

(No Model.)

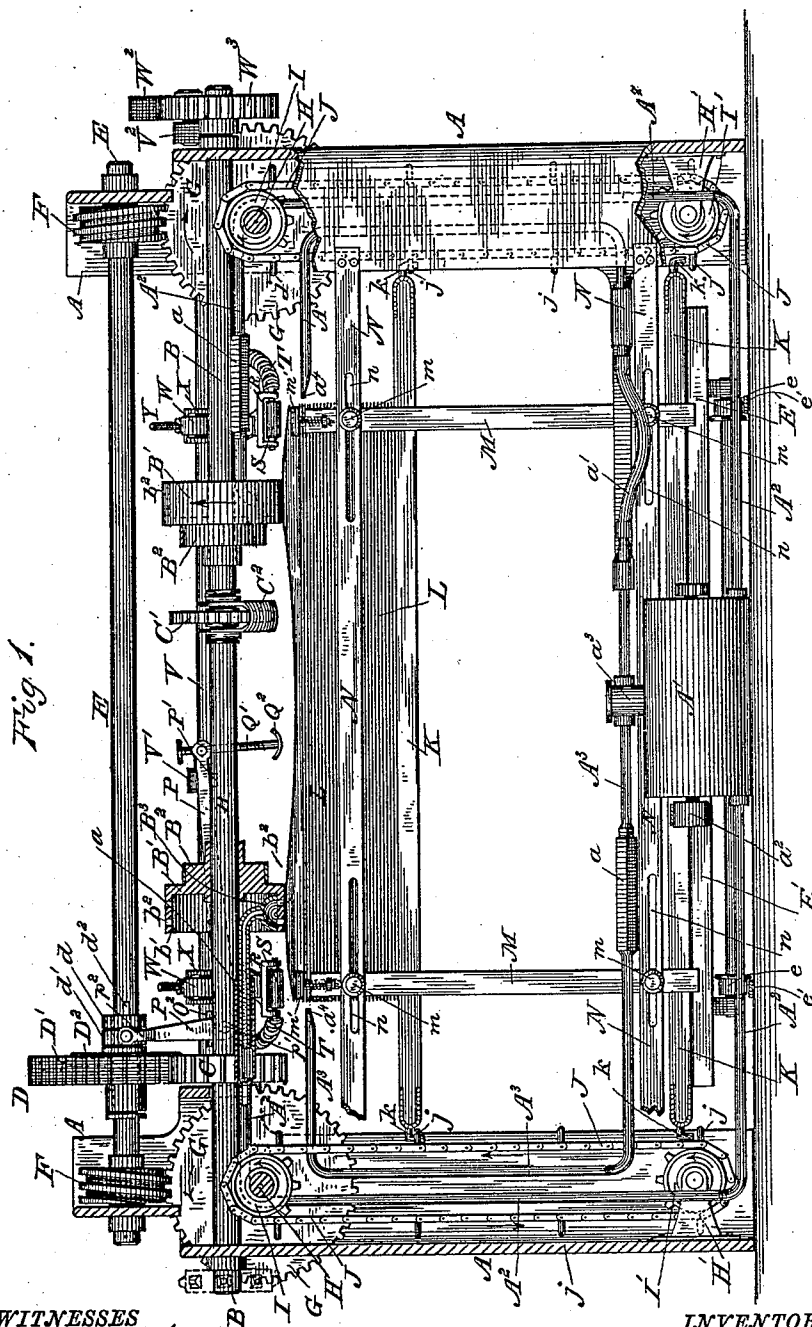
5 Sheets—Sheet 1.

A. SEDGWICK.

MACHINE FOR SEPARATING OR FEEDING PAPER.

No. 469,366.

Patented Feb. 23, 1892.



WITNESSES

Harry King
C. W. H. Russell

INVENTOR:

Alouzo Sedgwick
By *Irving Utting*
Attorney

(No Model.)

