July 11, 1939. H. P. ELLIOTT 2,165,748

ADDRESSING MACHINE AND CARD FEEDING MECHANISM THEREFOR

Filed Jan. 31, 1938 3 Sheets-Sheet 1

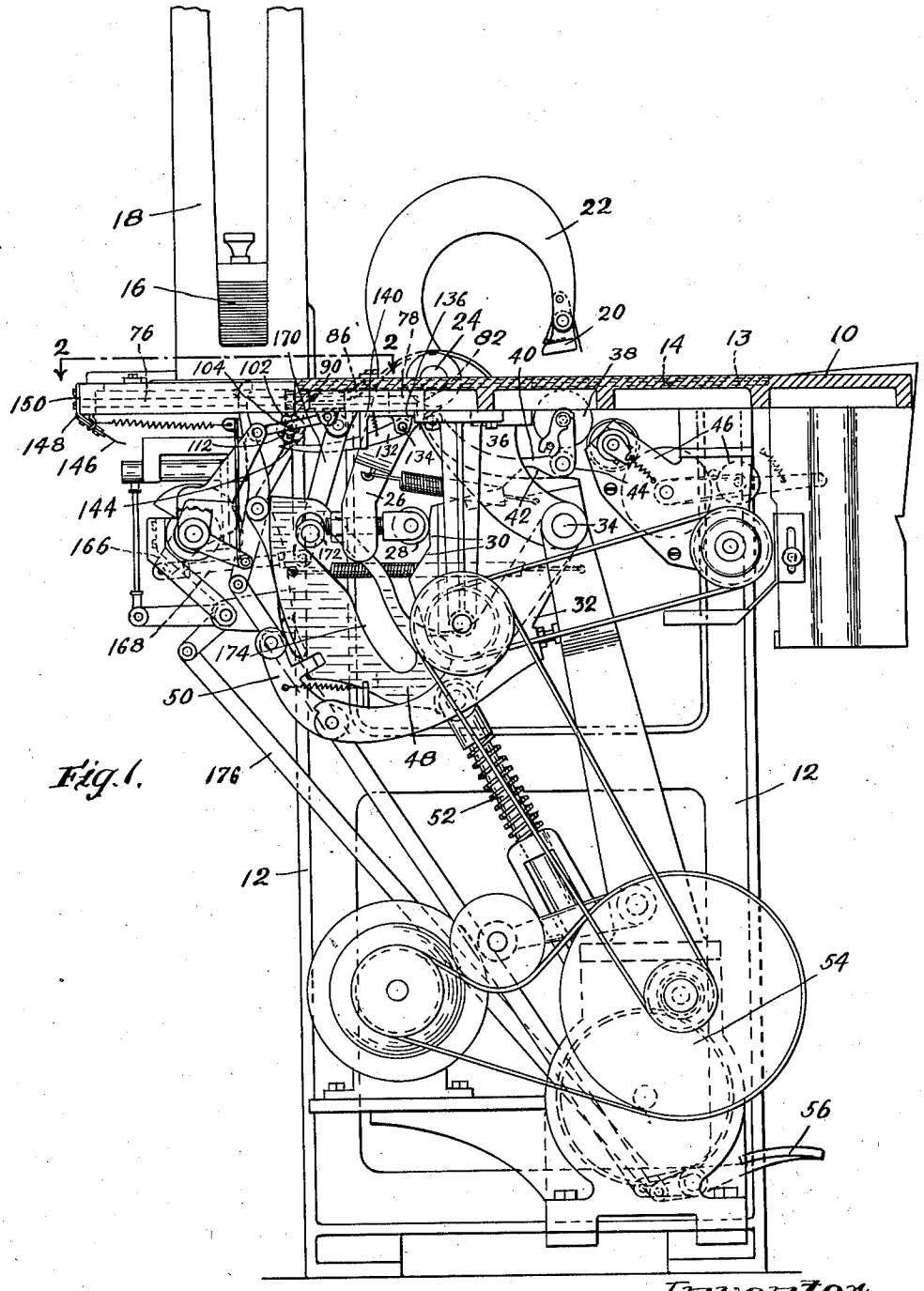



Fig. 1.

