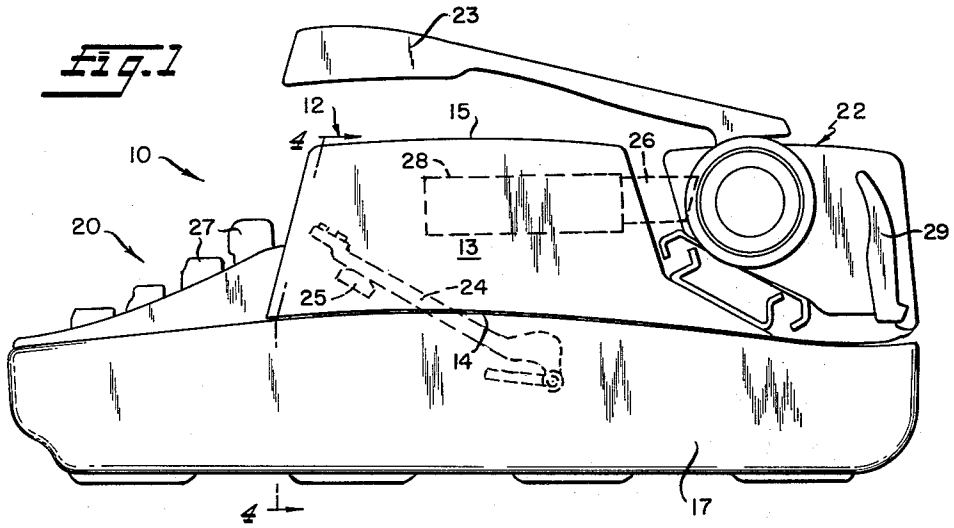
June 29, 1965 J. E. HARMON 3,191,742

TYPEWRITER RIBBON COVERS

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Fig. 1



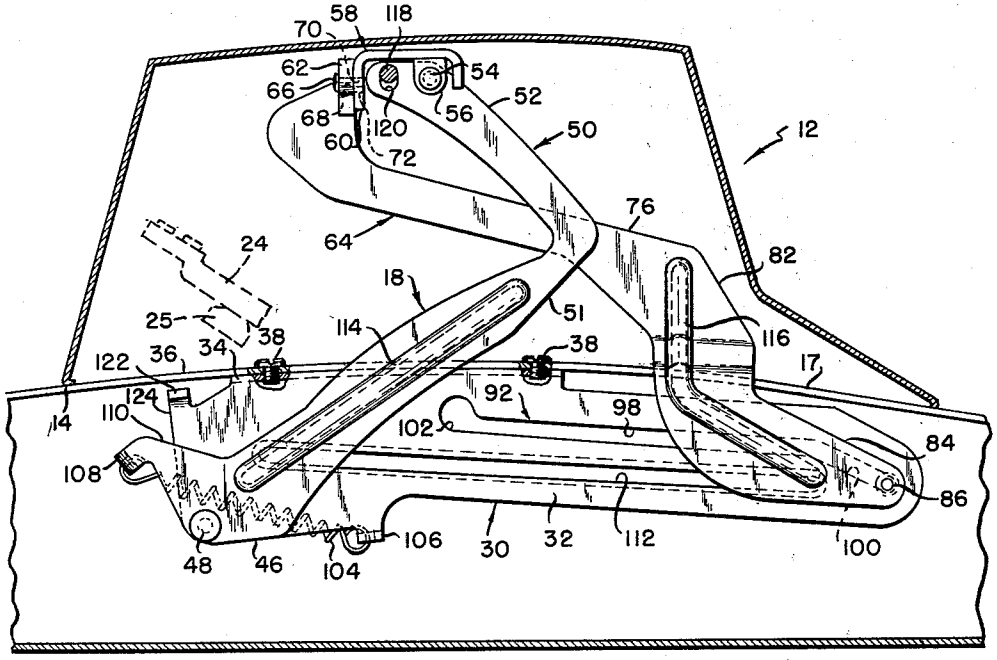


Fig. 2

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TYPEWRITER RIBBON COVERS