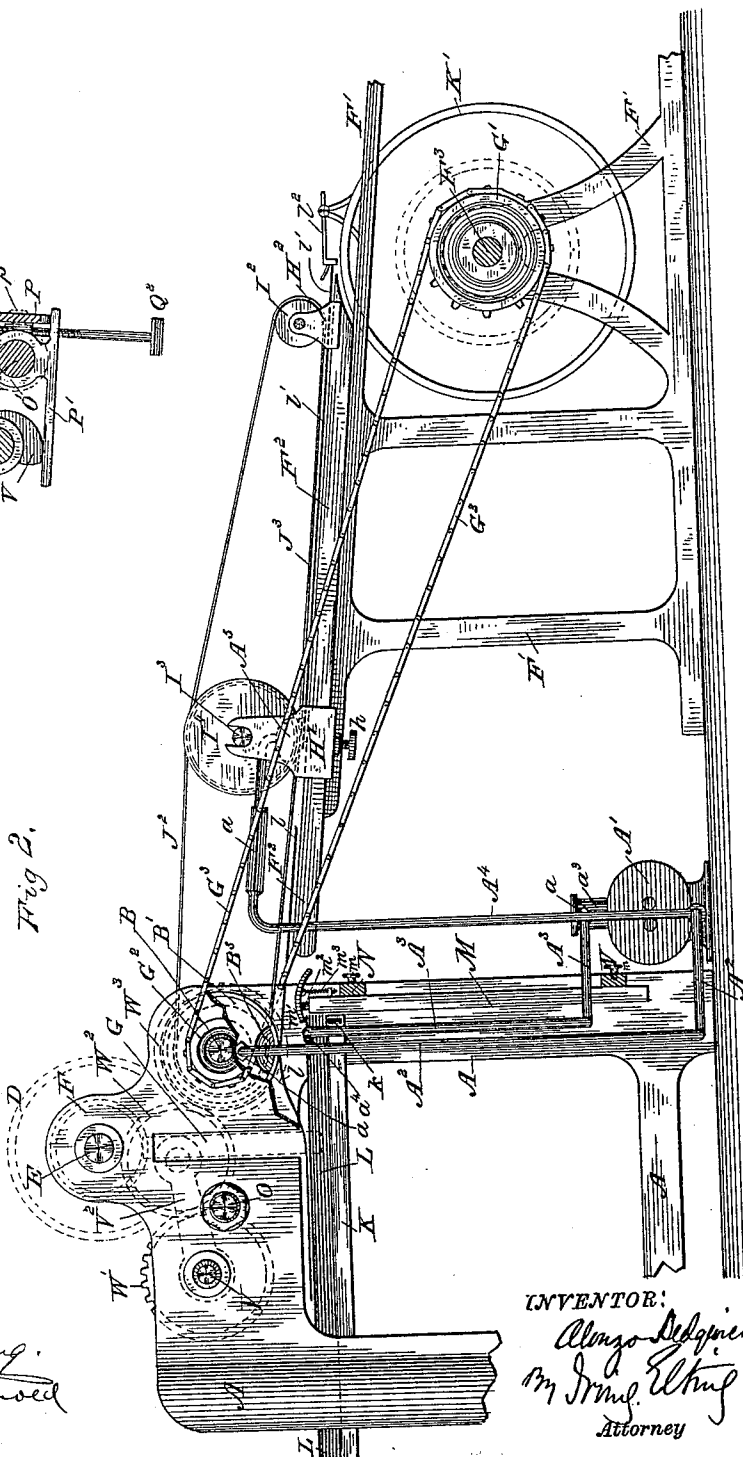
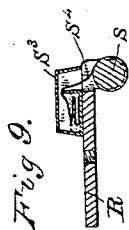
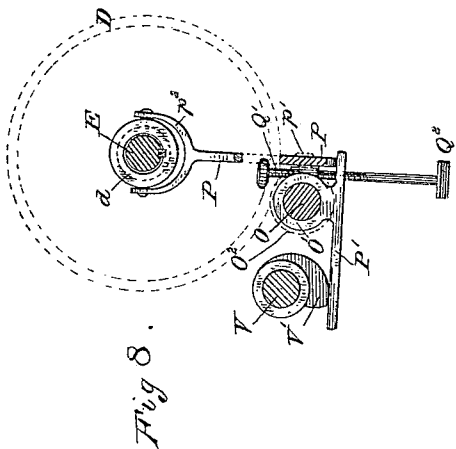
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(No Model.)

