Nov. 28, 1961 G. H. HILL 3,010,392

PRINTING MACHINES

Filed Nov. 23, 1959 4 Sheets-Sheet 1

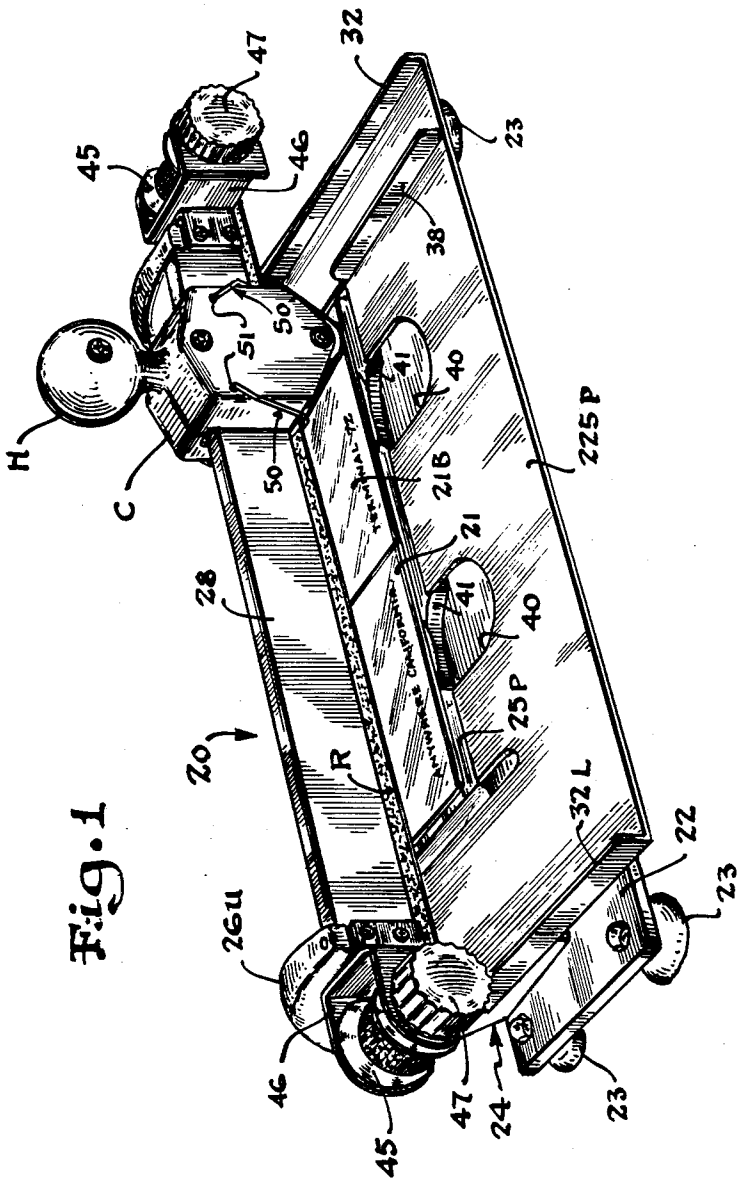


Fig. 1

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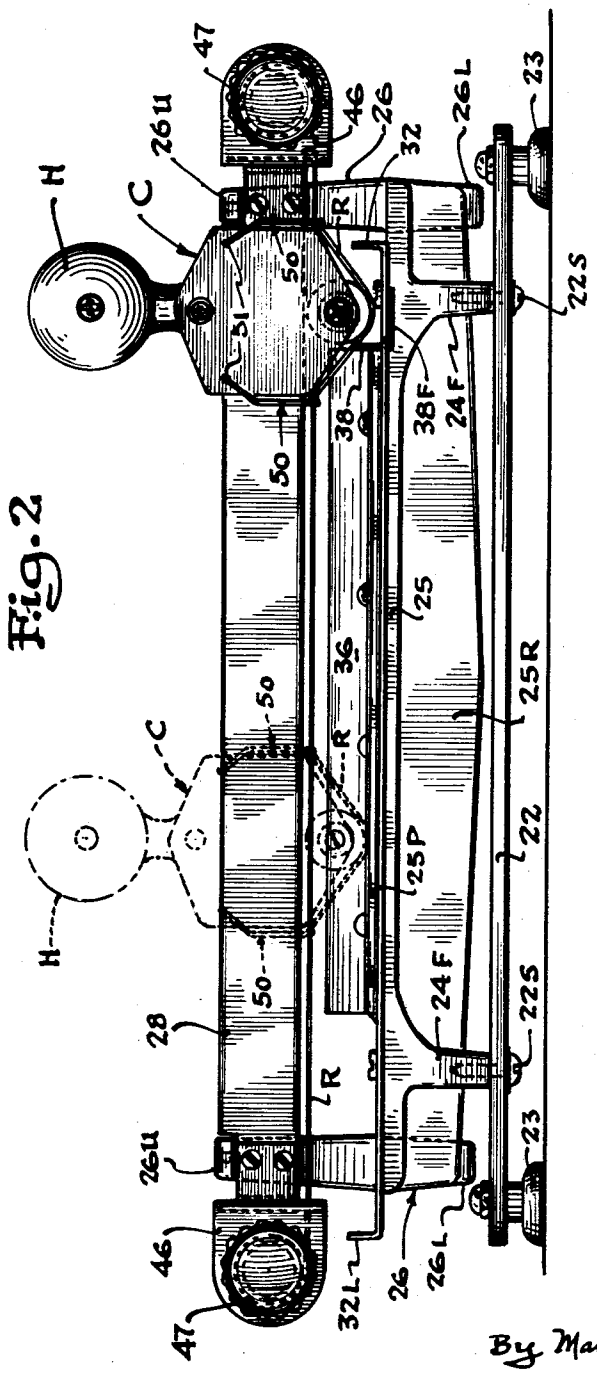


