Dec. 2, 1952 W. T. GOLLWITZER 2,619,899

RIBBON INKER IN ADDRESS PRINTING MACHINES

Original Filed Feb. 16, 1946 3 Sheets-Sheet 1

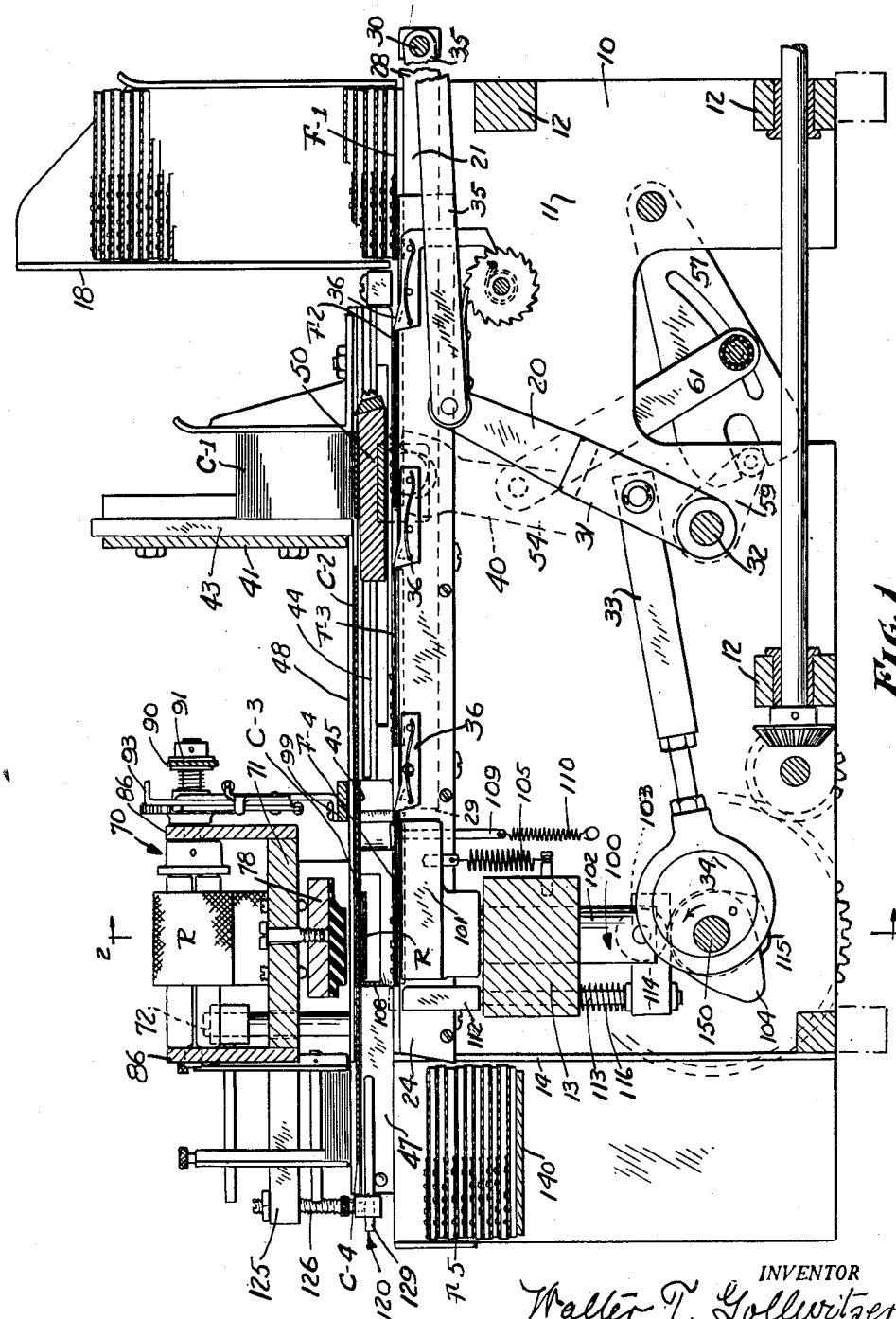

