June 9, 1964 C. J. ANTONUCCI 3,136,466

PAPER PHASING MECHANISM

Filed Dec. 11, 1961

Fig. 1.

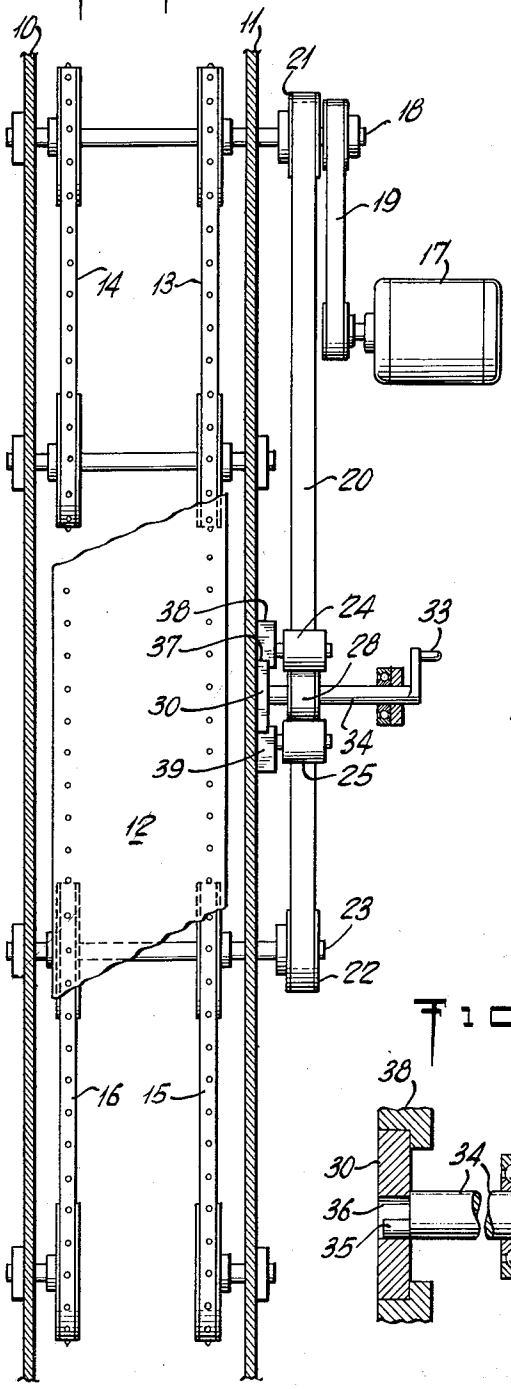



Fig. 2.

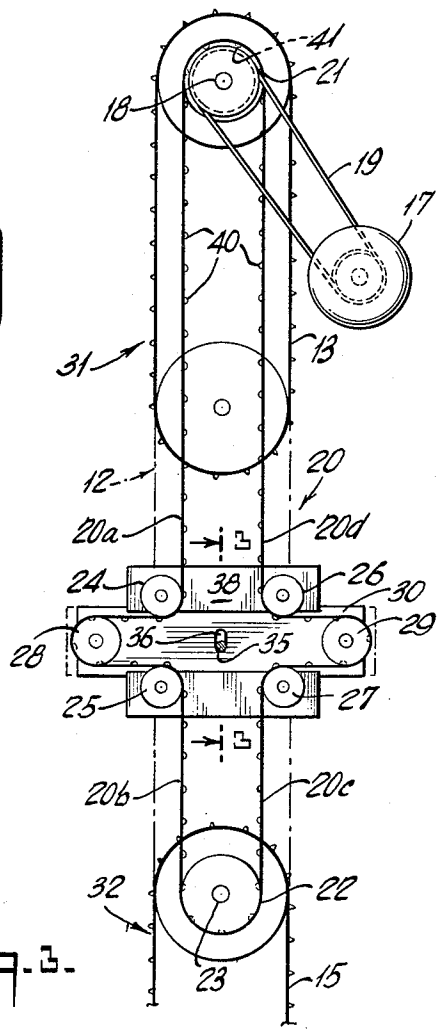



Fig. 3.




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# PAPER PHASING MECHANISM

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1 Claim. (Cl. 226—111)

The present invention, generally, relates to high speed printer apparatus and, more particularly, to a mechanism for adjusting tension in the printing paper for such high speed printer apparatus.

In apparatus for printing out information received at a rapid rate, for example, from a computer, usually two pairs of paper drive tractors are provided, one pair on each side of the printing drum. Either at the time the paper is fed into the apparatus initially or while the printer apparatus is operating, it is desired to adjust the tension in the paper on which characters are printed.

Accordingly, the present invention provides a mechanism for adjusting the phase of paper feed tractor drives on each side of a printing drum in high speed printer apparatus.

It is also an object of the invention to provide a paper phasing mechanism that may be adjusted even when the printer apparatus is in operation.

A further object of the invention is to provide a mechanism for adjusting the phase between treads of two separate drive tractor treads.

