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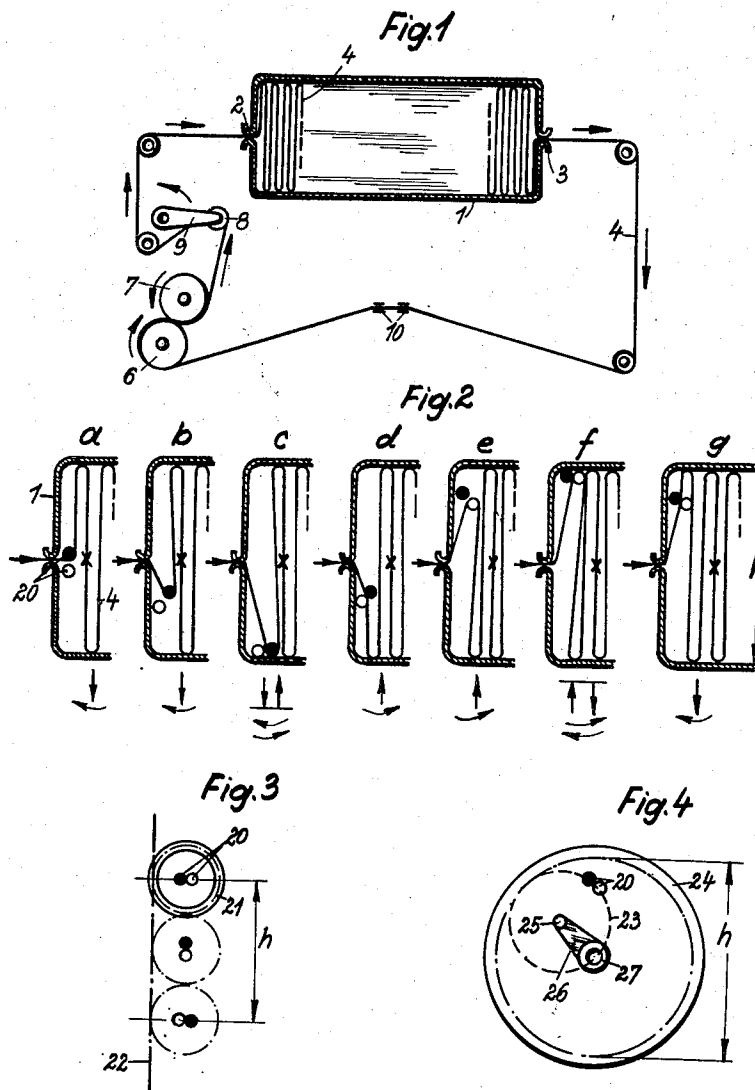
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2,685,357

