

July 5, 1932.

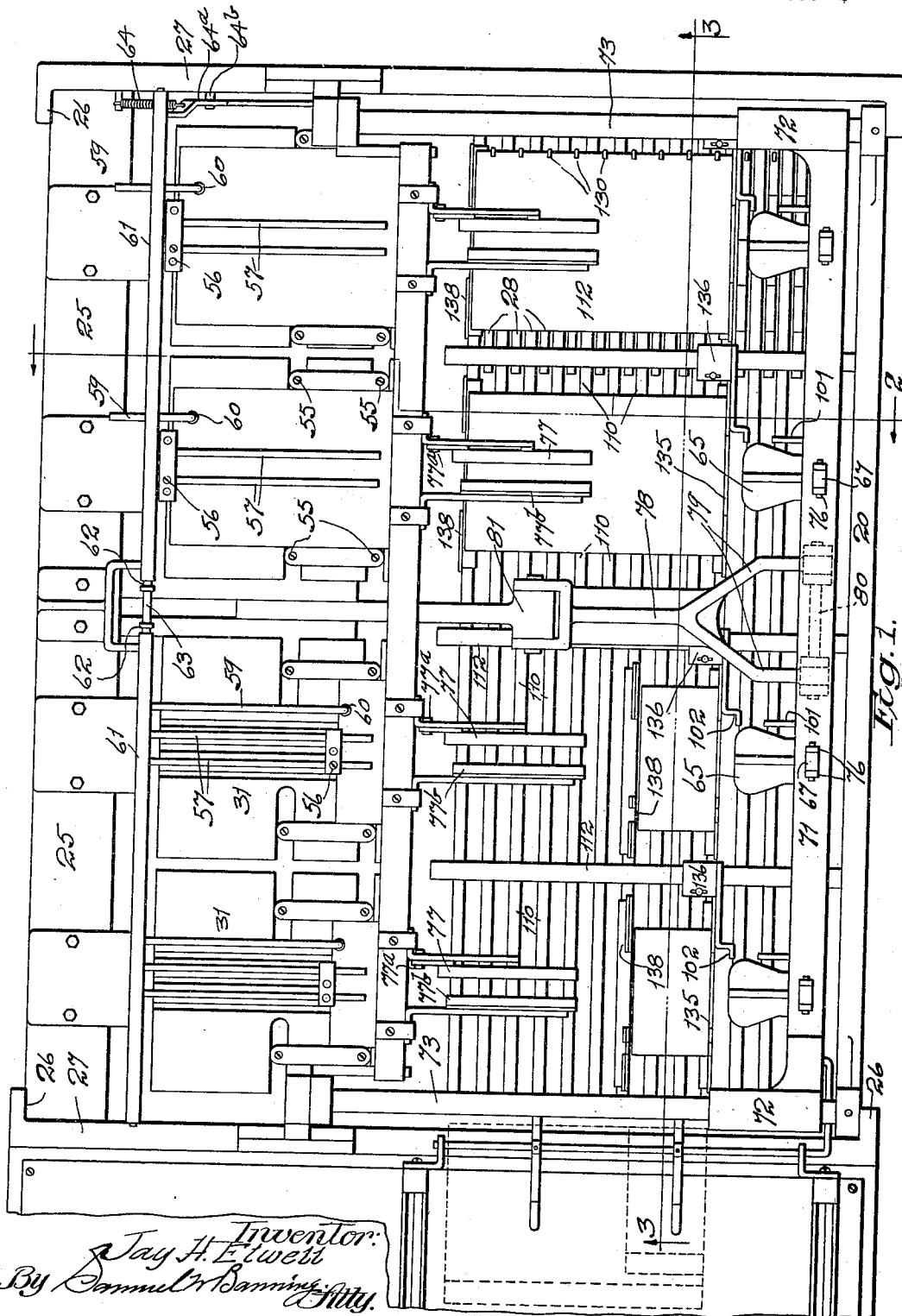
J. H. ELWELL

1,865,750

MACHINE FOR FEEDING AND COLLECTING SHEETS OF PAPER OR THE LIKE

Filed Nov. 5, 1930

8 Sheets-Sheet 1



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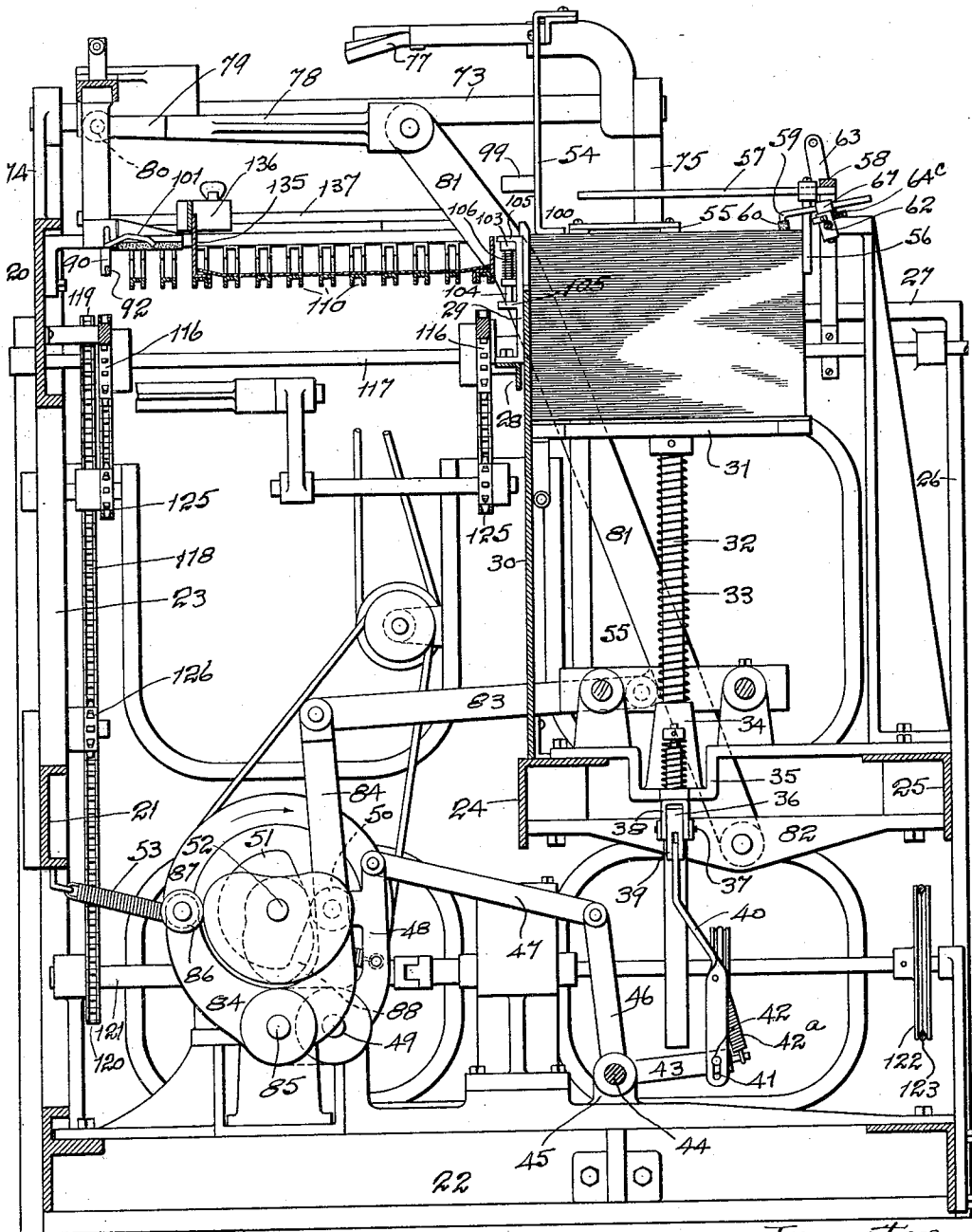
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MACHINE FOR FEEDING AND COLLECTING SHEETS OF PAPER OR THE LIKE

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8 Sheets-Sheet 2

Fig. 2.



