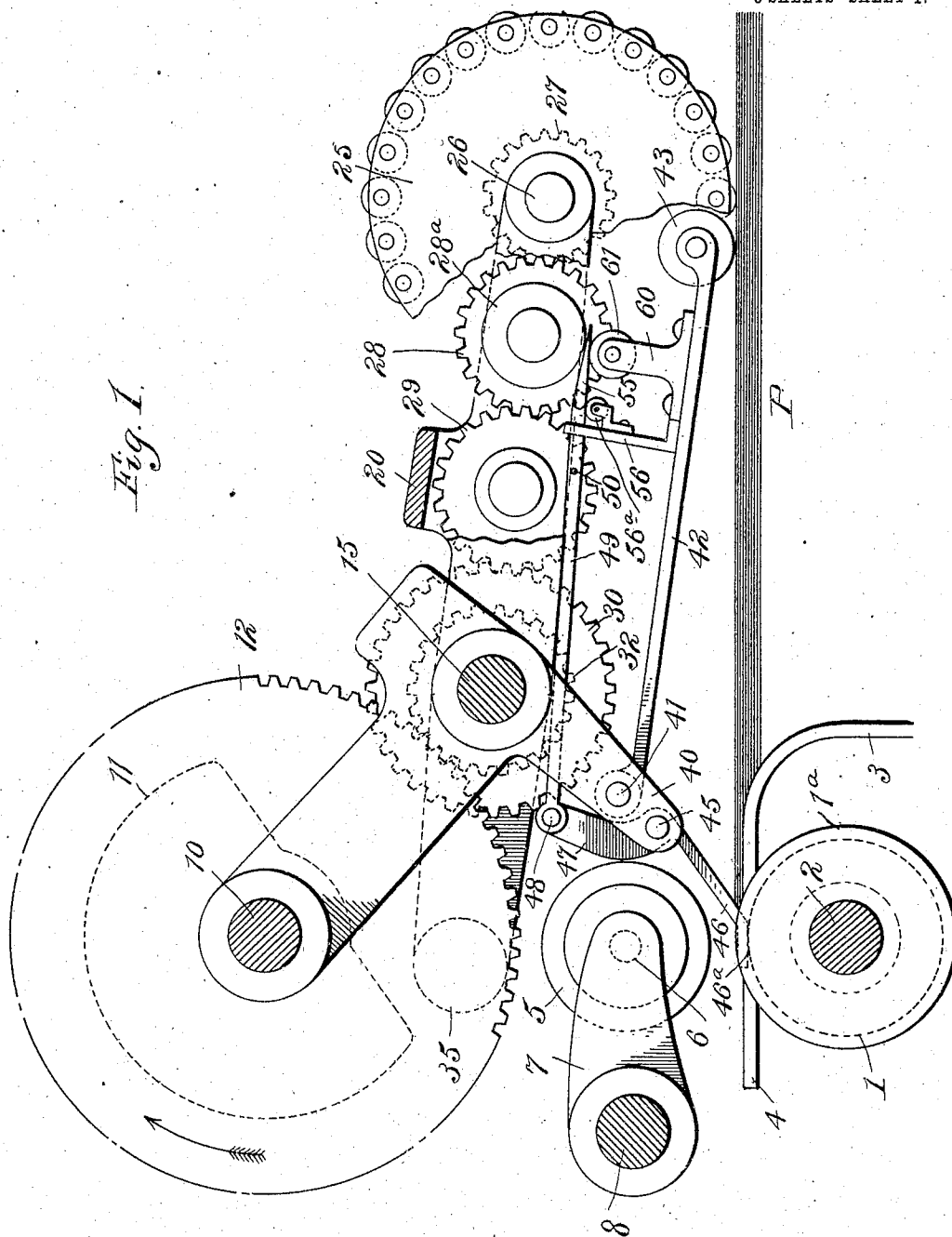


No. 790,681.

PATENTED MAY 23, 1905.

T. C. DEXTER.
PAPER FEEDING MACHINE.
APPLICATION FILED APR. 1, 1904.

3 SHEETS—SHEET 1.



Witnesses
A. F. Lamm
L. Hyman.

