

[54] TYPEWRITER RIBBON ARRANGEMENT

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Nurnberg, Germany[22] Filed: **Aug. 16, 1973**[21] Appl. No.: **388,983**[30] **Foreign Application Priority Data**

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197/170[56] **References Cited****UNITED STATES PATENTS**

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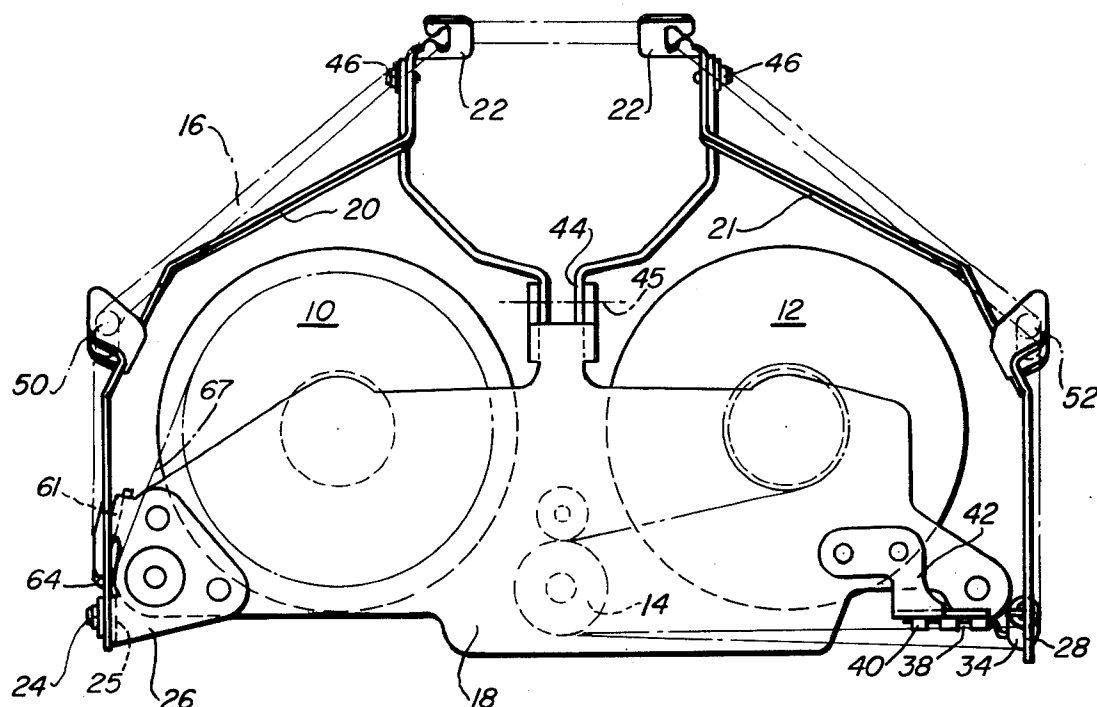
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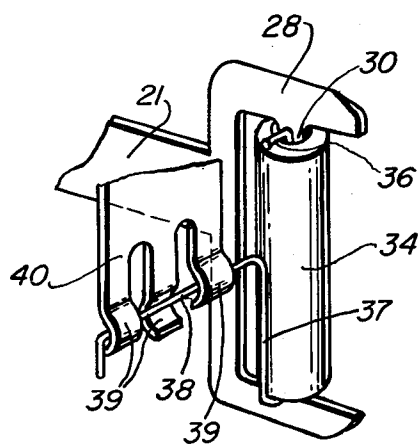
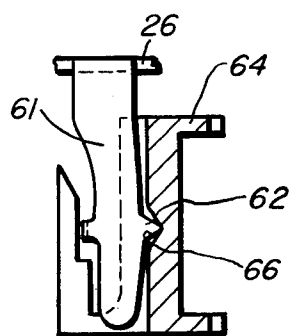
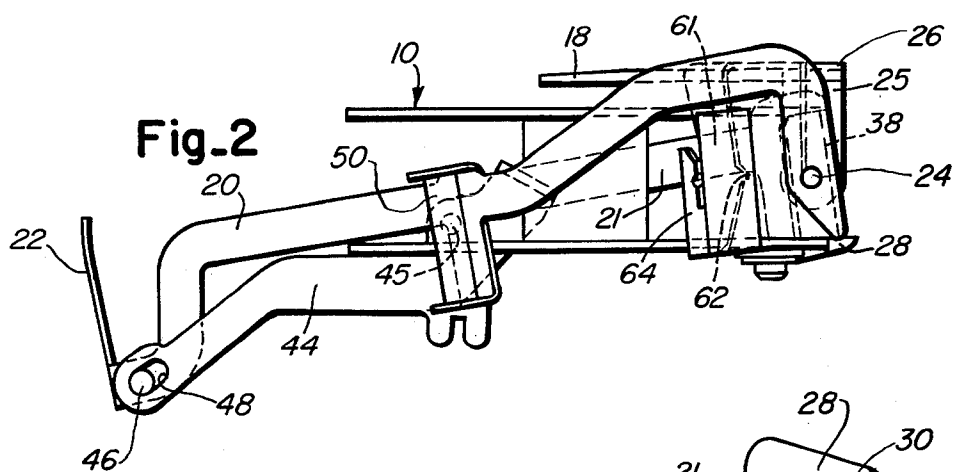
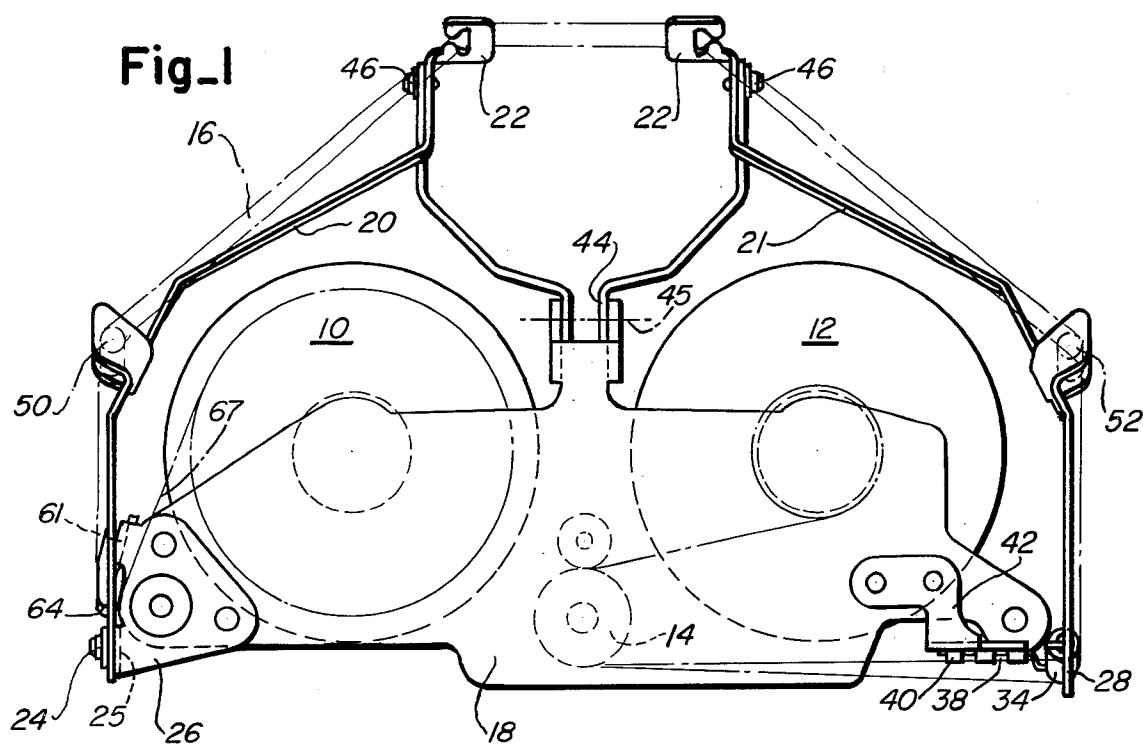
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T. Smith[57] **ABSTRACT**