Fig. 1

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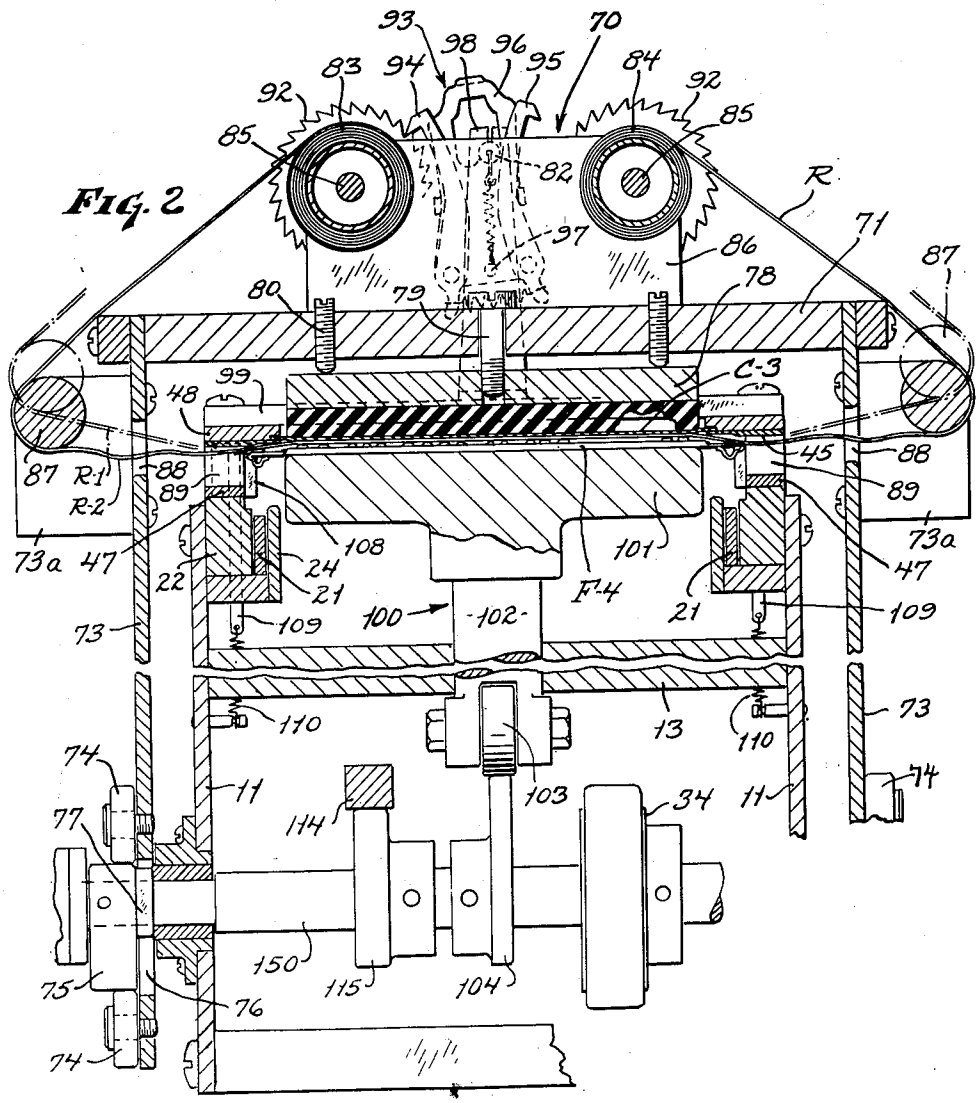
Original Filed Feb. 16, 1946 3 Sheets-Sheet 2

