		connector, and thereby the rechargeable battery of the head-worn personal electronic apparatus is able to be recharged while the head-worn personal electronic apparatus is placed in the charging apparatus. (Claims) 2. A head-worn personal electronic apparatus, comprising: a head-worn structure configured to be worn by a user; a speaker at least partially contained within the head-worn structure, the speaker being configured to be worn proximate to an ear of the user when the head-worn structure is being worn by the user; a motion detector at least partially contained within the head-worn structure and configured to provide motion data pertaining to the head-worn personal electronic apparatus; a first microphone at least partially contained within the head-worn structure, the first microphone being positioned to pick up at least audio input from at least the user; a second microphone at least partially contained within the head-worn structure; a piezoelectric device configured to receive a user input based on a force induced on the piezoelectric device, the piezoelectric device being at least partially contained within the head-worn structure, wherein the received user input operating to at least alter operation of the head-worn electronic personal audio apparatus;	

		a rechargeable battery contained within the head-worn structure; electronic circuitry contained within the head-worn structure, the electronic circuitry being electrically connected to at least the rechargeable battery; and wireless communication circuitry at least partially contained within the head-worn structure.	
L2787	Sort results by: Similarity to Application # 18/597,874 Retrieve results by: Application # 18/597,874	(Abstract) Techniques for providing eyewear or other head-worn personal electronic apparatus with electrical components are disclosed. The electrical components can provide electrical technology to eyewear or other head-worn personal electronic apparatus without having to substantially compromise aesthetic design principles. The electrical components can be partially or completely internal to eyewear or other head-worn personal electronic apparatus. The electrical components can operate independently or together with other electrical components provided elsewhere. Apparatus for presenting after-market electrical components are also disclosed. (Claims) 1. A system, comprising: a head-worn personal electronic apparatus, including at least: a head-worn structure configured to be worn by a user; a speaker at least partially contained within the head-worn structure, the speaker being configured to be worn	(G02C5/143) Side-members having special ear pieces (G02C5/146) Side-members having special front end

		proximate to an ear of the user when the head-worn structure is being worn by the user; a motion detector at least partially contained within the head-worn structure and configured to provide motion data pertaining to the head-worn personal electronic apparatus; a first microphone at least partially contained within the head-worn structure, the first microphone being positioned to pick up at least audio input from at least the user; a second microphone at least partially contained within the head-worn structure; a piezoelectric device configured to receive a user input based on a force induced on the piezoelectric device, the piezoelectric device being at least partially contained within the head-worn structure, wherein the received user input operating to at least alter operation of the head-worn electronic personal audio apparatus; a rechargeable battery contained within the head-worn structure; electronic circuitry contained within the head-worn structure, the electronic circuitry being electrically connected to at least the rechargeable battery; wireless communication circuitry at least partially contained within the head-worn structure, the wireless communication circuitry being electrically connected to at least the rechargeable battery; and at least one conductive	

		element at least partially included within the head-worn structure, the at least one conductive element being at least partially exposed to enable interconnection therewith, the at least one conductive element being electrically connected to at least the rechargeable battery; and a charging apparatus having at least a charging connector, wherein on placement of the head-worn personal electronic apparatus in the charging apparatus, electrical connection results at least from the at least one conductive element connecting with the charging connector, and thereby the rechargeable battery of the head-worn personal electronic apparatus is able to be recharged while the head-worn personal electronic apparatus is placed in the charging apparatus. (Claims) 2. A head-worn personal electronic apparatus, comprising: a head-worn structure configured to be worn by a user; a speaker at least partially contained within the head-worn structure, the speaker being configured to be worn proximate to an ear of the user when the head-worn structure is being worn by the user; a motion detector at least partially contained within the head-worn structure and configured to provide motion data pertaining to the head-worn personal electronic apparatus; a first microphone at least	

		partially contained within the head-worn structure, the first microphone being positioned to pick up at least audio input from at least the user; a second microphone at least partially contained within the head-worn structure; a piezoelectric device configured to receive a user input based on a force induced on the piezoelectric device, the piezoelectric device being at least partially contained within the head-worn structure, wherein the received user input operating to at least alter operation of the head-worn electronic personal audio apparatus; a rechargeable battery contained within the head-worn structure; electronic circuitry contained within the head-worn structure, the electronic circuitry being electrically connected to at least the rechargeable battery; and wireless communication circuitry at least partially contained within the head-worn structure.	
L2788	Sort results by: Similarity to Application # 18/597,874 Retrieve results by: Application # 18/597,874	(Abstract) Techniques for providing eyewear or other head-worn personal electronic apparatus with electrical components are disclosed. The electrical components can provide electrical technology to eyewear or other head-worn personal electronic apparatus without having to substantially compromise aesthetic design principles. The electrical components can be partially or completely internal to eyewear or other head-worn personal electronic apparatus. The electrical components can operate independently or together with	(G02C5/143) Side-members having special ear pieces (G02C5/146) Side-members having special front end (G02C11/06) Hearing aids (G02C11/10) Electronic devices other than hearing aids

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		other electrical components provided elsewhere. Apparatus for presenting after-market electrical components are also disclosed. (Claims) 1. A system, comprising: a head-worn personal electronic apparatus, including at least: a head-worn structure configured to be worn by a user; a speaker at least partially contained within the head-worn structure, the speaker being configured to be worn proximate to an ear of the user when the head-worn structure is being worn by the user; a motion detector at least partially contained within the head-worn structure and configured to provide motion data pertaining to the head-worn personal electronic apparatus; a first microphone at least partially contained within the head-worn structure, the first microphone being positioned to pick up at least audio input from at least the user; a second microphone at least partially contained within the head-worn structure; a piezoelectric device configured to receive a user input based on a force induced on the piezoelectric device, the piezoelectric device being at least partially contained within the head-worn structure, wherein the received user input operating to at least alter operation of the head-worn electronic	

		personal audio apparatus; a rechargeable battery contained within the head-worn structure; electronic circuitry contained within the head-worn structure, the electronic circuitry being electrically connected to at least the rechargeable battery; wireless communication circuitry at least partially contained within the head-worn structure, the wireless communication circuitry being electrically connected to at least the rechargeable battery; and at least one conductive element at least partially included within the head-worn structure, the at least one conductive element being at least partially exposed to enable interconnection therewith, the at least one conductive element being electrically connected to at least the rechargeable battery; and a charging apparatus having at least a charging connector, wherein on placement of the head-worn personal electronic apparatus in the charging apparatus, electrical connection results at least from the at least one conductive element connecting with the charging connector, and thereby the rechargeable battery of the head-worn personal electronic apparatus is able to be recharged while the head-worn personal electronic apparatus is placed in the charging apparatus. (Claims) 2. A head-worn personal electronic apparatus, comprising:	

		a head-worn structure configured to be worn by a user; a speaker at least partially contained within the head-worn structure, the speaker being configured to be worn proximate to an ear of the user when the head-worn structure is being worn by the user; a motion detector at least partially contained within the head-worn structure and configured to provide motion data pertaining to the head-worn personal electronic apparatus; a first microphone at least partially contained within the head-worn structure, the first microphone being positioned to pick up at least audio input from at least the user; a second microphone at least partially contained within the head-worn structure; a piezoelectric device configured to receive a user input based on a force induced on the piezoelectric device, the piezoelectric device being at least partially contained within the head-worn structure, wherein the received user input operating to at least alter operation of the head-worn electronic personal audio apparatus; a rechargeable battery contained within the head-worn structure; electronic circuitry contained within the head-worn structure, the electronic circuitry being electrically connected to at least the rechargeable battery; and wireless communication	

		circuitry at least partially contained within the head-worn structure.	
L2789	Sort results by: Similarity to Application # 18/597,874 Retrieve results by: Application # 18/597,874	(Abstract) Techniques for providing eyewear or other head-worn personal electronic apparatus with electrical components are disclosed. The electrical components can provide electrical technology to eyewear or other head-worn personal electronic apparatus without having to substantially compromise aesthetic design principles. The electrical components can be partially or completely internal to eyewear or other head-worn personal electronic apparatus. The electrical components can operate independently or together with other electrical components provided elsewhere. Apparatus for presenting after-market electrical components are also disclosed. (Claims) 1. A system, comprising: a head-worn personal electronic apparatus, including at least: a head-worn structure configured to be worn by a user; a speaker at least partially contained within the head-worn structure, the speaker being configured to be worn proximate to an ear of the user when the head-worn structure is being worn by the user; a motion detector at least partially contained within the head-worn structure and configured to provide motion data pertaining to the head-worn personal electronic apparatus;	(G02C5/143) Side-members having special ear pieces (G02C5/146) Side-members having special front end (G02C11/06) Hearing aids (G02C11/10) Electronic devices other than hearing aids (G02C2200/08) Modular frames, easily exchangeable frame parts and lenses (H02J7/0045) Circuit arrangements for charging or depolarising batteries or for supplying loads from batteries characterised by the mechanical construction concerning the insertion or the connection of the batteries

		a first microphone at least partially contained within the head-worn structure, the first microphone being positioned to pick up at least audio input from at least the user; a second microphone at least partially contained within the head-worn structure; a piezoelectric device configured to receive a user input based on a force induced on the piezoelectric device, the piezoelectric device being at least partially contained within the head-worn structure, wherein the received user input operating to at least alter operation of the head-worn electronic personal audio apparatus; a rechargeable battery contained within the head-worn structure; electronic circuitry contained within the head-worn structure, the electronic circuitry being electrically connected to at least the rechargeable battery; wireless communication circuitry at least partially contained within the head-worn structure, the wireless communication circuitry being electrically connected to at least the rechargeable battery; and at least one conductive element at least partially included within the head-worn structure, the at least one conductive element being at least partially exposed to enable interconnection therewith, the at least one conductive element being electrically connected to at least the rechargeable battery; and	

		a charging apparatus having at least a charging connector, wherein on placement of the head-worn personal electronic apparatus in the charging apparatus, electrical connection results at least from the at least one conductive element connecting with the charging connector, and thereby the rechargeable battery of the head-worn personal electronic apparatus is able to be recharged while the head-worn personal electronic apparatus is placed in the charging apparatus. (Claims) 2. A head-worn personal electronic apparatus, comprising: a head-worn structure configured to be worn by a user; a speaker at least partially contained within the head-worn structure, the speaker being configured to be worn proximate to an ear of the user when the head-worn structure is being worn by the user; a motion detector at least partially contained within the head-worn structure and configured to provide motion data pertaining to the head-worn personal electronic apparatus; a first microphone at least partially contained within the head-worn structure, the first microphone being positioned to pick up at least audio input from at least the user; a second microphone at least partially contained within the head-worn structure; a piezoelectric device configured to receive a user	

		input based on a force induced on the piezoelectric device, the piezoelectric device being at least partially contained within the head-worn structure, wherein the received user input operating to at least alter operation of the head-worn electronic personal audio apparatus; a rechargeable battery contained within the head-worn structure; electronic circuitry contained within the head-worn structure, the electronic circuitry being electrically connected to at least the rechargeable battery; and wireless communication circuitry at least partially contained within the head-worn structure.	
L2901	Sort results by: Similarity to Application # 18/597,874 Retrieve results by: Application # 18/597,874	(Abstract) Techniques for providing eyewear or other head-worn personal electronic apparatus with electrical components are disclosed. The electrical components can provide electrical technology to eyewear or other head-worn personal electronic apparatus without having to substantially compromise aesthetic design principles. The electrical components can be partially or completely internal to eyewear or other head-worn personal electronic apparatus. The electrical components can operate independently or together with other electrical components provided elsewhere. Apparatus for presenting after-market electrical components are also disclosed. (Claims) a head-worn personal electronic apparatus, including at least: a head-worn structure configured to be worn by a	No selections

		user; a speaker at least partially contained within the head-worn structure, the speaker being configured to be worn proximate to an ear of the user when the head-worn structure is being worn by the user; a motion detector at least partially contained within the head-worn structure and configured to provide motion data pertaining to the head-worn personal electronic apparatus; a first microphone at least partially contained within the head-worn structure, the first microphone being positioned to pick up at least audio input from at least the user; a second microphone at least partially contained within the head-worn structure; a piezoelectric device configured to receive a user input based on a force induced on the piezoelectric device, the piezoelectric device being contained within the head-worn structure, wherein the received user input operating to at least alter an operation of the head-worn personal electronic apparatus; a rechargeable battery contained within the head-worn structure; electronic circuitry contained within the head-worn structure, the electronic circuitry being electrically connected to at least the rechargeable battery; 1. (Previously Presented) A system, comprising: wireless communication circuitry at least partially	

		contained within the head-worn structure, the wireless communication circuitry being electrically connected to at least the rechargeable battery; and (Claims) at least one conductive element at least partially included within the head-worn structure, the at least one conductive element being at least partially exposed to enable interconnection therewith, the at least one conductive element being electrically connected to at least the rechargeable battery; and a charging apparatus having at least a charging connector, wherein on placement of the head-worn personal electronic apparatus at least partially in the charging apparatus, electrical connection is configured to result at least from the at least one conductive element connecting with the charging connector, and thereby the rechargeable battery of the head-worn personal electronic apparatus is able to be recharged while the head-worn personal electronic apparatus is placed at least partially in the charging apparatus. a head-worn structure configured to be worn by a user; a speaker at least partially contained within the head-worn structure, the speaker being configured to be worn proximate to an ear of the user when the head-worn structure is being worn by the user; a motion detector at least partially contained within the head-worn structure and	

		configured to provide motion data pertaining to the head-worn personal electronic apparatus; a first microphone at least partially contained within the head-worn structure, the first microphone being positioned to pick up at least audio input from at least the user; a second microphone at least partially contained within the head-worn structure; 2. (Previously Presented) A head-worn personal electronic apparatus, comprising: a piezoelectric device configured to receive a user input based on a force induced on the piezoelectric device, the piezoelectric device being contained within the head-worn structure, wherein the received user input operating to at least alter an operation of the head-worn personal electronic apparatus; a rechargeable battery contained within the head-worn structure; electronic circuitry contained within the head-worn structure, the electronic circuitry being electrically connected to at least the rechargeable battery; and wireless communication circuitry at least partially contained within the head-worn structure. (Claims) 72. (New) A head-worn personal electronic apparatus, comprising: a rechargeable battery contained within the head-worn structure; electronic circuitry contained within the head-worn	

		structure, the electronic circuitry being electrically connected to at least the rechargeable battery; wireless communication circuitry at least partially contained within the head-worn structure; at least one conductive element at least partially included within the head- worn structure, the at least one conductive element being at least partially exposed to enable interconnection therewith, the at least one conductive element being electrically connected to at least the rechargeable battery; and a radiation detector contained within the head-worn structure and configured to capture radiation data, wherein the head-worn personal electronic apparatus is configured to determine whether the head-worn personal electronic apparatus is being worn by the user based on the radiation data captured by the radiation detector, and wherein the second microphone is configured to at least pick-up an environmental audio input. the head-worn structure, wherein the received user input operating to at least alter an operation of the head-worn personal electronic apparatus; (Claims) 95. (New) A head-worn personal electronic apparatus, comprising: a motion sensor at least partially contained within the head-worn structure and configured to provide motion data pertaining to the head-	

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		worn personal electronic apparatus; a first microphone at least partially contained within the head-worn structure, the first microphone being positioned to pick up at least audio input from at least the user; a second microphone at least partially contained within the head-worn structure; a display at least partially contained within the head-worn structure, the display configured to present information to the user of the head-worn personal electronic apparatus; a rechargeable battery contained within the head-worn structure; electronic circuitry contained within the head-worn structure, the electronic circuitry being electrically connected to at least the rechargeable battery; and wireless communication circuitry at least partially contained within the head-worn structure. (Claims) a head-worn structure configured to be worn by a user, the head-worn structure including a front section and first and second temples; a first speaker at least partially contained within the first temple of the head- worn structure; a second speaker at least partially contained within the second temple of the head-worn structure; a motion sensor at least partially contained within the head-worn structure and	

		configured to provide motion data pertaining to the head-worn personal electronic apparatus; a microphone at least partially contained within the head-worn structure, the microphone being positioned to pick up at least audio input from at least the user; a display at least partially contained within the head-worn structure, the display configured to present information to the user of the head-worn personal electronic apparatus; electronic circuitry contained within the head-worn structure and configured to control the display to present the information to the user of the head-worn personal electronic apparatus; and data communication circuitry at least partially contained within the head-worn structure. 100. (New) A head-worn personal electronic apparatus, comprising: (Claims) 08. (New) A head-worn personal electronic apparatus, comprising: a first microphone at least partially contained within the head-worn structure, the first microphone being positioned to pick up at least audio input from at least the user; a second microphone at least partially contained within the head-worn structure; a first optical sensor at least partially contained within the first extended endpiece; a second optical sensor at least partially contained within	

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		the second extended endpiece; a rechargeable battery contained within the head-worn structure; electronic circuitry contained within the head-worn structure, the electronic circuitry being electrically connected to at least the rechargeable battery; and wireless communication circuitry at least partially contained within the head-worn structure. a processor at least partially contained within the head-worn structure and configured to control operation of the head-worn personal electronic apparatus;	
L2902	Sort results by: Similarity to Application # 18/597,874 Retrieve results by: Application # 18/597,874	(Abstract) Techniques for providing eyewear or other head-worn personal electronic apparatus with electrical components are disclosed. The electrical components can provide electrical technology to eyewear or other head-worn personal electronic apparatus without having to substantially compromise aesthetic design principles. The electrical components can be partially or completely internal to eyewear or other head-worn personal electronic apparatus. The electrical components can operate independently or together with other electrical components provided elsewhere. Apparatus for presenting after-market electrical components are also disclosed. (Claims) a head-worn personal electronic apparatus, including at least: a head-worn structure configured to be worn by a user;	(G02C5/146) Side-members having special front end (G02C5/143) Side-members having special ear pieces

		a speaker at least partially contained within the head-worn structure, the speaker being configured to be worn proximate to an ear of the user when the head-worn structure is being worn by the user; a motion detector at least partially contained within the head-worn structure and configured to provide motion data pertaining to the head-worn personal electronic apparatus; a first microphone at least partially contained within the head-worn structure, the first microphone being positioned to pick up at least audio input from at least the user; a second microphone at least partially contained within the head-worn structure; a piezoelectric device configured to receive a user input based on a force induced on the piezoelectric device, the piezoelectric device being contained within the head-worn structure, wherein the received user input operating to at least alter an operation of the head-worn personal electronic apparatus; a rechargeable battery contained within the head-worn structure; electronic circuitry contained within the head-worn structure, the electronic circuitry being electrically connected to at least the rechargeable battery; 1. (Previously Presented) A system, comprising: wireless communication circuitry at least partially contained within the head-	

		worn structure, the wireless communication circuitry being electrically connected to at least the rechargeable battery; and (Claims) at least one conductive element at least partially included within the head-worn structure, the at least one conductive element being at least partially exposed to enable interconnection therewith, the at least one conductive element being electrically connected to at least the rechargeable battery; and a charging apparatus having at least a charging connector, wherein on placement of the head-worn personal electronic apparatus at least partially in the charging apparatus, electrical connection is configured to result at least from the at least one conductive element connecting with the charging connector, and thereby the rechargeable battery of the head-worn personal electronic apparatus is able to be recharged while the head-worn personal electronic apparatus is placed at least partially in the charging apparatus. a head-worn structure configured to be worn by a user; a speaker at least partially contained within the head-worn structure, the speaker being configured to be worn proximate to an ear of the user when the head-worn structure is being worn by the user; a motion detector at least partially contained within the head-worn structure and configured to provide motion	

		data pertaining to the head-worn personal electronic apparatus; a first microphone at least partially contained within the head-worn structure, the first microphone being positioned to pick up at least audio input from at least the user; a second microphone at least partially contained within the head-worn structure; 2. (Previously Presented) A head-worn personal electronic apparatus, comprising: a piezoelectric device configured to receive a user input based on a force induced on the piezoelectric device, the piezoelectric device being contained within the head-worn structure, wherein the received user input operating to at least alter an operation of the head-worn personal electronic apparatus; a rechargeable battery contained within the head-worn structure; electronic circuitry contained within the head-worn structure, the electronic circuitry being electrically connected to at least the rechargeable battery; and wireless communication circuitry at least partially contained within the head-worn structure. (Claims) 72. (New) A head-worn personal electronic apparatus, comprising: a rechargeable battery contained within the head-worn structure; electronic circuitry contained within the head-worn structure, the electronic	

		circuitry being electrically connected to at least the rechargeable battery; wireless communication circuitry at least partially contained within the head-worn structure; at least one conductive element at least partially included within the head- worn structure, the at least one conductive element being at least partially exposed to enable interconnection therewith, the at least one conductive element being electrically connected to at least the rechargeable battery; and a radiation detector contained within the head-worn structure and configured to capture radiation data, wherein the head-worn personal electronic apparatus is configured to determine whether the head-worn personal electronic apparatus is being worn by the user based on the radiation data captured by the radiation detector, and wherein the second microphone is configured to at least pick-up an environmental audio input. the head-worn structure, wherein the received user input operating to at least alter an operation of the head-worn personal electronic apparatus; (Claims) 95. (New) A head-worn personal electronic apparatus, comprising: a motion sensor at least partially contained within the head-worn structure and configured to provide motion data pertaining to the head-worn personal electronic	

		apparatus; a first microphone at least partially contained within the head-worn structure, the first microphone being positioned to pick up at least audio input from at least the user; a second microphone at least partially contained within the head-worn structure; a display at least partially contained within the head-worn structure, the display configured to present information to the user of the head-worn personal electronic apparatus; a rechargeable battery contained within the head-worn structure; electronic circuitry contained within the head-worn structure, the electronic circuitry being electrically connected to at least the rechargeable battery; and wireless communication circuitry at least partially contained within the head-worn structure. (Claims) a head-worn structure configured to be worn by a user, the head-worn structure including a front section and first and second temples; a first speaker at least partially contained within the first temple of the head- worn structure; a second speaker at least partially contained within the second temple of the head-worn structure; a motion sensor at least partially contained within the head-worn structure and configured to provide motion	

		data pertaining to the head-worn personal electronic apparatus; a microphone at least partially contained within the head-worn structure, the microphone being positioned to pick up at least audio input from at least the user; a display at least partially contained within the head-worn structure, the display configured to present information to the user of the head-worn personal electronic apparatus; electronic circuitry contained within the head-worn structure and configured to control the display to present the information to the user of the head-worn personal electronic apparatus; and data communication circuitry at least partially contained within the head-worn structure. 100. (New) A head-worn personal electronic apparatus, comprising: (Claims) 08. (New) A head-worn personal electronic apparatus, comprising: a first microphone at least partially contained within the head-worn structure, the first microphone being positioned to pick up at least audio input from at least the user; a second microphone at least partially contained within the head-worn structure; a first optical sensor at least partially contained within the first extended endpiece; a second optical sensor at least partially contained within the second extended	

		endpiece; a rechargeable battery contained within the head-worn structure; electronic circuitry contained within the head-worn structure, the electronic circuitry being electrically connected to at least the rechargeable battery; and wireless communication circuitry at least partially contained within the head-worn structure. a processor at least partially contained within the head-worn structure and configured to control operation of the head-worn personal electronic apparatus;	
L2903	Sort results by: Similarity to Application # 18/597,874 Retrieve results by: Application # 18/597,874	(Abstract) Techniques for providing eyewear or other head-worn personal electronic apparatus with electrical components are disclosed. The electrical components can provide electrical technology to eyewear or other head-worn personal electronic apparatus without having to substantially compromise aesthetic design principles. The electrical components can be partially or completely internal to eyewear or other head-worn personal electronic apparatus. The electrical components can operate independently or together with other electrical components provided elsewhere. Apparatus for presenting after-market electrical components are also disclosed. (Claims) a head-worn personal electronic apparatus, including at least: a head-worn structure configured to be worn by a user;	(G02C5/146) Side-members having special front end (G02C5/143) Side-members having special ear pieces (G02C11/06) Hearing aids (G02C11/10) Electronic devices other than hearing aids

		a speaker at least partially contained within the head-worn structure, the speaker being configured to be worn proximate to an ear of the user when the head-worn structure is being worn by the user; a motion detector at least partially contained within the head-worn structure and configured to provide motion data pertaining to the head-worn personal electronic apparatus; a first microphone at least partially contained within the head-worn structure, the first microphone being positioned to pick up at least audio input from at least the user; a second microphone at least partially contained within the head-worn structure; a piezoelectric device configured to receive a user input based on a force induced on the piezoelectric device, the piezoelectric device being contained within the head-worn structure, wherein the received user input operating to at least alter an operation of the head-worn personal electronic apparatus; a rechargeable battery contained within the head-worn structure; electronic circuitry contained within the head-worn structure, the electronic circuitry being electrically connected to at least the rechargeable battery; 1. (Previously Presented) A system, comprising: wireless communication circuitry at least partially contained within the head-worn structure, the wireless	

		communication circuitry being electrically connected to at least the rechargeable battery; and (Claims) at least one conductive element at least partially included within the head-worn structure, the at least one conductive element being at least partially exposed to enable interconnection therewith, the at least one conductive element being electrically connected to at least the rechargeable battery; and a charging apparatus having at least a charging connector, wherein on placement of the head-worn personal electronic apparatus at least partially in the charging apparatus, electrical connection is configured to result at least from the at least one conductive element connecting with the charging connector, and thereby the rechargeable battery of the head-worn personal electronic apparatus is able to be recharged while the head-worn personal electronic apparatus is placed at least partially in the charging apparatus. a head-worn structure configured to be worn by a user; a speaker at least partially contained within the head-worn structure, the speaker being configured to be worn proximate to an ear of the user when the head-worn structure is being worn by the user; a motion detector at least partially contained within the head-worn structure and configured to provide motion data pertaining to the head-	

		worn personal electronic apparatus; a first microphone at least partially contained within the head-worn structure, the first microphone being positioned to pick up at least audio input from at least the user; a second microphone at least partially contained within the head-worn structure; 2. (Previously Presented) A head-worn personal electronic apparatus, comprising: a piezoelectric device configured to receive a user input based on a force induced on the piezoelectric device, the piezoelectric device being contained within the head-worn structure, wherein the received user input operating to at least alter an operation of the head-worn personal electronic apparatus; a rechargeable battery contained within the head-worn structure; electronic circuitry contained within the head-worn structure, the electronic circuitry being electrically connected to at least the rechargeable battery; and wireless communication circuitry at least partially contained within the head-worn structure. (Claims) 72. (New) A head-worn personal electronic apparatus, comprising: a rechargeable battery contained within the head-worn structure; electronic circuitry contained within the head-worn structure, the electronic circuitry being electrically	

		connected to at least the rechargeable battery; wireless communication circuitry at least partially contained within the head-worn structure; at least one conductive element at least partially included within the head- worn structure, the at least one conductive element being at least partially exposed to enable interconnection therewith, the at least one conductive element being electrically connected to at least the rechargeable battery; and a radiation detector contained within the head-worn structure and configured to capture radiation data, wherein the head-worn personal electronic apparatus is configured to determine whether the head-worn personal electronic apparatus is being worn by the user based on the radiation data captured by the radiation detector, and wherein the second microphone is configured to at least pick-up an environmental audio input. the head-worn structure, wherein the received user input operating to at least alter an operation of the head-worn personal electronic apparatus; (Claims) 95. (New) A head-worn personal electronic apparatus, comprising: a motion sensor at least partially contained within the head-worn structure and configured to provide motion data pertaining to the head-worn personal electronic apparatus;	

		a first microphone at least partially contained within the head-worn structure, the first microphone being positioned to pick up at least audio input from at least the user; a second microphone at least partially contained within the head-worn structure; a display at least partially contained within the head-worn structure, the display configured to present information to the user of the head-worn personal electronic apparatus; a rechargeable battery contained within the head-worn structure; electronic circuitry contained within the head-worn structure, the electronic circuitry being electrically connected to at least the rechargeable battery; and wireless communication circuitry at least partially contained within the head-worn structure. (Claims) a head-worn structure configured to be worn by a user, the head-worn structure including a front section and first and second temples; a first speaker at least partially contained within the first temple of the head- worn structure; a second speaker at least partially contained within the second temple of the head-worn structure; a motion sensor at least partially contained within the head-worn structure and configured to provide motion data pertaining to the head-	

		worn personal electronic apparatus; a microphone at least partially contained within the head-worn structure, the microphone being positioned to pick up at least audio input from at least the user; a display at least partially contained within the head-worn structure, the display configured to present information to the user of the head-worn personal electronic apparatus; electronic circuitry contained within the head-worn structure and configured to control the display to present the information to the user of the head-worn personal electronic apparatus; and data communication circuitry at least partially contained within the head-worn structure. 100. (New) A head-worn personal electronic apparatus, comprising: (Claims) 08. (New) A head-worn personal electronic apparatus, comprising: a first microphone at least partially contained within the head-worn structure, the first microphone being positioned to pick up at least audio input from at least the user; a second microphone at least partially contained within the head-worn structure; a first optical sensor at least partially contained within the first extended endpiece; a second optical sensor at least partially contained within the second extended endpiece;	

		a rechargeable battery contained within the head-worn structure; electronic circuitry contained within the head-worn structure, the electronic circuitry being electrically connected to at least the rechargeable battery; and wireless communication circuitry at least partially contained within the head-worn structure. a processor at least partially contained within the head-worn structure and configured to control operation of the head-worn personal electronic apparatus;	
L2904	Sort results by: Similarity to Application # 18/597,874 Retrieve results by: Application # 18/597,874	(Abstract) Techniques for providing eyewear or other head-worn personal electronic apparatus with electrical components are disclosed. The electrical components can provide electrical technology to eyewear or other head-worn personal electronic apparatus without having to substantially compromise aesthetic design principles. The electrical components can be partially or completely internal to eyewear or other head-worn personal electronic apparatus. The electrical components can operate independently or together with other electrical components provided elsewhere. Apparatus for presenting after-market electrical components are also disclosed. (Claims) a head-worn personal electronic apparatus, including at least: a head-worn structure configured to be worn by a user; a speaker at least partially	(G02C5/146) Side-members having special front end (G02C5/143) Side-members having special ear pieces (G02C11/06) Hearing aids (G02C11/10) Electronic devices other than hearing aids (G02C2200/08) Modular frames, easily exchangeable frame parts and lenses (H02J7/0045) Circuit arrangements for charging or depolarising batteries or for supplying loads from batteries characterised by the mechanical construction concerning the insertion or the connection of the batteries

		contained within the head-worn structure, the speaker being configured to be worn proximate to an ear of the user when the head-worn structure is being worn by the user; a motion detector at least partially contained within the head-worn structure and configured to provide motion data pertaining to the head-worn personal electronic apparatus; a first microphone at least partially contained within the head-worn structure, the first microphone being positioned to pick up at least audio input from at least the user; a second microphone at least partially contained within the head-worn structure; a piezoelectric device configured to receive a user input based on a force induced on the piezoelectric device, the piezoelectric device being contained within the head-worn structure, wherein the received user input operating to at least alter an operation of the head-worn personal electronic apparatus; a rechargeable battery contained within the head-worn structure; electronic circuitry contained within the head-worn structure, the electronic circuitry being electrically connected to at least the rechargeable battery; 1. (Previously Presented) A system, comprising: wireless communication circuitry at least partially contained within the head-worn structure, the wireless communication circuitry being	

		electrically connected to at least the rechargeable battery; and (Claims) at least one conductive element at least partially included within the head-worn structure, the at least one conductive element being at least partially exposed to enable interconnection therewith, the at least one conductive element being electrically connected to at least the rechargeable battery; and a charging apparatus having at least a charging connector, wherein on placement of the head-worn personal electronic apparatus at least partially in the charging apparatus, electrical connection is configured to result at least from the at least one conductive element connecting with the charging connector, and thereby the rechargeable battery of the head-worn personal electronic apparatus is able to be recharged while the head-worn personal electronic apparatus is placed at least partially in the charging apparatus. a head-worn structure configured to be worn by a user; a speaker at least partially contained within the head-worn structure, the speaker being configured to be worn proximate to an ear of the user when the head-worn structure is being worn by the user; a motion detector at least partially contained within the head-worn structure and configured to provide motion data pertaining to the head-worn personal electronic	

		apparatus; a first microphone at least partially contained within the head-worn structure, the first microphone being positioned to pick up at least audio input from at least the user; a second microphone at least partially contained within the head-worn structure; 2. (Previously Presented) A head-worn personal electronic apparatus, comprising: a piezoelectric device configured to receive a user input based on a force induced on the piezoelectric device, the piezoelectric device being contained within the head-worn structure, wherein the received user input operating to at least alter an operation of the head-worn personal electronic apparatus; a rechargeable battery contained within the head-worn structure; electronic circuitry contained within the head-worn structure, the electronic circuitry being electrically connected to at least the rechargeable battery; and wireless communication circuitry at least partially contained within the head-worn structure. (Claims) 72. (New) A head-worn personal electronic apparatus, comprising: a rechargeable battery contained within the head-worn structure; electronic circuitry contained within the head-worn structure, the electronic circuitry being electrically connected to at least the	

		rechargeable battery; wireless communication circuitry at least partially contained within the head-worn structure; at least one conductive element at least partially included within the head- worn structure, the at least one conductive element being at least partially exposed to enable interconnection therewith, the at least one conductive element being electrically connected to at least the rechargeable battery; and a radiation detector contained within the head-worn structure and configured to capture radiation data, wherein the head-worn personal electronic apparatus is configured to determine whether the head-worn personal electronic apparatus is being worn by the user based on the radiation data captured by the radiation detector, and wherein the second microphone is configured to at least pick-up an environmental audio input. the head-worn structure, wherein the received user input operating to at least alter an operation of the head-worn personal electronic apparatus; (Claims) 95. (New) A head-worn personal electronic apparatus, comprising: a motion sensor at least partially contained within the head-worn structure and configured to provide motion data pertaining to the head-worn personal electronic apparatus;	

