May 6, 1958 J. J. KOJIS ET AL 2,833,868

MICROPHONE MOUNTING FOR HEARING AIDS

Filed May 7, 1953

Fig. 1

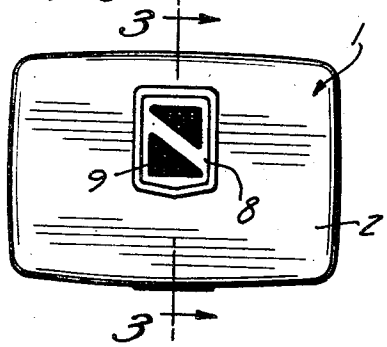


Fig. 2

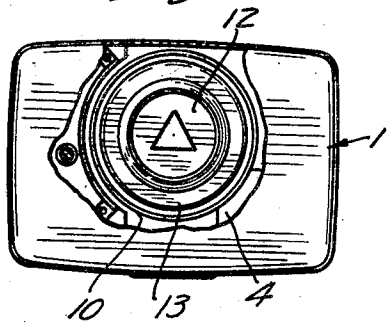


Fig. 3

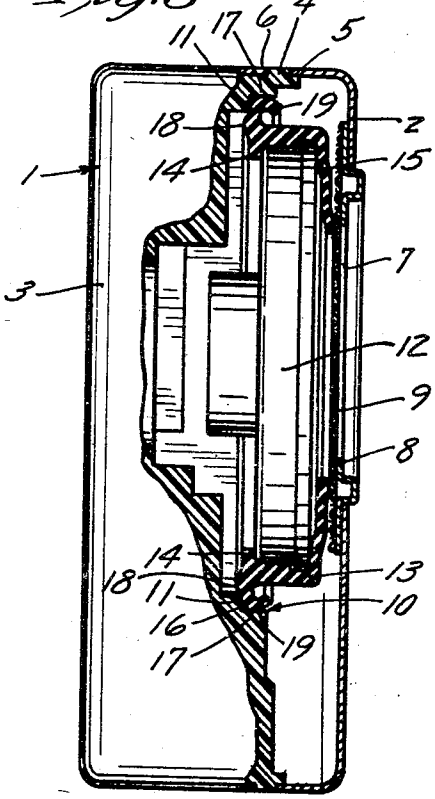
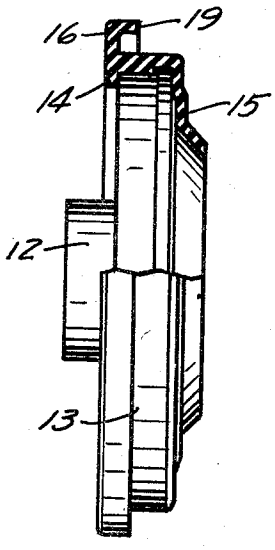


Fig. 4



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MICROPHONE MOUNTING FOR HEARING AIDS

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2 Claims. (Cl. 179—107)

Our invention relates to electronic hearing aids and the like and more particularly to resilient microphone mounting means therefor.

The primary object of our invention is the provision of a novel means for resiliently mounting a microphone within a housing structure or casing of an electronic hearing aid, whereby to greatly reduce, if not eliminate, noises normally transmitted thereto through the casing.

A still further object of our invention is the provision of a novel rubber mounting for microphones and a novel recess therefor within the casing, whereby the microphone is cause to "float" with respect to the casing.

Still more specifically, an object of our invention is the provision of a wearable hearing aid having a casing with a sound aperture in the wall thereof, a mounting plate supported within the casing in spaced parallel relation to the apertured casing wall and having an aperture generally concentric with the sound aperture of said casing wall and providing an annular seating surface marginally of said aperture and opposed to said casing wall, a microphone mounted in the space between the apertured casing wall and the apertured mounting plate and generally in axially centered relation therewith, the microphone being of less diameter than the aperture in the mounting plate, and an annular mounting element of highly resilient and elastic material marginally embracing the periphery of the microphone and having axially spaced radially inwardly directed inner and outer retaining flanges engaging the marginal portions of the inner and outer walls of the microphone, the outer of said flanges comprising an acoustical seal and extending inwardly and axially outwardly of the associated marginal edge portion of the microphone into engagement with the front wall of the casing adjacent the microphone opening therein, and said resilient and elastic mounting member further defining a radially outwardly projecting annular mounting flange spanning the space between said microphone and said microphone mounting seat and seated upon the latter, said acoustical seal-forming flange exerting outwardly yielding pressure on the front wall of the casing and yieldingly urging said mounting flange against the cooperating seating surface.

A still further object of our invention is the provision of a device of the class immediately above described wherein said mounting plate further defines a generally annular retaining shoulder marginally of the seating surface thereof, and within which said resilient mounting flange is confined.

The above and still further objects of our invention will become apparent from the following detailed specification, appended claims, and attached drawings.