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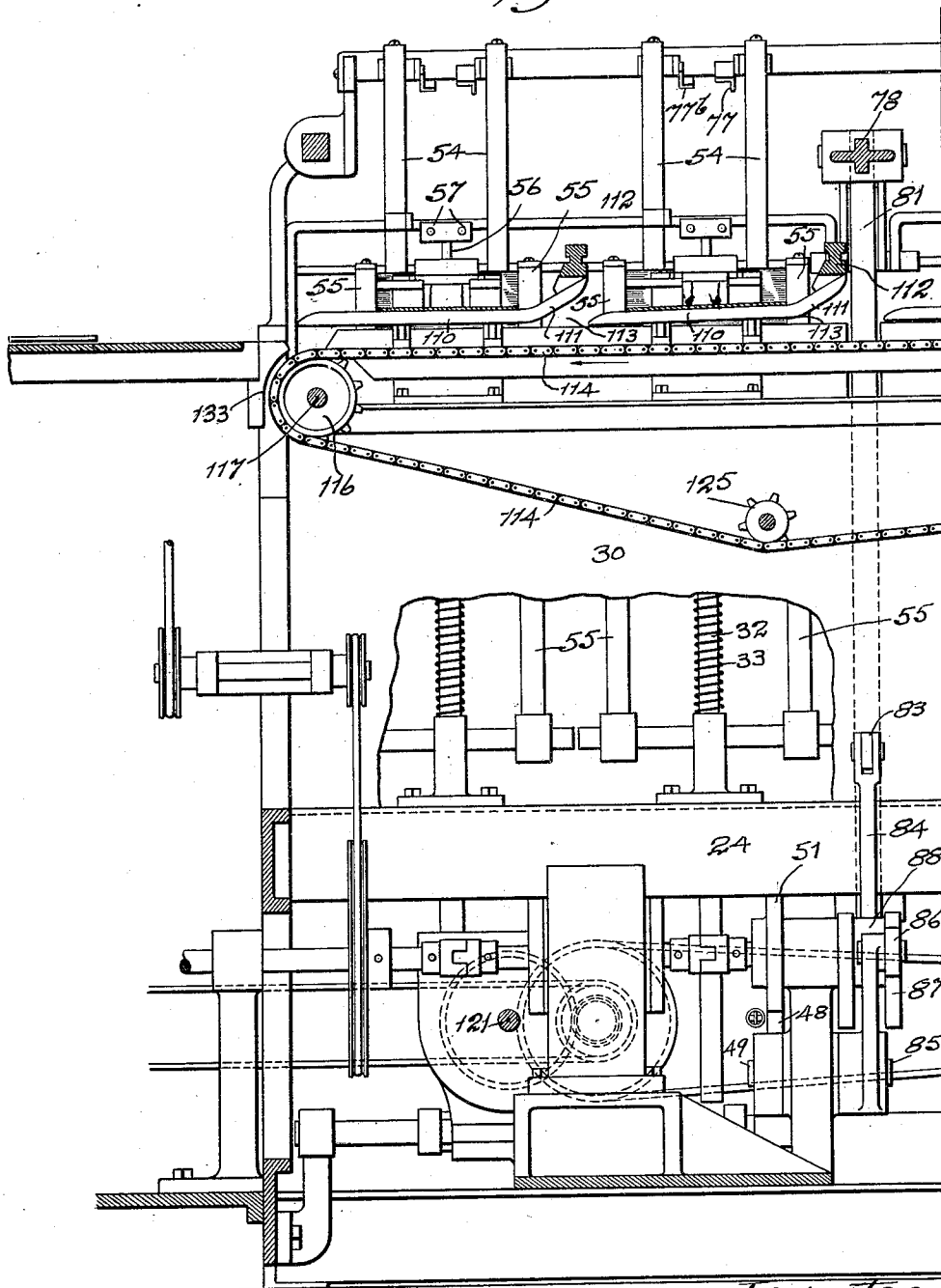
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8 Sheets-Sheet 3

Fig. 3.



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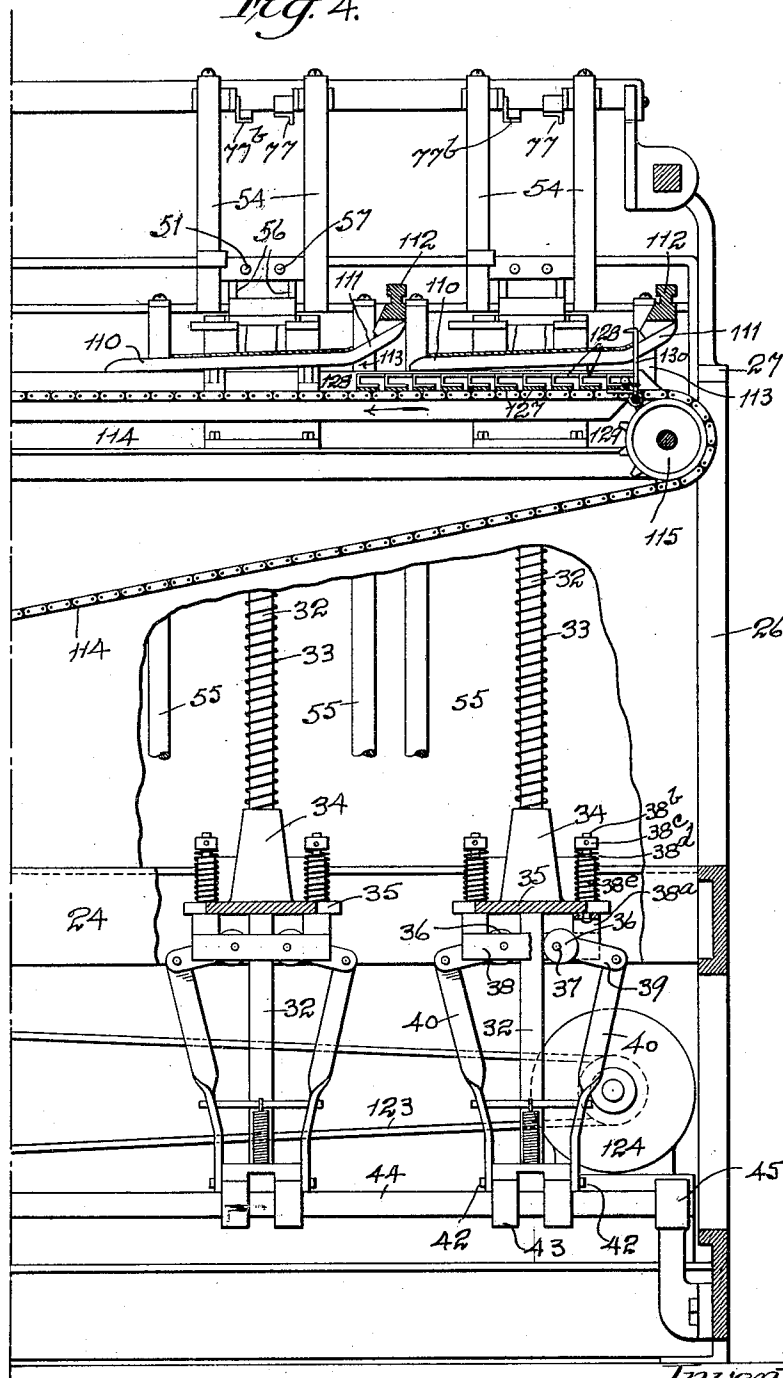
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8 Sheets-Sheet 4

Fig. 4.