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		a first microphone at least partially contained within the head-worn structure, the first microphone being positioned to pick up at least audio input from at least the user; a second microphone at least partially contained within the head-worn structure; a display at least partially contained within the head-worn structure, the display configured to present information to the user of the head-worn personal electronic apparatus; a rechargeable battery contained within the head-worn structure; electronic circuitry contained within the head-worn structure, the electronic circuitry being electrically connected to at least the rechargeable battery; and wireless communication circuitry at least partially contained within the head-worn structure. (Claims) a head-worn structure configured to be worn by a user, the head-worn structure including a front section and first and second temples; a first speaker at least partially contained within the first temple of the head- worn structure; a second speaker at least partially contained within the second temple of the head-worn structure; a motion sensor at least partially contained within the head-worn structure and configured to provide motion data pertaining to the head-worn personal electronic	

		apparatus; a microphone at least partially contained within the head-worn structure, the microphone being positioned to pick up at least audio input from at least the user; a display at least partially contained within the head-worn structure, the display configured to present information to the user of the head-worn personal electronic apparatus; electronic circuitry contained within the head-worn structure and configured to control the display to present the information to the user of the head-worn personal electronic apparatus; and data communication circuitry at least partially contained within the head-worn structure. 100. (New) A head-worn personal electronic apparatus, comprising: (Claims) 08. (New) A head-worn personal electronic apparatus, comprising: a first microphone at least partially contained within the head-worn structure, the first microphone being positioned to pick up at least audio input from at least the user; a second microphone at least partially contained within the head-worn structure; a first optical sensor at least partially contained within the first extended endpiece; a second optical sensor at least partially contained within the second extended endpiece;	

		a rechargeable battery contained within the head-worn structure; electronic circuitry contained within the head-worn structure, the electronic circuitry being electrically connected to at least the rechargeable battery; and wireless communication circuitry at least partially contained within the head-worn structure. a processor at least partially contained within the head-worn structure and configured to control operation of the head-worn personal electronic apparatus;	

Bibliographic Data

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35 USC 119 (a-d) conditions met: ☐ Yes ☑ No ☐ Met After Allowance

Verified and Acknowledged: /JIE LEI/ (Examiner's Signature) | (Initials)

Title: SYSTEM FOR CHARGING EMBEDDED BATTERY IN WIRELESS HEAD-WORN PERSONAL ELECTRONIC APPARATUS

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
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CONTINUING DATA

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FOREIGN APPLICATIONS

IF REQUIRED, FOREIGN LICENSE GRANTED**

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FILING FEE RECEIVED

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: HOWELL et al.	Attorney Docket No.: IPVCP003X1C4X1C2
Application No.: 18/597,874	Examiner: LEI, JIE
Filed: March 6, 2024	Group: 2872
Title: SYSTEM FOR CHARGING EMBEDDED BATTERY IN WIRELESS HEAD-WORN PERSONAL ELECTRONIC APPARATUS	

INFORMATION DISCLOSURE STATEMENT
37 CFR §§1.56 AND 1.97(b)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

The references listed in the attached PTO Form 1449, copies of which are attached, may be material to examination of the above-identified patent application. Applicant submits these references in compliance with their duty of disclosure pursuant to 37 CFR §§1.56 and 1.97. The Examiner is requested to make these references of official record in this application.

Under their duty of disclosure, Applicant hereby submits copies of the cited references, other than the U.S. patent publications of the U.S. Patent and Trademark Office.

Applicants would also like to inform the Patent Office of a potentially related case, as follows: United States International Trade Commission Investigation No. 337-TA-1423, filed on October 10, 2024 pertaining to U.S. Patent Nos. 10,310,296; 11,762,224, and 12,078,870.

This Information Disclosure Statement is not to be construed as a representation that a search has been made, that additional information material to the examination of this application does not exist, or that these references indeed constitute prior art.

This Information Disclosure Statement is: (i) filed within three (3) months of the filing date of the above-referenced application, (ii) believed to be filed before the mailing date of a first Office Action on the merits, or (iii) believed to be filed before the mailing of a first Office Action after the filing of a Request for Continued Examination under §1.114.

Accordingly, it is believed that no fees are due in connection with the filing of this Information Disclosure Statement. However, if it is determined that any fees are due, the Commissioner is hereby authorized to charge such fees to Deposit Account 50-3874 (Order No. IPVCP003X1C4X1C2).

Respectfully submitted,

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Applicant	KIM, SEUNG HO
Rightholder	Seung-Ho Kim

발명의 명칭

헤드셋을 구비한 안경

Title of Invention

Glasses with headset

요약

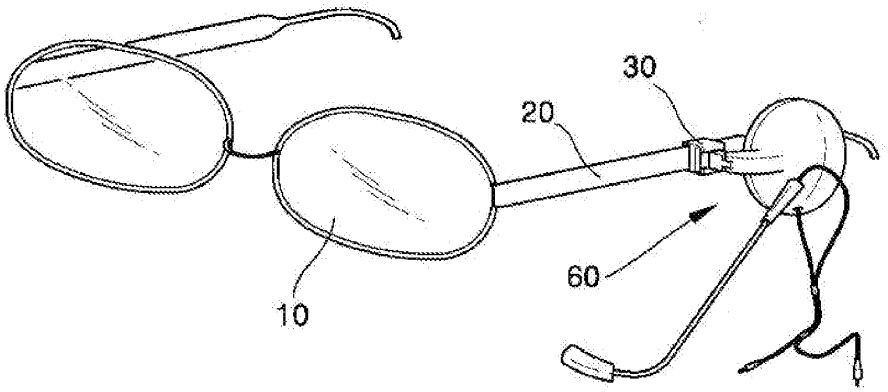
본 고안은 헤드셋을 구비한 안경에 관한 것으로, 안경테(20)에 탈착가능하게 고정설치된 베이스브라켓(30)과, 상기 베이스브라켓(30)에 슬라이드이동가능하게 삽입설치된 회동부재(40)와, 일단은 상기 회동부재(40)에 회전가능하게 결합설치되고 타단은 스피커폰(61)에 회동가능하게 힌지결합된 절첩부재(50) 및, 전기신호를 음성으로 변환하는 스피커폰(61)과, 외부기기로부터 상기 스피커폰(61)에 음성신호를 입력하는 스피커폰단자(62)와, 음성을 전기신호로 변환하는 마이크로폰(63), 상기 마이크로폰(63)에서 음성신호를 외부기기로 출력하는 마이크로폰단자(64)가 구비되어, 안경과 헤드셋(60)을 동시에 편리하게 사용할 수 있도록 된 것이다.
안경, 헤드셋

Abstract

The present invention relates to the glasses equipped with the head set, and the base bracket (30), fixed to the detachably in the glass frame (20) and the turning member (40), which is possible in the base bracket (30) with sliding is inserted and set up and the folder member (50), in which one end is pivotally connected and installed in the turning member (40) and the other end is hinged in the speaker phone (61) and the speaker phone (61), converting the electric signal into voice and the speaker phone terminal (62), inputting the audio signal to the speaker phone (61) from the external device and the microphone (63) converting voice into the electric signal, and the microphone terminal (64) outputting the audio signal in the microphone (63) to the external device are equipped and the glasses and head set (60) can be simultaneously conveniently used.
The glasses, and the head set .

대표도면(Representative drawing)

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청구의 범위

청구 1항:

안경테(20)에 헤드셋(60)이 결합수단으로 결합설치되고, 상기 헤드셋(60)은 전기신호를 음성으로 변환하는 스피커폰(61)과;외부기기로부터 상기 스피커폰(61)에 음성신호를 입력하는 스피커폰단자(62)와;안경테(20)에 결합설치되고, 음성을 전기신호로 변환하는 마이크로폰(63) 및;상기 마이크로폰(63)에서 음성신호를 외부기기로 출력하는 마이크로폰단자(64);으로 이루어진 헤드셋을 구비한 안경.

청구 2항:

제1항에 있어서, 상기 스피커폰단자(62)와 마이크로폰단자(64)는 일체형으로 되어 상기 헤드셋(60)을 휴대폰의 핸즈프리 단자(70)에 연결하여 사용할 수 있도록 된 것을 특징으로 하는 헤드셋을 구비한 안경.

청구 3항:

제1항에 있어서, 상기 결합수단은 안경테(20)에 탈착가능하게 고정설치되고, 안경테(20)의 길이방향으로 슬라이드홈(33)이 형성된 베이스브라켓(30)과;상기 베이스브라켓(30)의 슬라이드홈(33)에 슬라이드이동가능하게 삽입설치되고, 회전홈(41)이 형성된 회동부재(40)와;일단은 상기 회동부재(40)의 회전홈(41)에 회전가능하게 결합설치되고, 타단은 상기 스피커폰(61)에 회동가능하게 힌지결합된 절첩부재(50);로 이루어진 것을 특징으로 하는 헤드셋을 구비한 안경.

Scope of Claims

Claim 1:

The glasses in which the head set (60) is connected and installed in the glass frame (20) to the combining means ; and the head set (60) includes the head set consisting of the speaker phone (61) converting the electric signal into voice, the speaker phone terminal (62) inputting the audio signal to the speaker phone (61) from the external device, the microphone (63), and the microphone terminal (64) outputting the audio signal in the microphone (63) to the external device, and the microphone (63) is connected and installed in the glass frame (20) ; and converts voice into the electric signal.

Claim 2:

The glasses of claim 1, wherein the speaker phone terminal (62) and microphone terminal (64) comprise the head set that connects to the handsfree terminal (70) of the cellular phone and can use the head set (60) it becomes integrally.

Claim 3:

As for claim 1, the glasses in which the combining means includes the head set consisting of the base bracket (30), the turning member (40), and the folder member (50), and as to the base bracket (30), the slide groove (33) is formed in a longitudinal direction of the glass frame (20) the detachably is fixed in the glass frame (20); as to the, it is possible in the slide groove (33) of the base bracket (30) with sliding it is inserted and set up ; and the rotation groove (41) is formed; and as to the folder member (50), one end is pivotally connected and installed in the rotation groove (41) of the turning member (40) ; and the other end is hinged in the speaker phone (61).

배경기술

본 고안은 안경에 관한 것으로, 특히 컴퓨터에 연결하여 사용하거나 휴대폰에 연결하여 사용하는 헤드셋이 장착된 헤드셋을 구비한 안경에 관한 것이다.

일반적으로 안경은 시력을 보정하기 위한 보정용 안경과 자외

Background Art

The invention relates to the glasses, and particularly, to the glasses equipped with the head set in which the head set connected to the computer and it uses or it connects to the cellular phone and it uses is mounted.

Generally, the glasses is variously developed according

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선을 차단하기 위한 썬글라스, 바람이나 이물질로부터 눈을 보호하기 위한 보안경(고글), 컴퓨터에서 방출되는 전자파로부터 눈을 보호하기 위한 보안경 등 기능에 따라 다양하게 개발되어 있다.

to the function for protecting eye from the electromagnetic wave emitted in the computer including the glasses for the correction for amending the sight and the sunglass, for blocking the ultraviolet ray the safety glasses (goggle), for protecting eye from wind or the foreign substance the safety glasses etc.

더우기, 최근에는 컴퓨터의 사용이 폭증함에 따라 모니터를 바라보는 시간이 증가하여 컴퓨터 보안경의 사용이 늘고 있는 추세이고, 모터싸이클을 탈 때나 스키를 탈 때와 같이 강한 바람으로부터 눈을 보호하기 위한 레저용 보안경의 사용 또한 증가하고 있는 실정이다.

Besides, recently, it is the trend that the time to look at the monitor as the use of the computer increases suddenly increases and the use of *** grows and the trend moreover increases. For protecting eye from the strong wind like the time getting the motorcycle or the time which is skiing.

종래의 안경은 렌즈와 안경테로 이루어지고, 안경테를 귀에 걸어 사용하도록 되어 있으므로, 헤드폰이나 헤드셋과 같이 귀에 걸어 사용하는 장치와 함께 사용하게 되면 귀에 무리한 하중을 주는 것은 물론 협소한 공간으로 인해 귀에 압박을 가하는 등의 문제점이 있었다.

The conventional glasses is composed of the lens and glass frame. And the glass frame was set up on the ear and it was configured to use. Therefore the ear had the problem of the etc. which gave the load which was excessive in the ear if it used with the apparatus for setting up on the ear like the headphone or the head set and using and added the pressure to the ear due to the narrow space.

또한, 헤드셋은 최근 들어 폭증하고 있는 핸즈 프리용 통신장비의 하나로서, 음을 출력하는 스피커폰과 음을 입력하는 마이크로폰으로 구성되어 휴대폰이나 컴퓨터에 연결단자로 연결하고, 스피커폰을 귀에 착용하고 마이크로폰을 입주위에 위치시킴으로써 통신이 가능하도록 된 것이다.

Moreover, as one of the telecommunication device for the handsfree in which recently the head set increases suddenly, it is made up of the speaker phone outputting the negative principle in nature and the microphone inputting the negative number and it connects to the cellular phone or the computer as the connection terminal and by the speaker phone being worn in the ear and positioning the microphone around the mouth the communication is possible.

종래의 헤드셋의 경우 귀를 통해서 소리를 들어야 하는 장치이기 때문에 스피커폰이 귀를 덮게 되고, 그 스피커폰이 안착될 수 있도록 머리에 쓰거나 귀에 걸어 사용하는 것이 대부분이었다.

In case of the conventional head set, because it was the apparatus for to giving sound through the ear the speaker phone covered the ear and it was the majority to spend on the begin so that the speaker phone be settled or wear on the ear and use.

따라서, 안경을 착용하는 사용자의 경우에는 상기한 바와 같이 귀에 불편함을 주는 문제점이 있었다.

Therefore, there is a problem that in case of the user wearing the glasses, as described above, the inconvenience is given to the ear.

한편, 이러한 귀의 불편함을 해소하기 위해 이어폰을 사용하게 되면 헤드폰과는 소리의 전달효과도 다를 뿐만 아니라 이어폰의 장시간 착용에 따른 문제점들이 있어 헤드폰 사용자들은 이어폰의 사용을 기피하고 있는 현실이다.

In the meantime, if the earphone is used in order to cancel the inconvenience of such ear, , it is the reality when the effect of delivery of sound and headphone is different the headphone users evade the use of the earphone reality has the problems according to the long time wearing of the earphone

발명의 내용

Summary of Invention

발명의 효과

Effects of the Invention

이상에서 설명한 바와 같이 본 고안에 따른 헤드셋을 구비한 안경에 의하면, 안경을 착용하는 사람이 편리하게 헤드셋을 사용할 수 있고, 컴퓨터를 사용하면서 헤드셋을 사용할 경우 보안경의 역할을 할 수 있을 뿐만 아니라 특히 모터싸이클을 타거나 스키를 탈 때와 같이 보안경이 필요한 경우에도 핸드폰을 편리하게 사용할 수 있는 효과가 있다.

As illustrated in the above, it has the effect that according to the glasses equipped with the head set according to the present invention, the human wearing the glasses conveniently can use the head set and the cellular phone can be used in case of using the head set while the computer is used even in case it need the safety glasses like the time serving gets especially, the motorcycle or is skiing of the safety glasses.

기술적 과제

Technical Task

이에 본 고안은 상기한 바의 제반 문제점들을 해소하기 위해 안출된 것으로, 헤드셋을 장착하여 안경을 착용하는 사람이

Thus, an object of the present invention is to provide the glasses which is devised it ravels the overall proble

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편리하게 헤드셋을 사용할 수 있도록 하거나 헤드셋을 사용할 때 보안경의 역할을 할 수 있도록 된 헤드셋을 구비한 안경을 제공함에 그 목적이 있다.

ms of above-described and includes the head set servi ng of the safety glasses when the human mounting the head set and wears the glasses conveniently using the head set or the head set.

상기한 바의 목적을 달성하기 위한 본 고안은, 안경테에 탈착 가능하게 고정설치된 베이스브라켓과, 상기 베이스브라켓에 슬라이드이동가능하게 삽입설치된 회동부재와, 일단은 상기 회동부재에 회전가능하게 결합설치되고 타단은 스피커폰에 회동가능하게 힌지결합된 절첩부재 및, 전기신호를 음성으로 변환하는 스피커폰과, 외부기기로부터 상기 스피커폰에 음성신호를 입력하는 스피커폰단자와, 음성을 전기신호로 변환하는 마이크로폰, 상기 마이크로폰에서 음성신호를 외부기기로 출력하는 마이크로폰단자가 구비된 구조이다.

The object of is achieved. And the invention relates to the structure in which the base bracket, fixed to the d etachably in the glass frame and the turning member, which is possible in the base bracket is inserted and se t up and the folder member, in which one end is pivotall y connected and installed in the turning member and th e other end is hinged in the speaker phone and the spe aker phone, converting the electric signal into voice an d the speaker phone terminal, inputting the audio signal to the speaker phone from the external device and the microphone converting voice into the electric signal, an d the microphone terminal outputting the audio signal i n the microphone to the external device are equipped.

따라서, 안경테에 헤드셋이 탈착가능하게 부착되고 안경테의 길이방향으로 이동이 가능할 뿐만 아니라 스피커폰이 귀에 인접할 수 있도록 회동이 가능하도록 됨으로써 안경과 헤드셋을 동시에 편리하게 사용할 수 있게 된다.

Therefore, since circulation is possible the glasses and head set are simultaneously conveniently used in additi on the head set is detachably adhered to the glass fra me and it is in a longitudinal direction transferable of th e glass frame the speaker phone is adjacent to the ea r.

발명의 구성 및 작용

Structure & Operation of the Invention

이하 본 고안의 바람직한 실시예를 첨부된 도면을 참조하여 상세히 설명한다.

Hereinafter, the preferred embodiment of the invention is particularly illustrated with reference to attached dra wing.

도 1은 본 고안에 따른 헤드셋을 구비한 안경의 일실시예를 나타낸 사시도이고, 도 2는 도 1의 분해사시도이며, 도 3은 본 고안에 따른 일실시예의 결합구조를 나타낸 개략적 단면도, 도 4는 본 고안에 따른 일실시예의 회동부재의 작동상태를 나타낸 사시도, 도 5는 본 고안에 따른 일실시예의 스피커폰의 작동상태를 나타낸 사시도이다.

Figure 1 is a perspective view showing the embodiment of the glasses equipped with the head set according to the present invention. Fig. 2 is the disassembled persp ective view of fig. 1. Figure 3 is a perspective view in which the outline sectional view , and fig. 4 show the o perating state of the turning member of the embodimen t according to the present invention, and the perspecti ve view in which fig. 5 shows the operating state of th e speaker phone of the embodiment according to the p resent invention showing the coupling structure of the embodiment according to the present invention.

상기한 도면에 의한 본 고안은, 렌즈(10)와 안경테(20)를 구비하고, 안경테(20)에 탈착가능하게 고정설치되고 안경테(20)의 길이방향으로 슬라이드홈(33)이 형성된 베이스브라켓(30)과, 상기 베이스브라켓(30)의 슬라이드홈(33)에 슬라이드 이동가능하게 삽입설치되고 회전홈(41)이 형성된 회동부재(40)와, 일단은 상기 회동부재(40)의 회전홈(41)에 회전가능하게 결합설치되고 타단은 스피커폰(61)에 회동가능하게 힌지결합된 절첩부재(50) 및, 상기 절첩부재(50)에 회동가능하게 힌지결합되고 전기신호를 음성으로 변환하는 스피커폰(61)과, 외부기기로부터 상기 스피커폰(61)에 음성신호를 입력하는 스피커폰단자(62)와, 안경테(20)에 결합설치되고, 음성을 전기신호로 변환하는 마이크로폰(63), 상기 마이크로폰(63)에서 음성신호를 외부기기로 출력하는 마이크로폰단자(64)가 구비된 구조이다.

By above-described drawing. And the invention relates to the base bracket (30), in which the slide groove (3 3) is formed in a longitudinal direction of the glass fram e (20) and the turning member (40), in which the rotati on groove (41) is formed it is inserted and set up it is p ossible in the slide groove (33) of the base bracket (3 0) with sliding and the folder member (50), in which the other end is hinged in the speaker phone (61) one end i s pivotally connected and installed in the rotation groo ve (41) of the turning member (40) and the speaker ph one (61), which converts the electric signal into voice i t is hinged to the rotatably in the folder member (50) a nd the speaker phone terminal (62), inputting the audio signal to the speaker phone (61) from the external devi ce and the structure which is connected and installed i n the glass frame (20) and the microphone (63) conver ting voice into the electric signal, and the microphone t erminal (64) outputting the audio signal in the microph one (63) to the external device are equipped. It the det achably is fixed in the glass frame (20) the lens (10) an d glass frame (20) are included.

상기의 구조로 된 본 고안의 특징은 안경테(20)에 헤드셋(6

The head set (60) is detachably adhered to the f as to

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0)이 구비된 것에 있는 바, 안경테(20)에 헤드셋(60)이 탈착 가능하게 부착되고, 안경테(20)의 길이방향으로 이동이 가능할 뿐만 아니라 스피커폰(61)이 귀에 인접할 수 있도록 회동이 가능하도록 된 것이다.

the characteristic of the present invention, consisting of the structure described in the above the head set (60) is equipped in the glass frame (20) have, and the glass frame (20) and circulation is possible in addition it is in a longitudinal direction transferable of the glass frame (20) the speaker phone (61) is adjacent to the ear.

상기 베이스브라켓(30)은 후측에 브라켓홈(31)이 형성되어 안경테(20)를 잡아 물도록 되어 있고, 전면에는 슬라이드홈(33)이 안경테(20)의 길이방향으로 형성되어 상기 회동부재(40)가 끼워져 슬라이드이동할 수 있게 되며, 그 슬라이드홈(33)에는 일정간격으로 복수개의 고정홈(34)이 형성되어 회동부재(40)가 일정거리마다 정지할 수 있도록 되어 있다.

The base bracket (30) has the bracket groove (31) in the back side. And the glass frame (20) is grasped and it is configured to bite and the slide groove (33) is formed in the front side of the glass frame (20) in a longitudinal direction and the turning member (40) is inserted and it slides and multiple fixing grooves (34) are with a constant interval formed in the slide groove (33) and the turning member (40) can stop at the constant distance.

즉, 상기 베이스브라켓(30)은 헤드셋(60)을 안경테(20)에 고정결합하는 수단으로 특히 후측에 서로 마주보며 형성된 한쌍의 고정편(32)이 탄성적으로 벌어지도록 되어 안경테(20)의 일정부분에 끼울 수 있도록 됨으로써 헤드셋(60)을 탈착가능하게 결합시키게 된다.

That is, by a pair of fixture pieces (32) which are formed in especially, the back side into the means in which the base bracket (30) fixes and combines the head set (60) with the glass frame (20) while facing taking place and inserting in the aliquot of the glass frame (20) the head set (60) is detachably bound.

여기서, 상기 베이스브라켓(30)의 고정편(32)은 탄성적으로 서로 벌어지도록 되어 안경테(20)을 잡아 물게 됨과 더불어 안경테(20)의 위치에 따라 두께가 다르더라도 고정편(32)이 그 두께에 맞게 벌어져 사용자의 편의에 따라 안경테(20)의 임의의 위치에 헤드셋(60)을 고정결합시킬 수 있게 된다.

Here, with the fixture piece (32) of the base bracket (30) taking place and the glass frame (20) being grasped and biting although the thickness varies according to the position of the glass frame (20) the fixture piece (32) takes place according to the thickness and the head set (60) is made according to the convenience of the user to the arbitrary position of the glass frame (20) with interference fit.

상기 회동부재(40)는 상기 베이스브라켓(30)에 형성된 슬라이드홈(33)에 삽입되어 안경테(20)의 길이방향으로 이동이 가능하도록 된 것으로, 베이스브라켓(30)에 의해 안경테(20)에서 헤드셋(60)의 위치를 잡은 다음, 사용자가 헤드셋(60)을 사용하면서 간단하게 미세하게 위치이동을 시킬 수 있도록 되어 있다.

It is inserted into the slide groove (33) in which the turning member (40) is formed in the base bracket (30) and it is in a longitudinal direction transferable of the glass frame (20). After the position of the head set (60) is caught with the base bracket (30) in the glass frame (20) while the user uses the head set (60) it is simply minute it can move.

그리고, 상기 회동부재(40)에는 안경테(20)와 연직방향으로 회전홈(41)이 형성되어 상기 절첩부재(50)의 회전편(51)이 끼워져 회전할 수 있도록 되어 있다.

And in the turning member (40), the rotation groove (41) is formed with the glass frame (20) and gravity direction and the rotation piece (51) of the folder member (50) is inserted and it can rotate.

또한, 상기 회동부재(40)의 후측에는 고정돌기(42)가 돌출형성되어 상기 베이스브라켓(30)의 슬라이드홈(33)에 형성된 복수개의 고정홈(34)에 끼워질 수 있도록 되어 회동부재(40)가 슬라이드홈(33)에서 슬라이드이동할 때 고정돌기(42)가 고정홈(34)에 선택적으로 끼우져 회동부재(40)의 이동이 일정한 간격으로 멈출 수 있도록 된 것이다.

Moreover, in the back side of the turning member (40), when the fixing projection (42) is protruded and it can be inserted in the multiple fixing grooves (34) formed in the slide groove (33) of the base bracket (30) and the turning member (40) slides in the slide groove (33), it is selectively muddy in the fixing groove (34) with the talent right and the fixing projection (42) can stop to the gap in which the movement of the turning member (40) is constant.

상기 절첩부재(50)는 상기 스피커폰(61)을 회동부재(40)에 회동가능하게 결합시키는 역할을 하는 것으로, 일단이 상기 스피커폰(61)의 일측에 회동가능하게 힌지결합되고, 타단에 회전편(51)이 형성되어 상기 회동부재(40)의 회전홈(41)에 끼워져 결합되어 있다.

The folder member (50) has the rotation piece (51) in the other end one end is hinged to the rotatably in one side of the speaker phone (61) it rotatably serves to bind in the turning member (40) the speaker phone (61). And inserted and coupled in the rotation groove (41) of the turning member (40).

즉, 상기 절첩부재(50)의 회전편(51)은 스피커폰(61)을 귀의 상하방향으로 회전이동시키게 되고, 힌지결합된 부분은 스피커폰(61)을 귀에 가깝게 하거나 멀어지도록 작동하는 것이다.