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ADDRESSING MACHINE AND CARD FEEDING MECHANISM THEREFOR

Filed Jan. 31, 1938 3 Sheets-Sheet 2

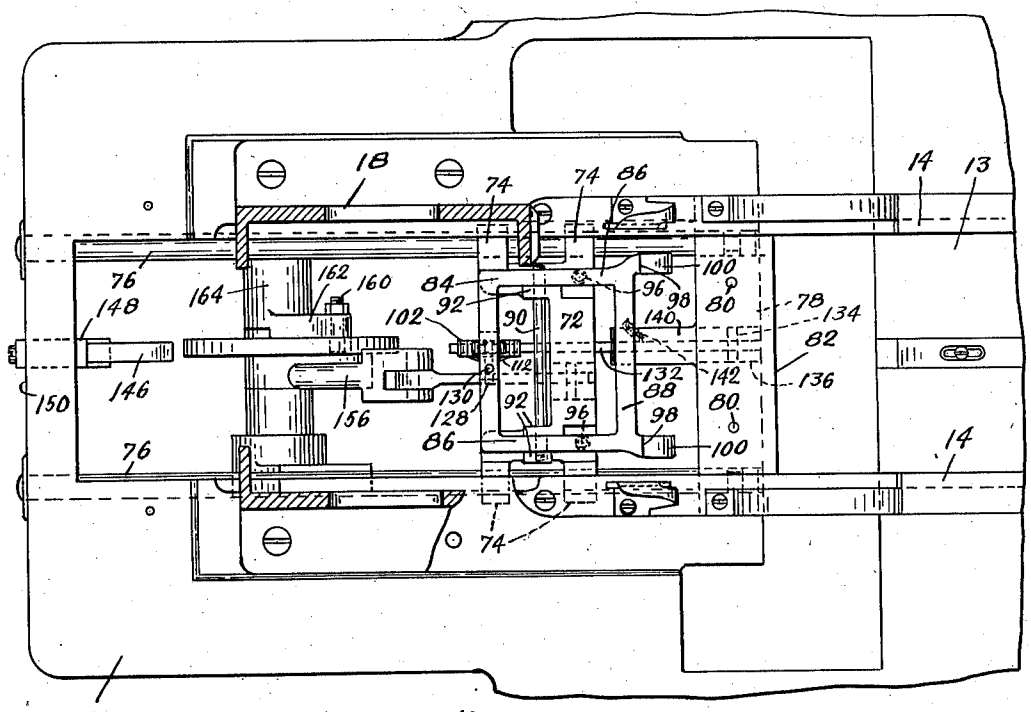



Fig. 2.

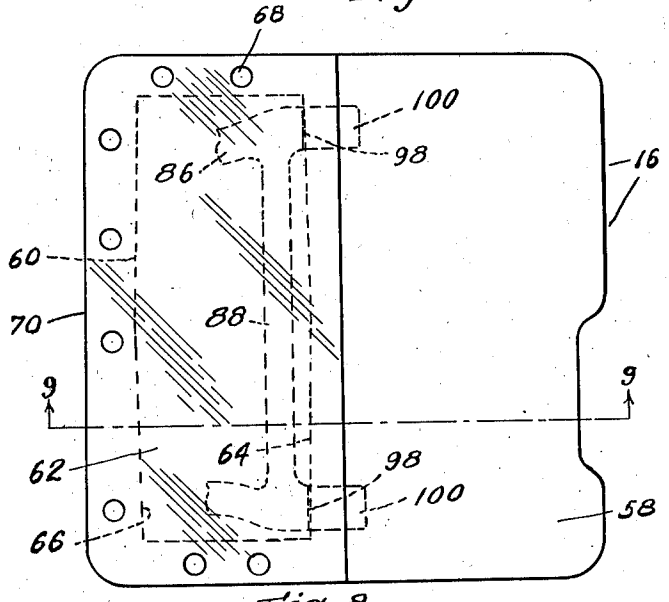



Fig. 8.

