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(54) TYPEBAR SUPPORT

(71) We, SCM CORPORATION, a corporation of the State of New York, United States of America, of 299 Park Avenue, New York, New York 10017, United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed to be particularly described in and by the following statement:—

The present invention relates to typewriters or other apparatus utilizing a typewriter-like mechanism and more particularly to a device for absorbing the energy of a typebar after it has been used.

Rebounding typebars have always been a problem in the typewriter industry and the problem is more acute with electric typewriters which generally are operated at high speed. This problem is even more acute when a typebar mechanism which does not lock in the rest position is used. In other words, any typebar may freely rebound from its rest position. Therefore, a returning typebar may easily rebound into the flight path of another typebar. Unless the energy of a returning typebar is substantially dissipated the moment it strikes a typebar support for supporting the typebars in the rest position, the typebar is likely to rebound. If the typebar rebound is great, the typebar may collide with an adjacent typebar that is already in flight towards a printing point on a work sheet.

Collision of the typebars has been known to cause damage to the typebar parts and reduce the driving speed and impact force of the typebar. Variations in the impact force of individual typebars causes undesirable non-uniform type density and line of write.

If a typebar is in the repeat action mode or rapid typing is in process, and the typebar rebounds too high, it may not return to its rest position on the typebar support. If this occurs and a subsequent typing action begins, the driving force of the subsequent typing action is adversely affected. Consequently, the density of the printed character may be too light or too dark or the subsequent typebar may not engage the driving means properly and result in a non-print.

The present invention provides a typewriter having a frame, a typebar segment rigidly assembled to the frame, a plurality of typebars each having one end pivotally attached to the segment, and a yieldable support having a rest position for the free ends of the typebars, the yieldable support comprising:

arcuate means spaced from the frame for supporting the free end of the typebars;

arm means having one end fixed to said arcuate means and having its opposite end defining an enlarged aperture therethrough;

retention means for attaching the arm means to the frame, and comprising a reduced cross sectional portion and an enlarged cross sectional portion, said reduced portion extending through and beyond said aperture and into said frame with sufficient clearance between said reduced portion and said aperture to allow said arm means to rock relative to the frame in a direction along the length of said reduced portion and wherein said enlarged portion is secured to said reduced portion on the side of said aperture opposite said frame and,

biasing means for dissipating energy of an impacting typebar by the impacting typebar rocking said arm means relative to the frame and for urging said arm means toward the rest position of the free end of the typebars.

A preferred embodiment provides a typebar support that is rockably suspended on a frame to prevent typebar rebound by dissipating and absorbing the energy of

typebars returning to rest. The typebar support is an arcuately shaped member that is rockably suspended in relation to a fixed member. The typebars are pivotally attached to a segment fixed to the frame intermediate their ends. The typebar support is supported at each end by an arm that is rockably mounted to a frame. A resilient pad covers the receiving edge of the typebar support. The rockably suspended typebar support is spring biased upward against an abutment fixed to the segment. As the typebar returns to rest on the support, a portion of its kinetic energy is dissipated upon contact with the resilient pad. The remaining and major portion of the energy is dissipated and absorbed as the entire support rocks on the loosely supported arms.

In the above arrangement, the mounting of the typebar support and most of the yielding of the typebar support occur about one common point.

The mounting and the rocking of the typebar support about a common point allows for a less costly construction in that the portion of the typebar support on which the typebars rest does not require any complicated structure for yielding. Dissipating the energy of the returning typebars throughout the entire support structure including the support arms allows a more economical, efficient and a simplified construction to be used.

Features and advantages of the invention will become apparent from the following description of an embodiment thereof taken in conjunction with the accompanying drawings, in which:

Figure 1 is a perspective view of a typebar support;

Figure 2 is an end elevation of the typebar support with all typebars at rest on the typebar support;

Figure 3 is an end elevation of the typewith sufficient clearance to allow a rocking motion of the typebar support 10 on the frame 14. A common point of mounting and rocking is defined by the co-operation of the shoulder screws and the flanges 28 and 30.

Typebar support 10 is biased upwards by two springs 38. One end of each spring 38 is attached to an arm 24 or 26 and the other end attached to a corresponding anchorage 44 or 46.

The anchorages 44 and 46 are fixed to the segment 12 and include two laterally extending abutment arms 48 and 50, which provide an upper limit abutment for the bar support immediately after a typebar strikes the support; and

Figure 4 is an enlarged sectional end elevation showing a portion of the typebar support of Figures 2 and 3 rocked about its mounting.