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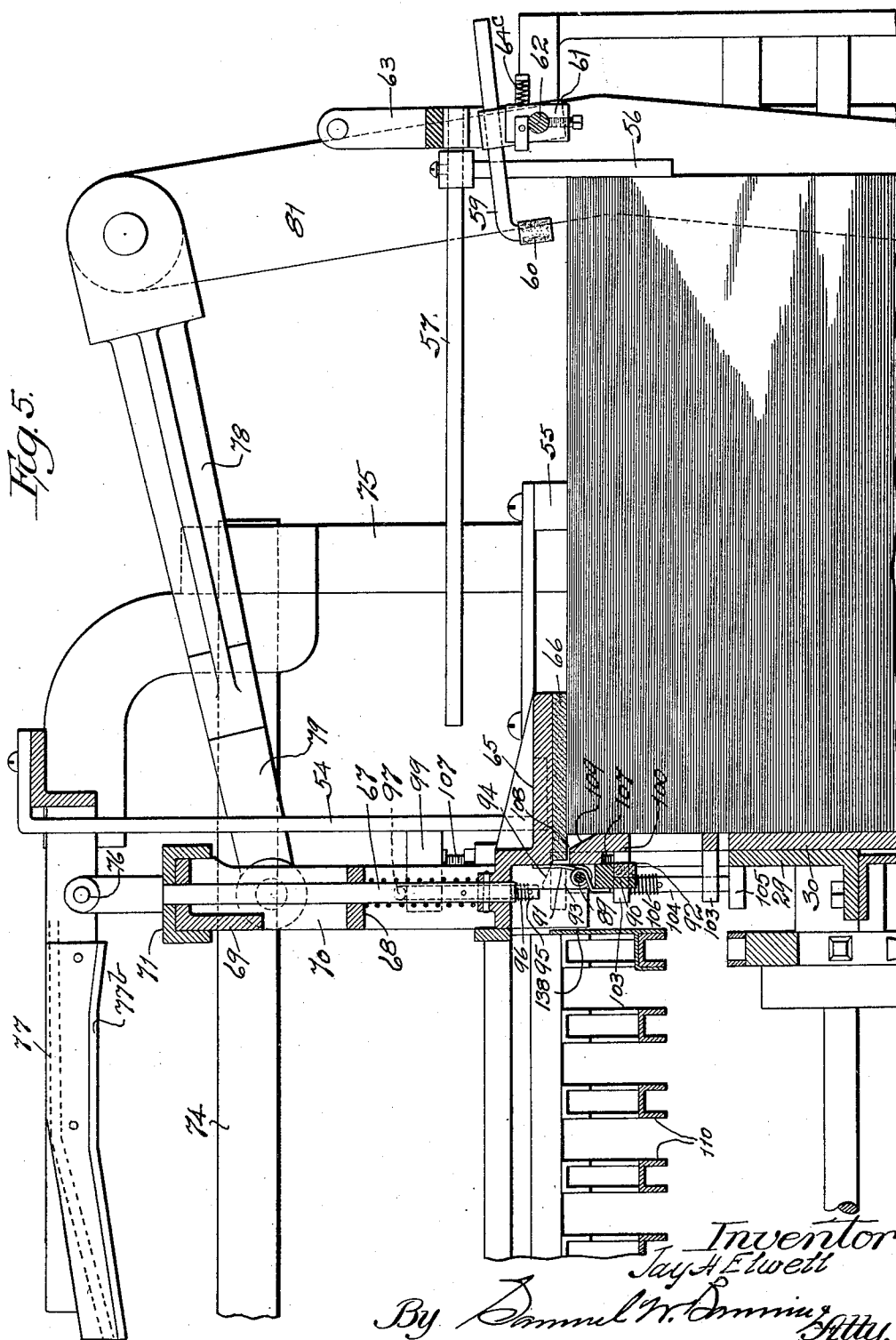
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8 Sheets-Sheet 6

Fig. 6. 44

Fig. 12.

The drawings illustrate a mechanical device, likely a pump or engine component. Fig. 6. 44 shows a side view of a lever arm (81) pivoted at one end and connected to a vertical rod (54) at the other. The lever arm has a curved end (78) and a pivot point (70). A vertical rod (54) is connected to a horizontal rod (99) which is part of a larger mechanism. Fig. 12 shows a cross-sectional view of the device, revealing internal components such as a piston (100) and a valve (101). The piston is connected to a vertical rod (103) which is part of a larger assembly. The valve is connected to a horizontal rod (104) which is part of a larger assembly. The device is shown in a cross-sectional view, revealing internal components such as a piston (100) and a valve (101). The piston is connected to a vertical rod (103) which is part of a larger assembly. The valve is connected to a horizontal rod (104) which is part of a larger assembly. The device is shown in a cross-sectional view, revealing internal components such as a piston (100) and a valve (101). The piston is connected to a vertical rod (103) which is part of a larger assembly. The valve is connected to a horizontal rod (104) which is part of a larger assembly.

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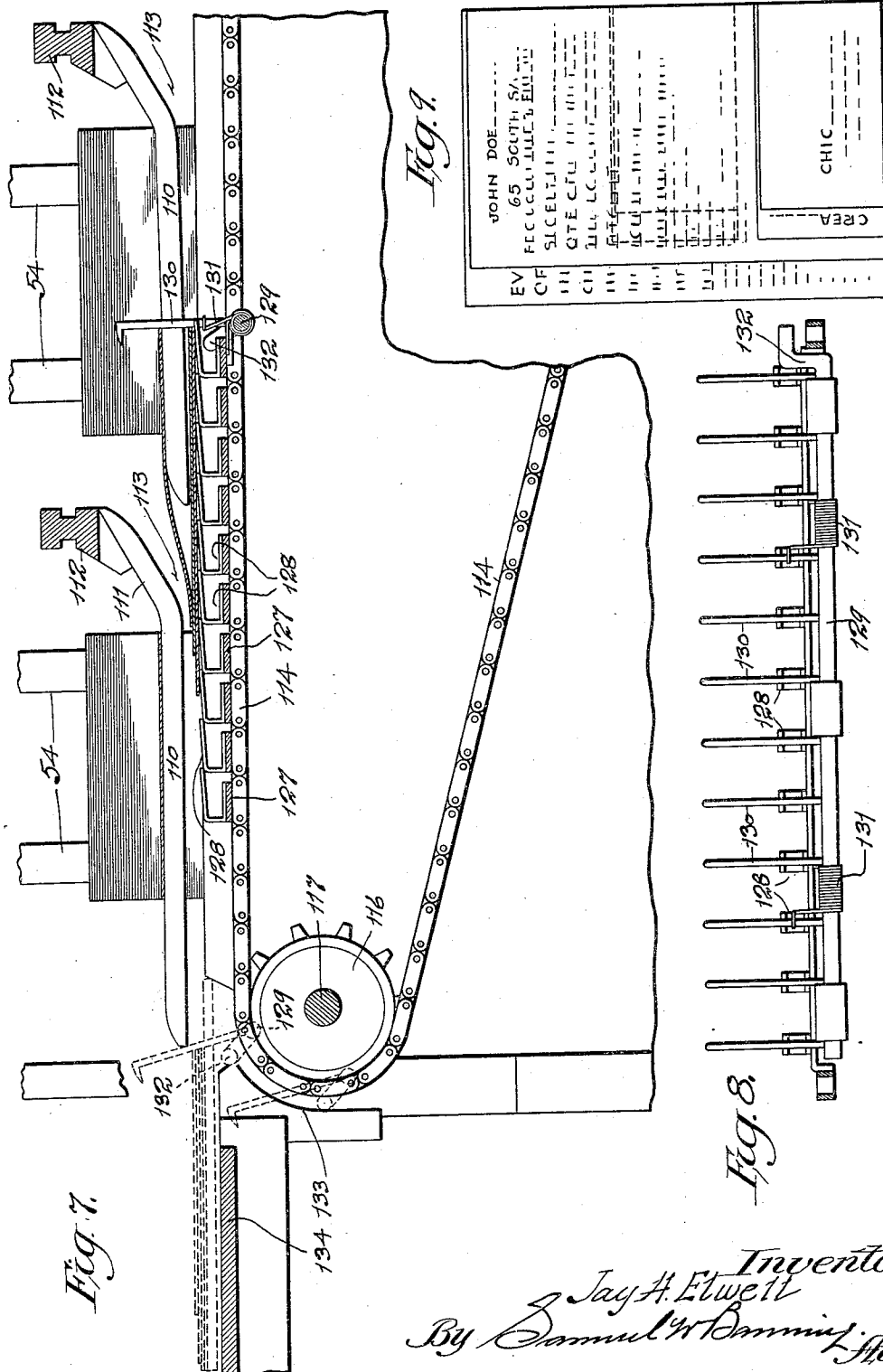
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MACHINE FOR FEEDING AND COLLECTING SHEETS OF PAPER OR THE LIKE