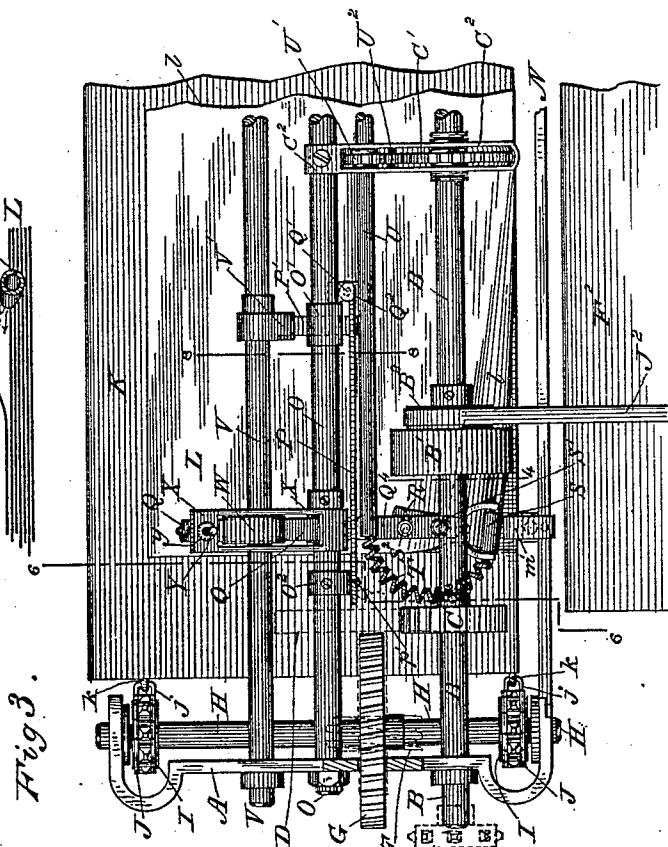
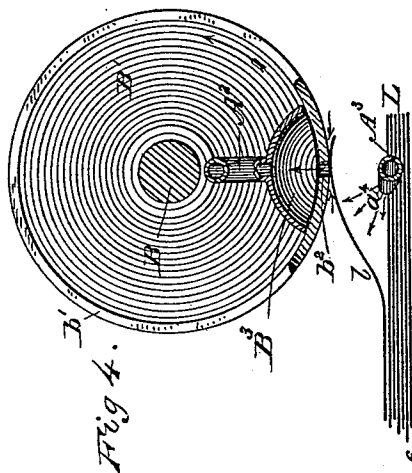
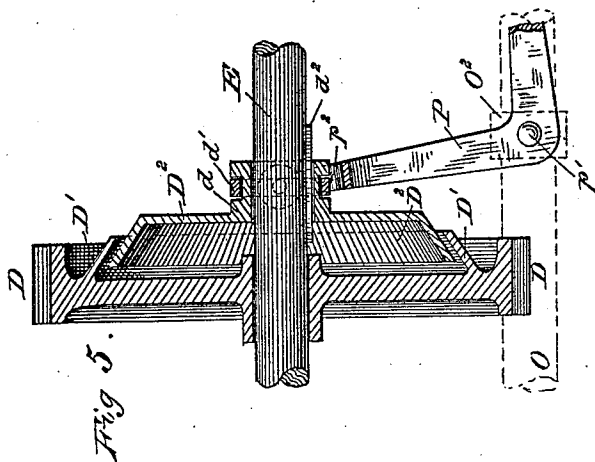
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A. SEDGWICK.

MACHINE FOR SEPARATING OR FEEDING PAPER.

No. 469,366.

Patented Feb. 23, 1892.



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Fig 6.

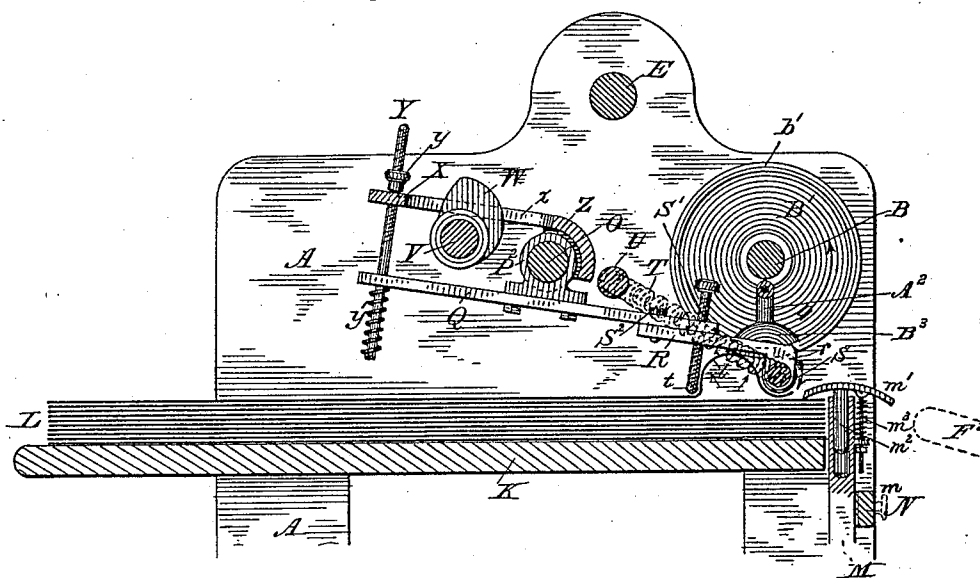
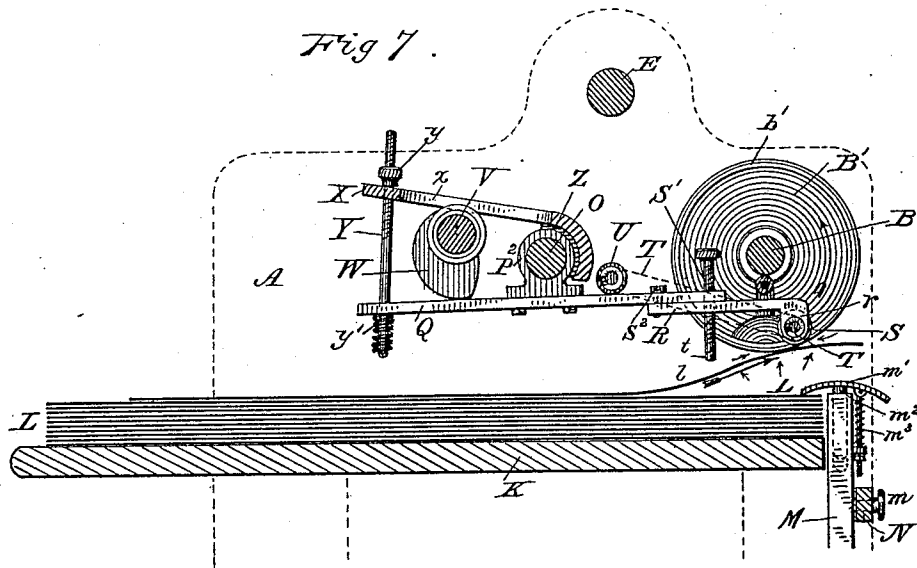


Fig 7.



