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A Component Harness

Field of Invention

This invention generally relates to a component harness. In particular, it relates to a component harness being implementable as a communication headset.

Background

Audio headsets are commonly used with entertainment systems, for example an MP3 player or a portable gaming console. These audio headsets come in various forms for catering to different needs. Some of these audio headsets contain earphones and microphones for enabling speech communication between persons when connected to, for example, a transceiver or a computer-based system.

When used for speech communication, it is preferred that sound signals be processed by a circuitry when received from the microphone or prior to being transmitted to the earphone. The circuitry is typically incorporated with either the earphone or the microphone. However, the connecting point between the circuitry and cables connecting to the circuitry is often subjected to strain from the weight of the cables. A conventional method for strain relief is to suspend the cables from a headband using contraptions such as a string attachment or a plastic clip. However, such contraptions do not fully immobilise movement of the cable relative to the earphone or microphones and therefore do not substantially relieve strain caused by movement of the cables relative to the connecting point. Additionally, replacement of cables from the headset, due to damage or otherwise, requires the appropriate tools to be readily available especially when the cables are solder-coupled to the circuitry incorporated with the microphone or the earphone.

There is therefore a need for an improved method for incorporating electrical components with an audio headset while minimizing undesirable relative movement of the electrical components.

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Summary

In accordance with a first aspect of the invention, there is disclosed a component harness comprising a headband and a housing. The headband has a protruding portion formed therealong and is elongated for extending around at least one of the head and the neck of a person and at least a portion of the protruding portion is receivable in the housing for coupling the housing to the headband and for substantially impeding movement of the housing about and along the longitudinal axis of the headband. In addition, the protruding portion is formed substantially away from each of the extremities of the headband and the headband is for structurally coupling at least an electrical component to the headband.

In accordance with a second aspect of the invention, there is disclosed a component harness comprising a headband and a housing. The headband has a protruding portion formed therealong and is elongated for extending around at least one of the head and the neck of a person. Each of the headband and the protruding portion has a C-shape and a concavity formed by the C-shape. The concavity of the headband substantially directionally opposes the concavity of the protruding portion. At least a portion of the protruding portion is receivable in the housing for coupling the housing to the headband and for substantially impeding movement of the housing about and along the longitudinal axis of the headband. In addition, the headband is for structurally coupling at least an electrical component to the headband.

In accordance with a third aspect of the invention, there is disclosed a component harness comprising a headband and a housing. The headband has a protruding portion formed therealong and is elongated for extending around at least one of the head and the neck of a person. At least a portion of the protruding portion is receivable in the housing for coupling the housing to the headband for forming a structural joint therebetween. The structural joint substantially impedes movement of the housing about and along the longitudinal axis of the headband. The component harness further comprises a circuit board being contained in the housing with at least one cable electrically connected to the circuit board and extending thorough and away from the

housing, and a connector formed on the circuit board. The connector is operable for one of physically coupling and physically decoupling the at least one cable to the circuit board such that the at least one cable electrically communicates with the circuit board when being physically coupled to the circuit board.

Brief Description of the Drawings

Embodiments of the invention are described hereinafter with reference to the drawings, in which:

Fig. 1 shows a partial front elevation of a component harness according to an embodiment of the invention with a housing coupled to a headband;

Fig. 2 shows a partial exploded view of the component harness of Fig. 1 with a protruding portion formed along the headband and a circuit board receivable in the housing;

Fig. 3 shows a partial plan view of the component harness according to View 'A' of Fig. 1; and

Fig. 4 shows a partial perspective view of a communication headset containing the component harness of Fig.1; and

Fig. 5 shows a partial side elevation of the circuit board according to View 'B' of Fig. 2 with a component cable being disposed for physically coupling to the circuit board.

Detailed Description

With reference to the drawings, an embodiment of the invention, an apparatus, is described hereinafter for securing electrical components to a headband and for impeding movement of the secured electrical components relative to the headband.

For purposes of brevity and clarity, the description of the invention is limited hereinafter to applications related to headsets with earphone-detached circuitries or circuit boards. This however does not preclude the invention from other areas of application requiring similar operating function and performance for attachment of electrical components to a headband or headset.

In the detailed description provided hereinafter and illustrations provided in Figs. 1 to 5 of the drawings, like elements are identified with like reference numerals.

With reference to Fig. 1 and Fig. 2, which shows respectively a perspective view of a component harness 100 and an exploded view of a housing 104, the component harness 100 comprises a headband 102 and a housing 104 coupled to the headband 102. The housing 104 is for coupling electrical components, for example an audio circuitry, electrical wirings and cables, to the headband 102. The headband 102 is preferably elongated and curved for extending around the head of a person and preferably resiliently biased for clasping onto at least one of the head of the user. Alternatively, the headband 102 is extendable around the neck of the person.

