July 31, 1923. 1,463,329

C. H. MARTIN

INDIVIDUAL SHEET AND ENVELOPE SEPARATOR FOR PNEUMATIC FEEDERS

Filed April 18, 1922 2 Sheets-Sheet 1

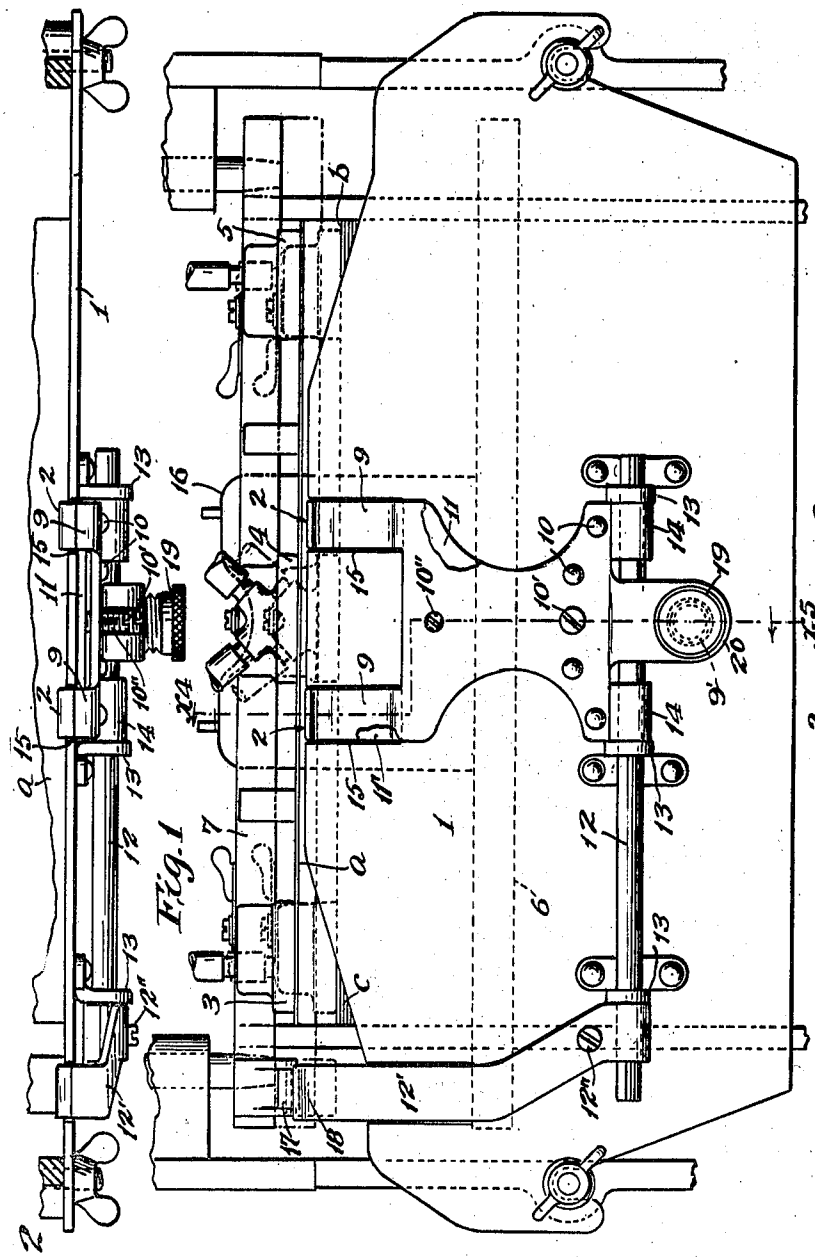

Fig. 1

Fig. 2

