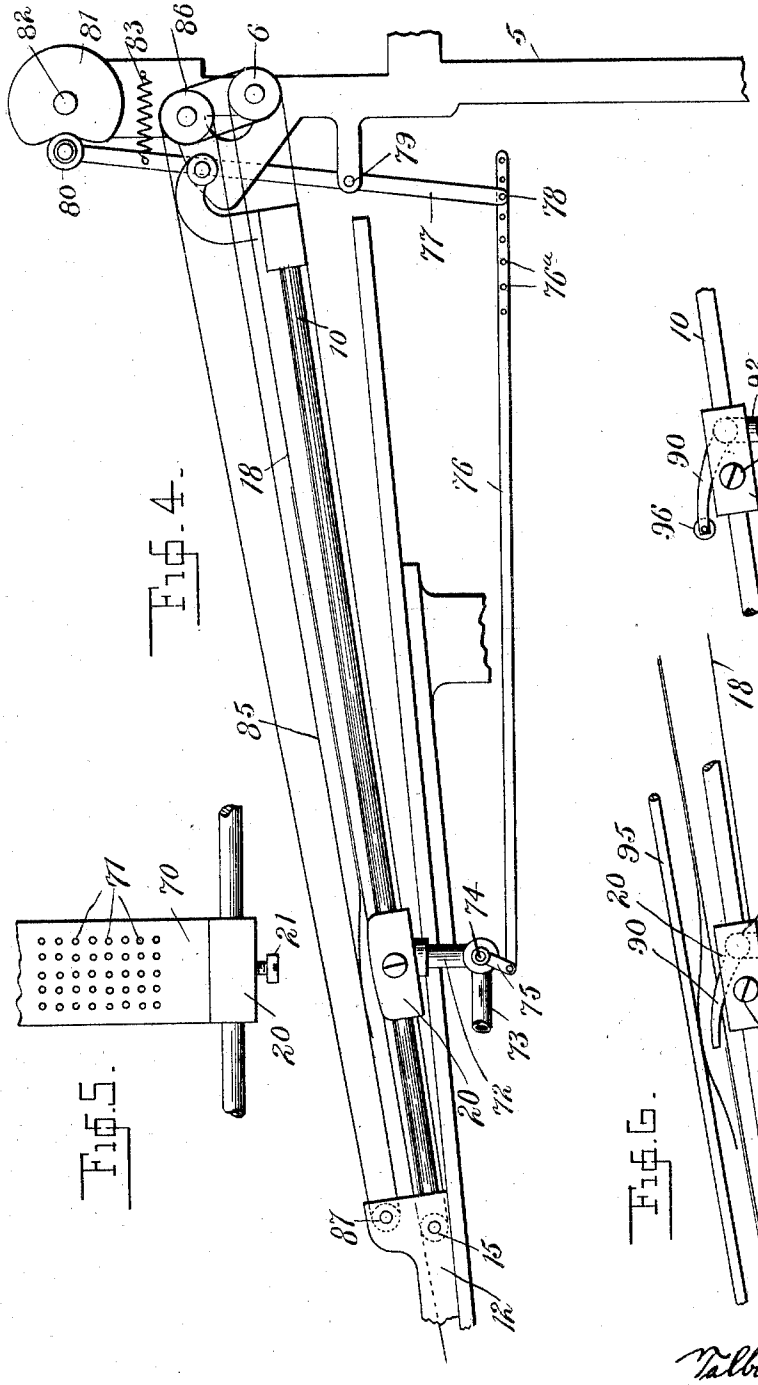


FIG. 4.




FIG. 5.




FIG. 7.




FIG. 6.

Witnesses
J. Green
O. F. Sonnek

Talbot C. Dexter
Inventor,
By his Attorneys Knight Bros

No. 759,211. Patented May 3, 1904.

# UNITED STATES PATENT OFFICE.

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

## SHEET-CONVEYING MACHINE.

SPECIFICATION forming part of Letters Patent No. 759,211, dated May 3, 1904.