Briefly, an arrangement in accordance with the present invention includes at least two spaced apart drive means for moving a printing medium through a printer apparatus and a single flexible belt means connected between the two spaced apart drive means. An arrangement of idler pulleys is positioned intermediate the spaced apart drive means in which two idler pulleys are spaced apart from each other on one side of the belt means, and two idler pulleys are spaced apart similarly on the opposite or return side of the belt means. These four idler pulleys are supported in a relatively fixed position to guide the belt means in forming a loop about a third idler pulley, one located between each pair of the first-mentioned idler pulleys. The third or intermediate idler pulleys are supported on a slidable member so that they may be shifted more to one side or the other of the belt means to accomplish a shortening or lengthening of the belt means on one side or the other, as desired.

Other objects and advantages will become apparent to one skilled in the art to which the invention pertains from the following detailed description of the presently preferred embodiment thereof which is described in conjunction with the accompanying drawing in which similar reference characters represent corresponding parts in the several views.

In the drawings:

FIG. 1 is a partial plan view of paper driving tractors to move printing paper through a high speed printer;

FIG. 2 is a side view of the arrangement shown in FIG. 1; and

FIG. 3 is a view taken along the line 3—3 in FIG. 2.

Referring now to FIGS. 1, 2 and 3 of the drawings, the numerals 10 and 11 represent side walls providing a suitable support within a housing (not shown) in which



a web of printing paper 12 is adapted to be moved. While the web 12 is referred to as paper, it is understood that any medium on which characters may be processed is included within the term "paper."

In the preferred form of the invention, a pair of belt tractor-treads 13 and 14 are spaced apart from similar tractor-treads 15 and 16 so that a printing drum (not shown) may be positioned between the two pairs of tractor-treads. The two pairs of tractor-treads 13—14 and 15—16 are powered from a common source, indicated by a motor 17, which turns a shaft 18 by means of a belt 19.

A flexible belt 20 is located around a suitable pulley 21 on the power shift 18 and connections with a suitable pulley 22 on a shaft 23 for supplying the common power source 17 with the second pair of tractor-treads 15—16.

An arrangement of idler pulleys intermediate the pulleys 21 and 22 is shown better in FIG. 2 of the drawings where it is seen that idler pulley 24 is spaced from a second idler pulley 25 on one side of the belt 20, and an idler pulley 26 is spaced from a similar idler pulley 27 on the opposite side of the belt 20. A third idler pulley 28 is positioned somewhat between the first two pulleys 24 and 25 and a similar idler pulley 29 is located somewhat between the two pulleys 26 and 27. However, the two pulleys 24—25 on one side of the belt 20 and the two pulleys 26—27 on the opposite side of the belt 20 are supported rotatably in a fixed position as contrasted with the movable support bar 30 on which the pulleys 28 and 29 are rotatably supported.

It may be seen now that if the bar 30 is moved to the right, as viewed in FIG. 2, the pulley 28 moves closer between the two pulleys 24 and 25 permitting the belt section 20*a* to move upwardly and the belt section 20*b* to move downwardly. At the same time, belt section 20*c* will move upwardly as the pulley 29 moves to the right, and the belt section 20*d* will move downwardly.

The result of this adjustment permits the paper engaging elements or nobs 31 on the upper tractor-treads 14—15 to move slightly upwardly on the side adjacent the paper 12 and the paper engaging elements or nobs 32 adjacent the paper 12 on the lower tractor-treads 15—16 to move in the opposite direction. By shifting the moveable bar 30, the spacing between the nobs 31 and the nobs 32 are adjustable first to match the opening in the edges of the paper 12 and, secondly, with the paper in place, to adjust paper tension.

A suitable handle 33 is an example of one means for adjusting the position of the moveable bar 30, and as best seen in FIG. 3, a bar 34 with an off-center pin 35 engaged in an opening 36 in the moveable bar 30 is adapted to move the bar 30 to the left or to the right as viewed in FIG. 2. Any suitable mounting may be provided for the moveable bar 30, it being shown in FIG. 1 that a groove 37 is formed between fixed bars 38 and 39 in which the moveable bar 30 is adapted to be slidable.

The belt 20 may be any suitable flexible element, and preferably, a plurality of teeth or ridges 40 should be formed on the inside surface of the belt 20 to engage grooves 41 in the pulley 21 and in the pulley 22.

The following claims are intended to define the valid scope of the invention under the prior art and to cover all changes and modifications falling within the true spirit and valid scope of the invention.

What is claimed is:

In a high speed printer apparatus including a first pair of tractor tread elements and a second pair of tractor tread elements spaced from the first pair a predetermined distance to move a web of paper in a printer apparatus and means to adjust the phasing of corresponding treads between said first pair of tractor tread elements and said second pair,

said phasing means comprising a flexible belt-like means connected between said first and second pairs of tractor tread elements so that a lineal movement in one pair of tractor tread elements is accompanied by a movement of equal magnitude in the second pair of tractor tread elements,

a first pair of idler pulleys spaced apart from each other along one side of said belt-like means,

a second pair of idler pulleys spaced apart from each other along the opposite side of said belt-like means,



means to support said idler pulleys rotatably in a relatively fixed position,

a bar slidable transversely between the two pairs of idler pulleys,

a pair of intermediate idler pulleys rotatably mounted on said bar and spaced apart from each other a distance sufficient to develop loops in both sides of said belt-like means,

and handle means attached to said slidable bar to adjust the position of said bar for altering the magnitude of the loops developed by said pulleys.

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