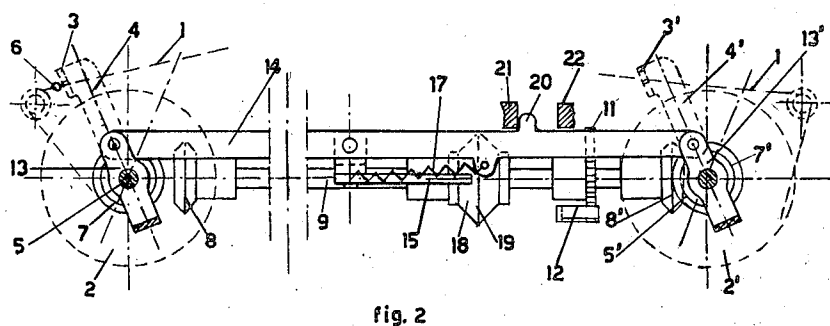
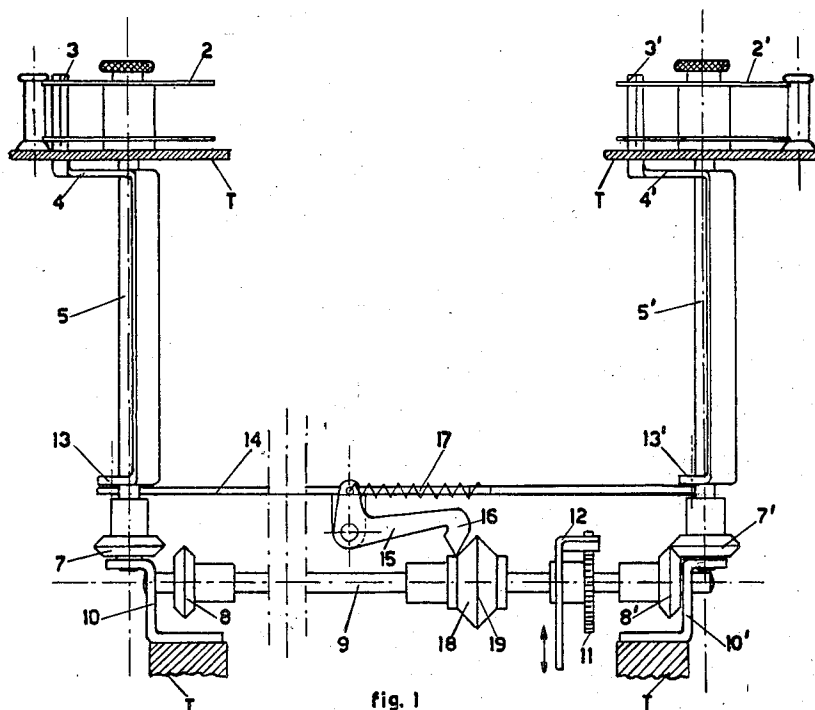


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AUTOMATIC INK-RIBBON REVERSAL MECHANISM FOR  
TYPEWRITERS AND PRINTING BUSINESS MACHINES  
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## AUTOMATIC INK-RIBBON REVERSAL MECHANISM FOR TYPEWRITERS AND PRINTING BUSINESS MACHINES

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The present invention relates to typewriters and like business machines and has for its object to provide an automatic reversal mechanism for the ink-ribbon used in such machines.

Several automatic ink-ribbon reversal mechanisms are known, which are either of complicated construction or often do not work satisfactorily. Sometimes the ink-ribbon becomes excessively stretched, whereby its duration is impaired, or it stops for more than one key stroke before being reversed, impairing again its duration and also the appearance of the writing.

These disadvantages are eliminated by the mechanism of the invention, which is composed of a very small number of parts, is of extremely simple construction and assures a lasting and perfect functioning.

In the said mechanism two pivot arms having slots for the passage of the ink-ribbon and rotatable by an obstruction provided near both the ends of the ink-ribbon, displace a thrust member in one or the opposed direction, whereby said thrust member snaps, during its displacement, from a position of action upon one face to a position of action upon the opposed face of a stop member mounted on the shaft driving the two ink-ribbon spools, said shaft being longitudinally movable in either direction and transmitting its rotary motion, according to its position, to one or the other spool.

In this way the displacement of the thrust member, which is actuated by the pivot arm corresponding to the spool from which the ink-ribbon has entirely unrolled, effects the longitudinal shifting of the driving shaft from one end position to the other end position, whereby said shaft disengages the full spool and starts to drive the empty spool.

