United States Patent

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[33] **Germany**
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[54] **TYPE LEVER SUPPORT FOR TYPEWRITERS AND SIMILAR MACHINES**
10 Claims, 2 Drawing Figs.

[52] **U.S. Cl.** **197/42**
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[50] **Field of Search** 197/42

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ABSTRACT: Support for the type levers for typewriters, teletypewriters and the like, arranged to abate the noise and attenuate the recoil force of the type levers when returning from printing to rest positions. The support is in the form of a relatively thick tape made from a plastic material having shock absorbing properties but poor elastic properties. The tape is suspended in the form of a uniform arc by leaf springs, extending tangentially of the arc of the tape, and connected with the tape in laterally offset relation with respect to the body of the tape. Guide pins extending perpendicularly to the leaf springs suspend the tape from the leaf springs. The guide pins extend perpendicular to and outwardly of the springs and have weights movable along their outer ends between stops, to increase the attenuating properties of the tape. Stops spaced on opposite sides of the springs are provided to limit flexing of the springs and degrade the impact oscillation of the springs.

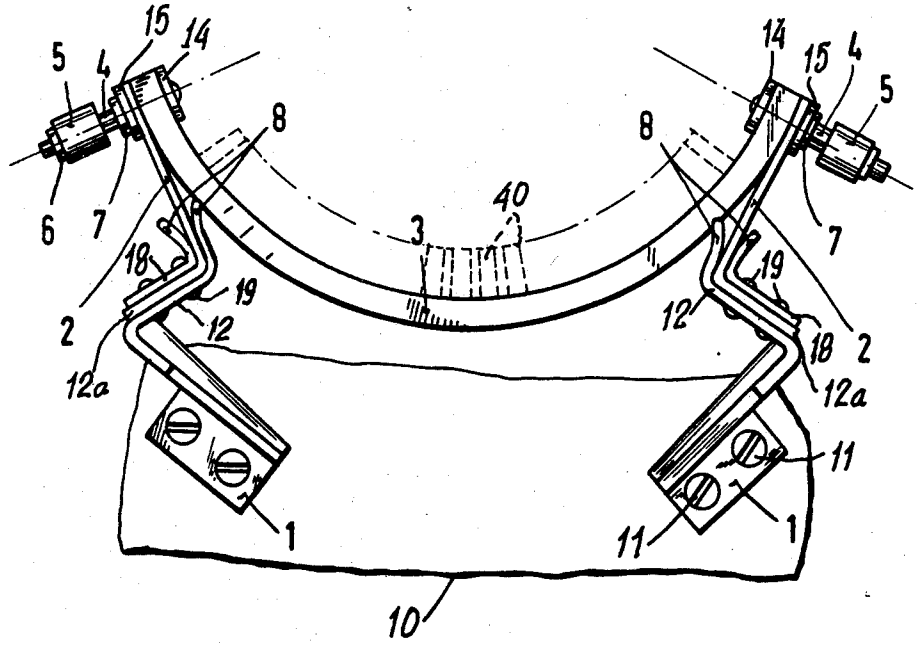


Fig. 1

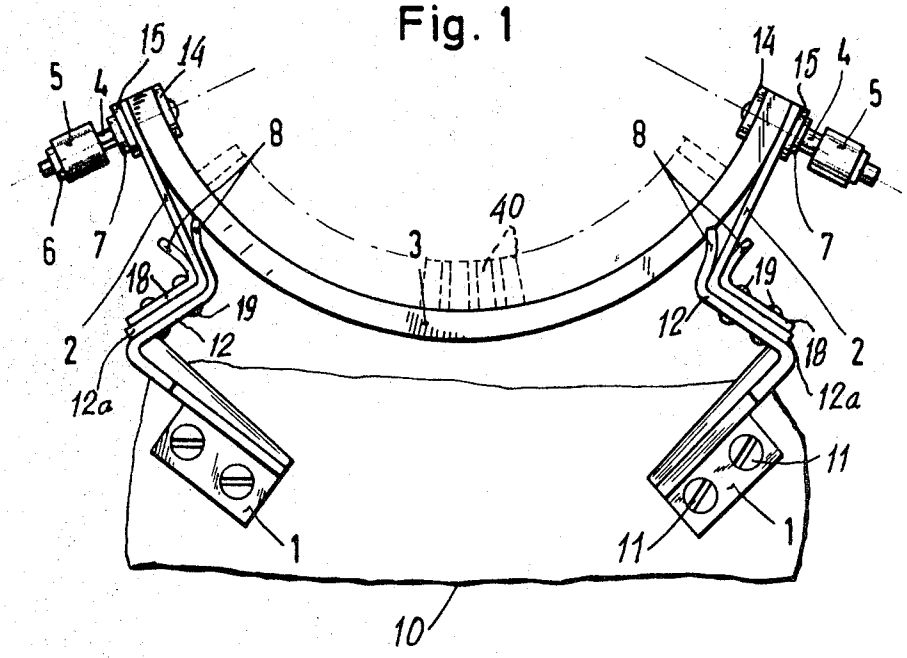
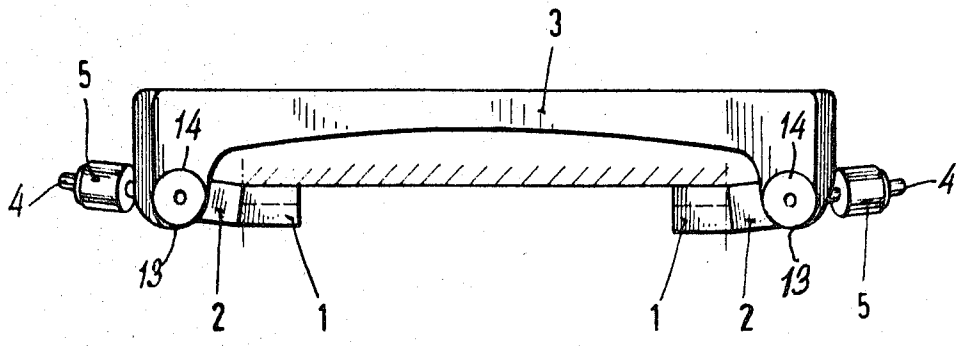


Fig. 2



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TYPE LEVER SUPPORT FOR TYPEWRITERS AND SIMILAR MACHINES

BACKGROUND OF THE INVENTION

Type lever supports have heretofore been rigidly connected to the type lever frame and in order to abate noise and attenuate the recoil force of the type levers when returning to their rest positions, have been provided with attenuating materials placed in the type lever supports, which are engaged by and support the type levers when in their rest positions.

Type lever supports have also been connected to the machine housing or frame by various spring arrangements and have comprised a rigid metal carrier and an elastic rest rigidly connected to the metal carrier. The carrier has been cushioned to the typewriter frame or housing by various cushioning supports or suspension means, but these supports or suspension means have been unduly expensive and complicated and have not been entirely satisfactory for average speeds of up to 25 characters per second.