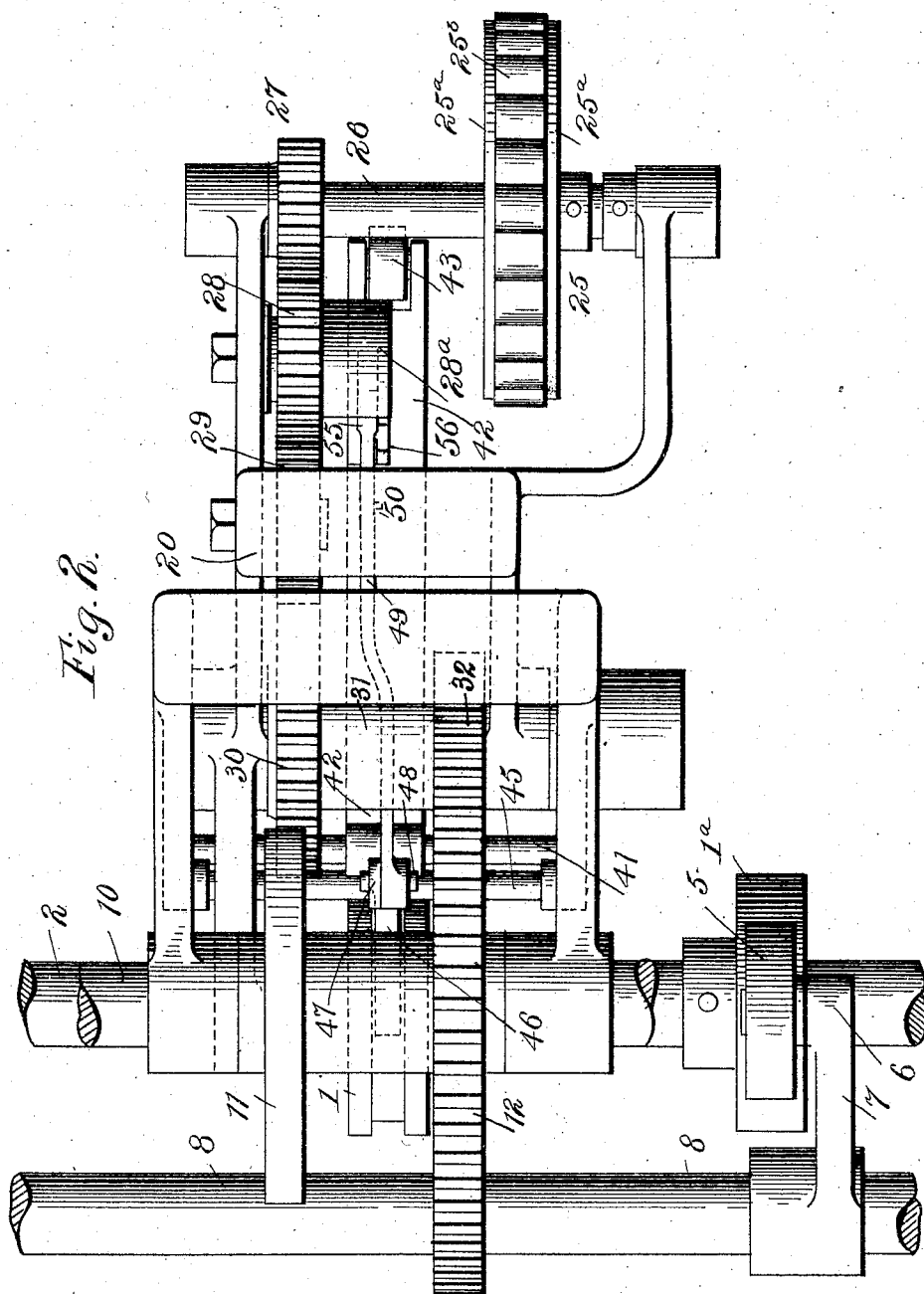
Talbot C. Dexter Inventor,
By his Attorneys Wright & Ross

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3 SHEETS—SHEET 2.

