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F. S. NELSON
RECEIVER FOR HEARING AIDS

2,549,629

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Fig. 1

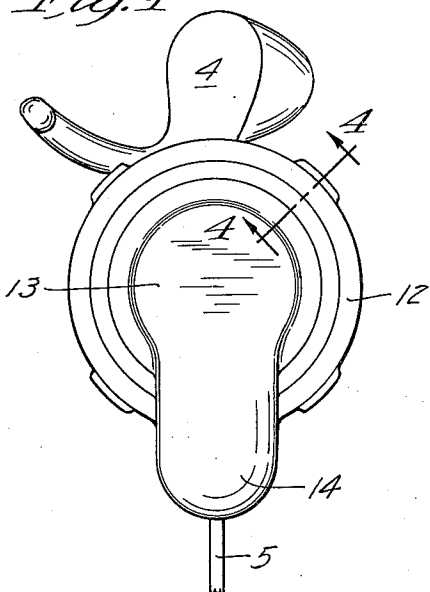


Fig. 2

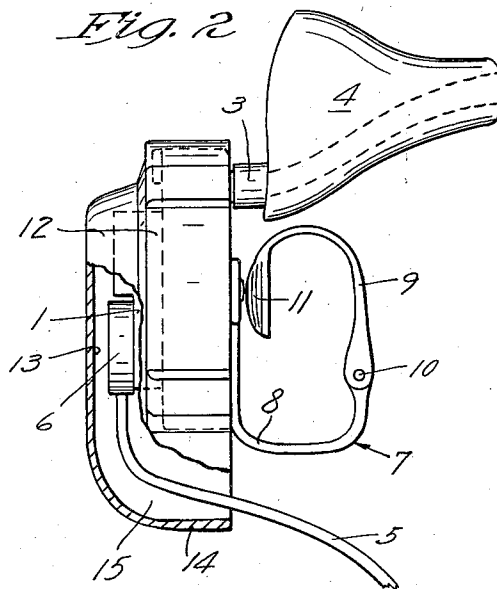


Fig. 3

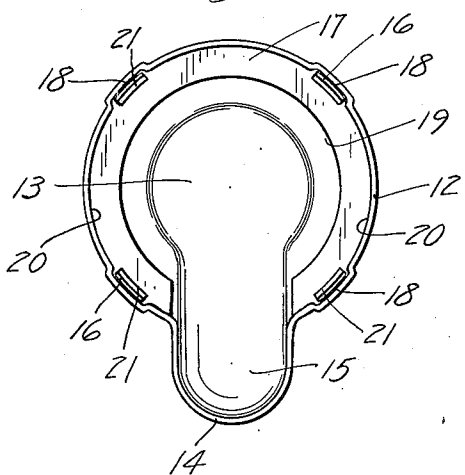


Fig. 4

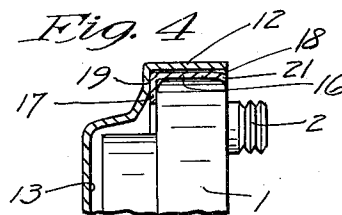
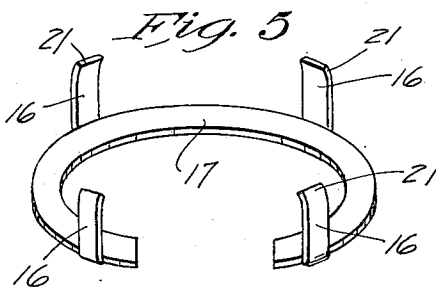


Fig. 5



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UNITED STATES PATENT OFFICE

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RECEIVER FOR HEARING AIDS

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5 Claims. (Cl. 179—107)

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My invention relates generally to hearing aids and, more particularly, to hearing aid receiver construction.

The primary object of my invention is the provision of a receiver for hearing aids, which may be secured to the lobe of a user's ear and which may be readily inserted into and removed from a decorative casing or shell, whereby a plurality of such shells, having different ornamental designs or of different materials, may be interchangeably used with a single receiver.

Another object of my invention is the provision of yielding means for frictionally locking a hearing aid receiver in a casing therefor against accidental removal.

Another object of my invention is the provision of a cup-like casing for hearing aid receivers, said casing having a recess in the side-wall thereof, and yielding means contained in the recess and engageable with said receiver.