FIG. 2



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RIBBON INKER IN ADDRESS PRINTING MACHINES

Original Filed Feb. 16, 1946 3 Sheets-Sheet 3

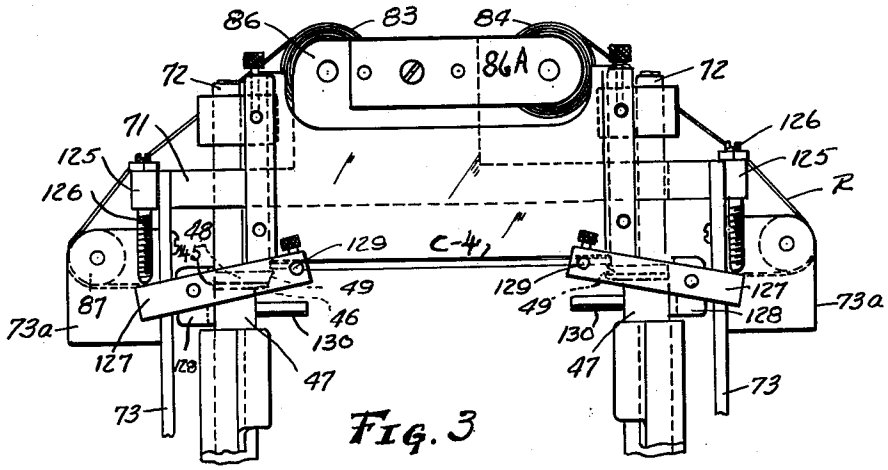

FIG. 3

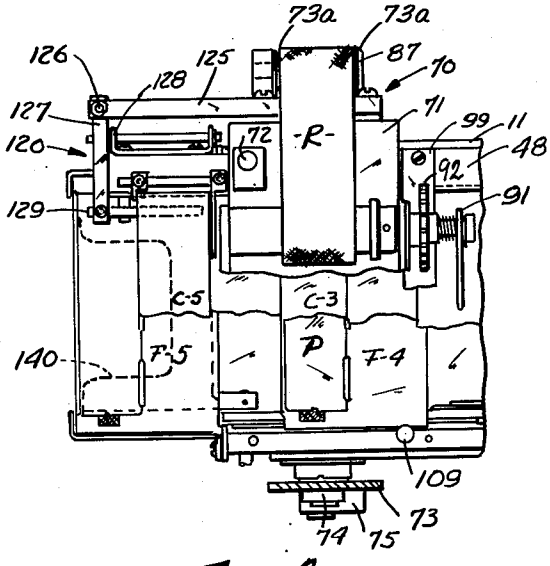

FIG. 4

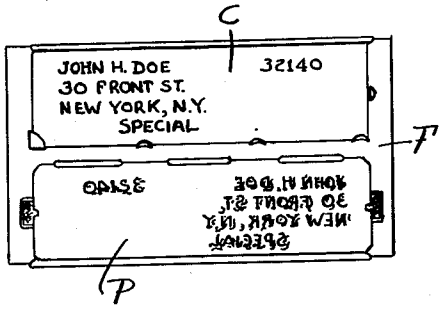

FIG. 5

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2,619,899

RIBBON INKER IN ADDRESS PRINTING MACHINES

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Original application February 16, 1946, Serial No. 648,076. Divided and this application May 29, 1947, Serial No. 751,178

9 Claims. (Cl. 101—57)

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This application is a division of application Serial No. 648,076, filed February 16, 1946, for Means for Printing Cards from Address Plates by the applicant and Donald B. Brewster, the present portion of such prior application, however, being the sole invention of the applicant Walter T. Gollwitzer.

The invention relates to a machine for printing a succession of cards individually from a succession of printing members such as address plates, the printing being effected through an inked ribbon. The invention is concerned with the ribbon inking mechanism, including the means for carrying such ribbon and automatically feeding it from spool to spool through an intermediate region between a platen and an anvil, so that a printing member and a card placed on respectively opposite faces of the ribbon in such region may be caused to mutually coact through the ribbon to form a printed impression on the card.

A further feature of the ribbon mechanism is that it holds the ribbon in a slack condition during the printing operation, which enables the better impression to be made from an embossed printing plate than if the ribbon were taut.

The above-mentioned features of the invention, and others contributing to the efficient operation of the inking mechanism, are illustrated in the drawings, which show a preferred form of the ribbon carrying and operating mechanism, and will become apparent from the following explanation of the structure shown in such drawings.

In the drawings, Fig. 1 is a longitudinal vertical section through a card printing machine having my ribbon inking mechanism; Fig. 2 is a transverse vertical section through the ribbon inker, the plane of the section being indicated by the line 2—2 on Fig. 1; Fig. 3 is a front elevation of the ribbon inker, the plane being parallel with Fig. 2; Fig. 4 is a fragmentary plan of the portion of the machine concerned with the ribbon inker; Fig. 5 is a plan showing a name card after it has been printed by the machine and inserted in a frame which carries the printed plate from which the card was printed.

Preliminary to a description of the machine itself, reference to Fig. 5 is suggested, wherein a printing member is illustrated typical of those for which the machine is designed. A printing member of this type is fully described, for instance, in my Letters Patent Reissue No. 22,249, issued January 12, 1943, to my assignee, Addressograph-Multigraph Corporation. Briefly, as shown, a printing plate P embossed with suitable printing indicia is carried by a frame F and held in position by suitable retainers. A name card C is carried in other retainers on the frame. This card has been printed from the associated printing plate, and hence provides an accurate indication of the embossing. Both the plate and card are readily removable when desired, but in use the whole device, called an address plate, operates as a unit.