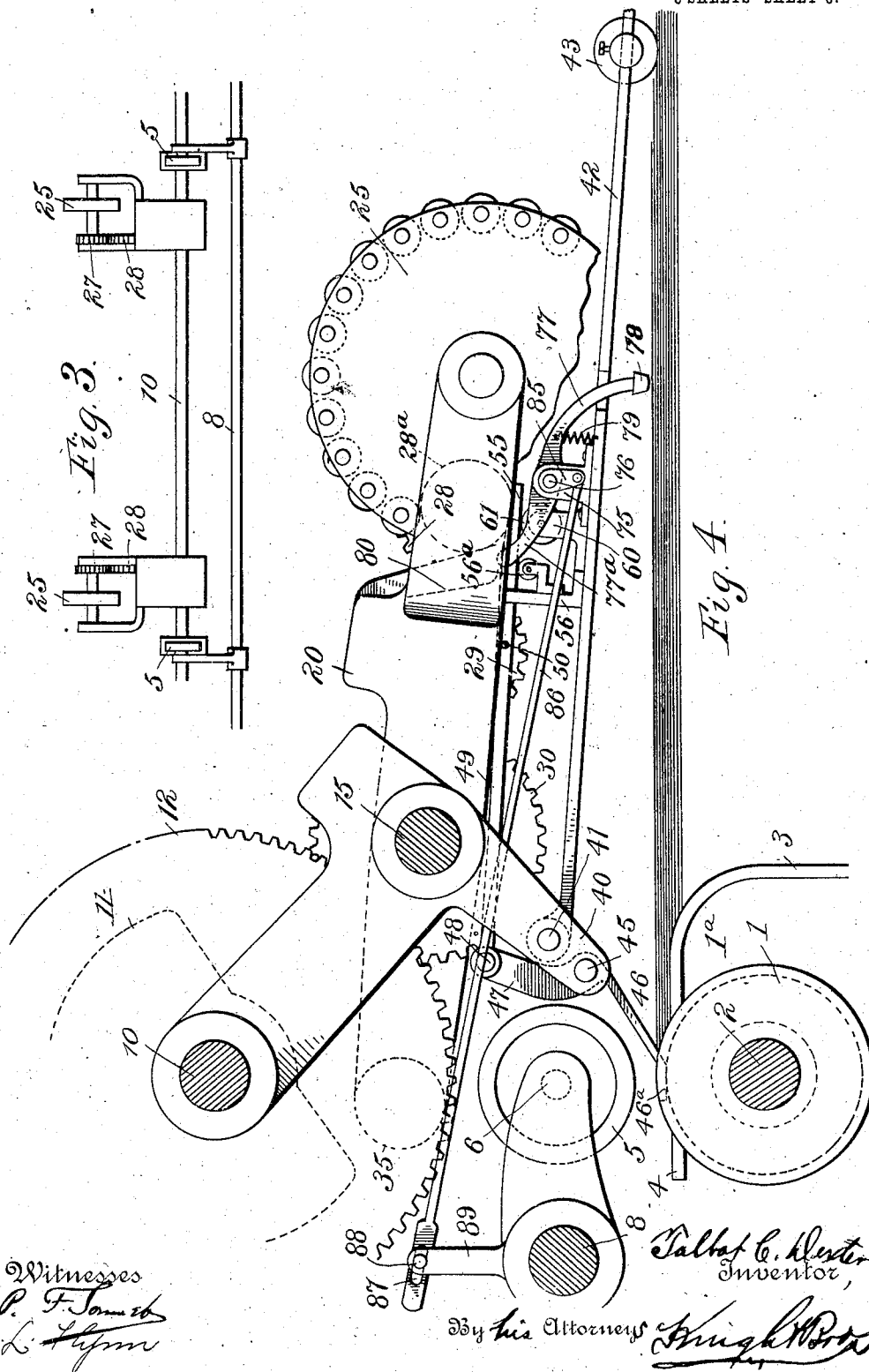


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3 SHEETS—SHEET 3.



UNITED STATES PATENT OFFICE.

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

PAPER-FEEDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 790,681, dated May 23, 1905.

Application filed April 1, 1904. Serial No. 201,095.

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 Paper-Feeding Machines, of which the following is a specification.

The present invention relates to improvements in paper-feeding machines, and particularly to feeding-machines of the combing type in which the upper sheets of an adjustably-supported pile are combed forwardly upon the pile and partially separated from each other and presented successively to suitable delivering mechanism—such, for instance, as the common form of drop-roller mechanism.

The main feature of novelty in the present invention consists of the means controlled by the successive sheets of paper combed from the pile for automatically and independently raising the two sets of combing feeding devices from the pile as the forward edge of each sheet in front of each combing device reaches proper position for the operation of the sheet-delivery mechanism. This improved sheet-actuated controlling means for elevating the combing devices from the pile to automatically arrest their operation comprises, essentially, two independent sheet-actuated tripping-fingers suspended in the path of the sheets, one in front of each combing device, and suitable wedging means connected with each independent tripping-finger in such manner that when one of the tripping-fingers is actuated by the sheet the connected wedging means of that tripping-finger will be actuated for raising from the pile the combing device in rear of the tripping-finger which was actuated. Each one of the combing-controlling mechanisms is independently operated, so that the two combing devices will be independently thrown out of operation, with the result that the sheet will be squared upon the pile just prior to the operation of the sheet-delivery mechanism. More specifically, this improved sheet-actuated controlling mechanism consists of two pivotally-mounted tripping-fingers and two longitudinally-movable wedges or tapered blocks, each one of which is connected with one of the tripping-fingers and is so supported