ENDLESS RIBBON FEEDING MECHANISM FOR TYPEWRITERS

Filed Nov. 22, 1950

2 Sheets-Sheet 1



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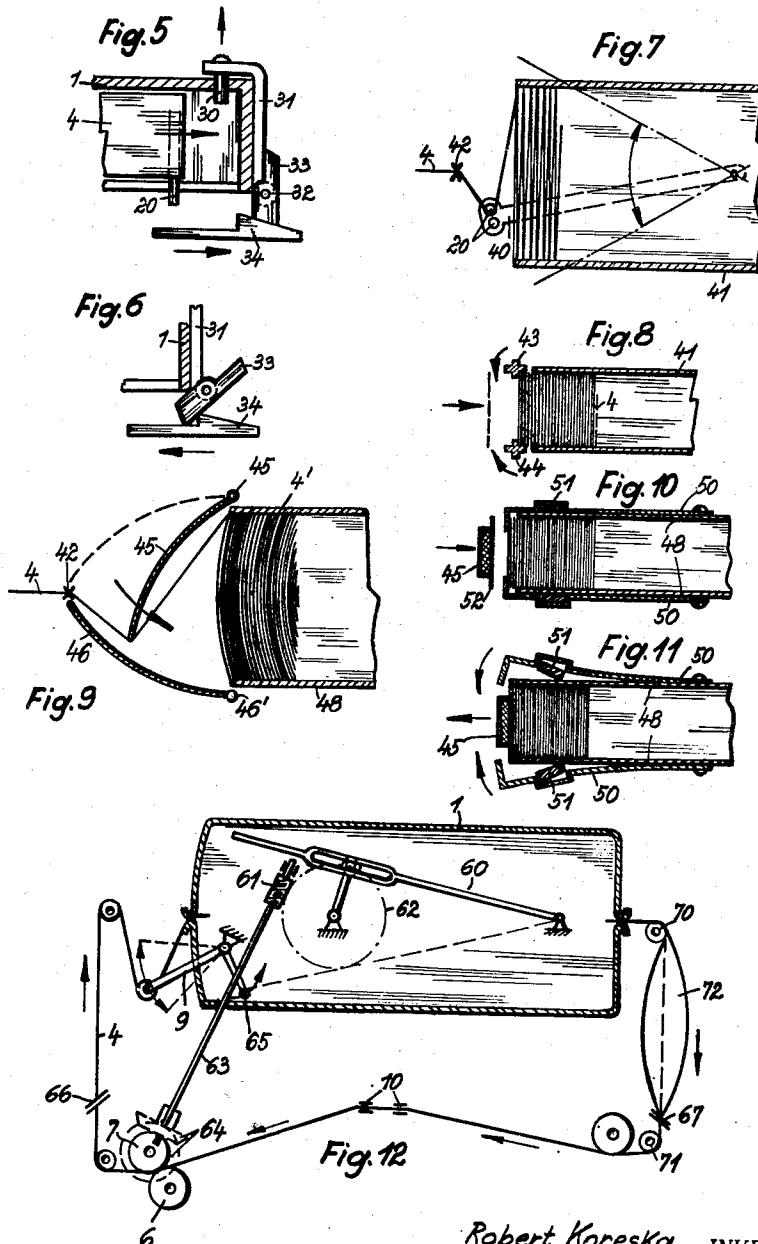
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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ENDLESS RIBBON FEEDING MECHANISM
FOR TYPEWRITERS

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6 Claims. (Cl. 197-168)

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The typewriters in general use at the present time are nearly all fitted with ink ribbons, the maximum length of which does not exceed 20 metres, and the ribbon feed is then obtained by arrangements which ensure that the spool on which the ribbon is being wound at any moment rotates through a constant angle each time a type key is struck.

It is well known that the ribbons of this kind used in such typewriters need to be renewed from time to time according to the life of the type of ribbon employed, and this is a somewhat troublesome operation, which also usually involves the soiling of the fingers of the operator with ink from the ribbon. The life of ordinary cotton ribbons depends mainly on the resistance of the fabric to the action of the typewriter types striking against it; nevertheless, if a good impregnating fluid is used, it is practically independent of the ink storing capacity of the fabric and is also free from any tendency for the impregnating fluid to dry up. This is because it is quite easy to keep the specific ink-absorbing capacity of the ribbon, as well as the quantity of ink incorporated in the fabric per unit length, sufficiently large, so that the ink can practically never be said to be dried up.

It has been found by experiment that a cotton ribbon will become torn after about 1200 and a silk ribbon after about 1800 type impacts per cm. of length. If inks are used which are adequately rich in pigment and are sufficiently difficult to make dry, then it usually happens that the mechanical destruction of the ribbon fabric takes place much sooner than the exhaustion of the supply of ink incorporated by the absorption of the fabric. It follows that the life of an ink ribbon, at least in the case of cotton ribbons, generally comes to a premature end solely because the fabric has insufficient mechanical resistance. Various procedures have been tried in order to obviate this disadvantage. First, an attempt has been made to prolong the life of a ribbon by using a fabric made from very strong synthetic fibres, but it has been found that such fabrics only absorb ink in a very inadequate and unsatisfactory manner, so that comparatively insufficiently impregnated ribbons are obtained due to the insufficient ink-storing capacity of this kind of fabric. This means that the relatively long life which fabrics of this kind have, cannot be utilized economically.