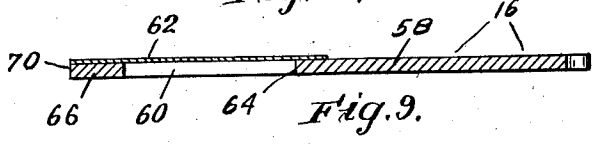



Fig. 9.

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ADDRESSING MACHINE AND CARD FEEDING MECHANISM THEREFOR

Filed Jan. 31, 1938 3 Sheets-Sheet 3

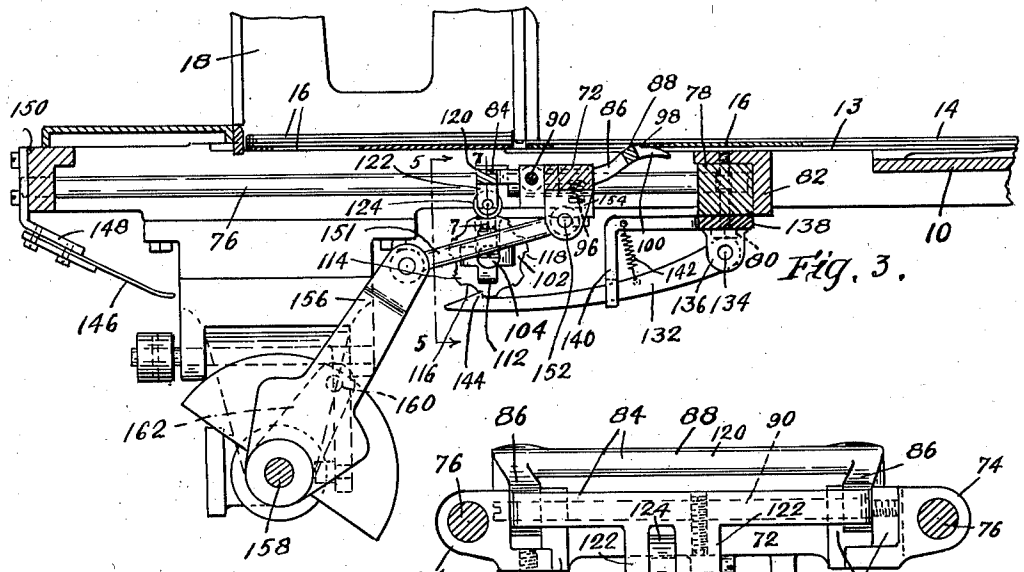



Fig. 3.

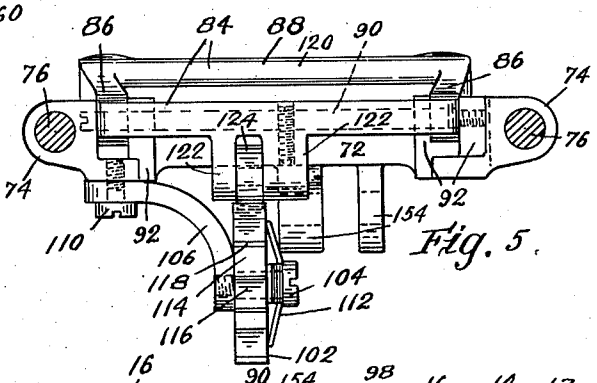



Fig. 5.

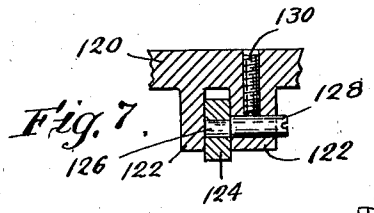



Fig. 7.

