

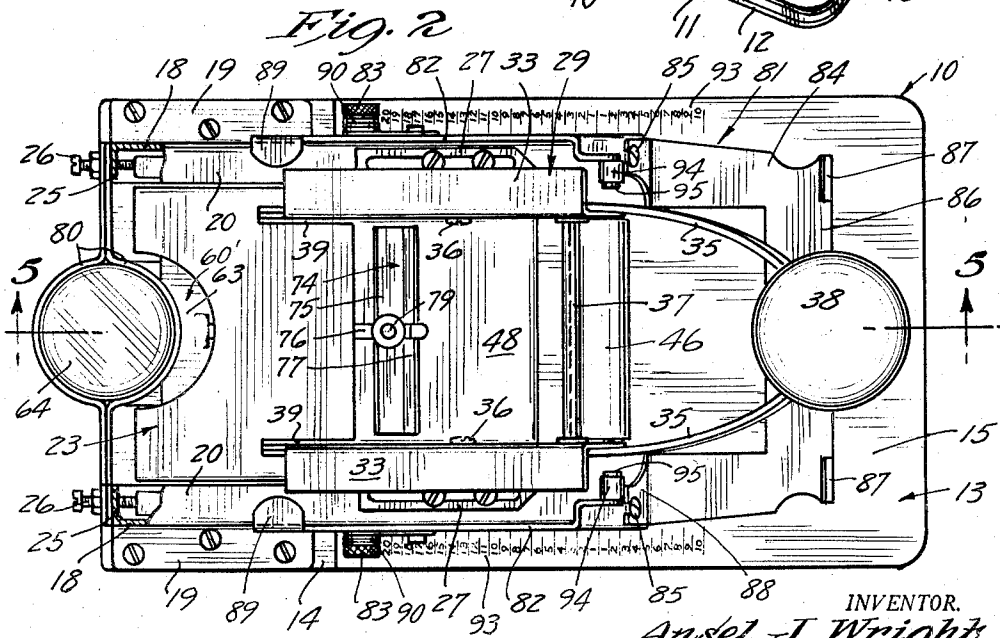
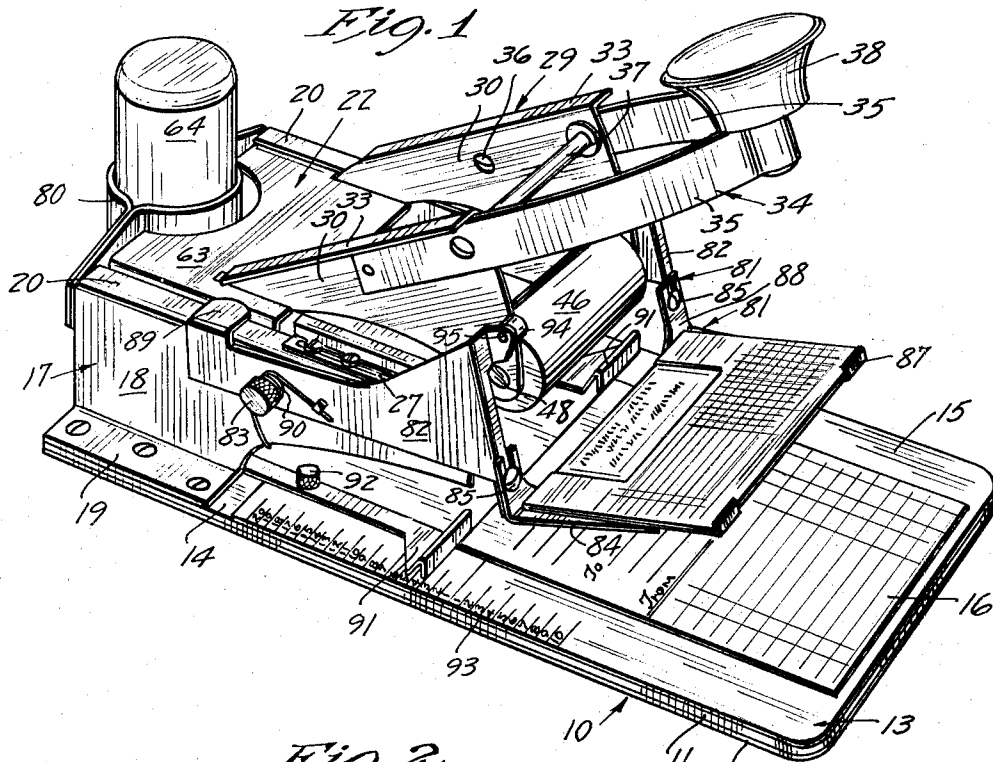
Dec. 9, 1958