Then again, arrangements have been tried out in which the typewriters are not only provided with very strong and tough ribbons but

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are also provided with means for constantly feeding liquid ink to said ribbons. Apart from the fact that the storage and distribution of liquid ink in a typewriter leads to a variety of troubles and inconveniences, the type impressions obtained with such ribbons are not uniformly inked. Finally, it has also been proposed to fit typewriters, which incorporate re-inking means, with comparatively long ink ribbons (e. g. 288 yards, see U. S. Patent No. 2,471,238) in anticipation of achieving in this manner the aim of providing a typewriter which requires no ribbon changing for several years.

Now, it is a fact which has been proved by experiment that the perforation of the ribbons or, in the case of natural silk ribbons, the exhaustion of the ink with which they have been impregnated, both of which result from the stresses imposed by the impact of the type upon the ribbons, do not occur uniformly along the whole length of said ribbons. The reason for this is that the amount of the ribbon feed is only constant with respect to the angle through which the wind-on spool rotates each time a key is struck, whereas the actual advance movement of the ribbon depends upon whether a large amount or only a small amount of the ribbon is wound up on the spool, i. e. the rate of advance of the ribbon depends on the effective diameter of the wind-on spool at the moment considered. If this effective diameter is large, then the rate of advance is consequently greater than when the spool has only received a few turns of the ribbon. This leads to the result that, if for example a band of 10 metres length is used and is wound on spools with a core diameter of 12 mm., the stresses and wear imposed on the end zones of the ribbon will be approximately 45% greater than those imposed on the middle zone. Consequently, the ribbon first becomes torn or worn out at the end zones, while the middle zone still shows relatively little wear. Since a ribbon cannot stand up to use after its most highly stressed parts are worn out, it is useless if it is perforated or worn out in any part thereof, despite the fact that other zones may still show only slight signs of wear. Although it would be possible, by careful operation of the ribbon feed mechanism, to concentrate the wear on the good middle zone of the ribbon, in practice, for reasons of convenience, no use is made of this possible method of extending the life of typewriter ribbons.

In view of what has been stated above, it is clear that the mere increasing of the length of the ribbon will not of itself effect any increase

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in its life, so long as the cause of the undesirable concentration of the type impacts on the marginal zones of the ribbon is not eliminated. Moreover, it is clear that by using a very strong fabric of substantial length (such for example as is proposed in the above-mentioned U. S. patent), the problem is not satisfactorily solved, because then, instead of having to change the ribbons from time to time, it is necessary to make provisions for replacing the ink, and typewriters with reservoirs for liquid ink have serious disadvantages from the standpoint of design.

The typewriter according to this invention avoids these disadvantages by being provided with an endless ink ribbon which at least in one part thereof constitutes a reserve supply of ribbon. This endless ink ribbon is fed through the typewriter, while the latter is in operation, by means of a ribbon feed mechanism which is so arranged that it transmits a constantly uniform advance movement to the ribbon each time a type key is struck. The use of endless ribbons in typewriters is not new per se, as is shown by German Patent No. 603,257, or U. S. Patents Nos. 2,074,969, 2,104,469, 2,387,330 and 2,475,336. In all of these cases, however, the ribbons are short ribbons, i. e. ribbons which do not provide a reserve supply of ribbon in the machine. Since these ribbons are short, their life span is correspondingly inadequate, when using ordinary textile materials (particularly cotton), due to the limited strength of the fabric; whilst when fabrics of greater strength (such as nylon or the like) are used, it is impossible to avoid making provision for a ribbon re-inking operation. Yet, even if such ribbon re-inking mechanism operated satisfactorily, the fact remains that short endless ribbons, even if they are to have only the same length of life as an ordinary 10 metre silk ribbon, must have a strength which is of a higher order of magnitude than the values obtained in practice. Fibres of this kind, which are capable of being woven and are suitable for the production of ink ribbons, are so far unknown.