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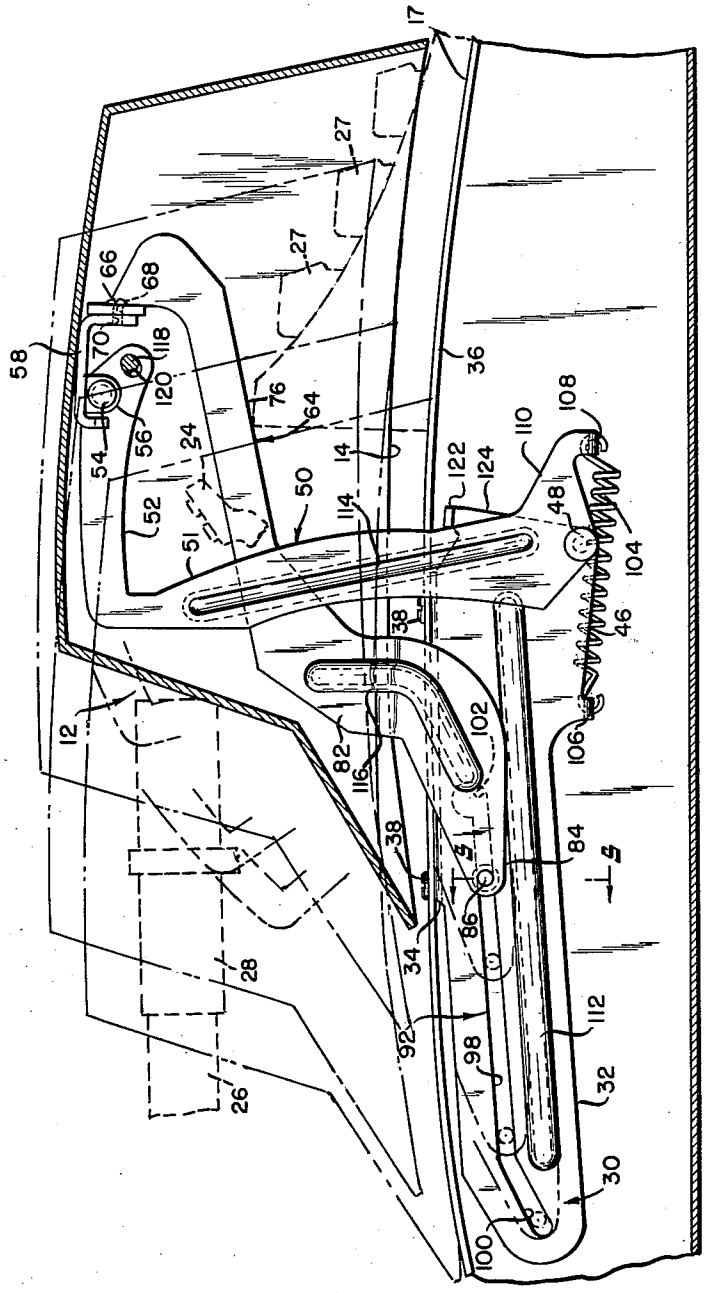


FIG. 3

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TYPEWRITER RIBBON COVERS

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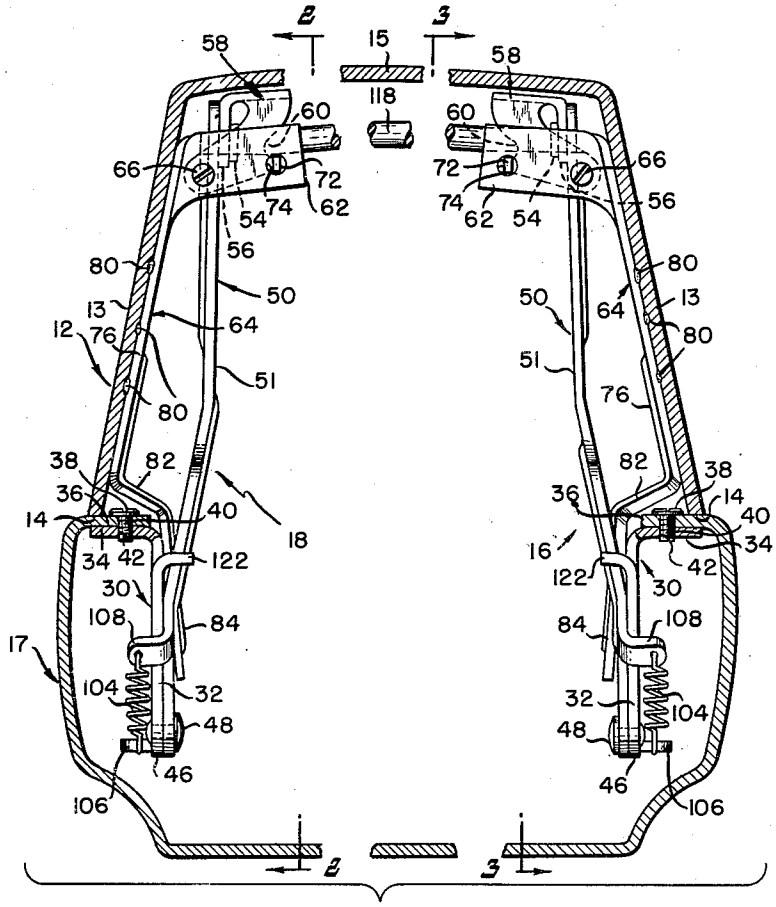