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(No Model.)

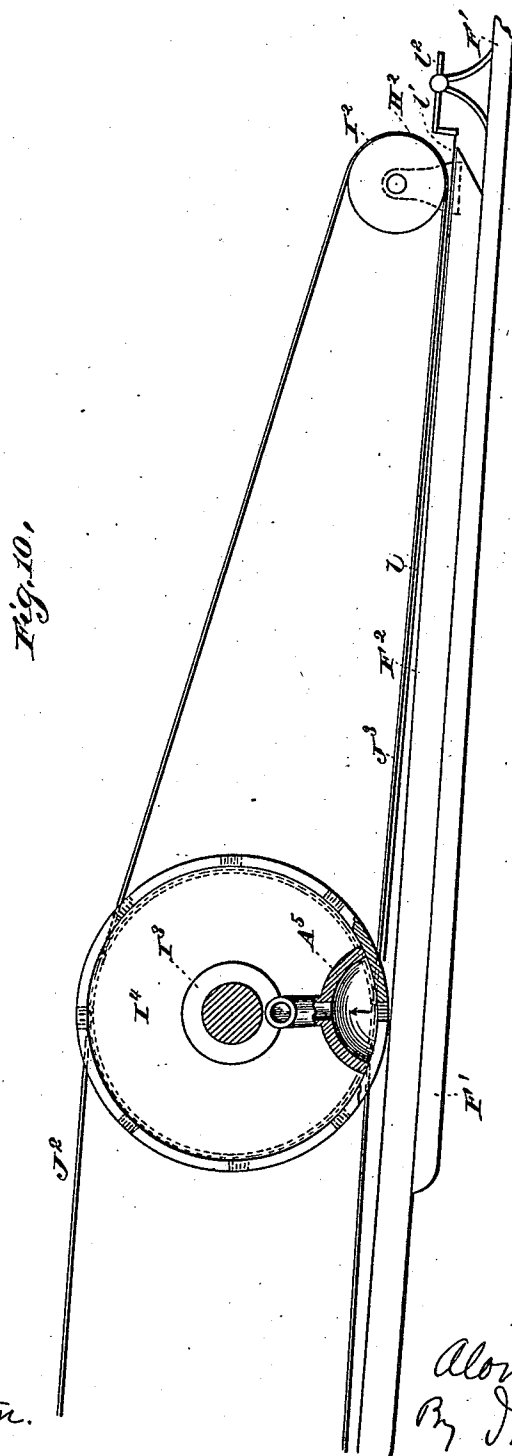
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A. SEDGWICK.

MACHINE FOR SEPARATING OR FEEDING PAPER.

No. 469,366.

Patented Feb. 23, 1892.



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UNITED STATES PATENT OFFICE.

ALONZO SEDGWICK, OF POUGHKEEPSIE, NEW YORK, ASSIGNOR TO ANNIE B. SEDGWICK, OF SAME PLACE.

MACHINE FOR SEPARATING OR FEEDING PAPER.

SPECIFICATION forming part of Letters Patent No. 469,366, dated February 23, 1892.

Application filed September 9, 1890. Serial No. 364,437. (No model.)

To all whom it may concern:

Be it known that I, ALONZO SEDGWICK, a citizen of the United States, residing at Poughkeepsie, in the county of Dutchess and State of New York, have invented certain new and useful Improvements in Machines for Separating or Feeding Paper; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in machines for feeding sheet-paper in which the sheets are automatically separated from a pile of paper and fed to a printing-press, folding-machine, &c.; and the objects of my improvements are, first, to provide by means of a rotary separating device driven against the corner of the paper and adjustable in the plane of the paper a truer and more positive method of separating one or more corners of the top sheet from a pile of paper than has heretofore been possible by means of a buckling-finger having a fixed frictional surface or similar device; second, to provide for the use of additional supply-platforms for holding the paper and to economize time and labor in adjusting the same by employing sprocket-wheels and chains in place of screws for elevating the platforms, as hereinafter described, and, third, to secure a more perfect mechanism than has hitherto been in use for carrying off the separated sheets and registering the same by means of revolving suction-wheels. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a rear elevation of my separating and feeding mechanism, showing a portion of the frame as removed. Fig. 2 is a side elevation of entire mechanism with a portion of one side of frame removed. Fig. 3 is a plan-view showing a portion of the feeding mechanism and also a portion of the elevator mechanism. Fig. 4 is an enlarged transverse section of suction-feeding-roller mechanism, cut through line 4 4 of Fig. 3. Fig. 5 is an enlarged longitudinal section of clutch mechanism for operating elevator. Fig. 6 is an enlarged transverse section of sheet-feeding mechanism, cut through line 6 6 of Fig. 3,