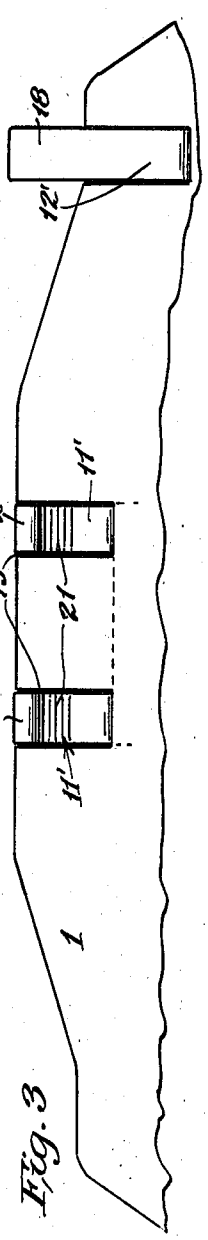

Fig. 3

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Fig. 4

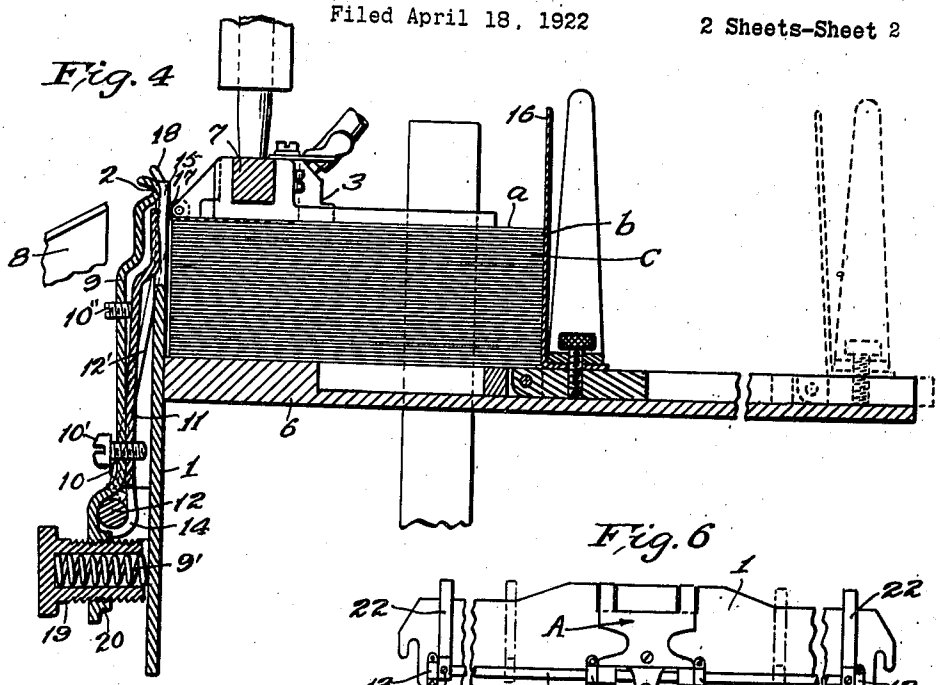
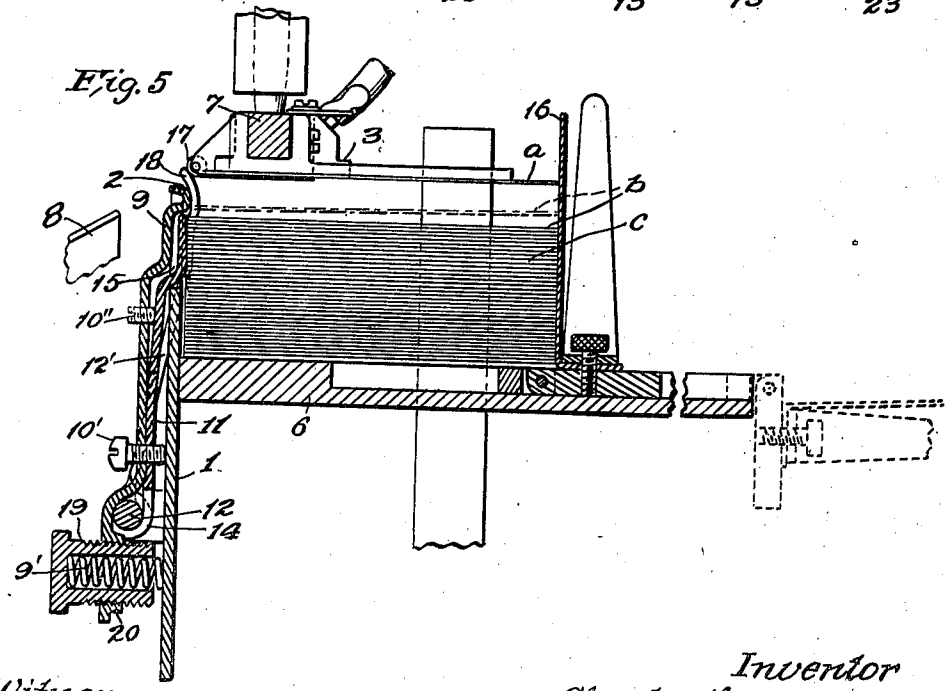