That is, the rotation piece (51) of the folder member (50) makes the speaker phone (61) rotative movement at upper and lower direction of the ear and the hinged part operates so that it makes near to the ear or the part becomes the speaker phone (61) distant.

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여기서, 상기 회전홈(41)의 내측벽에는 복수개의 정지홈(43)이 형성되고, 상기 절첩부재(50)의 회전편(51)에는 그 외주면에 복수개의 정지돌기(52)가 형성되어 상기 회전편(51)이 회전홈(41)에 끼워져 회전하되, 일정간격으로 정지할 수 있도록 되어 있다.

Here, in the inner wall of the rotation groove (41), multiple stop grooves (43) are formed and multiple rests (52) are formed in the outer periphery in the rotation piece (51) of the folder member (50) and the rotation piece (51) is inserted in the rotation groove (41) and it rotates. It with a constant interval can stop.

상기 헤드셋(60)은 통상 스피커폰(61)과 마이크로폰(63) 및 스피커폰단자(62), 마이크로폰단자(64)로 이루어진 것으로, 스피커폰()에 마이크로폰(64)이 회동가능하게 결합설치되어 있고 스피커폰(61)에는 스피커폰단자(62)가 마이크로폰(63)에는 마이크로폰단자(64)가 연결되어 있는 것이 일반적이다.

The head set (60) is made of ordinarily, the speaker phone (61), the microphone (63) and speaker phone terminal (62), and microphone terminal (64). It is general that the microphone (64) is rotatably connected and installed in the speaker phone and the microphone terminal (64) of the speaker phone terminal (62) is connected in the speaker phone (61) in the microphone (63).

상기 스피커폰(61)은 전기신호를 음성으로 변환하는 장치이고, 상기 스피커폰단자(62)는 외부기기로부터 상기 스피커폰(61)에 음성신호를 입력하는 장치이며, 상기 마이크로폰(63)은 안경테(20)에 결합설치되고 음성을 전기신호로 변환하는 장치이고, 상기 마이크로폰단자(64)는 상기 마이크로폰(63)에서 음성신호를 외부기기로 출력하는 장치이다.

It is the apparatus in which the speaker phone (61) converts the electric signal into voice and it is the apparatus in which the speaker phone terminal (62) inputs the audio signal to the speaker phone (61) from the external device and it is the apparatus for the microphone (63) being connected and installed in the glass frame (20) and converting voice into the electric signal and it is the apparatus in which the microphone terminal (64) outputs the audio signal in the microphone (63) to the external device.

도 6은 본 고안의 다른 일실시예로서, 헤드셋이 구비된 보안경을 나타낸 사시도이다.

Fig. 6 is the dissimilar embodiment of the invention. It is the perspective drawing showing the safety glasses in which the head set is equipped.

도 6에 도시된 바와 같이, 통상 컴퓨터의 모니터를 사용할 때 착용하게 되는 보안경이나 모터싸이클, 스키 등의 레저용 보안경에 상기 헤드셋(60#39#)을 결합수단을 매개로 안경테에 탈착가능하게 고정설치함으로써 보안경으로 눈을 보호함은 물론 헤드셋(60#39#)을 사용하여 컴퓨터나 휴대폰을 이용할 수 있도록 된 것이다.

As shown in FIG. 6, generally, by the detachably fixing the head set (60') the combining means to the glass frame with the intermediation in the safety glasses for leisure including the safety glasses or the motorcycle, which it puts when using the monitor of the computer the ski etc. the computer or the cellular phone eye can be used as the safety glasses using the head set (60') as well as the protection container.

여기서, 휴대폰에 사용하는 경우에는 휴대폰의 핸즈프리단자(70)에 스피커폰단자(62#39#)와 마이크로폰단자(64#39#)를 일체형으로 하여 하나의 단자를 꽂아 사용할 수 있도록 해야 한다.

Here, in case of using in the cellular phone it is integrally the speaker phone terminal (62') and microphone terminal (64') at the handsfree terminal (70) of the cellular phone and one terminal is into and uses stuck.

도 7은 본 고안의 또 다른 일실시예로서, 휴대폰과 함께 사용되는 상태를 나타낸 사시도이다.

Fig. 7 is another embodiment of the invention. It is the perspective drawing showing the state used with the cellular phone.

도 7에 도시된 바와 같이, 통상 헤드셋(60#39#)은 휴대폰의 핸즈프리단자(70)에 연결하여 사용할 수 있도록 된 것이므로, 상기 스피커폰단자(62#39#)와 마이크로폰단자(64#39#)를 일체형으로 하여 기존의 휴대폰의 핸즈프리단자(70)에 연결함으로써 시력보정용 안경이나 보안경을 착용하는 사용자에게 휴대폰의 사용 또한 편리하게 할 수 있도록 되어 있다.

As shown in FIG. 7, generally, the head set (60') connects to the handsfree terminal (70) of the cellular phone and it can use. Therefore by the speaker phone terminal (62') and microphone terminal (64') being integrally done and connecting to the handsfree terminal (70) of the existing cellular phone it moreover makes convenient to the glasses for the sight correction or the user wearing the safety goggles.

따라서, 상기한 바와 같이 본 고안에 의해 안경에 헤드셋(60)을 탈착가능하게 고정설치할 수 있어 안경과 헤드셋(60)을 동시에 편리하게 사용할 수 있게 되는 것이다.

Therefore, as described above, the head set (60) can be fixed with the detachably and the glasses and head set (60) are simultaneously conveniently used in the glasses with the invention.

또한, 본 고안의 헤드셋(60)은 마이크로폰(63)을 안경테(20)에 별도로 부착시키는 것도 가능하고, 안경의 양쪽 안경테(20)에 한쌍의 스피커폰(61)을 결합수단을 통해 각각 탈착가능하게 고정설치하는 것도 가능하다.

Moreover, it is possible that the head set (60) of the invention separately attaches the microphone (63) in the glass frame (20) and it is possible to the detachably fix a pair of speaker phones (61) to both sides glass frame (20) of the glasses with the respectively through the combining means.

Apple Inc. Exhibit 1015 Page 1300

도면에 대한 간단한 설명

도 1은 본 고안에 따른 헤드셋을 구비한 안경의 일실시예를 나타낸 사시도,

도 2는 도 1의 분해사시도,

도 3은 본 고안에 따른 일실시예의 결합구조를 나타낸 개략적 단면도,

도 4는 본 고안에 따른 일실시예의 회동부재의 작동상태를 나타낸 사시도,

도 5는 본 고안에 따른 일실시예의 스피커폰의 작동상태를 나타낸 사시도,

도 6은 본 고안의 다른 일실시예를 나타낸 사시도,

도 7은 본 고안의 또 다른 일실시예와 그 사용상태를 나타낸 사시도이다.

* 도면의 주요부분에 대한 부호의 설명 *

10 : 렌즈 20 : 안경테

30 : 베이스브라켓 31 : 브라켓홈

32 : 고정편 33 : 슬라이드홈

34 : 고정홈 40 : 회동부재

41 : 회전홈 42 : 고정돌기

43 : 정지홈 50 : 절첩부재

51 : 회전편 52 : 정지돌기

60, 60#39#, 60#39# : 헤드셋 61 : 스피커폰

62, 62#39#, 62#39# : 스피커폰단자 63 : 마이크로폰

64, 64#39#, 64#39# : 마이크로폰단자 70 : 핸즈프리단자

Brief explanation of the drawing

Figure 1 is an outline sectional view, in which the perspective view , and

2 the disassembled perspective view of fig. 1 , and

3 shows the coupling structure of the embodiment according to the present invention the perspective view, in which

4 shows the operating state of the turning member of the embodiment according to the present invention the perspective view, in which

5 shows the operating state of the speaker phone of the embodiment according to the present invention the perspective view in which

6 shows the dissimilar embodiment of the invention, and the perspective view in which

7 shows another embodiment and the active condition of the present invention showing the embodiment of the glasses equipped with the head set according to the present invention.

the description *

of the denotation about the main part of * drawing 10: the lens 20: the glass frame

30: the base bracket 31: the bracket groove

32: the fixture piece 33: the slide groove

34: the fixing groove 40: the turning member

41: the rotation groove 42: the fixing projection

43: the stop groove 50: the folder member

51: the rotation piece 52: the rest

60, 60', and 60': the head set 61: the speaker phone

62, 62', and 62': the speaker phone terminal 63: the microphone

64, 64', and 64': the microphone terminal 70: the handsfree terminal

.

Disclaimer

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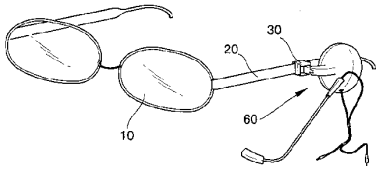
(54)헤드셋을 구비한 안경

(57)요 약

본 고안은 헤드셋을 구비한 안경에 관한 것으로, 안경테(20)에 탈착 가능하게 고정설치된 베이스브라켓(30)과, 상기 베이스브라켓(30)에 슬라이드이동가능하게 삽입설치된 회동부재(40)와, 일단은 상기 회동부재(40)에 회전가능하게 결합설치되고 타단은 스피커폰(61)에 회동가능하게 힌지결합된 절첩부재(50) 및, 전기신호를 음성으로 변환하는 스피커폰(61)과, 외부기기로부터 상기 스피커폰(61)에 음성신호를 입력하는 스피커폰단자(62)와, 음성을 전기신호로 변환하는 마이크로폰(63), 상기 마이크로폰(63)에서 음성신호를 외부기기로 출력하는 마이크로폰단자(64)가 구비되어, 안경과 헤드셋(60)을 동시에 편리하게 사용할 수 있도록 된 것이다.

키워드 : 안경, 헤드셋

대 표 도 - 도 1



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청구의 범위

청구항 1

안경테(20)에 헤드셋(60)이 결합수단으로 결합설치되고, 상기 헤드셋(60)은

전기신호를 음성으로 변환하는 스피커폰(61)과;

외부기기로부터 상기 스피커폰(61)에 음성신호를 입력하는 스피커폰단자(62)와;

안경테(20)에 결합설치되고, 음성을 전기신호로 변환하는 마이크로폰(63) 및;

상기 마이크로폰(63)에서 음성신호를 외부기기로 출력하는 마이크로폰단자(64);으로 이루어진 헤드셋을 구비한 안경.

청구항 2

제1항에 있어서, 상기 스피커폰단자(62)와 마이크로폰단자(64)는 일체형으로 되어 상기 헤드셋(60)을 휴대폰의 핸즈프리단자(70)에 연결하여 사용할 수 있도록 된 것을 특징으로 하는 헤드셋을 구비한 안경.

청구항 3

제1항에 있어서, 상기 결합수단은

안경테(20)에 탈착가능하게 고정설치되고, 안경테(20)의 길이방향으로 슬라이드홈(33)이 형성된 베이스브라켓(30)과;

상기 베이스브라켓(30)의 슬라이드홈(33)에 슬라이드이동가능하게 삽입설치되고, 회전홈(41)이 형성된 회동부재(40)와;

일단은 상기 회동부재(40)의 회전홈(41)에 회전가능하게 결합설치되고, 타단은 상기 스피커폰(61)에 회동가능하게 힌지결합된 절첩부재(50);로 이루어진 것을 특징으로 하는 헤드셋을 구비한 안경.

명세서

발명의 명칭

헤드셋을 구비한 안경{ Glasses with headset }

도면의 간단한 설명

도 1은 본 고안에 따른 헤드셋을 구비한 안경의 일실시예를 나타낸 사시도,

도 2는 도 1의 분해사시도,

도 3은 본 고안에 따른 일실시예의 결합구조를 나타낸 개략적 단면도,

도 4는 본 고안에 따른 일실시예의 회동부재의 작동상태를 나타낸 사시도,

도 5는 본 고안에 따른 일실시예의 스피커폰의 작동상태를 나타낸 사시도,

도 6은 본 고안의 다른 일실시예를 나타낸 사시도,

도 7은 본 고안의 또 다른 일실시예와 그 사용상태를 나타낸 사시도이다.

* 도면의 주요부분에 대한 부호의 설명 *

10 : 렌즈 20 : 안경테

30 : 베이스브라켓 31 : 브라켓홈

32 : 고정편 33 : 슬라이드홈

34 : 고정홈 40 : 회동부재

41 : 회전홈 42 : 고정돌기

43 : 정지홈 50 : 절첩부재

51 : 회전편 52 : 정지돌기

60, 60', 60'' : 헤드셋 61 : 스피커폰

62, 62', 62'' : 스피커폰단자 63 : 마이크로폰

64, 64', 64'' : 마이크로폰단자 70 : 핸즈프리단자

발명의 상세한 설명

본 고안은 안경에 관한 것으로, 특히 컴퓨터에 연결하여 사용하거나 휴대폰에 연결하여 사용하는 헤드셋이 장착된 헤드셋을 구비한 안경에 관한 것이다.

일반적으로 안경은 시력을 보정하기 위한 보정용 안경과 자외선을 차단하기 위한 썬글라스, 바람이나 이물질로부터 눈을 보호하기 위한 보안경(고글), 컴퓨터에서 방출되는 전자파로부터 눈을 보호하기 위한 보안경 등 기능에 따라 다양하게 개발되어 있다.

더우기, 최근에는 컴퓨터의 사용이 폭증함에 따라 모니터를 바라보는 시간이 증가하여 컴퓨터 보안경의 사용이 늘고 있는 추세이고, 모터싸이클을 탈 때나 스키를 탈 때와 같이 강한 바람으로부터 눈을 보호하기 위한 레저용 보안경의 사용 또한 증가하고 있는 실정이다.

종래의 안경은 렌즈와 안경테로 이루어지고, 안경테를 귀에 걸어 사용하도록 되어 있으므로, 헤드폰이나 헤드셋과 같이 귀에 걸어 사용하는 장치와 함께 사용하게 되면 귀에 무리한 하중을 주는 것은 물론 협소한 공간으로 인해 귀에 압박을 가하는 등의 문제점이 있었다.

또한, 헤드셋은 최근 들어 폭증하고 있는 핸즈 프리용 통신장비의 하나로서, 음을 출력하는 스피커폰과 음을 입력하는 마이크로폰으로 구성되어 휴대폰이나 컴퓨터에 연결단자로 연결하고, 스피커폰을 귀에 착용하고 마이크로폰을 입주위에 위치시킴으로써 통신이 가능하도록 된 것이다.

종래의 헤드셋의 경우 귀를 통해서 소리를 들어야 하는 장치이기 때문에 스피커폰이 귀를 덮게 되고, 그 스피커폰이 안착될 수 있도록 머리에 쓰거나 귀에 걸어 사용하는 것이 대부분이었다.

따라서, 안경을 착용하는 사용자의 경우에는 상기한 바와 같이 귀에 불편함을 주는 문제점이 있었다.

한편, 이러한 귀의 불편함을 해소하기 위해 이어폰을 사용하게 되면 헤드폰과는 소리의 전달효과도 다를 뿐만 아니라 이어폰의 장시간 착용에 따른 문제점들이 있어 헤드폰 사용자들은 이어폰의 사용을 기피하고 있는 현실이다.

이에 본 고안은 상기한 바의 제반 문제점들을 해소하기 위해 안출된 것으로, 헤드셋을 장착하여 안경을 착용하는 사람이 편리하게 헤드셋을 사용할 수 있도록 하거나 헤드셋을 사용할 때 보안경의 역할을 할 수 있도록 된 헤드셋을 구비한 안경을 제공함에 그 목적이 있다.

상기한 바의 목적을 달성하기 위한 본 고안은, 안경테에 탈착가능하게 고정설치된 베이스브라켓과, 상기 베이스브라켓에 슬라이드이동가능하게 삽입설치된 회동부재와, 일단은 상기 회동부재에 회전가능하게 결합설치되고 타단은 스피커폰에 회동가능하게 힌지결합된 절첩부재 및, 전기신호를 음성으로 변환하는 스피커폰과, 외부기기로부터 상기 스피커폰에 음성신호를 입력하는 스피커폰단자와, 음성을 전기신호로 변환하는 마이크로폰, 상기 마이크로폰에서 음성신호를 외부기기로 출력하는 마이크로폰단자가 구비된 구조이다.

따라서, 안경테에 헤드셋이 탈착가능하게 부착되고 안경테의 길이방향으로 이동이 가능할 뿐만 아니라 스피커폰이 귀에 인접할 수 있도록 회동이 가능하도록 됨으로써 안경과 헤드셋을 동시에 편리하게 사용할 수 있게 된다.

이하 본 고안의 바람직한 실시예를 첨부된 도면을 참조하여 상세히 설명한다.

도 1은 본 고안에 따른 헤드셋을 구비한 안경의 일실시예를 나타낸 사시도이고, 도 2는 도 1의 분해사시도이며, 도 3은 본 고안에 따른 일실시예의 결합구조를 나타낸 개략적 단면도, 도 4는 본 고안에 따른 일실시예의 회동부재의 작동상태를 나타낸 사시도, 도 5는 본 고안에 따른 일실시예의 스피커폰의 작동상태를 나타낸 사시도이다.

상기한 도면에 의한 본 고안은, 렌즈(10)와 안경테(20)를 구비하고, 안경테(20)에 탈착가능하게 고정설치되고 안경테(20)의 길이방향으로 슬라이드홈(33)이 형성된 베이스브라켓(30)과, 상기 베이스브라켓(30)의 슬라이드홈(33)에 슬라이드이동가능하게 삽입설치되고 회전홈(41)이 형성된 회동부재

(40)와, 일단은 상기 회동부재(40)의 회전홈(41)에 회전가능하게 결합설치되고 타단은 스피커폰(61)에 회동가능하게 힌지결합된 절첩부재(50) 및, 상기 절첩부재(50)에 회동가능하게 힌지결합되고 전기신호를 음성으로 변환하는 스피커폰(61)과, 외부기기로부터 상기 스피커폰(61)에 음성신호를 입력하는 스피커폰단자(62)와, 안경테(20)에 결합설치되고, 음성을 전기신호로 변환하는 마이크로폰(63), 상기 마이크로폰(63)에서 음성신호를 외부기기로 출력하는 마이크로폰단자(64)가 구비된 구조이다.

상기의 구조로 된 본 고안의 특징은 안경테(20)에 헤드셋(60)이 구비된 것에 있는 바, 안경테(20)에 헤드셋(60)이 탈착가능하게 부착되고, 안경테(20)의 길이방향으로 이동이 가능할 뿐만 아니라 스피커폰(61)이 귀에 인접할 수 있도록 회동이 가능하도록 된 것이다.

상기 베이스브라켓(30)은 후측에 브라켓홈(31)이 형성되어 안경테(20)를 잡아 물도록 되어 있고, 전면에는 슬라이드홈(33)이 안경테(20)의 길이방향으로 형성되어 상기 회동부재(40)가 끼워져 슬라이드이동할 수 있게 되며, 그 슬라이드홈(33)에는 일정간격으로 복수개의 고정홈(34)이 형성되어 회동부재(40)가 일정거리마다 정지할 수 있도록 되어 있다.

즉, 상기 베이스브라켓(30)은 헤드셋(60)을 안경테(20)에 고정결합하는 수단으로 특히 후측에 서로 마주보며 형성된 한쌍의 고정편(32)이 탄성적으로 벌어지도록 되어 안경테(20)의 일정부분에 끼울 수 있도록 됨으로써 헤드셋(60)을 탈착가능하게 결합시키게 된다.

여기서, 상기 베이스브라켓(30)의 고정편(32)은 탄성적으로 서로 벌어지도록 되어 안경테(20)을 잡아 물게 됨과 더불어 안경테(20)의 위치에 따라 두께가 다르더라도 고정편(32)이 그 두께에 맞게 벌어져 사용자의 편의에 따라 안경테(20)의 임의의 위치에 헤드셋(60)을 고정결합시킬 수 있게 된다.

상기 회동부재(40)는 상기 베이스브라켓(30)에 형성된 슬라이드홈(33)에 삽입되어 안경테(20)의 길이방향으로 이동이 가능하도록 된 것으로, 베이스브라켓(30)에 의해 안경테(20)에서 헤드셋(60)의 위치를 잡은 다음, 사용자가 헤드셋(60)을 사용하면서 간단하게 미세하게 위치이동을 시킬 수 있도록 되어 있다.

그리고, 상기 회동부재(40)에는 안경테(20)와 연직방향으로 회전홈(41)이 형성되어 상기 절첩부재(50)의 회전편(51)이 끼워져 회전할 수 있도록 되어 있다.

또한, 상기 회동부재(40)의 후측에는 고정돌기(42)가 돌출형성되어 상기 베이스브라켓(30)의 슬라이드홈(33)에 형성된 복수개의 고정홈(34)에 끼워질 수 있도록 되어 회동부재(40)가 슬라이드홈(33)에서 슬라이드이동할 때 고정돌기(42)가 고정홈(34)에 선택적으로 끼우져 회동부재(40)의 이동이 일정한 간격으로 멈출 수 있도록 된 것이다.

상기 절첩부재(50)는 상기 스피커폰(61)을 회동부재(40)에 회동가능하게 결합시키는 역할을 하는 것으로, 일단이 상기 스피커폰(61)의 일측에 회동가능하게 힌지결합되고, 타단에 회전편(51)이 형성되어 상기 회동부재(40)의 회전홈(41)에 끼워져 결합되어 있다.

즉, 상기 절첩부재(50)의 회전편(51)은 스피커폰(61)을 귀의 상하방향으로 회전이동시키게 되고, 힌지결합된 부분은 스피커폰(61)을 귀에 가깝게 하거나 멀어지도록 작동하는 것이다.

여기서, 상기 회전홈(41)의 내측벽에는 복수개의 정지홈(43)이 형성되고, 상기 절첩부재(50)의 회전편(51)에는 그 외주면에 복수개의 정지돌기(52)가 형성되어 상기 회전편(51)이 회전홈(41)에 끼워져 회전하되, 일정간격으로 정지할 수 있도록 되어 있다.

상기 헤드셋(60)은 통상 스피커폰(61)과 마이크로폰(63) 및 스피커폰단자(62), 마이크로폰단자(64)로 이루어진 것으로, 스피커폰()에 마이크로폰(64)이 회동가능하게 결합설치되어 있고 스피커폰(61)

에는 스피커폰단자(62)가 마이크로폰(63)에는 마이크로폰단자(64)가 연결되어 있는 것이 일반적이다.

상기 스피커폰(61)은 전기신호를 음성으로 변환하는 장치이고, 상기 스피커폰단자(62)는 외부기기로부터 상기 스피커폰(61)에 음성신호를 입력하는 장치이며, 상기 마이크로폰(63)은 안경테(20)에 결합설치되고 음성을 전기신호로 변환하는 장치이고, 상기 마이크로폰단자(64)는 상기 마이크로폰(63)에서 음성신호를 외부기기로 출력하는 장치이다.

도 6은 본 고안의 다른 일실시예로서, 헤드셋이 구비된 보안경을 나타낸 사시도이다.

도 6에 도시된 바와 같이, 통상 컴퓨터의 모니터를 사용할 때 착용하게 되는 보안경이나 모터싸이클, 스키 등의 레지용 보안경에 상기 헤드셋(60')을 결합수단을 매개로 안경테에 탈착가능하게 고정설치함으로써 보안경으로 눈을 보호함은 물론 헤드셋(60')을 사용하여 컴퓨터나 휴대폰을 이용할 수 있도록 된 것이다.

여기서, 휴대폰에 사용하는 경우에는 휴대폰의 핸즈프리단자(70)에 스피커폰단자(62')와 마이크로폰단자(64')를 일체형으로 하여 하나의 단자를 꽂아 사용할 수 있도록 해야 한다.

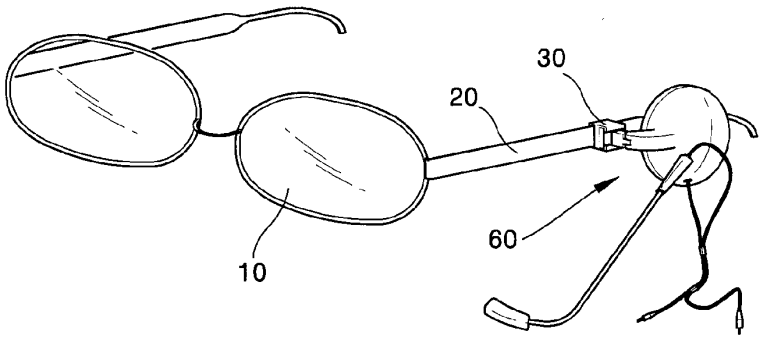
도 7은 본 고안의 또 다른 일실시예로서, 휴대폰과 함께 사용되는 상태를 나타낸 사시도이다.

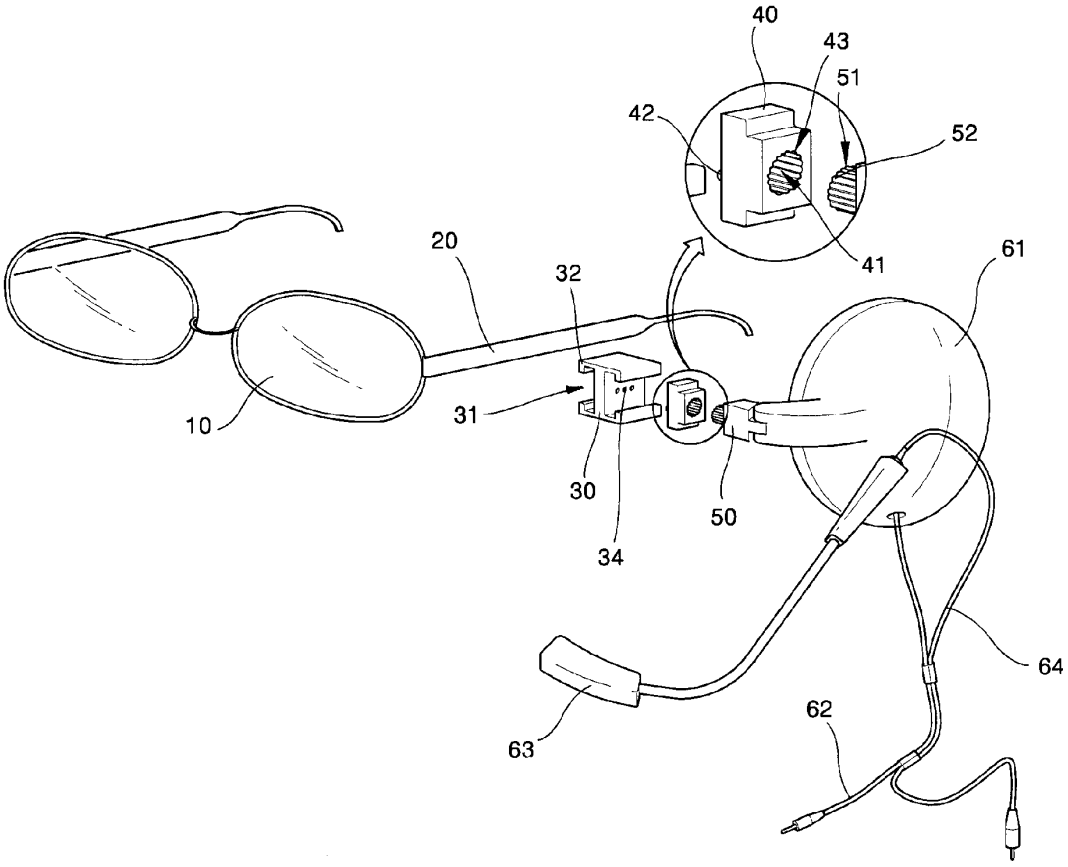
도 7에 도시된 바와 같이, 통상 헤드셋(60')은 휴대폰의 핸즈프리단자(70)에 연결하여 사용할 수 있도록 된 것이므로, 상기 스피커폰단자(62')와 마이크로폰단자(64')를 일체형으로 하여 기존의 휴대폰의 헨즈프리단자(70)에 연결함으로써 시력보정용 안경이나 보안경을 착용하는 사용자에게 휴대폰의 사용 또한 편리하게 할 수 있도록 되어 있다.

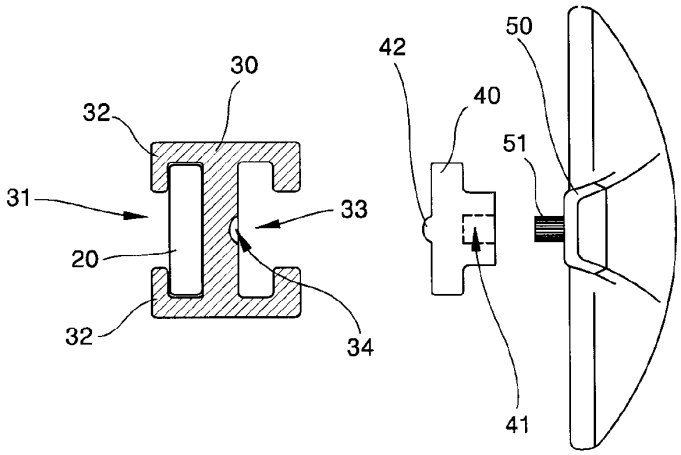
따라서, 상기한 바와 같이 본 고안에 의해 안경에 헤드셋(60)을 탈착가능하게 고정설치할 수 있어 안경과 헤드셋(60)을 동시에 편리하게 사용할 수 있게 되는 것이다.

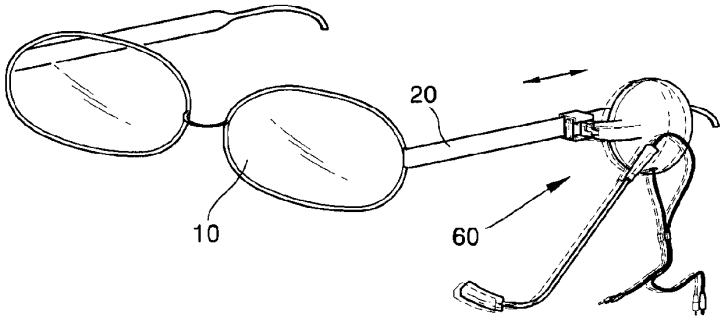
또한, 본 고안의 헤드셋(60)은 마이크로폰(63)을 안경테(20)에 별도로 부착시키는 것도 가능하고, 안경의 양쪽 안경테(20)에 한쌍의 스피커폰(61)을 결합수단을 통해 각각 탈착가능하게 고정설치하는 것도 가능하다.