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8 Sheets-Sheet 7



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MACHINE FOR FEEDING AND COLLECTING SHEETS OF PAPER OR THE LIKE

Filed Nov. 5, 1930

8 Sheets-Sheet 8

Fig. 10.

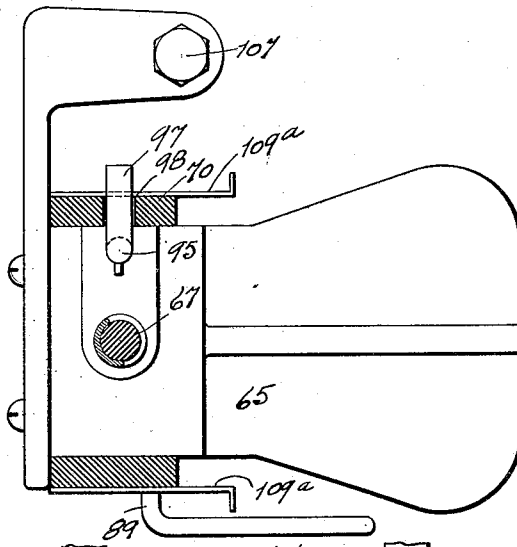
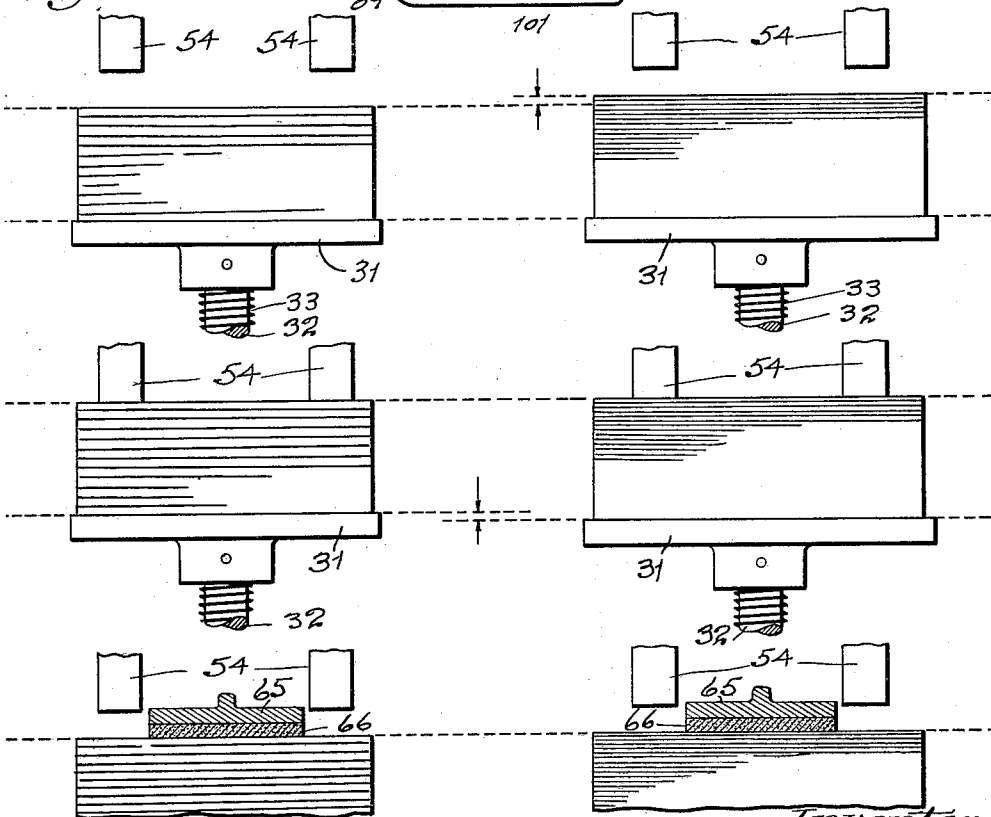


Fig. 11.



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UNITED STATES PATENT OFFICE

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MACHINE FOR FEEDING AND COLLECTING SHEETS OF PAPER OR THE LIKE

Application filed November 5, 1930. Serial No. 493,505.

This invention relates to machines for feeding and collecting sheets of paper or the like.

The present invention is intended primarily as a machine for feeding and collecting sheets of paper into groups preparatory to their folding and insertion into envelopes for mailing purposes.

Although the details of the present invention are confined to the feeding and collecting department of the machine, it may be used for other purposes than that for which it was particularly designed.

The object of the present invention is to produce a machine of relatively simple and compact construction, in which provision is made for the simultaneous withdrawal of sheets from several stacks by feeding mechanism of unified construction which coacts with the several stacks.

The sheets of paper, cards or the like, thus withdrawn, are delivered to a runway, where they are collected into the form of superposed layers preparatory to delivery from the present machine. The sheets or cards in column form may be delivered to a folding and stuffing machine, or any other machine or instrumentality designed to deal with sheets of paper or cards in superposed form. The present invention relates to the mechanism for simultaneously separating the uppermost sheet from each of the several aligned stacks;

To the mechanism for restraining the displacement of underlying sheets while the uppermost sheet is being withdrawn;

To the mechanism for maintaining an upward feeding pressure on each of the several columns of sheets or inserts, so constructed and arranged as to momentarily relieve the pressure in order to permit withdrawal of the uppermost sheet from each of the stacks;

To the means for clamping and transporting the sheets withdrawn from the stacks and delivering the same in procession form to a runway; and

To the mechanism provided for operating through the runway to accumulate the sheets into superposed relation in the form of a stack or column.

The invention also relates to the means for operating the various instrumentalities in timed relationship to one another in the accomplishment of their respective functions, and to the machine as a whole and the constituent portions thereof.

In the drawings:

Figure 1 is a plan view of the machine as a whole;

Fig. 2 is a sectional elevation taken on line 2—2 of Fig. 1;

Figs. 3 and 4 are complementary views taken on line 3—3 of Fig. 1;

Figs. 5 and 6 are detailed views of the feeding mechanism for engaging and withdrawing the uppermost sheet from the stack, showing the mechanism in two positions of movement;

Fig. 7 is a detail of the chain mechanism and carrier for transporting and accumulating the sheets fed from the stacks;

Fig. 8 is a detail of the rake prongs for engaging and accumulating the sheets;

Fig. 9 is a detail showing several forms of sheets accumulated as an insert into a mailing envelope or package;

Fig. 10 is a detail of one of the presser feet for engaging the paper sheets;

Fig. 11 is a series of diagrammatic views illustrating the method of maintaining uniformity of the top level of the several stacks during progressive feeding and irrespective of variations in the thickness of the individual sheets composing the respective stacks; and

Fig. 12 is a sectional detail of one of the presser feet and clamping blocks.

