

Dec. 23, 1969

A. J. WRIGHT ET AL

3,485,166

PRINTING MACHINE WITH IMPROVED MASTER HOLDING STRUCTURE

Filed Aug. 4, 1967

5 Sheets-Sheet 1

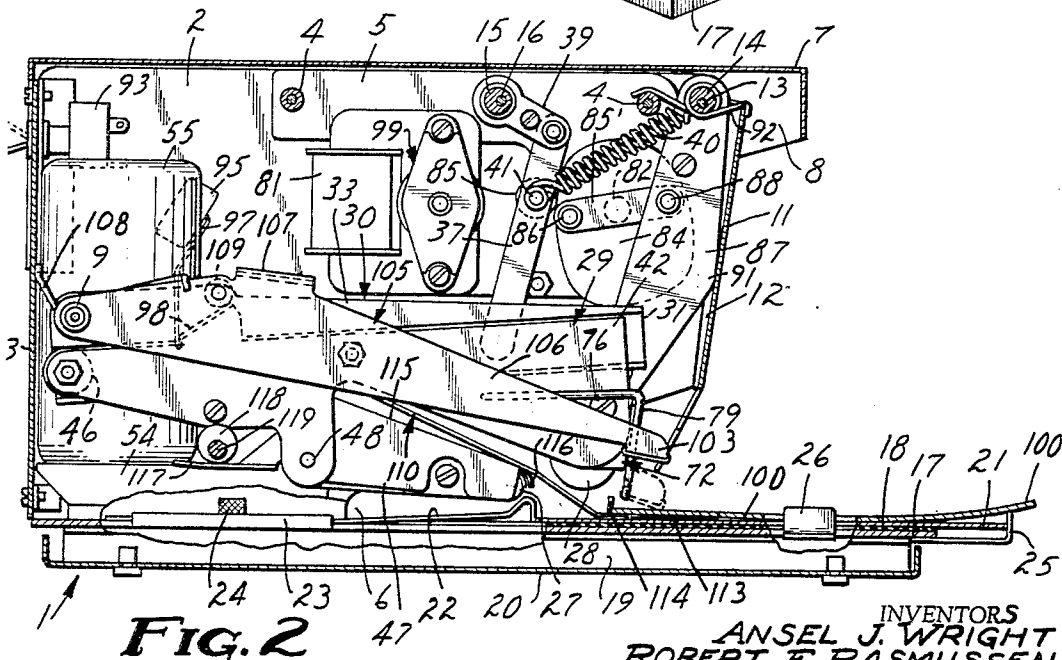
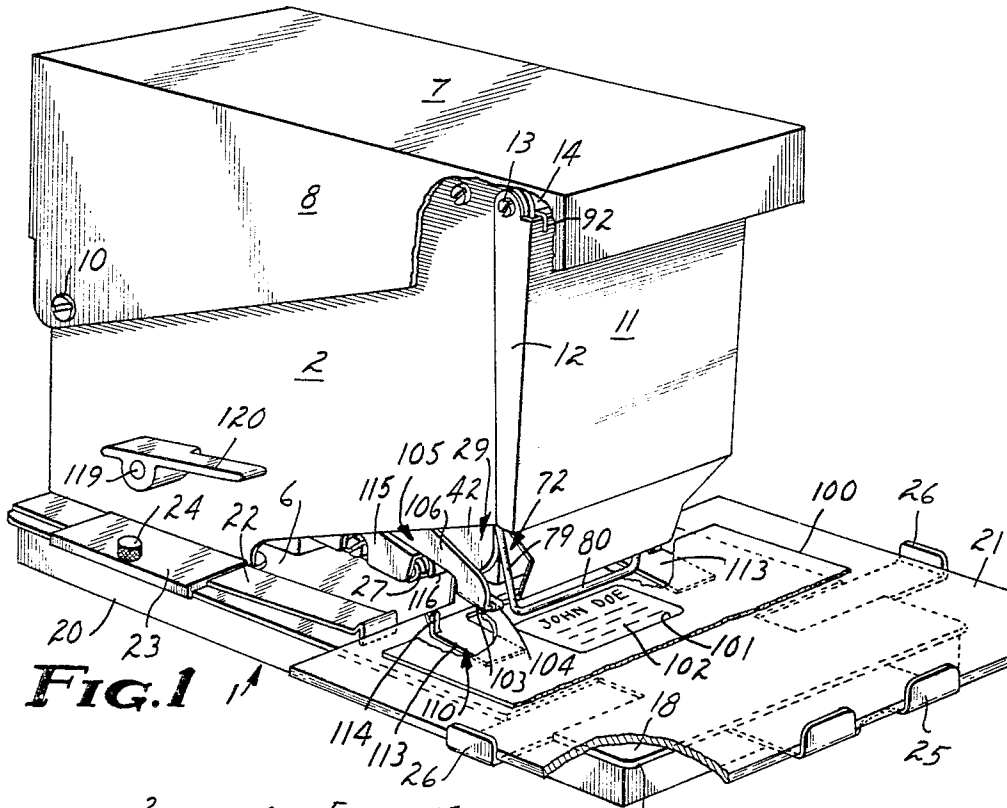