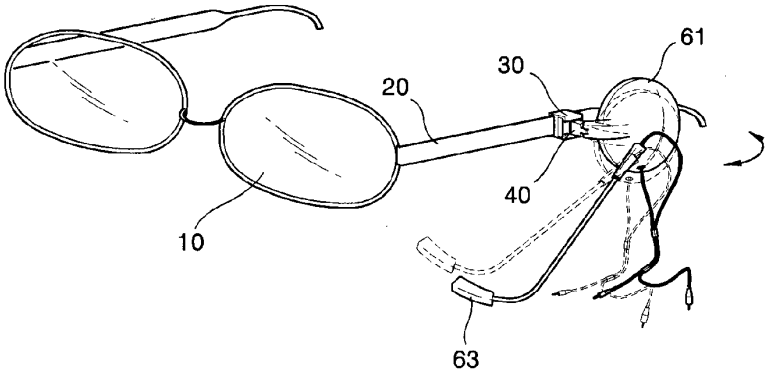
이상에서 설명한 바와 같이 본 고안에 따른 헤드셋을 구비한 안경에 의하면, 안경을 착용하는 사람이 편리하게 헤드셋을 사용할 수 있고, 컴퓨터를 사용하면서 헤드셋을 사용할 경우 보안경의 역할을 할 수 있을 뿐만 아니라 특히 모터싸이클을 타거나 스키를 탈 때와 같이 보안경이 필요한 경우에도 핸드폰을 편리하게 사용할 수 있는 효과가 있다.

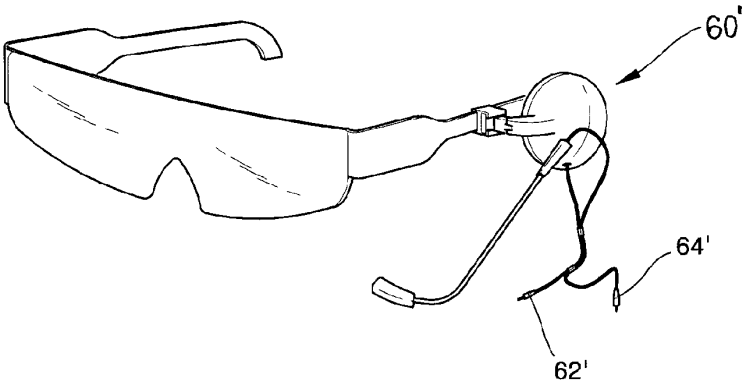

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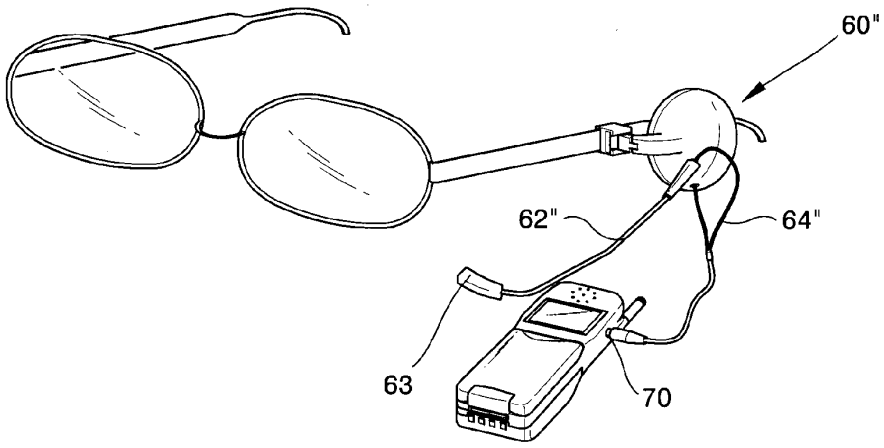

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G02C 11/00

(52) UK CL (Edition R)
G2J JS2AX1 JS2A2 JS2A2X JS2A5 JS2A5A2 JS2A5X

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UK CL (Edition R) G2J JS2A2
INT CL[7] G02C
ONLINE: WPI, EPODOC, JAPIO

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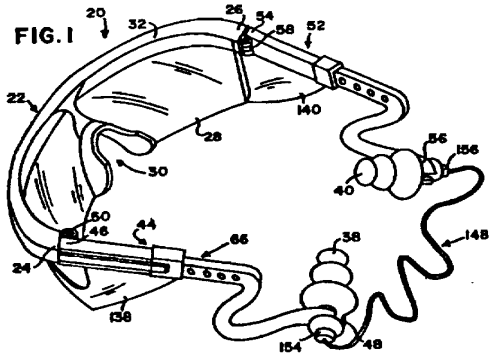
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(54) Abstract Title
Eyewear with ear support and spread adjustment means

(57) Eyewear with earpieces (20) supported from a wearer's ear with optional audio apparatus for use by the wearer, having a front frame browpiece portion (22) including a front transparent panel (28) that may be tinted and/or may be designed to correct vision impairments, being supported on a wearer's head by a nose bridge (30) and by at least one earpiece or earplug (38, 40) that is received into the concha of the wearer's ear and/or into the ear canal. The earpiece or earplug (38, 40) is attached to a rear end of its respective temple (44, 52) of the eyewear and the respective temple (44, 52) for the earpiece or earplug (38,40) is not supported over the wearer's ear. Preferably both temples (44, 52) are only supported by their respective earpiece or earplug (38, 40). The eyewear (20) may include a microphone, whether as a boom-mounted microphone or an ear microphone, and may include audio earpieces for reproducing sound from an audio source. Various earpiece attachments (48, 56) are provided for attaching the earpieces and earplugs (38, 40) to the temples (44, 52) of the eyewear (20). The temples (44, 52) have length adjustments (66) and have spread adjustments (5.158, 5.160) to adjust for various-sized wearer's heads. The temples (44, 52) preferably exert an inward pressure on the earpieces and earplugs (38, 49) so as to retain the eyewear (20) on the wearer's head during physical activity. A browpiece portion 5.32 and adjustable apertures (5.166, 5.168) of temples (5.44, 5.52) are also shown in figure 24. An overglasses embodiment (fig 89) provided that can be worn over standard eyeglasses.

FIG. 1



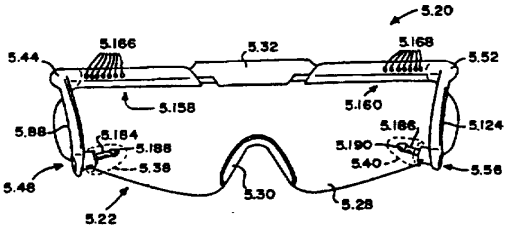


FIG. 24

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FIG. 1

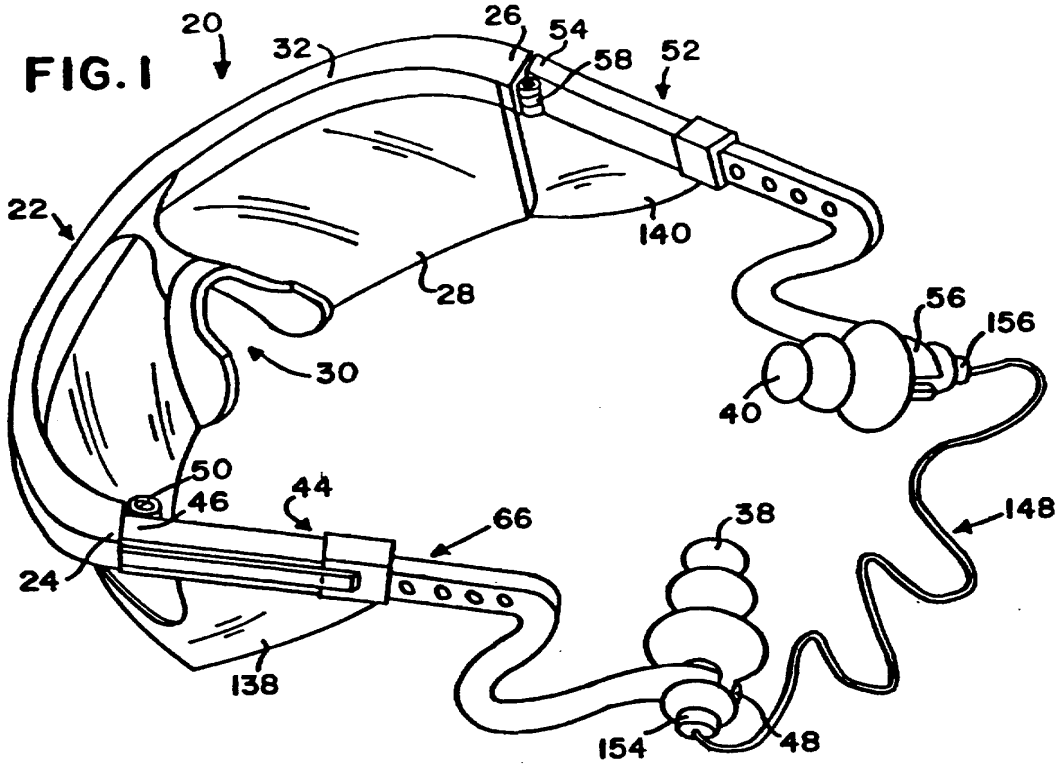

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FIG. 2

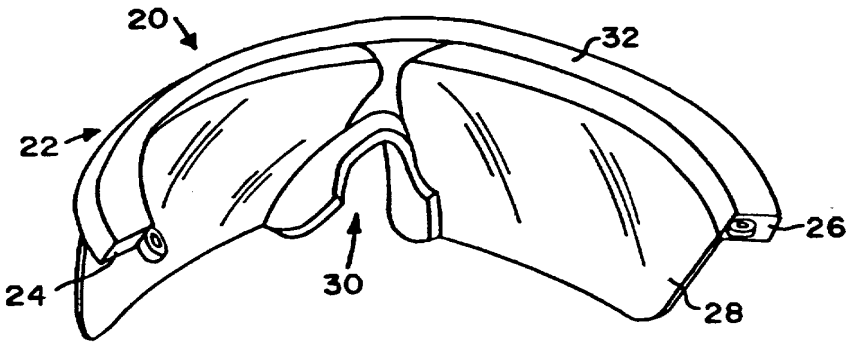

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FIG. 3

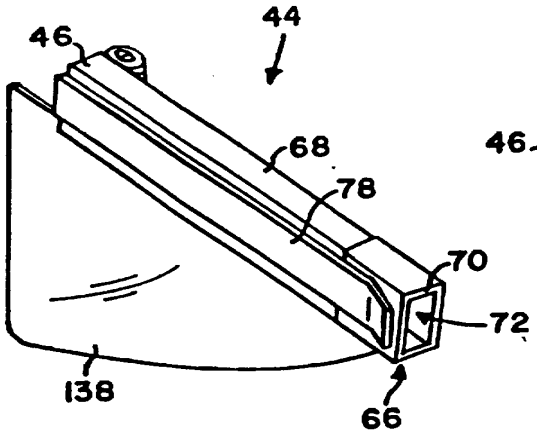


FIG. 4

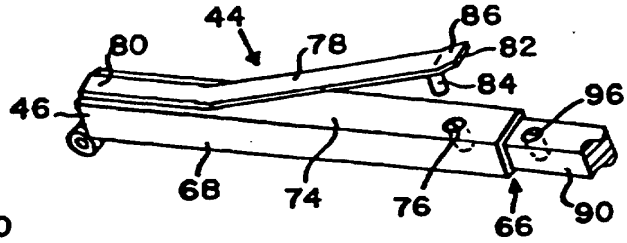


FIG. 5A

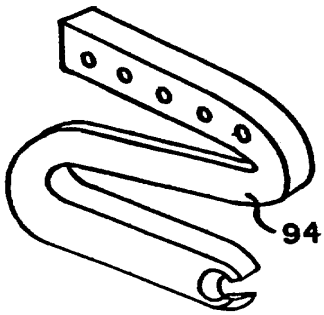


FIG. 5

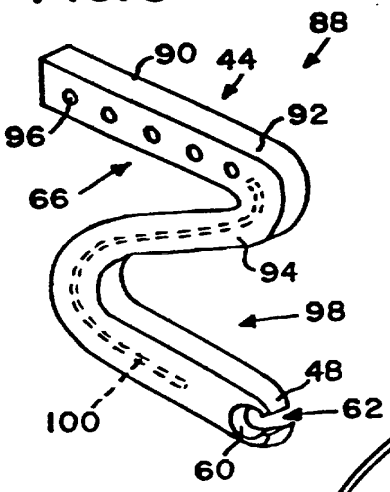


FIG. 6

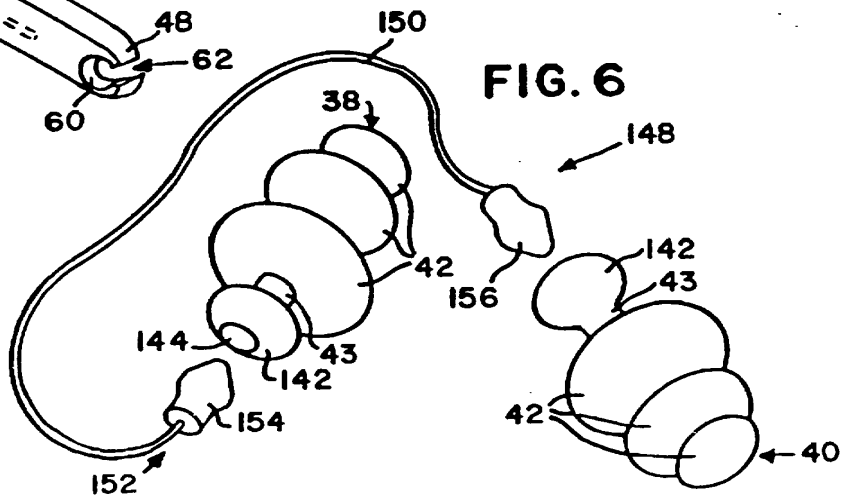


FIG. 8

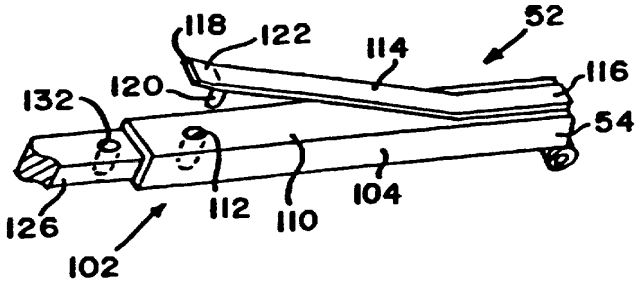


FIG. 7

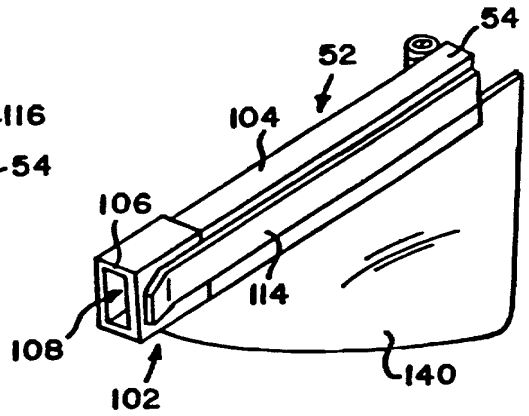


FIG. 9A

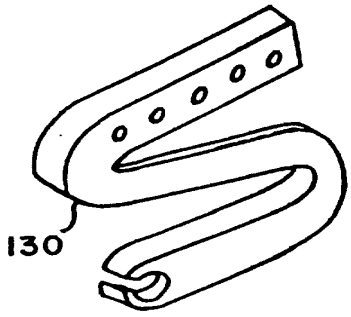
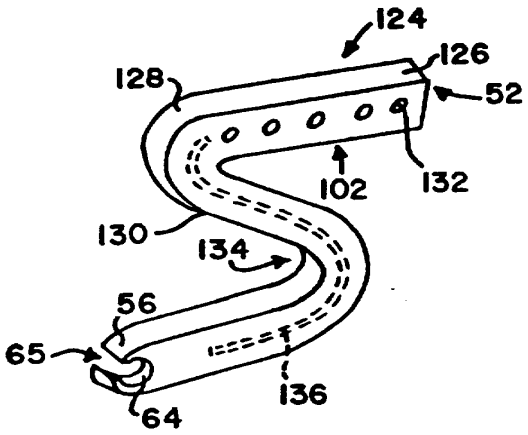


FIG. 9



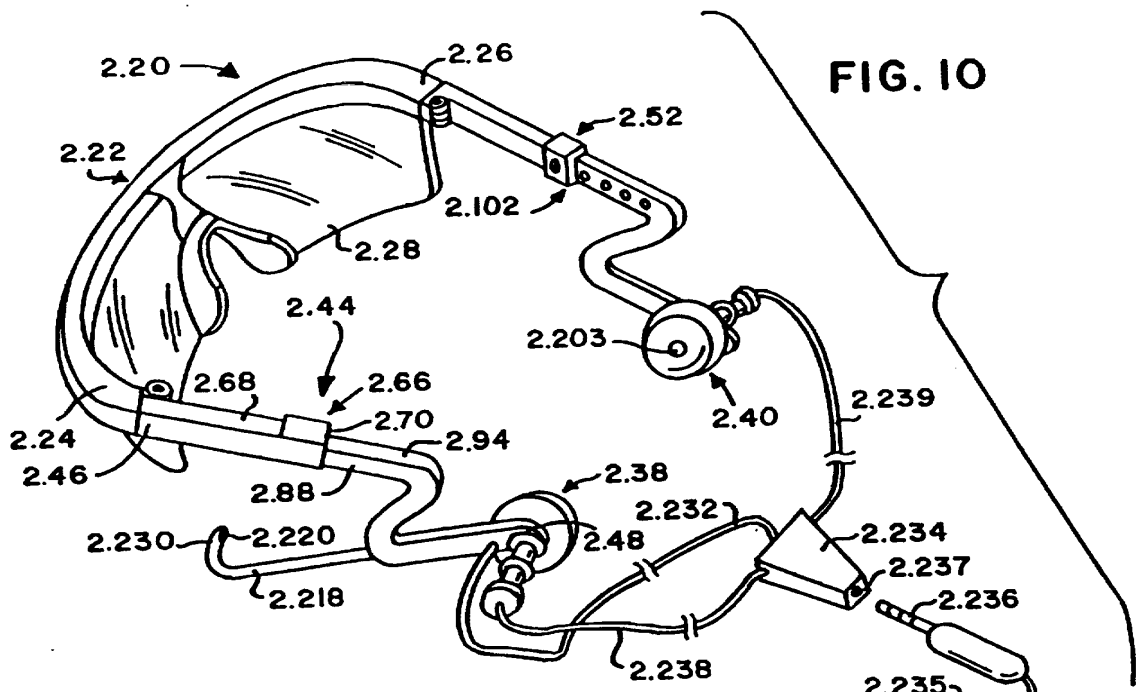

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2.203
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2.66
2.40
2.239
2.24
2.70
2.94
2.46
2.88
2.38
2.232
2.230
2.220
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2.234
2.237
2.218
2.236
2.238
2.235
2.241
RADIO
2.240

FIG. 10

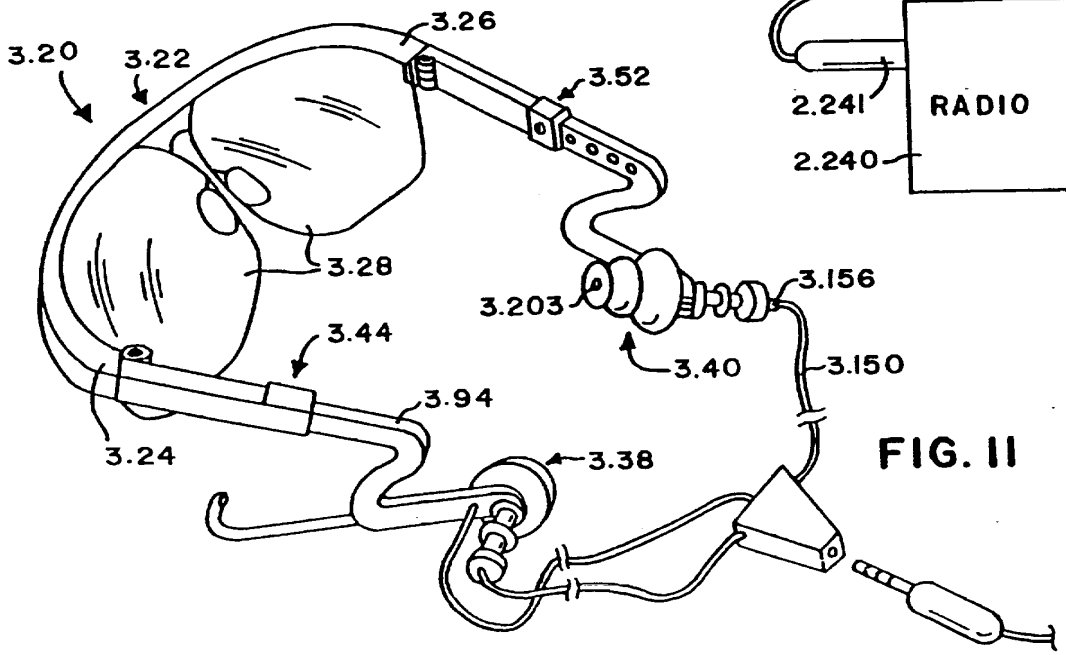

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3.203
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3.44
3.40
3.150
3.94
3.24
3.38

FIG. 11

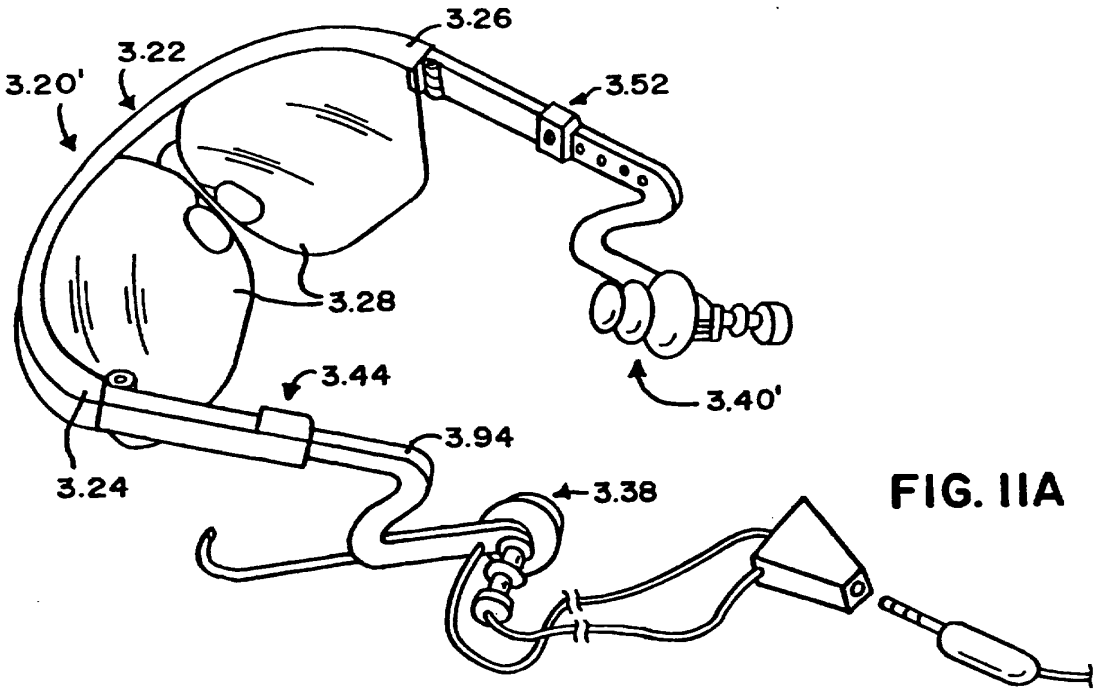


FIG. IIA

FIG. 12

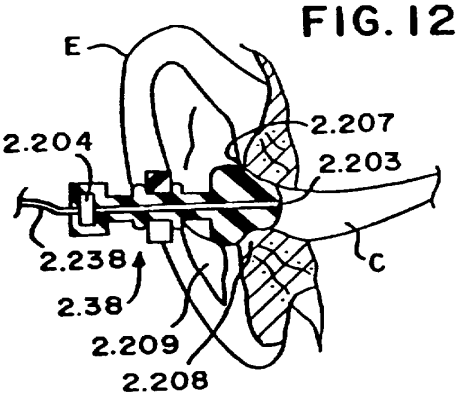


FIG. 13

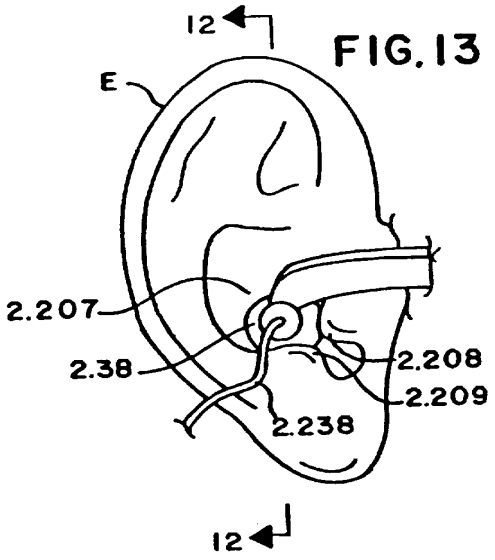


FIG. 14

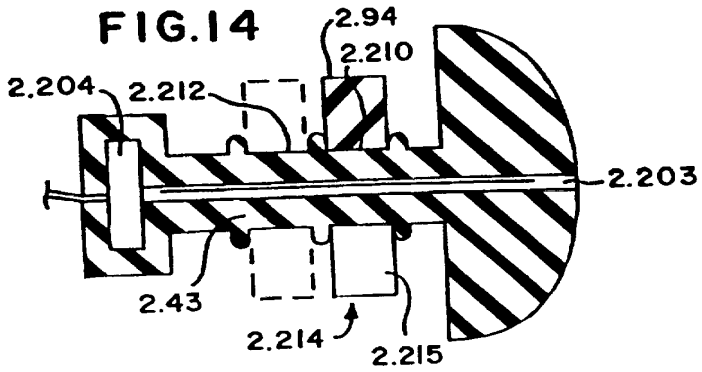


FIG. 15

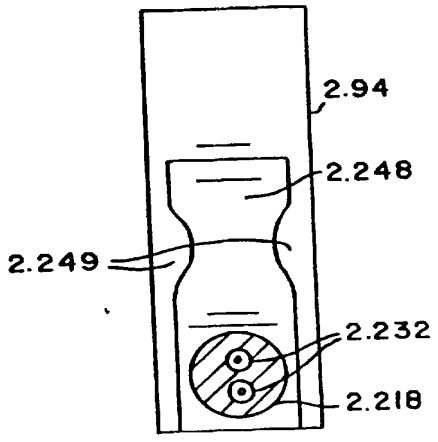
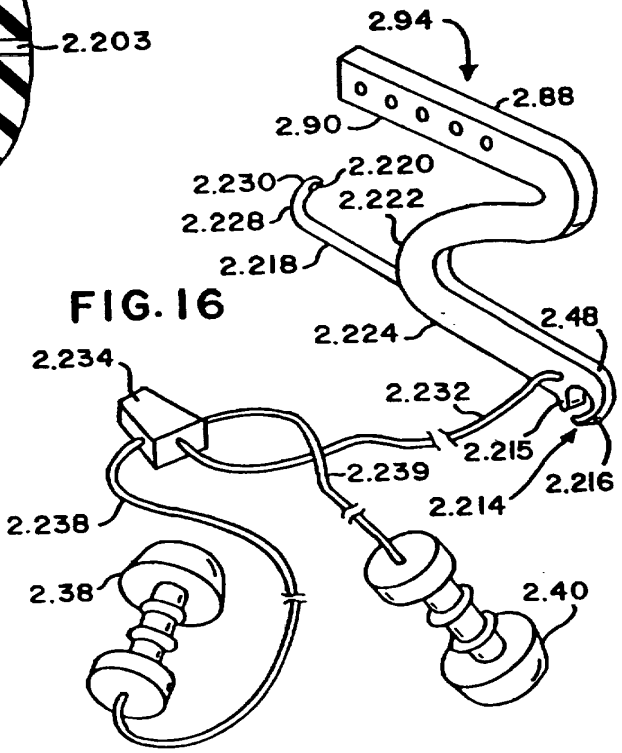