Application filed October 25, 1902. Serial No. 128,714. (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 present invention is to produce a simple and effective sheet-conveying mechanism which can readily be adjusted to suit the different sizes of sheets which are to be fed to a printing-press or other machine.

To this end my invention consists of a series of sheet-carrying belts or tapes arranged to convey sheets from an automatic feeding-machine to the gage end of the feed-board of the printing-press or other machine and means adjustable toward and away from the gages for raising or deflecting upwardly the successive sheets on the tapes to cause them to overlap as they approach the registering-gages.

The sheet deflecting or raising means for overlapping the sheets may be variously constructed. I may employ pneumatic devices arranged beneath the carrying portion of the tapes with controlling devices for intermittently blowing air under the traveling sheets, or I may employ sheet-deflecting fingers which raise the sheets from the carrying-tapes and support the leading edge of the sheets sufficiently as they are moving forward to cause the leading edge of one sheet to overlap the rear edge of the preceding sheet, or I may employ a combination of the sheet-deflecting devices with pneumatic devices for accomplishing the desired result. The pneumatic devices are also important in affording a film of air between the overlapping portions of the sheets to facilitate the withdrawal of each sheet after it has been registered.

The sheet deflecting or raising devices are adjustable in the plane of feed toward and away from the registering-gages of the machine to which the sheets are to be fed. This is for the purpose of adapting the machine to feed different sizes of sheets.

In order that my invention may be 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.

In said drawings, Figure 1 is a detail side elevation of my improved sheet feeding or conveying mechanism. Fig. 2 is a detail side elevation of a slight modification of the same. Fig. 3 is a detail plan view of the mechanism shown in Fig. 1. Fig. 4 is a view similar to Fig. 1, showing a further modification of my invention. Fig. 5 is a detail plan view of the pneumatic sheet-elevating device shown in Fig. 4. Fig. 6 is a detail side elevation of another modification, embracing the sheet-deflecting fingers and air-blast devices. Fig. 7 is a detail side elevation of a further modification.

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 the delivery-tape roller suitably journaled in the side brackets 12, referred to.

18 indicates the parallel series of sheet-carrying tapes, which are supported upon the tape-rollers 6 and 15 and driven by the roller 6. These tapes 18 are supported with their upper carrying portion in a gradual incline from the delivery mechanism of the automatic feeding-machine to the gage end of the feed-board of the printing-press or other machine to which the sheets are to be fed.

20 is one of a pair of brackets or carriages which are mounted to slide upon the side bars 10 of the conveyer-frame. These brackets or carriages 20 are secured in the desired adjusted position upon the bars 10 by means of set-screws 21.

30 indicates a series of sheet-deflecting plates or fingers which are mounted at their rear ends upon a shaft or bar 31, which is supported in the rearwardly-projecting arms 32 of the brackets or carriages 20. These plates or fingers 30 extend from their supporting-bar 31, which is located beneath the carrying portion of the tapes 18 on an upward incline toward the delivery end of the tapes.

Supported between the individual tapes at their delivery ends are the adjustable and extensible frictional plates or bars 60 for regulating the propelling force of the tapes upon the sheets. These frictional plates or bars are constructed and arranged as set forth in my application filed of even date herewith, Serial No. 128,711. Each friction plate or bar consists of two telescoping plate-sections, the sections of which are connected, respectively, to the rods 65 and 66, mounted between brackets 12 and brackets 20, respectively. By adjusting the brackets or carriages 20 the plates or bars 60 will be extended or shortened, as the case may be, in the manner explained in my above-named application.

In the modified structure shown in Fig. 2 the sheet-deflecting fingers 30 carry in their upper ends the freely-journaled antifriction-rollers 30ª, which are for the purpose of lessening the friction of the sheets passing over the deflecting-fingers 30.