showing the separating-roller S down in contact with the top sheet l of pile of paper L. Fig. 7 is the same as Fig. 6, showing separating-roller raised from the paper, the upper sheet l having been brought up in contact with the suction separating and feeding roller B. Fig. 8 is an enlarged transverse section of portion of regulating and clutch mechanism cut through, as partially shown by line 8 8 of Fig. 3; and Fig. 9 is a transverse section of the arm R, supporting the separating-roller S, and showing a fountain S⁵ and a conducting-flannel S⁴, adapted to moisten the roller by capillary attraction.

Similar letters refer to similar parts throughout the several views.

A represents the main frame of the machine, held in position by the main brace O and the front braces N N.

B is the main shaft, driven from the printing-press F' (or other machine to which it may be attached) by the sprocket-wheels G¹ and G² and chain G³, as shown in Figs. 1 and 2. On the shaft B are the suction-wheels B¹; the gear C¹, connecting-gear U¹ for driving the separator-shaft U, the gears being held in position by the oil-case C² and supported by the brace O, as shown in Figs. 1 and 3. On the shaft B is also the gear W³, connected to gear W¹ by the intermediate gear W², mounted on the adjustable arm V², as shown in Figs. 1 and 2. These gears serve to communicate the proper speed to the shaft V, on which are mounted the cams W W for lifting the separating mechanism and the cam V¹ for operating the regulating and clutch mechanism, as shown in Figs. 3 and 8, as will hereinafter be more fully described.

In Figs. 1, 3, 6, and 7 is shown my improved mechanism for separating the top sheet from a pile of paper, K being the platform of the elevator on which the paper L is placed in proper position against the adjustable guards M, the guards being held in place by the slotted braces N. The separating mechanism is shown in two sets, one or both being used, as the size of the sheet or kind of paper may require. The mechanism consists of the levers Q, mounted on the brace O by means of the couplings P². These are held in position and made laterally adjustable on the brace O by

the slotted lever-frames X, hinged at Z to the brace O and secured by set-screws in the collars which form a part of X. The outer ends of the levers Q and lever-frames X are held together and the vertical motion regulated by means of the screws Y, nuts y, and springs y', for the purpose of lifting the separating-rollers from the paper while the separated sheet is being carried out or forward and also assisting by means of this adjustment in regulating the pressure of the separating-roller upon the paper. On the other end of the levers Q are bifurcated arms R, attached to Q by the adjusting-screws S' and held at the proper angle on the plane of the paper by the screws S². In the fork of the arms revolve the separating-rollers S, driven by the flexible shafts T, coupled to the shaft U, a vertical motion being communicated to the mechanism by the cams W. When the cams W turn so far as to allow the mechanism to be lowered until the adjusting-screws S' come in contact with the surface of the paper, thereby holding it in place, the separating-rollers can then be brought with any desired pressure against the paper by means of the screws Y, nuts y, and springs y', the rollers turning in the direction of the arrow, thereby separating the corners of the top sheet, drawing them out from under the fingers m', and buckling the paper against the screws or resisting-fingers S', thereby separating the front edge of the sheet from the pile of paper.

This separating device is an improvement over the mechanism heretofore used for separating the top sheet from a pile of paper—first, because it is much simpler, consisting of fewer parts; second, the separating-roller, having a continuous rotary motion, acts more positively on the paper, because in revolving it instantly removes any particles of paper or other foreign substance that may be on the surface of the paper; third, the rollers can be run at a rapid speed, thereby acting quicker on the surface of the paper than the buckling-finger provided with a fixed frictional surface, as heretofore used, as in that case any foreign particles are not removed until the next backward motion of the finger, thereby preventing the separation of the top sheet until at least the next forward movement of the buckling-finger; fourth, it is found that the rapid motion of the separating-roller is more certain to separate only one sheet from the pile, the motion being continuous and as rapid as necessary without regard to the speed of the other parts of the machine; fifth, the surface of a pile of paper is often uneven, generally being lowest at the corners, which has made it necessary heretofore in case of such unevenness to use only a small pile of paper or to raise up the corners, because the buckling-finger provided with a fixed frictional surface in pushing over the uneven surface of the paper is more likely to separate two or more sheets than when the surface is level, whereas the revolving roller, remain-

ing in one position on the paper, does not have a tendency to crowd against the pile, although the surface is uneven, and it also remains close to the corner of the sheet, where the paper is separated most readily; sixth, it has also been found that different thicknesses and qualities of paper require for the most perfect separation different angles in the action of the buckling device, and by means of the flexible shafts and adjustable arms shown in the accompanying drawings the separating-rollers are readily adjusted to any desired angle, whereas it has been found impracticable to make the finger having a forward and backward motion adjustable in relation to the angle at which it acts upon the paper; seventh, as the separation of the front corners of the top sheet is accomplished in less time by means of the revolving rollers than has heretofore been possible more time can be given to the other operations during each revolution of the machine.