Fig. 4

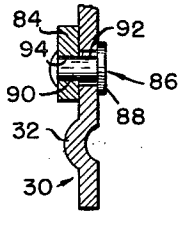


Fig. 5

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3,191,742

TYPEWRITER RIBBON COVERS

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Filed Aug. 11, 1961, Ser. No. 130,959
6 Claims. (Cl. 197—186)

This invention relates to typewriters and, more specifically, to a typewriter having a displaceable cover for gaining access to the ribbon spools and to the printing mechanism such as a type basket.

In certain conventional typewriters, the ribbon spool cover (which also covers the type basket) is completely removed from the machine when it is desired to change the typewriter ribbon or to clean the type characters. This type of cover has several disadvantageous features. It is conventionally held in place on the typewriter by a detent arrangement and a relatively strong force is therefore required to remove it . Replacement of this type of cover is a bothersome and time consuming task since it is necessary to accurately align the cover on the machine before the detents can be engaged. Again, the operator and the maintenance personnel are faced with the problem of finding a place to put the cover after it is detached from the machine. And it may well wind up in a precarious position from which it may fall or be accidentally knocked to the floor and damaged.

It has long been recognized, therefore, by those familiar with the utilization and operation of typewriters, that it is preferable to have the ribbon spool cover attached to the machine in its open position as well as in its closed position. Covers of this general type are well known to the prior art, typical structures being illustrated in United States Patent No. 2,113,006 issued to J. A. B. Smith, April 5, 1938, for "Typewriting Machine" and in United States Patent No. 2,344,118 issued March 14, 1944, to F. Wunderlich for "Typewriting Machine with Cover Hood."

In the type of arrangement illustrated in the Smith patent, the ribbon spool cover is mounted on a pair of brackets which may be slid horizontally to move the cover forward to an open position and rearward to a closed position. The typewriter is equipped with spring retainers to hold the brackets in place when the cover is in the closed position. This cover arrangement has two undesirable characteristics: (1) a strong force is required to overcome the holding action of the spring retainers when the cover is moved from the closed to the open position; and (2) there is no satisfactory provision for retaining the cover in the open position. Moreover, it is preferable to employ a cover mounting mechanism which will lift the cover clear of the adjoining portions of the typewriter casing before it is moved forward to prevent the cover from scratching or otherwise damaging the casing. Another desirable feature which this type of cover lacks is an overcenter spring which will assist the operator in moving the cover forward and backward between the open and closed positions.

The Wunderlich patent typifies a ribbon spool cover arrangement in which the ribbon cover is mounted on hinge mechanisms which pivot it upwardly at the rear of the type basket (and behind the ribbon spools) to an open position. The main objection to this type of cover is that as the cover pivots upwardly, it will strike the carriage return lever unless the carriage is moved well to the left of the machine to a position where the cover will clear the return lever. Accordingly, Wunderlich employs an elaborate mechanism which maintains the cover in a partially open position below the return lever until the carriage is moved to the point where the cover can clear the return lever. The expense of producing and assembling this additional mechanism of course adds to the price of the machine and

to the cost of maintaining and repairing it. Moreover, this cover arrangement has no positive stop to support it in the open position. And, it has no overcenter spring arrangement to assist the operator in closing the cover.