SUMMARY OF THE INVENTION AND OBJECTS

According to the present invention, the foregoing deficiencies in type lever supports have been remedied by utilizing a flexible tape of elastic, shock absorbing material having poor elastic properties, as the support for the type levers when in their rest position and by suspending the tape in the form of a uniform arc, by leaf spring suspension members extending tangentially of the arc of curvature of the tape.

A principal object of the present invention, therefore, is to provide a simplified and improved form of type lever support, arranged with a view toward more efficiently attenuating the type levers of a typewriter and the like when returning to their rest positions.

Another object of the invention is to improve upon the type lever supports heretofore in use by utilizing a flexible tape of shock absorbing material having poor elastic properties as the type lever support and by suspending the tape from positions disposed above the rest positions of the type levers in the form of a uniform arc, by leaf springs extending tangentially of the arc of curvature of the tape.

A further and important object of the invention is to provide a type lever support, simple in design and efficiently attenuating the type levers at average speeds of up to 25 characters per second, by utilizing a shock absorbing tape of poor elastic material suspended from its ends in the form of uniform arc from positions above the rest positions of the type levers, and by enhancing the attenuating qualities of the tape by the suspension means therefor.

These and other objects of the invention will appear from time to time as the following specification proceeds and with reference to the accompanying drawings.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a fragmentary generally diagrammatic view in front elevation of a type lever support constructed in accordance with the principles of the present invention; and

FIG. 2 is a diagrammatic plan view of the type lever support shown in FIG. 1.