The adjusting-screw S' performs five different functions, taking the place of two, and in some cases three, devices heretofore used: First, it supports the weight of the separating mechanism, allowing the pressure of the separating-roller to be much more correctly adjusted by means of the screw Y, nut y, and spring y' than is otherwise possible; second, it takes the place of a holding-down or resisting finger to hold the pile of paper in place while the front edge of the top sheet is being separated by the roller; third, it acts as a resisting-finger against which the top sheet is buckled by the separating-roller; fourth, the relative position of the resisting-finger and the separating-roller remaining the same, and the two being as close together as it is possible to place them without breaking the paper in the operation of buckling, the auxiliary finger heretofore used in separating the top sheet is no longer necessary to insure positive and perfect separation; fifth, the separating mechanism can be made without special regard to its weight, as it is supported by the screw S' without other devices to assist in sustaining the weight, or without making the separating mechanism light in order to act correctly on the thinnest paper.

Fig. 9 shows a traverse section of part of the separating mechanism with a fountain S³ placed over the separating-roller S for the purpose of applying moisture or adhesive mixture to the surface of separating-roller when required to assist in separating paper that is difficult to handle, it being found that a slight application of moisture or mucilage applied to the surface of the roller by capillary attraction by means of a flannel S⁴, or by a roller, if preferred, readily separates paper when it cannot be otherwise done with certainty.

In Figs. 1, 2, 3, 6, and 7 is shown the finger m' resting on the top front edge of the pile of paper and held in position by a shank fitting loosely in a socket made for it in the top

end of the upright guard M. The finger is provided with a spring m^3 , supported on a rod provided with a screw and nut for regulating the pressure of the finger on the surface of the paper. This finger has advantages, in connection with my rotary separating-roller, over the side finger now in use to assist in separating the top sheet. Owing to its position in front of the pile, it does not require any complicated mechanism to regulate the pressure while the sheet is separated, nor to assist in holding the pile when the separated sheet is passing out of the machine, because with my improvement only the separated sheet can by any possibility be carried forward as the balance of the paper is held under the finger m' and against the guards M. The finger m' , with the front guards M, is readily adjusted in the slots n , formed in the braces N, to any position or any-sized sheet by means of the thumb-screw m .

In Figs. 1, 3, 4, 6, and 7 is shown the mechanism for carrying the separated sheet forward and off from the pile after being separated by the separating mechanism; and it consists of the suction-wheels B'. (Shown in Fig. 4.) Suction-caps B³ rest on the inner periphery of the wheels and draw the air by means of a suction-blower A' and pipes A², the pipes being provided with telescoped joints for lengthening or shortening the pipes to the position of the wheels B'; or, if preferred, flexible joints, same as shown at a' , may be used for the same purpose. When the top sheet is drawn from under the finger m' and buckled against the finger S' by the separating-roller S, it forms a buckle or arch in the paper, as shown in Figs. 3 and 6, causing the paper to come in contact with the under side of the suction-wheels B', by means of which the paper is drawn forward off the pile, as shown in Figs. 1, 2, 4, and 7, the air from the pipes a' aiding the operation where it is necessary in the case of printed matter, as hereinafter described. This is an improvement over the devices heretofore used by which the separated sheet is pushed off from the pile by means of fingers or wheels covered with rubber, as by my improvement there is no action on the underlying sheets tending to work the top of the pile forward or offset the printed matter by the action of the fingers rubbing on the paper or of the sheets one against the other. As the suction through the caps B³ is only through the lower portion of the flange of the wheels B', there is but little tendency for the sheets to be carried around with the wheels B', and that is entirely prevented by the endless bands passing around the pulleys B², forming a part of the suction-wheels B', and connecting with similar pulleys on the suction-wheels I'. The air drawn into the blower A' is returned through the pipes A³ and discharged through the nozzle a' above the side of the pile of paper in the buckle at an angle directed somewhat toward the back of the sheet

to serve to form an air-cushion between the top sheet and the next and thus by the intervening air between the sheets to prevent the printed matter from being offset, similar telescoped or flexible joints being made in the pipes for proper adjustment, these discharge-pipes not being used for the separation of the sheets, but only to prevent offsetting where printed matter is fed through a second time.

I am aware that prior to my invention paper-feeding machines with suction-wheels and pipes for blowing air between the sheets for separating the top-sheets from a pile of paper and for carrying forward the separated sheet have been made, but never have come into successful use for the reason that the separation was not sufficiently positive or regular to answer the purpose, whereas in my invention by first separating the corner of the top sheet and buckling the separated sheet against the suction-wheel and meanwhile holding the separated sheet on the pile until the proper time a positive regular-feed is secured.