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The present invention provides mechanism for carrying an inking ribbon from one spool to another and extending intermediately across the underside of a platen and above an anvil, and the machine feeds the address plate or other printing member onto the top of the anvil beneath the inking ribbon and the card into position above the inking ribbon and beneath the platen, so that when the platen and anvil are brought into impressing coaction the upwardly projecting characters on the printing member form an imprint on the underside of the card.

The printing members, as frames carrying embossed plates, are mounted in one stack and blank cards, accurately cut to size are mounted in another stack, and the machine feeds the plate-carrying frames along one course and the cards along a surmounting course, so that a printing frame and card arrive simultaneously between the anvil and platen with the ribbon interposed between them. At the time of impression the ribbon is slack, which allows it to conform readily to the formation of the embossed characters on the plate and gives a more accurate printing impression than a taut ribbon. Thereafter when the platen and anvil are separated the ribbon is rendered taut and fed slightly from one spool to the other and thus fresh portions of the ribbon come into operation on successive impressions.

It will be convenient to describe first the general characteristics of the complete machine, as illustrated in Fig. 1, after which I will describe in detail the ribbon mechanism shown in that figure and also in Figs. 2, 3 and 4.

The machine frame 10 in Fig. 1 supports at C^1 a magazine for a stack of cards and at F^1 a magazine for a stack of printing frames. A reciprocable frame feeding mechanism indicated generally at 20 advances the lowermost frame in the stack by successive stages to a printing position F^4. Simultaneously a reciprocable card feeding mechanism indicated generally at 40 advances the cards by successive stages to a printing position at C^3 directly over the printing plate. Both the card and plate are at this time over the vertically reciprocable anvil 100 and beneath the

platen 78 mounted in a vertically reciprocable carrier 70, and the inking ribbon R extends horizontally between the plate and card.

At the appropriate time in a cycle of the machine, the platen is lowered against the card C^3, slack is provided in the inking ribbon, and the anvil raises the frame F^4 and its associated printing plate to cause a printing impression to be made through the ribbon onto the card. Thereafter the frame F^4 is lowered, to be ejected at the start of the succeeding cycle upon a depressible platform 140, at the position F^5, while the card is moved forward by the following card during the succeeding cycles to a position below a storage stack into which it is subsequently placed by a stacking mechanism 120.

Summarizing the above, it will be seen that on each cycle of the machine a card and a printing plate are withdrawn from their respective magazines; another card is printed from another printing plate, and still a further card and printing plate are discharged into suitable receiving magazines at the end of the machine. Various moving parts are driven by a cam shaft 150, as hereinafter set out in greater detail.

Referring to the main frame 10 of the machine, it will be seen that two side plates 11 are interconnected by tie bars 12 and 13 to provide a rigid structure open at the top. The printing frames are stacked in a magazine 18 carried by the main frame 10. These plates rest upon, and are advanced by, a pair of carrier bars 21 slidable in guideways at the top of the respective side plates 11. These carrier bars have pawls (not shown) adapted to engage successive frames.

The rear ends of the carrier bars 21 are interconnected by a rod 30. The plate feed driving mechanism reciprocates the carrier bars by pushing and pulling upon this rod 30. As shown, a rocker arm 31, secured to a rock shaft 32 carried in bearings in the side plates, is driven through a link 33 by an eccentric 34 secured to the shaft 150. A link 35 interconnects the upper end of the rocker arm 31 with the rod 30 secured to the carrier bars. Thus, upon a revolution of the shaft 150, the carrier bars are driven forwardly to advance the plates and then are returned to starting position.

When the frames are moved to advanced positions, (the lowermost frame in the stack by means of the shoulder 28 and the preceding frames F^2, F^3 and F^4 by means of drive pawls carried by the bars 21) they are retained in such positions, against the action of the subsequently retreating carrier bars, by means of stop pawls 36 pivoted to the guideways.

Referring now to the card feed mechanism 40, a magazine member 41 is mounted at the top of the machine, and allows only the lowermost card to be drawn from the stack at C^1. The stack rests upon, and the lowermost card slides along, a horizontal card support comprising two plates 44 above the plates supporting bars heretofore mentioned. Forwardly of the plates 44, and providing a direct continuation of the upper surface thereof, are a pair of thin strips 45 each having a feather edge 46, as shown in Fig. 3.

A guideway for the cards is provided by a pair of hold-down strips 48 which are mounted immediately above, and extending longitudinally of the card pathway. As best seen in Fig. 2, the strips 48 are rabbeted at their lower inner edge to accommodate the ends of the cards. At the forward end of each strip the rabbet is altered to a bevel 49, as illustrated in Fig. 3, to enable the removal of the cards upwardly to stack them after printing.

