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HEARING AID BATTERY SWITCH

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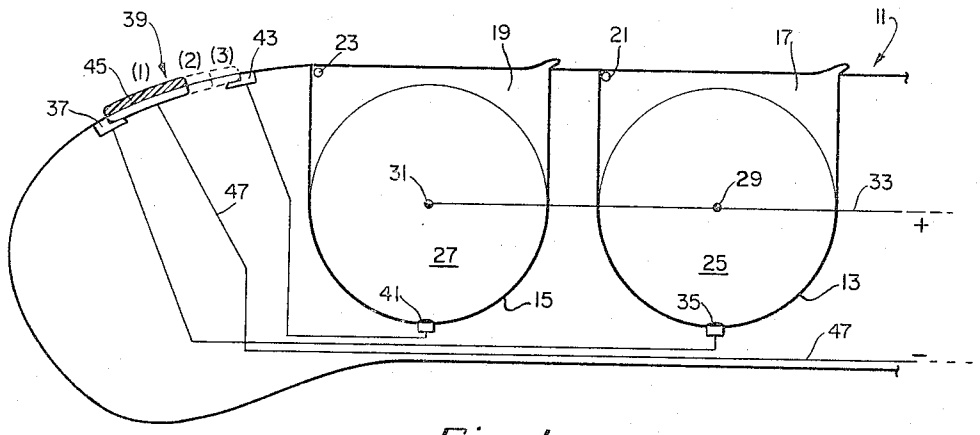


Fig. 1

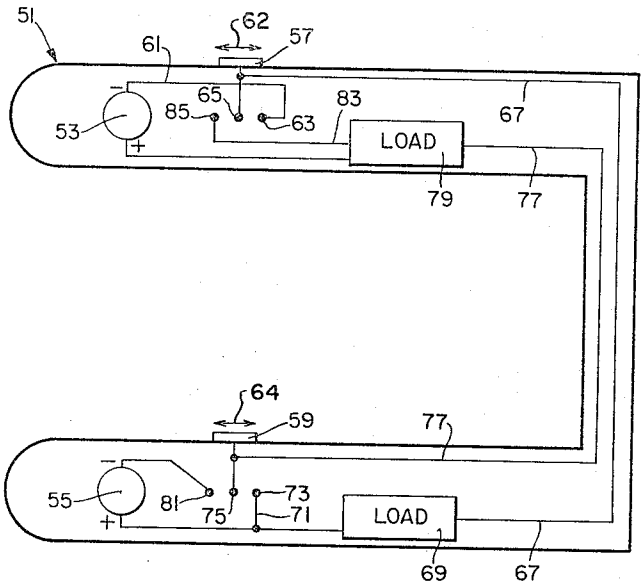


Fig. 2

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HEARING AID BATTERY SWITCH

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This invention relates to hearing aids and more particularly to battery supplies for hearing aids.

The battery supply for a hearing aid is limited because of the limited physical facilities to hold large batteries. The foregoing limitation is especially true with hearing aid devices that are held in eyeglass frames.

The accepted practice for providing a battery supply to an eyeglass hearing aid device is to provide two cavities in the eyeglass frame. One of the cavities holds the battery which is in use and the other cavity holds a spare battery. When the battery which is in use becomes worn out it is removed from the first cavity and the spare battery from the second cavity is removed therefrom and placed in the first cavity.

While the foregoing spare battery arrangement has merit, it is very disconcerting to have a battery fail in the middle of a conversation and cause the hearing aid user to remove his eyeglasses and transfer the "live" battery.

The present invention provides a means for carrying the spare battery and readily connecting it into the circuit when the first battery goes dead.

Accordingly it is an object of the present invention to provide an improved battery supply arrangement for hearing aid devices.

It is a further object of the present invention to provide a battery supply arrangement for a hearing aid device which enables the user to switch in a spare battery when the "in use" battery goes dead, without having to transfer batteries.

In accordance with a feature of the present invention there is provided at least a double cavity in the hearing aid holder, such as an eyeglass piece. In each cavity there is a battery mounting piece to hold a battery which provides power to the hearing aid and connected to the mounting pieces is a switch which connects either one mounting or another into the circuit.

In accordance with another feature of the present invention there is provided a neutral position on said switch means to render the battery mounting pieces disconnected from the circuit.

The foregoing and other objects and features of this invention will be best understood by reference to the following description of an embodiment of the invention taken in conjunction with the accompanying drawings, wherein:

FIGURE 1 is a pictorial schematic of one embodiment of the present invention;

FIGURE 2 is a block-schematic diagram of a second embodiment of the present invention.

Referring to FIGURE 1 there is shown a pictorial schematic of a preferred embodiment of the present invention. In FIGURE 1 there is shown a section of a sidepiece **11** of a pair of eyeglasses which includes a hearing aid not shown. In the sidepiece **11** there are shown two cavities **13** and **15**. The cavities **13** and **15** can be respectively opened by the rotatable covers **17** and **19**. The rotatable cover **17** rotates open on pin **21**, while rotatable cover **19** rotates on pin **23**. While there are only two cavities shown, it should be understood that there could be more and while the cavities are shown in an eyepiece hearing aid device, it should be understood that the cavities could be in any hearing aid device such as a vest pocket device.

Inserted in the cavities **13** and **15** are respectively two batteries **25** and **27**. The batteries are held by battery mountings which have positive and negative terminals. The positive terminal **29** of battery **25** and the positive terminal **31** of battery **27** are connected through their respective mounting positive terminals to the positive line **33**. Line **33** provides one side of the circuit for the hearing aid equipment, not shown.