Fig. 6

Fig. 5



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Patented July 31, 1923. 1,463,329

UNITED STATES PATENT OFFICE.

CHARLES HUGH MARTIN, OF LOS ANGELES, CALIFORNIA.

INDIVIDUAL SHEET AND ENVELOPE SEPARATOR FOR PNEUMATIC FEEDERS.

Application filed April 18, 1922. Serial No. 555,004.

To all whom it may concern:

Be it known that I, CHARLES HUGH MARTIN, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Improvement in Individual Sheet and Envelope Separators for Pneumatic Feeders, of which the following is a specification.

This invention relates to the art of supplying sheets to the grippers of pneumatic feeders for printing presses, and is an improvement upon the envelope separator for printing presses, set forth in my application for Letters Patent of the United States, filed August 30, 1920, Serial No. 406,812, allowed June 28, 1921, renewed April 15th, 1922, Serial No. 553,073 and copending herewith, and comprising in combination with a sheet support and a sheet barrier, and pneumatic means for lifting sheets from a stack on said support and putting them over the barrier; of resiliently mounted means adapted to displace by laterally shifting from the directly held sheet, such sheet or sheets as may be carried by such directly held sheet through suction of said pneumatic envelope separator; said means contacting with such envelope only at the time of displacement of such indirectly held envelope; and, in combination with the barrier and pneumatic means adapted to engage and lift over the barrier a thin flat object from the top of a stack of such objects lying with their advanced edges against or close to such barrier, a tappet, the body of which extends upwardly in a plane extending vertically between said barrier and the edges of such objects; such tappet having a slight rounding protuberance projecting over the advance edge of such object, and adapted to intercept the advance edge of such of said objects as are lifted by, but are not in touch with, the pneumatic lifting means; and a spring supporting said protuberance so as to allow it to be placed out of the way by the object directly held by the suction means.

An object of the present invention is to so construct the attachment as to make it operate more certainly and surely, to avoid wear, and noise of operation, and allow adjustment where required for lighter and thinner or for heavier, thicker and stiffer stock.

Another object is to avoid such displacement of the sheets in the stack as would interfere with perfect operation.

Other objects, advantages and features of invention may appear from the accompanying drawings, the subjoined detail description and the appended claims.

The invention may be variously constructed and the accompanying drawings illustrate the same in a form at present deemed most desirable.

Figure 1 is a rear elevation of the invention as applied in connection with a pneumatic appliance heretofore employed in printing presses for lifting envelopes and other sheet-like bodies over a barrier. Fragments of said pneumatic means are shown.

Fig. 2 is a plan of the main parts of the invention shown in Fig. 1 with fragments of other parts there shown or indicated.

Fig. 3 is a fragmental view of the reverse side of the barrier and the tappets shown in Fig. 1.

Figs. 4 and 5 are vertical sections on the irregular line indicated by x^4—x^5, Fig. 1, showing respectively the start and finish positions of parts during the lifting and separating operation.

Fig. 6 is a fragmental rear elevation of a modification of the invention adapted for use with extremely long sheet-like bodies.

