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SPECTACLE HEARING AID MOUNTING

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This invention relates to hearing aids of the type adapted to be positioned on the head of an individual particularly with the microphone in close proximity to one ear and with a receiver designed to be positioned in an ear and particularly in the other ear of the individual, and in particular, a pair of spectacles having temples hinged to a spectacle lens frame with cavities in the inner surfaces of the temples and with the hearing aid elements removably mounted in the cavities.

Attempts have been made to incorporate elements of a hearing aid in temples of a pair of spectacles, particularly with the elements embedded in the material of the temples, however, with such constructions, a defect in an element of the hearing aid makes it necessary to discard the spectacles and the entire assembly. With this thought in mind, this invention contemplates an improved mounting for elements of a hearing aid in temples of a pair of spectacles whereby the hearing aid elements are incorporated in units and the units are adapted to be inserted in and removed from sockets in cavities in the inner surfaces of the temples of a pair of spectacles.

The object of this invention is, therefore, to provide means for mounting elements of a hearing aid in temples of a pair of spectacles whereby the elements are interchangeable and may readily be removed and replaced.

Another object of the invention is to provide a mounting for a hearing aid wherein noise resulting from the microphone of the hearing aid rubbing against or coming in contact with clothing is eliminated.

Another object of the invention is to provide a hearing aid in which the elements thereof are incorporated in a pair of spectacles whereby all of the elements are mounted in one device obviating the necessity of separate means of support for the microphone and hearing aid elements.

Another object of the invention is to provide means for mounting elements of a hearing aid in temples of a pair of spectacles whereby the hearing aid elements are independent of the lenses of the spectacles so that in repairing the hearing aid the services of both an optometrist and a hearing aid consultant are not required.

Another object of the invention is to provide means for mounting a hearing aid in a pair of spectacles whereby the spectacles are adapted to be used without the hearing aid.

Another object of the invention is to provide means for mounting a hearing aid in a pair of spectacles whereby pre-selected frames of the spectacles are not required, the hearing aid elements being adapted to be inserted in a selected pair of a plurality of spectacles.

Another object of the invention is to provide means for mounting elements of a hearing aid in a pair of spectacles whereby in making repairs it is only necessary to remove the hearing aid unit so that it is not necessary to forward the spectacles in order to have the hearing aid elements repaired, the spectacles being adapted to be retained and used until the repaired hearing aid elements are returned.

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Another important object of the invention is to provide means for mounting hearing aid elements in temples of a pair of spectacles wherein sockets for receiving hearing aid elements may or may not be embedded in material of the temples at the ends of cavities of the temples.

Another object of the invention is to provide means for mounting hearing aid elements in a pair of spectacles whereby the user may readily change from spectacle frames of one design to frames of a different design without purchasing new hearing aid elements.

Another important object of the invention is to provide means for mounting hearing aid elements in temples of a pair of spectacles wherein the microphone may readily be changed from a temple on one side of the spectacles to the temple on the opposite side and the other parts of the elements correspondingly reversed.

A further object of the invention is to provide means for mounting a hearing aid so that the device is particularly adapted for children in which the casing with the elements therein is continuously in a fixed or stationary position and is not constantly flapping against clothing or portions of the body.

A further object of the invention is to provide means for mounting a hearing aid in a pair of spectacles whereby coordination between the body and hearing aid is obtained without adjustment of the head to the direction from which sounds emanate.

A still further object is to provide an improved hearing aid mounting in which the elements of the hearing aid weigh less than one ounce so that they may be incorporated in one of the temples of a pair of spectacles without throwing the spectacles out of balance.

Another important object of the invention is to provide a hearing aid mounting in which the possibility of cords wearing out as a result of contact with starched collars and other parts of clothing is eliminated, all of the elements being installed in a unit, such as a cartridge, and the unit being adapted to be inserted in a cavity in one of the temples of a pair of spectacles.

A still further object of the invention is to improve the reception of hearing aids by shortening the length of the cord between a transmitter and a receiver, the shorter length of cord offering less impedance and refraction.

And a still further object of the invention is to provide an improved mounting for elements of a hearing aid whereby the device is adapted to be used in an inconspicuous position making the device adapted for receiving broadcasts, particularly from directional wireless circuits such as may be desirable in announcing and in secret service reception.