FIG. 2

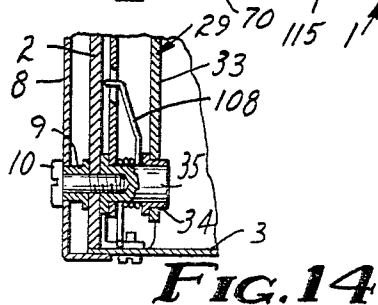
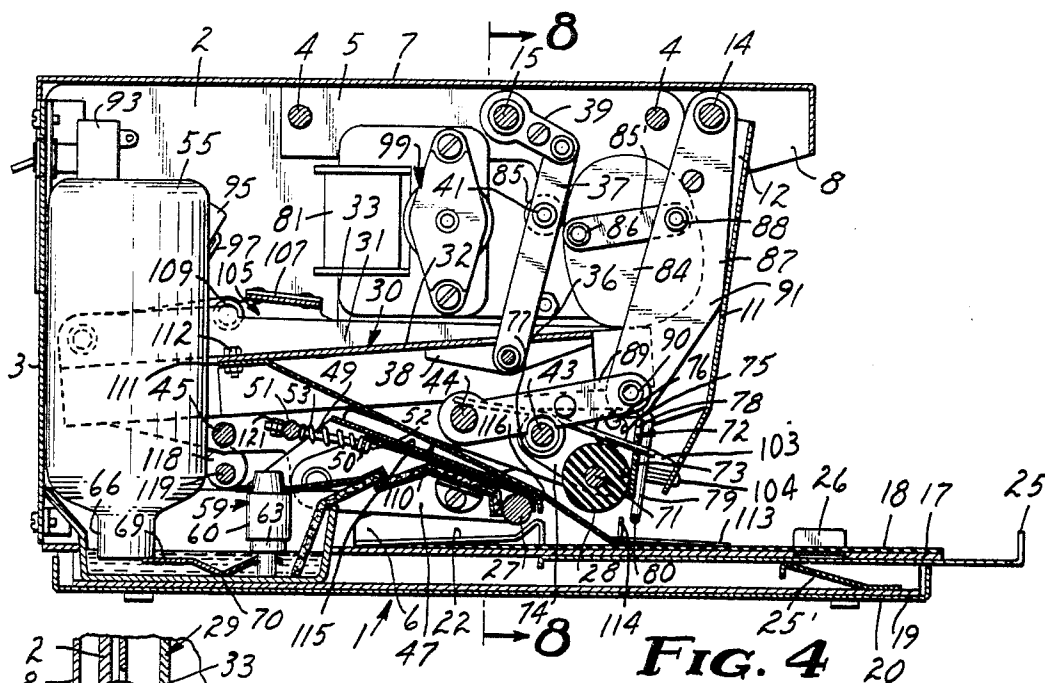
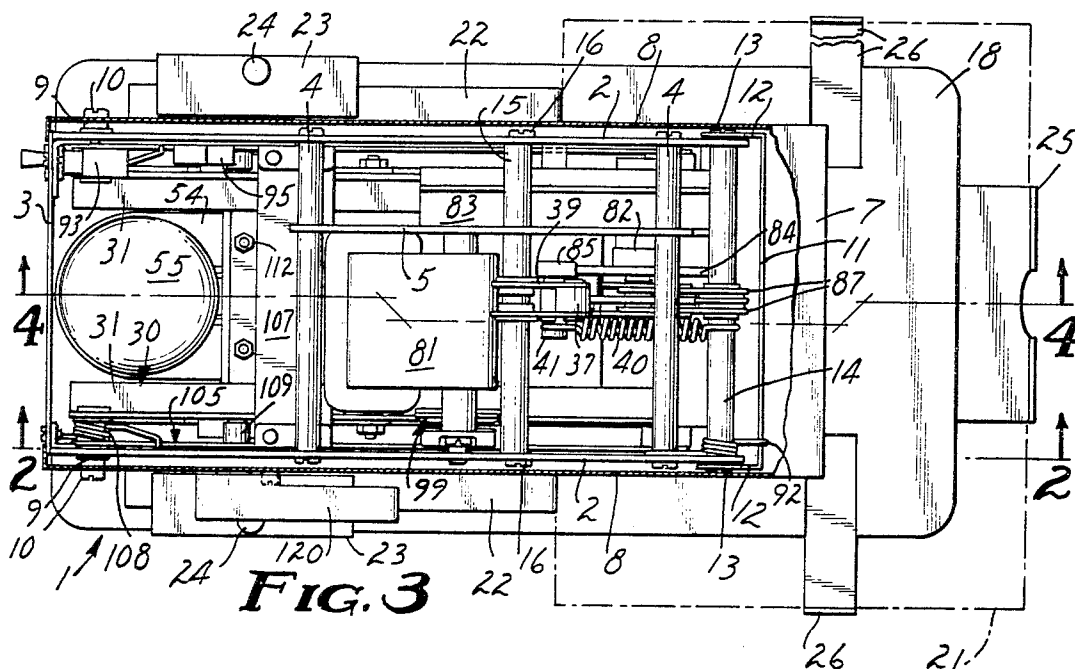
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# PRINTING MACHINE WITH IMPROVED MASTER HOLDING STRUCTURE

