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S. A. OKCUOGLU ETAL

3,133,620

WEAR COMPENSATOR WITH CLAMPING DEVICE

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FIG. 1

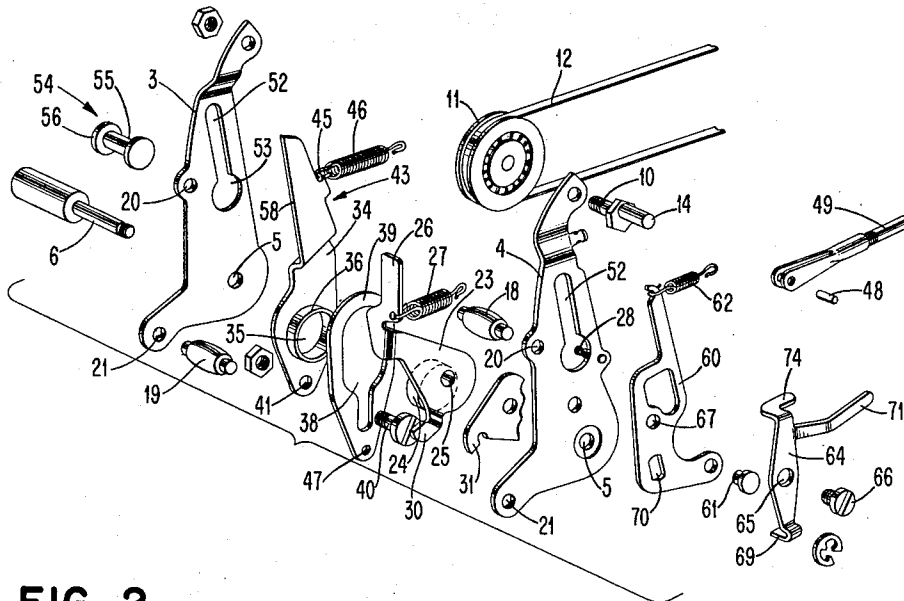


FIG. 2

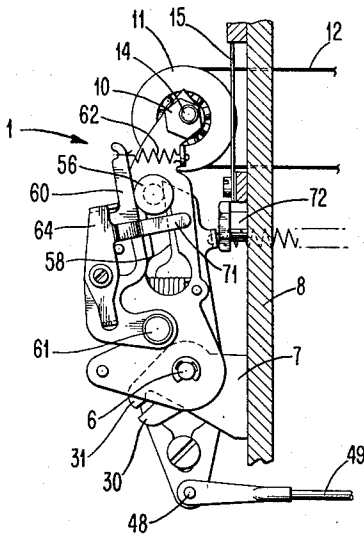
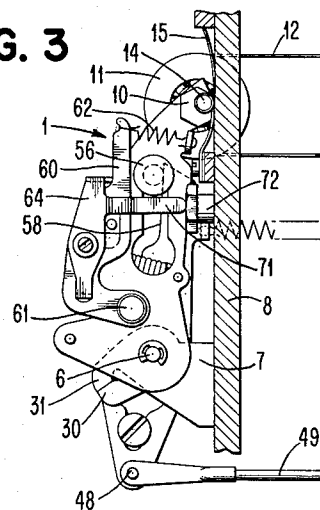


FIG. 3



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WEAR COMPENSATOR WITH CLAMPING DEVICE
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2 Claims. (Cl. 197-16)

This invention is directed to devices for compensating any wear taking place in parts which operate to position a type head in different printing positions, and more particularly to means for clamping such a device against an inadvertent compensating action.

There is shown in U.S. Patent 2,989,166, issued to G. A. Walker et al., a device which operates automatically to compensate for any wear taking place in a means which drives a print head of a typewriter to different printing positions. This device comprises a pair of arms carrying a pulley about which a tape passes. One end of the tape is connected to a relatively stationary point and the other end is connected to a pulley fixed on a spindle carrying the print head. A spring tends to rotate the latter pulley for maintaining a tension on the tape. Formed in the arms are vertical slots carrying a roller which is held against a lever by the action of the tape on the arms. During a compensating action, the lever is caused to move slightly relative to the arms and permit the roller to move to a lower position in the slots. If the tension on the tape is inadvertently removed at any time, the arms may move relative to the lever and permit the roller to drop, thereby causing the setting of the device to become inaccurate. A removal of the tension on the tape may take place in various ways, for instance a turning of the print head manually against the action of the spring which tends to rotate the pulley on the spindle will result in a loss of tension on the tape. Such turning of the print head may occur when it is being either mounted on or removed from the spindle by the operator.