With the endless ribbon according to the present invention, the re-inking mechanisms in the typewriter are dispensed with, because a sufficient reserve of ink is stored in the reserve supply of ribbon.

The various features, objects and advantages of the present invention will be more particularly described in conjunction with some now preferred embodiments illustrated in the accompanying drawing, it being clearly understood that the invention is not limited to these embodiments and that many other practical solutions within the spirit and scope of the invention may occur to the skilled in the art. In the drawing,

Fig. 1 is a schematic view of an arrangement in accordance with the invention;

Fig. 2 shows, schematically, one embodiment of a ribbon-folding device in seven successive positions;

Fig. 3 shows one actuating mechanism for the ribbon-folding device of Fig. 2;

Fig. 4 shows another actuating mechanism for the ribbon-folding device of Fig. 2;

Figs. 5 and 6 show a holding mechanism for the ribbon folds in different operating positions;

Fig. 7 shows another embodiment of a ribbon-folding device;

Fig. 8 shows a holding mechanism for the ribbon folds used in conjunction with the ribbon-folding mechanism of Fig. 7;

Fig. 9 shows still another embodiment of a ribbon-folding device;

Figs. 10 and 11 show a holding mechanism for the ribbon folds used in conjunction with the ribbon-folding mechanism of Fig. 9; and

Fig. 12 is a schematic view of one embodiment of a ribbon-feed, storage and folding arrangement in accordance with the invention.

In a rectangular box 1 (Fig. 1) with lateral openings 2 and 3, lies a ribbon 4 which is folded in a large number of zig-zag turns. The folded part of the ribbon 4 fills the whole of the available space within the box 1 and exerts considerable pressure against the walls thereof. The part of the ribbon 4 leaving the box 1 through the opening 3, after travelling round a sufficiently large loop, returns back into the box 1 through the opening 2 and is thus endless.

The ribbon obtains its drive in the usual manner, i. e. each time a type key is struck, it is fed forward by a roller 6 turning through a constantly uniform angle, which roller 6 co-operates with a friction counter-roller 7 so as to ensure a non-slip driving connection between the roller 6 and the ribbon. A roller 8 is capable of rocking with a lever 9 and is adapted to extend a reserve of ribbon which is required in connection with the arrangement of the folds of ribbon in the box, as will be described later. 10 is the ribbon fork.

Fig. 2 shows only the end of the box through which the ribbon enters and illustrates seven successive positions *a* to *g* of the elements which serve for the folding of the ribbon. This folding operation is performed by a two-pronged fork 20 which reciprocates across the width *h* of the box 1 and, simultaneously with this reciprocating movement, performs a rotary oscillation about its own axis of symmetry, i. e. about the axis located midway between its two prongs. This fork 20 will be referred to elsewhere in this specification as the "reciprocating oscillating fork." In Figure 2, the cross-sections of the two prongs are indicated by two circles, one of which is blacked in while the inside of the other is left white. The reciprocating movement takes place along a path closely adjacent the wall of the box 1 which is formed with the intake opening 2 (Figure 1), while the oscillating movements take place simultaneously about the axis of symmetry of the fork which has been already referred to. The procedure whereby the ribbon is drawn into the box 1 is clearly illustrated by the fragmentary diagrams of Figure 2, and the directions of movement of the fork are indicated by the arrows beneath these diagrams.

In position *a*, the fork is swinging downward and is at the same time turning clockwise. As shown in the diagram of position *b*, the prong indicated in black seizes the ribbon and draws it inward in the form of a loop. In position *c*, the loop of ribbon has been drawn out as far as the side wall of the box, the fork is beginning to swing back upward (as seen in the diagram) and to change its direction of rotation. The position *d* diagram shows how the fork slides upward along the loop already formed. The next diagram shows the fork in position *e* in which the prong indicated in white is in engagement with the ribbon and is drawing it out again to form another loop; at the same time, the fork is rotating further in the anti-clockwise direction, so that in due course it assumes the position *f* illustrated by the next diagram. The fork now slides downward, as shown in diagram *g* of Fig-

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ure 2, while at the same time rotating clockwise and so returns to the position *a*, whereupon the cycle of operations already described is repeated. During each cycle, as can be seen from the displacement of the point marked *x* on the ribbon in successive diagrams of Figure 2, a length of ribbon equal to $2h$ is drawn into the box 1. From among the various different possible methods of imparting the required simultaneous reciprocating and oscillating motion to the ribbon fork, two are illustrated in Figures 3 and 4.