with relation to a rotating part of the sheet-combing device and a part of its support which is fulcrumed upon the pile of sheets that the movement of the tripping-finger will project the contracted end of the wedge or tapered block between the said support and the rotating part of the comb, causing the rotating part of the comb to frictionally engage the wedge or tapered block and compel it to quickly complete its longitudinal movement for wedging the rotating part of the combing device away from the support, to thereby raise the combing-wheel from the top of the pile of sheets. The fulcrum-supports for the longitudinally-movable wedges consist, preferably, of pivotally-mounted bars having anti-friction-rollers in their rear ends which rest upon the top of the pile of sheets adjacent to the sheet-combing wheels, each of these fulcrum-supports being adapted to form a pivot around which the sheet may be shifted in the straightening or squaring operation, the fulcrum-support acting in this manner after the combing device adjacent to it has been thrown out of action and while the other combing device continues to act to straighten the sheet.

The invention includes other features of novelty in addition to the above-recited main features, all of which will first be described with reference to the accompanying drawings, and afterward pointed out more particularly with reference to novelty in the annexed claims.

In said drawings, Figure 1 is a detail side elevation of part of a combing feeding machine, parts being broken away and parts in section for clearness. Fig. 2 is a plan view of one of the improved combing devices shown in Fig. 1. Fig. 3 is a diagrammatic plan view illustrating the arrangement of the two combing devices transversely of the pile of sheets. Fig. 4 is a view similar to Fig. 1, showing a slight modification or extension of the invention.

P represents the top of a pile of sheets which is intended to be supported upon an automatically-adjustable table or platform (not shown) by which the top of the pile is maintained at a normal feeding elevation.

1 is one of a pair of circumferentially-

grooved under feed-rollers, and 1^a one of a series of plain under feed-rollers, all of which rollers 1 1^a are keyed to a constantly-rotating shaft 2, suitably journaled in the machine-frame, so as to support the rotating peripheries of the under feed-rollers 1 1^a directly beneath the plane of feed of the sheets. This shaft 2, carrying under feed-rollers 1 1^a, is located at the forward end of the machine directly in front of the vertical guide-bars 3, which have the horizontal extensions 4, projecting parallel with the plane of feed and slightly beneath the upper portions of the feed-rollers 1 1^a.

5 is one of a pair of drop-rollers having soft-rubber peripheries and journaled at 6 in the free ends of rock-arms 7, keyed to a transverse rock-shaft 8, which is provided with suitable means for rocking it once for every revolution of the machine for dropping rollers 5 into peripheral engagement with the plain under feed-rollers 1^a.

10 is the main cam-shaft of the machine, suitably journaled in the side frames. (Not shown.) The shaft 10 carries a pair of approximately semicircular cams 11, one for each combing device, as hereinafter explained, and a pair of large gear-wheels 12, one of which is also for each of the combing devices.

15 is a rigid transverse shaft suitably supported in the side frames of the machine, and 20 is one of a pair of comber-supporting frames freely journaled upon the shaft 15 and carrying at its rear free end the freely-journaled combing-wheel 25, which is mounted upon the short shaft 26, journaled in the frame 20.

Each of the pair of combing-wheels 25 is constructed in the usual manner of two plates or disks 25^a, between which are freely journaled a series of small rollers 25^b, whose peripheries project a little beyond the peripheries of the disks 25^a, so that they may be brought into working contact with the top of the pile of sheets for combing the sheets forwardly in the usual manner.

Each of the short comber-shafts 26 has keyed to it a small gear-wheel 27, which meshes with the first gear 28 of a train of gears 28, 29, and 30, all of which are freely journaled upon the pivotally-mounted comber-supporting frame 20.

The gear 30 is rigidly connected, through a suitable sleeve 31, with a smaller gear 32, said connected gears being freely journaled upon the transverse shaft 15 and said gear 32 meshing with a large gear 12 on cam-shaft 10, so that the rotation of shaft 10 will be transmitted to the combing-wheel.