DESCRIPTION OF PREFERRED EMBODIMENT OF INVENTION

In the drawings, we have shown a fragment of a frame or housing 10 of a typewriter, or a teletypewriter or like apparatus and have shown angle brackets 1 secured to said housing in spaced relation with respect to each other as by machine screws 11. The angle brackets 1 form supports for leaf springs 2 extending generally tangentially of the arc of curvature of a type lever support 3 and forming a suspension means therefor. The type lever support 3 is shown as being relatively thick in proportion to its width and is in the form of a flexible tape made from a shock absorbing material of poor elastic qualities and forms a support for type levers 40 when in their rest positions.

The flexible tape 3 may be made from an organic synthetic plastic material having good shock absorbing qualities poor elasticity. One form of plastic material found to be satisfactory as an attenuating type lever support is a fluorelastomer known by the trade name of VITON. A type lever support constructed from such a plastic material and suspended in the form of a uniform arc as shown in the drawings, has been found to brake the type levers so strongly both in the center of the type lever support and at the lateral ends of the support, that an immediate operation of the type lever last operated or of an adjacent type lever can be attained at a speed of up to 25 characters per second.

The dropping back energy of a type lever returning to its resting position at the center of the type lever support is transmitted primarily to the flexible tape 3, which is deflected by the dropping back of the type lever into a resting position. This deflection as the type lever returns into a resting position degrades the kinetic energy by the frictional forces produced between the type levers and support. Moreover, the type levers located at the center of the type lever support are attenuated as they return to their resting positions primarily by the elasticity of the flexible tape 3, while the type levers located outwardly of the center of the type lever support, upon return to their positions of rest, engage the tape 3 in the direction of the curvature radius of the tape and tend to place a twisting action on the leaf springs suspending the tape.

The bracket members 1 are spaced beneath the tape 3 and extend angularly upwardly and outwardly in the general direction of the arc of the tape and have angularly inturned portions 12 abutted by right angled feet 12*a* of the leaf springs 2 and position the leaf springs to extend angularly upwardly tangentially of the arc of the tape 3, to rigidly position the tape in the area of its suspension points in the direction of the curvature radii, elastically and tangentially to the arc of curvature of the tape.

As shown in FIG. 2, the elastic tape 3 is narrower at its center than at its ends and uniformly diverges in opposite direction from its center to its ends to laterally projecting end portions 13, abutting the outer ends of the leaf springs 2 and forming a suspension means for the tape 3 in laterally spaced relation with respect to said leaf springs. Guide pins 4 extend through the lateral projection 13 perpendicular to the planes of the leaf springs 2 and through the leaf springs to secure the tape 3 to said leaf pins. As shown in FIG. 1, the guide springs 4 extend through washers 14 abutting the outer surfaces of the laterally projecting end portions 13. Other washers 15 abut the outer surfaces of the leaf springs 2. The washers 14 and 15 may be suitably secured to the guide pins 4 to retain said guide pins in position on the leaf springs and to secure the laterally projecting end portions 13 of the tape 3 to said leaf spring to be suspended therefrom in the form of a uniform arc. The washers 14 and 15 may be suitably secured to the guide pins 4 in any well known manner.

The impact of the type levers 40 on the tape 3, when returning to their rest positions, tends to twist the leaf springs 2 and thereby increase the relative movement of the type lever support 3 in relation to the type levers and enhance the attenuating effect of the type lever support.

Means are provided to limit the flexing of the leaf springs 2, which are shown in FIG. 1 as being stops 8, diverging from opposite sides of the leaf springs 2 adjacent the feet 12*a* thereof. One stop 8 is shown as extending along the inside of the leaf spring and as being formed from the angularly inturned portion 12 of the bracket 1 and as turning at generally right angles to said right angled portion 12 and diverging from the leaf spring towards the tape 3, but as being spaced laterally of said tape so as not to impede the flexing of said tape. The other stop 8 has a foot portion 18 extending along the foot portion 12 of the associated leaf spring 2 and turns at right angles with respect to said foot portion upwardly along the leaf spring and diverges therefrom adjacent the base of said leaf spring. Rivets 19 are shown as securing the stops and leaf springs to the inturned portions 12 of the brackets 1.

The guide pins 4 extend perpendicular to the leaf springs 2 and have displaceable weights 5 slidably mounted thereon. Stops 6 and 7 limit movement of the weights 5 along the pins 4. The weights 5 in cooperation with the stops 8 serve to attenuate the impact force transmitted to the type lever support at its ends and to degrade the impact oscillations of the leaf springs 2.

