

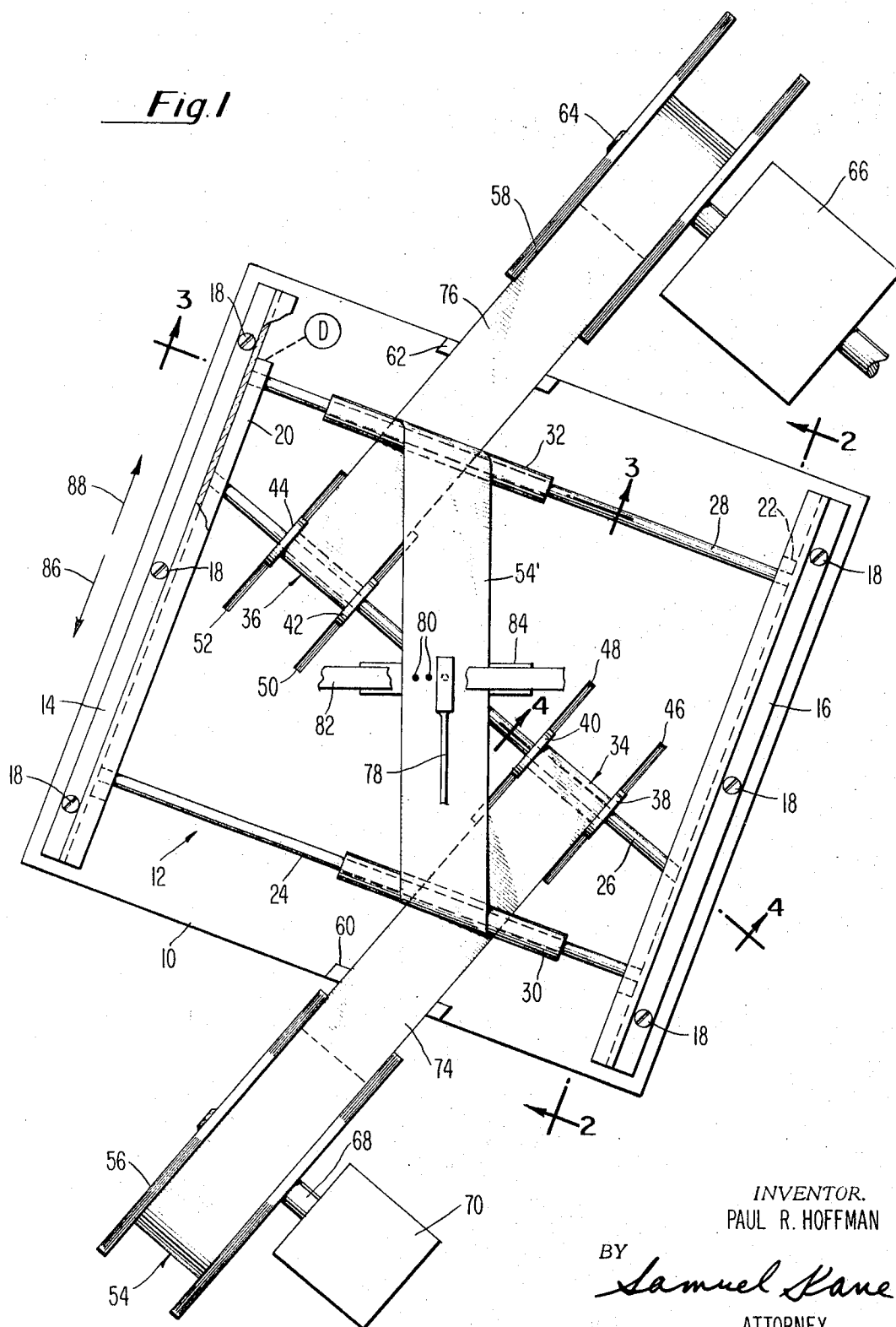
Sept. 12, 1967

P. R. HOFFMAN
CARRIAGE MECHANISM PROVIDING LETTER SPACING
WITHOUT MOVING ENDS OF WEB

3,340,988

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2 Sheets-Sheet 1



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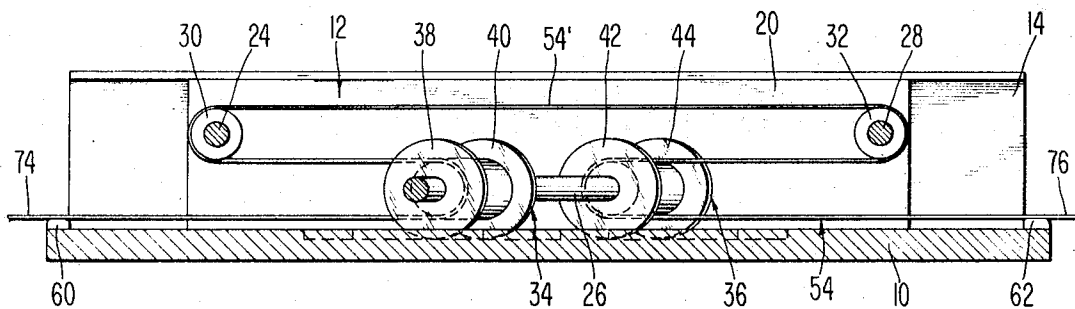


Fig. 2

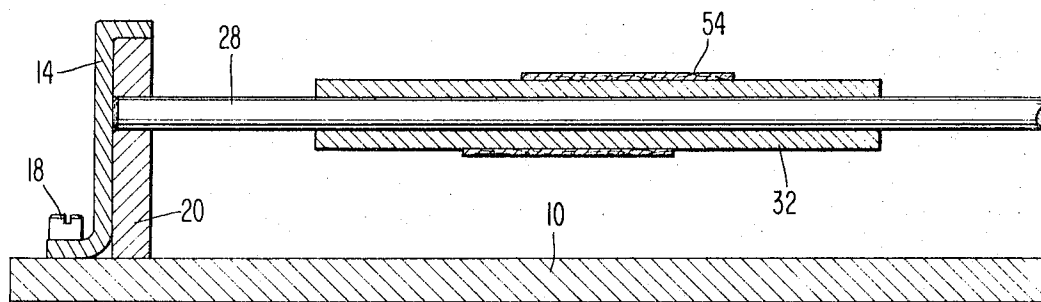


Fig. 3

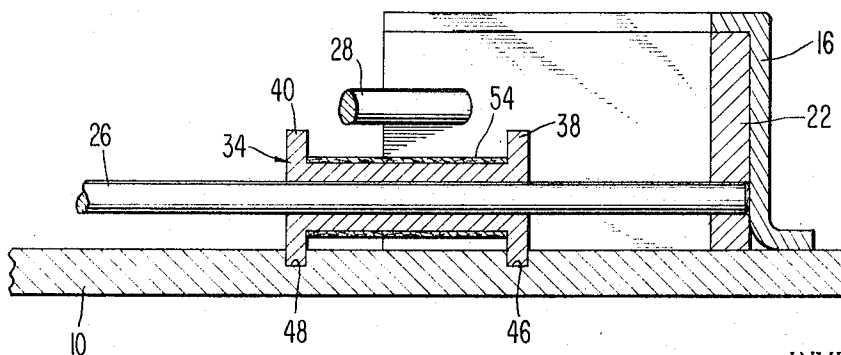


Fig. 4

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CARRIAGE MECHANISM PROVIDING LETTER SPACING WITHOUT MOVING ENDS OF WEB

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This invention relates generally to printing machines, and more particularly to improvements in carriage mechanisms for serial printers which have a fixed printing mechanism and a movable record medium.

In serial-type printers in which the printing mechanism remains in the same general position, the record medium, which is usually paper, must be moved laterally to space the printed characters along the printing line. A familiar example of such a machine may be found in the ordinary office typewriter of conventional design.

Certain types of these serial printers use a long record medium which is supplied in the form of a relatively large journal roll. In this type of machine, the weight of the carriage which supports the journal roll, plus the weight of the roll itself, add up to a considerable weight which must be moved each time that a character is to be printed.

An object of the invention, therefore, is to provide a carriage mechanism for serial printing machines whereby the quantity of mass which must be moved during printing may be minimized.