The barrier 1 is much the same as the barrier common to pneumatic sheet separators of the character described. 2 indicates a rounded knob or projection adjustably arranged with respect to barrier 1, near the level of the top edge of said barrier and above the level of the objects to be lifted over the barrier and normally non-contacting with such objects, so that the operator can adjust the same as to the distance said knob extends over the advanced edges of such objects as the envelopes *a*, *b*, *c*, stacked adjacent the barrier, in position to intercept or tap loose from the directly sucked envelope *a*, the second and succeeding envelopes *b*, *c*, as the directly sucked envelope is lifted to a level above that of the barrier, by the pneumatic appliance indicated by the suckers 3, 4 and 5. In Fig. 5 the envelope *b* is shown dropped back to rest, but is indicated in broken lines as being shifted laterally by contact with the knobs 2 as the envelope *a* has passed upward.

The barrier 1 is usually a metal plate arranged vertically or about so, beside and

extending above the level of an envelope carriage 6. The suckers are mounted on the usual bar 7 and are reciprocated up and down by the same and the usual mechanism, not shown, in a path that is in front of the barrier 1, while the operation of lifting the envelope is effected; and they also have a movement, as is well known, over and across the top of the barrier to carry the envelopes to the platen 8.

Preferably the projections 2 are formed as humps in springs 9 which are made to operate lightly by a light spring 9′, and said springs are adjustably connected by suitable means as rivets 10 and adjusting screws 10′, 10″ to a clip 11 of sheet metal formed with strips 11′ adapted to extend flatwise of the guiding face of the barrier 1 into the space between such face and the edges of the objects as envelopes or other sheets held therein. Said clip is mounted on the barrier 1 by suitable retainers as the shaft 12 and bosses 13; said clip being bent into loops as at 14 and thereby fixed to said shaft.

The faces of the strips 11′ of the clip, extend through slots 15 at the upper edge of the barrier toward the resilient adjustable envelope or sheet holder 16 and said clip is adapted to yield by reason of its spring 9′ to allow the envelope *a* which is directly held by the pneumatic means to be lifted past the knobs carried by the springs. Said springs have sufficient tension to cause the tappet to shift or displace the second envelope *b* from the directly lifted envelope *a*, whereupon the second envelope will fall back to the stack while the envelope *a* is carried on by the suction means.

The rounded protuberance 2 of such tappet is located above the level of the stack of sheets, envelopes or other sheet-like objects on the carrier, and is non-contacting with the envelopes after an envelope has been disengaged from under the envelope held by the pneumatic sucker. In order to avoid any likelihood of the tappet detaching the pneumatically held envelope *a*, automatic means are provided operable through the medium of the bar 7 to retract the tappets from the path of said envelope at the moment the upper envelope *a* passes the protuberance. These means consist of the shaft 12 fixed to the tappet and journaled in the bosses, and an arm 12′ adjustably fixed to said shaft by a clamping screw 12″ and extending into the path of vertically reciprocating means as the roller 17 acting against the curved upper end 18 of the arm 12′.

The tension of the spring 9′ is adjusted by the hollow bushing 19 threaded through the reinforced extension 20 from the springs 9.

By adjusting the bushing, the tension of the spring 9′ is determined. By adjusting the screw 10′, the position of the face of the limbs 11′ of the tappet relative to the face of the barrier 1 is determined. By adjusting the screw 10″, the position of the protuberance 2 relative to the face of the tappet limbs 11′ is determined. Said face is corrugated as at 21 so as to break local adhesion between the envelope or other objects to be lifted, as they pass upward toward the protuberance 2.

In practical operation the tappet is retracted by action of the roller 17 on the curved upper end 18 of the arm 12′ and escapes such arm sufficiently to allow the protuberance to strike the indirectly lifted envelopes as stated to separate them from the suction-held top envelope *a*.

In the form shown in Fig. 6 for separating long sheets, the barrier 1 is constructed for attachment to the maximum width press; and the shaft 12 is extended approximately the full length of said barrier and is mounted in the bearings or bosses 13, and the central tappet member A is of the same general construction as that shown in Figs. 1–5. The auxiliary tappet members 22 are slidingly journalled on the shaft 12 and are fixed in adjusted position by means of the screw 23.