Fig. 2

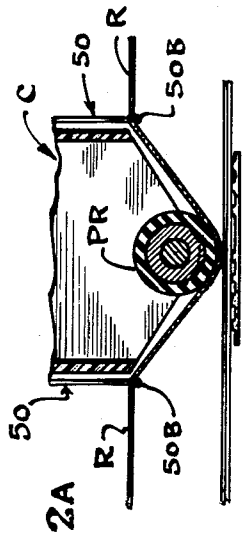


Fig. 2A

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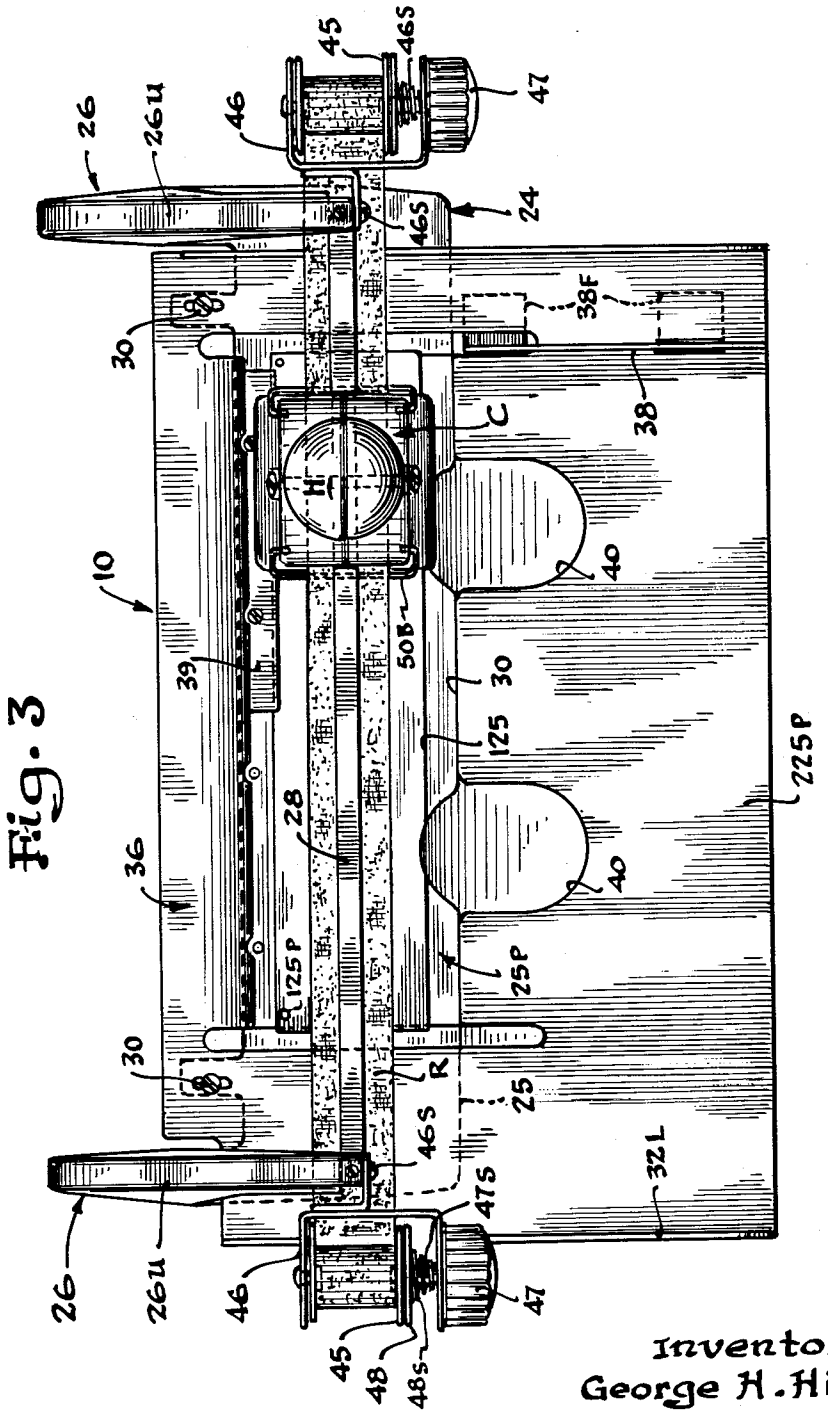


Fig. 3

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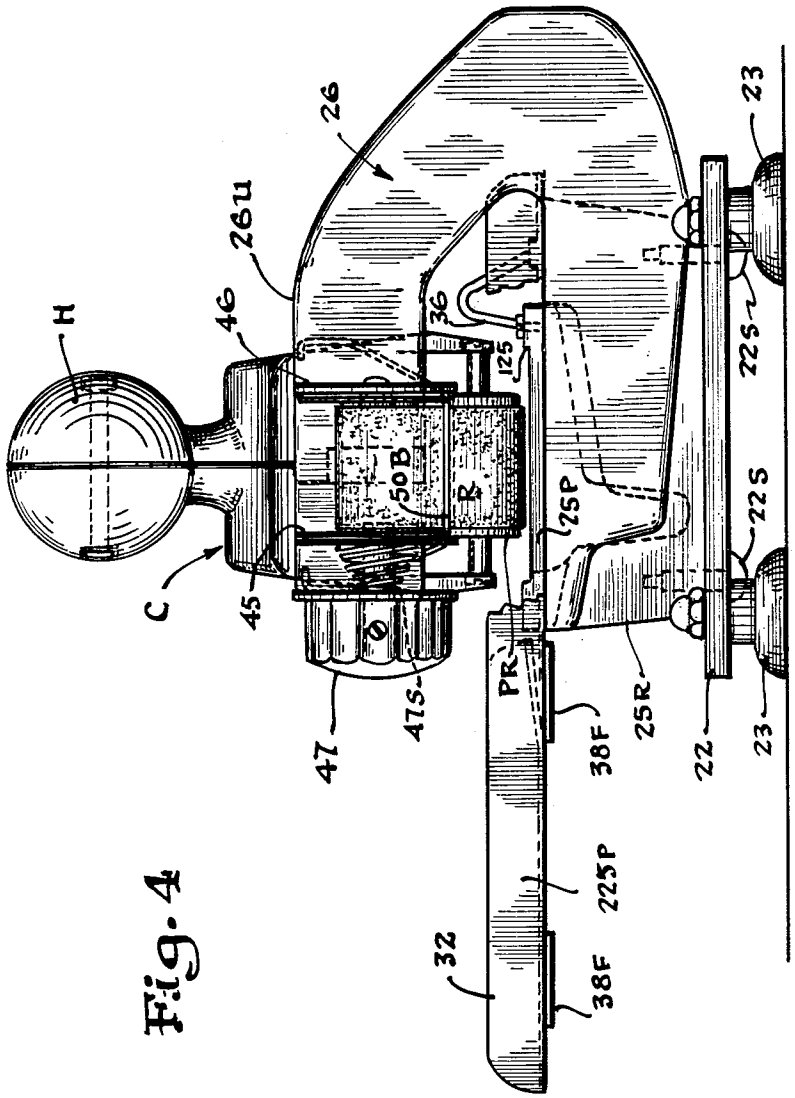