In a preferable construction the thrust member is formed of a spring urged pawl pivoted on a bar which is parallel to the shaft driving the two spools and which is connected with the two pivot arms pivoted on the two spool shafts; the stop member is formed of a double cone, which is acted upon by the spring urged pawl during the shifting of the bar carrying the pawl, in such a way that the latter, due to the action of the spring tensioned during said shifting, after having reached the edge of the cone, snaps from the action upon one of the faces of said cone to the action upon the other face of same.

The result is a quick reversal of the direction of motion of the ink-ribbon, which does not stop for more than one key stroke.

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In the drawing, showing the mechanism schematically,

Fig. 1 is a front elevation, and

Fig. 2 a plan view.

5 The ink-ribbon 1, wound on the spools 2 and 2', passes through the slotted vertical portions 3 and 3' of the arms 4 and 4' which are pivoted on the spool shafts 5 and 5'. Near each end of the ink-ribbon is an obstruction, one of which can be seen at 6, corresponding to the lefthand spool, from which the ribbon has entirely unrolled. These obstructions are of such thickness that they cannot pass the slotted portions 3 and 3'.

10 The spool shafts 5 and 5' are provided at their lower ends with bevel gears 7 and 7' which can mesh with the bevel gears 8 and 8' mounted on the spool driving shaft 9. This shaft is pivoted on the brackets 10 and 10', secured to the frame T of the machine. Besides its rotary motion, the shaft 9 can slide longitudinally; this movement is limited by the engagement of the bevel gears 7 and 7' with the bevel gears 8 and 8' respectively, the distance between the latter two being such that one couple of gears is in mesh when the other one is out of mesh. In this way the shaft 9 can drive alternatively the two spools, being rotated intermittently at every key stroke by known means, for example by a pawl 12 driving a ratchet wheel 11.

30 The arms 4 and 4' have two lower prolongations 13 and 13' which are connected together by a link 14. A spring urged pawl 15 is pivoted on the link 14; the spring 17, tensioned between the pawl and the link, holds the tooth 16 of the pawl in contact with one of the faces of the double cone 18, secured to the shaft 9 and having a sharp edge 19.

35 When the obstruction 6 contacts the slotted portion 3, shifting it to the right during a few key strokes, the arm 13 rotates clockwise with the arm 4 around the shaft 5 and pushes the link 14 to the right. Since the shaft 9 is already in its right hand position, the tooth 16 of the pawl 15 rises upon the left face of the double cone, rotating the pawl counter-clockwise and tensioning the spring 17. After passing the sharp edge 19, the tooth 16, due to the tension of the spring, descends quickly along the right face of the double cone and causes the immediate shifting of the shaft 9 to the left, so that the couple of gears 7', 8' goes out of mesh and the couple of gears 7, 8 comes into mesh. To limit the shifting of the link 14 and to avoid that it itself becomes 50 shifted instead of the shaft 9 by the action of

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the pawl, the link is provided with a lug 20, co-operating with two stops 21 and 22.

It is obvious that the details described here can also be formed differently without altering the nature of the invention.

It is obvious, too, as already mentioned in the introduction, that the mechanism is applicable not only to typewriters, but also to any printing business machine, having an alternately fed ink-ribbon, for example printing computing machines, teleprinters, cash registers and so on.

What I claim is:

1. In an automatic ink-ribbon reversal mechanism for typewriters and like business machines, the combination of: a pair of pivotally mounted ribbon-actuated levers, a spool-driving shaft endwisely-shiftable into two end-postions, a transverse bar having its ends pivotally connected to said levers and being endwisely-shiftable by said levers into two positions, a spring-actuated pawl pivoted to said bar, and a double cone secured to said shaft and engaged by said pawl, said pawl being urged by its spring to snap, during the shifting of said bar, from position of action upon one face to a position of action upon the opposite face of said double cone, whereby said shaft is shifted into one of its two end-positions.

2. In an automatic ink-ribbon reversal mech-

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anism for typewriters and like business machines, the combination of: a pair of pivotally mounted ribbon-actuated levers, a spool-driving shaft endwisely-shiftable into two end-positions, a transverse bar having its ends pivotally connected to said levers and being endwisely-shiftable by said levers into two positions, a spring-actuated snap-over pawl pivoted to said bar, and a double cone, said double-cone being secured to said shaft and being axially shiftable by said spring-actuated snap-over pawl in one or the other of two opposite directions during the shifting of said bar, one end of the spring acting on said pawl being attached to said pawl, the other end of said spring being attached to said bar, and said spring normally urging said pawl into position for holding said shaft in either one of its two end-positions.

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