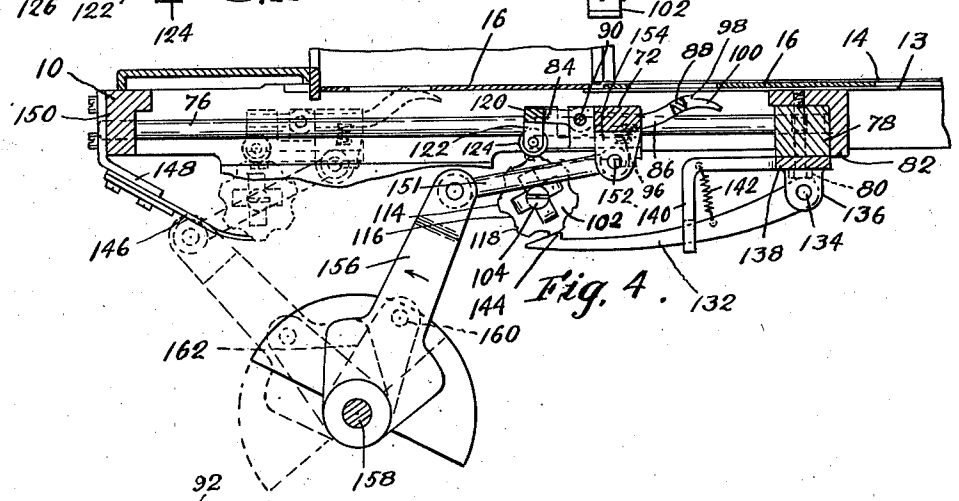



Fig. 4.

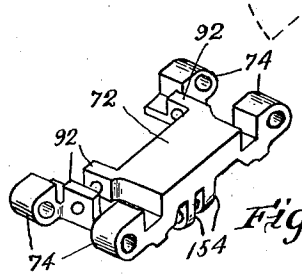



Fig. 6.

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Patented July 11, 1939 2,165,748

# UNITED STATES PATENT OFFICE

2,165,748

## ADDRESSING MACHINE AND CARD FEEDING MECHANISM THEREFOR

Harmon P. Elliott, Watertown, Mass.

Application January 31, 1938, Serial No. 187,835

12 Claims. (Cl. 101—48)

This invention relates to addressing machines, adapted to operate on a series of stencils to print the address forming characters carried thereby and has particular reference to mechanism for advancing the successive stencils from a stack thereof toward a printing position.

A stencil as used in an addressing machine usually comprises a relatively thick frame either of solid or laminated paper stock having a window therein traversed by a stencil sheet bearing the address printing characters. The well known "Belknap" stencil with which this invention is particularly concerned, although to which it is not necessarily limited, comprises a frame composed of a single thickness of paper stock formed with a window therein. The stencil sheet overlies the window on one face of the frame.

The usual manner of moving the successive stencils out of a vertical stack of such stencils and into a guideway is by a reciprocating pusher which pushes against the leading edge of the stencil window so that the frame in the rear of this edge, which frame usually has machine-controlling perforations, is free from any tendency to buckle. Heretofore, however, the pusher in its return movement has dragged over the stencil and particularly the stencil sheet thereof and is liable to rupture the stencil sheet.

Hence an object of the present invention is the provision of pusher mechanism wherein the parts that engage the stencil for advancing it are held out of contact with a stencil during the retraction of the pusher.

A further object of the invention is the provision of a pusher mechanism and control mechanism therefor so arranged that the pusher is alternately conditioned at the end parts of its stroke for movement in one direction in engagement with a stencil and for movement in the opposite direction free from contact with a stencil.

A yet further object of the invention is generally to improve the construction of addressing machines and stencil advancing mechanism therefor.

Fig. 1 is an end elevation of an addressing machine embodying the present invention with the table partly in section.

Fig. 2 is a plan view of the stencil holder and pusher mechanism taken along line 2—2 of Fig. 1.

Fig. 3 is a sectional elevation of the pusher mechanism taken along the median line of Fig. 2.

Fig. 4 is a view similar to Fig. 1 but illustrating the position of the pusher parts in retracted position.

Fig. 5 is a section taken along line 5—5 of Fig. 3, and illustrating a rear view of the pusher.