A. J. WRIGHT
PRINTING MACHINE

2,863,385

Filed Aug. 24, 1956

4 Sheets-Sheet 1



INVENTOR.
Ansel J. Wright
BY
Merchant & Merchant
ATTORNEYS

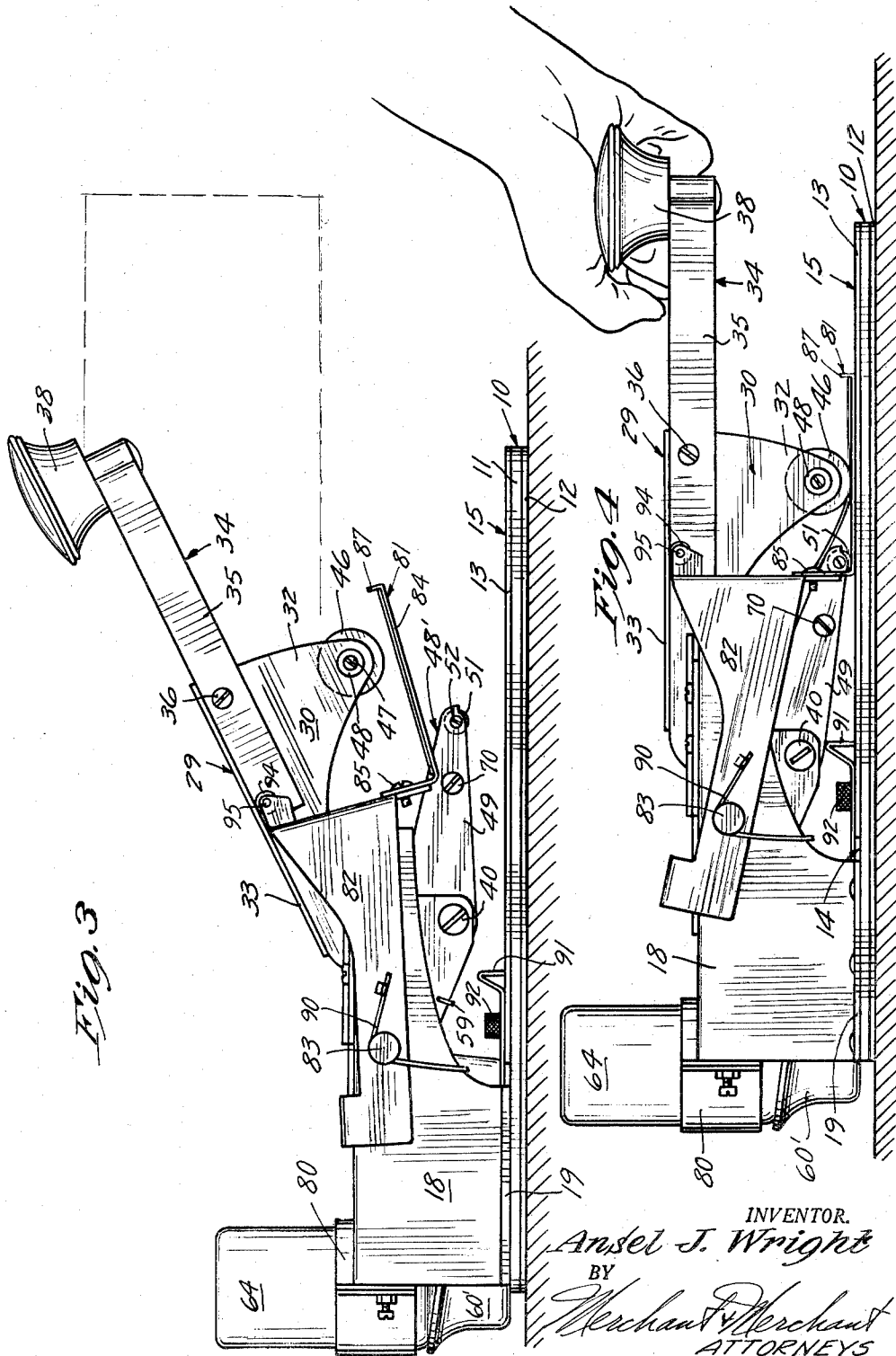
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4 Sheets-Sheet 2



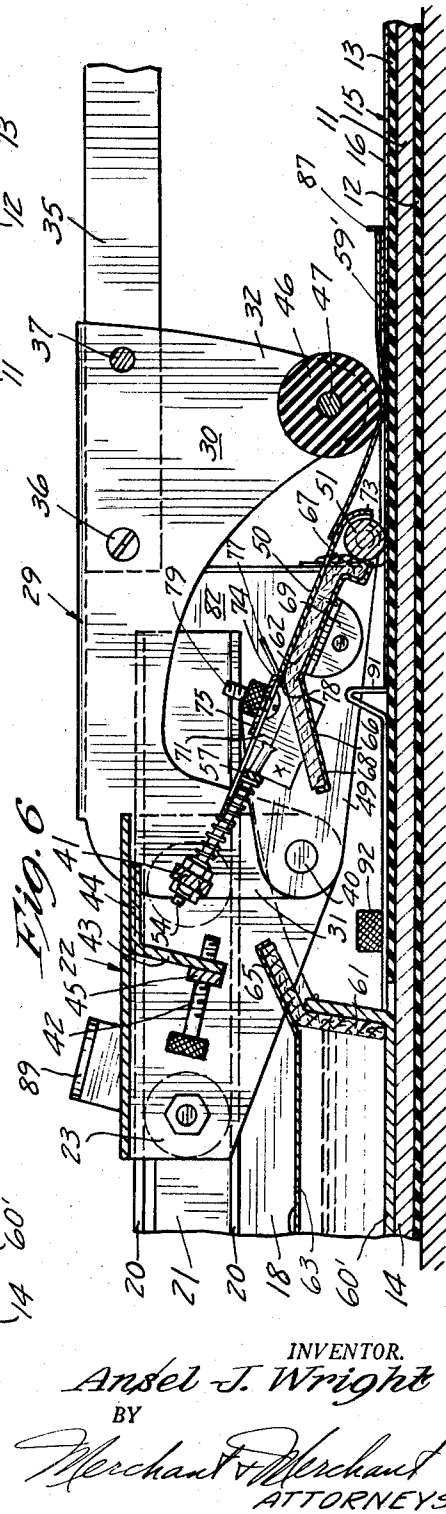
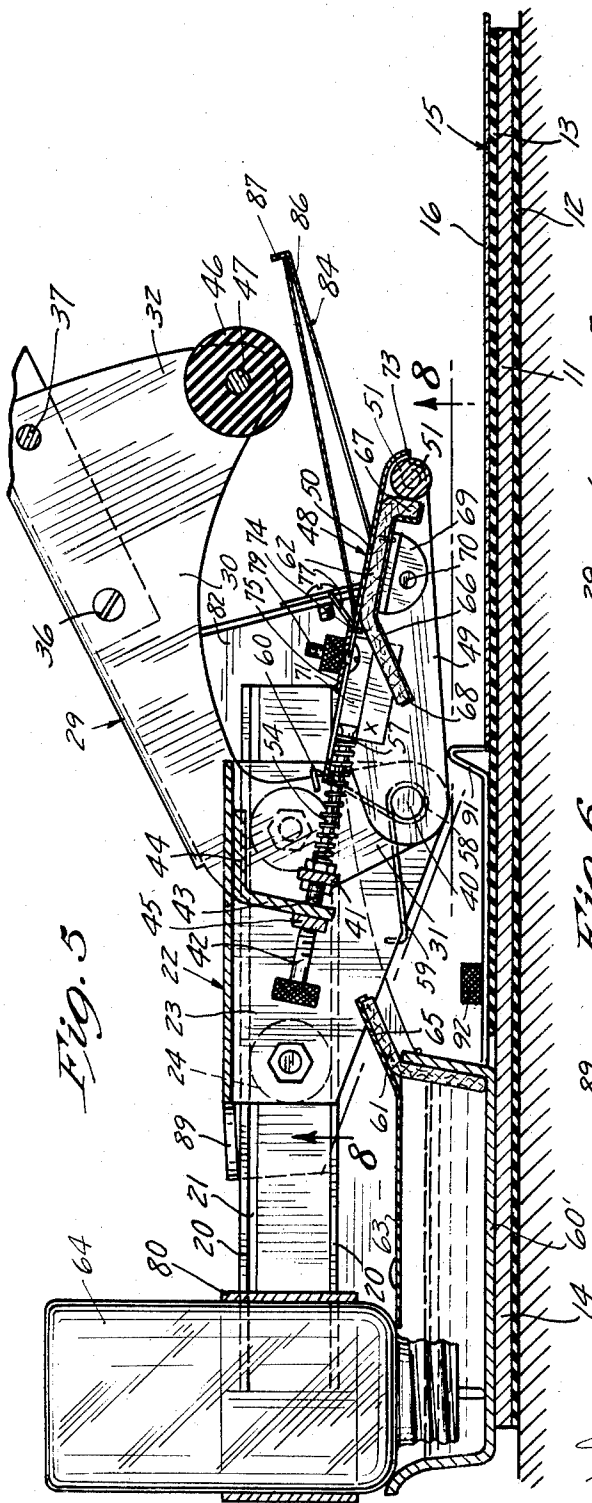
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A. J. WRIGHT
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4 Sheets-Sheet 3