By providing a clamping member which is held by a spring against the roller at all times except when the compensating device is in a position to make an error correction, an inadvertent movement of the roller in the slots is prevented.

An object of this invention is to provide an improved device for compensating wear in parts of an operating mechanism.

Another object is to provide a wear compensating device having means for clamping it against any inadvertent compensating action.

The foregoing and other objects, features and advantages of the invention will be apparent from the following more particular description of a preferred embodiment of the invention, as illustrated in the accompanying drawings.

In the drawings:

FIG. 1 is an exploded perspective view of the improved compensating device.

FIG. 2 is a side elevational view of the compensating device in its normal position.

FIG. 3 is a view like FIG. 2 but showing the device in a position in which compensation may be made for wear in operating parts.

Referring to the drawings, it will be noted that there is shown an improved wear compensating device, generally designated 1, which is similar to that shown and described in the above mentioned patent to Walker et al. This device comprises a pair of arms 3 and 4 having openings 5 through which a pivot pin 6 extends. The ends of the pivot pin are supported by a bracket 7 attached to a side plate 8 of a typewriter housing. The upper ends of the arms are connected by a bolt 10 on which a

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pulley 11 is rotatably mounted. Extending about the pulley is a tape 12 which may be operatively connected to a print head (not shown) in the same manner as that described in the Walker et al. patent. A tension is maintained continuously on the tape, tending to swing the arms in a clockwise direction about the pin 6.

Extending from one end of the bolt 10 is a projecting portion 14 which engages a flexible member 15 just before the arms are moved to an extreme position in a clockwise direction. Continued movement of the arms causes the member 15 to deflect until it engages the side plate 8, as shown in FIG. 3, and limits the movement of the arms 3 and 4. The portion 14 is located eccentrically with respect to the bolt 10 in order to control the time of contact between the portion 14 and the member 15 by changing the angular position of the bolt. Arms 3 and 4 are held in the proper spaced relationship on the pin 6 by spacers 18 and 19 having reduced ends which extend through openings 20 and 21, respectively.

Arranged between the arms 3 and 4 is a member 23 having an eccentric hub portion 24 which contains an opening 25 through which the pin 6 extends. Formed on the member 23 is an arm 26 which is normally held by a spring 27 in engagement with the spacer 18. Spring 27 is connected at its ends to the arm 26 and to a stud 28 carried by the arm 4. Another arm 30 on the member 23 is arranged to engage a projection 31 on the bracket 7 at approximately the same time the portion 14 engages the flexible member 15 during a clockwise swinging of the arms 3 and 4. When this engagement takes place, the member 23 is held against further movement in a clockwise direction.

Located between the arms 3 and 4 is a member 34 having an opening 35 which receives the hub portion 24 on the member 23. Surrounding the opening 35 is a sleeve portion 36 extending through a slot 38 in a member 39 with a sliding fit. The slot 38 has a lower portion of reduced width for receiving a bolt 40 which extends through an opening 41 in the member 34. Bolt 40 connects the members 34 and 39 together for operation as a single lever, generally designated 43. When the bolt 40 is loosened, the member 39 may be moved radially of the opening for varying the length of the lower lever arm. Extending from the member 34 is a flange 45 which is connected by a spring 46 to a stationary point, not shown, for urging the lever 43 in a clockwise direction. At the lower end of the member 39 is an opening 47 receiving a pin 48 (FIG. 2) to which an operating link 49 is connected.

Formed in each of the arms 3 and 4 is a vertical slot 52 communicating at its lower end with a larger opening 53. A roller 54 operates within the slot 52 as a stop for determining the position of the arms 3 and 4 relative to the lever 43. This roller comprises a cylindrical portion 55 which fits loosely within the slots 52, and integral head portions 56 which pass through the openings 53 but act on the outer surfaces of the arms 3 and 4 for holding the roller in place when its portion 55 is moved into the slot 52. Formed on the member 34 adjacent the slot 52 is a surface 58 which is inclined relative to the sides of the slot. As shown in FIG. 2, the surface 58 is so inclined that its lower end lies nearer the center line of the slot 52 than does its upper end. Some point on the surface 58 always engages the portion 55 on the roller 54. A movement of the lever 43 in a clockwise direction relative to the arms 3 and 4 results in a dropping of the roller within the slots 52 for holding the lever 43 in a new position relative to the arms.