Fig. 6 is a perspective view of the pusher frame.

Fig. 7 is a sectional detail of the eccentric support for the retracting roller, taken along line 7—7 of Fig. 3.

Fig. 8 is a plan view of a stencil and illustrating the manner in which the pusher engages the leading edge of the window.

Fig. 9 is a cross section of the stencil taken along line 9—9 of Fig. 8.

The addressing machine embodying the present invention is constructed generally as illustrated in my copending application Serial No. 92,582, filed July 25, 1936, and need not be described in great detail.

The machine comprises a horizontal table 10 supported on end frames 12. The table has a groove or depression 13 in the middle of the table extended from front to rear thereof in which are positioned horizontally spaced grooved tracks 14, Fig. 2, which constitute a guideway for the stencils 16 of a vertical stack of such stencils held in a holder 18 located above the guideway at the rear of the table.

A printing platen 20 is located above the guideway for operation upon the successive stencils therein and is carried at the ends of reciprocating arcuate arms 22 pivoted at 24 and having an extension 26 located under the table, said extension 26 carries a roll 28 which cooperates with cam faces 30 of an operating arm 32 pivoted at 34 to a depending bracket 36 fixed to the underside of the table 10 whereby the platen is reciprocated by reciprocation of said operating arm.

Cooperating with the platen 20 is a printing roll 38 rotatably journalled at the free end of a pivoted frame 40 which is reciprocated by engagement of the cam surfaces 42 of said operating arm 32 with a roller 44 of said printing roll frame. The printing roller 38 receives ink on its surface from suitable inking mechanism 46.

The operating arm 32 is reciprocated by an actuating arm 48 pivoted at 34 concentrically with the operating arm and having a disengageable latch connection 50 therewith. The actuating arm is reciprocated by means of a connecting rod 52 which is reciprocated by a power mechanism 54 of well known construction controlled by one of a series of pedals one of which is indicated at 56 to effect one complete printing operation of the aforesaid elements following the momentary depression and subsequent release of the pedal.

The type of stencil 16 for which the invention embodied in the present machine is particularly intended, although to which it is not necessarily limited, is what is generally known as a "Belknap" stencil, illustrated in Figs. 8 and 9. The stencil comprises a relatively thick rectangular sheet 58 of paper stock, usually not laminated, at least in the process of making the stencil from such sheet. The sheet has a usually oblong window 60 cut therethrough, the sheet thus constituting a frame for the window. The window is overlaid with a relatively thin sheet 62 of stencil paper on which the address printing characters are formed, the stencil sheet overlying the edges 64 of the window and being cemented to one face of the sheet of the frame. The frame section 66 around at least three edges of the stencil is relatively narrow. The frame frequently has relatively large perforations 68 only some of which are herein indicated, disposed around the window and through the narrow sections 66 for the purpose of controlling the operation of the addressing machine, such as, discharging into a special receptacle, stencils having a perforation in a location corresponding, for instance, to the expiration date of a magazine subscription. These perforations somewhat weaken the margin of the frame so that the frame tends to bend or buckle at a perforation, especially after the stencil has had long usage, under the friction that the stencil encounters when it is pushed from the stack into the guideway by a pusher of the usual type acting against the trailing edge 70 of the stencil.

The pusher mechanism of the present invention is provided which acts against the leading edge 64 of the stencil window to move the stencil out of the stack into the guideway. Thus any frictional resistance encountered by the stencil in such movement and acting on the marginal part 66 thereof places these parts in tension rather than in compression so that the tendency is to straighten these parts rather than to buckle them.

The pusher mechanism comprises a support or carrier 72 having pairs of ears 74 at the ends thereof mounted loosely on a pair of parallel spaced horizontal guide rods 76 removably secured at their forward ends in a cross block 78 fixed by bolts 80 to a cross piece 82 of the table. The carrier then can be reciprocated on said rods under the holder. The carrier provides pivotal support for a pusher frame 84 comprising a pair of arms 86 connected integrally intermediate their forward ends by a front cross bar 88.