Figure 1 shows a typebar support 10 and a typebar segment 12 that is rigidly mounted to a frame 14. Normally a full compliment of typebars are pivotally mounted on segment 12, but for purposes of clarity, only a few typebars 16 are shown.

Typebar support 10 includes an arcuate member 18 spaced from and parallel to the frame 14. The arcuate member 18 is of thin metal construction having an edge 20 oriented to receive and support typebars in their rest position. Edge 20 is covered by a pad 22 of resilient material. Two arms 24 and 26 extend from the ends of frame 14 to support the arcuate member 18 in spaced relationship to the segment 12. The ends of arms 24 and 26 that are attached to frame 14 terminate in lateral flanges 28 and 30 each of which is provided with an aperture 32 (Figure 4). The walls defining the apertures 32 co-operate with the head 34 of a shoulder screw, shank portion 36 of which extends through the aperture 32 arms 24 and 26 of the typebar support 10.

As a typing operation commences, a keylever (not shown) is depressed and through a linkage (not shown) a typebar 16 is placed in flight to travel to a typing station and then return to rest on the typebar support 10. When a typebar 16 is in-flight and returning to rest, it accumulates kinetic energy which must be dissipated and absorbed quickly and efficiently, otherwise the typebar may rebound into the flight path of the next typebar to be actuated and cause the typebars to collide.

When a typebar returns to rest on support 10, the energy of the initial impact of the typebar is partially absorbed by the resilient pad 22 covering the support edge 20. The absorption of the energy is a result of the immediate portion of the pad struck by the typebar yielding under the force of the impact. The remaining energy is dissipated in the springs 38 as the typebar support 10 is urged to rock about the shoulder screws which attach the arms 24, 26 to the frame 14, as shown in Figures 3 and 4. If a typebar 16 on the right side of centre of the segment 12 is actuated and returns to rest, the energy at impact on the support 10 will cause the right side of the support 10 to rock about the right-hand shoulder screw. Any excess energy will thereafter be dissipated through the remaining portion of the typebar support 10. If a typebar 16 on the left side of centre of the segment 12 is actuated and returns to rest, the energy at impact on support 10 will cause the left side of the support 10 to rock about the left-hand screw. Any excess energy will thereafter be dissipated through the remaining portion of the typebar sup-

port 10. If a typebar 16 in the centre area of segment 12 is actuated, and returns to rest, the energy at impact on typebar support 10 will cause the left and right sides of typebar support 10 to rock about both the shoulder screws.

Therefore, the absorption of the energy of the typebar 16 by resilient pad 20 and the dissipation of the excess energy by the rocking of typebar support 10 minimize any rebound of the typebars as they return to rest.

WHAT WE CLAIM IS:

1. A typewriter having a frame, a typebar segment rigidly assembled to the frame, a plurality of typebars each having one end pivotally attached to the segment, and a yieldable support having a rest position for the free ends of the typebars, the yieldable support comprising:

arcuate means spaced from the frame for supporting the free end of the typebars;

arm means having one end fixed to said arcuate means and having its opposite end defining an enlarged aperture therethrough;

retention means for attaching the arm means to the frame, and comprising a reduced cross sectional portion and an enlarged cross sectional portion, said reduced portion extending through and beyond said aperture and into said frame with sufficient clearance between said reduced portion and said aperture to allow said arm means to rock relative to the frame in a direction along the length of said reduced portion and wherein said enlarged portion is secured to said reduced portion on the side of said aperture opposite said frame; and

biasing means for dissipating energy of an impacting typebar by the impacting typebar rocking said arm means relative to the frame and for urging said arms means toward the rest position of the free end of the typebars.

2. A typewriter according to claim 1, wherein said arcuate means includes a resilient material along its typebar receiving edge for resiliently supporting the free end of the typebars.

3. A typewriter according to claim 1 or 2, further comprising abutment means on the frame engaged by said arm means for defining the rest position of the free end of the typebars.

4. A typewriter according to claim 1, 2 or 3 wherein said retention means is a screw having a shoulder extending through said aperture with sufficient clearance to allow said arm means to rock in the direction along the length of the shoulder.

5. A typewriter according to claim 1, wherein said biasing means is a spring.

6. A typewriter substantially as hereinbefore described with reference to the accompanying drawings.

A. A. THORNTON & CO.,
Chartered Patent Agents,
Northumberland House,
303/306 High Holborn,
London, WC1V 7LE.

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biasing means for dissipating energy of an impacting typebar by the impacting typebar rocking said arm means relative to the frame and for urging said arms means toward the rest position of the free end of the typebars.

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