The primary objects of this invention, therefore, include:

(1) The provision of a typewriter having an improved ribbon spool cover mounting arrangement by which the cover may be displaced to allow free access to the ribbon spools and to the type basket;

(2) The provision of a typewriter having a ribbon spool cover mounting arrangement by which the cover is movable between open and closed positions and which remains attached to the machine when it is moved to the open position;

(3) The provision of a typewriter having a ribbon spool cover which may be moved by a very light force between open and closed positions;

(4) The provision of a typewriter having a ribbon spool cover movable between open and closed positions and provided with a positive stop arrangement for supporting the cover in its open position;

(5) The provision of a typewriter having a ribbon spool cover movable betwen closed and open positions and mounted on hinge mechanisms which, when the cover is moved from the closed to the open position, move it along a substantially arcuate path having an initial upward component and then primarily a horizontal component; and,

(6) The provision of a typewriter having a ribbon spool cover movable between open and closed positions and mounted on hinge mechanisms which include overcenter springs to assist the operator in moving the cover between these positions.

In conjunction with the foregoing objects, a further primary objects of this invention resides in the provision of a typewriter having a ribbon spool cover which has all of the advantages described in the foregoing objects and which is, in addition, constructed of a minimum number of moving parts, is rugged and sturdy, and is inexpensively fabricated, assembled, and maintained.

Further novel features and other objects of this invention will become apparent from the following detailed description, discussion and the appended claims taken in conjunction with the accompanying drawings showing a preferred structure and embodiment, in which:

FIGURE 1 is a right side elevational view of a typewriter equipped with a ribbon spool cover constructed in accord with the principles of the present invention, the cover being in closed position;

FIGURE 2 is a sectional view of the typewriter shown in FIGURE 1 showing the cover hinge mechanism attached to the left side of the cover and showing the cover in the closed position and being in effect a section along line 2—2 of FIGURE 4;

FIGURE 3 is a sectional view of the typewriter shown in FIGURE 1 showing the cover hinge mechanism attached to the right side of the cover, being in effect a sectional view along the line 3—3 of FIGURE 4, and showing the cover in the open position;

FIGURE 4 is a sectional view of the typewriter shown in FIGURE 1 with the cover in the closed position and taken substantially along line 4—4 of FIGURE 1; and

FIGURE 5 is a sectional view taken substantially along line 5—5 of FIGURE 3 and showing in detail the connection of the arm member and the slide member.

Turning now to FIGURES 1 and 4, the typewriter 10 is equipped with a displaceable ribbon spool cover 12 constructed in accord with the principles of the present invention and having two substantially vertical end walls 13 (FIGURE 4) connected by a horizontal, laterally extending top wall 15. When cover 12 is in the closed position, its lower edge 14 rests on the top surface of a pan

17 which houses the lower portion of the machine as shown in FIGURE 2. A pair of hinge mechanisms 16 and 18 (see FIGURE 4) connect cover 12 to pan 17 in a manner which will be described presently. In the closed position, cover 12 encloses the upper portion of the typewriter including the ribbon spools 28 and the type basket (not illustrated). In the open position (see FIGURE 3), cover 12 is supported above pan 17 and is displaced forwardly with respect to its closed position in a manner which will be explained later in more detail to expose the ribbon spools and the type basket.

Located at the forward side of typewriter 10 is a keyboard 20 of conventional construction. A carriage 22 provided with a return lever 23 is conventionally supported for axially shiftable movement at the rear of the machine. Typewriter 10 includes a conventional ribbon equipped printing mechanism comprising type bars 24 operable from a rest position in which they are supported by a type bar rest 25 into impression producing engagement with a typewriter ribbon 26 by type keys 27. Ribbon 26 moves between ribbon spools 28 located adjacent opposite sides of typewriter 10 in closely spaced relationship to a platen supported print receiving member (not shown). Typewriter 10 is also equipped with the other conventional typewriter instrumentalities such as a platen or paper release lever 29.

While it is believed that FIGURE 1 makes sufficiently clear the relation of cover 12 to the other components of typewriter 10, a more complete illustration of this overall arrangement is found in design patent application No. 60,700, filed August 25, 1960, by David O. Chase et al., to which reference may be made if it is deemed necessary for a more complete understanding of the present invention.

