

**(11) 3,592,068**

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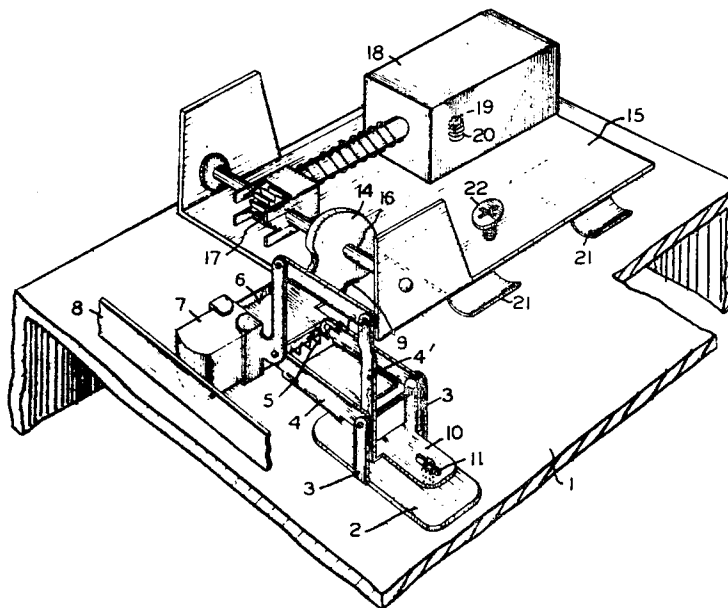
**[54] DEVICE FOR ADJUSTING THE HEAD IN TAPE  
RECORDER  
3 Claims, 3 Drawing Figs.**

**[52] U.S. Cl.**..... 74/89,  
179/100.2, 274/4

**[51] Int. Cl.**..... **F16h 21/02**

**[50] Field of Search**..... 74/89, 96,  
55, 112, 116, 567; 274/4 A, 43; 179/100.2 CA,  
100.2

**ABSTRACT:** A tape recorder head adjuster includes a mounting plate fixed to a frame. The mounting plate has a parallelogram link member supported by a pin on the mounting plate. The free end of the member has a head mounting plate having at one end the head. At the other end of the head mounting plate is contacted by a cam mounted on a rotatable shaft. A spring operates to bias the member and the head normally up. When the cam is rotated, the head is forced down against the force of the spring.



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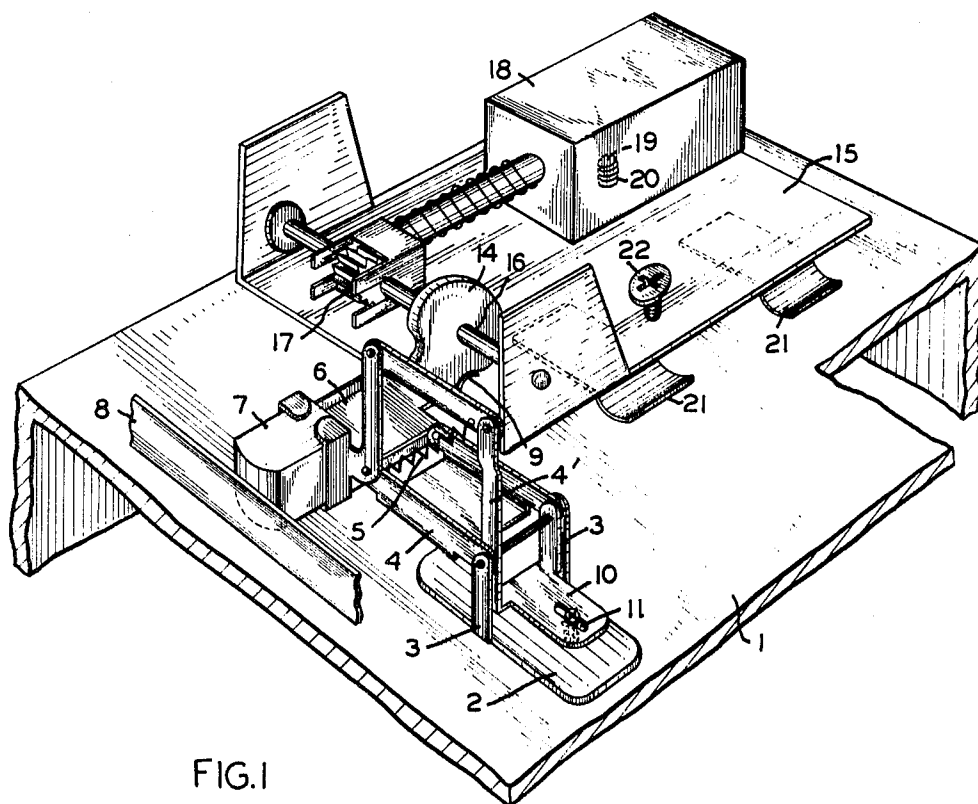