Fig. 4

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PRINTING MACHINES

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6 Claims. (Cl. 101—274)

This invention relates to printing machines and particularly to such machines of the roller platen type.

Printing machines of the aforesaid character have been widely used for making printed impressions from individual embossed printing devices such as embossed credit cards and the like, and when such printing devices are of the reverse reading type the printing operation is carried out by supporting the device on a bed with an inked ribbon extending over and in contact with the type, and a sheet is pressed into printing cooperation with the type of the printing device by a roller platen that is rolled across the top surface of the sheet so as to produce the desired printed impression on the bottom face of the sheet.

However, in many instances it is found desirable to use direct reading type, and in efforts to employ direct reading embossed type in such credit cards or printing devices, it has been necessary to mount the inked ribbon and the roller platen in an upwardly retractable head so as to provide clearance that will enable the user to insert the sheet between the ribbon and the printing device carried by the printing bed. This has materially complicated and increased the cost of printing machines for use with direct reading printing devices.

In view of the foregoing it is the primary object of this invention to simplify printing machines of the aforesaid character, and a related and more specific object of the invention is to facilitate the use of direct reading printing devices in cooperation with a roller platen and an inked ribbon.

Another and more specific object of this invention is to support an inked ribbon over a printing bed of such a machine in substantial upwardly spaced relation to the bed so as to simplify the insertion of a sheet between the ribbon and the bed, and to provide for pressing the ribribbon against the sheet only along the bottom of a platen roller that is disposed for travel along a stationary guideway.

Other and further objects of the present invention will be apparent from the following description and claims, and are illustrated in the accmompanying drawings, which, by way of illustration show a preferred embodiment of the present invention and the principles thereof, and what is now considered to be the best mode in which to apply these principles. Other embodiments of the invention embodying the same or equivalent principles may be used and structural changes may be made as desired by those skilled in the art without departing from the invention.

In the drawings:

FIG. 1 is a front perspective view of a printing machine embodying the features of the invention;

FIG. 2 is a front elevational view of the machine;

FIG. 2A is a fragmental vertical sectional view through the roller platen carriage and the ribbon and ribbon guide means;

FIG. 3 is a plan view of the machine; and

FIG. 4 is a right hand end elevational view of the machine.