In Fig. 2 is shown a side elevation of the entire machine attached to part of a printing-press, showing my improvement for carrying the separated sheet forward to the front guides of the press in perfect register with the front guides. I¹ are similar suction-wheels to B', already described, with similar suction-pipes attached to the blower A'. There are two or more of these wheels mounted on a shaft I³, journaled in the boxes H', the boxes being provided with clamps and screws h , by means of which they are clamped to the feed-board F² of the press F' and made adjustable thereon. The wheels I⁴ are driven by bands J² running over the pulleys B² and similar pulleys on the wheels I⁴. On the forward end of the feed-board of the printing-press F² are small pulleys I² on a shaft running in the boxes H². The pulleys I² being driven by the bands J³ from pulleys on the shaft I³, the pulleys and bands being so adjusted that the lower portion of the bands J³ run near the top of the feed-board F², the operation is as follows: The separated sheet is carried forward by the suction-wheels B' under the bands J² on the feed-board F² and under the suction-wheels I⁴ and is carried forward by them at the proper speed under the bands J³ to the front guides G' of the press F', the suction-caps A⁵ of the wheels I⁴ releasing the back of the sheet just as the front edge of the sheet reaches the guides G', holding it in perfect register until it is seized by the grippers of the press, the mechanism being simple and the adjustments easily and quickly made.

Figs. 1 and 3 show the elevator, on the platform of which the paper is piled and lifted to the proper height to be fed off. It consists of a shaft E, driven from the shaft B by the gears C D and controlled by the regulating mechanism, which will be hereinafter described. On the shaft E are fastened the worms F, which engage with the worm-wheels

G on the shafts H. On the shafts H are also the four sprocket-wheels I. Below the shafts H in the frame A are bolted adjustable brackets H', in which are journaled four sprocket-wheels I', corresponding with sprocket-wheels I, on which run the four elevator-chains J. These are provided with lugs j, formed as part of the links of the chain at suitable distance apart, and into these lugs the pins k of the platform K engage, by means of which the platform is elevated, it being easily attached or detached, as required. In the lower part of the machine, Fig. 1, is shown a second platform K, supported on the truck E', the wheels e of which are provided with flanges to keep the truck in place on the rails e', extending out in front of the machine. By means of this improvement the second platform K, on being placed in proper position on the truck B', can be loaded with paper while the machine is at work feeding the paper off from the upper platform K and at the proper time run in position under the machine so that it may be elevated as soon as the paper is all fed off the upper platform, thereby not only saving the time of the operator, but keeping the machine constantly at work, instead of stopping the machine when the paper is fed off, running the platform down by hand, and loading with paper again, as heretofore. The platform can also be used singly and run up and down by means of a crank on shaft E, although this mode is not shown in the drawings.

Figs. 1, 5, and 8 show the regulating mechanism for the elevator, and also the mechanism for regulating the feeding out of the separated sheets. This mechanism consists of a clutch operating on the gear D, Fig. 5. D' is a part of or is attached firmly to gear D. D² is fitted loosely on the shaft E and made to revolve with the shaft by means of the feather d². D² is thrown in and out of contact with D' by means of a lever P, connected to the fork d', working in the groove p² of the clutch. The lever P is supported on the shaft O by the collar Q² and pin p'. At the other end of the lever P is the regulating-screw Q', attached to the lever P by means of an adjustable nut. The lower end of the regulating-screw Q' is provided with a foot Q², adapted to rest on the surface of the pile of paper, so that when adjusted to the proper height it will regulate the height of the paper when fed off by allowing D' and D² to engage with each other or not, as is required, and when engaging to turn the gear D, thus moving the elevator up as far as required to keep the surface of the paper at the proper height. In order to allow these separated sheets to pass out of the machine and also to regulate the time to correspond to the time of the operation of the machine to which the feeder is attached, the arm P, with the regulating-screw Q', is lifted at regular intervals by means of the lever P', coupled to the shaft O by means of the coupling O', and operated at the proper time by the cam V' on the shaft V.

The cam V' is so adjusted as to lift the regulating-screw Q' as soon as the top sheet is separated, thus allowing the suction-wheels B' to draw the paper out on the feed-board of the press, on which it is farther drawn to the front guides of the press by the suction-wheels I', as before described.

Other devices may be employed in place of the caps B³ for exhausting the air through the lower part of the wheels B', for which reason I do not desire to confine myself to that exact construction of suction-wheel.

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

1. In a machine for separating or feeding paper, one or more carrying-arms each provided with a roller adjustable horizontally, as described, and a suitable mechanism for driving the roller so as to cause it to revolve at any required angle against the paper at the corner of the sheet and to separate the same, as and for the purpose specified.

2. In a machine for separating or feeding paper, the combination of a resisting-finger, a separating-roller constructed so as to be adjustable both vertically and horizontally, and a flexible driving-shaft by means of which the roller is caused to revolve against the paper for the purpose of separating the corners of the top sheet from the pile, substantially as described.

3. In a machine for separating or feeding paper, a carrier having a bifurcated arm provided with a revolving roller adjustable horizontally at different angles on the plane of the paper, in combination with a resisting-finger for the purpose of buckling the paper, as specified.