FIG. 16



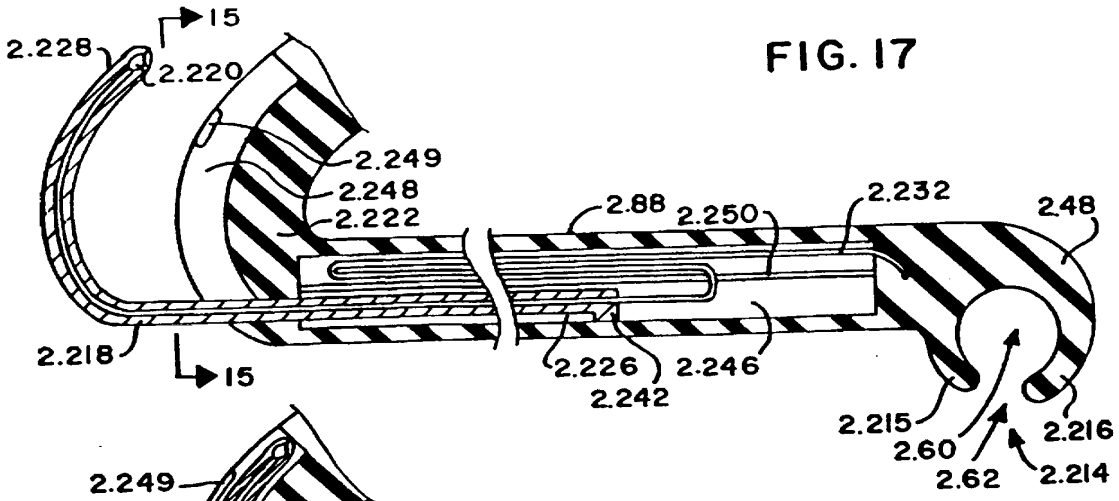


FIG. 17

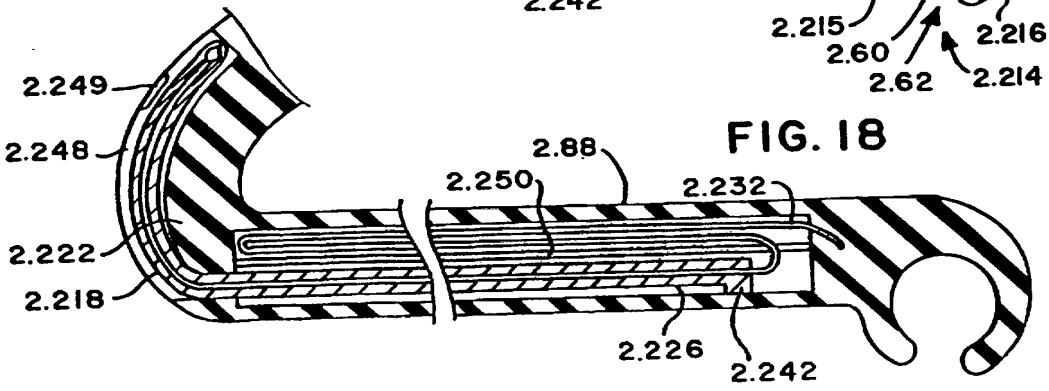


FIG. 18

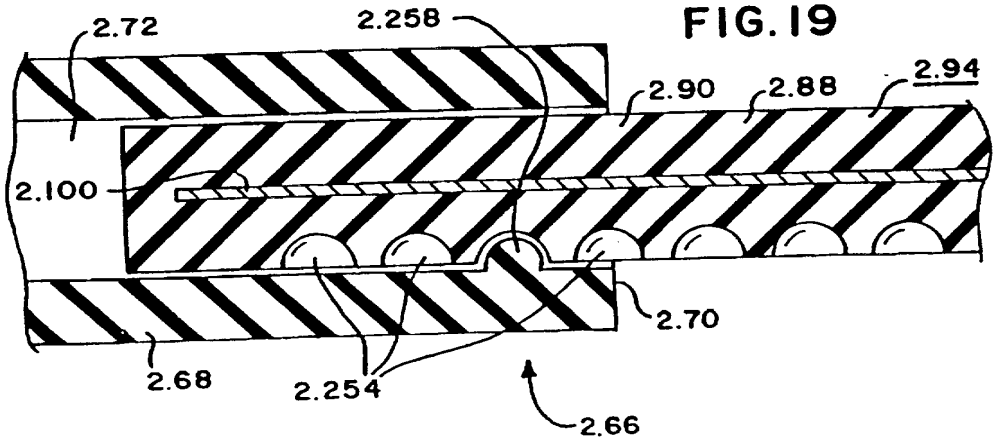


FIG. 19

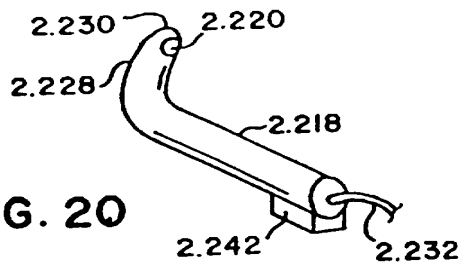


FIG. 20

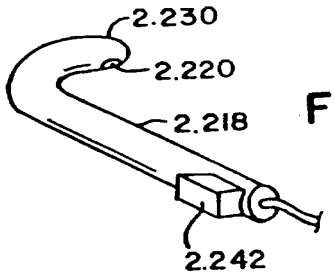


FIG. 20A

FIG. 21

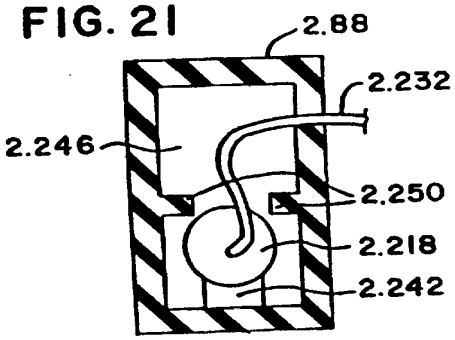
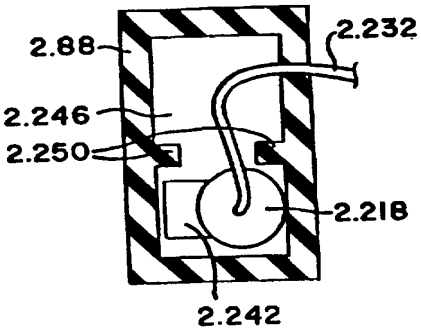


FIG. 21A



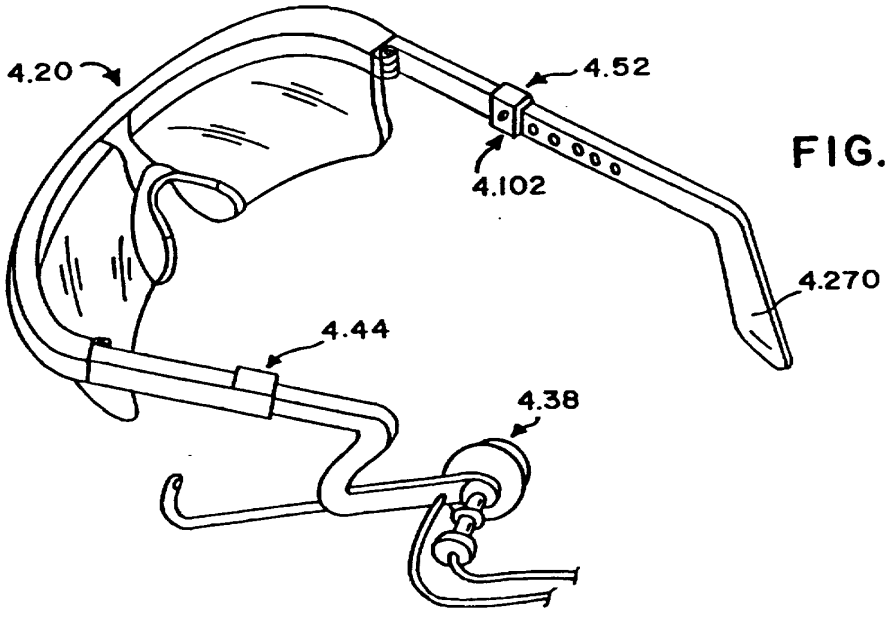


FIG. 22

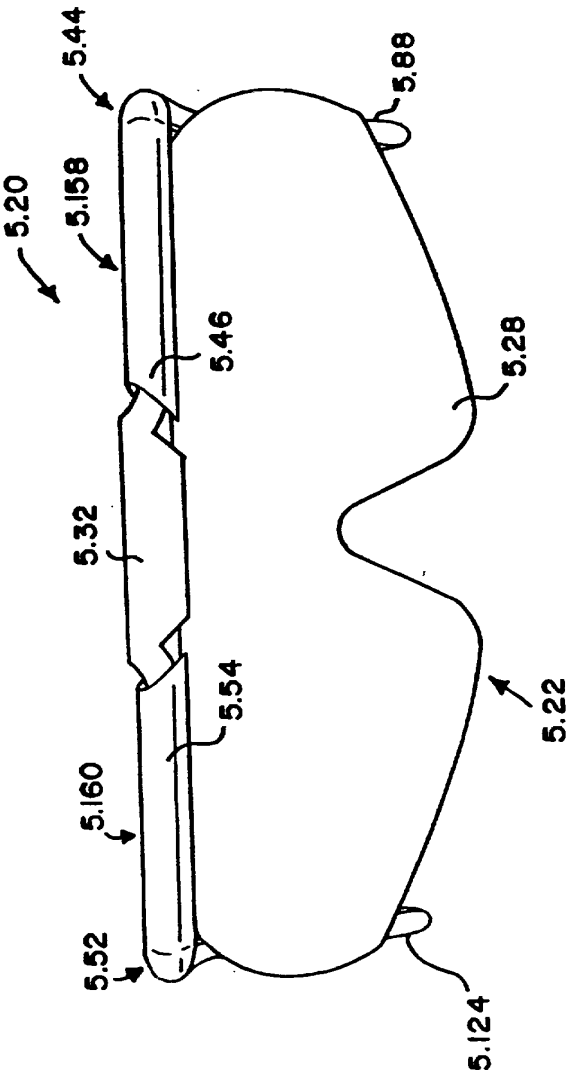


FIG. 23

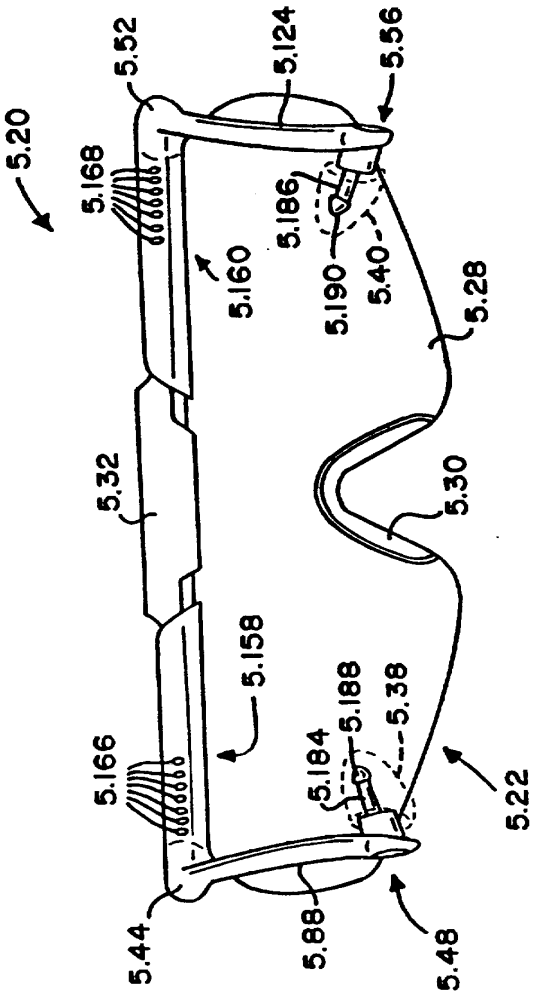

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5.48

FIG. 24

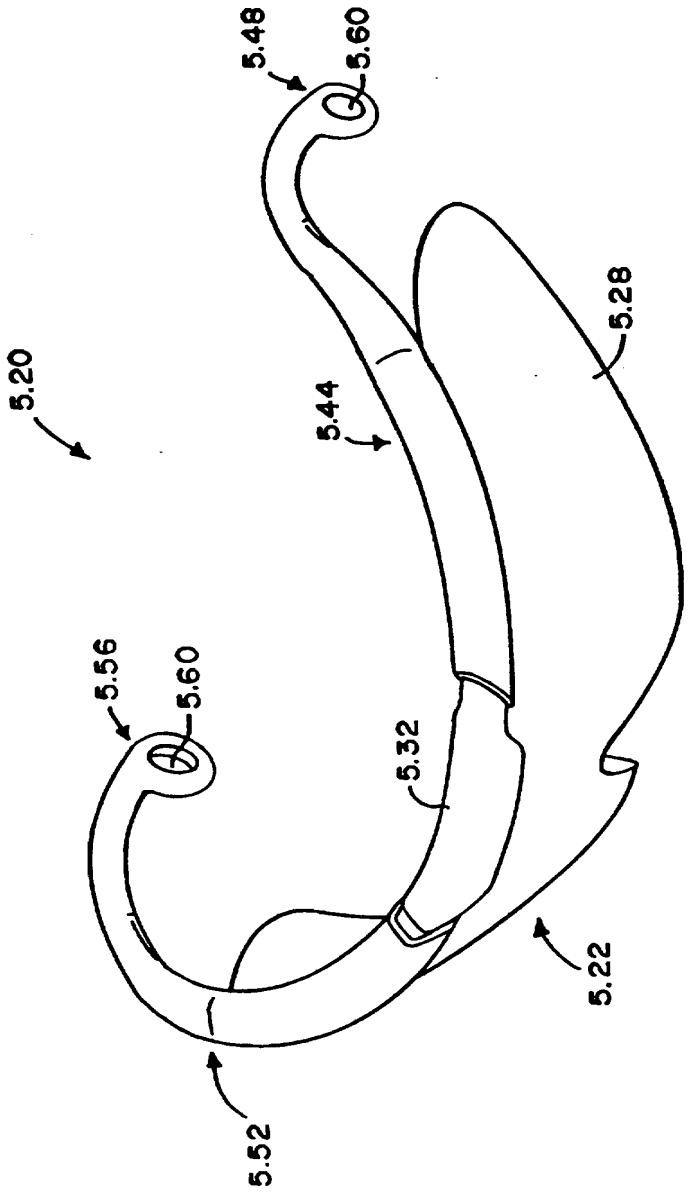


FIG. 25

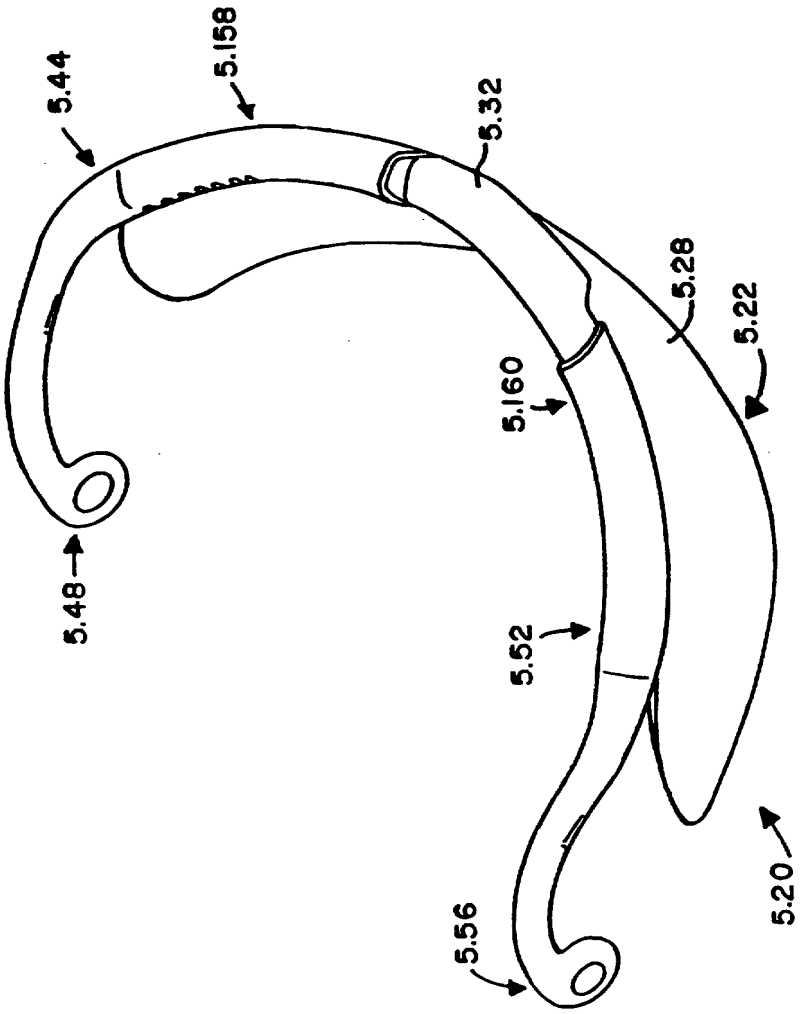


FIG. 26

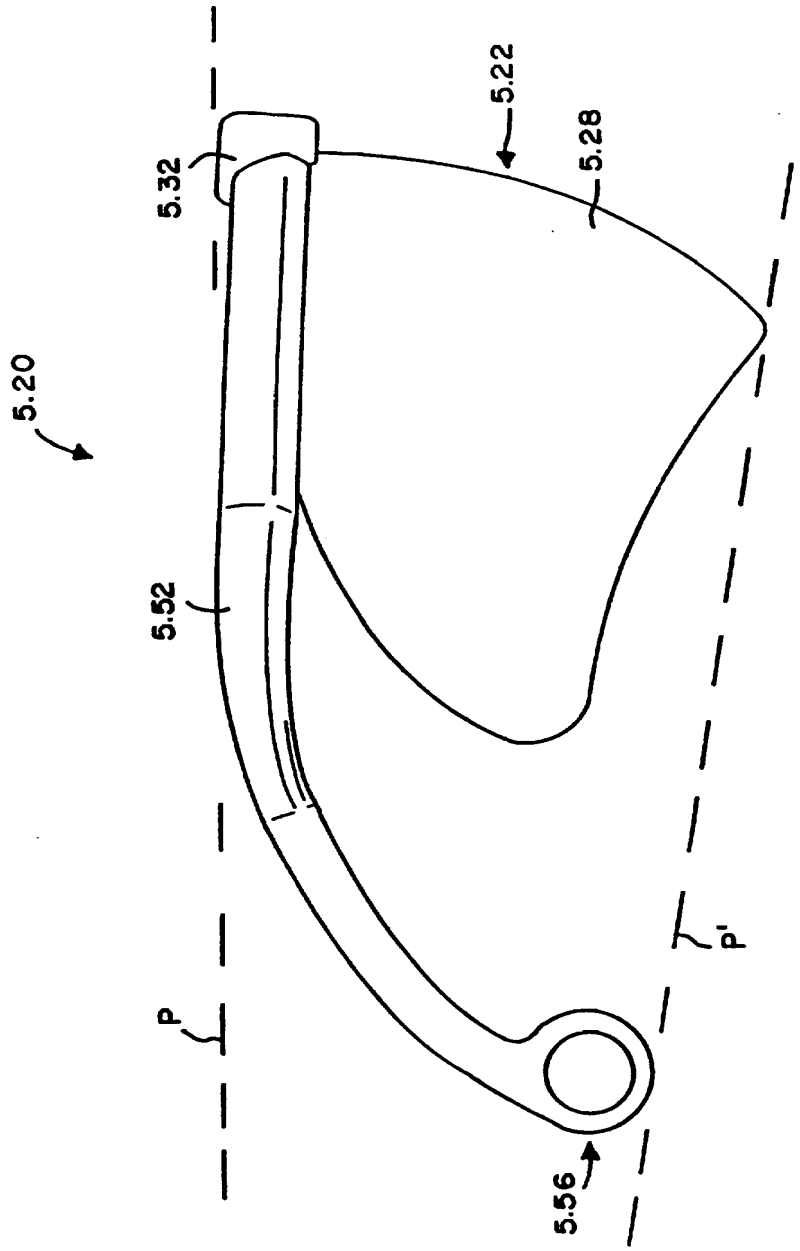


FIG. 27

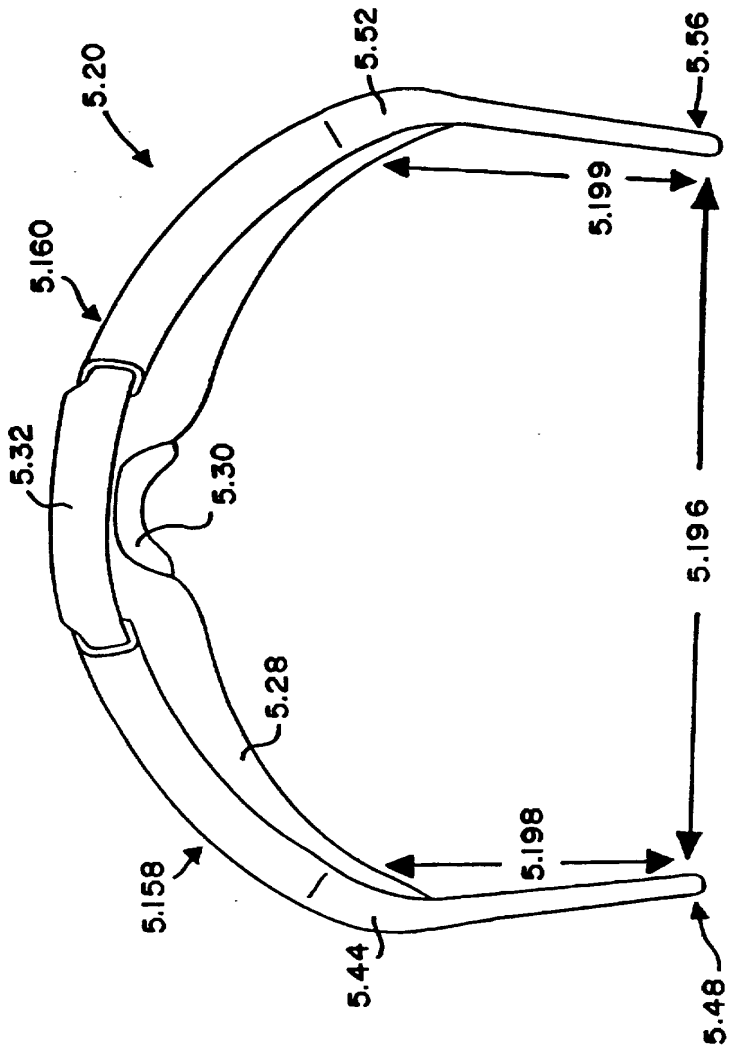


FIG. 28

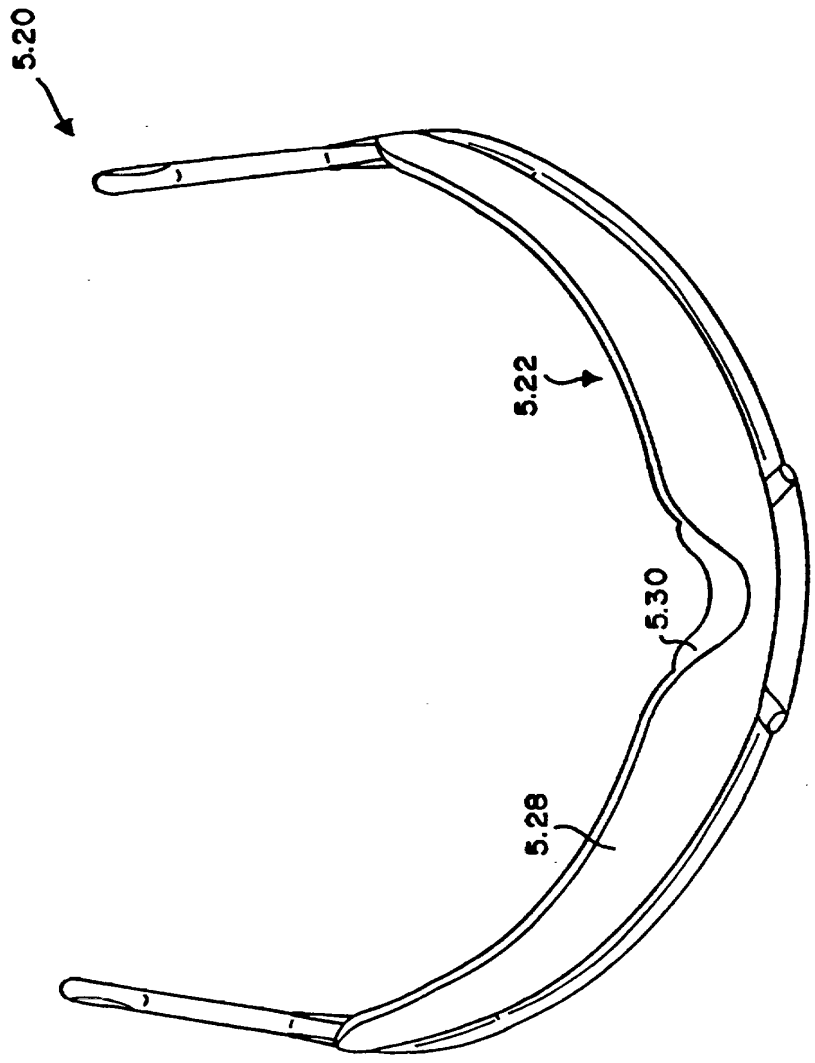


FIG. 29

FIG. 30

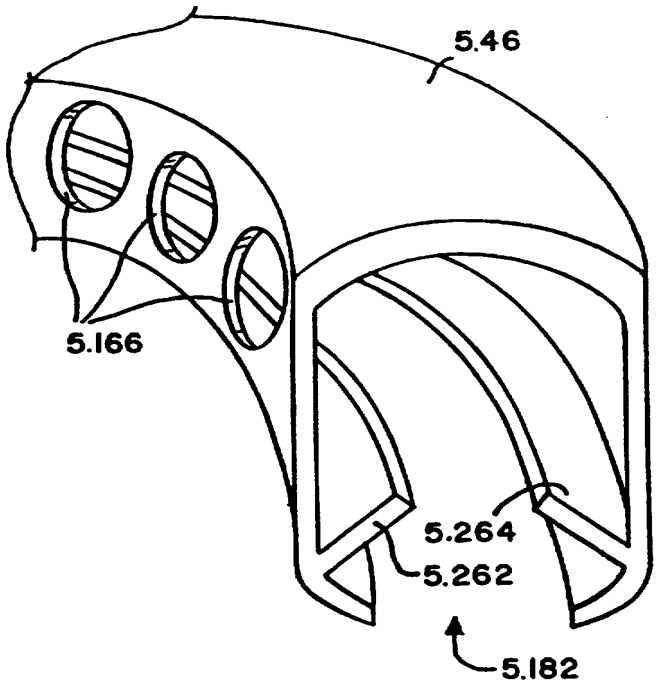
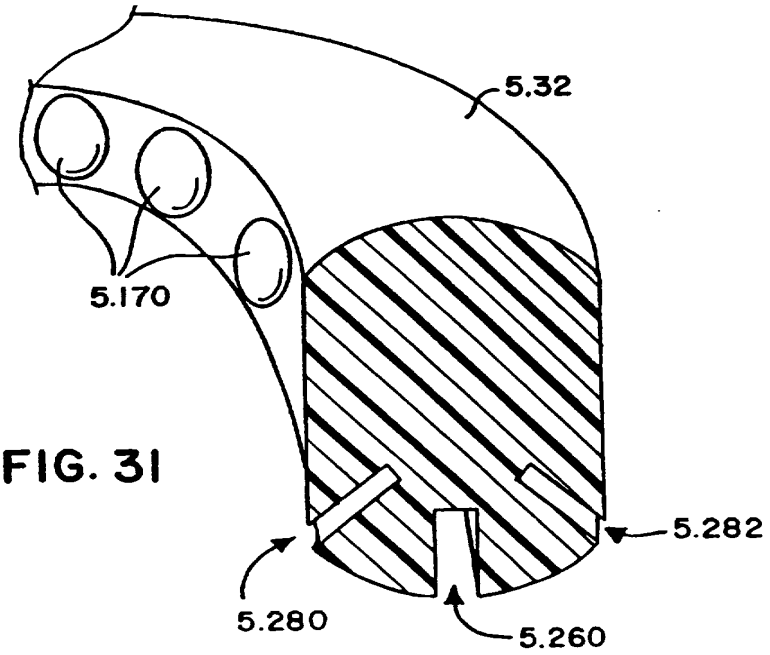