The cards are moved forwardly by means of a card feed slide 50, reciprocation of which is obtained by means of rocker arms 54 at either side of the machine which are freely pivoted on the shaft 32 and are bifurcated at their tops to embrace rollers 55 carried by the slide. These rocker arms are adjustably connected by links 61 to pivoted plates 57 swung up and down by rocker arms 59 tight on the shaft 32.

I will now take up the description of the platen and ribbon carrier with which the present application is specifically concerned and which is shown in Figs. 1 to 4. This construction designated in general 70 includes a horizontal plate 71, mounted for vertically reciprocatory motion on guide posts 72. The plate is supported and reciprocated through the intermediacy of legs 73 secured to the plate at their tops and each provided with a pair of rollers 74, near its bottom, which operate as cam followers in coaction with a pair of eccentrics 75 drivingly secured to the single revolution shaft 150. Fig. 2 shows one of these eccentrics; the other is a duplicate, acting on the right hand roller 74 of that figure.

The shaft 150 projects through slots 76 in the legs and is provided with positioning blocks 77 in the slots to maintain alignment of the legs. During each revolution of the shaft 150, in each cycle of operation, the platen and ribbon carrier is raised from its mid-position to its uppermost position, then lowered to its bottom position, and then back to mid-position.

The platen 78, provided with an appropriate resilient under surface, is rigidly supported beneath the plate 71 by means of a holding screw 79 and adjusting screws 80. As illustrated in Fig. 1, the platen in its idle or mid-position stands well above the cards to avoid interference therewith. During the cycle the platen is lifted still farther by the carrier, then lowered to contact the card C^3 at the time of printing, and then raised again into idle position.

The inking ribbon mechanism is also mounted on the carrier 70. Ribbon spools 83 and 84 are mounted on shafts 85 having bearings in brackets 86 on the carrier, one of which has a removable portion 86A (Fig. 3) to enable removal of the spool 84 to install a fresh ribbon. The ribbon R is led from the spool 83 around a guide 87 which is a smooth rod carried by a pair of outwardly projecting brackets 73a mounted on the adjacent leg 73 of the carrier 70. The ribbon passes from the rod 87 through an opening 88 in the leg 73 to a guide comprising a slot 89 formed in a relatively stationary ribbon guide block 47 which is fixed to the machine frame 10 and which extends lengthwise at one end of the platen 78. The ribbon passes through the guide slot 89, between the platen 78 and the anvil 100 to a second guide slot 89 formed in a second ribbon guide block 47 which is fixed to the frame 10 at the opposite side of the platen, through such guide slot 89 and an opening 88 in the other carrier leg 73, around a second guide rod 87 carried by a pair of brackets 73a secured to the other side of the carrier 70 and thence to the ribbon spool 84.

The spool shafts 85 are provided with spring-pressed friction discs 90 which engage a non-rotating cross bar 91. Ratchet wheels 92 are carried by each spool shaft and are operated by a ratcheting device 93, to wind and unwind the ribbon. Such device is preferably of the form illustrated in Fig. 2 wherein two pawls 94 and 95

are pivoted to a pawl carrier 96 which, in turn, is pivoted at 97 to a standard 98. The standard is mounted upon a cross bar 99 secured to the side rails of the machine frame and thus does not partake of the vertical movement of the carrier. A detent 82 restrains the pawl carrier in either of two positions whereby either the pawl 94 or the pawl 95 is caused to engage its respective ratchet wheel.

As illustrated in Fig. 2, the pawl 94 is in operation and as the carrier raises the ratchet wheel past the pawl, the pawl causes the ratchet wheel to be turned to wind the ribbon upon the spool 83, unwinding it from spool 84 against the action of the friction brakes 91. The ends of the ribbon are secured to the respective spools so that when the spool 84 is emptied, the pawl 94 can no longer turn the ratchet wheel. During a subsequent ascent of the carrier the resilient detent 82 will be overcome and the pawl carrier 96 will be snapped over to the right hand position wherein the pawl 95 engages its ratchet wheel to wind the spool 84. The ribbon is thus repeatedly transferred from one spool to the other in an efficient manner to preserve a proper distribution of the ink.