Yet another object is to provide a hearing aid mounting that is adapted to include a fixed resistance which is set to correspond with any desired kilocycle, or which may involve a miniature tuning condenser.

With these and other objects and advantages in view, the invention embodies a pair of spectacles having a lens frame or front with temples hinged to ends thereof in which elements of a hearing aid are removably mounted in cavities in inner surfaces of the temples wherein contacts of the elements are adapted to be snapped into sockets installed or embedded in the temples and wherein a user may purchase the entire hearing aid assembly or any part thereof that may be desired.

With the parts mounted in this manner, the user may examine and understand the construction of the hearing aid and the component parts may be standardized so that the frames can be changed as desired. The elements may be connected with wires or the printed circuit or the like.

In such a device, the hearing aid may be preset to a broadcast wave-length or band and it may be set so that it is also adapted for use in an industrial plant where it

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may be desired to pick up the operation of the individual machines.

Other features and advantages of the invention will appear from the following description, taken in connection with the accompanying drawing, wherein:

Figure 1 is a plan view of a pair of spectacles with parts broken away showing sections through the parts to illustrate the mounting of the hearing aid elements in the temples.

Figure 2 is a longitudinal section through the spectacles taken on line 2—2 of Figure 1 showing a hearing aid unit in a cavity in one of the temples and with part of the temples broken away showing conductors extended to a receiver.

Figure 3 is a side elevational view of the spectacles showing a multiple switch for completing circuits through the front and temples and with parts of the temples broken away.

Figure 4 is a plan view showing the connection of one of the temples to the front with the temple in the folded position wherein the multiple contacts are separated and also showing the device with parts broken away.

Figure 5 is a cross section through one of the temples, taken on line 5—5 of Figure 3, illustrating the hinge structure.

Figure 6 is a sectional plan through one of the temples taken on line 6—6 of Figure 2 with parts broken away illustrating the mounting of the hearing aid unit in a cavity of the temple.

Figure 7 is a cross section through one of the temples taken on line 7—7 of Figure 2 showing the contact pins and sockets whereby the hearing aid unit is removable and replaceable.

Referring now to the drawing, wherein like reference characters denote corresponding parts, the improved spectacle hearing aid mounting of this invention includes a lens frame having sections 10 and 11 connected by a bridge 12 with temples 13 and 14 connected to ends of the lens frame with hinges 15 and 16 and with a hearing aid unit 17 positioned in a cavity 18 in the temple 13, the unit being adapted to be snapped into sockets 19 and 20 and connected by suitable conductors to a receiver 21 at the end of the temple 13 and to a volume control 22, a microphone 23 and a battery 24 in the temple 14.

It will be understood that although the temples 13 and 14 are secured to the lens frame with hinges, such as the hinges 15 and 16 which are positioned on the inner surfaces of the parts, the parts may be connected by hinges of other suitable designs and the hinges may be positioned as desired.

The unit 17 contains the elements of a hearing aid, such as resistors, transistors, and capacitors and these units are standardized whereby they may be removed and replaced or, in instances where an individual has several pairs of spectacle frames, the units may readily be removed from one frame and installed in another.

The ends of the unit 17 are provided with contact pins, such as the pins 25 and 26, and these pins are adapted to be inserted in tubular contacts, such as the contacts 27 and 28, in the sockets 19 and 20, respectively, as shown in Figure 6. It will be understood that the units may be provided with any suitable number of contact pins and the sockets provided with a corresponding number of tubular contacts that are positioned to receive the pins and in which the pins are frictionally retained.

As illustrated in Figure 1, a transistor, as indicated by the numeral 29, is removably mounted in the end of the cavity 18 and the transistor is also provided with suitable contacts, as indicated by the numeral 30, so that the transistor may readily be removed and replaced.

The sockets for the transistor and unit, such as the sockets 19 and 20, may be frictionally held in the cavity or may be embedded in the material of the temple, as may be desired. In the design shown, the temple is provided with a cover plate 31 that is secured in posi-

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tion over the unit 17 and the transistor 29 with screws 32.

The terminals of the sockets in which the hearing aid unit 17 and transistor 29 are positioned are connected by wires 33 and 34 to terminals 56 and 57 of the receiver 21, as shown in Figure 2, and the other terminals of the unit are connected by the wires 35 and 36 to the microphone, the wires 35 and 36 being connected across the hinge 15 with contacts 37 and 38 and across the hinge 16 with similar contacts 39 and 40.