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Ansel J. Wright
BY
Merchant & Merchant
ATTORNEYS

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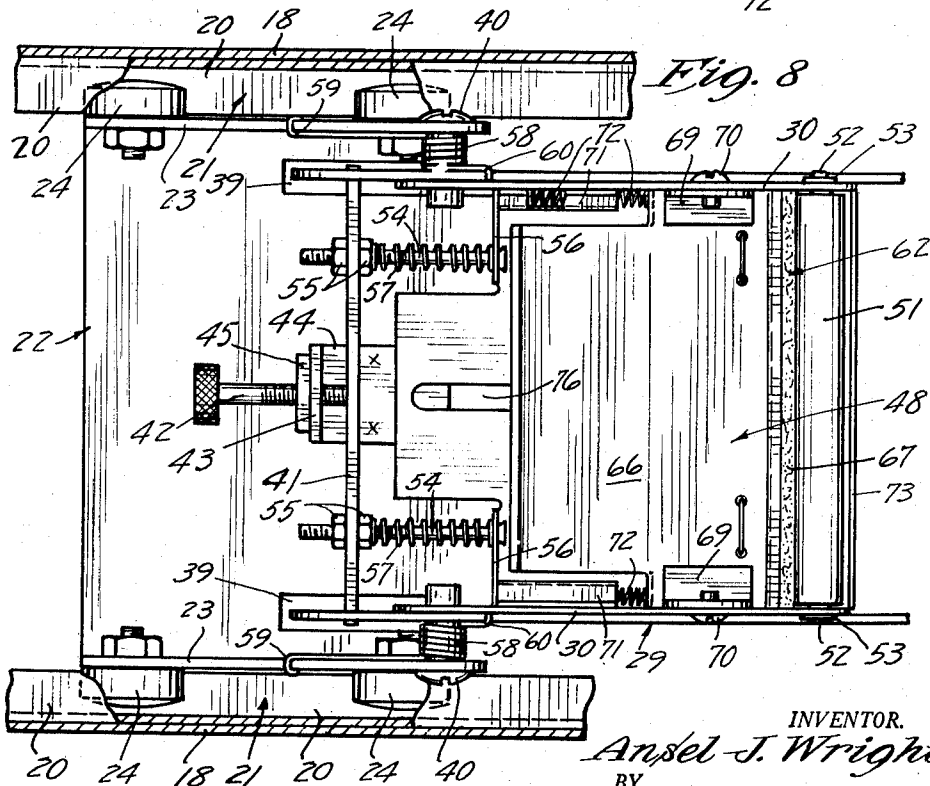
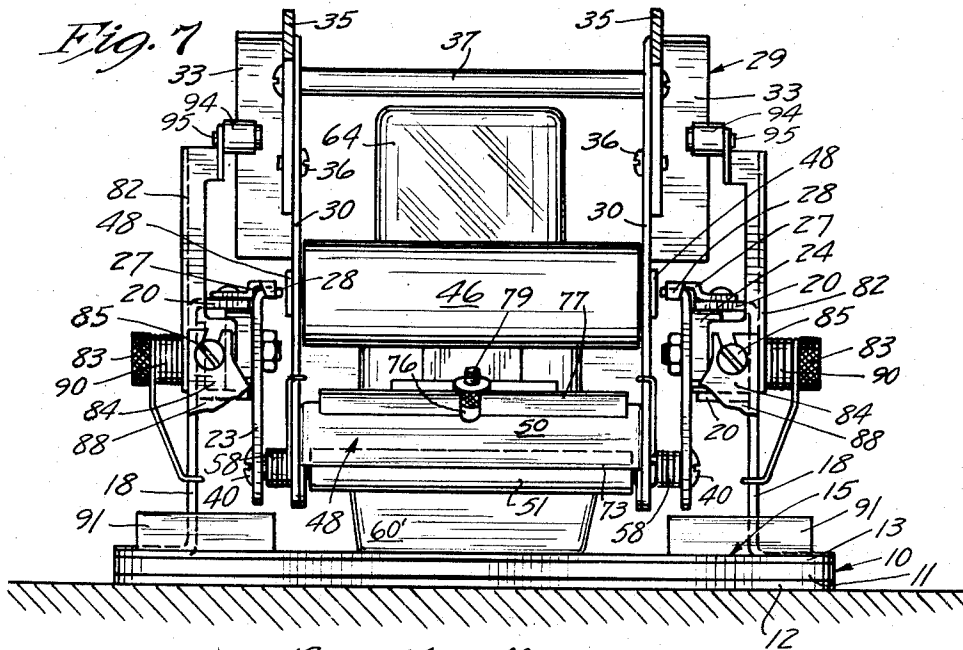
A. J. WRIGHT

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PRINTING MACHINE

Filed Aug. 24, 1956

4 Sheets-Sheet 4



INVENTOR.

Ansel J. Wright

BY

Merchant & Merchant
ATTORNEYS

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2,863,385

PRINTING MACHINE

Ansel J. Wright, Minneapolis, Minn., assignor to Master Addresser Company, Minneapolis, Minn., a partnership

Application August 24, 1956, Serial No. 606,086

9 Claims. (Cl. 101—133)

My invention relates generally to a printing machine and more specifically to a printing machine utilizing the spirit transfer process of printing and a master element having spirit-responsive transfer material imprinted thereon.

Printng machines of this type are commonly referred to as "spirit duplicators" and function as follows: The matter to be duplicated is first printed in reverse on a master sheet from hectographic carbon. Copy or impression sheets are individually moistened by the machine with spirit solvent or duplicator fluid. While an impression sheet is in a moistened condition, it is brought into intimate face-to-face contact with the reversely printed master sheet or element under sufficient pressure to dissolve the amount of copying ink out of the master sheet or element necessary to produce a positive copy of the printed matter on the impression sheet.

More particularly, my invention relates to a printing machine of the aforementioned type having a normally flat stationary bed, whereon one or a plurality of copy sheets are retained during the copying or duplicating operation. An impression roller and a moistening roller are mounted for common longitudinal movement over the printing bed and for pivotal swinging movements toward and away from the bed. The impression roller and moistening roller are normally spaced apart so that a master element is positioned between the rollers with the reversely printed side generally facing the impression sheet. The impression roller and moistening roller are then swung pivotally toward the bed and then moved longitudinally across the bed so that a path of printing fluid is laid on the impression sheet by the moistening roller. The impression roller follows after the moistening process, pressing the carbon side or reversely printed side of the master element against the moistened impression sheet to produce a positive copy of the printed matter.