The forward end of each comber-supporting frame 20 is extended beyond the shaft 15 and carries in its forward end a freely-journaled antifriction-roller 35, which is adapted to operate upon the periphery of one of the cams 11. By the rotation of cams 11 the comber-frames 20 are intermittently rocked

upon their supporting-shaft 15 for periodically raising and lowering the combing-wheels with reference to the top of the pile of sheets. This raising and lowering of the combing-wheels by cams 11 is timed with relation to the operation of the drop-roller delivery mechanism above referred to, it taking place after the automatic control of the combers in the manner which will now be explained. Depending from the shaft 15 is a pair of brackets 40. Journaled at 41 upon each of these brackets 40 is a rearwardly-extending arm 42, carrying in its rear free end a freely-journaled roller 43. The arm or bar 42 and roller 43 constitute one of the fulcrum-supports upon which is mounted the comber-elevating wedge.

Freely journaled at 45 upon each of the brackets 40 is a tripping-finger 46, which projects downwardly from the bracket and rests with its forwardly-projecting horizontal portion 46^a in the peripheral groove of one of the under feed-rollers 1. The tripping-fingers are supported in the path of the sheets, so as to be raised by each successive sheet that is combed forwardly into proper position for the operation of the drop-roller delivery mechanism. Each tripping-finger 46 has an upwardly-projecting finger 47, to the upper end of which is freely pivoted at 48 a rod 49, which extends rearwardly therefrom and has formed on its rear end a wedge or tapered block 55. This wedge or tapered block 55 rests freely upon an antifriction-roller 56^a, journaled upon a bracket 56, mounted upon and projecting up from the fulcrum arm or support 42. The fulcrum arm or support 42 also carries a bracket 60, in which is freely journaled an antifriction-roller 61, supported by its bracket directly beneath the rotating hub portion 28^a of the gear 28, said hub portion 28^a and the roller 61 being in the same vertical plane.

The roller 56^a supports the wedge or tapered block 55 with its contracted rear end adjacent to the peripheries of roller 61 and hub portion 28^a and normally out of contact with said parts, so that when one of the tripping-fingers 46 is actuated the wedge or tapered block 55 will be thrust rearwardly to a sufficient extent to cause the rotating hub portion 28^a to frictionally engage said wedge or tapered block and forcibly draw the wedge or block rearwardly to the extent of its rearward movement, which is limited by the laterally-projecting pin 50 engaging an upward extension of the bracket 56. This forcing of the wedge or tapered block 55 between the roller 61 and hub portion 28^a will raise the rear end of the comber-supporting frame 20 upon its shaft 15, and thereby lift the combing-wheel 25 away from the top of the pile of sheets and cause the arrest of its combing action, although the combing-wheel will continue to rotate through the gearing described.

In fact, the combing-wheels 25 in the improved machine are constantly rotated whether in engagement with or elevated from the pile of sheets.

5 In this type of machine it is common to employ two sets of combing devices arranged at equal distances from the side edges of the pile of sheets and operating in parallelism. It is also common with this type of machine
10 to utilize the automatic control of the combing devices for straightening or squaring the successive sheets upon the pile. In the present case each of the fulcrum-supports 43 serves as a pivot around which the sheet may be
15 straightened when one of the combing-wheels is thrown out of operation in advance of the other.

In Fig. 4 I have shown a slight modification or extension of the invention in which the
20 main parts of the machine are the same as above described. The only difference of importance in this extension of the machine is the provision of fulcrum-points around which the sheets may be straightened, which are automatically moved away from the top of the
25 pile of the sheets when the combing devices are lowered into engagement and again when the delivery mechanism operates. The advantage of such an arrangement is that the fulcrum-supports are removed from the top
30 sheet of the pile when the combers and delivery mechanism operate so that the sheet has nothing in engagement with it to resist its movement.

35 Referring now particularly to Fig. 4, it will be observed that the supporting-arm 42 (shown in Fig. 1) is extended so that the fulcrum-roller 43 will rest upon the rear edges of the under sheets—that is, sheets three or four
40 beneath the top. Mounted upon the fulcrum-arm 42 is a bracket 75, in which is journaled a short rock-shaft 76, carrying a curved fulcrum-arm 77, having a pile-engaging end 78, which is adapted to engage the top of the pile
45 of sheets directly beneath the journal of the combing-wheel 25. A small spring 79 connects the fulcrum-arm 77 with the arm 42 for giving arm 77 a normal spring tendency for moving into engagement with the pile of
50 sheets. The forward end 77^a of the curved fulcrum-arm 77 projects beneath a bracket portion 80 of the comber-frame 20, so that when the comber is lowered into engagement with the pile of sheets the bracket-arm 80
55 will engage the forward portion 77^a of fulcrum-arm 77 and automatically raise the sheet-engaging head 78 away from the pile of sheets, so that the comber will have perfect freedom in feeding forward the sheets. When the
60 comber-frame is raised, either automatically by the control of the sheet, as above described, or by the action of one of the cams 11, as also described, the bracket-arm 80 will be moved away from the end 77^a of fulcrum-arm 77 and
65 allow the spring 79 to again throw the head

