Nov. 27, 1951 J. F. DALTON 2,576,447

HEAD TELEPHONE SET SUPPORTS

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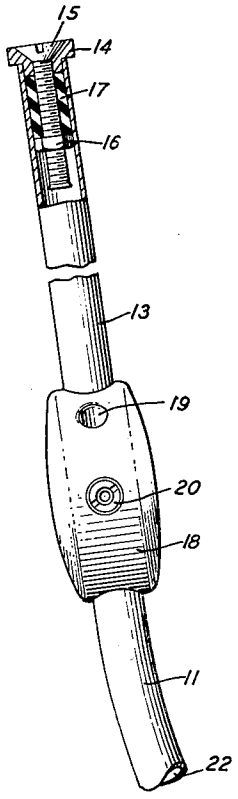
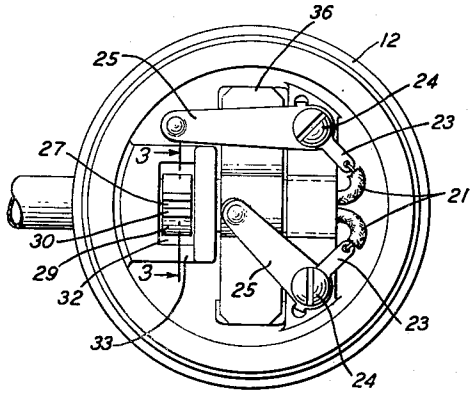


FIG. 1

FIG. 2



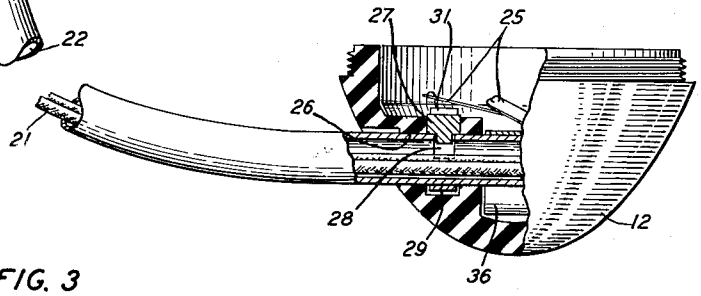
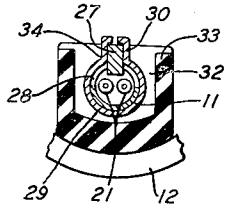


FIG. 3



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HEAD TELEPHONE SET SUPPORTS

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3 Claims. (Cl. 179—152)

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This invention relates to telephone supports and, more particularly, to rotatable supports for transmitter or receiver housings.

With the advent of telephone sets, such as headsets, including small transmitter and receiver housings which are adjustable to the user by being mounted for a limited rotation on their supports, it has been found necessary, where rotation stops are provided within the housing, to restrict the arc of rotation and to employ particularly hard materials in the housing. Hard materials have been used in order to avoid cutting the restricting edges of the housing by the projecting stops on the turning parts. These restrictions on design have been necessary since satisfactory strength requires a certain minimum wall thickness and size restrictions require the support member to be near the outer wall, the apparatus taking up the remainder of the space within the housing. Therefore, the stops within the housing have been so positioned as to limit the arc between them to substantially less than 180 degrees. Since the moving projection on the support has a thickness the arc of rotation is usually considerably less than the arc between the two housing stops if the working face of the moving projection rests on the stop in the housing. On the other hand, if the working face of the shaft projection engages a wall of the housing, the arc can be increased but excessive wear occurs at the wall unless extremely hard materials are employed in the housing. Hard materials are usually brittle and have a low impact strength; thus, although most portions of a telephone headset, for example, can be made of soft, high impact strength material such as cellulose propionate, the housings which are arranged for limited rotation on their supports and have internal stops must be of a harder material, for example, the more brittle methal methalcrylate. The result of such requirements has been that housings having the requisite degree of adjustability and resistance to cutting are subject to an inordinately high rate of breakage.

One object of this invention is to improve rotatable supports for telephone unit housings. More specific objects of the invention are to reduce the initial and maintenance cost of rotatably supported instrument housings in telephone headsets, increase their arc of adjustment, and enable a softer housing material to be employed in their construction.

One feature of this invention resides in mounting a housing of soft material having a high impact strength on a shaft having a projection in

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the interior of the housing to limit the degree of rotation, such projection cooperating with shoulders within the housing so that the working faces of the projection engage the top of the shoulders to avoid cutting of the housing material. The reduction in the arc of adjustment which ordinarily would result from such construction is avoided by journaling the projection on the shaft for limited relative rotation. This is done by providing a detent on the inner surface of the projection and a cooperating slot in the shaft so that the detent rides in the slot and permits rotation of the projection on the shaft substantially through the arc of the slot.

Another feature resides in constructing the projection of strip material in the form of a spring clip encircling the supporting shaft to form a collar having a portion which protrudes on one side to provide a working surface which engages shoulders in the housing. The detent or projection rotation limiter is formed of a flat piece having a T-shaped section which is fitted into the collar projection with its plane parallel to the axis of the rod so that the upper portion of the T is contained in the projection and the lower portion or shaft extends into a slot in the rod. This construction provides an economic, reliable stop.