More specifically, it is another object of this invention to provide a carriage mechanism for serial printers characterized by its low mass.

A further object of the invention is to provide a carriage mechanism for serial printers which has only to move a short strip of the record medium at the printing zone while the bulk of the record medium remains stationary.

Another object of the invention is to provide a carriage mechanism for serial printers of such design that the line feed mechanism of the machine is not involved in the transverse incremental movements of the carriage mechanism.

In accordance with the above objects, and considered first in one of its broader aspects, a carriage mechanism according to the invention for moving an elongate record medium along a printing line comprises a frame movable in a printing operation along a rectilinear path. Mounted on the frame is a first pair of spaced rollers with their axes at an angle to the rectilinear path for supporting and guiding the printing zone portion of the record medium and adapted to be moved axially by movement of the frame and record medium. A second pair of rollers is mounted on the frame with their axes at a different angle to the rectilinear path than the first pair of guide rollers for respectively supporting and guiding the record medium beyond each end of the printing zone portion. Guiding means is provided for causing the second pair of rollers to move axially in the same general direction as the first pair of rollers when the frame is moved, and further means are provided for holding the end portions of the record medium stationary when the frame is moved to cause the printing zone portion to move so that a point thereon will move along a line parallel to the printing line.

The invention will be more clearly understood when the following detailed description of the preferred embodiment thereof is read in conjunction with the accompanying drawings in which,

FIG. 1 is an elevational view of a carriage mechanism constructed in accordance with the invention, and with parts broken away to more clearly reveal other parts;

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FIG. 2 is an enlarged sectional view taken along line 2-2 of FIG. 1;

FIG. 3 is an enlarged sectional view taken along line 3-3 of FIG. 1, and

FIG. 4 is an enlarged sectional view taken along line 4-4 of FIG. 1.

Turning now to the details of the illustrated embodiment of the invention, a plate 10 (FIG. 1) of an associated serial printing machine, not shown, serves as a stationary mounting plate for a movable frame 12. Two side members, or ways, 14 and 16, secured to the plate 10 in any suitable manner as by screws 18, form a rectilinear path for guiding the frame 12 in its printing and return movements.

The frame 12 comprises two side rails 20 and 22, fitted for sliding movement in the ways 14 and 16, and shafts 24, 26 and 28, each having its end portions secured to the side rails 20 and 22. As viewed in FIG. 1, the axes of the shafts 24 and 28 are parallel and, preferably, though not limitingly, perpendicular to the rectilinear path defined by the side ways 14 and 16. Also as viewed in FIG. 1, the shaft 26 is inclined to the side ways 14 and 16, and at a different angle thereto than the shafts 24 and 28, for a purpose which will appear more clearly hereinafter. It is also preferable, though not limiting, to have the axis of the shaft 26 in a different plane containing the axes of the shafts 24 and 28.

A roller 30 is rotatably and slidably mounted on the shaft 24, and a similar roller 32 is similarly rotatably and slidably mounted on the shaft 28. Two flanged rollers 34 and 36 are rotatably and slidably mounted on the shaft 26 but are controllably guided in their axial movements on the shaft 26 by having their flanges 38, 40, 42 and 44 slidably guided in elongate grooves 46, 48, 50 and 52 in the plate 10.

The record medium 54 in the form of an elongate web is fed from a roll thereof on a supply reel 56, and after passing through the carriage mechanism is collected on a take-up reel 58. The record medium 54 leaves the supply reel 56, passes across a guiding pad 60, fixed to the plate 10, and then bends around the rollers 34, 30, 32 and 36 to pass across a second guiding pad 62, fixed to the plate 10, and finally to be taken up on the reel 58.

The portion 54' of the record medium between the rollers 30 and 32 may be referred to as the printing zone portion of the record medium.

The reel 58 is securely mounted on a shaft 64 which is coupled to a line advance mechanism 66 which is operable for causing the record medium to be advanced one or more lines at a time. The supply reel 56 is similarly secured on a shaft 68 which is coupled to a suitable holding device which may be in the form of a slippable clutch or brake mechanism 70 constructed to exert a sufficient drag on the record medium so that together with the line advance mechanism 66 it can hold the record medium stationary in the regions 74 and 76.

