Sept. 13, 1932. P. KÄPPLER 1,876,687

RIBBON REVERSE FOR TYPEWRITERS AND LIKE MACHINES

Filed Nov. 19, 1927 2 Sheets-Sheet 1

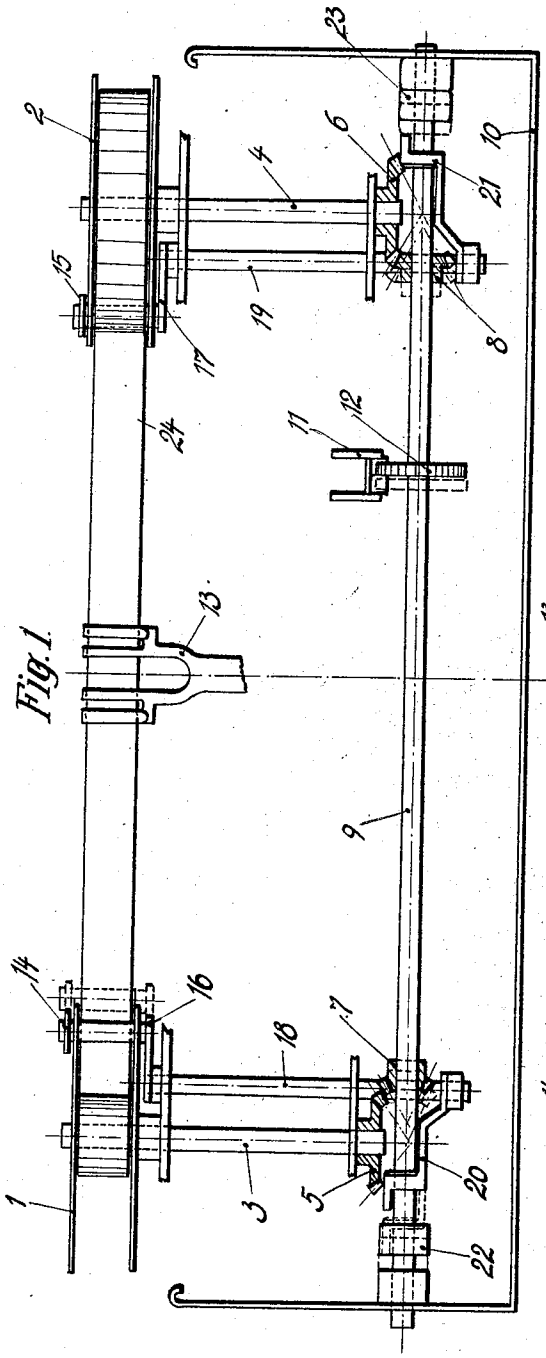


Fig. 1.

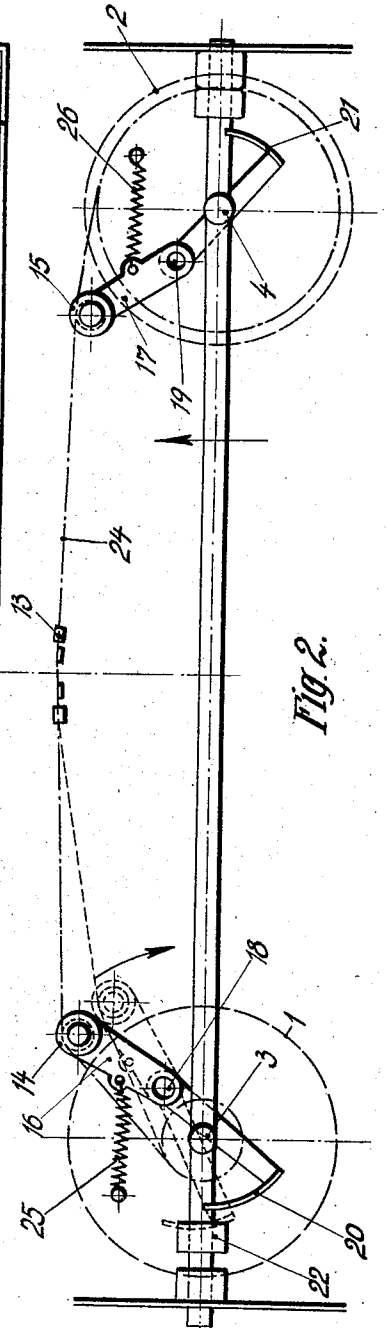


Fig. 2.