A ribbon guiding arrangement in which tracking of a ribbon from a supply to a take-up spool past a printing zone is accomplished without stressing the ribbon as the length of ribbon between spools is elevated above the plane of the spools by a pair of spaced vibrator levers pivotally supported on the spool supporting structure. The arrangement is characterized by a first ribbon deflector mounted on the spool supporting structure near the supply spool and adjacent one vibrator lever pivot which is movably mounted to adjust its axis to allow ribbon to pivot as the vibrator levers are moved together to elevate the length of ribbon between spools. The arrangement also includes deflectors intermediate the ends of each of the vibrator levers and by a deflector structure which includes the pivot axis of the other vibrator lever.

4 Claims, 4 Drawing Figures



TYPEWRITER RIBBON ARRANGEMENT

The present invention relates to ribbon lifting arrangements for typewriters and the like. In conventional typewriters, the ribbon is extended between a pair of ribbon guides proximate the typing zone and is selectively elevated by a ribbon lifter which subjects the lower edge of the ribbon supported by the ribbon guides to substantial stress. As a result, the ribbon is never taut at the printing zone and tends to slide up and down thereby preventing a precise feeding of the ribbon. This is particularly troublesome when the feed increments are very small.

Additionally, with each elevation of the ribbon, the portions of the ribbon which are proximate stationary deflecting members are subjected to non-uniform stressing which results in the uneven wearing of the ribbon.

It is accordingly an object of the present invention to provide a ribbon lifting arrangement which will substantially isolate the ribbon from all forces except the force generated by the take-up spool as it advances the ribbon past the printing zone.

Other objects and advantages of the present invention will become apparent from the following portion of this specification and from the accompanying drawing wherein like reference numerals designate like or corresponding parts throughout the several views and which illustrate, in accordance with the mandate of the patent statutes, a presently preferred embodiment incorporating the teachings of the invention.

Referring to the drawing:

FIG. 1 is a top view of a ribbon arrangement for a typewriter or the like;

FIG. 2 is a side view of the ribbon arrangement illustrated in FIG. 1 taken from the left side thereof;

FIG. 3 is a magnified view partly in section of a portion of the ribbon lifting arrangement illustrated FIG. 2; and

FIG. 4 is an oblique front view of a portion of the right-hand corner of the ribbon arrangement illustrated in FIG. 1.

The typewriter ribbon arrangement for a typewriter or the like which is illustrated in FIGS. 1 to 4, is operated with each actuation of a type key and includes a structure for defining the ribbon circuit, a ribbon lifter and a ribbon feed arrangement for advancing the ribbon along the ribbon circuit and through the ribbon lifting arrangement.

The ribbon feed arrangement includes a supply spool 10, a take-up spool 12 and a feed roller 14, which is selectively and conjointly driven with the take-up spool 12 in a known manner to unwind the ribbon 16 from the supply spool 10, to advance the ribbon 16 about the ribbon circuit and to rewind the ribbon on the take-up spool 12. The supply spool 10, take-up spool 12 and feed roller 14 are, as shown in FIG. 2, suitably mounted on the underside of a support plate 18 adapted to be mounted on a single element typewriter carriage (not shown), which is selectively traversed across a typewriter platen or the like.

The ribbon circuit is defined by a pair of ribbon vibrator levers 20, 21, each of which includes an integral ribbon guide assembly 22 at one end thereof. One of the ribbon vibrator levers 20, is pivotally secured at the other end by means of a pin or the like 24 extending from a depending ear 25 of mounting bracket 26,

which is fixedly secured to one end of the support plate 18 on the typewriter carriage. The other end of the second ribbon vibrator lever 21 includes as best seen in FIG. 3 a vertically oriented fork member 28 which has a downwardly depending element 30 and an opposite upwardly projecting element (not shown). A deflection roller 34 is fixedly located intermediate these opposing elements and has an inner diameter selected to permit the insertion of one leg 36 of a wire hinge clip 37. The other leg 38 of the wire clip, which extends in a direction perpendicular to the axis of the deflection roller is received in a channel defined by a plurality of alternatively oriented grooves in the legs 39 of the downwardly projecting tab portion 40 of a second mounting bracket 42 also suitably secured to the other end of the support plate 18.