Said arms rearwardly of said cross bar are journalled upon a pivot pin 90 loosely extended through said arms and through a pair of parallel spaced ears 92 at one end of the carrier. A pair of compression springs 96 underlie said arms 86 forwardly of the pivot pin 90 and bear against said arms and the carrier in a direction urging said arms constantly in an upward direction for engagement with superposed stencils. Said arms forwardly of the cross bar 88 are provided with upstanding shoulders or abutments 98 for engagement with the leading edge 64 of the stencil window. Fingers 100 project forwardly from the base of said abutments to underlie the stencil and limit the extent of which the abutments project into the windows and also to insure the correct engagement of the pusher frame with the leading edge of the stencil window. The rearmost position of the carrier and pusher frame is illustrated by the dotted lines Fig. 4 and the almost fully advanced position by the full lines of this figure.

If the pusher frame were allowed to move rearwardly from the full line position in engagement with the stencils under urge of the springs 96 it would ride over and tend to tear the stencil sheet 62. Hence mechanism is provided to depress the leading edge of the pusher frame during the rearward movement and to elevate the frame only when it is in almost retracted position.

Said mechanism includes a cam wheel 102 journalled on a shoulder screw 104 screw-threaded in a bracket 106 fixed to the underside of the carrier by suitable means as the screw 110. A spring fingered washer 112 is located on the screw 104 and exerts pressure against the head thereof and against said cam wheel to hold the said cam wheel from unintended rotation. Said cam wheel is provided with a series of high points or lobes 114 and intervening low points or arcuate depressions 116. The lobes 114 are provided with radial detent faces 118.

The arms 86 of the pusher frame are integrally connected rearwardly of the pivot pin 90 by a cross bar 120 provided in the middle part thereof with a pair of depending ears 122 between which a cam roller 124 is located, the roller having a diameter conformed approximately to the diameter of the circular recesses 116 of the cam wheel 102. The roller is rotatably mounted on an eccentric part 126 of a bearing pin 128 angularly adjustably located in one of the ears 122 and secured against rotation by the set screw 130, see Fig. 7. With this arrangement the roller 124 can be raised and lowered by the angular adjustment of the pin 128 so as to raise and lower the forward end of the pusher frame and thereby to adjust the depth of engagement of the abutments 98 of the pusher frame with the stencil.

As the pusher carrier is moved forwardly from its rearmost position the roller 124 of the pusher frame is adapted to be in a depression 116 of the cam wheel 102. The springs 98 are thus effective in holding the forward end of the pusher frame yieldingly in elevated position so that the pusher frame can engage the leading edge of the stencil window and thereby advance the lowermost stencil of the stack in the holder 18 out of the stack and into the stencil guideway.

During the first part of the rearward movement of the pusher the cam wheel 102 is adapted to be rotated sufficiently to position a lobe 114 under the pusher roll 122, thereby to raise the roll end of the pusher frame and depress the forward end so that the pusher can move rearwardly free from engagement with an overlying stencil. This rotation of the cam wheel is accomplished automatically during the first part of the rearward movement of the pusher by a rearwardly extended latch member 132 pivoted at its forward end on a pin 134 disposed between ears 136 of a plate 138 secured to the underface of the cross block 78 by the aforesaid bolts 80.

Said plate 138 has a rearwardly projecting arm 140 provided with a bifurcated downturned end between the furcations of which the latch member 132 is located and held against sidewise movement. The latch member is normally held in elevated position by a tensile spring 142 the ends of which are fixed respectively to the arm 140 and the latch member 132. The latch member is provided at its rear end portion with a hook 144 which the cam wheel 102 rides over during the final movement of the pusher into fully advanced position so that the hook 144 is

disposed behind a lobe 114 and in engagement with the detent face 118 thereof.

When the pusher moves rearwardly the cam wheel is caught by the latch member 132 and is caused to be rotated sufficiently to position a lobe 114 under the pusher frame roll 124, thereby to raise the rear end of the pusher frame and depress the front end thereof. Further movement of the pusher in a rearward direction causes the cam wheel to ride off the latch member without further rotation.