Still another object of my invention is the provision of a casing of the above type having a plurality of axially-extended circumferentially-spaced recesses and a segmental band secured within said casing, said band carrying a plurality of gripping fingers positioned within said recesses and frictionally engageable with the peripheral wall of a receiver in said casing.

Another object of my invention is the provision of a gripping finger-equipped band within a hearing aid casing as set forth, which will not interfere with the electrical conduit and connections thereof to said receiver.

Other highly important objects and advantages of my 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 a hearing aid receiver casing produced in accordance with my invention;

Fig. 2 is a view in side elevation, some parts broken away and some parts shown in section;

Fig. 3 is a rear elevation of the cup-like casing or shell of my invention;

Fig. 4 is a fragmentary view, partly in side elevation and partly in section, taken on the line 4—4 of Fig. 1; and

Fig. 5 is an enlarged perspective of a frictional locking device for the hearing aid receiver of my invention.

An electronic hearing aid receiver is more or less diagrammatically shown in the drawings

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and is indicated in its entirety by the numeral 1. The receiver 1 is generally circular in cross-section and is provided with an axially-extended tubular stud 2 to which is connected a flexible sound-transfer tube 3 which terminates in a relatively rigid ear insert 4. The insert 4 is adapted to fit within the outer ear of the user and conducts impulses from the receiver 1 to the interior of the ear. The receiver 1 is adapted to be connected to a conventional electronic hearing aid transmitter unit, not shown but worn elsewhere on the user's person, by an electrical conduit 5 which is connected to the receiver 1 by a plug connector 6.

A spring clip 7 of the type usually found in ear rings and the like comprises a generally U-shaped member 8, having one leg thereof rigidly secured to the receiver 1, and an inverted U-shaped clamp element 9. One end of the clamp element 9 is connected to the free end of the U-shaped member 8 by a hinge joint 10, the other end terminating in an ear lobe-engaging pad 11. A torsion spring, not shown, but generally used in devices of this nature, biases the pad 11 toward the receiver 1 whereby to exert clamping pressure on the lobe of the user's ear when mounted thereon.

For concealing the receiver 1 and the plug-connector 6 thereof, I provide a cup-like shell or casing 12. The casing 12 may be made from any suitable material and is preferably formed with ornamental configurations on its exterior to resemble a conventional ear ornament. The casing 12 is of a size to slidably receive and contain the hearing aid receiver 1 and is provided with a central well 13 for the reception of the plug connector 6. The casing 12 is further radially outwardly bulged, as indicated at 14, to form a passage 15 communicating with the interior of the well 13 and through which the electrical conduit or cord 5 extends outwardly and downwardly to the transmitter, not shown.

Heretofore, difficulty has been experienced in providing an ornamental casing 1 which will be complimentary in appearance to a wide variety of colors and styles in dress. To overcome this difficulty, I provide casings 12 in a variety of colors and made from different materials, such as metals, synthetic resins and the like. To effect interchangeability of the different casings 12, and to compensate for wear by application of the casings 12 to the receiver 1 and removal therefrom, I utilize a plurality of resilient gripping fingers 16 integrally formed with a segmental band 17 securely mounted in each of the sev-

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eral casings. As shown, the casing 1 is formed with circumferentially-spaced axially extended internal recesses or channels 18 and an internal shoulder 19. The recesses 18 open inwardly of the inner side wall 20 of the casing 1 and axially outwardly thereof. The segmental shoulder 19 adjoins the well 13 and terminates at opposite sides of the passage 15, the band 17 being rigidly secured thereto by soldering or the like in the case of a metallic casing, or by other suitable means when used with a casing made from synthetic resins or other non-metallic material. The band 17 is positioned on the shoulder 19 so that one each of the resilient fingers 16 lie in one of the recesses 18. It will be noted that the recesses 18 are deeper than the thickness of the gripping fingers 16 and that the inner surfaces of the gripping fingers are normally flush with the inner side wall 20. The free ends of the gripping fingers 16 are curved inwardly, as indicated at 21, so as to hook over the outer side edge of the receiver 1, when it is placed within the casing 12, and prevent accidental removal thereof. As shown in Fig. 3, the curved hook-like ends 21 of the gripping fingers normally lie radially inwardly of the inner wall 20, and the recesses 18 are of a depth to permit flexing or spreading of the fingers 16 sufficiently to allow passage therebetween of the receiver. As indicated in Fig. 4, the corner edge portions of the receiver are rounded, the radii being substantially that of the curved ends 21 so that a camming action is imparted to the ends 21 by the receiver 1, when the same is inserted into the casing 12 or removed therefrom to spread the fingers 16. The yielding bias of the fingers 16 in the direction of the receiver 1 is sufficient to securely frictionally lock the receiver 1 in place against accidental removal.