FIG. 1

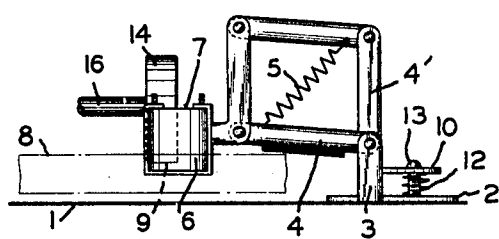


FIG. 2a

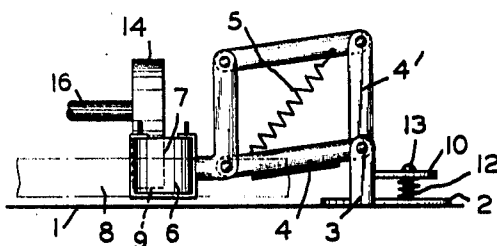


FIG. 2b

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# DEVICE FOR ADJUSTING THE HEAD IN TAPE RECORDER

## BACKGROUND OF THE INVENTION

The present invention relates to a device for adjusting the head in a tape recorder. The objects of the present invention are to provide a head-adjusting device by which the head can be retained in a horizontal position even on a base always subjected to vibration as in the case of a stereo on a motor vehicle, such as a stereo carrying a four-track or eight-track endless tape, and by which the head can be moved in a vertical direction accurately and reliably with respect to the desired track on the tape and to effect such adjustment while eliminating the possibility of making overlapping reproductions of two tracks.

Other objects and features of the invention will be made clear by the following description taken together with the accompanying drawings.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view showing an embodiment of a device for adjusting the head in a tape recorder in accordance with the present invention; and

FIG. 2 is a schematic view illustrating the device of the present invention, (a) showing the head located at an elevated position (b) showing the head located at a lowered position.

The structure of the device of the present invention will now be described with reference to the drawings in which a preferred embodiment is shown. Designated at 1 is a frame and at 2 a mounting plate fixed to the frame 1 and carrying brackets 3. A parallelogram link member 4 with constituent side links pivotally connected at respective corners thereof is pivotally mounted on the brackets 3 on the mounting plate 2, one vertical side link 4' thereof being fixed in the vertical direction. Designated at 5 is a spring provided across the link member 4 and having one end thereof attached to a portion proximate to the upper end of the fixed vertical link 4' and the other end thereof to a free end of the lower side link, the upper and lower sides thereby being urged into upward pivotal movement at all times. A head mounting plate 6 is secured to the free end of the vertical side of the parallelogram link member 4 and carries at one end thereof a head 7 so that the head may be in contact with the inner surface of a tape 8 and at the other end thereof a cam engaging portion 9 in the shape of a projection. An adjusting plate 10 for adjusting the fixed position of the vertical side of the link member 4 is formed integrally with the vertical side link 4' supported on the brackets 3 and is provided at its end with a slot 11 carrying an adjusting screw 12 disposed between the slot and the mounting plate 2, the arrangement being such that the adjusting screw when rotated makes fine adjustment by pivoting the vertical side link 4' around the brackets. A cam plate 14 is mounted on a shaft 16 supported on a baseplate 15 so as to always be in contact with the cam-engaging portion 9 of the head-mounting plate 6. Fixedly mounted on the shaft 16 is a gear 17 which is rotated by a drive rod adapted to be driven when a solenoid 18 is energized. Due to the rotational displacement of the cam plate 14 effected by the above rotation, the head-mounting plate 6 is moved upward or downward, whereby the head 7 is so controlled as to be automatically adjusted to the position of a desired track of the tape 8. Designated at 19 is a guide pin projecting from the under surface of the baseplate 15 and providing a spring 20 thereon to thereby support the baseplate 15 resiliently on the frame 1. Secured to an edge portion of the baseplate 15 are plate springs 21 which serve to support the baseplate 15 resiliently on the frame 1 together with the spring 20 against vibration exerted thereon externally. An adjusting screw 22 for adjusting the position of the baseplate 15 is mounted at the center