The machine as a whole comprises a suitable framework which in the form shown includes an upper front rail 20, a lower front rail 21, and a base portion 22. The front rails are connected by vertical posts 23 which spring upwardly from the base.

The rear operating portion of the mechanism is supported upon longitudinally extending rails 24 and 25 which are supported from uprights 26, the upper ends of which merge into cross bars 27, the construction being duplicated at each end of the machine. The particular construction of the frame-

work is not deemed essential, since any adequate structure may be employed which is capable of providing support for the operating portions of the machine.

5 Above the rail 24 is a longitudinally extending rail 28, which supports a series of brackets 29 which abut against and furnish support for an inner vertical wall 30, the lower edge of which rests upon the inner rail 10 24. This wall constitutes the forward side of the space allotted to the respective stacks of sheets, which are arranged in alignment from one end of the machine to the other.

15 As shown, the machine makes provision for feeding from four stacks, although obviously the same mechanism may be employed for feeding from two, three or any other number of stacks, depending upon the number of sheets which it is desired to handle.

20 Immediately behind the wall 30 are arranged a plurality of movable platforms 31, one for each of the columns of sheets, but in view of the fact that the construction and arrangement of these platforms and of the mechanism for operating the same is simply multiplied, a description of one of these mechanisms will suffice for all. Each platform is provided with and mounted upon a stem 32 which is surrounded by a coil spring 30 33 bearing at its lower end against a cone-shaped standard 34 carried by a bracket member 35, the arrangement being such that the spring will constantly exert a lifting pressure upon the platform, the range of the spring action being sufficient to intermittently lift the platform after each delivery of a sheet until the column of sheets has been exhausted. In other words, the range of spring action must be at least commensurate 40 with the height of the column of sheets.

The stem 32 extends through the standard 34 and through the bracket 35, and is adapted to be gripped by oppositely disposed rollers 36 (see Fig. 4), each of which is eccentrically 45 mounted upon a pin 37 carried between the walls 38 of a frame which depends below the base of the bracket 35. Each of the eccentrically mounted rollers 36 has rigidly secured thereto an outwardly extending arm 50 39, and each of the arms has pivoted thereto a link 40 provided with a slot 41 at its lower end, which receives a pin 42 outwardly extending from an arm 43 rearwardly extending from a rock shaft 44 suitably mounted 55 on journals 45.

A rocking action is imparted to the rock shaft by means of an arm 46 which is rigid therewith and which in turn is pivoted to a link 47 which connects with a cam arm 48 60 pivoted at its lower end 49 and mounting a roller 50 which rides upon a cam 51 mounted upon a cam shaft 52. The roller 50 is held in contact with the cam by a spring 53.

65 The frame walls 38 are arched upwardly at 38a and each is provided with an upwardly

extending pin 38b which carries a collar 38c bearing against a coil spring 38d, which latter encircles a tube 38e through which the associated pin extends, so that the tubes 38e 70 will act as stops to limit the downward movement of the frame which carries the rollers 36.

The arrangement is such that when a downward movement is imparted to the links 40 through the cam and connections just described, the rollers 36 will be rocked on their 75 eccentric mountings and caused to bite against and clamp the stem 32 of the associated platform, so that thereafter a continued downward movement of the links 40 will draw down the platform against the tension of the 80 coil spring 33, until the collars 38c contact the tubular stops 38e, which limits the extent of the downward movement. However, it is desirable as a safety factor to afford an excess of movement to the pin 42 on the arm 43 85 which is normally held in engagement with the upper end of the slot 41 by the action of a heavy spring 42a which will be tensioned after the movement of the platform has been arrested by contact of the collars 38c with 90 the tubular stops.

This platform movement, which is slight in extent, serves to momentarily relieve the pressure exerted upon the stock of sheets supported upon the platform, so that the uppermost sheet may be withdrawn from the top of the stack. As soon as the upper sheet is withdrawn, in the cycle of operations, the clamping action of the rollers 36 is released, and the stem is then free to spring upwardly under 100 spring tension to again compress the stack and at the same time this upward movement in each instance will be sufficient to not only restore the movement occasioned by the drawing down of the platform, but also to advance 105 upwardly to a degree sufficient to compensate for the decreased height of the stack occasioned by the withdrawal of a sheet from the top. In this way the platform will progressively follow upward as the stack is concurrently depleted, and maintain an adequate 110 pressure on the stack at all times to hold the uppermost sheet at the feeding plane.

Feeding mechanism

115 The uppermost sheet of each stack is forced upwardly into contact along its front edge with a pair of spaced depending gauge bars 54, and the column is guided on each side by vertically disposed guide bars 55 between 120 which the platform rides in elevating the stack. The uppermost portion of the stack is gauged along the rear edges of the sheets by contact with fingers 56 which are adjustable along forwardly extending bars 57 carried by a fixed rail 58, so that, irrespective of 125 its depth from front to rear, the stack can be properly positioned to bring the front edges of the respective sheets into butting contact with the wall 30, which properly gauges the 130

stack and holds the front edges of the sheets in proper feeding position. In addition to the above gauge members, the rear upper edge of the stack is adapted to be contacted by fingers 59, each of which carries a rubber tip 60 to afford a firm contact with the uppermost sheet.

Each of the fingers 59 is adjustably mounted within a head 61 rigidly mounted upon a rock shaft 62, which rock shaft carries a bail 63 adapted to be contacted at the proper moment to elevate the finger tips 60 against the tension of a spring 64 which connects with an arm 64a which normally engages the stop pin 64b. In addition to the universal action of the spring 64, each of the fingers is urged downwardly against the particular stack with which it engages by the action of a small spring 64c, so that any deficiency in movement of the rock shaft by contact of one of the fingers with the top sheet of a stack of somewhat stiff or incompressible sheets of material, will be compensated for by a slight additional movement imparted to the other fingers by the individual springs 64c, so that the uppermost sheets of each of the stacks will be adequately compressed near the rear edges thereof. The arrangement provides for a momentary release of the uppermost sheets of the respective stacks during the interval of withdrawal.

The withdrawal from each stack is effected by the operation of a shoe 65 provided with a sponge rubber sole 66 adapted to contact the uppermost sheet near its forward edge. Each of the shoes is carried by a depending stem 67, which is guided for reciprocating movement within the rails 68 and 69 of a frame 70, one frame being provided for each of the shoes, and all of the frames being hung from and rigidly secured to a universal bar 71 provided at its ends with guide heads 72—72 which ride upon rails 73—73 which stand at opposite ends of the machine and are supported between pairs of front and rear standards 74 and 75.

The arrangement is one which permits the universal bar 71 to travel forward and back across the machine and carry with it all of the shoes 65 composing the entire group, so that, when all of the stacks are being operated upon, in the embodiment shown, four sheets will be simultaneously withdrawn, one from each of the four stacks, and the sheets thus withdrawn will be simultaneously transported to the forward side of the machine and deposited in processional arrangement one in advance of the other from end to end of the machine.

The upper end of each of the stems 67 carries a pair of oppositely disposed rollers 76—76. One of the rollers 76 is positioned to ride, during the rearward movement of the universal bar, upon a cam trackway 77 hinged at 77a to an adjacent portion of the

frame, and the other roller is positioned to ride backward upon a fixed cam trackway 77b, which is located at a somewhat lower level than the hinged cam trackway 77.

The arrangement constitutes a switchback, which permits each of the shoe stems to be elevated to a relatively high level against spring tension on the rearward movement until the end of the associated hinged cam track is reached, at which point the roller will suddenly escape from the terminus of the hinged cam track, and the shoe will drop downwardly to engage the uppermost or exposed sheet on the stack.