It should be further noted that the casings 1 are provided in pairs, one to be used for each ear of the wearer for the sake of appearance, it being necessary to utilize only a single receiver 1. A dummy receiver, not shown, is provided for the ear not using the receiver 1, the dummy receiver comprising a receiver shell having thereon an ear clip similar to the clip 7, but with the mechanism therein, the connector plug, conduit therefor, and the ear fitting eliminated.

From the above, it will be seen that a hearing aid construction made in accordance with my invention is adapted to any desired ornamental design, the shells or casings being interchangeable with respect to the hearing aid receiver, removal of one casing and application of another to the receiver being accomplished with a minimum of time and effort.

My invention has been thoroughly tested and found to be completely satisfactory for the accomplishment of the objectives set forth; and while I have disclosed a preferred embodiment of my novel device, it will be understood that the same is capable of modification without departure from the spirit and scope of the invention, as defined in the claims.

What I claim is:

1. In a device of the class described, a cup-like casing having a radially inwardly-opening channel in its inner side wall, said channel extending axially inwardly from the open end of said casing, an axially-extended resilient finger secured to said casing, said finger being retractable into said channel and being curved at its free end to provide a radially inwardly-opening hook, said finger being biased to project the hook-

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acting free end thereof radially inwardly of said inner side wall, a circular hearing aid receiver axially slidably receivable within said casing, said receiver having a side wall portion which corresponds approximately in axial length and in general shape to said finger and which is adapted to cooperate with said finger to retain said receiver within said casing against accidental displacement.

2. In a device of the class described, a cup-like generally circular casing having a plurality of circumferentially-spaced channels in its inner side wall, said channels opening radially inwardly of said casing and extending from the open inner end thereof, said casing being provided with a reduced central well in its base, said casing defining a circumferentially-extended shoulder laterally-outwardly of the well, an arcuate band secured to said shoulder, a plurality of resilient fingers secured to said band in circumferentially-spaced relationship and extending axially of the casing adjacent the side wall thereof, said fingers having a thickness less than said channels and one each thereof being radially retractable into one of said channels, radially inwardly-extending hook-acting elements on the free ends of said fingers, said fingers extending substantially to the open end of said casing and being biased in a direction to project the free ends radially inwardly of the inner side wall, and a receiver in said casing, the inner face of said receiver resting upon said band, said receiver having an axial length corresponding generally to the length of said fingers and being slidably rounded at its outer edge to conform generally to the shape of the intumed ends of the fingers.

3. The structure defined in claim 2 in which said fingers are formed integrally with said band.

4. In a device of the class described, a generally circular cup-like casing having a plurality of circumferentially-spaced axially-extended radially inwardly-opening channels in its inner side wall, said casing being provided with a reduced central well in its base and a radially outwardly-projected recess communicating with said well and located between adjacent ones of said channels, the side wall of the casing having a bulged portion between two adjacent channels which defines an enlarged passage extending radially and axially from said well, a shoulder in said casing radially outwardly of said well, a segmental band element overlying said shoulder and secured thereto, a plurality of resilient fingers extending axially outwardly of said band in circumferentially-spaced relationship, said fingers having a thickness less than the depth of said channels and being radially retractable one each into one of said channels, said segmental band element terminating on opposite sides of said passage, said fingers extending substantially to the open end of said casing and curving generally radially inwardly at their free ends, said fingers being biased in a direction to project said free ends radially inwardly of said inner side wall, a circular hearing aid receiver in said casing, the inner face of said receiver resting on said band element, said receiver having a thickness corresponding generally to the length of the fingers and being slightly rounded at its outer edge to conform generally to the shape of the intumed ends of said fingers, and an electrical conduit in said passage, said conduit terminating in a connector element coupled to said receiver within said well.

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5. The structure defined in claim 4 in further combination with a clamping element for securing said receiver to the lobe of a user's ear, and a flexible sound-transfer tube extending axially outwardly from said receiver at a point diametrically opposite said passage, said sound-transfer tube terminating at its free ends in a relatively rigid ear insert.

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6**REFERENCES CITED**

The following references are of record in the file of this patent:

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