In operation, the sheets will be so positioned that the central tappet member A operates centrally of the sheet and the auxiliary tappet members 22 will be so adjusted that they will engage the sheets near their ends. Dotted lines, Fig. 6 indicate an adjustment of the members 22 for separating sheets differing in length from those to which the machine is adapted when the tappets 22 are in the position shown in solid lines.

I claim.

1. In a sheet separator, the combination with a barrier and pneumatic means adapted to lift a sheet from the top of a stack, and a spring operated tappet having a protuberance for loosening lifted sheets not in direct contact with the lifting means; of means operable by the lifting means to retract the protuberance from the path of the topmost sheet as it passes the protuberance, and adapted to allow the spring operated tappet to be returned to tap lifted sheets not in touch with the lifting means.

2. The combination with the barrier; of a shaft mounted on the barrier; a tappet fixed to the shaft; and a spring to operate the tappet.

3. In combination with a barrier and pneumatic means adapted to engage and lift over the barrier a thin flat object from the top of a stack of such objects; a tappet for loosening sheets not in direct contact with the lifting means; means operable by the lifting means to retract the tappet from

the path of the topmost object, and to release the tappet after said topmost object has passed; and spring means adapted to return said tappet so as to tap the lifted objects not in contact with the lifting means.

4. In combination with a barrier; a shaft mounted on the barrier; a tappet mounted on the shaft; an arm secured to said shaft; means to move said arm to retract said tappet; and resilient means to return said tappet.

5. In combination with a barrier; a shaft mounted on the barrier; a tappet mounted on the shaft; an arm secured to said shaft; means to move said arm to retract said tappet; a spring to return said tappet; and means to adjust the tension of said spring.

6. In a sheet separator, the combination of a barrier; pneumatic means adapted to lift a sheet from the top of a stack; a shaft mounted on the barrier; a tappet mounted on the shaft and normally extending over the edges of the sheets of the stack; and means for adjusting the distance said tappet extends over the edge of the stack.

7. In a sheet separator, the combination of a barrier; pneumatic means adapted to lift a sheet from the top of a stack; a shaft mounted on the barrier; a tappet mounted on the shaft and normally extending over the edges of the sheets of the stack; resilient means adapted to normally hold said tappet over the edge of the stack; and means for adjusting the distance said tappet extends over the edge of the stack.

8. In a sheet separator, the combination of a barrier; pneumatic means adapted to lift a sheet from the top of a stack; a tappet having a protuberance normally extending over the edges of and non-contacting with the edges of the sheets; means to adjust the distance said protuberance extends over the edge of the stack; and a spring adapted to resiliently operate said tappet.

9. In a sheet separator, the combination of a barrier; pneumatic means adapted to lift a sheet from the top of a stack; a tappet having a protuberance normally extending over the edges of and non-contacting with the edges of the sheets; means to adjust the distance said protuberance extends over the edge of the stack; a spring adapted to resiliently operate said tappet; and means for adjusting the tension of said spring.

10. In a sheet separator, the combination of a barrier; pneumatic means adapted to lift a sheet from the top of a stack; a tappet having a protuberance normally extending over the edges of and non-contacting with the edges of the sheets; means to adjust the distance said protuberance extends over the edge of the stack; means operable by the lifting means to retract the protuberance as the sheet to be lifted passes said protuberance; and means to return said tappet to tap the sheets lifted by but not in contact with the lifting means.

11. In a sheet separator, the combination of a barrier; pneumatic means adapted to lift a sheet from the top of a stack; a shaft mounted on the barrier; a clip mounted on said shaft and having corrugated strips adapted to contact with sheets of the stack; and springs adjustably connected to the clip and having protuberances for loosening lifted sheets not in direct contact with the lifting means.

12. In combination with a barrier; a shaft mounted on the barrier; a tappet mounted on the shaft having protuberances and corrugated limbs; and means whereby said protuberances may be adjusted relative to said limbs and said barrier.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 11th day of April, 1922.

CHARLES HUGH MARTIN.

Witness:
ARTHUR F. LARRABEE.