FIG. 31



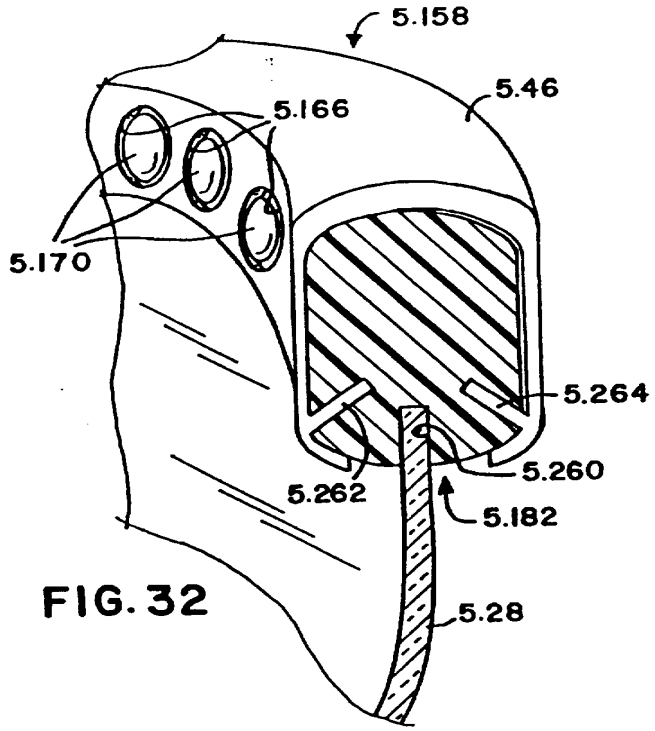


FIG. 32

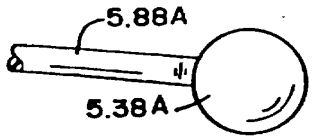


FIG. 35

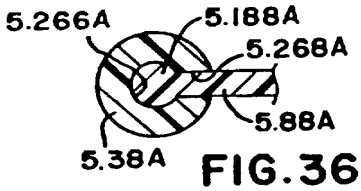


FIG. 36

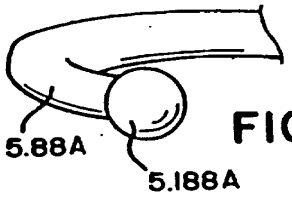


FIG. 37

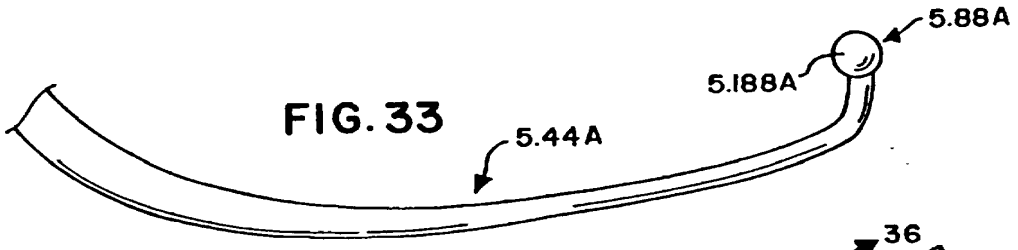


FIG. 33

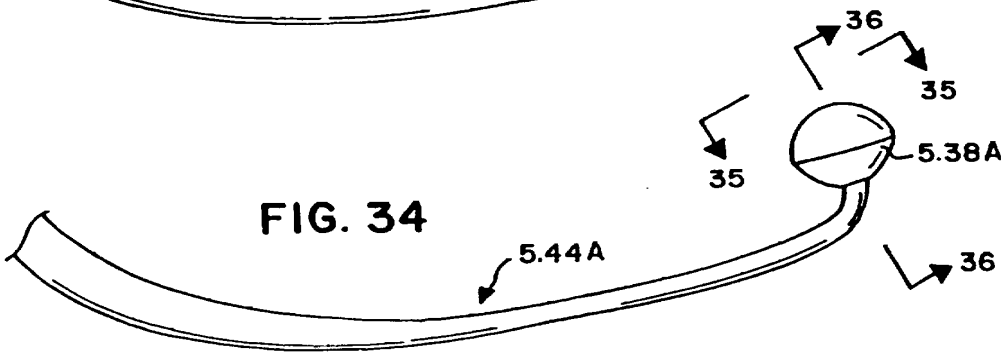


FIG. 34

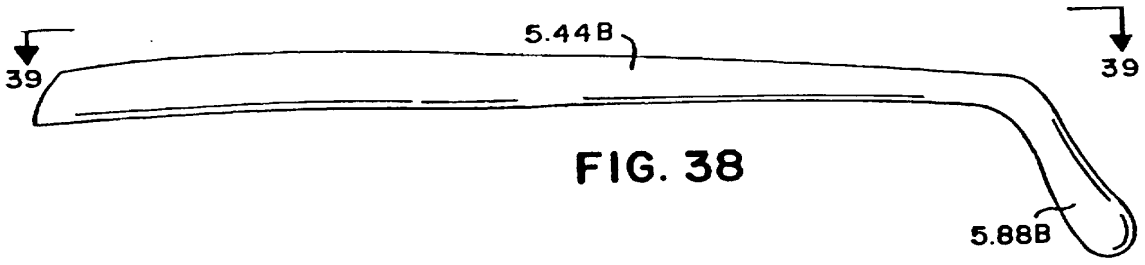


FIG. 38

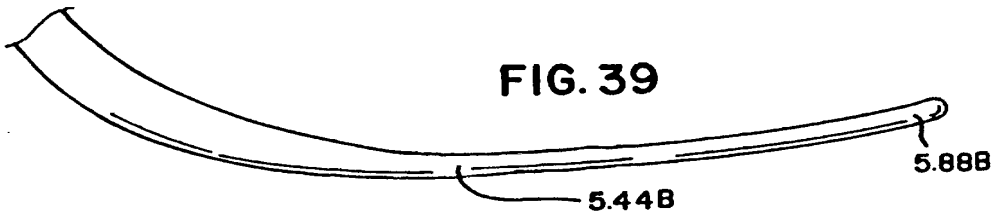


FIG. 39

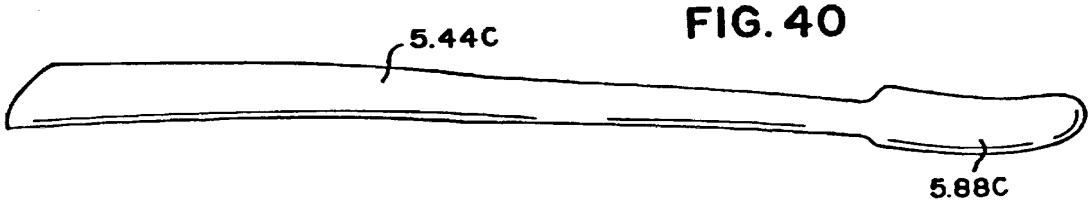


FIG. 40

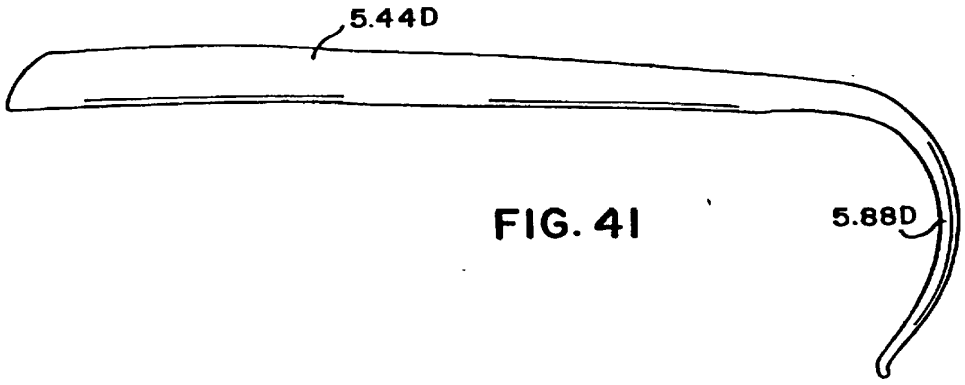


FIG. 41

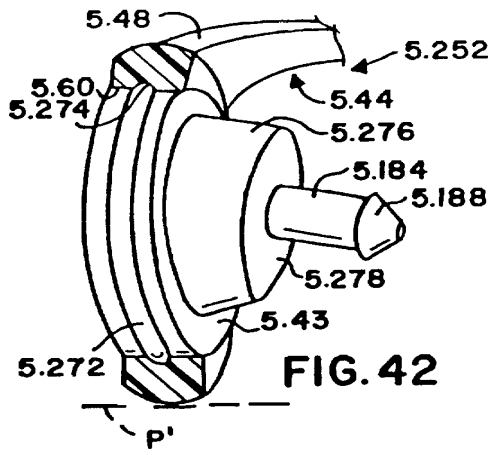


FIG. 42

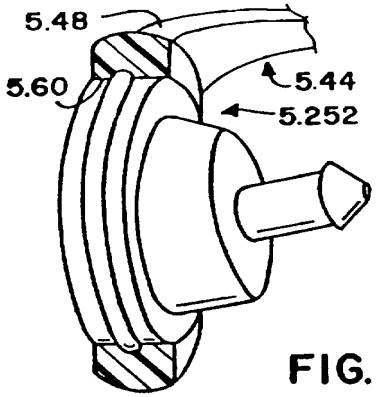


FIG. 43

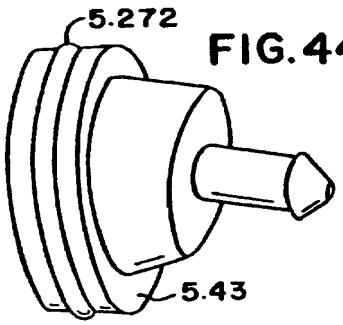


FIG. 44

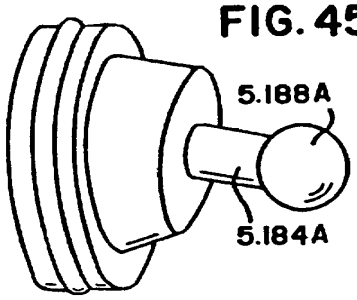


FIG. 45

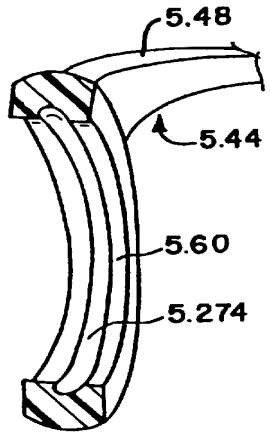


FIG. 46

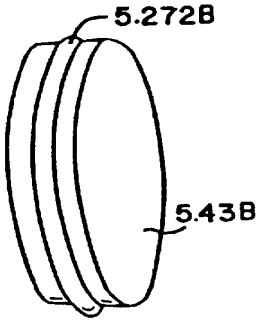


FIG. 47

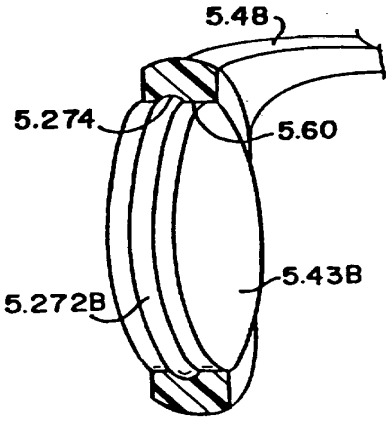


FIG. 48

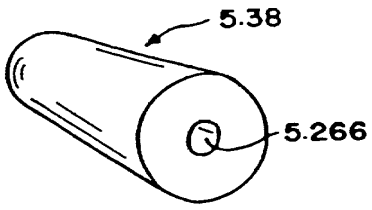


FIG. 49

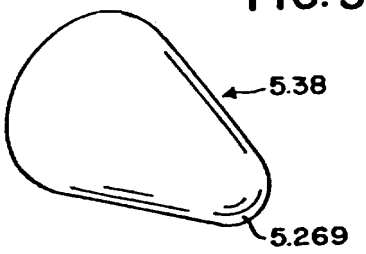


FIG. 50

FIG. 51

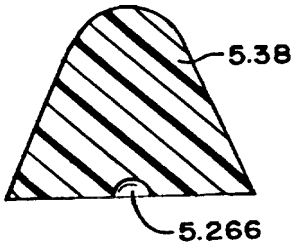


FIG. 52

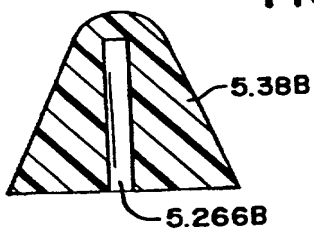


FIG. 53

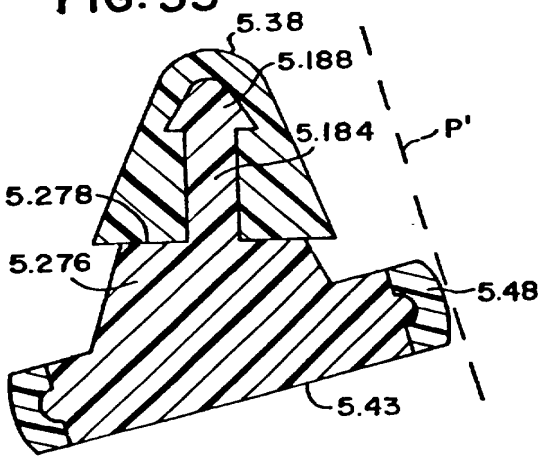


FIG. 54

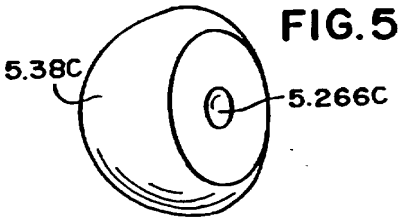


FIG. 55

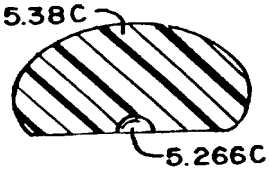


FIG. 56

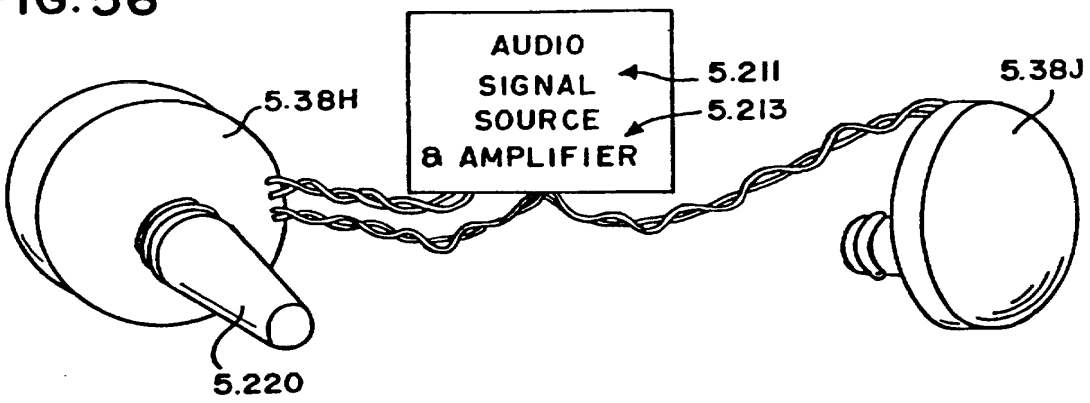


FIG. 57

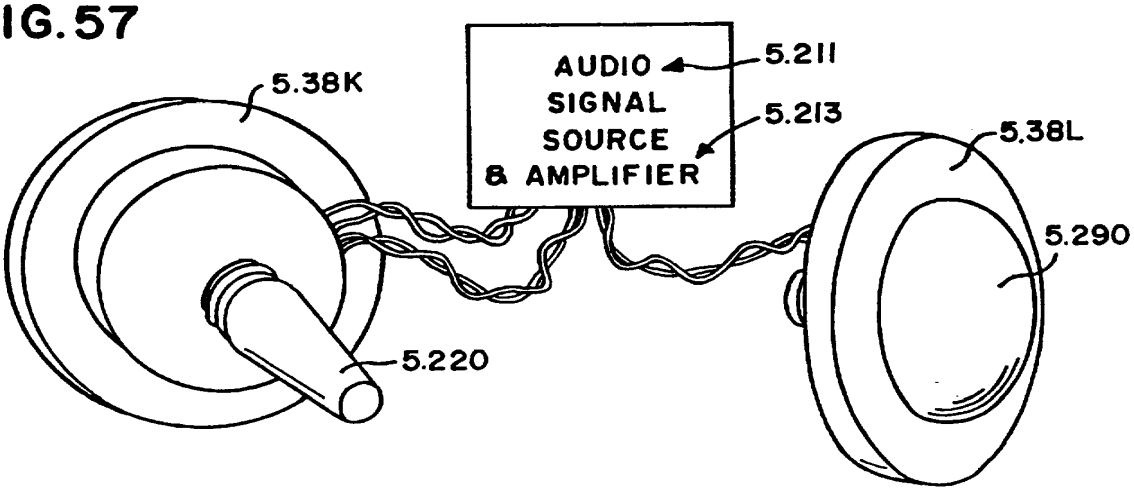
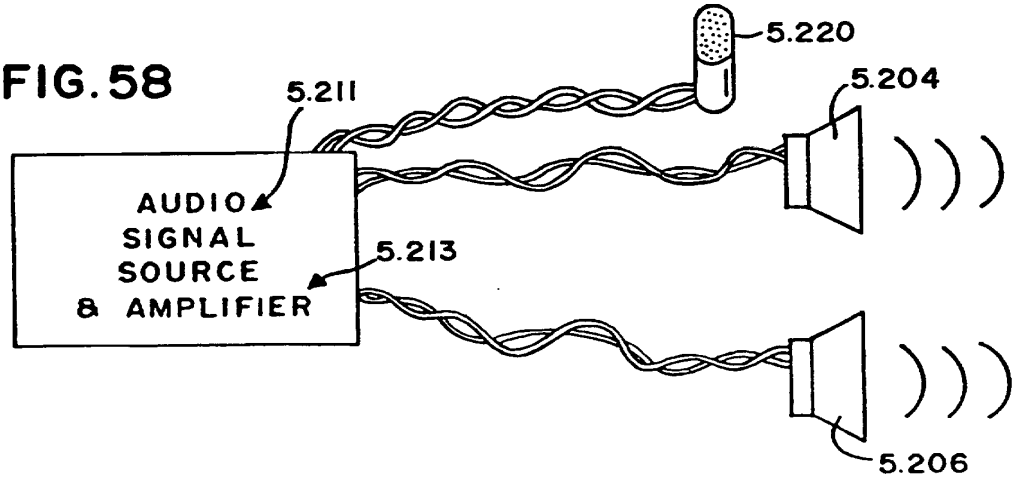


FIG. 58



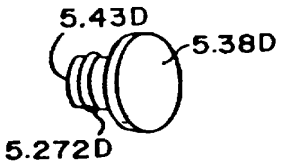


FIG.59

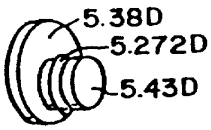


FIG.60

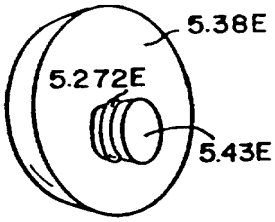


FIG.61

FIG.62

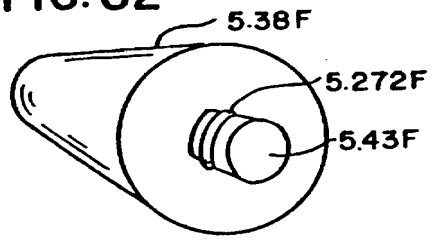
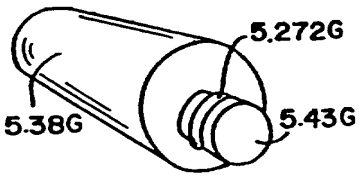


FIG.63



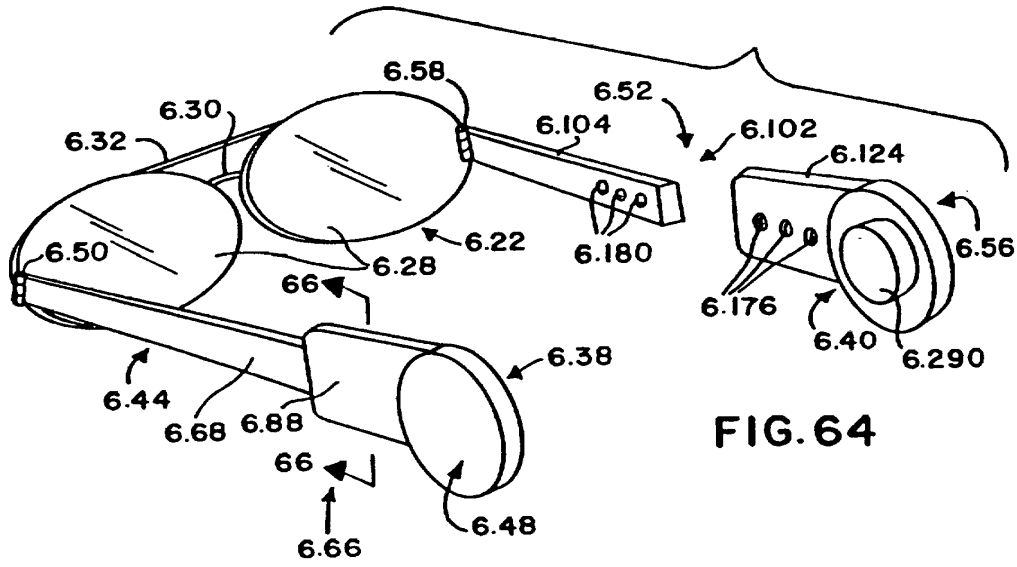


FIG.64

FIG. 65

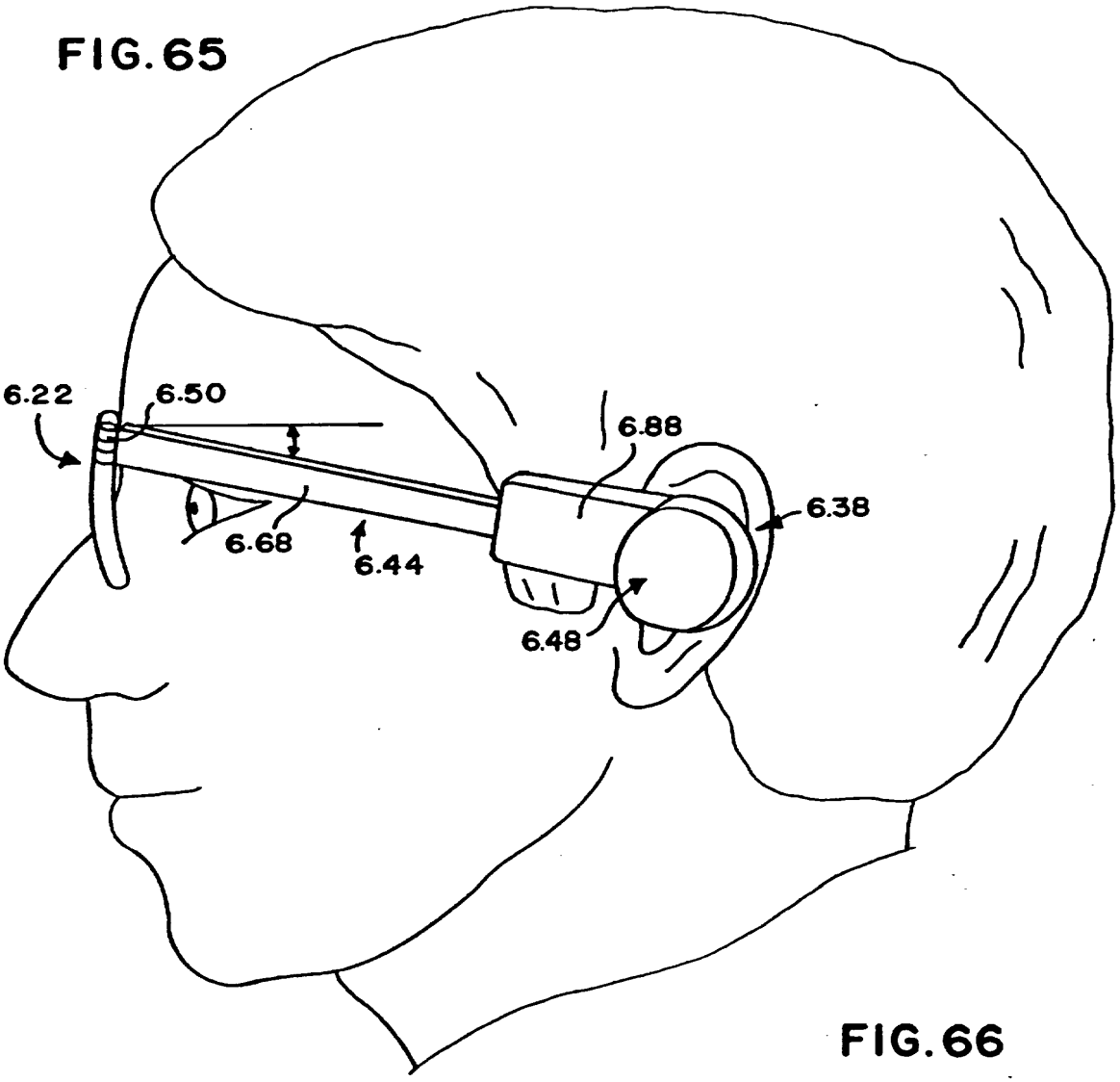
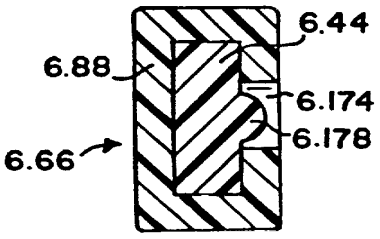


FIG. 66



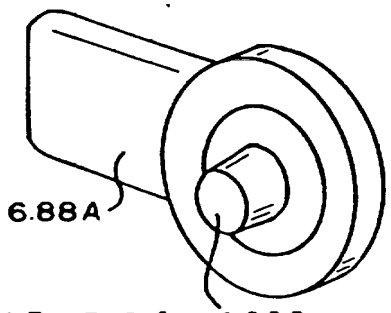


FIG. 64A

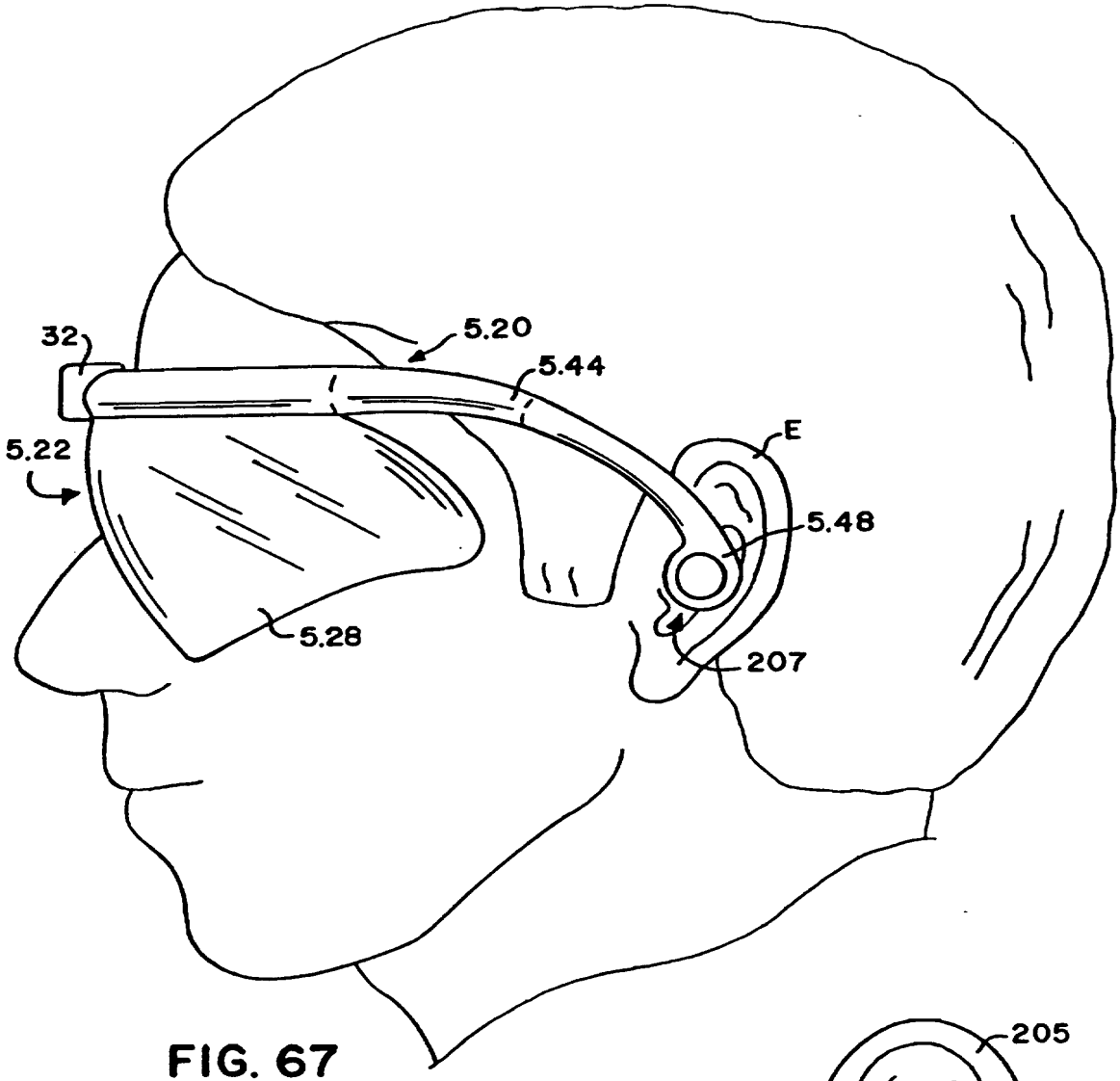


FIG. 67

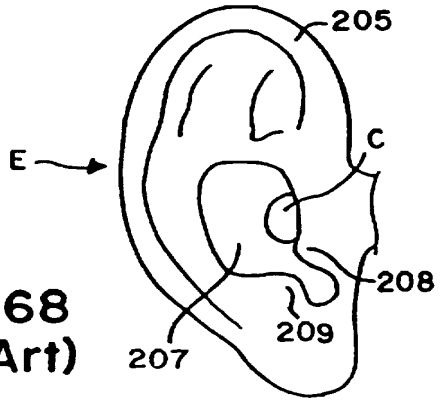


FIG. 68
(Prior Art)

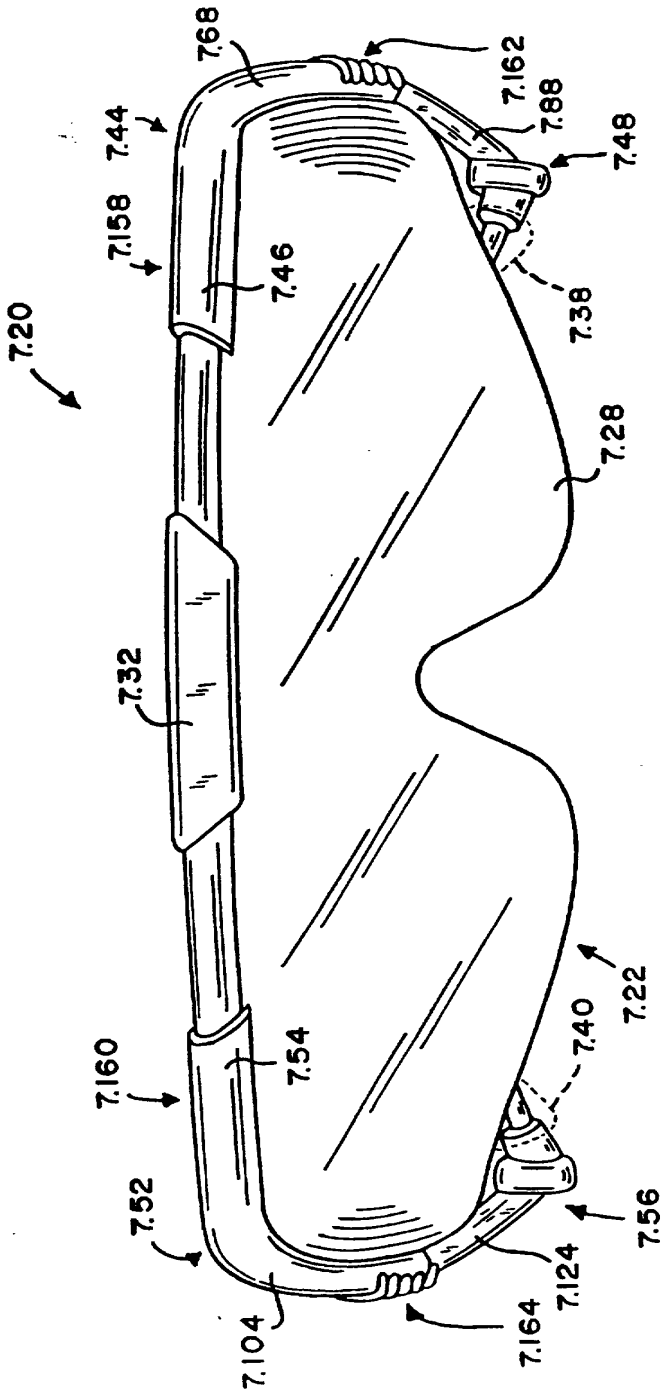

7.68
7.162
7.88
7.44
7.48
7.158
7.46
7.38
7.20
7.28
7.32
7.22
7.40
7.160
7.54
7.52
7.56
7.124
7.164
7.104