With reference to Fig. 3, the headband 102 has a protruding portion 106 formed therealong. The protruding portion 106 is for substantially impeding movement of the housing 104 about and along the longitudinal axis of the headband 104 when the housing 104 is coupled to the headband 102. The protruding portion 106 is preferably formed substantially away from the extremities of the headband 102. However, the protruding portion 106 can alternatively be formed adjacent one of the extremities of the headband 102 for disposing the housing 104 thereat.

The housing 104 preferably comprise a first cover 202 and a second cover 204. The first and second covers 202/204 inter-couple to form an enclosure for enclosing and holding electrical components. Additionally, the protruding portion 106 is received within the enclosure to ensure the housing 104 is coupled to the headband 102.

The electrical components preferably comprise a circuit board 206 carrying circuitries for processing audio signals. Preferably, an interface cable 208 electrically couples the circuit board 206 to external devices. The interface cable 208 is for carrying and transmitting electrical signals therethrough. However, this does not limit the circuit board 206 to carrying only circuitries for processing audio signals. The circuit board 206 can, alternatively or additionally, carry other types of circuitries such as a Radio Frequency (RF) circuitry.

The protruding portion 106 is preferably shaped as an arc for protruding away from the curvature of the headband 102 as shown in Fig. 3. Alternatively, the protruding portion 106 can take on other shapes. Preferably, the curvature of the headband 102 and the arc formed by the protruding portion 106 extends along substantially the same plane.

Inner faces of the first and second covers 202/204 are shaped to conform to the shape of the headband 102. Specifically, a slot 210 is formed in the inside face of the first cover 202 for receiving the protruding portion 106 therein. The first and second covers 202/204 physically inter-cooperate to clasp the protruding portion 106 for receiving the protruding portion within the slot 210 and for forming a structural joint between the protruding portion 106 and the housing 104. The structural joint impedes movement of the housing 104 and its content along the headband 102 and about the longitudinal axis of the headband 102.

Referring to Fig. 4, the component harness 100 is preferably being integrated into a communication headset 300 and therefore further comprises an earphone and a microphone (not shown). The earphone and the microphone are for transducing between sound signals and sound.

The earphone and the microphone are configuratively coupled to, preferably, the extremities of the headband 102. This enables the headband to spatially position the earphone and the microphone for audibly coupling the earphone and the microphone

to a person. Alternatively, the earphone and the microphone are replaceable with a sound transducer and a bone vibrator respectively for transducing between sound signals and vibration.

Each of the earphone and the microphone is coupled to the circuit board 206 by a component cable 209. The circuit board 206 is further for processing sound signals received from the microphone and for amplifying sound signals for transmission to the earphone.

Preferably, the circuit board 206 is further connected to a transceiver (not shown) for transceiving sound signals to and from another transceiver, for example an RF transceiver or a HF transceiver, to enable communication between two or more persons.

Referring to Fig. 5 and Fig. 2, the interface cable 208 is coupled to the circuit board 206 by a connector 212, for example, a Molex connector. The connector 212 is operable for physically coupling the interface cable 208 or physically decoupling the interface cable 208 from the circuit board 206. The interface cable 208 is for electrically communicating with the circuit board 206 when being physically coupled to the circuit board 206.

The component harness 100 further comprises a support structure 214 coupled to and protruding from the housing 104. The support structure 214 has a channel (not shown) formed therethrough for aligning with an opening formed in the housing 104. The support structure 214 is for substantially relieving structural strain on the interface cable 208 extending from the housing 104 and supported by the support structure 214 through the channel.

The connector 212 on the circuit board 206 enables devices of the communication headset 300, for example the earphone and the microphone, to be field-replaceable as the earphone and microphone are easily connectable to and disconnectable from the

circuit board 206 and therefore are replaceable without need for specialized tools, for example, a soldering iron.

Additionally, the connector 212 and the circuit board 206 are immobilized relative to the headband 102 of the communication headset 300 by the housing 104 and the structural joint formed with the protruding portion 106 of the headband 102 to impede undesirable relative movement when the communication headset 300 is in use.

In the foregoing manner, a component harness for being implemented as a communication headset is disclosed. Although only one embodiment of the invention is disclosed, it becomes apparent to one skilled in the art in view of this disclosure that numerous changes and/or modification can be made without departing from the scope and spirit of the invention.

Claims

1. A component harness comprising:

a headband having a protruding portion formed therealong, the headband being elongated for extending around at least one of the head and the neck of a person; and

a housing, at least a portion of the protruding portion being receivable in the housing for coupling the housing to the headband and for substantially impeding movement of the housing about and along the longitudinal axis of the headband,

wherein the protruding portion is formed substantially away from each of the extremities of the headband and the headband is for structurally coupling at least an electrical component to the headband.

2. The component harness as in claim 1, the headband being resiliently biased for clasping onto at least one of the head and the neck of the user.

3. The component harness as in claim 1, the at least an electrical component being at least one of an audio circuitry, electrical wirings and cables.

4. The component harness as in claim 1, further comprising:

a circuit board being contained in the housing; and

at least one cable electrically connected to the circuit board and extending thorough and away from the housing.