Although my novel and improved printing machine is adapted to perform the usual duplicating or printing functions of similar machines now known in the art, it is particularly effective with respect to two functions wherein it is novel and/or highly superior over any similar machines now known in the art, to wit:

(1) My novel and improved printing machine is particularly adapted and effective in making a quick print or prints from a single master element; and,

(2) My novel and improved printing machine is particularly adapted to make a print from a master element which has been attached to a record card of any size; that is, the same machine is adapted to be used with a variety of record cards of various sizes each having a master element attached therewith or formed as a part thereof.

Thus, one important object of my invention is to provide a novel and improved printing machine which is capable of effectively accomplishing the aforementioned functions; although it should be clearly understood that my invention is not limited in use to such functions but

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can be adapted to almost any repetitive printing or duplicating job.

Another object of my invention is to provide a printing machine of the type described whereby the master element is disposed during the printing process in a position that the printed matter to be reproduced can be easily read by the operator.

Further objectives and advantages of the instant invention is to provide a printing machine of the type described which is compact and rugged in construction, durable in use, relatively inexpensive and yet engineered to make the highest quality reproductions with the utmost simplicity of operation.

Other objectives and advantages of my invention will become apparent in the course of the following specification and claims, reference being had to the drawings wherein:

Fig. 1 is a view in perspective of the printing machine of my invention;

Fig. 2 is a view in top plan of the structure of Fig. 1;

Fig. 3 is a view in side elevation of the structure of Fig. 1;

Fig. 4 is a view similar to Fig. 3 and showing a different position of some of the parts;

Fig. 5 is a slightly enlarged view partly in elevation and partly in vertical section taken on the line 5—5 of Fig. 2, some parts being broken away;

Fig. 6 is a fragmentary view similar to Fig. 5 but showing some of the parts thereof moved to the same position as shown in Fig. 4;

Fig. 7 is a view in front elevation of the structure shown in Fig. 1; and

Fig. 8 is an enlarged fragmentary view partly in section and partly in bottom plan taken on the broken line 8—8 of Fig. 5, some parts being broken away.

Referring more particularly to the drawings, wherein like parts will be indicated by the same numeral, a generally rectangular base portion is indicated in its entirety by the numeral 10, and comprises a plate-like metallic member 11 having a pad member 12 formed of felt, rubber or the like rigidly anchored to the underside thereof, and adapted to prevent marring a supporting surface, and having a somewhat resilient base member 13 formed of rubber the like rigidly anchored to the top side thereof. Pad member 12 conforms to and completely covers the underside of plate-like member 11; whereas, base member 13 only partially covers plate-like metallic member 11 leaving a portion adjacent the rearward end 14 thereof uncovered. Base portion 10 defines a printing bed, which for ease of identification will be given the general reference numeral 15, and the top surface of base member 13 is adapted to receive one or a plurality of copy or impression sheets 16.

Frame structure, indicated generally by the numeral 17, comprises a pair of laterally spaced upstanding frame members 18 each having a horizontally disposed outwardly projecting flange 19 rigidly anchored to plate-like metallic member 11 adjacent the rearward end 14 thereof, by screws or the like. Each of the frame members 18 has a pair of vertically spaced laterally inwardly projecting horizontal flanges 20 which define oppositely disposed horizontal guideways 21 upwardly spaced from base portion 10. A generally U-shaped carriage element 22 includes a pair of oppositely disposed depending side flanges 23, and to each is journaled by bolts or the like a pair of horizontally aligned longitudinally spaced laterally outwardly projecting mounting rollers 24. Mounting rollers 24 are disposed in guideways 21 to mount carriage element 22 for longitudinal movement alternately in opposite directions over the base portion 10. Each of the frame members 18 has an integral inwardly projecting flange 25 extending between flanges 20 at the

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rearward end of guideway 21 formed thereby; and adjustable stop screws 26 extend through flanges 25 to limit rearward or retracting movements of carriage element 22. A pair of slotted adjustable stop plates 27 are each connected to the top flange 20 of a different one of the frame members 18, and each has a depending lug 28 which is engageable with the carriage element 22 to limit forward or advancing movements thereof. The retracted position of carriage element 22 is defined as its position when the rearwardmost rollers 24 engage adjustable stop screws 26, which is shown in Figs. 1 and 2; and the advanced position of carriage element 22 is defined as its position when it is in engagement with the depending lugs 28 of stop plates 27, which position is generally shown in Figs. 3 and 5.

Mounting structure, indicated in its entirety by the numeral 29, comprises a pair of laterally spaced generally vertically disposed supporting plates 30 each defining rearward and forward depending mounting ears 31 and 32 and a cam-acting flange portion 33. Mounting structure 29 further comprises a bail 34 having each of its arms 35 rigidly anchored to a different one of the supporting plates 30 by screws or the like 36 and a transverse connecting rod 37. A knob-like handle 38 is anchored to bail 34 at the apex or junction of arms 35 thereof. Each of the supporting plates 30 of mounting structure 29 is received in a different one of a pair of laterally spaced forwardly opening slots 39 formed in carriage element 22 to dispose rearward mounting ears 31 each adjacent a different one of the flanges 23 in laterally inwardly spaced parallel relationship therewith. Each of the mounting ears 31 is journaled on a different one of a pair of horizontally disposed axially aligned pivot bolts 40 which extend between the mounting ears 31 and flanges 23 of carriage element 22 to connect mounting structure 29 to carriage element 22 for longitudinal movements in common therewith and for pivotal swinging movements about the horizontal axis defined by pivot bolts 40 toward and away from printing bed 15. A transverse bar 41 is rigidly connected at its opposite ends to supporting plates 30 adjacent but upwardly spaced from pivot bolts 40, and is engageable with an adjustable stop screw 42 screw-threaded into a depending flange portion 43 of an angle bracket 44, which is rigidly anchored by welding or the like to carriage element 22 centrally intermediate flanges 23. A lock nut 45 is associated with stop screw 42. The engagement of transverse bar 41 with stop screw 42 limits the pivotal movement of mounting structure 29 away from printing bed 15.

An impression roller 46 formed of rubber or the like is mounted on a shaft 47 which extends axially beyond the limits of roller 46. Shaft 47 is journaled at its opposite ends in bearings 48 connected to forward mounting ears 32 to mount impression roller 46 for rotation with respect to mounting structure 29 about a horizontal axis at right angles to the direction of longitudinal movement of carriage element 22. Impression roller 46 is disposed forwardly of carriage element 22 in the direction of advancing movements thereof; the movement of carriage element 22 from its retracted position to its advanced position being considered a forward movement thereof. Impression roller 46 by its connection with mounting structure 29 is longitudinally movable therewith over the printing bed 15 and is pivotally swingable therewith toward and away from printing bed 15 between an operative position, adjacent the bed, and a normal position upwardly spaced therefrom. Impression roller 46 is at its normal position when mounting structure 29 is at its limit of pivotal swinging movement in a direction away from bed 15, that is, when transverse bar 41 is in engagement with stop screw 42. Impression roller 46 is shown in its normal position in Figs. 1, 3, and 5; and it is shown in its operative position in Figs. 4 and 6.