FIG. 69

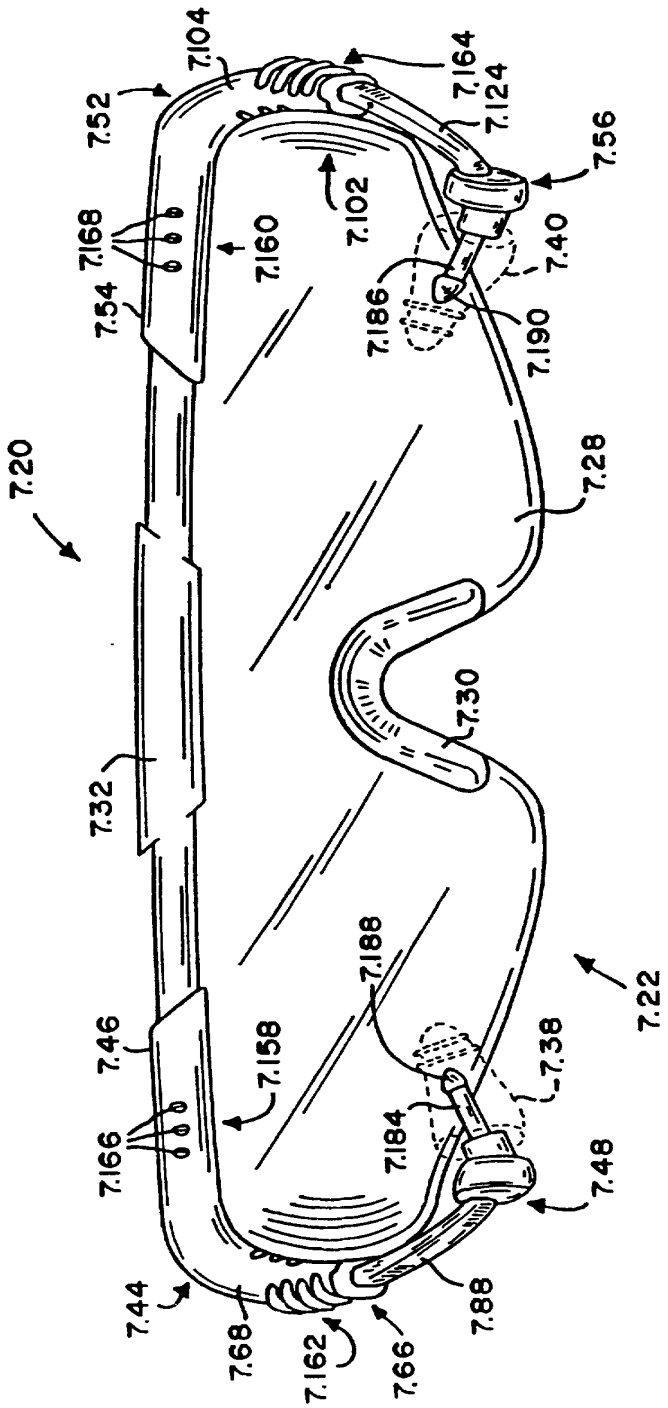

7.104
7.52
7.164
7.124
7.56
7.102
7.168
7.160
7.40
7.54
7.186
7.190
7.20
7.28
7.30
7.32
7.188
7.22
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7.166
7.184
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7.44
7.88
7.68
7.162
7.66

FIG. 70

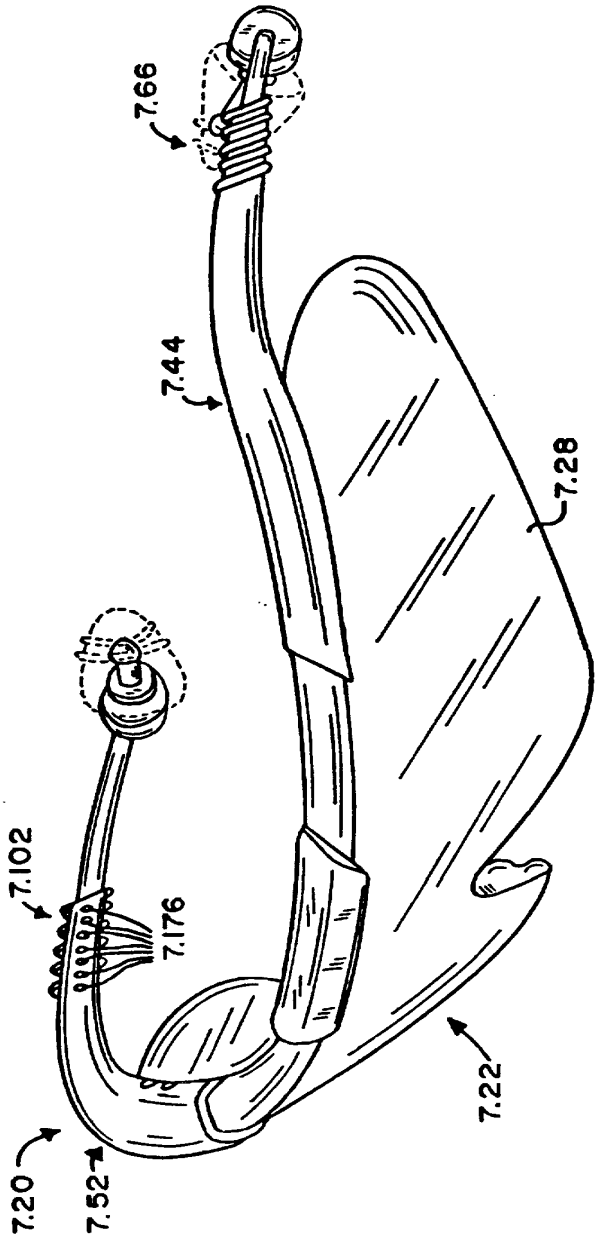


FIG. 7I

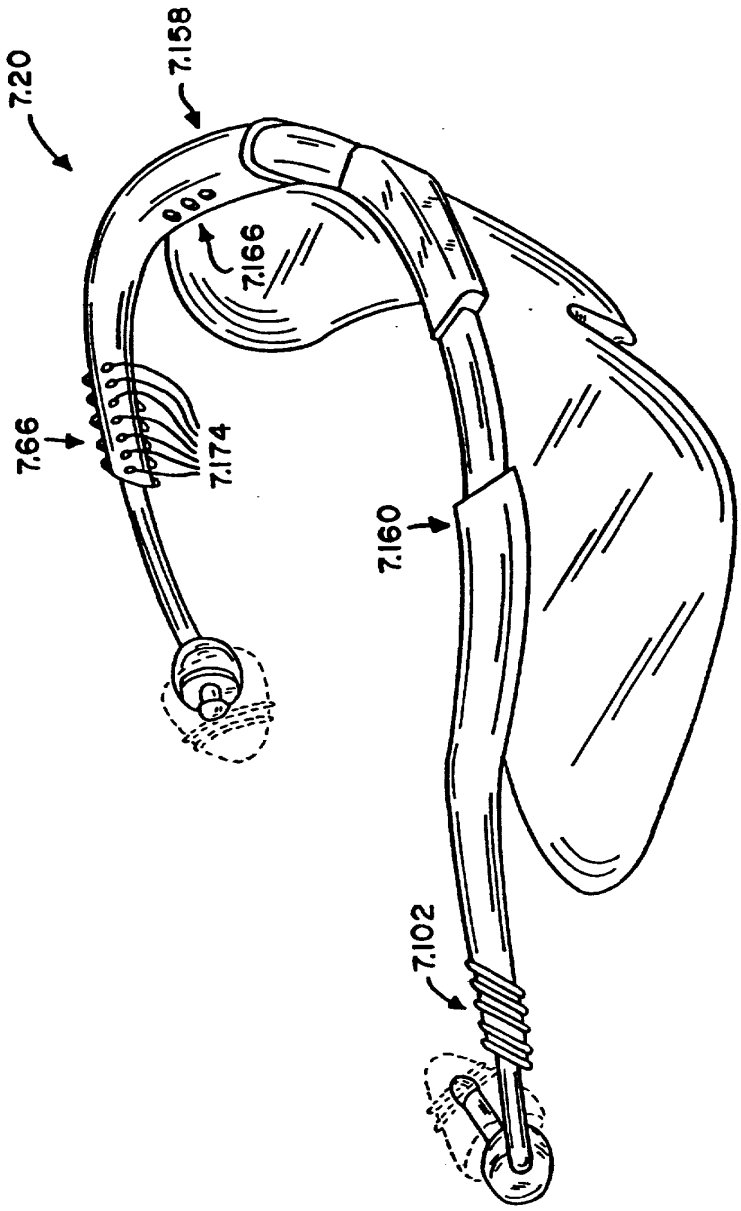


FIG. 72

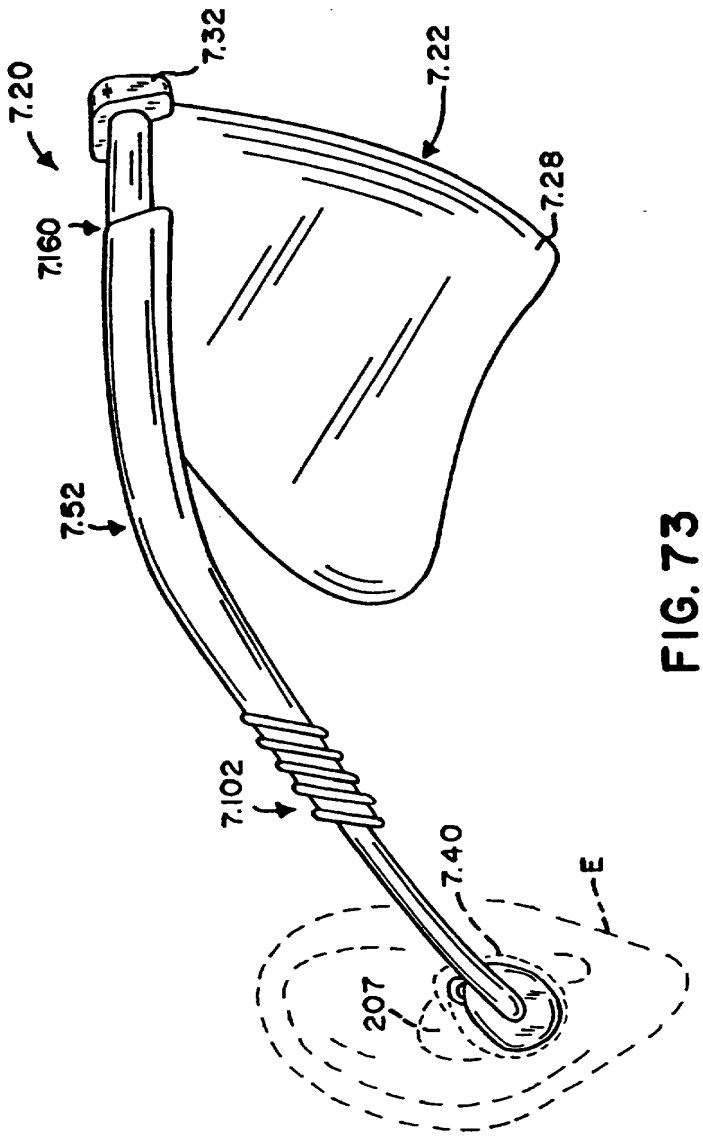


FIG. 73

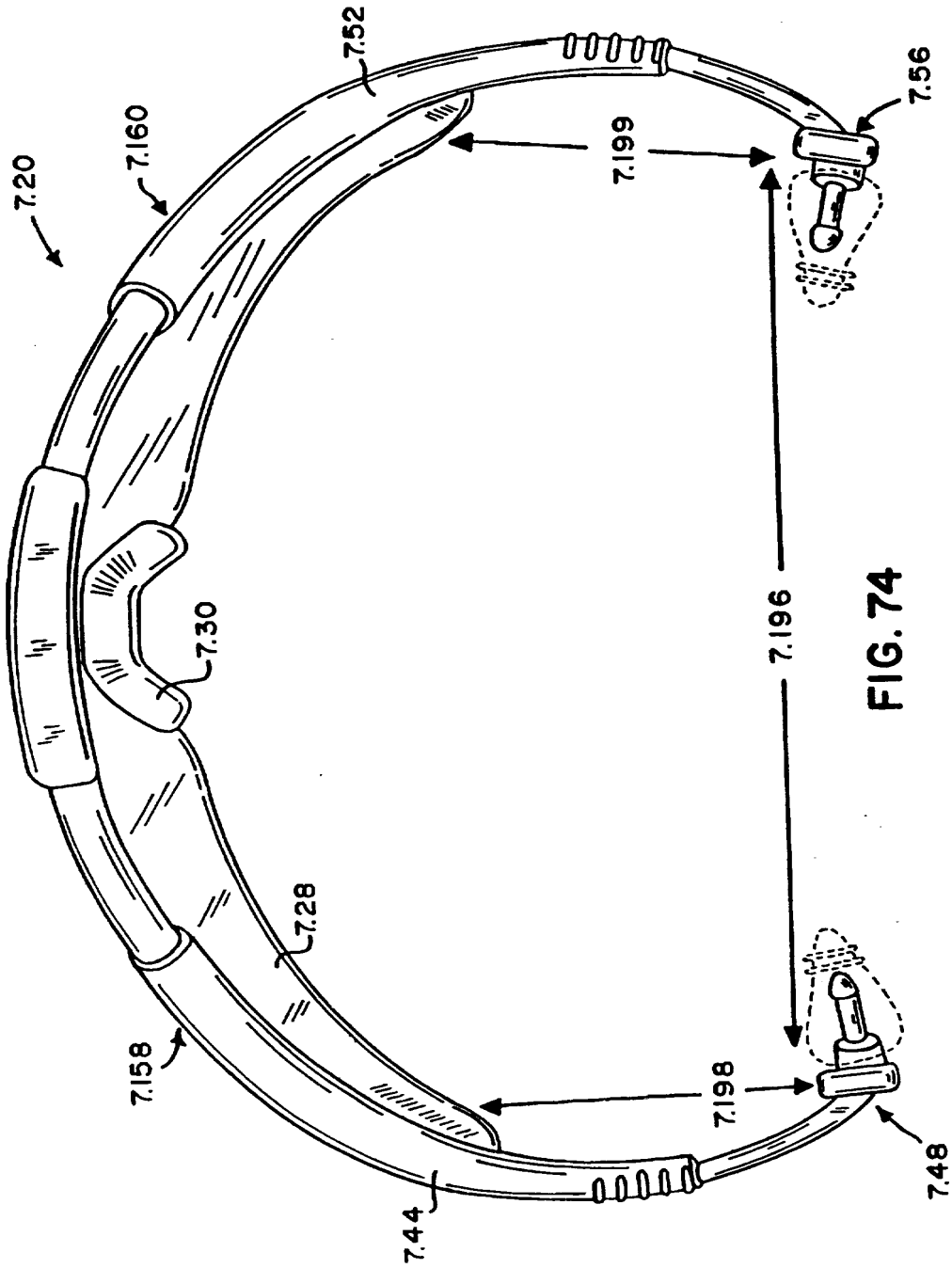


FIG. 74

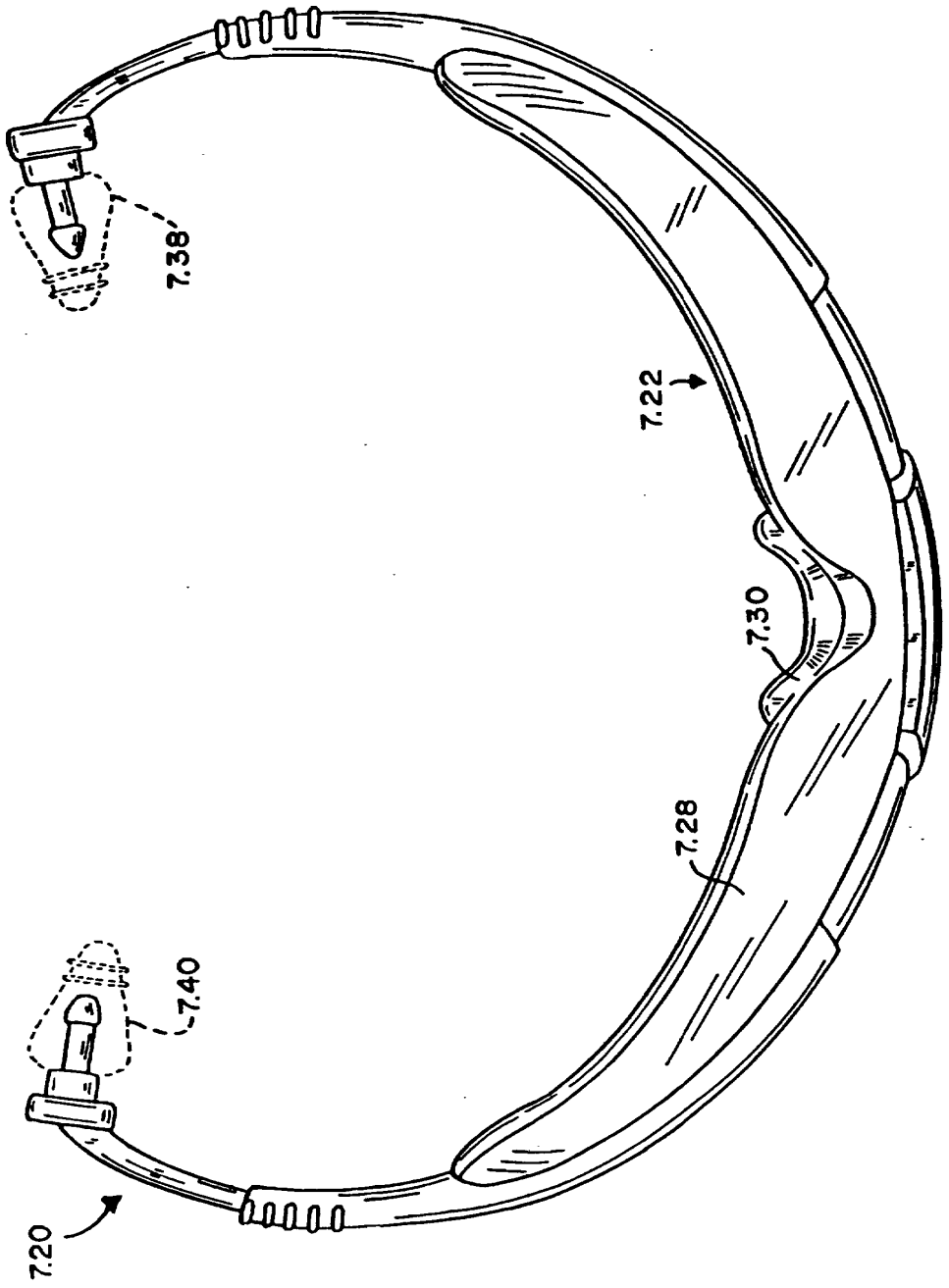


FIG. 75

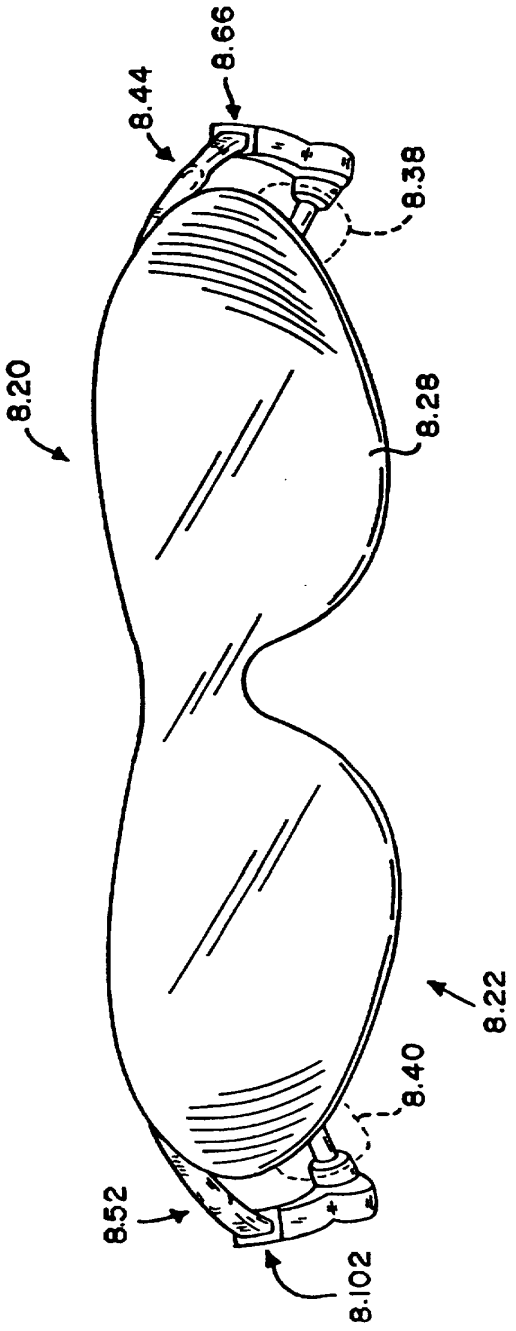


FIG. 76

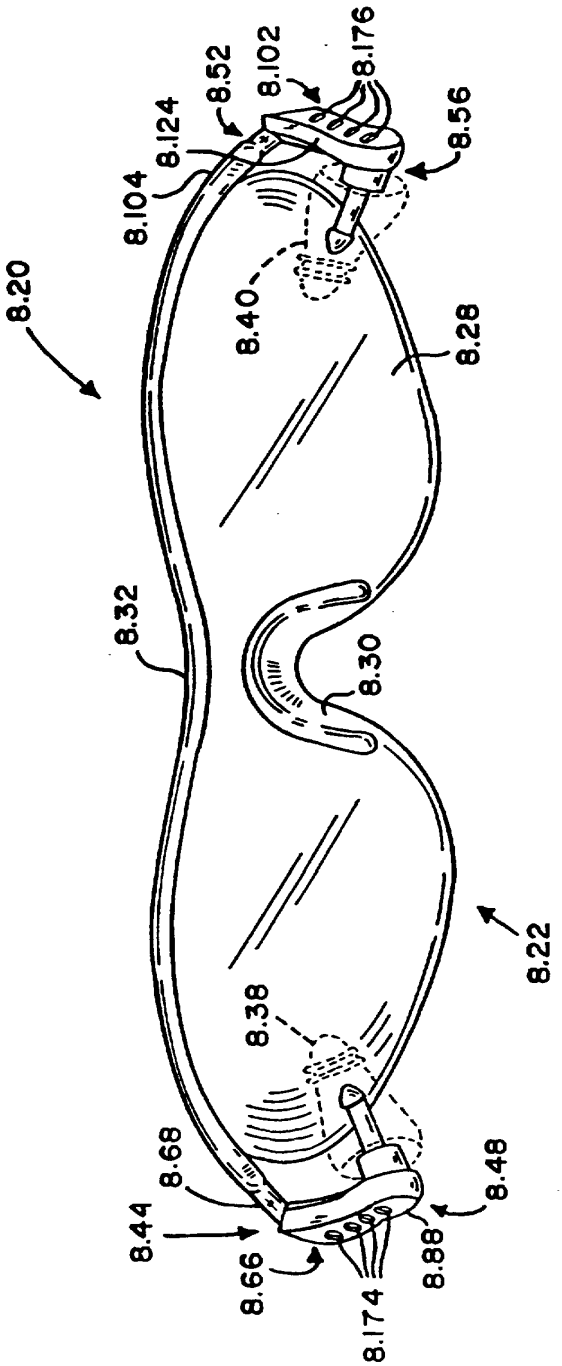

8.20
8.104
8.124
8.52
8.102
8.176
8.56
8.40
8.28
8.32
8.30
8.22
8.38
8.68
8.48
8.44
8.66
8.88
8.174