On the rearward movement, the other roller will ride upon the fixed cam track and the shoe will maintain a lower position (see Fig. 6) until the end of the fixed track is reached, during which time the companion roller will be at a proper elevation to lift the forward end of the pivoted cam track, which latter will be elevated during the forward movement of the shoe by contact of the associated roller with its under surface.

Motion is imparted to the universal bar 71 by means of a link 78 which is bifurcated at its forward end 79 and hinged upon a pintle 80 carried by the universal bar, as shown in Fig. 1. The rear end of the link 78 is pivoted to a swinging arm 81, the lower end of which is pivoted to a plate 82 secured to the framework of the machine, and the swinging arm 81 has pivoted thereto a link 83 which in turn is pivoted to a cam arm 84 of J-shaped formation, which is pivoted at the center of its base upon a pivot pin 85, and is provided at its forward end with a roller 86 which engages a cam 87 mounted upon the cam shaft. This serves to impart a forward movement to the linkage which connects with the universal bar, but the rearward movement is provided for by a pear-shaped cam 88 which at the proper time engages the inner or forward side of the cam arm 84 to impart a rearward swinging movement to the cam arm, the cams 87 and 88 being properly configured to thus act in succession and to afford the necessary clearances to provide for the respective movements without interference.

The frame 70 of each shoe is provided near its base with a short rock shaft 89 which carries a clamping block 90 which is urged upwardly by the action of a spring 91 which encircles the rock shaft, with the result that, when free to act, the clamping block will be swung upwardly into clamping position, as illustrated in Fig. 6.

The clamping block 90 is provided with a rubber insert 92 for contact with the lower marginal edge of a sheet of paper, so that when in this position the paper will be clamped between the rubber sole 66 of the shoe and the rubber insert 92 for withdrawal.

The clamping block is provided with a rearwardly extending heel 93 provided with

a beveled edge 94 which is adapted, when the clamping block is swung downwardly, as in Fig. 5, to cam past a latch stem 95 which is downwardly urged by a spring 96, with the result that when the heel 93 has been swung past the latch stem, the latter will spring downwardly to hold the clamping block in open position.

The latch stem 95 extends upwardly through the lower cross wall of the shoe frame 70, and its upper end 97 is turned outward in the form of a finger through a slot 98 in the side wall of the shoe frame 70 (see Fig. 10).

When the universal bar 71 bearing the shoe frames moves to the rear, the shoes will be elevated by the rolling of the rollers 76 along the hinged cam trackways 77, and the relation of the parts will be such that the shoes will be sufficiently elevated, as in Fig. 5, to carry each finger 97 above the upper edge of the associated stop fingers 99 which extend forwardly from the proximate gauge bar 54, and at the same time the springs for the stem 67 of the associated shoes will act to depress the shoes and maintain a clamping pressure against the upper sheet of the stack.

As a result of this correlation of the parts, as each shoe approaches the paper stack, and as it is released and bears downwardly by the action of its spring while the latch stem is restrained against corresponding movement, the heel of the clamping block will be released from latching engagement with the latch stem, but the latch block is not free to swing upwardly in closed position on account of its instant contact with a movable gate bar 100 (see Fig. 5), which in this position of adjustment stands across the front of the paper stack near the upper edge thereof, and affords an abutment for holding the respective clamping blocks in open or depending position.

As the shoe begins to move forward (Fig. 6), the upper end 97 of the latch stem will escape the confinement of the stop finger 99, and at the same time the clamping block will begin to swing upwardly past the forward edge of the gate bar 100, so that it will immediately thereafter spring up into biting or clamping relation against the under edge of the paper sheet, as in Fig. 6, and this adjustment will continue while the paper sheet is being withdrawn. At the forward terminus of the movement, an arm 101 (see Fig. 10) which is formed on the end of the rock shaft 89 will come into contact with a stop finger 102 (see Fig. 1) which intercepts its path of movement and will have the effect of swinging down the clamping block into depending or open position and causing the beveled heel of the clamping block to cam past the end of the associated latch stem, which latches the clamping block in its open position preparatory to the next rearward

movement of the shoe. This opening movement, of course, releases the paper sheet.

The gate bar 100 is provided with forwardly extending ears 103 which are slidably mounted on vertical guide rods 104 rigidly secured to lugs 105 secured to the frame of the machine, and the gate bar is urged upwardly by coil springs 106 which encircle the guide rods 104. As the shoe moves rearwardly toward the stack and is released from its elevated position on the cam trackway 77, the gate bar will be depressed by contact of an adjustable screw 107 with one of the lugs 103 of the gate bar (see Fig. 6), from its elevated position, as shown in Fig. 6, to its lower position, as shown in Fig. 5.

The screw 107 should be adjusted so as to bring the upper rim or edge of the gate bar slightly below the upper surface of the stack (see Fig. 5), which affords a slot at 108 for the withdrawal of a single sheet from the top of the stack. The upper rear margin of the gate bar is beveled at 109, which facilitates the release and withdrawal of the uppermost sheet (see Fig. 6), and at the same time interposes a barrier against the withdrawal of the underlying sheets, which, however, may be dragged forward slightly to abut against the beveled surface 109, but will afterwards be restored to exact vertical plane as the gate bar springs upwardly under spring pressure after its release by the adjustable screw 107.

The screw 107 should be adjusted so as to bring the upper rim or edge of the gate bar either in flush relation with or slightly below the upper surface of the stack (see Fig. 5), which latter adjustment affords a slot at 108 for the withdrawal of a single sheet from the top of the stack. Where very thin paper sheets are being fed, it suffices to make an adjustment which will bring the upper rim of the gate bar into light contact with the surface of the rubbershoe, which being formed of sponge rubber, will compress sufficiently when brought in contact with the upper surface of the thin sheet to permit the latter to be withdrawn over the gate bar without affording a slot for its removal.

The upper rear margin of the gate bar is beveled at 109 which facilitates the release and withdrawal of the uppermost sheet (see Fig. 6) and at the same time it imposes a barrier against the withdrawal of the underlying sheets which, however, may be dragged forward slightly to abut against a beveled surface 109 during the feeding of the uppermost sheet, but will afterwards be restored as the gate bar springs upwardly under spring pressure after it is released by the adjustable screw 107. This restoring action is supplemented by the provision of fingers 109a which project rearwardly from each of the shoe frames (see Fig. 10) and which on their rearward movement of the shoes will

contact any paper sheets which may be displaced from vertical alignment in the stack and true the stack up before the withdrawal of the uppermost sheet begins.

5 The rear terminus of the fixed cam track 77^b, as shown, is so located that it will engage the associated roller at the upper end of the shoe stem before the adjusting screw 107 slips past the end of the lug 103 upon the associated gate bar.

10 In view of the fact that the space between the sole of the shoe and the gate bar is exactly gauged by an adjustment of the screw 107, it is evident that but a single sheet will be 15 extracted from each stack and clamped as the universal bar begins its forward movement.

Accumulating mechanism

20 The frame of the machine, in advance of the partition wall 30, is provided with a plurality of slatted floors, one for each stack, which floors are afforded by spaced bars 110, the bars of each set being upturned at their 25 right hand ends 111 in Fig. 7, which ends are secured to cross rails 112, one for each set of bars. The floors thus afforded present their upper surfaces in the same plane, but each slatted floor affords a throated entry-way 30 113 to the space beneath, as best indicated in Fig. 7. Immediately below the slatted floors is located a longitudinally extending carrier consisting of two endless chains 114 in spaced relation to one another, which 35 chains, as best shown in Figs. 3 and 4, are mounted on idle sprockets 115 and 116, at opposite ends of the machine.