For purposes of disclosure the invention is herein illustrated as embodied in a relatively small hand operated printing machine 20 adapted particularly for counter mounting and use, and a roller platen carriage C is mounted for reciprocation in the machine for use, for

example, in the printing of sales slips in gasoline stations from individual direct reading embossed printing devices 21 and 21B. The printing machine 20 has a base 22 supported on suction cups 23 and carrying a cast frame 24 that provides a horizontal main bed 25 with integral C-shaped frame members 26 disposed near its opposite ends so that lower arms 26L of the frame members 26 extend beneath the bed 25 while upper arms 26U of the C-shaped frame members extend forwardly over the printing bed 25 in upwardly spaced relation. Mounting feet 24F extend downwardly from the bed 25 near the ends and are secured to the base 22 by screws 22S. The bed 25 is stiffened in the present instance by a longitudinal rib 25R that is cast so as to project downwardly from the bottom surface of the bed 25.

The platen carriage C is mounted for reciprocation across the printing area of the bed 25 on a supporting guide bar 28 that is supported in fixed position at its opposite ends on the forward ends of the arms 26U, and an upwardly projecting knob-like handle H on the carriage C provides for convenient manual actuation of the carriage along its guideway.

The platen carriage C has a platen roller PR rotatably supported thereon beneath the guide bar 28 and on a horizontal axis substantially perpendicular to the path of reciprocation of the carriage C so that the platen roller PR may effect printing cooperation between a sheet and the printing means such as the printing devices 21 and 21B. These printing devices are removably supported on an upwardly projecting elongated platform 25P formed on and as a part of the upper surface of the bed 25 so as to be located beneath and parallel to the path of the platen roller PR. The upper face of the platform 25P has a shallow channel 125 formed therein in which the printing devices 21 and 21B may be positioned, and the pins 125P in the channel near its opposite ends are adapted to engage locating notches formed in the rear edges of the printing devices to hold the printing devices in the proper longitudinal positions in the channel.

To simplify the support and location of a sheet over the printing area of the machine, a sheet metal platform extension 225P is provided which is cut out as at 30 so as to fit around the platform 25P and is secured in this position on the bed by screws 31, FIG. 3. The platform extension 225P has upwardly bent stiffening flanges 32 and 32L at its opposite side edges, while a rear portion of the sheet metal of the extension 225P is formed to provide a rear sheet stop or paper guide 36 as shown in FIGS. 3 and 4.

Spaced to the left from the right hand stiffening flange 32 is an upwardly extending paper guide 38 that has downwardly extended mounting flanges 38F thereon which project downwardly through slots in the platform extensions 225P and which are bent laterally so that they may be secured to the bottom of the platform extension as by welding. The guide 38 is located in substantial alignment with the right hand end of the platform 25P, and the space between the flange 32 and the paper guide defines the width of a right hand home position for the carriage C wherein the platen roller PR is disposed to the right of the right hand end of the platform 25P.

A sheet that is to have an impression made thereon is put in position on the platform and the platform extension by moving the sheet rearwardly into engagement with the rear paper guide 36, and at the same time moving the sheet to the right into position against the right hand paper guide 38.

Similarly, the printing device 21 and 21B are put in position by moving the same rearwardly into position over the channel 125 in the platform 25P, and by engaging the same with pins 125P. The right hand printing device 21B in the present instance is utilized for printing more or less permanent data, and since it need not be removed after

each printing operation, a retaining plate 39 is put in position so as to overlie a narrow rear border portion of the channel at the position that is to be occupied by the printing device 21B. To facilitate removal of the printing devices, the platform extension 225P has openings 40 cut therein forwardly of the platform 25P, and the platform 25P opposite these cut away portions is cut away at 41 so as to provide clearance space through the side of the channel and for a short distance into the channel so that the user may engage the bottom of a printing plate and may grasp the forward edge of the plate for lifting and removal thereof from its printing position.

Under the present invention, the inked ribbon R is mounted in such a relation that a substantial space is provided above the printing platform 25P for convenient insertion and removal of the printing devices, as well as the sheets upon which impressions are to be made. In carrying out this invention, the inked ribbon R is extended longitudinally of the platform 25P so that the major portion of the ribbon is located relatively close to the bottom of the guide or supporting bar 28, and at its opposite end the ribbon R is secured to and carried by winding spools 45. These winding spools 45 are mounted in brackets 46 that are secured by screws 46S to the forward ends of the upper arms 26U, and the spools 45 are adapted to be actuated by knobs 47 that are provided at the forward sides of the brackets 46 on the shafts 47S which support the forward ends of the spools 45. Friction plates 48 and springs 48S are provided on the shafts 47S for holding the spools 45 in any adjusted rotative position.