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A generally channel-shaped mounting member, indicated in its entirety by the numeral 48 comprises a pair of laterally spaced vertically disposed depending side portions 49, which are tapered, and an inter-connecting central portion 50 integral with side portions 49 and which overlies printing bed 15. Central portion 50 defines a normally forwardly sloping guide plate; and for ease of identification, central portion 50 will hereinafter be referred to as guide plate 50. Side portions 49 are journaled on pivot bolts 40, each in laterally inwardly disposed adjacent relationship with a different one of the rearward mounting ears 31, to connect mounting member 48 to mounting structure 29 and carriage element 22 for longitudinal movements in common therewith and for pivotal swinging movements with respect thereto about a horizontal axis common with the pivotal axis of mounting structure 29. A longitudinally extended spirit transfer element 51, which is a metallic moistening roller, has a pair of axially aligned pintle-forming screws 52 rigid therewith which are journaled in bearings 53 in the narrowed ends of side portions 49 for connecting moistening roller 51 to mounting member 48 for rotation about a horizontal axis at right angles to the direction of longitudinal movement of carriage element 22 and for both longitudinal and pivotal movement in common with mounting member 48. Moistening roller 51 is pivotally moveable toward and away from printing bed 15 between an operative copy sheet engaging position, which is shown in Figs. 4 and 6, and a normal position upwardly spaced therefrom, which is shown in Fig. 5.

I provide a connection between mounting structure 29 and mounting member 48 comprising a pair of laterally spaced parallel rigid pins 54 each having a head at one end and screw threaded at the other end. Pins 54 are rigidly anchored at their threaded ends to transverse bar 41 by nuts 55 and are journaled in depending bearing flanges 56, which are integral with mounting member 48, for longitudinal movement with respect to bearing flanges 56. The connection between mounting structure 29 and mounting member 48 further comprises a pair of coiled compression springs 57 each encompassing a different one of the pins 54 between a nut 55 and bearing flange 56 for yieldably biasing bearing flanges 56 into engagement with the heads of pins 54. Mounting structure 29 and mounting member 48 are pivotally swingable toward and away from each other about the common axis defined by pivot bolts 40 between maximum and minimum spaced positions. It is clear that pivotal movement of mounting member 48 away from mounting structure 29 is limited by the engagement of bearing flanges 56 with the head of pins 54, which defines the maximum spaced position of mounting structure 29 and mounting member 48. Mounting member 48 is pivotally swingable generally toward mounting structure 29 against the bias of springs 57, which yieldably urge mounting structure 29 and mounting member 48 to their maximum spaced position. Unless external force is applied tending to urge mounting member 48 pivotally toward mounting structure 29, pivotally swinging movements of mounting structure 29 will effect pivotal swinging movements of mounting member 48 in common therewith. When impression roller 46 is at its normal position and mounting structure 29 and mounting member 48 are in their maximum spaced positions, moistening roller 51 will be disposed at its normal position. As shown in Figs. 5 and 6, moistening roller 51 has a shorter distance to travel between its normal position and its operative position than has impression roller 46. Upon pivotal swinging movements of mounting structure 29 from its limit of upward movement toward printing bed 15, mounting structure 29 and mounting member 48 will move in common until moistening roller 51 engages copy sheet 16; thereupon further pivotal movement of mounting structure 29 towards printing bed 15 moves mounting member 48 and mounting structure 29 pivotally toward one another from

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their maximum spaced position against the bias of springs 57 until impression roller 46 reaches its operative position, shown in Fig. 6. I provide a pair of torsion springs 58 each having a central coiled portion encompassing a different one of the pivot bolts 40 and each having one end 59 looped about the adjacent flange 23 and its other end 60 looped about the adjacent supporting plate 30 to yieldably bias mounting structure 29 to its limit of pivotal movement away from printing bed 15, which urges impression roller 46 and moistening roller 51 to their normal positions. If the operator has applied pressure to the handle 38 to move mounting structure 29 pivotally downwardly until impression roller 46 is in its operative position and this pressure is then released, mounting structure 29 will first move away from printing bed 15 by the effect of torsion springs 58 and moistening roller 51 will be maintained in its operative position until mounting structure 29 and mounting member 48 are in their maximum spaced positions; at which positions, further pivotal movement of mounting structure 29 upwardly will positively move mounting member 48 away from printing bed 15, and thereby move moistening roller 51 from its operative position to its normal position. Thus, pivotal swinging movements of mounting member 48 is responsive to pivotal movements of mounting structure 29 in the manner aforementioned; and torsion springs 58, by virtue of yieldably biasing mounting structure 29 and therewith impression roller 46 to its normal position, will also yieldably bias mounting member 48 in a direction away from printing bed 15 and therewith moistening roller 51 to its normal position.

Although this will be more fully clarified in a discussion of the operation of my invention, it should be noted that moistening roller 51 is rearwardly disposed with respect to impression roller 46 whereby upon printing movements of carriage element 22 and attached structure, which is in the direction of longitudinal movement of carriage element 22 from its advanced position to its retracted position, moistening roller 51 will first pass over copy sheet 16 and impression roller 46 will follow after to press a master element 59 into engagement with the moistened copy sheet 16. Also, impression roller 46 and moistening roller 51 are vertically spaced when they are in their normal positions so that a master element 59' can pass into the area therebetween.

I provide a moistening device which comprises the aforementioned moistening roller 51, a well 60', and relatively movable wick elements 61 and 62. Well 60' is rigidly anchored to base portion 10 at the rearward end 14 of plate-like member 11 thereof, by any suitable means, intermediate frame members 18. Wick element 61 is anchored to a supporting and guard-plate 63 which in turn is connected to well 60'. Plate 63 partially overlies the open top of well 60' leaving open a portion thereof adapted to receive an inverted bottle 64 of spirit ink solvent. Plate 63 is preferably formed of a thin metal sheet and has a forwardly-projecting beveled end portion 65 which mounts the underlying portion of wick element 61 in proper position to be engaged by the second wick element 62, carried by mounting member 48, when carriage element 22 is at its retracted position. Wick element 62 is fixedly mounted on the supporting plate 66 which is shaped as shown in Fig. 6 whereby end portion 67 of wick element 62 is adapted to engage moistening roller 51 and the other end portion 68 of wick element 62 is adapted to engage wick element 61. Wick element 62 and its mounting plate 66 are connected to mounting member 48 by a pair of oppositely disposed angle brackets 69 which are anchored to side portions 49 by screws 70. Wick element 62 and its supporting plate 66 are mounted by brackets 69 for limited movement toward and away from moistening roller 51. A pair of sleeve-forming members 71 are each rigidly anchored, by welding or the like, to a different one of the side portions 49 of mounting member 48. Sleeve-forming members 71

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act to contain compression springs 72 disposed between bearing flanges 56 and oppositely disposed abutments integral with plate 66 to yieldably urge end portion 67 of wick 62 into engagement with moistening roller 51. The mounting of wick 62 acts to take up any wear thereof and to insure proper engagement of wick 62 with moistening roller 51.