The sprockets 116 (see Fig. 2) are mounted upon a sprocket shaft 117, which is power 40 driven by means of a sprocket chain 118 passing over a sprocket wheel 119 on the sprocket shaft 117 and over a sprocket wheel 120 on a driving shaft 121, which extends from front to rear of the machine, and as 45 shown is provided with a pulley 122 carrying a belt 123 which is driven by a motor 124. Suitable means are afforded the sprocket chains to maintain the upper turns in level relation by the provision of aligned idle sprocket wheels 125—125 (see Fig. 2). 50 Proper tension is maintained on the driving sprocket chain 118 by the provision of an idle sprocket 126.

Corresponding links in the endless carrier 55 chains 114 serve as a mounting for cross slats 127 which stand in closely spaced relation to one another and serve as mountings each for a plurality of aligned C-shaped bracket fingers 128, the upper turns of which slightly 60 overlap one another when the slats 127 occupy the upper run in their orbit of travel (see Fig. 7), so that the brackets in unison constitute rows of carriers operating between the bars constituting the slatted floors, 65 and presenting their surfaces in substantial-

ly flush relation with the surfaces of the bars composing the floors. This arrangement affords a substantially continuous surface for the reception of the sheets, and permits them 70 to be accumulated in the form of a stack as the carrier advances toward the discharge end of the machine.

At the rear of the series of slats 127 is located a rock shaft 129 provided with a series of upstanding prongs 130 which are 75 urged forwardly by springs 131, and the prongs in unison constitute a rake, the prongs or tines of which are adapted to work between the bars 110 constituting the slatted floors in the accumulation of the paper sheets. 80 As the prongs approach the left or delivery end of the machine, they are tilted backwardly by contact of a crank arm 132 formed on the end of the rock shaft 129, with a curved cam surface 133 located at the forward end 85 of the machine and within the path of movement of the crank arm. This enables the prongs to clear a delivery table 134 at the discharge end of the machine. Suitable gearing and connections are provided for 90 driving the cam shaft 52 at a speed commensurate with the travel of the endless conveyor, but it is not deemed necessary to describe such power transmission elements in detail.

Operation

95 In operation, one or more of the stack platforms are loaded with columns of sheets, which may be in the form of inserts of various sizes intended for enclosure as a group 100 in a mailing envelope or package. The platforms are each depressed to the required degree to permit the columns of sheets to be positioned and vertically aligned, after which the machine is ready for operation. 105 Each of the platforms will be forced upwardly to bring the surface of the stack supported thereby in contact with the gauge bars, which limit the upward travel of the top of the stack so that all of the upper sheets 110 will stand in the same plane.

As the machine begins to operate, the universal bar carrying the feeding shoes will move to the rear and in elevated relation by 115 contact of the rollers with the respective pivoted cam tracks, and as the shoes approach the termini of the respective tracks, the upward pressure of each of the stacks will be momentarily relieved by the drawing 120 down of the respective platforms, so that as the feeding shoes drop into position to engage the uppermost sheets, the latter will be free to slip forward as the shoes begin their return movement.

The friction of the rubber soled shoes will 125 drag forward a sheet from each of the stacks, and these will pass over the respective gate bars while the latter are still in their lowered position to afford space for the withdrawal of the sheets. As the sheets are drawn 130

forwardly, the gate bars will be released, as in Fig. 6, and will move upwardly under the advancing sheets, which will be bowed upwardly and drawn over the obstruction thus interposed, which, however, will realign the underlying sheets and prevent any considerable displacement thereof. Slightly before the final upward movement of the gate bars, and while the soles of the shoes still overlie the respective stacks, the clamping blocks will be released and sprung upwardly into clamping relation to the respective shoes with which they are associated, so that the group of sheets will be positively gripped and carried forward over the slatted floors until the forward edges of the sheets are brought into contact with stripper bars or plates 135, one for each stack, which plates are supported from riders 136 adjustably mounted on rails 112, which permits the point of deposit to be properly gauged for each of the sheets composing the intended group.

The fingers 102 are also carried by the same riders which support the stripper bars, so that the two devices will be adjusted in unison, with the result that in each instance the clamping block 90 will swung down to releasing position at the instant the edge of the paper encounters the stripper bar, so that the point of deposit will be exactly maintained for each sheet. In addition to the stripper bars, the space allotted in each instance to the respective sheets can be adjusted by the provision of a rear gauge bar 138 (see Fig. 5) which fits upon a selected one of the bars composing the slatted floor and serves to support a rear wall for defining the space allotted for the reception of the delivered sheets.

In Fig. 1, it will be noted that the two right hand stacks are composed of sheets of full length from front to rear, while the two left hand stacks are composed of narrow sheets, and it will also be noted that the rear gauge bars 138 in the latter instance are adjusted comparatively close to the front of the machine, which arrangement serves to properly align the respective sheets preparatory to their accumulation in superposed relation.

As soon as the set of sheets has been thus aligned, the movement of the endless chain conveyors will bring the slatted section with the upstanding brackets into position immediately adjacent to the first sheet of the series (at the right in Fig. 4), and the prongs 130 will sweep through the spaces between the bars composing the first slatted floor and carry forward the first sheet, which as it advances will dip or be forced down, as in Fig. 7, and slide under the next succeeding slatted floor and through the throated space 113, so that it will immediately underlie the next succeeding sheet of the series as the latter is engaged by the tines and shoved forward,

with the result that before the delivery end of the machine is reached, all of the sheets will lie superposed and in abutting relation at their right hand edges with the tines, and in this condition be delivered onto the discharge table 134, for folding or other desired manipulation.

It will thus be seen that by suitably adjusting the present machine, groups of sheets, each group having the sheets uniformly arranged in the intended relation to one another, will be accumulated and delivered, the only limitation in the manner of deposit being that the rear edges of the sheets which are contacted by the prongs will stand in even relation to one another.

It frequently happens that in the feeding and accumulating of sheets for insertion into envelopes, some of the inserts will be thicker than others, but this inequality in thickness can be easily compensated for by regulating the gap or space afforded between the respective gate bars and the feeding shoe, so that in each instance a space equal to or slightly less than the thickness of a single sheet will be afforded. Furthermore, the same inequality in the thickness of sheets will be reflected in the height of the respective stacks, but the feeding arrangement provided will constantly maintain the uppermost sheets at the same feeding level, so that a single universal bar carrying a plurality of feeding shoes may operate upon a plurality of stacks.

The invention is one which insures precision not only in the simultaneous feeding of sheets but also in the accumulation of the sheets in definitely stacked or superposed arrangement to one another. The release of the uppermost sheet will be permitted by the momentary lifting of the rubber tipped fingers 59 at the instant the sheet is contacted by the rubber sole of the shoe, but as soon as the uppermost sheet has been partially withdrawn, the rubber tipped fingers 59 will again descend and contact the underlying sheets of the stack, so that displacement will be prevented.

The arrangement is one which insures a constant order in stacking arrangement throughout the entire period of delivery and until the stack has been completely exhausted.

Although the invention has been described with particularity as to detail, it is not the intention to limit the invention strictly to the construction shown and described by way of exemplification, since numerous variations thereof may be introduced without departing from the spirit of the invention.

I claim:

1. In a machine of the class described, a plurality of platforms adapted respectively to each carry a stack of sheets, means for elevating the respective platforms for maintaining the uppermost sheets at the intended feed-

ing line, and a universal member carrying a plurality of feeding members adapted each to engage and withdraw the uppermost sheet of one of the stacks, said universal member being movable to withdraw the sheets engaged by the respective feeding members, and means for releasing the respective sheets, receiving means for supporting the released sheets in processional relation, and an accumulating member movable with relation to the receiving means for successively engaging the deposited sheets and accumulating them in superposed relation.

2. In a machine of the class described, a plurality of platforms adapted respectively to each carry a stack of sheets, means for elevating the respective platforms for maintaining the uppermost sheets at the intended feeding line, and a universal member carrying a plurality of feeding members adapted each to engage and withdraw the uppermost sheet of one of the stacks, said universal member being movable to withdraw the sheets engaged by the respective feeding members, and means for releasing the respective sheets, receiving means for the released sheets in the form of a plurality of slatted floors in aligned relation to one another, one floor for each of the stacks, and accumulating means movable through the slatted floors and adapted to engage and accumulate the sheets into superposed relation.