According to Figure 3, the fork 20 is mounted on a gear wheel 21 which is in mesh with a stationary toothed rack 22 and performs a reciprocating movement through a distance *h*. If the pitch circle diameter *d* of the gear wheel is expressed in the formula

$$2d = \frac{2h}{\pi}$$

then the fork, during the reciprocating movements of the wheel 21, performs precisely those oscillations which are necessary according to Fig. 2.

According to Figure 4, the fork 20 is mounted on a gear wheel 23 of pitch circle diameter $d = 0.5h$, which rolls to and fro through an angle of 180° within an internally toothed gearwheel of twice this diameter. The axis pin 25 of the wheel 23 in this case requires no rectilinear guiding means, but rocks with the crank 26 about a stationary axis 27.

It would be simpler from the standpoint of design to mount the wheel 21 on the end of a long oscillating lever in which case the need for straight line guide means for the gear wheel 21 can be dispensed with. The toothed rack 22 is replaced by a gently curved internally toothed arc. In order to make use of the simpler external gear teeth, all that need be done is to arrange the arc on the opposite side of the gear wheel 21, but in this case an intermediate gear wheel must be arranged between the gear wheel 21 and the toothed arc. The reciprocating-oscillating fork travels along a flat arcuate path, as is also the case in the arrangement according to Figure 12 which will be described later.

The reciprocating-oscillating fork described above has, however, a tendency during its return movement to pull back again the loops of ribbon which have only just been formed. If this happens, then additional folds are made which are finally capable of obstructing the reciprocating movements of the fork. In order to eliminate this possibility with certainty, use is made of an additional device which is shown in two different positions in Figures 5 and 6. This device is primarily designed with the object of holding tight the freshly formed loop of ribbon during the return movement of the fork.

For this purpose, there is provided at each turning point of the fork a short retaining pin 30 (Figure 5). This pin 30 is mounted on a lever 31 which is pivotally mounted on the side of the box 1. The pivot pin on which the lever 31 is mounted is omitted from the drawing for the sake of simplicity. Mounted on a pivot pin 32 on the lower end of lever 31 so as to be able to swing outward in one direction is a pawl 33.

An operating tooth 34 engages the fork gear-wheel 21 or the above-mentioned pivoted lever 31. The prongs of the fork 20 are shortened by 2 to 3 mm. on the side adjacent the retaining pin. As the fork 20 approaches the retaining pin 30, the latter is lifted for a short period by the control tooth 34. If the fork has then reached

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its turning point, the retaining pin will snap into the freshly formed loop. During the return movement of the ribbon fork 20 and the control tooth 34, the pawl 33 will be tripped (Figure 6) so that the retaining pin will remain engaged in the loop of ribbon and will only be withdrawn when the fork pulls out the next loop on the same side.

The two retaining pins can naturally be controlled in other ways; the only essential requirements are that the loop of ribbon should be engaged immediately after it has been formed and that it should continue to be held by the retaining pin or its equivalent throughout the whole of the return movement of the ribbon fork.

The drawing-in of the ribbon by the reciprocating-oscillating fork takes place periodically. In the course of each cycle of movements, the ribbon is twice drawn in a distance *h*, and between these two operations, it remains stationary. Consequently, the draw-in movement is incapable by itself of serving at the same time as a ribbon-feed mechanism. A function which the ribbon-feed mechanism must perform is that of advancing the ink ribbon a uniform distance after each type key is struck. For this reason there must be provided on the typewriter between the ribbon fork and the entrance guide a feed apparatus (e. g. a pair of feed rollers 6, 7, Figure 1). This feed apparatus draws the ribbon 4 (Figure 1) out of the ribbon box 1, conveys it past the ribbon fork 10 and delivers it via the reserve ribbon control member 8 to the entrance opening 2 of the box 1.