A printing hammer, or type bar, 78 is constructed and arranged for successively printing a line of illustrative dots 80. Positioned between the printing bar 78 and the printing zone portion 54' is an inking ribbon 82. A platen 84 is positioned behind the printing zone portion 54'.

As indicated previously, the mechanisms 66 and 70, or other suitable holding devices applied to the regions 74 and 76 of the record medium, must be so constructed as to hold the record medium stationary at the regions 74 and 76 during printing.

Now, with the regions 74 and 76 held stationary, a line of printing, such as depicted illustratively by the line of dots 80, is effected by moving the frame 12 stepwise by any suitable drive mechanism D in the direction of the arrow 86, and operating the type bar 78 with any suitable

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printing mechanism at each stepwise movement. Each time that the frame 12 is moved downwardly in the direction of the arrow 86 during printing, the rollers 34 and 36 will move with it and will be forced to take on an axial increment of movement by reason of the fixed grooves 46, 48, 50 and 52. As the rollers 34 and 36 slide axially along the shaft 26, they will be moving closer to the side rail 20. Through the coupling afforded by the record medium 54, the motion of the rollers 34 and 36 will be transmitted to the rollers 30 and 32 and cause them also to move toward the side rail 20. The result of these motions will be that the printing zone portion 54' of the record medium will move from right to left, as viewed in FIG. 1, so that any point on the printing zone portion 54', such as a dot 80, will move along a line parallel to the printing line depicted by the line of dots 80.

Carriage return movement of the frame 12 may be effected by returning the frame in the opposite direction indicated by the arrow 88 by means of the driving mechanism D. Line spacing of the record medium 54 may be accomplished by operating the line advance mechanism 66 either during or after the carriage return movement of the frame 12.

While there has been shown and described a specific carriage mechanism to exemplify the principles of the invention, it is to be understood that this is but one embodiment of the invention, and that the invention is capable of being constructed in a variety of shapes, sizes and modifications without departing from the true spirit and scope thereof. Accordingly, the invention is not to be limited by the specific carriage mechanism disclosed, but only by the subjoined claims.

What is claimed is:

1. A carriage mechanism for moving an elongate record medium along a printing line comprising a frame movable in a printing operation along a rectilinear path, a first pair of spaced rollers mounted on said frame with their axes at an angle to said rectilinear path for supporting and guiding the printing zone portion of said record medium and adapted to be moved axially by movement of said frame and said record medium, a second pair of rollers mounted on said frame with their axes at a different angle to said rectilinear path than said first pair of guide rollers for respectively supporting and guiding said record medium beyond each end of said printing

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zone portion, guiding means for causing said second pair of rollers to move axially in the same general direction as said first pair of rollers when said frame is moved, and means for holding the end portions of the record medium stationary when said frame is moved to cause said printing zone portion to move so that a point thereon will move along a line parallel to said printing line.

2. A carriage mechanism according to claim 1 wherein the axes of said first pair of spaced rollers are parallel.

3. A carriage mechanism according to claim 2 wherein the axes of said first pair of spaced rollers are perpendicular to said rectilinear path.

4. A carriage mechanism according to claim 1 wherein said second pair of rollers are coaxial.

5. A carriage mechanism according to claim 4 wherein the axis of said second pair of rollers is in a different plane than the plane containing the axes of said first pair of spaced rollers.

6. A carriage mechanism according to claim 5 wherein said second pair of rollers is parallel to the plane containing the axes of said first pair of spaced rollers.

7. A carriage mechanism according to claim 5 wherein said second pair of rollers are between said first pair of spaced rollers when viewed in a direction which is perpendicular to the plane containing the axes of said first pair of spaced rollers.

8. A carriage mechanism according to claim 1 wherein said guiding means constitutes at least one fixed guideway for each of said second pair of rollers and each of said second pair of rollers is provided with a circular portion guided by its associated guideway.

References Cited

UNITED STATES PATENTS

493,255	3/1893	Densmore	197—167
503,736	8/1893	Brown	197—167
886,759	5/1908	Brown	197—170
1,166,635	1/1916	Rouillot	197—133
1,298,752	4/1919	Manning	197—133
2,250,012	7/1941	Eddy	197—133

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