As described in the Walker et al. patent, the link 49 is moved longitudinally different distances for swinging the arms 3 and 4 to actuate the tape 12 for positioning a print head. The mechanism so far described for accomplish-

ing this is substantially the same as that of the patent. Assuming that the link 49 is moved to the left, the lever 43 swings in a clockwise direction under the action of the link and the spring 45. Any play resulting from wear between the operating parts is taken up by the action of the spring 46 on the lever. As the lever 43 swings in a clockwise direction, the arms 3 and 4 follow it due to the tension on the tape 12. The roller 54 determines the positions of the arms and the lever 43 relative to each other during this time. When the compensating device is initially adjusted, the roller is firmly clamped between the arms 3, 4 and the lever 43 while it is located near the upper end of the slots 52. A movement of the link 49 to its extreme left position will result in a swinging of the lever 43 just far enough to maintain the roller 54 clamped against the arms when the latter have been stopped by engagement of the flexible member 15 with the plate 8, as shown in FIG. 3. Any wear between the parts operating the lever 43 will permit the latter to swing further so that the roller drops slightly in the slots 52 after the arms have been stopped. The roller 54 then holds the arms and the lever 43 in new positions relative to each other. The roller remains clamped between the lever and the arms until further wear takes place and permits the lever to swing further to the right after the arms have been stopped in their extreme positions to the right.

It was mentioned above that the member 23 is held by a spring 27 against a spacer 18 for the arms 3 and 4 so it moves with the latter until an arm 30 on the member engages a projection 31 on the bracket 7. As the member 23 swings with the arms, the lever 43 as well as the arms swing about the axis of the pin 6. After the member 23 is stopped by the projection 31, the arms continue to swing about the pin axis but the lever 43 swings about the axis of the hub portion 24. The lower arm of the lever 43 is now shorter than it was while the upper arm of this lever is longer. This is necessary since the upper end of the lever must move the same distance as the arms 3 and 4 while the lower end of the lever moves a shorter distance due to a contraction of the system with a reduction of the load resulting from engagement of the arms with the spring member 15.

If the compensating device included nothing more than the mechanism described above, then a removal of the tension on the tape 12 while the device was in the position shown in FIG. 2 would result in a swinging of the arms 3 and 4 in a counterclockwise direction relative to the lever 43, permitting the roller 54 to drop in the slots 52 and produce an incorrect setting of the device. To prevent this from happening, there is provided a clamping member 60 which is pivotally mounted on the arm 4 by a stud 61. The clamping member 60 is urged by a spring 62 into engagement with one of the head portions 56 on the roller 54 for clamping the latter against movement in the slots 52. It is desired that this clamping action be maintained at all times except when the compensating device may operate to compensate for wear. Since compensation for wear may take place only when the device is in the position of FIG. 3, means are pro-

vided for disengaging the clamping member 60 from the head portion 56 of the roller during this time. Such means comprises a member 64 having an opening 65 through which a screw 66 passes for engagement with a threaded opening 67 in the clamping member 60. The opening 65 is large enough to permit some adjustment of the member 64 relative to the screw before it is clamped in place. An inwardly bent portion 69 on the lower end of the member 64 is received in a slot 70 in the clamping member 60 for preventing a turning of the member 64 on the screw. Projecting from the member 64 is a finger 71 which moves into engagement with the head of a screw 72 on the plate 8 just before the device reaches the position shown in FIG. 3. This causes the clamping member 60 to be disengaged from the roller 54 so it is free to move downwardly if the lever 43 is also released from the roller due to wear. The member 64 is provided with another finger 74 which extends along the inner side of the arm 4 for guiding the clamping member 60 to move in a plane including the head portion 56 of the roller 54. As soon as the compensating device is swung away from the plate 8, the clamping member 60 is moved by the spring 62 into engagement with the roller for clamping it in the position assumed during the printing operation.

While there have been shown and described the fundamental novel features of the invention as applied to a preferred embodiment, it will be understood that it may be modified and embodied in various other forms without departing from the spirit of the invention. It is the intention to be limited only as indicated by the scope of the following claims.

What is claimed is:

1. In a wear compensating device having a roller which is normally clamped between at least one arm and a lever defining a pair of members as said pair of members move in a given plane and which changes its position under the force of gravity on movement of one of said pair of members relative to the other to effect a holding of said pair of members in new relative positions, the combination of means for normally clamping said roller against a change in position, said clamping means comprising a clamping member pivotally mounted upon one of said pair of members, means for yieldingly holding said clamping member in engagement with said roller, and means for disengaging said clamping member from said roller at a predetermined point in the movement of said pair of members to permit said roller to change its position if it is not then clamped between said pair of members.

2. The mechanism of claim 1 in which said disengaging means comprises a stationary abutment, and a finger movable with said clamping member and engageable with said abutment upon movement of said pair of members to said predetermined point.

References Cited in the file of this patent

UNITED STATES PATENTS

2,989,166 Walker et al. _____ June 20, 1961