78 into engagement with the top of the pile of sheets. To again relieve the sheet from engagement of the fulcrum-arm 77 when the delivery mechanism operates, a short rock-arm 85 depends from the rock-shaft 76 and
70 is pivoted at its lower end to a forwardly-extending rod 86, which is formed with a slotted forward end 87, in the slot of which engages a pin 88, projecting from an arm or lug 89,
75 secured to the drop-roller rock-shaft 8. It will be observed from this construction that when the drop-rollers 5 are dropped into operative engagement with the under feed-rollers 1^a the pin 88 will engage the rear end of slot 87 of rod 86 and force the rod 86 rear-
80 wardly, causing the rocking of arm 85 and shaft 76 and the elevation of head 78 from the pile of sheets. The sheet is thereby freed from the fulcrum-arms 77, so that the delivery mechanism can operate without obstruc-
85 tion.

The operation of the machine may be briefly described as follows: The controlling-cams 11 are correspondingly mounted upon the cam-shaft 10, so that they will operate simultane-
90 ously upon the antifriction-rolls 35 for simultaneously raising and lowering the comber-supporting frames. These cams 11 are so placed upon their shaft that they will raise
95 the combing-wheels from the pile of sheets once for every revolution just prior to the moment when the drop-rollers are lowered into engagement with the under feed-rolls. As stated above, the combing-wheels 25 are
100 constantly rotated. When the low parts of cams 11 reach the antifriction-rolls 35 upon the forward part of frames 20, the rotating comber-wheels will be lowered into engagement with the top sheet of the pile and im-
105 mediately start the combing operation. If both combing-wheels act equally upon the sheets, the forward edge of the top sheet will actuate both tripping-fingers 46 at the same time, so that through the action of the wedg-
110 ing means described both combing-wheels will be simultaneously raised from the pile to arrest the combing action and hold them in raised position until the high portions of cams 11 reach the antifriction-rolls 35, when the
115 comber-supporting frames will be raised a trifle more for the purpose of relieving the wedges 55 from the grip of antifriction-rolls 61 and hub portions 28^a and allowing the gravity of tripping-fingers 42 to partially withdraw the wedges 55, the tripping-fingers
120 resting upon the sheet which has been fed forward into position. Immediately following the elevation of the combing-wheels by the action of cams 11 the drop-rollers 5 are lowered into engagement with the sheet above
125 the under feed-rolls 1^a, causing the sheet to be rapidly fed from the pile. As soon as the rear edge of the sheet passes the tripping-fingers 46 said tripping-fingers will drop to their
130 normal lowered position into the grooves of

under feed-rollers 1 and by this return movement will completely withdraw the wedges 55 to their forward inactive position out of engagement with rolls 61 and hub portions 28^a.

5 Immediately following this action the low parts of cams 11 again arrive at the antifric-tion-rolls 35, and the rotating combing-wheels are again dropped into engagement with the top sheet of the pile for repeating the operation just described. In case the top sheet of the pile is combed unevenly by the two combing-wheels or is for any other reason out of alinement with the pile, so that its forward edge moves forwardly at an angle to the front edge of the pile, the part of the edge of the sheet in front of one of the combing-wheels will reach and actuate one of the tripping-fingers before the part of the edge of the sheet in front of the other combing-wheel actuates the other tripping-finger. In this case the combing-wheels will be automatically raised successively—that is to say, the combing-wheel in line with the portion of the front edge of the sheet which first reaches position will first be raised, and the other combing-wheel in rear of the portion of the front edge of the sheet which is out of alinement will continue to operate so as to shift and straighten the sheet around the fulcrum-roll 43 adjacent to the combing-wheel which was first raised. After this automatic and successive elevation of the combing-wheels from the pile of sheets the cams 11 come into operation in the same manner as above described.

35 I desire to claim, broadly, a machine of the character described in which a constantly-rotating feeding instrument is automatically raised away from the pile of sheets by wedging means operated by a sheet-controlled tripping device.

40 While I have shown and described my invention as applied to a combing feeding-machine, I would have it understood that I do not limit myself to the combing feeding instrument, but consider my invention of sufficiently broad scope to include any form of rotating feeding instrument which is controlled in the manner set forth.