portion of the baseplate 15.

Although an automatic position-selecting system in which the shaft 16 is driven upon the energization of the solenoid 18 is employed in the above embodiment and drawings as a mechanism for controlling the rotational position of the cam plate 14, the mechanism is not limited to this system, but instead of the automatic system it is possible, for instance, to rotate the shaft 16 manually in making the selection.

The operation of the device in accordance with the present invention will now be described. When the solenoid 18 employed in the foregoing automatic position-selecting system is energized, the shaft 16 is driven through the gear 17 to rotate the cam plate 14, which in turn presses on the cam-engaging portion 9 of the head-mounting plate 6 and exerts thereon a stress to lower the head 7. Although the parallelogram link member 4 supporting the head 7 is so urged that the upper and lower sides thereof are always pivotally moved upward by the pulling force of the spring 5, the link member is pivotally pushed downward about the pivoted portion of the brackets 3 of the mounting plate 2 against the force of the spring (see FIG. 2b). Thus, the position of the head 7 fixed to the head-mounting plate 6 can be adjusted. Since the vertical side link 4' of the parallelogram link member 4 is supported on the bracket 3 and is fixed in the vertical direction by the adjusting spring 13, the other vertical side in facing relationship therewith, during this operation, is also pivotally moved upward or downward while being retained in the vertical position, with the result that it is moved and adjusted always in the vertical direction with respect to the line along which the tape 8 is advanced.

The head-adjusting device in a tape recorder of the present invention has the structure described above. Accordingly, the head 7 can be adjusted in the vertical direction to the desired track on the tape 8 with accuracy and reliability simply by turning the cam plate 14. In addition, since vibration is absorbed by the parallelogram link member 4 including the spring 5 and by the baseplate supported on the spring 20 and plate spring 21, the head 7 can be retained at the desired position even when placed on a base which is always subjected to vibration as in the case of a stereo in a motor vehicle. The head-adjusting device is thus free from the possibility of making overlapping reproductions.

Although a single embodiment of the invention has been described in detail, such description is intended to be illustrative only, and not restrictive, since many details of the construction of the invention may be altered or modified without departing from the spirit or scope of the invention.

What I claim is:

1. A device for adjusting the head in a tape recorder comprising a frame, a mounting plate fixed to said frame and having brackets thereon, a parallelogram link member having the respective links pivotally connected at the corners thereon, one of said corners of said member being formed of a vertical link and the lower link being supported on a pin at said brackets, said vertical link having an integral adjusting plate fixed to said mounting plate thereby fixing the position of said vertical link, means to urge the upper and lower links of said member to pivot upwardly around said vertical link, a head-mounting plate disposed at the free end of said member and adapted to hold a head at one end thereof in contact with a tape, a cam plate mounted on a shaft and adapted to contact the other end of said head-mounting plate, and means to rotate said shaft and said cam plate, whereby said head is lowered in opposition to said urging means to contact various tracks of said tape.

2. A device as claimed in claim 1, wherein said cam plate and said shaft are mounted on a baseplate, and further comprising means for resiliently supporting said baseplate.

3. A device as claimed in claim 2, wherein said means for resiliently supporting said baseplate comprises a spring and a plate spring positioned between said baseplate and said frame.