The drive of the reciprocating-oscillating fork, which is not shown in Figure 1, may for example be derived from the feed roller 6.

The ribbon preferably acquires a somewhat higher speed at the entrance opening 2 in the reserve supply box 1 than at the outlet opening 3, which may be achieved for example by the use of a friction clutch which allows a small amount of slip. It therefore remains constantly under a light tension; moreover, it is then also possible when fitting the long ribbon to draw out a sufficiently large amount of slack and to tension the ribbon again before putting the typewriter into use.

Since the ribbon runs through the machine after the manner of an endless belt, the normal feed mechanism is dispensed with, its function being performed instead by the roller 6 (Figure 1) which constitutes the one and only feed member and works continuously in the same direction until the ribbon is worn out.

Figures 7 and 11 show further possible methods of depositing the ribbon within the box 1 in the necessary zig-zag folds. Figure 7 shows an embodiment in which the folding of the ribbon is effected by a pivoted fork. The manner in which this embodiment operates is as follows.

The two prongs 20 of the pull-in fork are mounted directly on a lever 40, which rocks to and fro about an axis pin O. An auxiliary rotary movement of the prongs of the fork does not occur in this case. The ink ribbon box 41 is open on the side on which the ribbon is drawn into it. The loops of ribbon are formed in the free space between the box 41 and the entrance guide 42. The lever 40 is given a certain amount of excess movement in order to provide sufficient time for the engagement of the loops as they are presented. Feed gates (not shown in Figure 7) may for example serve for this purpose. Figure 8 shows a longitudinal cross-section through the

ribbon box 41 fitted with feed gates in the form of holding crosses 43, 44. Between the upper and lower walls of the box are arranged the folds of ribbon which have already been thrust in and which are supported on the entrance side across the whole width of the box against the feed gates 43, 44.

In the position shown, the pivoted fork can add a fresh turn of ribbon from the left. If this is done, the two feed gates 43, 44 rotate through 90° in the direction of the arrows. By this means the new turn of ribbon is engaged and pressed in against the other turns which are already in the box.

When the pressure on the ribbon is low, the supporting pressures acting on the feed gates are so small that storage and feeding present no difficulties. Care must, however, be taken to ensure that the tension on the ribbon as it enters the box remains constant at a low value, since otherwise the ribbon might be drawn out again past the ends of the feed gates.

The constructional embodiment according to Figures 9 to 11 operates with so-called fold levers. The ink ribbon 4, after passing through the entrance guide 42, is alternately gripped by each of two fold levers 45 and 46, which are mounted on pivots 45' and 46' respectively, and is laid in folds against the stack 4' of folded ribbon in the box 48. Throughout a complete oscillation (to and fro movement) of one fold lever, the other fold lever remains at rest. The folds of ribbon are held by spring-loaded gripping members, which are raised for a short period, when one or the other of the fold levers is lying up against the folded ribbon. Before the lever swings back again, the fold of ribbon which has just been formed by it is engaged and held against the stack 4'. A constructional embodiment of means for doing this is described below with reference to Figures 10 and 11.

On the top and bottom walls of the box 48 are riveted a pair of retaining springs 50 beneath which lie lifting bars 51. One of the two fold levers (e. g. lever 45) brings up a new fold 52 of ribbon and places it over the retaining springs which are still closed against the stack of ribbon. The lifting bars 51 are now inclined as shown in Figure 11 and the retaining springs are consequently lifted away from the walls of the box 48. The fold lever 45 then moves 1 to 2 mm. further and slides the stack of folded ribbon together with the new fold further into the box. The retaining springs are then allowed to close in again and the fold lever swings back, whereupon the stack of folded ribbon presses with a light resilient pressure against the retaining springs 50. The retaining springs would also be made so that they are resiliently loaded towards the outside and are closed together by sliders which are arranged to move over them.