As may be seen from FIGURES 2 and 3, the two hinge mechanisms 16 and 18 are mirror images. Therefore, only the details of hinge mechanism 18 will be described, it being understood that this description is equally applicable to hinge number 16. Like reference characters have been employed to identify like parts in the two mechanisms.

Looking next to FIGURES 2, 4 and 5, hinge mechanism 18 comprises an elongated platelike support member having a vertically disposed main body portion 32 with an integral horizontal, outwardly extending flange 34 formed at the upper edge thereof. Support member 30 is mounted adjacent the under surface of an inwardly extending flange portion 36 of pan 17 by screws 38 which extend downwardly through holes 40 in pan flange 36 into threaded engagement with drilled and tapped holes 42 in support member flange 34.

Pivotally mounted on support member 30 adjacent its front end and adjacent the lower edge surface 46 of main body portion 32 by a pivot stud 48 is an upwardly extending inverted L-shaped cover supporting arm 50. Arm 50 has an elongated leg 51 journalled on pivot stud 48 and a forwardly extending leg 52 at the upper end of leg 51 pivotally attached by a pivot stud 54 to the outer side of a depending tab 56 at the outer end of an inwardly extending U-shaped bracket 58.

As is best shown in FIGURE 4, downwardly extending leg 60 of U-shaped bracket 58 is attached to the inwardly extending arm 62 of a bracket 64 by a screw 66 extending through a drilled hole 68 in bracket arm 62 into threaded engagement with a drilled and tapped hole 70 in U-shaped bracket leg 60 and by a forwardly bent tab 72 on U-shaped bracket leg 60 which extends into a drilled hole 74 in bracket arm 62 and prevents bracket 58 from rotating about screw 66.

A downwardly and rearwardly extending arm portion 76 of bracket 64 is attached to the inner side of the adjacent end wall 13 of ribbon spool cover 12 by spot welds 80. The lower rearward end of bracket portion 76 is joined by an integral inwardly bent arm portion 82 to an integral rearwardly extending portion 84.

Referring now to FIGURE 5, the rearwardly extending portion 84 of bracket 64 is slidably disposed adjacent the inner side of main body portion 32 of support member 30. A guide member 86 has an enlarged head 88 disposed adjacent the outer side of support main body portion 32 and a shank portion 90 extending through a slot 92 in main body portion 32 and a hole 94 in bracket portion 84 to which it is secured by riveting.

As is best shown in FIGURE 2, slot 92 has a main portion 98 extending longitudinally in support bracket main body portion 32, a portion 100 extending downwardly from the rear end of main portion 98, and an enlarged diameter portion 102 at the front end of main slot portion 98. The enlarged portion 102 is larger than head 88 of member 86 to permit interconnection of bracket 64 and members 30 and 86 as shown in FIGURE 5.

A tension spring 104 is connected between outwardly extending tabs 106, formed at the bottom of support bracket main body portion 32, and 108 integrally joined to the bottom of a forwardly extending, hook-shaped portion 110 integral with the bottom end of arm 50.

Ribs 112, 114 and 116 are stamped in support 30, arm 50, and in bracket 64 respectively to add structural strength and rigidity to these members.

Looking again to FIGURE 4, a torsion bar 118 extends between hinge mechanisms 16 and 18, through holes 120 in the upper ends of the arms 50, and is rigidly connected to these arms. Torsion bar 118 is effective to prevent torsional twisting of cover 12 as it is moved between open and closed positions by off center, manually applied forces.

To expose the type basket and ribbon spools, cover 12 is moved along a substantially arcuate path having an initial upward component and then primarily a horizontal component to the open position. This operation is most conveniently accomplished by grasping the conventional centrally located opening or recess in the top wall 15 of the cover 12 (not illustrated) and lifting slightly upward and forward. As is apparent from the arrangement illustrated in FIGURE 2, this provides a substantial leverage to overcome the spring toggle formed by spring tabs 106 and 108 and pivot stud 48. As the hinge mechanisms 16 and 18 move from the closed position of FIGURE 2 to the open position of FIGURE 3, arms 50 and, therefore, spring tabs 108 pivot counterclockwise about stud 48 and the upper ends of forwardly extending legs 52 of arms 50 pivot counterclockwise about pivot studs 54. When spring tabs 106 and 108 reach the point in their travel where they are aligned with pivot stud 48, spring 104 snaps over center and, during the remainder of the movement, urges the hinge mechanisms 16 and 18 (and, therefore, cover 12) toward the open positions. The forward movement of hinge mechanisms 16 and 18 is limited by contact of the forward edges of arms 50 with inward extending tabs 122 formed at the upper front ends 124 of the main body portions of support members 30.