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

1. The combination of a support for a pile of sheets, a supporting-frame movable toward and away from the pile of sheets, and rotatable sheet-moving means mounted upon said supporting-frame, with a sheet-controlled tapered block or wedge constructed and arranged to engage the supporting-frame and raise the sheet-moving means into inactive position, substantially as set forth.

2. The combination of a support for a pile of sheets, a pivotally-mounted supporting-frame carrying a rotatable sheet-feeding device, with a sheet-controlled wedge adapted to be shifted into engagement with a rotating

part upon said supporting-frame and move said supporting-frame upon its pivot away from the pile for shifting the sheet-feeding device into inactive position, substantially as set forth.

3. The combination of a pivotally-supported frame, and sheet-moving means carried thereby, with a fulcrum-support, and sheet-controlled wedging means mounted upon said fulcrum-support and constructed and arranged to engage a part upon the supporting-frame for shifting the sheet-moving means into inactive position, substantially as set forth.

4. The combination of a support for a pile of sheets, a supporting-frame movable toward and away from the pile, and sheet-moving means carried by the supporting-frame, with a fulcrum-support engaging the pile, and sheet-controlled wedging means mounted upon said fulcrum-support and constructed and arranged to engage a part upon the supporting-frame for raising the sheet-moving means into inactive position, substantially as set forth.

5. The combination of a support for a pile of sheets, a pivotally-supported frame movable toward and away from the pile, and sheet-moving means carried thereby, with a pivoted fulcrum-support engaging the pile, and sheet-controlled wedging means mounted upon said fulcrum-support and constructed and arranged to engage a rotating part upon the supporting-frame for raising the sheet-moving means into inactive position, substantially as set forth.

6. The combination of a pivotally-mounted frame, a rotating sheet-moving wheel journaled upon said frame, a train of gearing driving said sheet-moving wheel, a longitudinally-movable tapered block or wedge supported beneath the said frame and adapted to engage a rotating part upon said frame, and a sheet-actuated tripping-finger suitably connected with said tapered block or wedge, substantially as set forth.

7. The combination of a support for a pile of sheets, a pivotally-mounted frame movable toward and away from the pile, a rotating sheet-feeding device journaled upon said frame, a train of gears driving said sheet-feeding device, a longitudinally-movable tapered block or wedge supported beneath the said frame, a roll supported beneath said wedge, a part rotating with one of the train of gears, and a sheet-actuated tripping-finger suitably connected with said tapered block or wedge and adapted to move it between said roll and said rotating part, substantially as set forth.

8. The combination of a support for a pile of sheets, a pivotally-mounted frame movable toward and away from the pile, a rotating sheet-feeding device journaled upon said frame, a train of gears driving said sheet-feeding device, a longitudinally-movable

tapered block or wedge, an arm or bar engaging the pile and supporting said wedge beneath the said frame, an antifriction-roller journaled upon said arm or bar beneath said wedge, a rotating part upon said frame above said roll, and a sheet-actuated tripping-finger suitably connected with said tapered block or wedge and adapted to move it between said roll and said rotating part, substantially as set forth.

9. The combination of a pivotally-mounted frame, a rotating combing-wheel journaled upon said frame, a train of gears upon said frame for driving said combing-wheel, a main shaft, a gear keyed to said shaft and driving said train of gears, a controlling-cam upon said shaft, an extension of said supporting-frame adapted to be engaged by said cam, a fulcrum-supporting arm, a longitudinally-movable tapered block or wedge mounted upon said supporting-arm adjacent to a rotating part carried by said frame, an antifriction-roller also mounted upon said fulcrum-support beneath said rotating part and adjacent to said tapered block or wedge, and a sheet-actuated tripping-finger suitably connected with said tapered block or wedge and adapted by its movement to move it between said antifriction-roller and said rotating part, substantially as set forth.

10. The combination of a support for a pile of sheets, a supporting-frame movable toward and away from the pile, a rotating combing-wheel journaled upon said supporting-frame, a train of gears upon said supporting-frame for driving said combing-wheel, a main shaft, a gear keyed to said shaft and driving said train of gears, a controlling-cam upon said shaft adapted to periodically raise and lower the combing-supporting frame, a fulcrum support or arm engaging the pile of sheets, a longitudinally-movable tapered block or wedge mounted upon said fulcrum support or arm adjacent to a rotating part carried by said frame, an antifriction-roller also mounted upon said fulcrum-support beneath said rotating part and adjacent to said tapered block or wedge, and a sheet-actuated tripping-finger suitably connected with said tapered block or wedge and adapted by its movement to move it between said antifriction-roller and said rotating part for automatically raising the combing-wheel under the control of the sheet, substantially as set forth.