Guide plate 50 acts as a guard overlying impression roller 51 and wick element 62; and the forward end 73 of guide plate 50 partially follows the arcuate curvature of impression roller 51 to provide a smoothly rounded end. A longitudinally extended guide stop member 74 is disposed normally at right angles to the direction of longitudinal movement of carriage element 22 and is adapted to square up the top of master element 59' in a manner which will be brought out further during an explanation of the operation of my device. Guide stop member 74 has a flat base portion 75 which slidably engages guide plate 50 for movement between the limits defined by the ends of slot 76, formed in guide plate 50 and extending longitudinally in the direction of movement of carriage element 22. Integral guide stop member 74 further includes the flange portion 77 inclined with respect to guide plate 50, and a depending guide lug 78 which projects into slot 76. A nut-equipped screw 79 projects through slot 76 and flange portion 75 to adjustably secure guide stop member 74 to guide plate 50.

A split ring supporting bracket 80 is anchored to frame structure 17 by stop screws 26 and acts to support bottle 64 in position.

A master element supporting means is indicated in its entirety by the numeral 81, and comprises a pair of laterally-spaced arms 82, each pivotally connected to a different one of the frame members 18 in adjacent laterally outwardly disposed relationship by bolts 83. Master element supporting means 81 further comprises a tray-like element 84 which is a thin flexible metallic U-shaped member releasably connected by screws 85 to arms 82. The central bridge portion 86 of tray-like element 84 has upstanding lugs 87 which cooperate with the oppositely-disposed upstanding ends 88 of tray-like element 84 to contain the master element 59' on the tray-like element 84. Tray-like element 84 is preferably of U-shape to provide the cut-out central portion so that the printed matter to be reproduced from the master element 59' may be pressed into engagement with the copy sheet 16. Each of the arms 82 has an inturned flange 89 engageable with the adjacent frame member 18 to limit upward pivotal movement of master element supporting means 81. I provide a pair of torsion springs 90, each having a coiled central portion encompassing a different one of the bolts 83 and its ends anchored one to an arm 82 and the other to a frame member 18, for yieldably urging master element supporting means 81 to its limit of pivotal movement wherein flanges 89 engage frame members 18. This defines the raised position of master element supporting means 81. Supporting means 81 at its raised position is adapted to support the master element 59' so that it will pass between impression roller 46 and guide plate 50 when the impression roller 46 and moistening roller 51 are in their normal positions and during advancing movements of carriage element 22. Tray-like element 84 is pivotally swingable downwardly from its raised position toward the printing bed 15 to its lowered position wherein it overlies a copy sheet 16 and supports the master element 59' in position to be pressed into engagement therewith by impression roller 46. I provide a pair of cooperating slotted margin guides 91 which may be adjustably secured to base portion 10 by screws 92 passing through the slots of margin guides 91 and screw-threaded into the plate-like metallic member 11 of base portion 10. The position of the print on the impression sheet or copy sheet 16 is ad-

justed by setting margin guides 91. For easy adjustment, a scale indicated by the numeral 93 is imprinted on the base member 13 and calibrated in typewriter lines; moving margin guides 91 one space on the scale will change the print position one typewriter line.

The operation of my invention is as follows:

When the parts of my printing machine are as shown in Figs. 1, 2, and 3, carriage element 22 is at its retracted position, impression roller 46 is at its normal position, moistening roller 51 is at its normal position, and master element supporting means 81 is at its raised position. At the retracted position of carriage element 22, wick elements 61 and 62 are in engagement, as shown in full and dotted lines in Fig. 5, wick element 62 being shown in dotted lines. Bottle 64 is filled with spirit ink solvent to supply well 60' from which the engaged wick elements 61 and 62 will become saturated with spirit ink solvent. Assuming margin guides 91 to be properly positioned, the copy sheet 16 is placed on the printing bed 15 with its top edge engaging margin guides 91. Although only a single copy sheet 16 is shown on the printing bed 15, a stack or plurality of such sheets up to one-quarter inch thick may be placed on printing bed 15 at one time. Master element 59' is positioned on tray-like element 84 as shown in Fig. 1, with the reversely printed or carbon side facing downwardly toward the copy sheet 16. The operator by handle 38 moves mounting structure 29, and therewith carriage element 22 and mounting member 48 longitudinally forwardly, that is, in an advancing direction of movement of carriage element 22, which will normally be a movement toward the operator, without depressing handle 38 so that impression roller 46 and moistening roller 51 are maintained in their normal positions. This forward movement continues until limited by stop plates 27. Handle 38 is then depressed to move mounting structure 29 pivotally downwardly toward printing bed 15. This moves impression roller 46 from its normal position to its operative position and moves moistening roller 51 from its normal position to its operative position. I provide cam followers which are a pair of rollers 94 each connected for rotation about a horizontal axis to a different one of the arms 82 by a pivot pin 95 or the like. Rollers 94 are positioned so that each is engaged by a different one of the cam acting flange portions 33 of mounting structure 29 at the advanced position of carriage element 22 so that upon depressing movements of handle 38, master element supporting means 81 is moved from its raised position to its lowered position in which it engages the copy sheet 16 in overlying relationship. Moistening roller 51 at its operative position is in engagement with copy or impression sheet 16 forward, that is, longitudinally spaced in the direction of advancing movements of carriage element 22, of the space to be imprinted on copy sheet 16. While maintaining handle 38 depressed under pressure, it is moved away from the operator or in the direction to move carriage element 22 from its advanced position toward its retracted position. During this movement, a path of printing or spirit ink solvent is laid on copy sheet 16 by moistening roller 51, which is fed by wick element 62 in engagement therewith. Impression roller 46 follows thereafter, pressing the reversely printed or carbon side of master element 59' against the moistened copy sheet 16. A small amount of the carbon material is dissolved and transferred to the copy sheet. When the operator releases handle 38 after printing copy sheet 16, impression roller 46 and moistening roller 51 will be returned to their normal positions, and carriage element 22 should be returned to its retracted position to insure that wick element 61 will convey sufficient spirit ink solvent to the movable wick element 62 for further operation. The printing process aforementioned may be repeated if desired.