With the inked ribbon R thus supported at its ends just below the lower edge of the support rail 28, the ribbon R extends longitudinally across the printing area at this substantially elevated location, and in the zone where the ribbon must pass beneath the platen roller PR, the ribbon is extended downwardly under the platen roller. Adjacent the side edges of the platen carriage C, the ribbon R is passed through guide means which serve to support those portions of the ribbon between the carriage and the respective spools 45 in a horizontal position wherein the ribbon is spaced upwardly a substantial distance from the printing plane. Such guide means in the present instance are provided by guide bails 50 that have the transverse bars 50B thereof located just slightly below the lower edge of the support bar 28. The upper ends of the arms of the bails 50 are bent inwardly and inserted into aligned pivot openings 51 in the carriage C near the top thereof.

With the arrangement that is thus provided the ribbon extends from the left spool 45 in a horizontal elevated relation and then through the left hand guide bail 50, and downwardly under the roller platen PR. The ribbon R then extends at an angle upwardly through the other guide bail 50 and in an elevated horizontal relation to the right hand spool 50. Thus, the roller plate PR may roll on the inked ribbon R at its line of contact with the sheet upon which an impression is being made, and at all other portions, the ribbon R is in an elevated position with respect to the printing plane.

In the use of machine, the carriage C is moved to the right hand home position shown in FIG. 2 of the drawings, and with the carriage in this position it will be noted that all of the ribbon R that is located to the left of the carriage C is elevated a substantial distance above the printing plane so that the printing devices 21 and 21B may be easily inserted or removed, and the sheet upon which an impression is made may be inserted readily and easily without fear of objectionable contact with the inked ribbon. After the sheet is in place, the carriage C may be moved to the left through a printing stroke, and when this printing stroke has been completed, the carriage C is located in a second home position where it is located beyond the left hand end of the platform 25P. The sheet may then be removed, and since the right end portion of the ribbon R is supported in an elevated relationship with respect to the printing device, the printing devices may be

readily and easily changed as above described. The platen carriage C may be allowed to remain in its left hand home position, and the next printing operation may be performed by moving the platen carriage C to the right through a printing stroke.

From the foregoing description it will be apparent that the present invention provides a simplified printing machine wherein direct reading printing devices may be used in association with an inked ribbon, while at the same time enabling sheets and printing devices to be mounted below the ribbon without the necessity for providing retractable head structures as has been required in the past.

It will also be apparent that the invention provides a new and improved way of supporting inked ribbons in a printing machine for platform direct-reading devices, and it will be apparent that this manner of supporting is simple and economical in character and has a long useful life.

Thus while I have illustrated and described a preferred embodiment of my invention it is to be understood that changes and variations may be made by those skilled in the art without departing from the spirit and scope of the appending claims.

I claim:

1. In a printing machine of the character described having a base with a print bed upon which individual printing devices having direct reading type may be supported with the printing faces thereof in a predetermined printing plane, a stationary platen guideway that is rectilinear throughout its length and is disposed in spaced relation above and parallel to such printing plane, a platen carriage supported for reciprocation along said guideway and having a platen roller mounted thereon for pressing a sheet into printing cooperation with printing means supported on said printing bed, an inked ribbon extended beneath said guideway and under said platen roller, and means including guides mounted on the platen carriage to guide the ribbon upwardly at a substantial angle on opposite sides of the platen roller and thereby maintain said ribbon a substantial distance above said printing bed except in the region where the ribbon passes about and beneath said platen roller.