5 Sheets-Sheet 2



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5 Sheets-Sheet 3

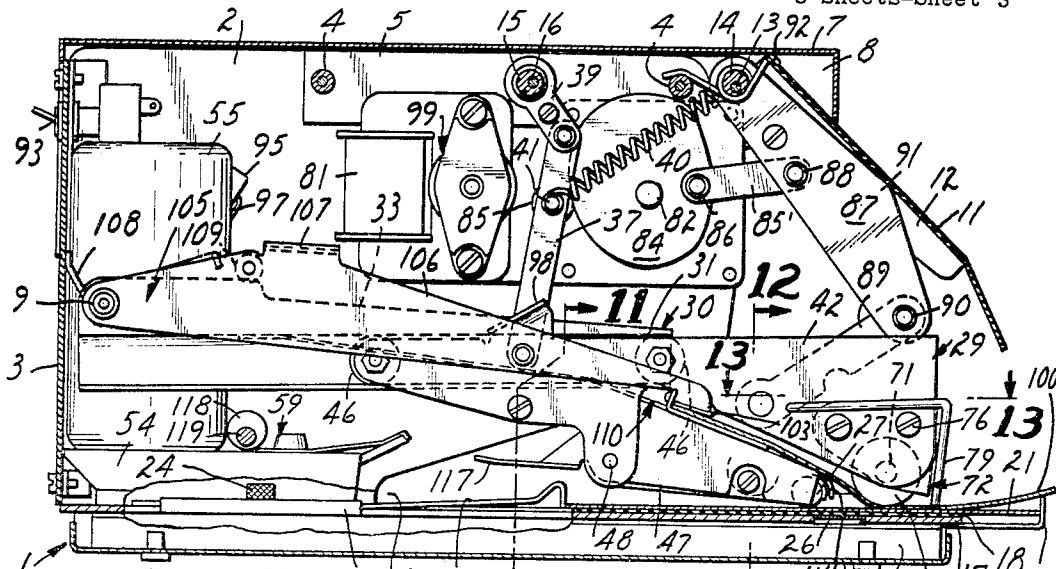


Fig. 5

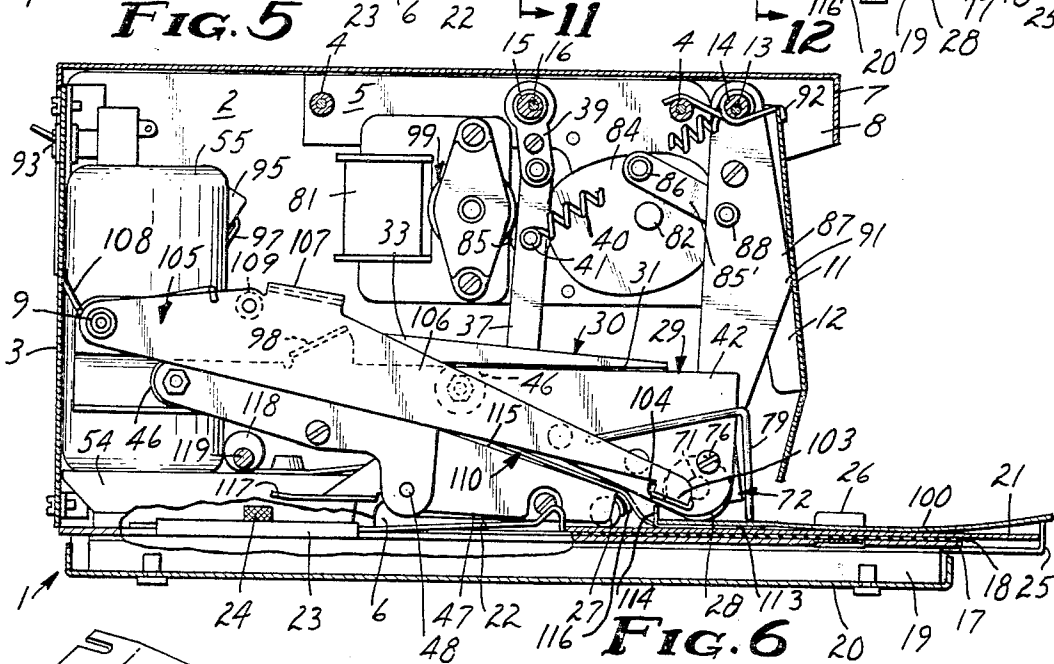


Fig. 6

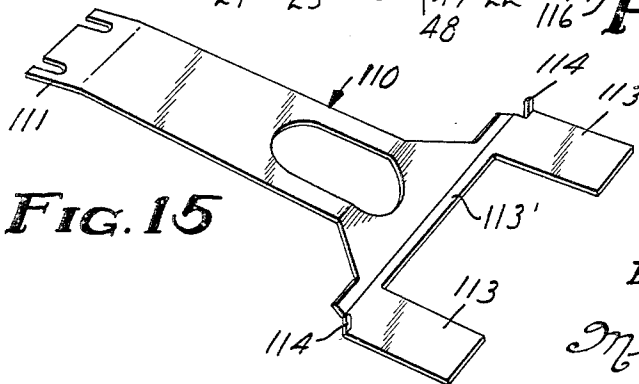


Fig. 15

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PRINTING MACHINE WITH IMPROVED MASTER HOLDING STRUCTURE

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5 Sheets-Sheet 4

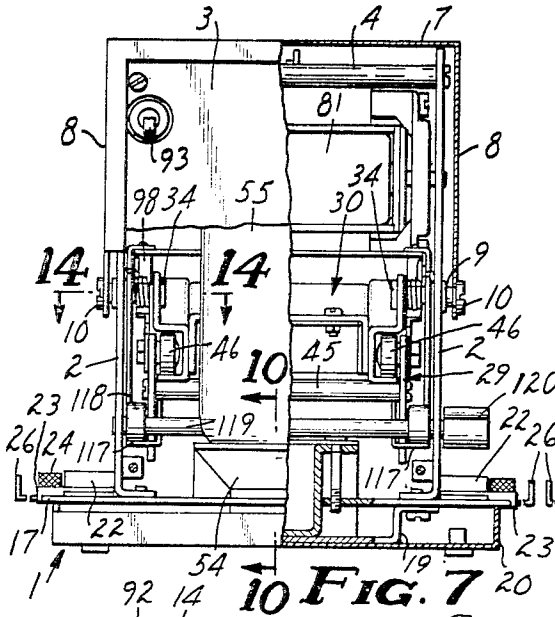


FIG. 7

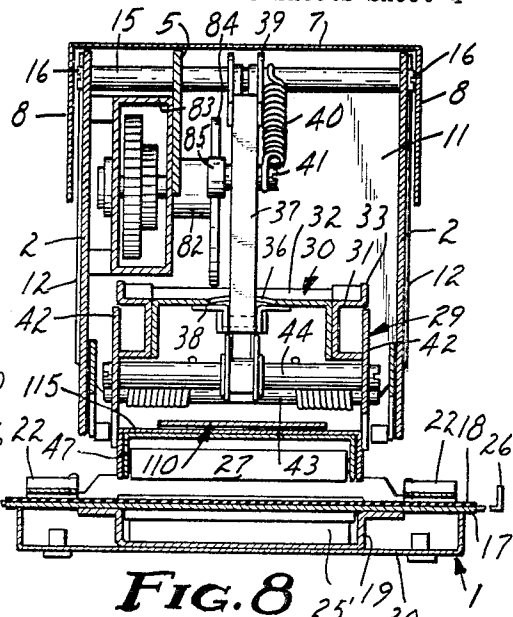


FIG. 8

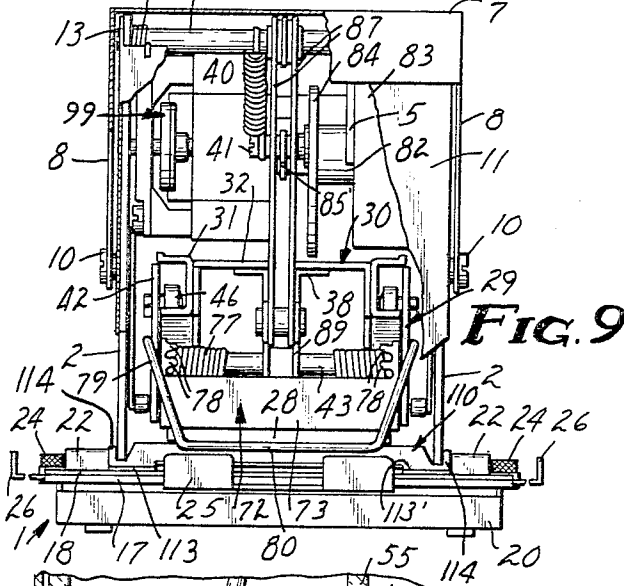


FIG. 9

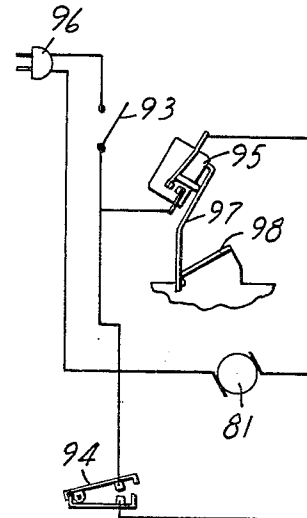


FIG. 16

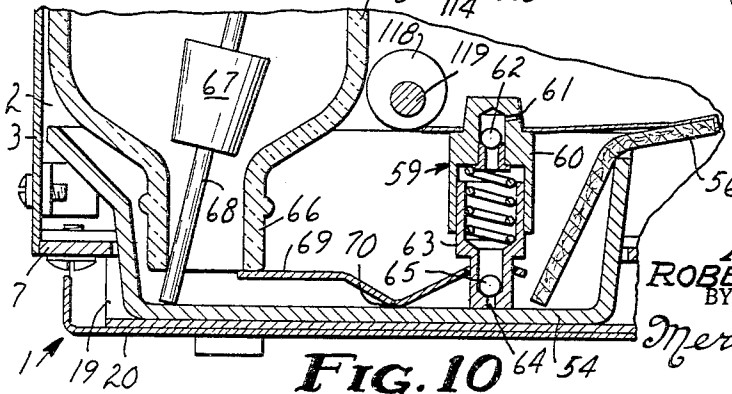


FIG. 10

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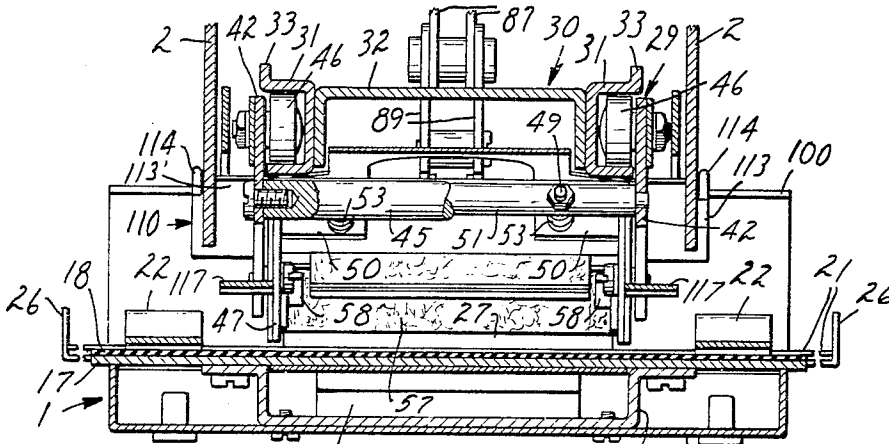
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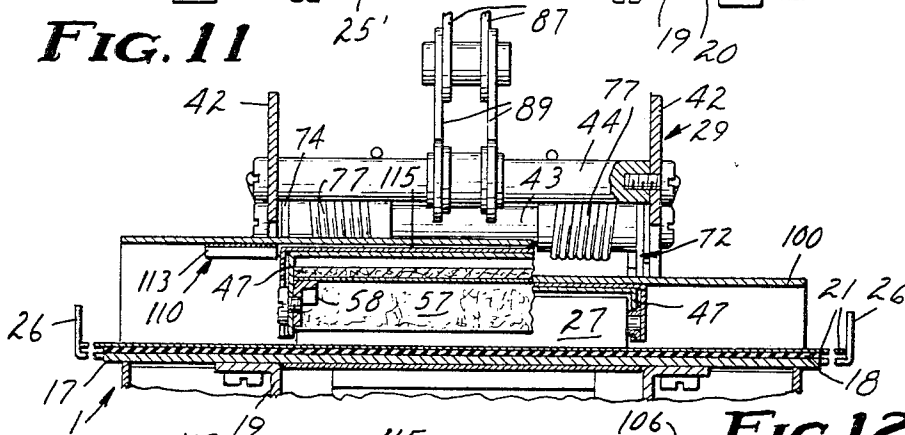
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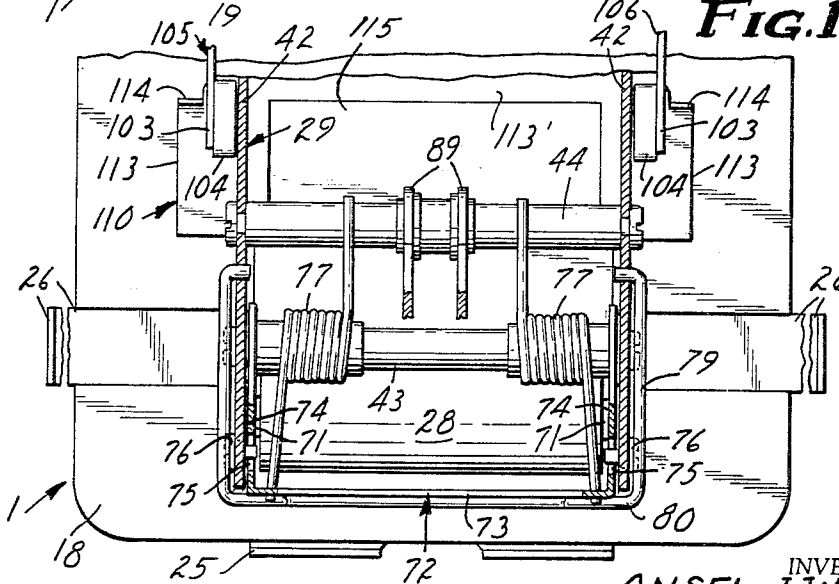
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**FIG. 11**



**FIG. 12**



**FIG. 13**

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3,485,166

## PRINTING MACHINE WITH IMPROVED MASTER HOLDING STRUCTURE

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Int. Cl. B411 11/02

U.S. Cl. 101—133

10 Claims

### ABSTRACT OF THE DISCLOSURE

A spirit transfer printing machine having a printing bed for copy sheets to be printed, a moistening device and an impression roller movable over the copy on the printing bed, and a cooperating member for alternately gripping and releasing a master sheet inserted therebetween to hold the master sheet in predetermined overlying relation to the copy during moistening of the copy by the moistening device and printing movement of the impression roller over the master sheet and underlying copy sheets.

### BACKGROUND OF THE INVENTION

This invention is in the nature of an improvement on printing machines of the type disclosed in one of the present applicant's prior Patents 2,859,690 and 2,863,385. These prior machines utilize master elements mounted in card folders of predetermined shape, size and stiffness, and in which master elements are supported in overlying relation to copy sheets to be printed therefrom. These machines are limited in their use to card-like holders of given size and shape.