4. In a machine for separating or feeding paper, the combination, with a resisting-finger and a rotary separating-roller, of the lever Q, the bifurcated arm R, and a cam mechanism, as described, whereby the resisting-finger and revolving roller are raised to allow the separated sheet to pass from underneath, substantially as specified.

5. In a machine for separating or feeding paper, a separating device consisting of the lever Q, the bifurcated arm R, a resisting-finger adapted to rest upon the paper, and the rotary separating-roller, the pressure of the roller upon the paper being regulated in part by adjustment upon the resisting-finger, as and for the purpose described.

6. In a machine for separating or feeding paper, a separating device consisting of a resisting-finger adapted to rest upon the paper and support the rotary separating-roller, in combination with a lever-bar, a yoke, and an adjustable screw and spring for regulating the vertical position of the lever-bar and the pressure of the separating device upon the paper, substantially as described.

7. In a machine for separating or feeding paper, a separating device consisting of a resisting-finger adapted to rest upon the paper

and support the rotary separating-roller, a lever-bar, a yoke, and an adjustable screw and spring, as and for the purpose described, in combination with a rotary separating-roller attached to a bifurcated arm and adjustable at different angles in relation to the resisting-finger and to the corners of the paper by means of a set-screw connecting the arm and lever-bar for adapting the separating device to any kind of paper, as specified.

8. In a machine for separating or feeding paper, an adjustable separating device consisting of a rotary separating-roller S, the bifurcated arm R, the lever Q, and the resisting-finger S', as described, in combination with the guards M for holding the pile of paper in place during the separation of the top sheet, substantially as set forth.

9. A separating device consisting of a rotary separating-roller S, the bifurcated arm R, the lever Q, and the resisting-finger S', in combination with a dividing-finger m' for retaining the pile of paper in place while the top sheet is being carried forward, as set forth.

10. In a machine for separating or feeding paper, the lever Q, the bifurcated arm R, and a rotary separating-roller designed to act upon the corners of the sheet, in combination with a fountain I⁵, provided with a conducting medium I⁴ for moistening the separator, as and for the purpose described.

11. A buckling device consisting of a revolving roller and a resisting-finger so constructed as to maintain fixed relative positions to each other and to the sheet of paper to be separated, the lever Q, the bifurcated arm R, the guards M, and the finger m', as and for the purpose set forth.

12. In a machine for separating or feeding paper, a separating mechanism provided with a rotary roller, as described, in combination with revolving suction-wheels, whereby the sheet after being separated is carried forward from the pile of paper, as and for the purpose specified.

13. A separating mechanism provided with a rotary roller, as described, in combination with the suction-wheels B', having suction devices within them adapted to carry the paper forward from the pile, and the discharge-pipes A, whereby the withdrawal of the rear portion of the top sheet from the pile to the feed-board is facilitated, as set forth.

14. A separating mechanism, as described, in combination with the suction-wheels B' and the suction feed-wheels I¹, whereby a perfect register of the separated sheets is obtained at the front guides of a printing-press or other machine, as set forth.

15. A feeding mechanism consisting of the

suction-wheels I¹, the pulleys I², the feed-board F², and the connecting-tapes J³, operating on the top of the sheet, as described, to obtain a perfect register against the front guides of a press or other machine, as set forth.

16. In a machine for separating or feeding paper, an elevating device consisting of two or more platforms for holding the paper fitted to engage with chains revolving upon sprocket-wheels, in combination with a regulating mechanism for controlling the movement of the tables as the sheets are fed off, as and for the purpose specified.

17. In a machine for separating or feeding paper, an elevating device in which two or more platforms are used and provided with devices for engaging said platforms, in combination with a mechanism for conveying the loaded platforms into position, consisting of the carrier E', provided with axles and wheels e and guides e', substantially as described.

18. In a machine for separating or feeding paper, a separating mechanism, in combination with an elevating device consisting of platforms K for holding the paper L, the sprocket-wheels II', the chains J, and the lugs j upon the chains for engaging with the pins k of the platforms, whereby a filled platform may be added without loss of time, as set forth.

19. In a machine for separating or feeding paper, an elevating mechanism, as described, in combination with a regulating device consisting of a screw Q', a foot Q'', adapted to rest upon the top of the pile of paper, a lever P, operating to engage or clutch D' D'' with the gearing C D, the worm F, the gear G, and the elevating-chains I, set in motion by the operation of the worm and gear when the lowering of the pile of paper allows the regulating-screw to drop sufficiently, as and for the purpose specified.

20. In a machine for separating or feeding paper, a regulating-screw adapted to rest upon the paper and to automatically set in motion the elevating mechanism, in combination with platforms K, sprocket-wheels II', chains J, and the mechanism, substantially as described, for conveying the loaded platforms into position to engage with the elevating-chains while the paper on the upper platform is being fed off, as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

ALONZO SEDGWICK.

Witnesses:

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C. W. H. ARNOLD.