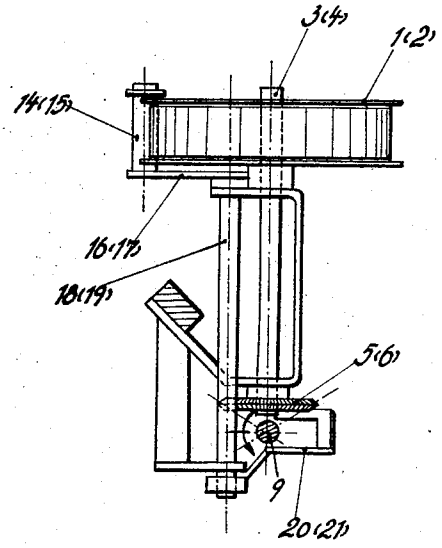
Paul Käppler, Inventor
by Paul A. Lieber
Attorney

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Filed Nov. 19, 1927 2 Sheets-Sheet 2

Fig. 3.



Inventor:
Paul Käppler
by Paul S. Schiemer
Attorney

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UNITED STATES PATENT OFFICE

PAUL KÄPPLER, OF DRESDEN, GERMANY

RIBBON REVERSE FOR TYPEWRITERS AND LIKE MACHINES

Application filed November 19, 1927, Serial No. 234,306, and in Germany November 27, 1926.

This invention relates to a device for automatically reversing the travel of the ink ribbons of typewriting, calculating and like machines, in which the reversal is effected in known manner by the direct action of the ribbon tension without the use of feeler levers or ribbon attachments.

The device of the present invention is distinguished from such known devices by its particular simplicity and reliable action, by the absence of any stops for the ribbon lifter, and by the prevention of damage to the ribbon.

The device in the embodiment of the invention as herein-disclosed comprises a cam which is caused by the tension on the band to press or rub against a collar on the ribbon feed shaft in such a manner that the rotation of the feed shaft caused by depression of a key helps to turn the cam, so that the feed shaft is shifted for a ribbon reversal by the cam alone. It is therefore only necessary that the ribbon tension should be sufficient to hold the cam in contact with the collar on the shaft, whilst the main power for displacing the shaft axially to reverse the ribbon feed is derived from the depression of the keys.

The accompanying drawings illustrate one embodiment of the invention by way of example.

Fig. 1 is a front view of the ribbon mechanism partly in section.

Fig. 2 is a plan view and Fig. 3 a side view thereof.

The two ribbon spools 1 and 2 are fitted upon the vertical spindles 3 and 4 so as to rotate therewith, the lower ends of the spindles carrying the bevel wheels 5 and 6 respectively, which intermesh with bevel wheels 7 and 8 on a ribbon feed shaft 9. The shaft 9 is journalled in the machine frame 10 and is driven from the universal bar of the machine in the usual manner by a pawl 11 and ratchet wheel 12. The shaft 9 is held against accidental axial movement by a spring-controlled catch not shown on the drawings.

The ribbon 24 is guided at the printing point by the swinging movement of the ribbon fork 13, and is also guided by rollers 14 and 15 whose journal pins are fixed on actuating arms 16 and 17 controlled by springs 25 and 26. The arms 16 and 17 are fixed to rock shafts 18 and 19 respectively, which also carry shifter cams or curved plates 20 and 21. The latter cooperate with collars 22 and 23 on the shaft 9.

The operation of the device is as follows:—

As shown in Fig. 2, the ribbon 24 is being wound on to the right-hand spool 2 and unwound from the left-hand spool 1. When the ribbon from the spool 1 is spent, the ribbon becomes taut because the shaft 9 continues to rotate through the space of one tooth of the ratchet wheel 12 every time a key is depressed. The spring 25 which controls the arm 16 is no longer able to hold the roller 14 in the position shown in full lines against the ribbon tension, and the roller 14 is forced by the ribbon into the dotted position. The ribbon tension has however no influence on the right-hand roller 15, because the arm 17 is so disposed as to hold the ribbon tangential to the fully-wound spool 2. When the roller 14 is moved from the position shown in full lines to the dotted position, the curved plate 20 moves in the opposite direction and touches or rubs against the collar 22 of the shaft 9 at a point above the shaft 9, that is to say, where the collar 22 with each stepwise rotation of the shaft 9, moves in the same direction, viz backwards, as is the movement of the cam plate 20. By this means, the friction between the two parts is usefully employed and the rotation of the shaft 9 effected by depression of a key is substantially utilized in conjunction therewith to displace the shaft 9 until the bevel wheel 7 meshes with the bevel wheel 5. When this occurs, the tension on the ribbon is completely relieved and the arm 16 is again brought into its normal position by the spring 25.