The above-noted and other objects and features of this invention will be more fully appreciated from the following detailed description when read in conjunction with the drawings, in which:

Fig. 1 represents a transmitter housing and transmitter arm for an operator's headset with portions broken away to more clearly illustrate the details of its construction;

Fig. 2 is a plan view of the transmitter housing and a portion of the transmitter arm as disclosed in Fig. 1; and

Fig. 3 is a sectioned view taken along the line 3—3 of Fig. 2 showing in detail the construction of the rotation-limiting stop constructed in accordance with this invention.

Referring now to the drawing, Fig. 1 shows a transmitter arm 11 formed of tubing supporting on one end a transmitter casing 12. This arm is arranged to be supported from a headband and receiver housing combination (not shown) by means of a journal on the receiver casing (not shown) arranged to receive the straight section 13 of the arm 11. The arm is held in the receiver housing journal by friction and is free to slide along its axis and to rotate around its axis to provide maximum adjustment.

The straight end 13 of arm 11 is terminated

with a cap 14 serving as a means of limiting the movement of the arm in its journal to prevent it being slipped completely therefrom. This cap is held in position by a screw 15 and nut 16 which when tightened draw a bushing 17 of rubber or other resilient material positioned coaxially on the screw into a more compact body along its axis while expanding it outwardly from its axis to frictionally engage the inner wall of the transmitter arm tubing. The other limit of travel of the arm is fixed by the terminal block 18 secured intermediate the ends of the arm.

The terminal block 18 is provided with jacks 19 suitable for the reception of plugs (not shown) associated with the circuit of the set. These plugs are secured in the jack by set screws 20 in the terminal block. Conductors 21 extend from the jacks 19 into the open center 22 of the transmitter arm and then to the lugs 23 within the transmitter casing. These lugs are held in position in the casing by screws 24 which also serve to secure the resilient contact fingers 25 in the proper location to engage a suitable transmitter unit (not shown) when mounted.

The casing for the transmitter unit, which may be molded of suitable insulating material having the desired mechanical properties, for example cellulose propionate as set forth above, is provided with a circular journal 26 for the reception of the circular tubing of the transmitter arm.

In the structure shown, the arc of rotation of the transmitter casing relative to the transmitter arm is restricted to somewhat in excess of 180 degrees. The limit of rotation is achieved through what amounts to a double stop combination in the form of a projection mounted on the transmitter arm for limited rotation relative thereto and limiting the rotation of the arm relative to the transmitter casing. This projecion is made up of a first T-shaped stop 27 having the shaft of the T fit into a slot 28 cut in the tube wall of the transmitter arm. This slot, as may best be seen in Fig. 3, extends through 180 degrees of the tube wall and the T therefore can be rotated through an arc somewhat less than 180 degrees as determined by its thickness. A spring clip 29 of strip material, for example beryllium copper, encircles the transmitter arm and holds the stop 27 in position, the top of the T being held in a projecting portion 30 of the spring clip. The stop and spring clip are located in a recess 32 which extends into the transmitter arm journal 26 of the transmitter casing. The stop locks the casing on the arm against axial displacement since the shaft of the T engages the slot 28 in the arm and the ends of the arms of the T engage the walls of the recess 32 in the housing.

Relative rotation between the transmitter arm and the casing is increased beyond that provided by the slot 28 and the stop 27, without reducing the strength of the transmitter arm by an extension of the slot, by permitting relative rotation between the stop 27 and the casing. This is done by providing shoulders 33 at the sides of the recess 32 which are engaged by the working faces 34 on the outer surface of the projection 30 on spring clip 29 only after the clip and stop 27 have rotated with the transmitter arm through an arc of about 45 degrees. The total permissible relative rotation is thus the sum of the arc of travel of the stop 27 in the slot 28 and of the projection 30 in the recess 32; in the illustrative embodiment this amounts to greater than 180 degrees. A friction clip 36 secured in the casing and frictionally engaging the arm retains the rotative adjustment of the casing on the arm.

What is claimed is:

1. A support for a telephone unit comprising a housing for said unit, a shaft journaled in said housing, said shaft having a slot transverse its axis and within said housing, a collar rotatably mounted on said shaft over the slot, a detent on the inner periphery on said collar and engaging said slot, a projection on the exterior of said collar, and a pair of stops in said housing for engaging said projection and limiting the degree of said housing relative to said collar.

2. A rotative support for a telephone unit comprising a casing for said unit, a shaft journaled in said casing, said shaft having a slot transverse its axis and within said casing, a stop member having a portion in said slot whereby its movement relative to said shaft is restricted to the limit of the slot, said stop having a portion extending from said shaft and a pair of shoulders in said casing arranged to engage the sides of said stop projection and to limit the degree of rotation of said casing relative to said stop.

3. A rotatable support for a telephone unit comprising a molded casing for said unit, a circular tubular shaft journaled in said casing, said shaft having a slot transverse its axis and within said casing, a T-shaped stop having its shaft in said slot whereby its movement relative to said tubular shaft is restricted to the limits of the slot, said T-shaped stop having its arms projecting from said tubular shaft, a spring clip encircling said shaft and embracing the projecting portion of said stop to maintain it in position, a pair of shoulders in said casing arranged to engage said spring clip where it embraces the projecting portion of said stop and arranged to limit the degree of rotation of said casing relative to said stop, and a friction member secured to said casing and engaging said shaft to maintain the rotative adjustment of said casing thereon.

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No references cited.