The fold levers may also either be somewhat strongly curved or be made rectilinear. In the first case, the amount of space they occupy is somewhat smaller and in the second case it is somewhat larger than is the case with the embodiment illustrated in Figure 9. In all cases, however, the amount of space that they occupy is considerably greater than the corresponding amounts in the embodiments according to Figures 2, 3, 4 and 7. This disadvantage is counterbalanced by the advantage that the stack of folded ribbon is formed in the ribbon reserve box and thrust into it by powerful levers.

In Figure 12 is schematically illustrated the

general arrangement of a possible constructional form of a feed mechanism for endless ribbons according to the present invention.

The arrangement illustrated schematically in Figure 12 presupposes that the ribbon box 1 is located below the keys. Of the mechanism for folding the ribbon and placing it in the box 1, the only part which is shown in this figure is the rocking lever 60 which is common to many of the embodiments described. A driving worm 61 for a crank disk 62 which actuates the rocking lever 60 is mounted on a shaft 63 which may, for example, be kept rotating by a pair of bevel wheels 64. The transmission is so chosen that 5% to 10% more ribbon 4 is drawn in than is released by the pair of feed rollers 6, 7.

The slack control and take-up lever 9 keeps the ribbon 4, which is being fed to the box, under a light tension and thus periodically swings slowly to and fro. If the mean length of the loops becomes gradually shorter, the pin 65 on the control and take-up lever 9 will approach the worm shaft 63 and will finally disengage the worm 61 from the worm wheel 62. After some time, the loop of ribbon passing over the roller on the end of the lever 9 will become larger again and the pin 65 will again engage the worm gear and the drawing in of the ribbon will be continued. By suitably selecting the strength of the spring of the slack control and take-up lever (which like the spring acting on the shaft 63 to hold the worm 61 in engagement with the worm-wheel 62 is not shown so as to keep the drawing simple and easy to follow), the tension of the part of the ribbon being fed to the box 1 can easily be kept within the desired limits.

66 and 67 indicate ribbon guides of known kind whereby the ribbon is diverted out of the plane of the type fork into the plane below the type keys in which lies the ink ribbon box 1 by means of pins located in the plane of the ribbon and disposed at an angle of 45° to the direction of travel of the ribbon.

The crank disk 62 may also have a pawl and ratchet drive in which case the worm 61 would be replaced by a pawl and ratchet drive which could be actuated by the same parts of the typewriter mechanism which, when a short ribbon is used, are employed to drive the ribbon feed mechanism. This arrangement may usefully be adopted in a new design of typewriters for endless ribbons, because less force is needed to disengage a pawl and ratchet drive than is needed for disengaging a worm drive.

The driving means for the drawing in of the ribbon may be set in motion by a very wide variety of the driving parts of the typewriter. Those which are particularly suitable include:

1. The platen carriage. This is operated at least six times with a total travel of about 1200 mm. for each 200 mm. travel of the ink ribbon. The diversion of the relatively small amount of feed work for drawing in the ribbon is scarcely felt by the user. It is relatively easily accessible.
2. The space bar with its lever system. This is operated 50 to 60 times with a total working movement of about 600 mm. for each 200 mm. of ribbon length. In this case also the additional resistance would scarcely be noticed.
3. The type keys. These are, because of their extraordinarily large total movement (about 6000 mm. for 200 mm. of ribbon length), the least likely to allow an additional load to be perceptible. Moreover, there is in every typewriter a drive take-off for the ribbon feed which may already

be present in the form of a ribbon-driving drum. With the present short ribbon this drive imparts to the ribbon advance movements of about 0.4 mm. to 1 mm., and at the same time overcomes substantial additional dynamic forces. Consequently the work of drawing in the ribbon can easily be transferred to it when a long ribbon is used and added to that which it already has to perform in imparting to the ribbon a constant feed movement of 0.3 to 0.5 mm. (without any additional dynamic forces).