It has been found that, in a printing operation, a much clearer imprint is obtained by the use of a slack ribbon. This result is most probably due to the fact that the ribbon is not stretched tightly between the crests of one printing character and the next and is thus pressed against the imprinted surface only at the high points of the characters. This result is obtained in the present embodiment by extending the ribbon from one supporting element, the spool 83, to a guide element, in the form of the slotted guides 89 which guides the ribbon across the printing position between the platen and anvil, and thence to another supporting element, the ribbon spool 84, and moving at least one of these elements bodily relative to the other two elements to alternately slacken and tauten the stretch of ribbon extending across the printing position. In the present embodiment the guiding element is movable relative to the other two elements. This relative movement is accomplished by holding the guiding element stationary and moving the frame 73 which supports the ribbon spools relative to the guide.

In the specific embodiment illustrated the ribbon guide rods 87 which are carried by the movable frame member are positioned so that they, as well as the ribbon spools, are closer to the ribbon guides 89 when the carrier is in its lowermost position than they are when the ribbon is being advanced during the upper movement of the carrier. The ribbon guide rods 87 (Fig. 2) are so positioned that their bottoms are above the tops of the guide slots 89 of the ribbon guide blocks 47 when the carrier is in its uppermost position of the platen the ribbon is taut and angles downwardly from one guide rod 87 to the guide slot 89 in the adjacent guide block 47 then across the printing position substantially parallel with the platen and anvil, and then angles upwardly to the other guide rod 87. In the lowermost position of the carrier the ribbon passes in substantially a straight line from one guide rod 87 through the guide slots 89 in the guide blocks 47 to the other guide rod 87. It follows therefore that the linear distance between the ribbon spool across the guide rods 87 through the guide slots 89 is less when the carrier 70 is in its lower position than it is when the carrier is in its upper position. As the ribbon spools are under no tension when the carrier moves downward, the ribbon will slacken as the carrier approaches its lowermost position and will be slack when the printing takes place. Likewise the ribbon will be taut at the uppermost position of the carrier during which time the platen is idle. In Fig. 2, the stretched or taut position of the ribbon is indicated at R^1 in broken lines while the slack position is indicated at R^2 in full lines.

The terms "slack" or "slackening" are used herein to indicate a condition of the ribbon where the stretch or reach thereof which extends between the platen and printing plate, is free from any tension or stretching, particularly tensions normally imparted to the ribbon by ribbon spools, ribbon advancing mechanisms or the like, as distinguished from merely decreasing the amount of the tension as in constructions wherein the tension on the ribbon is greater during ribbon advancing operations than it is at other times, but is never eliminated.

Referring now to the anvil actuating mechanism 100, best seen in Figs. 1 and 2, an anvil or block 101 is adapted to raise the printing frame F^4, whereby the printing plate thereon is caused to make an impression through the inking ribbon R onto the card C^3. The anvil is carried by a ram 102 slidable in the enlarged tie bar 13 between the side plates 11. A cam-following roller 103 at the end of the ram is maintained in engagement with a cam 104 as by means of a tension spring 105 between the anvil and the tie bar. The cam 104 is drivingly carried by the single revolution shaft 150 and has a single sharp rise whereby the anvil is moved upwardly with a sharp printing stroke.

To allow the printing frame F^4 to be raised from its guideway, the block 47, which elsewhere overhangs the guideway to retain the frames, is at the printing position milled out, as indicated at 108, Figs. 1 and 2, to provide clearance for the rising frame.

To assure the return of the frame to the guideway after the printing operation, pull-down pins 109 are provided at each side rail 22. The pins have enlarged heads which overhang the guideway and thus are raised by the rising frame, against the action of tension springs 110 anchored to the side plates 11. As the anvil descends, the heads of the pins maintain the printing frame in engagement therewith, until the frame rests upon the guide strips 24 and the anvil continues to descend to idle and frame-clearing position indicated at Fig. 1.

A frame stop 112 is preferably provided which is periodically interposed into the path of the frames whereby the leading frame may be accurately stopped in printing position, without overthrow. The stop shown is in the form of a block having a stem 113 slidable in the tie bar 13. A cam-follower 114 is secured to the stem and coacts with a cam 115 on the single-revolution shaft 150. A spring 116, interposed between the tie bar and the cam follower, maintains the coacting engagement. The cam raises the stop 112 to the dotted line position in Fig. 1 at an appropriate time during the cycle to stop the oncoming frame, and the stop is again withdrawn previous to the return of the frame to the guideway after printing.

Following the printing operation the plate carrying frame and card are fed to the front of the machine, the printing members are stacked from the top downwardly in the plate stacking mech-

anism 140, and the card is stacked from the bottom upwardly in the card stacking mechanism 120. The platform in the plate receptacle is resilient carried by means not shown but adjusted so that the platform will automatically descend as printing frames accumulate in the stack.