### SUMMARY OF THE INVENTION

The primary object of this invention is the provision of a printing machine of the spirit transfer type in which the master element may be mounted on a card or sheet of any desired dimensions, and of novel means for holding such a card or sheet securely during the printing operation. To this end, we provide a frame structure having a base defining a printing bed at one end portion of the base for supporting a stack of copy sheets thereon, a carriage mounted in a guideway for reciprocatory advancing and retracting movements relative to the printing bed and carrying a moistening device and an impression roller for respectively moistening the copy sheet and impressing the master element on the moistening sheet. Means is further provided for moving the moistening device and impression roller generally upwardly and downwardly relative to the printing bed during said reciprocatory movement of the carriage. For the purpose of supporting a master element during said movements of the carriage and parts carried thereby, we provide a pair of upper master element gripping members and a cooperating lower support member operable to automatically engage opposite sides of the master element and firmly grip the element responsive to said movement of the carriage, and to automatically release the master element at the end of the printing cycle.

### DESCRIPTION OF THE DRAWINGS

Referring to the drawings, which illustrate the invention, and in which like reference characters indicate like parts throughout the several views:

FIG. 1 is a view in perspective of a printing machine produced in accordance with this invention;

FIG. 2 is a view partly in side elevation and partly in section, taken substantially on the line 2—2 of FIG. 3;

FIG. 3 is a view in top plan, some parts being broken away and some parts being shown in section;

FIG. 4 is a longitudinal section taken generally on the line 4—4 of FIG. 3;

FIG. 5 is a view corresponding to FIG. 2 but showing a different position of some of the parts;

FIG. 6 is a view corresponding to FIGS. 2 and 5 but showing a still different position of some of the parts;

FIG. 7 is a view in rear elevation, some parts being broken away and some parts being shown in section;

FIG. 8 is a transverse section taken substantially on the line 8—8 of FIG. 4;

FIG. 9 is a view in front elevation, some parts being removed and some parts being broken away and shown in section;

FIG. 10 is an enlarged fragmentary section taken on the line 10—10 of FIG. 7;

FIGS. 11 and 12 are enlarged fragmentary transverse sections taken respectively on the lines 11—11 and 12—12 of FIG. 5;

FIG. 13 is an enlarged fragmentary view partly in horizontal section, taken substantially on the line 13—13 of FIG. 5;

FIG. 14, Sheet 2, is an enlarged fragmentary section taken on the line 14—14 of FIG. 7;

FIG. 15, Sheet 3, is a view in perspective of the master sheet support member of this invention; and

FIG. 16, Sheet 4, is a wiring diagram.

In the preferred embodiment of the invention illustrated, a generally rectangular frame structure is shown as comprising, an elongated generally rectangular base 1, laterally spaced parallel vertical side walls 2, rigidly secured to the base 1, a rear wall 3 releasably anchored to the rear ends of the sidewalls 2, a pair of transverse tie rods 4 rigidly secured at their opposite ends to the side walls 2 adjacent the upper edges thereof, and a plate-like brace member 5 mounted on the tie rods 4 intermediate the upper edge portions of the sidewalls 2. The sidewalls 2 are cut away at their lower edge portions to provide a forwardly opening throat 6, the purpose of which will hereinafter become apparent. A top cover 7 is formed to provide side flanges that are pivotally secured to adjacent ones of the side walls 2 on aligned bearings 9 mounted on their respective sidewalls 2 by mounting screws or the like 10. A front cover 11 is formed to provide laterally spaced side flanges 12 having upper ends journaled on the heads of a pair of axially aligned screws 13 that are screw threaded into the opposite ends of a cross rod 14 that extends between the upper front corners of the sidewalls 2. It will be noted that the screws 13 are disposed eccentric to the cross rod 14, for a purpose which will hereinafter be described. A second cross rod 15 is similarly mounted between the sidewalls 2 intermediate the tie rods 4, by eccentrically disposed aligned screws 16, the cross rods 14 and 15 cooperating with the tie rods 4 to further brace the sidewalls 2. The base 1 includes an elongated rectangular bed plate 17 that extends from the rear wall 3 to a point forwardly of the front cover 11, a plate-like printing bed 18, secured to the top surface of the bed plate 17 at the front end portion thereof, extends rearwardly into the throat 6, a channel member 19 extending longitudinally of and welded or otherwise rigidly secured to the undersurface of the bed plate 17 and a bottom pan 20 underlying the channel member 19 and secured thereto by suitable means, not shown. The base 1 is provided with a plurality of guides or locating elements for properly positioning a stack of copy sheets 21 placed on the printing bed 18. A pair of laterally spaced rear guides 22 are mounted on the bed plate 17 for forward and rearward sliding movements, one each laterally outwardly of a different one of the sidewalls 2, by clamping plates 23 secured to the bed plate 17 by clamping screws or the like 24. A front guide or locating element 25 projects forwardly from the front end of the

base 1, and is longitudinally slidably mounted therein, being frictionally held in place by a leaf spring 25'; see FIG. 4, the rear and front locating elements 22 and 25 respectively cooperating to hold the copy sheets 21 against movement longitudinally of the machine. A pair of opposed side guides or locating elements 26 are mounted in the base 1 for adjustment laterally thereof, and engage side edges of the copy sheets 21 to hold the same against movements transversely of the machine.

A spirit transfer element in the nature of a moistening roller 27, and an impression roller 28 are supported by a carriage 29 that is mounted in the frame structure for advancing and retracting reciprocatory movements toward and away from the printing bed 18, and for raising and lowering movements relative to the printing bed 18, by guide means indicated generally at 30. The guide means 30 comprises a pair of laterally spaced outwardly opening channel members 31 that extend longitudinally of the base 1, and an inverted generally U-shaped connecting member 32 welded or otherwise rigidly secured to the channel members 31. The channel members 31 are formed to provide upwardly projecting flanges 33 that are journaled in bearings 34 mounted on studs 35 threaded on the screws 10, see particularly, FIGS. 3, 7 and 14. Adjacent its front end, the connecting member 32 is provided with an opening 36 for reception of a link 37, the lower end of which is pivotally secured between a pair of bearing brackets 38 welded to the connecting member 32, the upper end of the link 37 being connected to one end of a crank 39, the opposite end of which is journaled on the cross rod 15. The link 37 and crank 39 are yieldingly urged in a direction to move the front end portion of the guide means 30 in an upward direction about the aligned axes of the studs 35 on the screws 10, by a coil tension spring 40 connected at one end to a stub shaft 41 on the link 37 and at its other end to the cross rod 14.

The carriage 29 comprises a pair of laterally spaced parallel side members 42 that extend longitudinally of the base 1 and which are rigidly connected together by front, intermediate and rear cross shafts 43, 44 and 45 respectively, below the guide means 30. Each of the side members 42 has journaled thereon a pair of longitudinally spaced rollers 46 disposed for rolling movement in an adjacent one of the channel members 31, whereby the carriage 29 partakes of advancing and retracting movements relative to the guide means 30 and frame structure toward and away from the printing bed 18.