I claim:

1. Ribbon mechanism comprising a pair of ribbon spools upon which a ribbon is wound and unwound, spindles carrying said spools, gear wheels on said spindles, a rotatable and axially movable feed shaft, gear-

ing on said shaft adapted in one position of the shaft to drive one of said spindles and in the other position of said shaft to drive the other of said spindles, means for intermittently rotating said shaft, a pair of collars fixed on said shaft, an element movable into the path of each of said collars so as to form an abutment and having a cam surface for engagement by the collar on rotation of the shaft to shift said shaft axially, and spring-controlled members held in contact with the ribbon and operative by tension on the ribbon to move the cam elements into position to engage the collars.

2. Ribbon mechanism comprising a pair of ribbon spools upon which a ribbon is wound and unwound, spindles carrying said spools, gear wheels on said spindles, an axially movable feed shaft, gearing on said shaft adapted in one position of the shaft to drive one of said spindles and in the other position of said shaft to drive the other of said spindles, means for intermittently rotating said shaft, a pair of collars fixed on said shaft, a cam cooperating with each of said collars, vertical shafts on which said cams are mounted, an arm projecting from each vertical shaft, a roller carried by said arm, and a spring for holding said roller in contact with the ribbon and for normally holding said cam out of engagement with the cooperating collar.

3. Ribbon mechanism comprising a pair of ribbon spools, spindles carrying said spools, a rotatable and axially movable feed shaft, sets of gearing whereby said spindles are alternately driven by axially shifting said shaft in opposite directions, means for intermittently rotating said shaft, an abutment fixed to the shaft adjacent to each set of gearing, and an abutment adjacent to each spool shiftable by the tension of a portion of a ribbon when spent from said spool into direct engagement with the abutment on the shaft adjacent to the set of drive gearing on said spool, said shiftable abutment having a surface operative on rotation of the coacting shaft abutment with the shaft to shift said shaft abutment and shaft axially toward the other set of drive gearing and related abutments.

4. In a ribbon mechanism for typewriters, ribbon carrying spools, and a ribbon feed and reversing mechanism including a rotary and longitudinally shiftable feed shaft, an abutment on the shaft, and a swinging member movable on ribbon exhaust from a spool transversely of the shaft and carrying a cam movable therewith to lie in the path of said abutment, said cam having a curved surface against which the abutment directly wipes on rotation of the shaft for shifting the shaft for a reversing action.

5. In a ribbon mechanism for typewriters, ribbon carrying spools, ribbon feed and reversing mechanism including a rotary and longitudinally shiftable feed and reversing shaft, an abutment on the shaft, a spring retracted swinging shift lever having a contact to engage a ribbon adjacent to a spool and arranged to hold the intervening portion of the ribbon tangentially to the periphery of the spool, said lever being movable for a shifting action in the direction of the ribbon feed under the tension of a final portion of the ribbon unwinding from the spool, and a member movable by said movement of the lever into the path of said abutment and having a surface directly engaged by said abutment on a rotary movement of the shaft to shift the latter for a reversing action.

6. In a ribbon mechanism for typewriters, ribbon carrying spools, a ribbon wound on said spools and having its ends fastened to respective spools, ribbon feed and reversing mechanism including a rotary and longitudinally shiftable feed and reversing shaft, an abutment on the shaft, a spring-retracted swinging shift lever arranged to engage a ribbon adjacent to a spool and to hold the intervening portion of the ribbon tangentially to the periphery of the spool, said lever being movable for a shifting action under the tension of the ribbon against its fastening to a spool upon a final portion of the ribbon unwinding from the spool, and a shoe movable by said movement of the lever into the path of said abutment on a rotary movement of the shaft to shift the latter for a reversing action.

PAUL KÄPPLER.