Adjustments of my printing machine are as follows: The adjustment of margin guides 91 has already been mentioned. Guide stop member 74 is adjusted longitudinally of the direction of movement of carriage element 22 so that it will square up the top of master element 59' when carriage element 22 reaches its advanced position during movement thereof from its retracted position. The positioning of stop plates 27 determines the extent of movement of carriage element 22 between its retracted and advanced positions. Master element supporting means 81 is not essential to the operation of my printing machine and tray-like element 84 may be removed for certain phases of operation. Master element supporting means 81 is particularly convenient when using a plurality of relatively small identical master elements like the one specifically shown here and identified by the numeral 59'. It should be pointed out that when using master element supporting means 81, that is, when tray-like element 84 is in position, stop plates 27 are adjusted to dispose moistening roller 51 at the advanced position of carriage element 22 just rearwardly, that is in the direction of retracting movements of carriage element 22, of bridge portion 86 of tray-like element 84. It might be noted that mounting member 48 is of a width such that it is able to pass between the laterally spaced sides of tray-like element 84 into the space bordered by tray-like element 84. To provide additional printing area, tray-like element 84 may be removed by loosening screws 85 and stop plates 27 may be moved forwardly, that is in the direction of advancing movements of carriage element 22, as far as necessary to give the additional printing area desired and locked in their new position.

As aforementioned, guide plate 50 acts as a guard over impression roller 51 and wick element 62; in addition, and for this reason it has been designated as a guide plate, plate 50 cooperates with guide stop member 74 to square up the top of master element 59' during movement of carriage element 22 from its retracted to its advanced position. The smooth beveled surface of guide plate 50 will guide the master element 59' to the guide stop member 74.

The beveled or sloping surface of guide plate 50 provides for the mounting member 48 to smoothly move from under master element 59' during printing movements of my machine or somewhat shown in Figs. 4 and 6.

The stop screw 42 which determines the limit of upward pivotal movement of mounting structure 29 likewise determines the normal or at rest position of moistening member 48 as aforementioned. Thus, the adjustment of stop screw 42 can raise or lower the at rest position of mounting member 48. Normally, it is best that mounting member 48 be allowed to raise as high as possible. However, should a master element 59' curl downwardly when set on the tray-like element 84 to the extent that it catches on guide plate 50, and is not properly guided to the guide stop member 74, an adjustment of stop screw 42 in a direction to decrease the amount of upward pivotal movement of mounting structure 29 will lower the normal or at rest position of moistening member 48 to avoid the aforementioned difficulty.

One important feature of my invention is that it can be used with a master element which has been attached to or formed as a part of a record card of almost any size; that is the same machine is adapted to be used with a variety of record cards of various sizes, each card having a master element portion. This flexibility of operation is important. In this regard, a tray-like element 84 is convenient for holding master elements of standard sizes and such tray-like elements 84 might be provided in a plurality of standard sizes. However, as aforementioned, tray-like element 84 is not essential and may be removed when using my machine for use with record cards which are not of a standard size or are possibly too large to be conveniently positioned on a tray-like ele-

ment 84. The printing operation of my machine is essentially the same as aforementioned whether the tray-like element 84 is used or not, except if the tray-like element 84 is not used, it is clear that the operator must hold the master element 59 in position to pass between impression roller 46 and moistening roller 51 during the movement of carriage element 22 from its retracted to its advanced position. Normally, carriage element 22 will be moved to its advanced position, and the operator will then place a master element between impression roller 46 and guide plate 50 with its top edge abutting guide stop member 74. The handle 38 is then depressed and the printing operation of my machine will proceed as aforementioned.

Another advantage of my machine is that the master element 59, when held in position for printing therefrom, either by hand or by tray-like element 84, the reversed carbon side faces downwardly away from the operator so that the side facing the operator is correctly disposed for reading the matter to be printed. Thus, at a glance, the operator can position the master element and at the same time read the printed matter to be sure it is the proper matter to be printed.

My novel and improved printing machine has been built and tested and found to be completely satisfactory for the accomplishment of the aforementioned objectives and advantages; and while I have shown and described a commercial embodiment thereof, it will be obvious to those skilled in the art that my invention may be modified by many substitutions and equivalents and that this disclosure is intended to be illustrative only. Therefore I intend to be limited solely by the scope of the appended claims.

What I claim is:

1. In a printing machine utilizing the spirit transfer process and a master element having material to be reproduced imprinted thereon, a normally generally horizontally disposed base portion which defines a printing bed, frame structure rigidly anchored to said base portion and defining generally horizontally disposed guideways spaced from said base portion, a carriage element mounted in said guideways for limited longitudinal movement alternately in opposite directions between a retracted position and an advanced position, a generally horizontally disposed impression roller adapted for pressing the master element into engagement with a copy sheet resting on the printing bed, mounting means connecting said roller to said carriage element for longitudinal movements therewith over said printing bed and for movements toward and away from said bed between an operative position adjacent the bed and a normal position upwardly spaced therefrom, a moistening device comprising a longitudinally extended spirit transfer element adapted to engage the copy sheet, said spirit transfer element being mounted in laterally spaced parallel relationship with said roller for longitudinal movement with said carriage element and for movements toward and away from said printing bed between an operative copy sheet engaging position and a normal position upwardly spaced therefrom, said spirit transfer element at its normal position being downwardly spaced from said roller at its normal position, master element supporting means connected to said frame structure for limited movements between a raised position and a lowered position, and resilient means yieldably biasing said supporting means to its raised position, said supporting means at its lowered position supporting said master element adjacent the copy sheet in position to be pressed into engagement with said copy sheet by said roller and said supporting means at its raised position supporting said master element to pass between said roller and said spirit transfer element when they are in their normal positions.

2. The structure defined in claim 1 in which said master element supporting means comprises a thin flexible tray-like element.

3. The structure defined in claim 1, in which said moistening device comprises a spirit fluid reservoir anchored to said base portion, a first wick element fixed with respect to said base portion fed by said reservoir, a second wick element in fixed relation with respect to said spirit transfer element and mounted to engage said first wick element at the retracted position of said carriage element, and said spirit transfer element comprising a moistening roller mounted in engagement with said second wick element.