The moistening roller 27 is journaled in the front end portion of an inverted generally U-shaped housing 47 that is pivotally mounted at its rear end between the carriage side members 42 by pivot pins or the like 48, on a horizontal axis extending transversely of the carriage 29. The housing 47 is limited in its pivotal movement about the aligned axes of the pins 48 by a pair of laterally spaced studs or rods 49 extending generally longitudinally of the carriage 29 and axially slidably movable in depending ears or flanges 50 on the housing 47 and longitudinally adjustably mounted adjacent their rear ends in a transverse crossbar 51 that is journaled at its opposite ends in the carriage side members 42. The rods 49 are provided at their front ends with heads 52 that engage their respective ears 50 to limit downward swinging movement of the housing 47, and coil compression springs 53 on each of the rods 49 are interposed between the transverse bar 51 and their respective ears 50 to yieldingly urge the housing 47 and moistening roller 27 toward their limit of downward movement.

Means for supplying spirit transfer liquid to the moistening roller 27 comprises a reservoir 54 mounted in the rear end portion of the base 1, for reception of an inverted container or bottle 55 of the moistening liquid, a supply wick 56 of felt or other suitable material extending generally forwardly of the reservoir 54, a moistening wick 57 removably mounted in the housing 47 by

angular clips or the like 58, and a liquid pump 59 mounted in the reservoir 54. As shown in FIG. 4, the moistening wick 57 has a front end portion that continuously engages the moistening roller or transfer element 27 and a rear end portion that engages the front end portion of the supply wick 56 when the carriage 29 is disposed in its retracted position, shown in FIG. 4, whereby the moistening wick 57 draws liquid from the supply wick 56 by capillary action. With reference to FIG. 10, it will be seen that the pump 59 comprises a fixed cylinder 60 having a forwardly directed outlet passage 61 above the reservoir 54 and a check valve 62, a spring biased piston 63 mounted in the cylinder 59 and having an inlet passage 64 communicating with the bottom position of the reservoir 54 and a check valve 65. The container or bottle 55 has a reduced diameter mouth portion 66 that is normally closed by a stopper 67 having an axial pin 68 extending therethrough. When the bottle 55 is inverted and pushed downwardly into the reservoir, the pin 68 pushes the stopper into the bottle 55, as shown in FIG. 10, to permit liquid from the bottle 55 to flow into the reservoir 54. In the inverted position of the bottle 55, the mouth portion 66 engages one end of a lever 69 that is fulcrumed on the bottom wall of the reservoir 54, as indicated at 70, the opposite end portion of the lever engaging the piston 63. By manually pressing the bottle or container 55 downwardly, the lever 69 moves the pump piston 63 upwardly to cause transfer liquid to be discharged through the discharge passage 61 on to the moistening wick 57 when the carriage 29 is in its retracted position of FIG. 4. By repeatedly moving the bottle 55 upwardly and downwardly, the moistening wick 57 becomes quickly charged with the transfer liquid, thus eliminating the necessity for waiting until the liquid saturates the moistening wick 57 by capillary action from the feeding wick 56. Obviously, it is only necessary to operate the pump 59 when the feeding wick 56 is dry and transfer liquid is initially supplied to the reservoir 54.

The impression roller 28 is journaled on a shaft 71 mounted at its opposite ends in a generally U-shaped bracket 72 having a front wall 73 and laterally spaced parallel sidewalls 74. The sidewalls 74 are journaled on the front cross shaft 43 adjacent the carriage side members 42, and are provided with relatively large apertures 75 which receive relatively small diameter pins 76 extending laterally inwardly from the adjacent carriage sidewalls 42, whereby to limit upward and downward movements of the bracket 72 and impression roller 28. The bracket 72 and impression roller 28 are yieldingly urged in a downward direction of swinging movement by a pair of torsion springs 77 each loosely encompassing the cross shaft 43 and having one end overlying the cross shaft 44 and other end selectively received in one of a plurality of vertically spaced notches 78 in the front wall 73 of the bracket 72. A guard member 79 is pivotally mounted in the front end portion of the carriage 29 and has a transversely extending portion 80 disposed forwardly of the impression roller 28 to prevent the operator's fingers from engaging the impression roller 28 during advancing and retracting movements of the carriage 29.

Means for imparting advancing and retracting movements to the carriage 29 and parts carried thereby, includes a conventional electric motor 81, which drives an output shaft 82 through speed reduction gearing, not shown, but contained within a housing 83 rigidly mounted in the frame structure between one of the sidewalls 2 and the brace member 5. A cam 84 is rigidly mounted on the shaft 82 and operatively engages a cam follower roller 85 journaled on the stub shaft 41 of the link 37, whereby to impart upward and downward swinging movement to the guide means 30 and the carriage 29 mounted therein. A pitman arm 85' is pivotally connected at one end to the cam 84 radially outwardly of the shaft 82, as indicated at 86, and at its other end to the intermediate portion of a lever 87, as indicated at 88, the

lever 87 being pivotally connected at its upper end to the cross rod 14. The lower end of the lever 87 is pivotally connected to one end of a rigid link 89, as indicated at 90, the opposite end of the link 89 being journaled on the intermediate cross shaft 44 of the carriage 29. The lever 87, intermediate its ends, is formed to provide a hump portion 91 that engages the front cover 11 to pivotally move the same forwardly during advancing movement of the carriage 29 against yielding bias of a torsion spring 92 mounted on the cross rod 14, see FIGS. 3 and 4. The front cover 11 acts as a guard to keep the operator's fingers away from the lever 87 and carriage 29 during operation of the machine. With reference to FIG. 16, it will be seen that operation of the machine is controlled by a pair of parallel circuits, one of which includes a master switch 93, a normally open momentary contact switch 94 and the drive motor 81, the other circuit including the switch 93, a normally closed micro switch 95, and the drive motor 81. Both circuits include a conventional connector plug 96 for engaging a conventional source of electrical potential, such as a wall receptacle or the like, not shown. The micro switch 95 includes an operating arm 97 that is yieldingly urged in a switch closed direction in the conventional manner, and which is adapted to be engaged by one of a pair of cams 98, one each on a different one of the carriage side members 42, to open the switch 95 during retracting movements of the carriage 29.