2. In a printing machine of the character described having a base with a printing bed upon which individual printing devices having direct reading type may be supported with the printing faces thereof in a predetermined printing plane, a platen guideway that is rectilinear throughout its length and is disposed in a fixed, spaced relation above and parallel to such printing plane, a platen carriage supported for reciprocation along said guideway and having a platen roller mounted thereon for pressing a sheet into printing cooperation with printing means supported on said printing bed, an inked ribbon extended beneath said guideway and under said platen roller, ribbon spools on which opposite ends of the ribbon are rolled and said spools being supported at opposite ends of the guideway in substantial upwardly spaced relation to said printing plane, and guides mounted on the platen carriage and cooperating with said ribbon spools to guide the ribbon upwardly at a substantial angle on opposite sides of the platen roller and thereby maintain said ribbon a substantial distance above said printing bed except in the region where the ribbon passes about and beneath said platen roller.

3. In a printing machine of the character described having a base with a printing bed upon which individual printing devices having direct reading type may be supported wth the printing faces thereof in a predetermined printing plane, a guideway mounted in a stationary position and extending across said bed parallel thereto throughout the length of the guideway, a platen carriage supported for reciprocation along said guideway and having a platen roller mounted thereon for pressing a sheet into printing cooperation with printing means supported on said printing bed, an inked ribbon extended beneath

said guideway and under said platen roller, and means including guides mounted on the platen carriage to guide the ribbon upwardly at a substantial angle on opposite sides of the platen roller and thereby maintain said ribbon a substantial distance above said printing bed except in the region where the ribbon passes about and beneath said platen roller.

4. In a printing machine of the character described having a base with a printing bed having a printing area upon which individual printing devices having direct reading type may be supported with the printing faces thereof in a predetermined printing plane, a stationary guideway extending across said bed parallel thereto throughout the length of the guideway, a platen carriage supported for reciprocation along said guideway and having a platen roller mounted thereon for pressing a sheet into printing cooperation with printing means supported on said printing bed, said carriage being shiftable to a home position wherein said platen roller is disposed beyond one extremity of the printing area, an inked ribbon extended beneath said guideway and under said platen roller, and means including guides mounted on the platen carriage to guide the ribbon upwardly at a substantial angle on opposite sides of the platen roller and thereby maintain said ribbon a substantial distance above said printing bed except in the region where the ribbon passes about and beneath said platen roller, whereby, when said carriage is moved to said home position, said ribbon is spaced upwardly from the entire printing area to facilitate positioning of a sheet thereon.

5. In a printing machine of the character described having a base with a printing bed upon which individual printing devices having direct reading type may be supported with the printing faces thereof in a predetermined printing plane, a platen carriage supported for recpirocation along a fixed path that is parallel to the bed throughout the length of the guideway and having a platen roller mounted thereon for pressing a sheet into printing cooperation with printing means supported on said printing bed, an inked ribbon extended along said plate and under said platen roller, and means including guides mounted on the platen carriage to guide the ribbon upwardly at a substantial angle on opposite sides of the platen roller and thereby maintain said ribbon a substantial distance above said printing bed except in the region where the ribbon passes about and beneath said platen roller.

6. In a printing machine of the character described having a base with a printing bed upon which individual printing devices having direct reading type may be supported with the printing faces thereof in a predetermined printing plane, a platen carriage supported for reciprocation along a fixed path that is parallel to the bed throughout the length of the guideway and having a platen roller mounted thereon for pressing a sheet into printing cooperation with printing means supported on said printing bed, said carriage being shiftable to a home position wherein said platen roller is disposed beyond one extremity of the printing bed, an inked ribbon extended along said path and under said platen roller, and means including guides mounted on the platen carriage to guide the ribbon upwardly at a substantial angle on opposite sides of the platen roller and thereby maintain said ribbon a substantial distance above said printing bed except in the region where the ribbon passes about and beneath said platen roller, whereby, when said carriage is moved to said home position, said ribbon is spaced upwardly from the entire printing bed to facilitate positioning of a sheet thereon.

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