By this means, a microphone, battery and volume control are adapted to be installed in one temple and the receiver, hearing aid unit and transistor in the other temple and with the circuits connected across the hinges the circuits will be broken as the temples are folded against the front, as shown in Figure 4.

It will be understood that wires connecting the elements may be embedded in the material of the temples, as shown in Figure 1, or the wires may be positioned against surfaces as shown at the hinge portions of Figure 1, or the wires may extend through cavities in the temples and frames, as may be desired.

The component parts, such as the microphone, battery, volume control, receiver and transistor may be conventional and these parts may be provided in different designs. These component parts are shown with the receiver transistor, and unit 17 incorporated in one temple and the microphone, battery and volume control in the other temple of a pair of spectacles and it will be understood that the elements may be distributed or positioned at different points in the temples and it will also be understood that all of the component parts may be incorporated in one temple.

With the parts assembled in a pair of spectacles in this manner, the microphone and receiver are adapted to be positioned adjacent the ears of an individual so that they are in close proximity to the natural hearing members of the human body. With the parts positioned in this manner, it is not necessary to turn the head or face the direction from which the sound signals emanate.

The contacts at the ends of the wires or conductors of the circuits are supported in shields 52 and the shields are retained in position by prongs 53 and 54, which extend into the material of the temples and front, as shown in Figure 5. The contacts may also be formed by other means.

It will be understood that modifications, within the scope of the appended claims, may be made in the design and arrangement of the parts without departing from the spirit of the invention.

What is claimed is:

1. A spectacle hearing aid mounting comprising a spectacle lens frame, temples having cavities therein hinged to ends of said frame, the hinges connecting the temples to the lens frame permitting the temples to be removed and used on other lens frames, sockets positioned in one of the cavities of one of said temples, a unit including component parts of a hearing aid positioned in the cavity in which the sockets are provided, contacts extended from the unit including the component parts of the hearing aid and frictionally retained in said sockets, whereby the contacts and sockets provides means for removing and replacing the unit including the component parts of the hearing aid, an ear receiver, conductors extended from sockets of said temple and connected to terminals of said ear receiver, and circuits connecting the said component parts of the hearing aid assembly to respective sockets in the temples.

2. In a spectacle hearing aid mounting, the combination which comprises a spectacle lens frame, temples having cavities therein hinged to ends of said lens frame, the hinges connecting the temples to the lens frame providing means whereby the temples may be removed and used on other lens frames, sockets positioned in a cavity of one of said temples, a unit including component parts of a hearing aid positioned in the cavity of

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said temple in which the sockets are positioned and having contacts therein, contacts of the unit including the component parts of the hearing aid positioned in and frictionally retained in the contacts of said sockets, an ear receiver, conductors extended from sockets in said temple and connected to terminals of said ear receiver whereby, the contacts and sockets of the unit of the component parts of the hearing aid provides means for removing the unit from the temple and also for replacing the unit in the temple, a microphone, a battery, a volume control, the microphone, battery and volume control being positioned in a cavity of one of said temples, and circuits connecting the elements and component parts of the hearing aid assembly.

3. In a spectacle hearing aid mounting, the combination which comprises a spectacle lens frame, temples having cavities therein hinged to ends of said lens frame, the hinges connecting the temples to the lens frame providing means whereby the temples may be removed and used on other lens frames, sockets positioned in a cavity of one of said temples, a unit including component parts of a hearing aid positioned in the cavity of said temple in which the sockets are positioned and having contacts therein, contacts of the unit including the component parts of the hearing aid positioned in and frictionally retained in the contacts of said sockets, an ear receiver, conductors extended from sockets in said temple and connected to terminals of said ear receiver where-

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by, the contacts and sockets of the unit of the component parts of the hearing aid provides means for removing the unit from the temple and also for replacing the unit in the temple, a microphone, a battery, a volume control, and a transistor, the microphone, battery, volume control and transistor being positioned in a cavity of one of said temples, circuits connecting the elements and component parts of the hearing aid assembly, and means connecting the circuit across the hinges connecting the temples to the lens front whereby upon folding the temples against the front the circuits are broken.

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