With the plug 96 connected to a source of electrical potential, and the master switch 93 closed, a cycle of operation of the machine is initiated by closing the momentary contact switch 94, whereupon the motor 81 will be energized to move the carriage 29 and parts carried thereby in an advancing direction toward the front end of the machine. Initial advancing movements of the carriage will move the switch operating one of the cams 98 away from the operating arm 97 to close the micro switch 95, after which the momentary contact switch 94 is allowed to open. Continued operation of the motor 81 causes the carriage 29 to move forwardly to its limit of advancing movement, as shown in FIG. 5, during which movement the cam 84 imparts movement to the link 37 and crank 39 to lower the carriage 29 to bring the moistening roller 27 and impression roller 28 toward engagement thereof with the printing bed 18, after which the carriage 29 is moved in a retracting direction toward the rear end of the machine. During final retracting movement of the carriage, the switch operating cam 98 again engages the operating arm 97 to open the micro switch 95 to deenergize the motor 81, thus completing a cycle of operation of the machine. The motor 81 is provided with an automatic braking mechanism of conventional design, indicated at 99, for preventing over-running of the motor at the end of an operational cycle.

A master element is illustrated fragmentarily in FIG. 1 as comprising a mounting sheet 100 having an opening 101 therein, and an insert 102 in the opening 101, the insert having imprinted thereon the legend to be transferred to the copy sheets 21. As customary, the legend is reproduced on the bottom side of the insert 102 in transferable carbon or similar material. A feature of this invention is the means for releasably gripping master elements of various sizes, the gripping means comprising upper gripping members and a lower support member which engage the top and bottom surfaces respectively of the mounting sheet 100 and hold the same in proper position for printing during an operating cycle of the machine. The upper gripping members are two in number, and are in the nature of a pair of flat fingers 103 disposed at opposite sides of the path of advancing and retracting movement of the impression roller 28, and equipped with friction elements 104 made from short pieces of rubber tubing or the like, stretched thereover. A mounting frame 105 for the upper gripping member 103 comprises a pair of elongated arms 106 each extending longitudinally of the base 1 between a different side of the

carriage 29 and an adjacent side wall 2, the front ends of the arms 106 each being integrally formed with a different one of the fingers 103. The arms 106 are connected intermediate their ends by a transverse connector plate 107, and at their rear ends, the arms 106 are journaled on the studs 35. A pair of torsion springs 108, each mounted on a different one of the studs 35, yieldingly urge the mounting frame 105 in a downward direction of swinging movement. The mounting frame 105 with its gripping members or fingers 103 is swung upwardly against bias of the springs 108 during final retracting movements of the carriage 29, by engagement of the cam 98 on the carriage side members 42 with a pair of cam follower rollers 109 each journaled on a different one of the arms 106.

The support member, indicated at 110, is in the nature of an elongated flexible metallic plate that extends generally longitudinally of the base 1 and which has a rear end portion 111 that is rigidly secured to the connecting member 32 by nut-equipped screws or the like 122. The support member 110 slopes forwardly and downwardly toward the printing bed 18, and at its front end portion is bifurcated to provide a pair of laterally spaced tongues 113, each of which underlies an adjacent one of the upper gripping members 103, and an intermediate ledge portion 113', see FIGS. 13 and 15, each of the tongues 113 normally resting on the copy sheets 21 on the printing bed 18. A pair of stop members in the nature of upstanding ears 114 are formed at the rear end of the tongues 113, for engagement with the adjacent edge of the master element 100 when the same is placed on the top surfaces of the tongues 113. The support member 110 is resiliently biased in a direction to cause said engagement of the tongues 113 with the underlying copy sheets 21 on the printing bed 18, and means for raising the front end portion of the member 110 against the yielding bias thereof and responsive to advancing movement of the carriage 29, comprises a shroud-like lifting element 115 which overlies the housing 47, and which is pivotally mounted on the aligned pins 48 for common swinging movements with the housing 47 and for swinging movements independently thereof. The lifting element 115 has a downturned nose portion 116 that engages the adjacent under surface of the support member 110 rearwardly of the tongues 113 to raise the tongues 113 toward operative gripping engagement with the overlying gripping fingers 103 during initial advancing movement of the carriage 29. Thus, during initial advancing movement of the carriage 29, with the tongues 113 moving upwardly and the fingers 103 moving downwardly, the mounting sheet 100 of the master element is immediately gripped between and securely held during the operating cycle of the machine. As the carriage 29 advances further, the lifting element 115 cams the support member 110 upwardly so that the moistening roller 27 moves under the master element, the impression roller 28 moving forwardly over the master element. During retracting movement of the carriage 29, the moistening roller 27 moves downwardly into engagement with the uppermost copy sheet 21 to transfer spirit liquid thereto, the impression roller 28 pressing the master element downwardly on to the moistened portion of the uppermost copy sheet to cause the legend on the insert 102 to be transferred to the copy sheet 21. The tongues 113 are spaced apart sufficiently for the impression roller 28 to move therebetween, so that full pressure of the roller 18 is applied directly to the insert 102 of the master element. During final retracting movement of the carriage 29, the cams 98 engage the rollers 109 to raise the upper gripping elements or fingers 103, and the lifting element 115 moves out of engagement with the overlying portion of the support member 110 to permit the same to assume its normal position shown in FIGS. 2 and 4.

For the purpose of raising the tongues 113, when the carriage 29 is in its fully retracted idle position, to facilitate placing of copy sheets 21 on the printing bed 18,



the lifting element 115 is provided with a pair of rearwardly projecting plate-like cam followers 117 that are adapted to be engaged by a cooperating pair of eccentric elements 118 mounted fast on a transverse shaft 119 suitably journaled in the frame structure sidewalls 2 on a horizontal axis. An operating handle 120 is mounted fast on the shaft 119 outwardly of one of the sidewalls 2, to impart rotation to the shaft 119 to pivotally move the lifting element 115 about the axis of the pins 48 independently of the housing 47, and in a direction to bring the nose portion 116 into lifting engagement with the adjacent portion of the support member 110, to raise the tongues 113 away from engagement with the printing bed 18. Thereafter, the operating handle 20 may be swung to its position shown in FIG. 1, permitting the tongues 113 to again move downwardly against the uppermost copy sheet 21. It will be appreciated that downward pressure of the tongues 113 on the copy sheets 21 is sufficiently light to permit easy withdrawal of each copy sheet 21 upon completion of an operating cycle of the machine.