When the pusher arrives about to the end of its rearward movement the cam wheel 102 is adapted to be further rotated sufficiently to position a depression 116 under the roller 124, thereby to permit the forward end of the pusher frame to be moved upwardly by the springs 95 into the window of the lowermost stencil of the stack, as indicated by the dotted lines Fig. 4. Rotation of the cam wheel at the end part of the return movement of the pusher is accomplished by a spring finger 146 secured to a bracket 148 depending from the rear edge 150 of the table 10 and projecting forwardly under the table so that the spring finger projects forwardly into the path of final movement of translation of the cam wheel. As the cam moves into its final rearmost position the detent face 118 of the wheel is brought into engagement with the end of the finger 146 and further rearward movement of the wheel in such engagement causes the wheel to be rotated sufficiently to position a recess 116 under the pusher frame roll 124 and thereby effect the raising of the forward end of the pusher frame.

The pusher is reciprocated more or less in the manner described in my aforesaid application by means of a connecting link 151 pivoted at its forward end on a pin 152 carried by ears 154 of the carrier 72. The rear end of the link is pivoted to an arm 156 journalled loosely on an oscillatable shaft 158 and having a disengageable driving connection therewith through a pin 160, see Fig. 2, seated removably in an aperture in a part of said arm, the pin being carried by an arm 162 of a hub 164 which oscillates with the shaft 158 but is free to slide axially thereof to disengage said pin 160 from said arm 156. Said shaft 158 is oscillated by means of an arm 166, see Fig. 1, fixed thereto and connected through a connecting rod 168 with an arm 170 pivoted at its upper end to the underside of the table 10 and having a cam roll 172 which is located in a cam slot 174 of the reciprocating actuating arm 48. The disengaging movement of the hub 164 can be effected manually by the operation of mechanism controlled by a link 176 operated by one of the aforesaid pedals 56. This mechanism, however, forms no part of the present invention and is specifically described in my aforesaid application.

I claim:

1. In an addressing machine, a holder for a stack of stencils, a stencil guideway, a pusher reciprocable under said holder to advance the stencils out of said holder and along said guideway, and means responsive to the movements of the pusher for positioning the pusher for engagement with a stencil in the advancing movement of the pusher and for removing the pusher from contact with an overlying stencil during the retraction of the pusher.

2. In an addressing machine, a holder for a stack of stencils, a guideway, a pusher movable in an advancing direction in engagement with a stencil to move it out of said holder into said guideway and means responsive to the retraction movement of the pusher for effecting such movement of the pusher free from contact with a stencil.

3. In an addressing machine, a holder for a stack of stencils, a guideway, a pusher having means for engaging a stencil during the advancing movement of the pusher for moving the stencil out of said holder into said guideway, and means responsive to retraction movement of the pusher for holding said pusher engaging means out of engagement with an overlying stencil during the retracting movement of said pusher.

4. In an addressing machine, a holder for a stack of stencils, a guideway, a pusher comprising a reciprocating carrier, a stencil engaging member thereon, means carried by and reciprocating with said carrier for supporting said stencil engaging member in stencil engaging position during the advancing movement of said carrier to move a stencil out of said holder into said guideway and to support said member out of stencil engaging position during the retracting movement of said carrier, and means responsive to the reciprocating movements of said carrier for operating said member supporting means.

5. In an addressing machine, a holder for a stack of stencils, a guideway, a reciprocable pusher movable in one direction to engage and move a stencil out of said holder into said guideway, a control member for said pusher movable with said pusher having a position to support said pusher for stencil engagement and another position to support said pusher away from stencil engagement, and means located at the end parts of the movement of said pusher and rendered effective by movements of the pusher for conditioning said control member for engagement with and also for disengagement from the stencil.