11. The combination of a support for a pile of sheets, a pair of pivotally-mounted frames 20, rotating combing-wheels 25 journaled upon said frames, trains of gears journaled upon said frame for driving said combing-wheels, a main shaft 10, main driving-gears 12 keyed to said shaft 10, and driving said trains of gears, two controlling-cams 11 upon said shaft 10, extensions of said supporting-frame 20 adapted to be engaged by said cams 11, ful-

crum supports or arms 42, having parts such as 43 engaging the pile, longitudinally-movable tapered blocks or wedges 55, brackets 56 mounted upon said fulcrum supports or arms 42 and having bearings in which wedges 55 are mounted, parts 28^a rotating with one of said gears upon each of said frames 20, antifriction-rollers 61 also mounted upon said fulcrum-supports beneath said rotating parts 28^a and adjacent to said tapered blocks or wedges 55, and sheet-actuated tripping-fingers 46 suitably connected with said tapered blocks or wedges and adapted by their movement to independently move said wedges between said antifriction-rollers and said rotating parts, substantially as set forth.

12. The combination of a support for a pile of sheets, with a sheet-feeding instrument, a movable frame upon which said instrument is mounted and by which it is moved into and out of engagement with the pile, a fulcrum support or arm engaging the pile of sheets, and a pivotally-mounted pile-engaging arm or lever mounted upon said fulcrum support or arm and having a part which is adapted to be engaged by said movable frame for raising the arm or lever from the pile when the feeding instrument is lowered into engagement with the pile, and means adapted to move said arm or lever into engagement with the pile when the feeding instrument is raised, as set forth.

13. The combination of a support for a pile of sheets, a pivotally-mounted frame supporting a sheet-feeding instrument, means for driving said feeding instrument and means for raising and lowering said frame, a fulcrum-supporting arm such as 42, a pile-engaging arm or lever 77 pivotally mounted upon arm 42, means for moving arm or lever 77 into engagement with the pile, and a part such as 80 carried by the pivotally-mounted frame and adapted to engage arm or lever 77 and raise it from the pile when the frame is lowered, as set forth.

14. The combination of a support for a pile of sheets, a sheet-moving instrument, means for moving the sheet-moving instrument into and out of engagement with the pile, a pile-engaging arm or lever, and sheet-delivery mechanism having means connected with said pile-engaging arm or lever for raising said arm or lever when the delivery mechanism operates, as set forth.

15. The combination of a support for a pile of sheets, a sheet-moving instrument, means for moving the sheet-moving instrument into and out of engagement with the pile, a pile-engaging arm or lever having a normal tendency to engage the pile, drop-roller delivery mechanism, and means connecting said arm or lever with the drop-rollers adapted to raise said arm or lever when the drop-rollers are lowered, as set forth.

16. The combination of a support for a pile of sheets, a sheet-moving instrument, means for moving the sheet-moving instrument into and out of engagement with the pile, a pile-engaging arm or lever having a normal tendency to engage the pile, drop-roller delivery mechanism including a drop-roller rock-shaft, an arm projecting from the drop-roller rock-shaft, a rod having pin-and-slot connection with said arm, and a rock-arm connected with said rod and with said pile-engaging arm or lever, as set forth.

17. The combination of a support for a pile of sheets, a sheet-feeding instrument, a movable frame upon which said instrument is mounted and by which it is moved into and out of engagement with the pile, a pivotally-mounted pile-engaging arm or lever which is adapted to be engaged by said movable frame for raising the arm or lever from the pile when the feeding instrument is lowered into engagement with the pile, drop-roller delivery mechanism, and means connecting said arm or lever with the drop-rollers adapted to

raise said arm or lever when the drop-rollers are lowered, as set forth.

18. The combination of a support for a pile of sheets, two sheet-feeding instruments operating in parallelism upon the pile, two independent movable frames upon which said instruments are mounted and by which they are moved into and out of engagement with the pile, independent sheet-controlled wedging devices, one for each movable frame, adapted to automatically and independently raise said frames, two independent pile-engaging arms or levers adapted to be independently raised from the pile, means whereby the lowering of said frames will elevate said pile-engaging arms or levers, drop-roller delivery mechanism, and means connecting said pile-engaging arms or levers with the drop-rollers adapted to raise said arms or levers when the drop-rollers are lowered, as set forth.

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Witnesses:

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