4. In a printing machine utilizing the spirit transfer process and a master element having material to be reproduced imprinted thereon, a normally generally horizontally disposed base portion which defines a printing bed, frame structure rigidly anchored to said base portion and defining generally horizontally disposed guideways spaced from said base portion, a carriage element mounted in said guideways for limited longitudinal movement alternately in opposite directions between a retracted position and an advanced position, mounting structure connected to said carriage element for longitudinal movements therewith and for limited pivotal swinging movements with respect thereto toward and away from said bed, a generally horizontally disposed impression roller connected to said mounting structure forwardly of said carriage element in the direction of advancing movements thereof for rotation and for pivotal movements therewith between an operative position adjacent the bed and a normal position upwardly spaced therefrom, a moistening device comprising a moistening roller, a mounting member connected to said mounting structure for longitudinal movements in common therewith and for pivotal swinging movements with respect thereto, said moistening roller being connected to said mounting member for rotation and disposed in laterally spaced parallel relationship with said impression roller intermediate said impression roller and said carriage element, said mounting member comprising a normally forwardly sloping guide plate overlying said moistening roller, said moistening roller being pivotally swingable with said mounting member between an operative copy sheet engaging position and a normal position upwardly spaced therefrom, said guide plate and said moistening roller at the normal position of the latter being downwardly spaced from said impression roller at its normal position, connecting means between said mounting structure and said mounting member whereby the latter is pivotally swingable responsive to pivotal movements of the former, resilient means yieldably biasing said mounting structure and said mounting member to their limit of pivotal movement away from said bed to urge said impression roller and said moistening roller to their normal positions, master element supporting means pivotally connected to said frame structure for limited swinging movements between a raised position and a lowered position, said supporting means at its lowered position supporting said master element adjacent the copy sheet in position to be pressed into engagement with said copy sheet by said impression roller and said supporting means at its raised position supporting said master element to pass between said impression roller and said guide plate when said impression roller and moistening roller are in their normal positions and upon advancing movements of said carriage element, and resilient means yieldably biasing said supporting means to its raised position.

5. The structure defined in claim 4 in which said master element supporting means comprises a thin flexible metallic tray-like element.

6. The structure defined in claim 4 in which said moistening device comprises a spirit fluid reservoir anchored to said base portion, a first wick element fixed with respect to said base portion fed by said reservoir, a second wick element connected to said mounting member in engagement with said moistening roller and mounted to engage said first wick element at the retracted position of said carriage element.

7. In a printing machine utilizing the spirit transfer process and a master element having material to be reproduced imprinted thereon, a normally generally horizontally disposed base portion which defines a printing bed, frame structure rigidly anchored to said base portion and defining generally horizontally disposed guideways spaced from said base portion, a carriage element mounted in said guideways for limited longitudinal movement alternately in opposite directions between a retracted position and an advanced position, handle-equipped mounting structure connected to said carriage element for longitudinal movements therewith and for limited pivotal swinging movements with respect thereto toward and away from said bed, a generally horizontally disposed impression roller connected to said mounting structure forwardly of said carriage element in the direction of advancing movements thereof for rotation about a horizontal axis and for pivotal movements therewith between an operative position adjacent the bed and a normal position upwardly spaced therefrom, a moistening device comprising a moistening roller and a wick element, a mounting member connected to said mounting structure for longitudinal movements in common therewith and for pivotal swinging movements with respect thereto about a horizontal axis common with the pivotal axis of said mounting structure, said moistening roller being connected to said mounting member for rotation and disposed in laterally spaced parallel relationship with said impression roller intermediate said impression roller and said carriage element, said wick element being connected to said mounting member in engagement with said moistening roller, said mounting member comprising a normally forwardly sloping guide plate overlying said moistening roller and wick element, said moistening roller being pivotally swingable with said mounting member between an operative copy sheet engaging position and a normal position upwardly spaced therefrom, said guide plate and said moistening roller at the normal position of the latter being downwardly spaced from said impression roller at its normal position, connecting means comprising a rigid element between said mounting structure and said mounting member securely anchored to one and slidably connected to the other to permit relative pivotal swinging movement of said mounting structure and said mounting member generally toward and away from each other about said common axis between maximum and minimum spaced positions and resilient means yieldably biasing said mounting structure and said mounting member to their maximum spaced position, other resilient means yieldably biasing said mounting structure and said mounting member to their limit of pivotal movement away from said bed to urge said impression roller and said moistening roller to their normal positions, master element supporting means pivotally connected to said frame structure for limited swinging movements generally toward and away from said bed between a raised position and a lowered position, said supporting means at its lowered position supporting said master element adjacent the copy sheet in position to be pressed into engagement with said copy sheet by said impression roller and said supporting means at its raised position supporting said master element to pass between said impression roller and said guide plate when said impression roller and moistening roller are in their normal positions and upon advancing movements of said carriage element, resilient means yieldably biasing said supporting means to its raised position, and a cam and cam follower one being rigidly connected to said supporting means and the other to said frame structure cooperating to maintain said supporting means at its lowered position when said impression roller is at its operative position and during movement of said carriage element from its advanced position to its retracted position.

8. In a printing machine utilizing the spirit transfer process and a master element having material to be reproduced imprinted thereon, a normally generally horizontally disposed base portion which defines a printing bed, a generally horizontally disposed impression roller, means for mounting said roller on said base portion for limited longitudinal movements in opposite directions generally perpendicular to the axis thereof over said printing bed and for limited movements toward and away from said bed between a normal position upwardly spaced from said bed and an operative position adjacent the bed, a moistening device comprising a longitudinally extended spirit transfer element, means for mounting said transfer element on said base portion in generally parallel relationship with said roller laterally spaced therefrom in a direction of longitudinal movement of said roller and for limited longitudinal movements of said transfer element in common with said roller and for limited movements of said transfer element toward and away from said bed between a normal position upwardly spaced from the bed and an operative position adjacent the bed at which latter position of the transfer element its lower portion is at generally the same level as the pressure roller at its operative position, the space between the transfer element at its normal position and the bed being free and unobstructed and adapted to receive a plurality of copy sheets, a master element supporting member positionable in spaced relation with said transfer element and said pressure roller and being positionable between said roller and transfer element when the roller and transfer element are upwardly spaced from their operative positions with the roller being disposed generally upwardly of the supporting member and the transfer element being disposed generally below the supporting member, said supporting member being mounted for movement toward and away from said bed and to a position adjacent said bed whereby said supporting member positions the master element supported thereby in upwardly disposed relation to said transfer element in operative engagement with a copy sheet on said bed and in upwardly spaced relationship with that portion of the copy sheet to be moistened by the transfer element and in proximity with that portion of a copy sheet adjacent the pressure roller and in position to be pressed into engagement therewith by said roller; whereby, the transfer element is adapted to engage and moisten a copy sheet resting on the printing bed, said transfer element being movable longitudinally over said bed and over and in engagement with a copy sheet resting on said bed in common with but in advance of said pressure roller, and longitudinal movement of said pressure roller over said bed in its operative position under pressure will press a master element supported by said supporting member into printing engagement with a moistened copy sheet positioned on said bed in underlying relationship with said master element.

9. The structure defined in claim 8 in which said master element supporting member comprises a thin flexible tray-like element adapted to support the master element with the material to be reproduced thereon disposed in exposed position and unobstructed by the supporting member.

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