It can, accordingly, be appreciated that when the ribbon vibrator levers 20, 21 are conjointly raised or lowered by a ribbon lifter 44, pivoted on the support plate 18 as at 45 (FIG. 2), and which is interconnected with the vibrator levers through conventional pin 46 and slot 48 connectors, the entire ribbon circuit will reciprocate about the pivot axis defined by mounting bracket pin 24 and the second leg 38 of the wire clip.

Since the entire ribbon circuit is reciprocated as a unit, intermediate deflection rollers 50, 52, which are mounted on the vibrator levers 20, 21 at the locations where the ribbon direction is changed, have a fixed orientation with regard to the vibrator levers 20, 21.

The first mounting bracket 26 also has an integral depending member 61 having a knife-edge 62 for supporting a non-rotatable, self-adjusting slotted cylindrical ribbon guide or deflector member 64 having a knife-edge receiving groove 66. As will be appreciated from FIG. 3, the self-adjusting deflection member 64 about which the ribbon run 67 is directed as shown in FIG. 1, will automatically angularly adjust about the knife edge 62 as the vibrator arms 20, 21 carrying the ribbon is elevated about pivots 24 and 38. Whereas the drag at the ribbon guide 64 is small thereby permitting the utilization of a non-rotatable cylindrical member 64, the drag at the deflection roller 34 is substantial thereby making it preferable for a roller to be utilized.

As can be appreciated in the present invention, the ribbon is only twisted at one location, that is, between the corner deflection roller 34 and the feed roller 14 and such twisting only takes place about its center line or neutral fiber. No deformation of the ribbon 16 occurs at other locations and ribbon 16 is not subjected to any uneven stress except at this location. Additionally, since the pivot axis of the ribbon circuit defined by pin 24 and wire leg 38 is situated at the farthest rearward location on the carriage assembly, the actual angular movement of the ribbon circuit proximate the pivot axis is very slight, and accordingly, even at the deflection roller 34 the ribbon is subjected to very minor stressing.

Having thus disclosed the invention, what is claimed is:

1. A ribbon guide arrangement for business machines comprising
 - a support means,
 - a ribbon supply spool and a take-up spool rotatably mounted in spaced apart relationship on said support means,
 - first and second spaced vibrator levers,

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means pivotally mounting one end of each of said vibrator levers on said support means, ribbon guides at the other ends of said vibrator levers,

means for directing a length of ribbon from said supply spool, across said guides on said ends of said first and second vibrator levers and to said take-up spool.

and means for elevating said vibrator levers as a unit relative to said support means to present the ribbon length extending across said guides opposite a printing zone,

said means for directing said length of ribbon including a ribbon deflector member adjacent the pivot of said first vibrator lever to direct ribbon from said supply spool to said guides on said vibrator levers, and means on said support means for pivotally supporting said deflector member about a point inter-

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mediate its ends whereby on movement of said vibrator levers to elevate ribbon opposite said printing zone said deflector will adjust its position to accommodate ribbon stresses.

2. A ribbon guide arrangement as recited in claim 1, said means for directing said length of ribbon further including a roller deflector mounted on the pivot end of said second vibrator lever and a pivot wire supporting by said roller deflector and extending at right angles therefrom, and means on said support means for supporting said pivot wire.

3. A ribbon guide arrangement as recited in claim 1, said means for directing said length of ribbon further including ribbon deflectors supported on and intermediate the ends of said vibrator levers.

4. A guide arrangement as recited in claim 3, said deflection means comprising guide rollers.

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