5. The component harness as in claim 4, further comprising:

a connector formed on the circuit board, the connector being operable for one of physically coupling and physically decoupling the at least one cable to the circuit board,

wherein the at least one cable electrically communicates with the circuit board when being physically coupled to the circuit board.

6. The component harness as in claim 4, further comprising:

a support structure coupled to and protruding from the housing, the support structure having a channel formed therethrough for aligning with an opening formed in the housing,

wherein the support structure is for substantially relieving structural strain from the at least one cable extending from the housing and supported by the support structure through the channel.

7. The component harness as in claim 4, further comprising:

at least one of a vibration transducer, a microphone, a bone vibrator and an earphone being coupled to at least one of the extremities of the headband,

wherein the headband positions at least one of a vibration transducer, a microphone, a bone vibrator and a earphone speaker for audibly coupling at least one of a vibration transducer, a microphone, a bone vibrator and an earphone to the person.

8. The component harness as in claim 7, the at least one of a vibration transducer, a microphone, a bone vibrator and an earphone is electrically couplable to the circuit board.

9. The component harness as in claim 1, the headband having a curvature and the protruding portion being shaped for protruding away from the curvature.

10. The component harness as in claim 1, the headband having a curvature and the protruding portion forming an arc being bent away from the curvature of the headband.

11. The component harness as in claim 10, the curvature of the headband and the arc formed by the protruding portion extending along substantially the same plane.

12. The component harness as in claim 10, each of the headband and the protruding portion having a C-shape and a concavity formed by the C-shape,

wherein the concavity of the headband substantially directionally opposes the concavity of the protruding portion.

13. The component harness as in claim 10, the arc of the protruding portion being shaped and dimensioned for forming a structural joint between the protruding portion and the housing and for impeding movement of the housing about and along the longitudinal axis of the headband.

14. The component harness as in claim 1, the housing comprising:

a first cover and a second cover being inter-couplable for forming an enclosure.

15. The component harness as in claim 1, the inside of the housing being shaped and dimensioned for substantially conforming to the shape of the protruding portion.

16. A component harness comprising:

a headband having a protruding portion formed therealong, the headband being elongated for extending around at least one of the head and the neck of a person, each of the headband and the protruding portion having a C-shape and a concavity formed by the C-shape and the concavity of the headband substantially directionally opposes the concavity of the protruding portion; and

a housing, at least a portion of the protruding portion being receivable in the housing for coupling the housing to the headband and for substantially impeding movement of the housing about and along the longitudinal axis of the headband,

wherein the headband is for structurally coupling at least an electrical component to the headband.

17. The component harness as in claim 16, the housing comprising:

a first cover and a second cover being inter-couplable for forming an enclosure,

wherein the inside of the housing is shaped and dimensioned for substantially conforming to the shape of the protruding portion, and

the at least an electrical components is at least one of an audio circuitry, electrical wirings and cables.

18. The component harness as in claim 16, further comprising:

a circuit board being contained in the housing;

at least one cable electrically connected to the circuit board and extending thorough and away from the housing; and

a connector formed on the circuit board, the connector being operable for one of physically coupling and physically decoupling the at least one cable to the circuit board,

wherein the at least one cable electrically communicates with the circuit board when being physically coupled to the circuit board.

19. The component harness as in claim 18, further comprising:

a support structure coupled to and protruding from the housing, the support structure having a channel formed therethrough for aligning with an opening formed in the housing,

wherein the support structure is for substantially relieving structural strain from the at least one cable extending from the housing and supported by the support structure through the channel.

20. The component harness as in claim 18, further comprising:

at least one of a vibration transducer, a microphone, a bone vibrator and an earphone being coupled to at least one of the extremities of the headband,

wherein the headband positions at least one of a vibration transducer, a microphone, a bone vibrator and a earphone speaker for audibly coupling at least one of a vibration transducer, a microphone, a bone vibrator and an earphone to the person, and

wherein the at least one of a vibration transducer, a microphone, a bone vibrator and an earphone is electrically couplable to the circuit board.

21. A component harness comprising:

a headband having a protruding portion formed therealong, the headband being elongated for extending around at least one of the head and the neck of a person;

a housing, at least a portion of the protruding portion being receivable in the housing for coupling the housing to the headband for forming a structural joint therebetween, the structural joint for substantially impeding movement of the housing about and along the longitudinal axis of the headband;

a circuit board being contained in the housing;

at least one cable electrically connected to the circuit board and extending thorough and away from the housing; and

a connector formed on the circuit board, the connector being operable for one of physically coupling and physically decoupling the at least one cable to the circuit board,

wherein the at least one cable electrically communicates with the circuit board when being physically coupled to the circuit board.

22. The component harness as in claim 21, further comprising:

at least one of a vibration transducer, a microphone, a bone vibrator and an earphone being coupled to at least one of the extremities of the headband,

wherein the headband positions at least one of a vibration transducer, a microphone, a bone vibrator and a earphone speaker for audibly coupling at

least one of a vibration transducer, a microphone, a bone vibrator and an earphone to the person.