Suitable mechanism is provided whereby the descent of the platen carrier operates to lift the cards from the position C^4 to the receptacle 120. As shown in Fig. 3, this mechanism includes a pair of adjustable screws 126 mounted in bars 125 extending forwardly from the platen carrier; a pair of levers 127 intermediately pivoted to a stationary support, and a pair of rods 129 carried by the levers and underlying the card position and normally resting on supports 130. When the levers are rocked by the descent of the screws 126, the rods 129 engage the card and lift it from the guideway into the receptacle, the ends of the card bending relatively downward in passing the beveled edges 49 of the strips 48 and then snapping back straight, so that the card, with the superimposed stack above it if any, remains supported on the upper surface of the strips 48.

After all the desired frames have been run through the machine and stored and the corresponding cards have been stored, the machine stops automatically. The operator may then grasp the stack of frames between her thumb and fingers, and, after lowering them sufficiently to clear the receptacle, may withdraw them. Similarly, she may grasp the stack of cards and move them upwardly and out of the card receptacle. When the stack of cards is turned over as a unit, it will be found that they are in corresponding relation to the frames and the top card may be inserted in the top frame and so on throughout the stacks with the result illustrated in Fig. 5.

It will be understood from the above description that the complete machine shown including this invention is adapted to be very quickly loaded with a stack of frames carrying address plates and a stack of cards the proper size for mounting in the frames and then may be rapidly operated to print the individual cards and stack them and the plate carrying frames in receptacles convenient for the operator, who may thus remove them and rapidly mount cards one after the other in their appropriate frames until every frame has received its proper card and is ready for use in the addressing machine. The card being printed form the printing plate itself necessarily corresponds thereto. The printing through a slack inked ribbon enables the impression, even though made at one stroke, to be very clear without danger of smudging between characters.

I claim:

1. In a machine for printing cards from plates having printing characters, the combination of an upwardly facing anvil adapted to support a plate in printing position, a downwardly facing platen adapted to register with a card in printing position, a movable frame above the anvil carrying the platen and carrying a pair of ribbon spools with an inking ribbon extending across the platen, means for holding a card in position between the platen and ribbon and means for holding a plate in position between the ribbon and anvil, and means for moving the frame carrying the platen toward the anvil, and means operated by such movement for shortening the ribbon distance from a spool to the platen without turning the spool to cause a slackening of the ribbon across the platen, and the printing by the plate characters on the card through the slackened ribbon.

2. In a machine for printing cards from plates having printing characters, the combination of an upwardly facing anvil adapted to support a plate in printing position, a downwardly facing platen adapted to register with a card in printing position, a movable frame above the anvil carrying the platen and carrying a pair of ribbon spools with an inking ribbon extending across the platen, means for feeding the cards into position between the platen and ribbon and means for feeding the plates into position between the ribbon and anvil, means for causing the anvil and the frame carrying the platen and ribbon to approach each other to print successive cards from the characters on the corresponding plates, and means between the platen and spools for holding back a portion of the ribbon as the platen and anvil separate whereby the ribbon is slack on the return impressing stroke.

3. In a machine for printing from printing plates, the combination of an anvil and a coacting platen normally spaced from each other, an elongated inking ribbon having an intermediate portion extending between and spaced from the platen and anvil, means for feeding printing plates between the ribbon and anvil and spaced from the ribbon, means for feeding articles to be printed between the ribbon and platen and spaced from the ribbon, a pair of relatively stationary ribbon guides, said guides being disposed at opposite sides of the platen, supporting means for opposite ends of said ribbon, said last-named means being bodily movable relative to said guides, means for moving the ribbon support relative to the guides to pull the ribbon taut while the platen and anvil are spaced from each other, means for moving the platen toward the anvil, and means including the ribbon guiding means and the ribbon supporting means to slacken the ribbon as the platen approaches the anvil whereby the ribbon will be slack across the printing plate at the time of impression.

4. In a machine for printing from plates, the combination of an anvil, a movable frame carrying a platen registering with the anvil, a pair of rotatable ribbon spools, a support for said ribbon spools, an inking ribbon extending from one spool across the anvil to the other spool, means for holding a printing plate between the ribbon and anvil, means for holding a sheet to be printed between the ribbon and platen, a pair of guides for the ribbon on opposite sides of the platen and movable relative to the ribbon spools, means for moving the platen toward the sheet and simultaneously moving the ribbon spools toward the guide to slacken the ribbon whereby an imprint is made through a slackened ribbon, and means to move the platen away from the sheet and simultaneously move the spools away from the guides to tauten the ribbon, and means to rotate one of said spools to feed the ribbon across the guides while the ribbon is taut.

