

July 9, 1963

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METHOD FOR FORMING EAR PLUGS FOR SUPPORTING
HEARING AID RECEIVERS
Filed June 23, 1960

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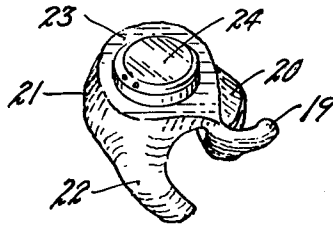


FIG 1

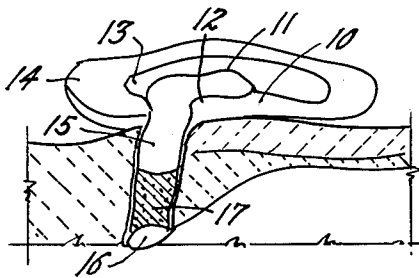


FIG 2

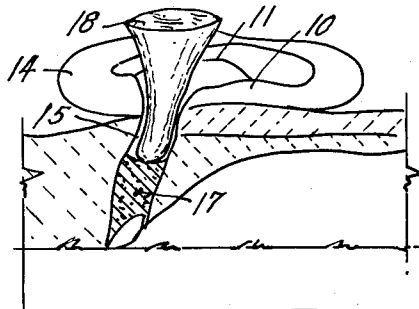


FIG 3

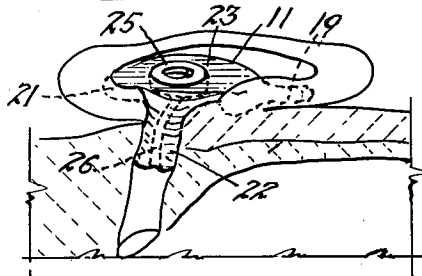


FIG 4

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METHOD FOR FORMING EAR PLUGS FOR SUPPORTING HEARING AID RECEIVERS

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Filed June 23, 1960, Ser. No. 38,267

1 Claim. (Cl. 18—55.05)

This invention relates to an ear plug for supporting the receiver of a conventional hearing aid in the ear and more particularly to a method for individually forming each ear plug to correspond exactly and in detail to the internal contours of the ear in which it is to be used.

Attempts have been made to supply receiver holding ear plugs of an average shape with the intention that they could be used in a variety of different ears. These attempts have been far from satisfactory and result in ill-fitting plugs and receivers.

Satisfactory ear plugs for hearing aid receivers have been made by forming a negative plaster cast of the ear, making a positive cast from the negative cast, molding a suitable acrylic plaster receiver plug into the positive cast, thence discarding the negative and positive plaster casts. If the work has been carefully and accurately done, a satisfactory plug will be obtained.

The latter method requires a high degree of skill and is exceedingly time consuming. The final receiver plug is never an exact negative reproduction of the ear due to the successive shrinkages in the various process steps.

The principal object of this invention is to provide a method for forming a hearing-aid-receiver-holder-plug which will produce an accurately and exactly-fitting plug for each individual ear in a small fraction of the time required by the other methods and which will eliminate the necessity for the negative and positive casts described above.

Another object is to provide a plug-forming method in which the final plug is initially formed directly in the ear of the patient without any intermediate molding or casting steps so that an accurately-fitting plug will be produced in one single process step.

Other objects and advantages reside in the detail construction of the invention, which is designed for simplicity, economy, and efficiency. These will become more apparent from the following description.

In the following detailed description of the invention, reference is had to the accompanying drawing which forms a part thereof. Like numerals refer to like parts in all views of the drawing and throughout the description.

In the drawing:

FIG. 1 is a perspective view of an ear plug and receiver combination as produced by the method of this invention; and

FIGS. 2, 3 and 4 are diagrammatic sections through the auditory canal of a human ear, with the patient in a repose position, illustrating successive process steps in this improved hearing-aid-plug-forming method to be later described.

In the drawing, elements of a human ear have been diagrammatically indicated and designated by numeral as follows: helix 10, anti-helix 11, tragus 12, anti-tragus 13, lobe 14, external auditory canal 15, membrana tympani 16.

This invention relates to a method for forming a plug-

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like element which will fit within the concha or hollow part of the external ear so as to hold the conventional hearing aid receiver, such as indicated at 24, in place in the ear without requiring external clamps or braces.

In carrying out this improved method for forming a hearing aid ear plug, the patient is preferably placed in a reclining position with the ear to be fitted directed upwardly, as diagrammatically indicated in FIGS. 2, 3 and 4. The auditory canal 15 is packed with surgical cotton 17, as indicated in FIG. 2, and the entire interior of the external ear is coated with suitable mineral oil.

A batch of suitable acrylic resin is now intermixed with a solvent liquid to form a freely moldable mass of soft malleable acrylic resin which can be freely handled with oiled fingers. The batch is formed into a relatively pointed easily handled piece, such as illustrated at 18 in FIG. 3, which is gently pressed into the canal 15 and into the curved channels in the folds of the ear to form a helix portion 19 filling the helix 10 of the ear and a projecting portion 20 filling into the anti-helix 11 of the ear and a tragus knob 21 fitting into the anti-tragus of the ear and a canal portion 22 which will fit perfectly into the auditory canal to the depth of the cotton packing.

The external surface of the plastic plug is now leveled off with a spatula to form a flat external surface 23 and a conventional receiver ring 25 is pressed into the flat surface 23 to a depth equal to the full thickness of the ring 25, as illustrated in FIG. 4, and the acrylic plug with the ring 25 in place is maintained stationary with the thumb or finger until the plastic sets. This can be ascertained by a feeling of warmth and usually requires about 4 or 5 minutes.

The newly molded plastic plug or impression and the cotton 17 are now removed from the ear and any rough spots or sharp edges in the acrylic are smoothed down with a brush containing a suitable solvent. A sound passage 26 is drilled into the plug from the enclosure of the receiver ring 25 and from the extremity of the canal portion 22, as shown in broken line in FIG. 4, to form a continuous sound passage from the internal ear to the receiver 24 when the latter is snapped in place in the receiver ring 25 as is conventional with hearing aid receivers and receiver rings.

The improved plug or receiver holder is self-retaining since it fits perfectly and snugly into the grooves of the external ear and into the external portion of the auditory canal of the ear and serves to inconspicuously and securely support a conventional hearing aid receiver within the confines of the external ear without additional support of any kind.

While a specific form of the improvement has been described and illustrated herein, it is to be understood that the same may be varied within the scope of the appended claim, without departing from the spirit of the invention.

Having thus described the invention what is claimed and desired secured by Letters Patent is:

A method for forming a near plug for supporting a hearing aid receiver in the ear of a patient comprising: packing the tympani extremity of the auditory canal of the ear of said patient with cotton; pressing a mass of self-hardening moldable material into said canal and into the concha of the external ear with the thumb and fingers; leveling off the external surface of the mass to produce

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a flat external surface; pressing a receiver supporting member into said flat external surface; allowing said mass to harden in the ear to form a solid plug conforming to the internal contours of said ear with the receiver supporting member permanently inbedded therein; removing said plug from the ear; and thence drilling a sound passage in said plug extending from the extremity of the canal portion of said plug to the receiver supporting member thereon, so that sound waves from a receiver supported by said receiver supporting member will be conducted to the membrana tympani of the ear.

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