With the structure just described, the type levers located at the center of the support and returning to their resting positions charge the elasticity of the flexible tape and deform the tape downwardly, which subsequently returns to its resting position. The tape further executes a movement relative to the type levers striking the tape laterally of the points of connection of the leaf springs 2, with the result that the friction between the flexible tape and the type levers degrade the kinetic energy of the type levers as returning to their resting positions.

The leaf springs 2 further twist about their longitudinal axes as the type levers engage the tape and further contribute to the attenuating properties of the tape as the type levers return to their resting positions. This twisting occurs principally due to the fact that the points of connection of the tape to the leaf springs are spaced laterally of the body of the tape which transmits a force to the springs to one side thereof and thereby causes a twisting movement of the springs to take place as the type levers return to their resting positions. This twisting movement in addition to the deflection of the tape and the friction created as the type levers strike the tape, further lends to the degrading of the kinetic energy of the type levers.

It should further be understood that the attenuation properties of the type lever support can be adjusted to the operating speed and mass of the type levers by varying the thickness of the flexible tape in accordance with the increased or decreased mass of the type levers.

Moreover, where there is sufficient vertical and lateral space the supports for the ends of the tape may be rigid. In such cases the tape is supported a greater distance above the range of rest of the type levers and extended farther laterally of the supports than is shown in the present disclosure. while we have herein shown and described one form in which the invention may be embodied, it may readily be understood that various variations and modifications in the invention may be attained without departing from the spirit and scope of the novel concepts thereof.

We claim:

1. A type lever support for use with a typewriter and the like having a frame and a pair of spaced support members carried by said frame, said type lever support comprising:

self-supporting means disposed in a curved configuration and supported adjacent each of its ends by spaced support members, and

means attached to said self-supporting means at each of its ends for suspending said self-supporting means from the spaced support members in a form of a uniform arc, said means for suspending said self-supporting means providing a rigid support for said ends in a direction tangential to said uniform arc at its point of attachment to said spaced support members while enabling movement of said ends along a radial direction of the arc,

said self-supporting means consisting of a self-support tape composed of a synthetic organic plastic material.

2. A type lever support in accordance with claim 1 wherein the support members for the self-supporting means are in the form of leaf springs extending tangentially of the arc of said self-supporting means.

3. A type lever support in accordance with claim 2 wherein the self-supporting means is composed of a fluorelastomer.

4. A type lever support in accordance with claim 2 wherein the points of connection of the self-supporting means to the spaced support members are in portions offset from the body of said self-supporting means and are spaced above the rest areas of the type levers.

5. A type lever support in accordance with claim 4 wherein guide pins extend perpendicularly to the plane of the leaf springs and form suspension means for the self-supporting means, and wherein displaceable weights are slidably mounted on said guide pins on the outsides of the leaf spring to increase the attenuation properties of the self-supporting means and degrade the impact oscillation of the leaf springs.

6. A type lever support in accordance with claim 5 wherein stops are mounted on said guide pins to limit movement of said weights along said pins.

7. A type lever support in accordance with claim 4 wherein spring stops extend along lower end portions of said leaf spring and flare outwardly of opposite sides thereof to degrade the impact oscillations of said springs.

8. A type lever support in accordance with claim 3 wherein guide pins extend perpendicular to the planes of said leaf springs and form a means for mounting the self-supporting means thereon in offset relation with respect to the body of said self-supporting means to effect twisting of said leaf spring inwardly towards the type lever support by engagement of the type levers with the self-supporting means when returning to their resting positions, and thereby causing a deflective movement between said self-supporting means and the type levers and creating a frictional force degrading the kinetic energy of the type levers.

9. A type lever support in accordance with claim 2 wherein the self-supporting means in plan view is narrower at its center than at its ends and uniformly diverges from its center toward its ends and has widened projecting portions extending from one side of said self-supporting means at each of the ends thereof,

wherein guide pins extend through said projecting portions and leaf springs perpendicular to the planes of said leaf springs and suspend said self-supporting means from said leaf springs, and

wherein said leaf springs have lower end portions mounted on said frame and stops extending upwardly therealong from said lower end portions and diverging from said springs in opposite directions, to degrade the impact oscillation of said springs.

10. A type lever support in accordance with claim 9 wherein displaceable weights are slidably mounted on said guide pins within predetermined limits to attenuate the impact transmitted to the type lever support and to degrade the impact oscillation of the leaf springs.