Referring to the drawings, wherein like characters indicate like parts throughout the several views:

Fig. 1 is a view in front elevation of our novel structure;

Fig. 2 is a view corresponding to Fig. 1, some parts being broken away;

Fig. 3 is an enlarged view partly in side elevation and partly in section, as seen from the line 3—3 of Fig. 1; and

Fig. 4 is a view partly in side elevation and partly in vertical section of the microphone and mounting therefor.

Referring with greater particularity to the drawings, the numeral 1 indicates in its entirety a casing or housing structure, and which preferably includes a cup-like front casing section 2, a rear cup-like casing section 3, and a mounting plate 4, preferably formed from nylon or the like. As shown, the mounting plate 4 is mounted between the casing sections 2 and 3 in generally parallel relation thereto and has notches 5 and 6 to telescopically receive the casing sections 2 and 3 respectively.

Front casing section 2 is provided with a sound aperture 7 which, preferably and as shown, is provided with a decorative grill 8 having a screen 9 thereover. Mounting plate 4 also has an aperture 10 therein which is generally concentric with the sound aperture 7. As shown, aperture 10 provides an annular seating surface 11 marginally of the aperture 7 and opposed to the wall of the apertured casing section 2. A microphone 12, preferably but not necessarily annular in form, is located in the space between the aperture 7 of casing section 2 and the aperture 10 of the mounting plate 4 and generally in axially centered relation with said openings 7 and 10. An annular microphone mounting element 13 is formed from crude or synthetic rubber or other highly resilient and elastic material, and has its marginal portions embracing the periphery of the microphone 12, the radially inwardly directed inner and outer retaining flanges 14 and 15 thereof engaging the marginal portions of the inner and outer walls of the microphone 12. The outer flange 15, as shown, comprises an acoustical seal and extends radially inwardly and axially outwardly of the associated marginal edge portion of the microphone 12 into engagement with the wall of the front casing section 2 adjacent the microphone opening 7 therein. Elastic mounting member 13 further defines a radially outwardly projecting annular mounting flange 16 which spans the space between said microphone 12 and said microphone mounting seat 11 upon which said flange 16 is seated. It is important to note that acoustical seal-forming flange 15 exerts outward yielding pressure on the wall of the casing section 2 and yieldingly urges the mounting flange 16 against its cooperating seating surface 11. Also as shown, the mounting plate 4 further defines a generally annular retaining shoulder 17 marginally of the seating surface 11 and within which the mounting flange 16 is confined. As shown, the external diameter of the mounting flange 16 is slightly greater than the diameter of the retaining shoulder 17. Therefore, when the flange 16 is forcibly applied between opposed retaining portions 17, the rubber forming the resilient mounting flange 16 is displaced laterally, as indicated at 18, and the flange 16 exerts a yielding outward expanding pressure against the shoulder 17. Also preferably and as shown, the flange 16, adjacent its free edge, is provided with an annular lip 19 which projects axially outwardly in the direction of the casing section 2. As shown in Fig. 3, when the mounting flange 16 is forced into position against the seat 11 and the shoulder 17, the lip 19 is frequently caused to assume a distorted position due to distortion or displacement of the rubber material from which the flange 16 is formed.

We have found that a microphone mounted in a casing in the manner above described is caused to "float" with respect to the casing sections and the mounting plate, and hence will pick up almost no scraping noises normally transmitted thereto from the casing and also substantially eliminates noises caused by impact of the casing or mounting plate. While we have disclosed a preferred embodiment of our invention, it should be obvious that

same is capable of modification without departure from the scope of the appended claims.

What we claim is:

1. In a device of the class described, a casing having a sound aperture in a wall thereof, a mounting plate supported within the casing in spaced generally parallel relation to said apertured casing wall and having an aperture generally concentric with the sound aperture of said casing wall and providing an annular seating surface marginally of said aperture and opposed to said apertured casing wall, a microphone located in the space between the apertured casing wall and the apertured mounting plate and generally in axially centered relation therewith, the microphone being of less diameter than the aperture in the mounting plate, an annular mounting element of highly resilient and elastic material marginally embracing the periphery of the microphone and having axially spaced radially inwardly directed inner and outer retaining flanges engaging the marginal portions of the inner and outer walls of the microphone, the outer of said flanges comprising an acoustical seal and flaring radially inwardly and axially outwardly of the associated marginal edge portion of the microphone into engagement with the front wall of the casing adjacent the microphone opening therein, and said resilient and elastic mounting member further defining a radially outwardly projecting annular mounting flange spanning the space between said microphone and said microphone mounting seat and seated upon the latter, said acoustical seal forming flange exerting outward yielding pressure on the front wall of the casing and yieldingly urging said mounting flange against its cooperating seating surface.

2. The structure defined in claim 1 in which the said mounting plate further defines a generally annular retaining shoulder marginally of the seating surface thereof and within which the said resilient mounting flange is confined.

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