In Figs. 4 and 5 I have shown another modification of my invention in which the air-blast box or chamber 70 extends transversely of the machine beneath the upper carrying portion of the tapes 18 and is supported at its ends upon the adjustable brackets or carriages 20, which are mounted upon the supporting-bars 10. This air-blast box 70 is formed in its upper face with a series of minute air-holes 71, and the air-box is connected through a pipe 72 with an air-blast pipe 73, controlled by a cock or valve 74, connected through arms 75 and link 76 with a cam-operated lever 77. The lever 77 carries in its lower end a pin 78, which is adapted to be inserted in one of the series of perforations 76ª, formed in the rear end of the rod 76, for the purpose of adjusting the operation of the valve 74. The lever 77 is journaled to the feeding-machine frame at 79 and carries in its upper end an antifriction-roller 80, which operates in peripheral engagement with the rotary cam 81, mounted on one of the shafts of the feeding-machine, as indicated at 82. A spring 83 connects lever 77 with the feeding-machine frame for holding it in operative relation to the cam 81.

The air-blast pipe 73 is suitably connected with any suitable blower—such, for instance, as the blower which is commonly used on the feeding-machine for assisting in the separation of the sheets from the pile.

Since the upward blasts of air from the air-box 70 might have a tendency to elevate the passing sheets too much, I propose to provide an upper series of endless belts or tapes 85, carried upon the tape-rollers 86 and 87, journaled, respectively, in the feeding-machine frame and the brackets 12. These tapes 85 are driven from the tape-roller 6, and their lower effective portions extend parallel with the upper carrying portions of the tapes 18.

In Fig. 6 I have shown a further modification in which the brackets or carriages 20 support a series of hollow sheet-deflecting fingers 90, supported from a transverse pipe 91, which communicates through pipe 92 with the blower-pipe 93. A valve 94, designed to be operated in the same manner as just explained in connection with Figs. 4 and 5, is also provided to regulate the blasts of air through the fingers 90. These fingers 90 are inclined from their supporting-pipe 91 upwardly and rearwardly across the path of the sheet-carrying tapes 18 similar to the sheet-deflecting fingers illustrated in Figs. 1 and 2. For confining the sheets against too great a lift from the carriage-tapes I provide a series of parallel bars 95, arranged above the carrying portion of the tapes 18.

The form of device shown in Fig. 7 is the same as just described with reference to Fig. 6, excepting that the hollow sheet-deflecting blast-fingers 90 are provided in their ends with freely-journaled antifriction-rollers 96 to reduce the friction of the sheets in passing over the fingers.

Referring first to Figs. 1, 2, and 3, it will be observed that as each sheet moves toward the gages its leading edge will be deflected upwardly by coming in contact with the inclined fingers 30. The sheet will pass from the fingers 30 to the friction plates or bars 60 and will be led by them back to the delivery portion of the tapes 18, which insure the movement of the sheet into registered position. After one sheet is in registered position the next sheet which follows closely after it will have its leading edge raised sufficiently

above the rear edge of the sheet which is being registered to cause said leading edge to overlap the sheet which is being registered. In accomplishing this result it will of course be understood that the carriages 20, supporting the sheet-deflecting fingers 30, must be adjusted upon the supporting-bars 10 to allow sufficient space between the gages and the carriages 20, so as to insure the rear edge of the sheet which is being registered resting a little beyond the carriages.

In the form of the mechanism shown in Figs. 4 and 5 the controlling mechanism of the air-blast is so timed that the blast will operate intermittently just as the leading edge of each sheet is passing over the air-box 70. By this means the leading edge of each sheet is raised and supported sufficiently to insure its passing over the rear edge of the sheet which has preceded it.

In the forms shown in Figs. 6 and 7 the operation is practically the same as in the forms shown in Figs. 1, 2, and 3, excepting that the air-blasts are also provided for assisting in the overlapping of the sheets.

In the forms of the mechanism in which air-blasts are employed it will be observed that films of air will be injected between the overlapping portions of the sheet. This is important, since it facilitates the withdrawal of the sheets from registered position without interfering with the overlapping sheets.

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 sheet-carrying tapes, and suitable registering-gages, with means for deflecting or raising sheets from the tapes, adapted to thereby overlap the successive sheets, and means for adjusting said sheet-deflecting means parallel with the plane of feed toward and away from the registering-gages, substantially as set forth.