The negative terminal **35** of battery **25** is connected through its mounting negative terminal to the switch terminal **37** of battery switch **39**. The negative terminal **41** of battery **27** is connected through its mounting negative terminal to the switch terminal **43**. The switch terminals **37** and **43** are mutually exclusive, i.e., when the switch slide **45** is making contact with the switch terminal **37** it cannot be making contact with switch terminal **43**.

The switch slide **45** has an upper part made of some electrical insulating material such as plastic or hard rubber. The lower portion of the switch slide **45** is made of conducting metal to make an electrical contact with the switch terminals **37** and **43**. The switch slide **45**: makes contact with switch terminal **37** when it is in position (1); doesn't make contact with either switch terminal (this position being the neutral position) when it is in position (2); and makes contact with switch terminal **43** when it is in position (3).

The switch slide **45** is connected by means of wire **47** to the negative side of the hearing aid circuit. Hence when the switch is closed on the side of switch terminal **37** (as shown in FIGURE 1) there is a circuit completed from positive terminal **29** of battery **25**, through the positive line **33**, through the hearing aid device (not shown), through the negative line **47**, through the slide switch **45**, through switch terminal **37** to negative terminal **35** of battery **25**.

If battery **25** should be used for its rated number of hours and it should go dead, it is a simple matter for the user to move the switch slide **45** to position (3) and enable the fresh battery **27** to supply the power. When the switch is closed on the side of switch terminal **43**, there is a complete circuit from positive terminal **31** of battery **27**, through positive line **33**, through the hearing aid device (not shown), back through the negative line **47**, through the switch slide **45**, through the switch terminal **43**, to the negative terminal **41** of battery **27**. In this way the user does not need to go through the cumbersome routine of removing the eyeglasses, removing the fresh battery from its storage cavity, and replacing the worn out battery with the fresh battery. Instead as mentioned before the user simply throws the switch slide **45** to the other side and very little of any conversation, entertainment or desirable sound is lost, because the fresh battery immediately supplies new power.

When a battery is to be replaced, for instance battery **25**, the rotatable covers are lifted to expose the cavities. The battery is removed and a fresh battery inserted therein. The cover is rotated back to the position shown in FIGURE 1 to secure the battery.

While the switch **39** has a primary role of inserting one of two batteries into the hearing device circuit it can and does serve as an on-off switch. When the switch slide **45** is located in the neutral position, i.e., not contacting either switch terminal **37** or **43**, the hearing aid device is turned off. Obviously, when the switch slide **45** makes contact with either switch terminal **37** or **43**, the hearing aid device is turned on.

FIGURE 2 shows a second embodiment of the present invention. Assume that the eyeglass frame **51** has a cavity in each sidepiece similar to the cavities **13** and **15** shown in FIGURE 1. In one cavity there is a battery **53** and in the other cavity there is a battery **55**.

The switch slides **57** and **59** as shown in FIGURE 2 are in their neutral positions. The two headed arrows **62** and **64** indicate that the switch slides can be moved in both directions. If both of the switch slides are moved in the forward direction; i.e., to the right in FIGURE 2, a completed circuit will be made from the negative terminal of battery **53**, through line **61**, across closed points **63** and **65**, through line **67**, through the transducer **69** (load), through line **71**, across points **73** and **75**, through line **77**, through amplifier **79** (load), to the positive side of battery **53**.

When battery **53** becomes worn out the user simply slides both switch slides **57** and **59** to their rearward positions, i.e., to the left in FIGURE 2. In the rearward positions the switches complete a circuit from the negative terminal of battery **55**, through closed terminals **81** and **75**, through line **77**, through amplifier **79**, through line **83**, through closed terminals **65** and **85**, through line **67**, through transducer **69** (load), to the positive terminal of battery **55**.

The arrangement shown in FIGURE 2 enables a battery to be worn on each side of the eyeglass frame which may provide a desirable weight or space balance but which has the disadvantage of requiring more equipment.

While I have described above the principles of my invention in connection with specific apparatus, it is to be clearly understood that this description is made only by way of example and not as a limitation to the scope of my invention as set forth in the objects thereof and in the accompanying claims.

What is claimed is:

1. A battery switching arrangement to be used with eye-glass frame hearing aid means comprising in combination at least two cavities in said eye glass frame, one of which will hold a battery in use and the other of which will hold a spare battery, first and second battery mounting pieces with one each assigned to a different associated one of said cavities and disposed therein; each of said mounting pieces having a positive terminal and a negative terminal to be connected to appropriate terminals on the associated batteries which such mounting pieces hold; two hearing aid devices each of which is disposed in a different side piece of said eye-glass frame; circuitry means connected to the positive terminals of said

mounting pieces and connected to both of said hearing aid devices to provide one portion of a circuit thereto; switching means having movable member means and at least two mutually exclusive electrical switch terminals mounted to be electrically connectable one at a time to said movable member means; circuitry means connecting said negative terminal of said first mounting piece to one of said at least two mutually exclusive electrical terminals and the negative terminal of said second mounting piece to another of said at least two mutually exclusive electrical terminals; circuitry means connecting said movable member means to both of said hearing aid devices to complete a circuit thereto through said switching means so that either said battery in use or said spare battery will exclusively supply current to both of said hearing devices.

2. A battery switching device according to claim **1** wherein said cavities are two in number and are disposed in the same sidepiece of hearing aid eyeglasses and wherein said plurality of mounting pieces constitutes two mounting pieces with one each assigned to one of said two cavities.

3. A battery switching device according to claim **2** wherein said movable means comprises a slideable member which is capable of being located in three positions, wherein a first position connects it to one of said electrical switch terminals, further wherein a second position locates the slideable member so as to be not connected to any one of said electrical switch terminals, and wherein a third position connects said slideable member to another of said electrical switch terminals so that either of two batteries can be connected in the hearing aid circuit or the hearing aid circuit can be rendered non-conductive.

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