6. In an addressing machine, a holder for a stack of stencils, a guideway, a pusher for advancing successive stencils out of said holder into said guideway including a carrier reciprocable in the line of stencil movement, a stencil engaging pusher member pivoted to said carrier, means carried by and movable with said carrier for positioning said pusher member in position to engage a stencil and also for positioning said member free from contact with a stencil, and means independent of said carrier for operating said aforesaid means.

7. In an addressing machine, a holder for a stack of stencils, a guideway, a pusher for advancing successive stencils out of said holder into said guideway including a carrier reciprocable in the line of stencil movement, a stencil engaging pusher member pivoted to said carrier, means carried by and movable with said carrier for positioning said pusher member in position to engage a stencil and also for positioning said member free from contact with a stencil, and means independent of said carrier for operating said aforesaid means to position said stencil engaging pusher member to engage and advance a stencil during the advancing movement of said pusher and to position said pusher member out of contact with a stencil during the retraction movement of said pusher.

8. In an addressing machine, a holder for a stack of stencils, a guideway, a reciprocating pusher for advancing successive stencils from said holder into said guideway including a reciprocating carrier, a pusher member pivotally

mounted on said carrier and having a stencil engaging shoulder, a cam wheel rotatably mounted on said carrier and having alternately raised and recessed portions alternately engageable with a part of said pusher member to hold said shoulder in a position to engage a stencil and also in a position free from contact with said stencil, and means for advancing said wheel in a step by step manner.

9. In an addressing machine, a holder for a stack of stencils, a guideway, a reciprocating pusher for advancing successive stencils from said holder into said guideway including a reciprocating carrier, a pusher member pivotally mounted on said carrier and having a stencil engaging shoulder, a cam wheel rotatably mounted on said carrier and having alternately raised and recessed portions alternately engageable with a part of said pusher member to hold said shoulder in a position to engage a stencil and also in a position free from contact with said stencil, and means for advancing said wheel in a step by step manner at the end parts of the stroke of said pusher to position said pusher shoulder in engagement with a stencil during the advance of said pusher and to position said shoulder out of engagement with a stencil during the retraction of said pusher.

10. In an addressing machine, a holder for a stack of stencils, a guideway, and a reciprocable pusher for advancing successive stencils out of said holder into said guideway, said pusher including a reciprocating carrier, a pusher member pivoted intermediate its ends to said carrier and having a stencil engaging shoulder at one end and a roller at its other end, a cam wheel carried by and journalled on said carrier disposed in engagement with said roll and having a series of elevated and recessed parts adapted to be successively positioned under said roller to support said pusher member in stencil engaging position and also away from said position, and means located at the opposite ends of the path of travel of said pusher alternately engageable with said cam wheel for advancing it the distance between a notch and a recess for strokes of said pusher in opposite directions.

11. In an addressing machine, a holder for a stack of stencils, a guideway, and a reciprocable pusher for advancing successive stencils out of said holder into said guideway, said pusher including a reciprocating carrier, a pusher member pivoted intermediate its ends to said carrier and having a stencil engaging shoulder at one end and a roller at its other end, a cam wheel carried by and journalled on said carrier disposed in engagement with said roll and having a series of elevated and recessed parts adapted to be successively positioned under said roller to support said pusher member in stencil engaging position and also away from said position, a latch member located in position to be engaged by said cam wheel during the end part of the forward movement of the pusher and to rotate said cam wheel during the first part of the return movement of the pusher to present a raised part of said cam wheel to engage said roller, whereby to hold said pusher member away from a stencil during the retraction movement of the pusher, and an abutment latch member disposed in position to engage said cam wheel during the latter part of the retraction movement of said pusher to advance said cam wheel to position a recess under said roller whereby to position said pusher member to engage a stencil upon the succeeding advance of said pusher.

12. In an addressing machine, a holder for a stack of stencils, a guideway, a reciprocable pusher for advancing successive stencils from said holder into said guideway, and means operated by movement of the pusher in the line of stencil advance for effecting engagement between said pusher and a stencil during the advancing movement of the pusher and for positioning said pusher out of contact with a stencil during the retracting movement of the pusher.

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