5. In a machine for printing from embossed printing plates, the combination, with means for supporting a printing plate in a printing position, a movable platen normally spaced from the printing plate, an inking ribbon, a supporting element for one end of the ribbon, a supporting element for the other end of the ribbon, said ribbon extending from one supporting element across the printing position and between the platen and printing plate to the other supporting element, a third element engaging said ribbon at a point

intermediate the supporting elements, at least one of said elements being bodily movable relative to the other two elements to alternately slacken and tauten the ribbon, and means to move the platen toward the printing plate and simultaneously move said movable element to a ribbon slackening position whereby an impression may be made through the slackened ribbon, and means acting thereafter to move the platen to its normal position and said movable element to a ribbon tautening position.

6. In a machine for printing from plates having printing characters, a main frame, an anvil mounted in said main frame for vertical movement, a supplemental frame mounted in the main frame for vertical movement, a platen secured to said supplemental frame and in registration with the anvil, a pair of guide blocks, carried by the main frame, said guide blocks each having a horizontal slot extending therethrough and being positioned at opposite ends of the platen, a pair of ribbon spools mounted on the supplemental frame, an inking ribbon extending from one spool through the slot in one guide block across and between the platen and anvil thence through the slot in the other block to the other spool, means to move the supplemental frame to and from the anvil to make an impression on sheets positioned between the ribbon and a printing plate positioned between the anvil and plate and to cause the ribbon spools to move to and from the guide blocks to slacken the ribbon while the platen moves toward the anvil whereby the impression is made through a slackened ribbon and to tauten the ribbon as the platen moves away from the anvil, and means to progress the ribbon while it is taut.

7. In a machine for printing from raised characters and having a printing position provided with a support for the characters, a platen movable alternately to and from the characters on the support, an elongated inking ribbon, a pair of ribbon spools, one of said spools comprising a ribbon supply spool, said ribbon extending in a predetermined path from the supply spool to the printing position thence across such printing position between the characters and the platen and thence to the other ribbon spool, means to periodically advance the ribbon to cause a fresh portion thereof to lie between the platen and printing characters, the combination of means to decrease the length of said path without decreasing the length of the extent of the ribbon as the platen approaches the characters in printing position and retain the ribbon slackened until the platen is spaced from the ribbon and thereafter restore the length of said path to its normal condition.

8. In a machine for printing from raised characters and having a printing position provided with a support for the characters, a platen movable alternately to and from the characters and the support, an elongated inking ribbon, a pair of ribbon spools, one of said spools comprising a ribbon supply spool, said ribbon extending from the supply spool to the printing position, thence across the printing position between the characters and the platen and thence to the other ribbon spool, the combination of means movable relative to the spools and engaging the ribbon intermediate the two spools to slacken the ribbon as the platen approaches the characters in printing position and retain the ribbon slackened until the platen is spaced from the ribbon and then tauten the ribbon, and means to periodically advance the ribbon to cause a fresh portion thereof to lie between the platen and printing characters while the platen is away from the characters and while the ribbon is taut.

9. In a machine for printing from embossed characters, having a printing position at which the characters are positioned, a platen movable alternately to and from the characters, an elongated inking ribbon, a pair of ribbon supports, one of said supports comprising a ribbon supply, said ribbon extending in a predetermined path from the supply support to and across the printing position between the characters and the platen and thence to the other support, means to periodically advance the ribbon to cause a fresh portion thereof to lie between the platen and printing characters, the combination of a ribbon slackening means to slacken said ribbon as the platen approaches the characters in printing position and retain the ribbon slackened until the platen is spaced from the ribbon and thereafter tauten the ribbon, and means to render the ribbon advancing means active while it is taut.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,710,088	Duncan	Apr. 23, 1929
1,744,965	Hubbard	Jan. 28, 1930
1,745,994	Hubbard	Feb. 4, 1930
1,754,361	Hubbard	Apr. 15, 1930
1,813,495	Johnson	July 7, 1931
1,876,969	Krell	Sept. 13, 1932
1,937,145	Gollwitzer	Nov. 21, 1933
2,011,949	Roberts	Aug. 20, 1935
2,214,796	Ostler	Sept. 17, 1940
2,301,010	Boutiette	Nov. 3, 1942
2,310,179	Kohnle	Feb. 2, 1943
2,372,736	Phillips et al.	Apr. 3, 1945