As the hinge mechanisms 16 and 18 move from the closed position of FIGURE 2 to the open position of FIGURE 3, brackets 64 and guide pins 86 move simultaneously with arms 50. Guide pins 86 first travel upwardly at an oblique angle in slot portions 100 in support members 30. This movement, transmitted through brackets 64, raises cover 12 upwardly from pan 17. Then, as guide pins 86 move forward through horizontal slot portions 98, cover 12 moves forwardly in a substantially arcuate path to the open position of FIGURE 3. The forward limit of motion of cover 12 is established by the engagement of leg 51 with stop tab 122.

In the open position of cover 12, as viewed in FIGURE 3, legs 51 of arms 50 are positioned substantially perpendicular to the base of typewriter 10 and in a substantially vertical line with respect to the pivot studs 48 on which they are mounted. Legs 52 of arms 50 are positioned

substantially parallel to the inside upper surface of top wall 15 of cover 12. This arrangement provides substantial vertical strength and will prevent the hinge mechanisms 16 and 18 from being damaged in the event that the operator rests her arms on cover 12 while cleaning the type or changing the ribbon.

To move cover 12 from the open position of FIGURE 3 to the closed position of FIGURE 2, rearward pressure is applied at any point on the front edge of the cover. The arms 50 pivot rearwardly and, simultaneously, cause guide pins 86 to follow slots 92 rearwardly. As tabs 106 and 108 reach the point of their travel where they are aligned with pivot studs 48, springs 104 snap over center and, during the remainder of the movement of the hinge mechanisms 16 and 18, urge cover 12 toward the closed position.

As pins 86 enter the downward sloped portions 100 of slots 92, the spring toggle action provides a relatively quick action to move cover 12 to its normally closed position with its bottom edge 14 seated on the top surface of pan 17.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiment is therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather then by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.

What is claimed and desired to be secured by United States Letters Patent is:

1. In a typewriter having a base and a key actuated, ribbon equipped printing mechanism on said base:
   (a) a cover for said mechanism;
   (b) means for guiding said cover between closed and open positions comprising a pair of base supported hinge mechanisms, each including:
   (c) an elongated cover support member rigid with the typewriter base and having an elongated slot therein;
   (d) an elongated arm member rigidly attached to said cover and immovable relative to said cover;
   (e) a guide member rigidly attached to the lower end of said arm member and disposed for sliding movement within said slot as said cover is moved between closed and open positions; and
   (f) an upwardly extending cover supporting arm pivotally attached at its lower end to said support member and pivotally fixed at its upper end to said arm member so disposed relative to said elongated slot that, as said guide member moves in said slot, said upper pivotal attachment moves from a position rearward of said lower pivotal attachment to a position forward of said lower pivotal attachment.

2. The typewriter of claim 1, wherein said cover supporting arm has angularly extending, integral first and second portions, said cover supporting arm is pivotally attached to said support member at a point adjacent the intersection of said first and second portions, and a spring is connected between the end of said second portion and said guide member.

3. The typewriter of claim 2, wherein the components of said guiding means are so arranged that when said guide member is moved from a dead center position intermediate the ends of said slot toward either end thereof, said spring will bias said guide member in the direction of movement.

4. The typewriter of claim 1, wherein said slot has a first portion inclined relative to the top edge of the base and a second portion communicating therewith which is substantially longer than said first portion and is generally parallel to the top edge of said base.

5. The typewriter of claim 1, wherein there is a stop formed on said support member in the path of movement of said cover supporting arm to limit the travel of said cover supporting arm and the travel of the cover in the cover opening direction.

6. The typewriter of claim 1:
   (a) wherein said hinge mechanisms are at opposite sides of said cover; and
   (b) including a torsion bar extending between said hinge mechanisms to prevent twisting of said cover, the ends of said torsion bar being fixed to the upper ends of the cover supporting arms in said hinge mechanisms.

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