In typewriters having a single colour ribbon, importance is attached to enabling full use to be made of the ribbon by changing over the spools. This is done, after the upper half of the ribbon has been used, so as to make the hitherto unused lower half usable also. The endless ribbons described above, if they are of the usual width (13 mm.) and are impregnated with ink of one colour only, make it possible in a simple manner to use these ribbons on both sides.

If, at any point on the outer loop of the ribbon, e. g. between the guide rollers 70, 71 (Figure 12), the ribbon is twisted through an angle of 180° (in the region indicated by reference 72), then, as soon as a complete length of the ribbon has run off, the other part of the ribbon which has hitherto not been struck automatically comes under the type, and is used again for the whole length of the ribbon.

If an endless 100-meter long natural silk ribbon having a thickness of 0.08 mm. is used and provision is made for twisting it around through 180°, its useful life will be about 3¼ years. This life is fully achieved in practice, since the greater part of the ribbon lies in the box where it is protected against drying up and where the conditions favour regeneration of the ribbon. The ribbon is however advantageously so dimensioned that the typewriter can be kept in use for 1½ to 2 years, so that in due course it can be fitted with a new ribbon at the same time as the necessary periodic basic cleaning becomes due.

What I claim is:

1. In a typewriter ribbon feed and storage mechanism comprising an endless ribbon, a receptacle for storing the major portion of the ribbon, said receptacle having side walls, end walls, a ribbon inlet in one end wall and a ribbon outlet in the opposite end wall, and means for withdrawing the ribbon from the ribbon outlet and feeding it to the ribbon inlet: a reciprocating device positioned at the ribbon inlet for inserting the ribbon in regular folds in said receptacle, said reciprocating device being arranged to engage the ribbon at least periodically and to fold it in contiguous substantially identical folds into a ribbon supply package, and means for keeping the ribbon supply package under pressure in the receptacle, said pressure being sufficient to cause movement of the entire package through the receptacle as additional ribbon is fed into the re-

ceptacle by said reciprocating device, the ribbon withdrawal from and feed to the receptacle depending on the ribbon transport through the typewriter and the length of the ribbon, and the speed of the ribbon supply package movement through the receptacle being determined by said ribbon withdrawal and feed.

2. In the combination of a typewriter ribbon feed mechanism comprising an endless ribbon, a receptacle for storing the major portion of the ribbon, said receptacle having a ribbon inlet and a ribbon outlet at opposite ends, and means for withdrawing the ribbon from the outlet, guiding it through the typewriter and feeding it to the inlet at a predetermined speed: a reciprocating feed device positioned at the ribbon inlet for inserting the ribbon in regular folds in said receptacle, said reciprocating device being arranged to engage the ribbon at least periodically and to fold it in contiguous substantially identical folds into a ribbon supply package, means for keeping the ribbon supply package under pressure in the receptacle, said pressure being sufficient to cause movement of the entire package through the receptacle as additional ribbon is fed into the receptacle, and transmission means connecting the pressure means and the ribbon withdrawal, guiding and feeding means to control the speed of the ribbon supply package movement through the receptacle.

3. A typewriter ribbon feed mechanism as defined in claim 2, wherein said reciprocating device is a fork engaging the ribbon at the inlet and oscillating in the direction of the ribbon folds, holding means being provided at the inlet to fix each newly inserted fold in place.

4. A typewriter ribbon feed mechanism as defined in claim 3, wherein said holding means comprises periodically rotating holding crosses at the inlet, said crosses engaging the ribbon fold formed by said fork and pressing it against the ribbon folds in the interior of the receptacle.

5. A typewriter ribbon feed mechanism as defined in claim 2, wherein said reciprocating feed device comprises two folding levers at the inlet alternately swinging in the direction of the ribbon folds and engaging the ribbon during their swinging movement, holding means being provided at the inlet to fix each newly inserted fold in place.

6. A typewriter ribbon feed mechanism as defined in claim 2, comprising a ribbon twisting device arranged to impart a 180° twist to the ribbon.

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