2. In a sheet-conveyer, the combination of sheet-carrying tapes, and sheet-registering gages, with sheet-deflecting plates or fingers supported in the path of the sheets and adapted to raise or deflect upwardly the sheets carried by the tapes and thereby overlap the successive sheets, and means for adjusting said sheet-deflecting plates or fingers toward and away from the registering-gages, substantially as set forth.

3. In a sheet-conveyer, the combination of sheet-carrying tapes, and sheet-registering gages, with inclined sheet-deflecting plates or fingers arranged between the receiving and delivery ends of said tapes to intersect the path of the carrying portion of the tapes and deflect sheets from the tapes, and frictional plates or bars arranged to lead sheets from said sheet-deflecting fingers to the delivery portion of said tapes, substantially as set forth.

4. In a sheet-conveyer, the combination of a supporting-frame, the tape-rollers, sheet-carrying tapes mounted upon said tape-rollers, an adjustable carriage mounted upon said frame between the tape-rollers, a series of sheet-deflecting fingers supported upon said carriage beneath the carrying portion of said tapes and inclined upwardly to intersect the path of the sheets and thereby overlap the successive sheets upon the carrying portion of the tapes adjacent to the delivery end, and registering-gages, substantially as set forth.

5. In a sheet-conveyer, the combination of a suitable supporting-frame, the tape-rollers journaled in said frame, the sheet-carrying tapes mounted upon said tape-rollers, an adjustable carriage mounted upon said frame between the tape-rollers, a transversely-arranged series of sheet-deflecting plates or fingers supported upon said carriage beneath the carrying portion of said tapes, and inclined upwardly to intersect the path of the sheets upon said tapes, extensible friction plates or bars connected with said carriage and with a stationary part of the supporting-frame, said frictional bars being arranged to intersect the path of the delivery portion of said tapes for returning sheets from the sheet-deflecting fingers to the tapes, and sheet-registering gages, substantially as set forth.

6. In a sheet-conveyer, the combination of sheet-carrying tapes, with air-blast devices supported adjacent to the carrying portion of said tapes, and adapted to raise the leading edge of the successive sheets from the tapes to thereby overlap the successive sheets upon the conveyer, and means supported above the conveyer for confining the upward movements of the sheets under the action of the air-blast devices, substantially as set forth.

7. In a sheet-conveyer, the combination of sheet-carrying tapes, with air-blast devices supported adjacent to the carrying portion of said tapes and adapted to raise the leading edge of the successive sheets from the tapes and thereby overlap the successive sheets upon the conveyer, and a series of sheet-confining surfaces arranged above and parallel with the carrying portion of said tapes for limiting the upward movement of the sheets under the action of the air-blast devices, substantially as set forth.

8. In a sheet-conveyer, the combination of sheet-carrying tapes, with air-blast devices supported adjacent to the carrying portion of said tapes and adapted to raise the leading edge of the successive sheets from the tapes to thereby overlap the successive sheets upon the conveyer, and a series of traveling sheet-confining tapes supported above and parallel with the carrying portion of the conveyer-tapes for limiting the upward movement of the sheets under the action of the air-blast devices, the lower or sheet-confining portion of said sheet-

confining tapes traveling in the same direction as the carrying portion of said conveyer-tapes, substantially as set forth.

9. In a sheet-conveyer, the combination of sheet-carrying tapes, with a series of hollow sheet-deflecting fingers supported adjacent, to the carrying portion of said tapes in position to intersect the path of the sheets so as to raise or deflect the successive sheets from the conveyer-tapes, and means for blowing air through said hollow deflecting-fingers for supporting the raised edge of the sheets to cause the sheets to be overlapped upon the conveyer, substantially as set forth.

10. In a sheet-conveyer, the combination of sheet-carrying tapes, with pneumatic means supported adjacent to the carrying portion of said tapes and adapted to raise the leading edge of the successive sheets from the tapes and thereby overlap the successive sheets upon the conveyer, gages for registering the successive sheets upon the conveyer, and means for adjusting said pneumatic means toward and away from said gages, substantially as set forth.

TALBOT C. DEXTER.

Witnesses:
J. GREEN,
WM. E. KNIGHT.