For adjustment of the carriage 29 and parts carried thereby in a direction longitudinally with respect to the base 1, it is only necessary to loosen the eccentrically disposed screws 13 and rotate the front cross rod 14 about the aligned axes of the screws 13. Such rotation moves the axis of pivotal movement of the lever 87 relative to the axis 88 of pivotal connection between the lever 87 and pitman 85' whereby to move the carriage forwardly or rearwardly relative to the base 1. When the carriage 29 is located as desired, the screws 13 are again tightened to hold the cross rod 14 against rotation. In like manner, the range of upward and downward swinging movement of the guide means 30 and carriage 29 mounted therein, may be shifted upwardly and downwardly by loosening the screws 16 and rotating the eccentrically mounted cross rod 15 to the desired extent, after which the screws 16 are again tightened to hold the cross rod 15 against rotation. Downward pressure of the impression roll 28 against the master element and underlying copy sheets may be adjusted by placing the front ends of the torsion springs 77 in given ones of the vertically spaced notches 78 in the bracket front wall 73. Downward pressure of the moistening roll 27 against the copy sheets 21, during moistening retracting movement of the carriage 29, may be adjusted by moving the rods 49 forwardly or rearwardly with respect to the transverse bar 51, and locking the rods 49 in place by means of the lock nuts screw threaded thereon at opposite sides of the transverse bar 51, said lock nuts being indicated at 121.

The operation of the above-described machine has been discussed. However, it will be appreciated that a full cycle of operation involves the placing of a master copy on the tongues 113, momentary closing of the switch 94 and, when the printing operation is completed, removing the master element and the topmost copy sheet 21 from the printing bed 18. With the above machine, the insert 102 may be mounted on record or ledger cards of any given size, enabling the machine to be used for printing names and addresses or other legend on time cards, checks, personnel forms, follow-up notices, etc.

In some instances, the master element may be in the nature of an elongated tabulating card or the like, not shown, and of a width less than the transverse distance between the tongues 113. In such case, the card is inserted into the machine with one end resting on the ledge portion 113' or on the support member 110 rearwardly of the ledge portion 113', the opposite end of the card being held by the operator's fingers forwardly of the printing bed 18. During the printing operation, the master card will be raised by the ledge portion 113' and the moistening roller 27 will move thereunder as above described, the impression roller engaging the top surface of the card and rolling thereover during retracting movement of the carriage 29.

What is claimed is:

1. A printing machine utilizing the spirit transfer process and a master element having material to be reproduced imprinted thereon and comprising:

- (a) frame structure including an elongated base defining a generally horizontal printing bed,
- (b) guide means mounted in said frame structure and defining a pair of laterally spaced generally horizontal parallel guideways upwardly spaced from said base and extending longitudinally thereof,
- (c) a carriage mounted in said guideways for longitudinal movement alternately in opposite directions between forwardly advanced and rearwardly retracted position longitudinally of said base, and generally upward and downward movements toward and away from said printing bed,
- (d) a moistening device including a generally horizontal transfer element extending transversely of the direction of longitudinal movement of the carriage,
- (e) means mounting said moistening device on the carriage for common movements therewith,
- (f) an impression roller,
- (g) bracket means on said carriage mounting said impression roller in forwardly spaced relation to said transfer element for rotation on a horizontal axis extending transversely of the direction of movement of the carriage,
- (h) means for imparting advancing and retracting movements to said carriage and for imparting downward and upward movement to said transfer element and impression roller during advancing and final retracting movements respectively of said carriage,
- (i) master element support means for supporting a master element in overlying relationship to a copy sheet on said printing bed, including a support member extending generally longitudinally of the direction of travel of the carriage and having a rear end anchored against movement in said direction of carriage travel and a master element engaging front end portion yieldingly biased downwardly into engagement thereof with a copy sheet on said printing bed and movable generally upwardly and downwardly relative to said printing bed; and
- (j) a lifting element connected to said carriage and underlying said support member, said lifting element engaging said support member responsive to advancing movement of the carriage to raise said front end portion of the support member and a master element thereon against said yielding bias and upwardly of the path of advancing movement of said transfer element and generally rearwardly of the impression roller relative to the direction of said advancing movement, whereby to dispose the master element between said transfer element and impression roller during said advancing and retracting movements.

2. The printing machine defined in claim 1 in which said guide means includes a rear end portion pivotally secured to said frame structure on a transverse horizontal axis for generally upward and downward swinging movements of said guideways, said means for imparting upward and downward movements to said carriage including linkage connected to said guide means and frame structure, rotary cam means journaled in the frame structure, and a cooperating cam follower on said linkage.

3. The printing machine defined in claim 2, in which said means for imparting advancing and retracting movements to said carriage includes a lever pivotally mounted in said frame structure, means operatively connecting said lever to said cam means for imparting pivotal swinging movements to said lever responsive to rotation of said cam means, and means operatively connecting a portion of said lever to the carriage.

4. The printing machine defined in claim 2, characterized by spring means yieldingly urging said guide means

in an upward direction, said cam means moving said linkage in a direction to impart downward swinging movement to said guide means against bias of said spring means.

5 5. The printing machine defined in claim 1 in which said support member comprises an elongated flexible resilient plate sloping downwardly and forwardly from its rear end toward said printing bed and having an intermediate portion engaged by said lifting element.

10 6. The printing machine defined in claim 5, in which said lifting element is mounted in the carriage for limited swinging movement about a horizontal axis extending transversely of said carriage, characterized by a rotary eccentric element mounted in said frame structure and a cooperating cam follower on said lifting element, said 15 cam follower being positioned to engage said eccentric element in the retracted position of said carriage, and means for rotating said eccentric element to move said lifting element in a direction to raise the front end portion of said flexible plate away from engagement with the 20 printing bed.

7. The printing machine defined in claim 1 in which said master element supporting means further includes a pair of laterally spaced master element gripping members disposed in overlying relationship to said front end 25 portion of the support member, and means mounting said gripping members for movement toward and away from operative master element gripping engagement relative to said support member, said gripping members being responsive to initial advancing and final retracting movement of said carriage to move relative to said support member to respectively grip and release a master element 30 therebetween and said support member.

8. The printing machine defined in claim 7 in which 35 said front end portion of the flexible plate is bifurcated

to provide a pair of forwardly projecting tongues, each underlying a different one of said gripping members, said tongues being laterally spaced apart for movement of said impression roller therebetween.

9. The printing machine defined in claim 7, in which said means mounting said gripping members comprises a mounting frame extending longitudinally of said base and having a rear end pivotally connected to said frame structure on a transverse horizontal axis, characterized by means yieldingly urging said mounting frame in a downward direction of swinging movement about said horizontal axis.

10. The printing machine defined in claim 9, characterized by a cam and a cooperating cam follower, one on said carriage and the other on said mounting frame, and responsive to final retracting movement of said carriage to impart upward swinging master element releasing movement to said mounting frame, against bias of said last-mentioned means.

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