3. In a machine of the class described, a plurality of platforms adapted respectively to each carry a stack of sheets, means for elevating the respective platforms for maintaining the uppermost sheets at the intended feeding line, and a universal member carrying a plurality of feeding members adapted each to engage and withdraw the uppermost sheet of one of the stacks, said universal member being movable to withdraw the sheets engaged by the respective feeding members, and means for releasing the respective sheets, receiving means in the form of a series of slatted floors in aligned relation to one another and each being configured to divert a sheet oncoming from behind to a position beneath the floor, and accumulating means provided with prongs operating through the slatted floors and adapted to successively engage and sweep forward the deposited sheets to accumulate the same in superposed relation.

4. In a machine of the class described, a plurality of platforms adapted respectively to each carry a stack of sheets, means for elevating the respective platforms for maintaining the uppermost sheets at the intended feeding line, and a universal member carrying a plurality of feeding members adapted each to engage and withdraw the uppermost sheet of one of the stacks, said universal member being movable to withdraw the sheets engaged by the respective feeding members,

and means for releasing the respective sheets, a plurality of slatted floors, one for each of the stacks, positioned to receive sheets deposited thereonto, an endless traveling member provided in part with a slatted surface and provided with an accumulating member having prongs adapted to work through the slatted floors and sweep together the deposited sheets into superposed relation and deliver them as a group.

5. In a machine of the class described, a plurality of platforms adapted respectively to each carry a stack of sheets, means for elevating the respective platforms for maintaining the uppermost sheets at the intended feeding line, and a universal member carrying a plurality of feeding members adapted each to engage and withdraw the uppermost sheet of one of the stacks, said universal member being movable to withdraw the sheets engaged by the respective feeding members, and means for releasing the respective sheets, a plurality of slatted floors, one for each of the stacks, positioned to receive sheets deposited thereonto, an endless traveling member provided in part with a slatted surface and provided with an accumulating member having prongs adapted to work through the slatted floors and sweep together the deposited sheets into superposed relation and deliver them as a group, and means for depressing the prongs after each delivery of a group of sheets.

6. In a machine of the class described, a plurality of platforms adapted respectively to each carry a stack of sheets, means for elevating the respective platforms for maintaining the uppermost sheets at the intended feeding line, and a universal member carrying a plurality of feeding members adapted each to engage and withdraw the uppermost sheet of one of the stacks, said universal member being movable to withdraw the sheets engaged by the respective feeding members, and means for releasing the respective sheets, a plurality of slatted floors, one for each of the stacks, positioned to each receive sheets when released, each of the floors being configured to discharge sheets therefrom beneath the next succeeding floor, and movable means adapted to sweep through the slatted floors to engage the sheets supported thereon and accumulate them into superposed relation.

7. In a machine of the class described, the combination of means for supporting the sheet in column formation and upwardly feeding the column to present the top sheet at the intended feeding position, means for engaging and withdrawing the uppermost sheet of the column and carrying it to a position beyond the column, means for insuring the release of the sheet after it has been carried forward, means for supporting the sheet after release, and a movable device op-

erating in conjunction with said supporting means for engaging and shoving forward the deposited sheets.

8. In a machine of the class described, the combination of means for individually supporting each stack of a plurality of stacks of sheets and successively bringing the uppermost sheet of each stack to the intended feeding position, means for simultaneously engaging the uppermost sheet of each of the stacks and carrying the same to a point beyond the position occupied by the stacks, and for releasing the respective sheets at positions to bring them into processional relationship, and means for moving at an angle to the movement of the feeding means and adapted to successively engage the sheets constituting the procession and accumulate them into a group of superposed sheets.

9. In a machine of the class described, the combination of means for supporting and forwardly feeding a plurality of sheets to the intended feeding position, means for engaging and withdrawing the uppermost sheets of the respective columns and carrying them to a position, in processional relation, beyond the columns, means for insuring the release of the respective sheets after they have been carried forward to such position, a plurality of slatted floors, one for each of the stacks, positioned to each receive a sheet when released, each of the floors being configured to discharge sheets therefrom beneath the next succeeding floor, and movable means adapted to sweep through the slatted floors to engage the sheets supported thereon and accumulate them into superposed relation.

10. In a machine of the class described, the combination of means for supporting and forwardly feeding a plurality of sheets to the intended feeding position, means for engaging and withdrawing the uppermost sheets of the respective columns and carrying them to a position, in processional relation, beyond the columns, means for insuring the release of the respective sheets after they have been carried forward to such position, a plurality of slatted floors, one for each of the stacks, positioned to receive sheets deposited thereon, an endless traveling member provided in part with a slatted surface and provided with an accumulating member having prongs adapted to work through the slatted floors and sweep together the deposited sheets into superposed relation and deliver them as a group.

11. In a machine of the class described, the combination of means for supporting and forwardly feeding a plurality of sheets to the intended feeding position, means for engaging and withdrawing the uppermost sheets of the respective columns and carrying them to a position, in processional relation, beyond the columns, means for insuring the release

of the respective sheets after they have been carried forward to such position, a plurality of slatted floors, one for each of the stacks, and endless accumulating means provided with prongs operating through the slatted floors and adapted to successively engage and sweep forward the deposited sheets to accumulate the same in superposed relation.

12. In a machine of the class described, the combination of means for supporting and forwardly feeding a plurality of sheets to the intended feeding position, means for engaging and withdrawing the uppermost sheets of the respective columns and carrying them to a position, in processional relation, beyond the columns, means for insuring the release of the respective sheets after they have been carried forward to such position, and receiving means in the form of a series of slatted floors in aligned relation to one another and each being configured to divert a sheet oncoming from behind to a position beneath the floor, and accumulating means provided with prongs operating through the slatted floors and adapted to successively engage and sweep forward the deposited sheets to accumulate the same in superposed relation.

13. In a machine of the class described, the combination of means for supporting and forwardly feeding a plurality of sheets to the intended feeding position, means for engaging and withdrawing the uppermost sheets of the respective columns and carrying them to a position, in processional relation, beyond the columns, means for insuring the release of the respective sheets after they have been carried forward to such position, and receiving means in the form of a series of slatted floors in aligned relation to one another and each being configured to divert a sheet oncoming from behind to a position beneath the floor, and accumulating means in the form of an endless chain, provided with prongs operating through the slatted floors and adapted to successively engage and sweep forward the deposited sheets to accumulate the same in superposed relation.

14. In a machine of the class described, the combination of means for supporting and forwardly feeding a plurality of sheets in column form to the intended feeding position, means for engaging and withdrawing the uppermost sheets of the respective columns and carrying them to a position, in processional relation, beyond the columns, means for insuring the release of the respective sheets after they have been carried forward to such position, receiving means positioned to receive and hold the respective sheets in processional relation, and accumulating means movable in the line of the procession and adapted to successively engage and sweep forward the deposited sheets to accumulate the same in superposed relation.

15. In a machine of the class described, the combination of means for supporting and forwardly feeding a plurality of sheets in column form to the intended feeding position, 5 means for engaging and withdrawing the uppermost sheets of the respective columns and carrying them to a position, in processional relation, beyond the columns, means for insuring the release of the respective sheets 10 after they have been carried forward to such position, receiving means adapted to receive the respective sheets in processional relation, and accumulating means movable along the line of the procession of sheets and provided 15 with prongs adapted to successively engage and sweep forward the deposited sheets to accumulate the same in superposed relation.

In witness that I claim the foregoing I have 20 hereunto subscribed my name this 29th day of October, 1930.

JAY H. ELWELL.

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