FIG. 77

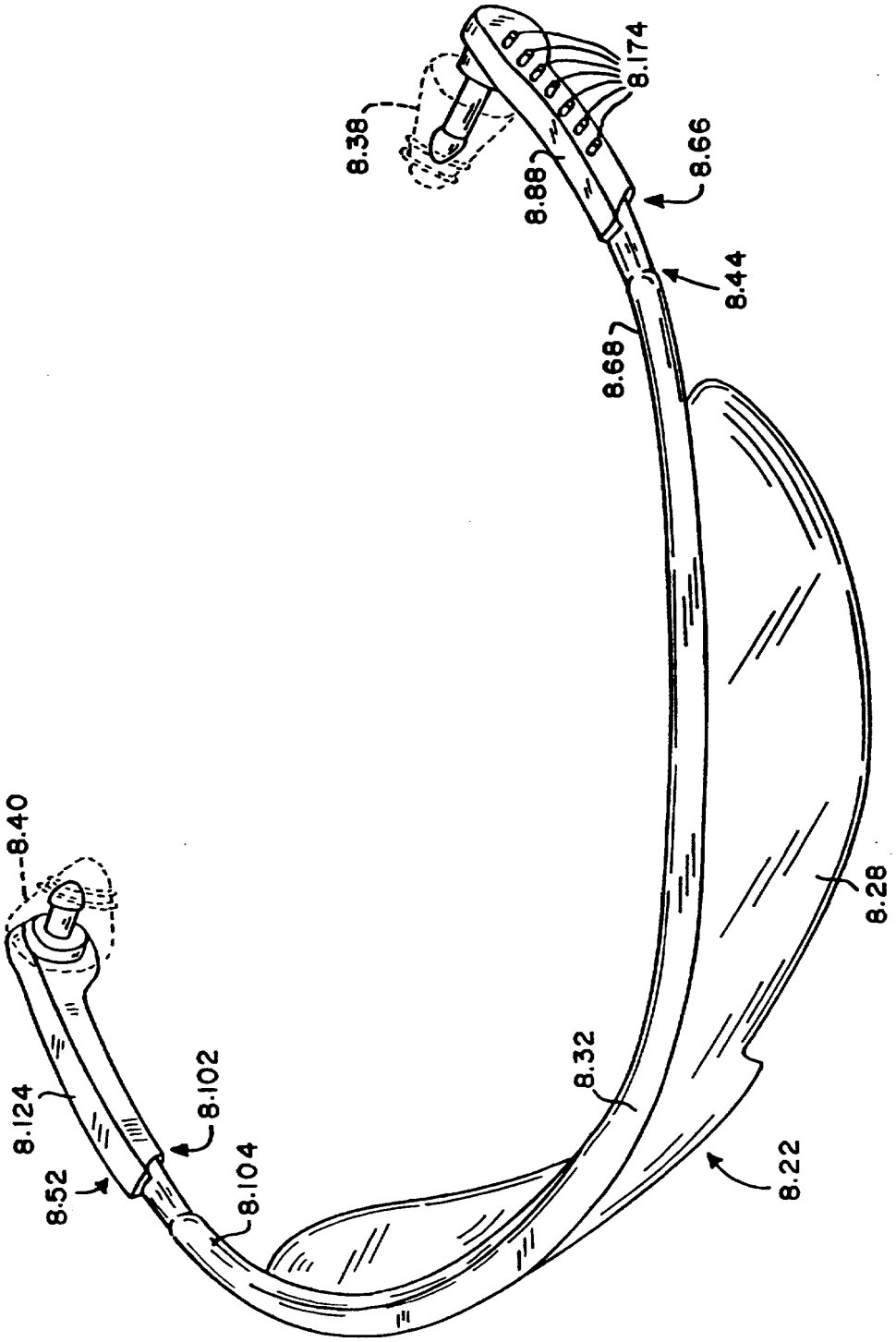


FIG. 78

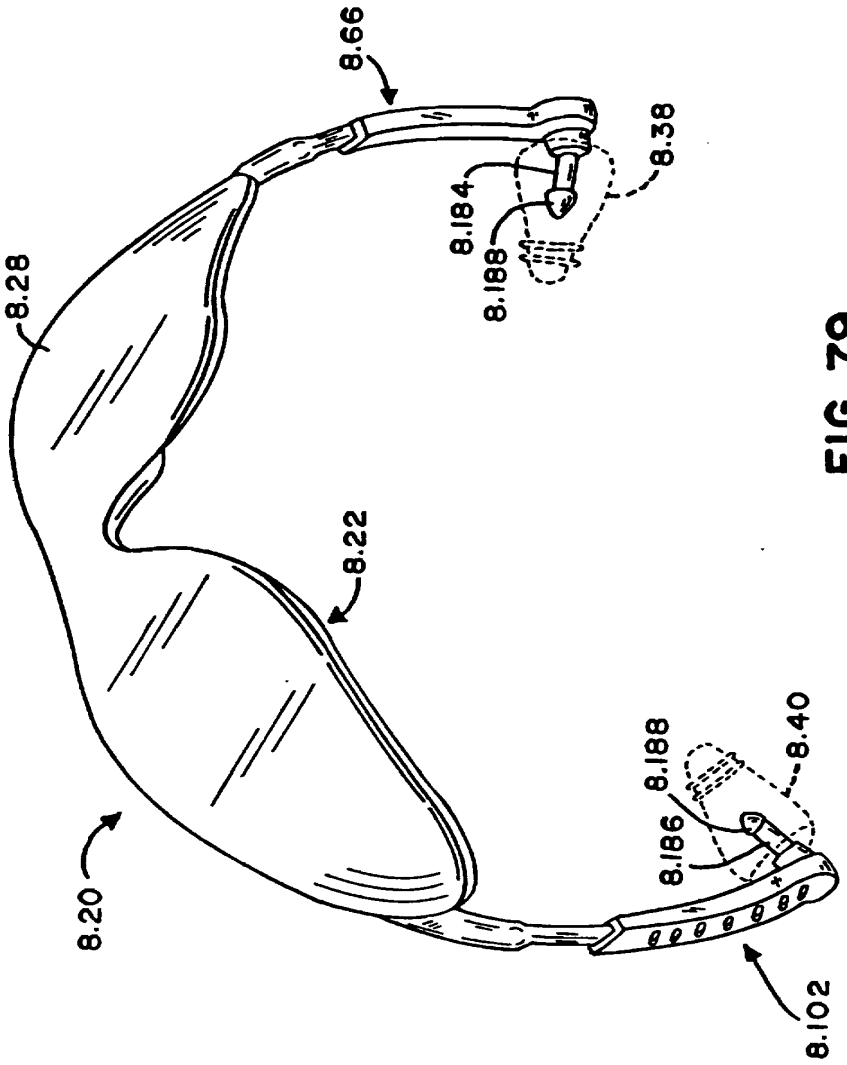


FIG. 79

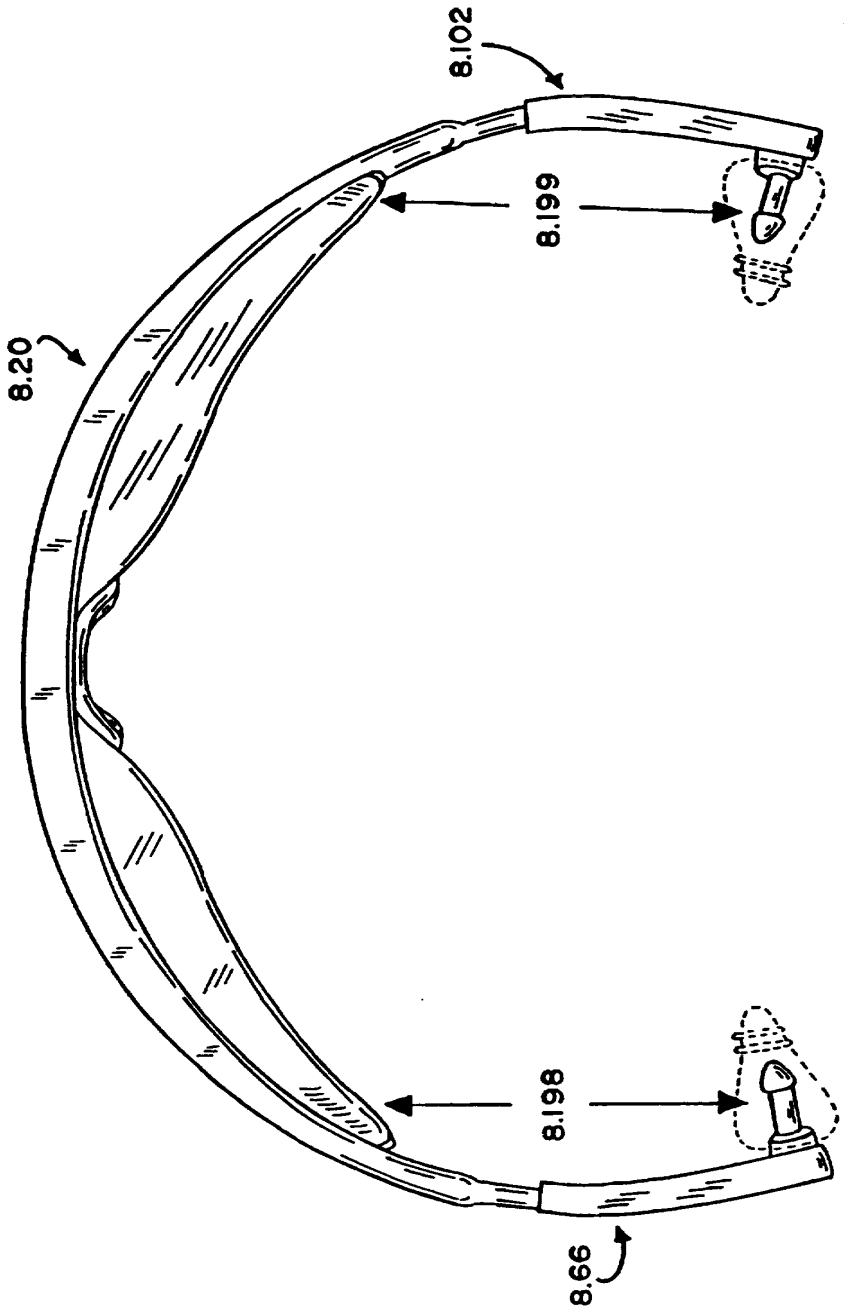


FIG.80

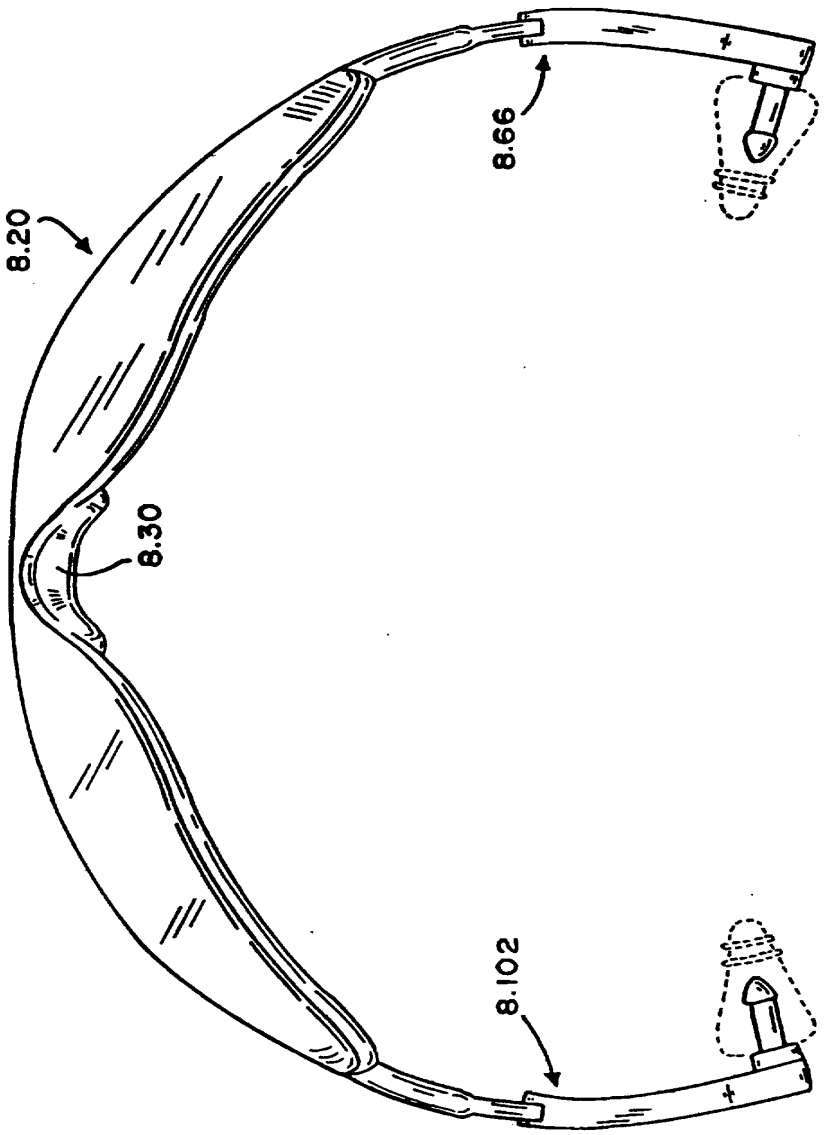


FIG. 8I

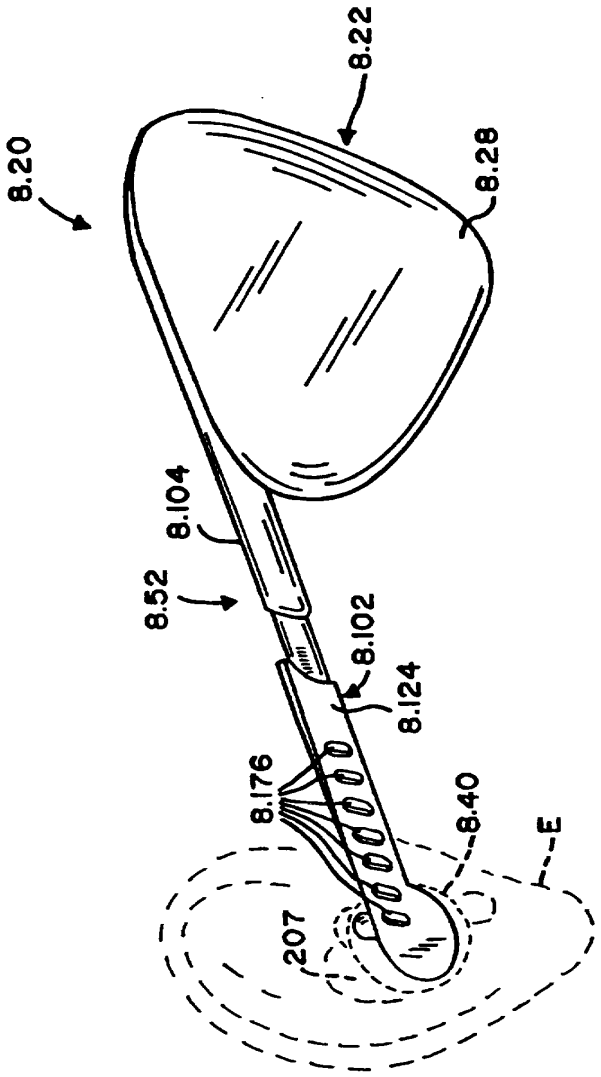


FIG. 82

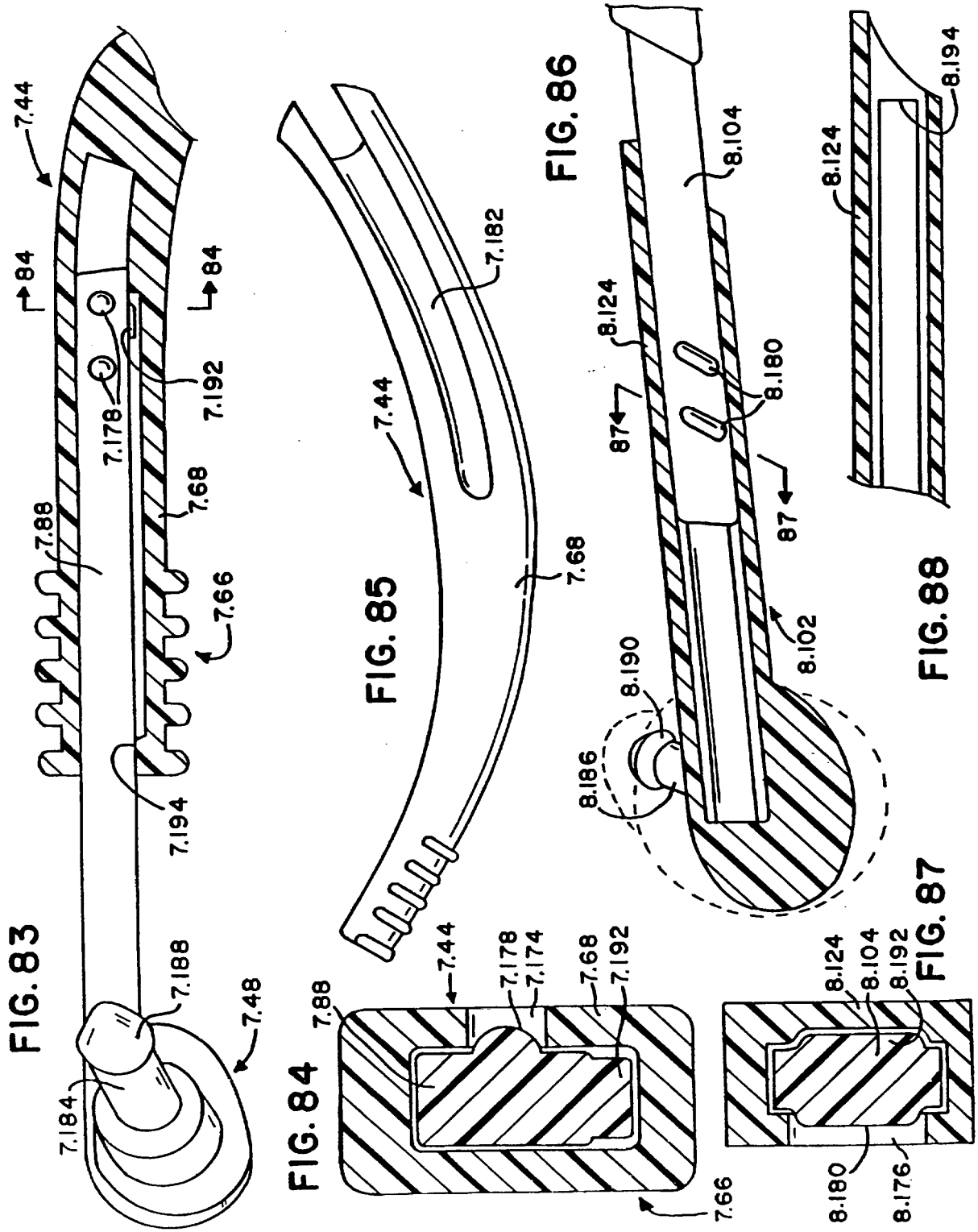


FIG. 83

FIG. 84

FIG. 85

FIG. 86

FIG. 87

FIG. 88

FIG. 89

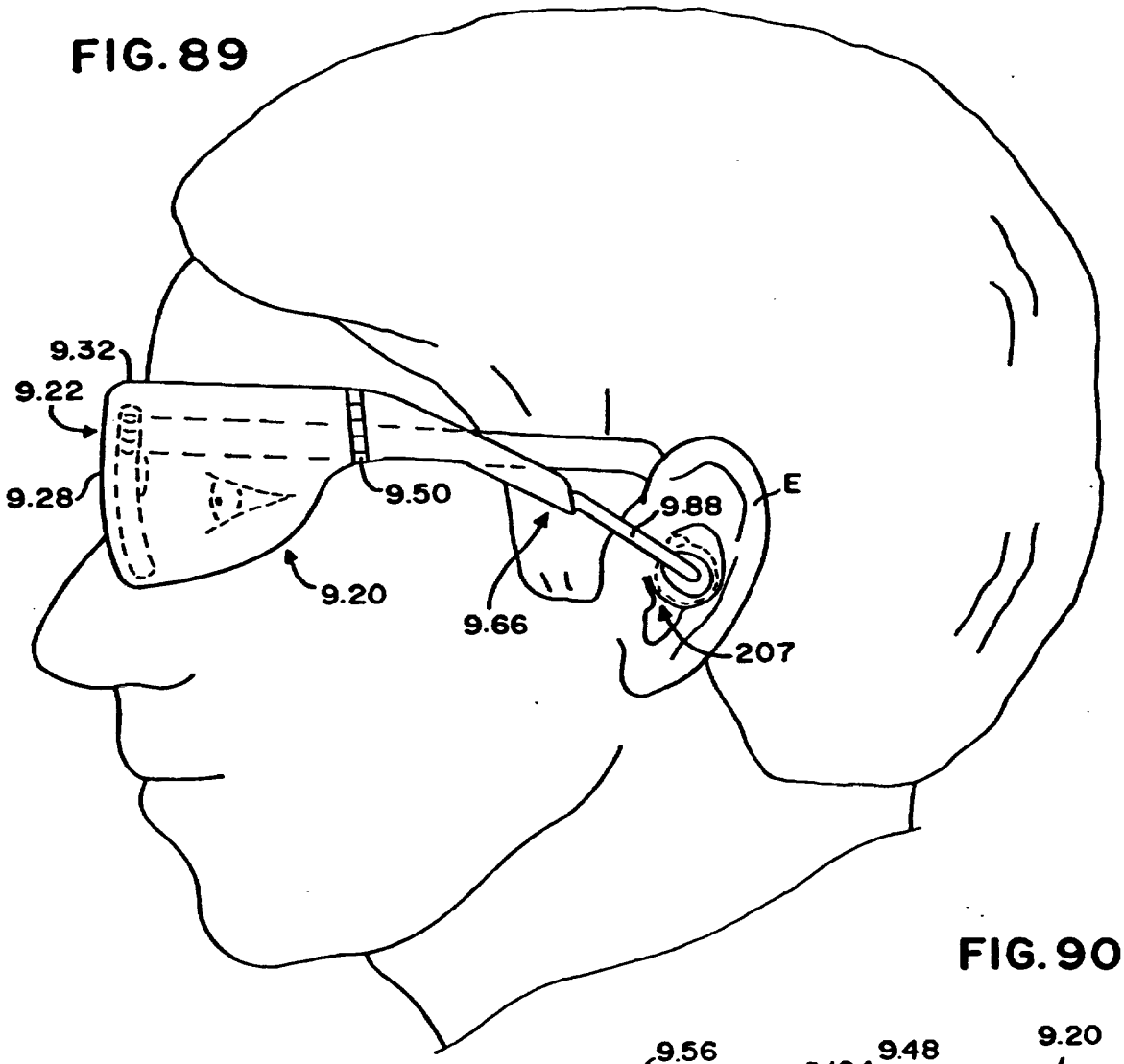


FIG. 90

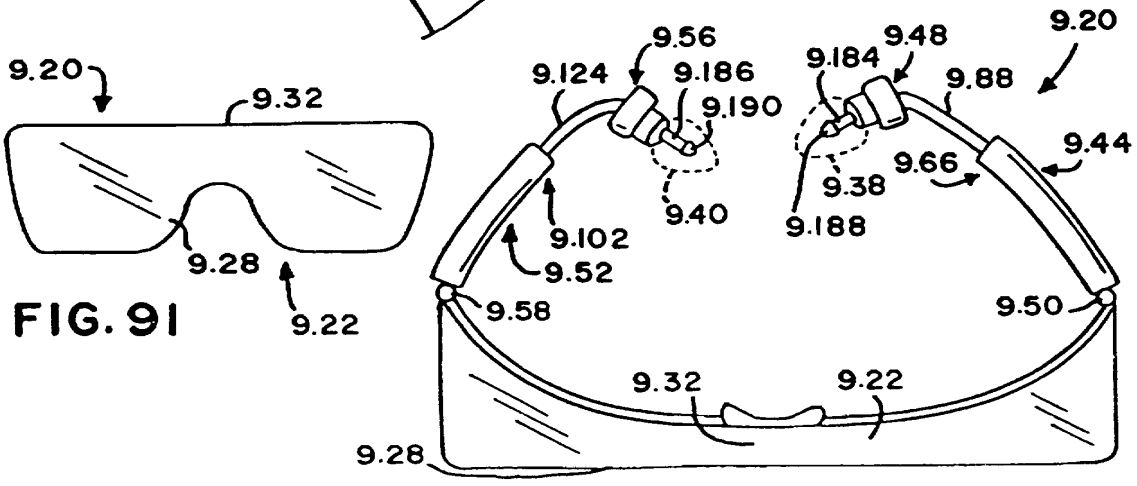


FIG. 91

TITLE OF THE INVENTION

EYEWEAR WITH EAR SUPPORTS

BACKGROUND OF THE INVENTION

The present invention relates, in general, to protective eyewear and protective earwear devices, and in particular, to protective eyewear with combined protective earpieces, as well as to protective eyewear devices having attached audio capability.

It is often desired to protect a person's eyes from being injured by flying debris at the workplace and to protect a person's hearing from being injured due to excessive noise at the workplace. Well-known solutions for this problem include providing separate safety glasses and earplugs. A problem occurs because a person, such as an employee, may use only one protective device when, in fact, both protective eyewear and protective earpieces are needed for proper protection in the work environment. Other well-known solutions for this problem include providing safety glasses with earplugs attached to the safety glasses in some manner, such as by cords. The problem with these solutions is that a user may wear the safety glasses without using the earplugs, thereby causing damage to his or her hearing. As an example, Leight, U.S. Patent No. 3,943,925, provides a hearing protector assembly that attaches to the temples of safety glasses, in which the temples of the glasses are supported over the ear. The protector assembly can be completely removed from the safety glasses, and, in addition, the assembly includes a brake that can hold the earplug away from the ear, thereby allowing the safety glasses to be worn without utilizing the hearing protector.

It is therefore desirable to have an eyesight and hearing safety device that, by design, requires the wearer to use both the safety glasses and earplugs simultaneously, thereby ensuring that the eyes and the hearing of the wearer are protected from harm.

It is also sometimes desired to listen to an audio device such as a radio, cassette tape player, or compact disc player while wearing protective or corrective eyewear, and there are occasions, such as, for example, on the floor of a large factory, where it is desirable to have the added convenience of a microphone along with audio reception capability so as to permit two-way communication. Well-known solutions to this problem include the use of an audio headset with the headset possibly having a microphone, and often such headsets are worn by those who wear glasses. The problem with prior art solutions is the inconvenience of having to put on or take off the glasses and headset with microphone separately and then having to

reposition both devices when either is disturbed.

Rickards, U.S. Patent No. 5,717,479, discloses a pair of safety glasses having a boom microphone and having disposable speaker earplugs attached by a sound tube or wire to a radio receiver mounted to the safety glasses. However, safety glasses of the Rickards device are supported over the ears of the wearer by earloops on the rear of the temples, thereby allowing the speaker earplugs to be removed while the safety glasses are worn and thereby removing any protection to the wearer's hearing. Such prior art is undesirable because the wearer's ears can become completely exposed and unblocked while wearing the glasses, and wearing of the earpieces thus cannot be compelled.

It is also known to have eyeglasses that incorporate a hearing aid into the frame of the eyeglasses. However, such solutions are not capable of attachment to a two-way communications device, such as a radio, and such hearing aid glasses do not incorporate a microphone. Additionally, such hearing aid glasses do not provide protection from further hearing loss.

It is further desirable that the eye protection lenses or shield of the eyewear may be tinted or have a polarizing coating for serving as sunglasses, thereby protecting the eyes from harmful glare or rays from the sun when outdoors, and that such eyewear be provided with audio earpieces and/or microphones.

BRIEF SUMMARY OF THE INVENTION

The present invention has many embodiments and improvements that accompany each of the succession of embodiments, but all embodiments are eyewear having a front transparent panel or single or dual lens (which may be clear or tinted for sunlight and glare protection and/or for eye protection during welding) that is supported on a wearer's head by a nose bridge and by at least one earpiece or earplug that is received into the concha of the wearer's ear and/or into the ear canal. The earpiece or earplug is attached to a rear end of its respective temple of the eyewear, and, unlike prior art, the temple for the earpiece or earplug is not supported over the wearer's ear, being only supported by the earpiece or earplug received into the wearer's ear without having any corresponding temple portion extending over the wearer's ear. Preferably both temples are only supported by their respective rear earpiece or earplug received into the wearer's respective ear, but some embodiments of the invention have a first temple on one side of the eyewear with a rear earplug or earpiece

supported only by the receipt of the earpiece or earplug into the wearer's ear and, on the other side of the eyewear, have a well-known conventional second temple supported over the wearer's ear, without an earpiece or earplug.

The earpieces of some embodiments sealingly and protectively plug the ear canal of the wearer and thus protect the wearer's hearing.

Some embodiments of the present invention have a microphone, whether as a boom-mounted microphone or an ear microphone; some embodiments of the present invention have audio earpieces for reproducing sound from an audio signal source; and some embodiments of the present invention have both a microphone and audio earpieces for providing two-way communication for the wearer. The audio earpieces may either sealingly and protectively plug the wearer's ear canal or may rest in the wearer's concha and on the outer ear. Various earpiece attachment means are provided for attaching the earpieces and earplugs to the temples of the eyewear.

The temples may have sliding length adjustment means and may have sliding spread adjustment means to selectively adjust for various-sized wearers' heads. The temples of the various embodiments of the invention are substantially shape-retaining, as contrasted to string, cord, or length-elastic bands. The eyewear is constructed so that the temples preferably exert an inward pressure on the earpieces and earplugs so as to retain the eyewear on the wearer's head during physical activity.

It is an object of the present invention to provide eyewear and audio apparatus that requires a wearer to use both eyesight and hearing protection while wearing the apparatus.

It is a further object of the present invention to provide an eyesight and hearing safety apparatus which can be firmly secured in place so that the human being can be very physically active while wearing the apparatus.

It is an object of the present invention to provide eyewear (sunglasses or corrective lenses) and audio (from a separate cellular telephone, radio, tape cassette, compact disc player, or two-way radio), with a microphone when appropriate, for both recreational and business use.

It is an object of the present invention to provide eyewear in which at least one temple is, and preferably both temples are, supported from the wearer's respective ear only by the earpiece or earplug attached to the rear of the temple, without having a temple portion

extending over that respective ear of the wearer.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

Fig. 1 is a perspective view of a first embodiment of the present invention.

Fig. 2 is a perspective view of the front guard portion.

Fig. 3 is a perspective view of a portion of a first temple and of a first side transparent panel of the first embodiment of the present invention.

Fig. 4 is a different perspective view of the portion of the first temple shown in Fig. 3.

Fig. 5 is a perspective view of another portion of the first temple shown adjusted to a first vertical position.

Fig. 5A is a perspective view of the other portion of the first temple shown adjusted to a second vertical position.

Fig. 6 is an enlarged perspective view of a first and a second earplug and suspending means.

Fig. 7 is a perspective view of a portion of a second temple and of a second side transparent panel.

Fig. 8 is a different perspective view of the portion of the second temple shown in Fig. 7.

Fig. 9 is a perspective view of another portion of the second temple shown adjusted to a first vertical position.

Fig. 9A is a perspective view of the other portion of the second temple shown adjusted to a second vertical position.

Fig. 10 is a perspective view of a second preferred embodiment of the present invention with tinted lenses, two earphones, and an extended microphone boom.

Fig. 11 is a perspective view of a third preferred embodiment of the present invention with corrective lenses, one earphone, one earplug-type earphone, and an extended microphone boom.

Fig. 11A is a perspective view of a variation of the third preferred embodiment of the present invention having corrective lenses, one earphone, one earplug, and an extended microphone boom.

Fig. 12 is a sectional view showing the earphone of the second and third embodiments

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in a user's ear.

Fig. 13 is a side view showing the earphone of the second and third embodiments in a user's ear.

Fig. 14 is a sectional view of the earphone of the second and third embodiments, taken along a diameter of the earphone, and showing the various adjustable positions of the temple gripping portion.

Fig. 15 is an end view showing the recess for receiving the retracted microphone boom, taken substantially along the line 15-15 shown in Fig. 17.

Fig. 16 is a perspective view of a portion of the adjustable temple of the second and third embodiments, showing the microphone boom and the earphones.

Fig. 17 is a side sectional view of a portion of the temple of the second and third embodiments, showing the microphone boom in a partially-extended position.

Fig. 18 is a side sectional view of a portion of the temple of the second and third embodiments, similar to Fig. 17, but showing the microphone boom in a fully-retracted position.

Fig. 19 is a top sectional view of the length adjustment means of the temple of the second and third embodiments.

Fig. 20 is a perspective view of the microphone boom showing its securing mechanism in an unsecured first position.

Fig. 20A is a perspective view of the microphone boom showing its securing mechanism rotated into a secured second position.

Fig. 21 is a transverse sectional view of the rear portion of the first temple showing the microphone boom's securing mechanism in the unsecured first position, taken substantially along the line 21-21 shown in Fig. 17.

Fig. 21A is a transverse sectional view of the rear portion of the first temple, similar to Fig. 21, but showing the microphone boom's securing mechanism rotated into the secured second position.

Fig. 22 shows a fourth embodiment in which one temple hooks or loops over one of the wearer's ears.

Fig. 23 is a front view of a fifth embodiment of the present invention with the rear earpieces removed.

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Fig. 24 is a rear view of the fifth embodiment of the present invention with a first version of the earpieces attached and shown in dotted outline.

Fig. 25 is a perspective view from one direction of the fifth embodiment of the present invention with the rear earpieces removed.

Fig. 26 is another perspective view from another direction of the fifth embodiment of the present invention with the rear earpieces removed.

Fig. 27 is a side view of the fifth embodiment of the present invention with the rear earpieces removed. The view from the other side is a mirror image.

Fig. 28 is a top view of the fifth embodiment of the present invention with the rear earpieces removed.

Fig. 29 is a bottom view of the fifth embodiment of the present invention with the rear earpieces removed.

Fig. 30 is a perspective view of a front temple portion of the temples for the fifth embodiment of the present invention.

Fig. 31 is a sectional view of the front browpiece of the fifth embodiment of the present invention.

Fig. 32 is a sectional view showing attachment of the front temple portion to the front browpiece of the fifth embodiment of the present invention so as to form the first temple spread-and-length adjustment means.

Fig. 33 is a top view of a first alternate temple for the fifth embodiment of the present invention with the earpiece removed.

Fig. 34 is a top view of the first alternate temple for the fifth embodiment of the present invention with the earpiece attached.

Fig. 35 is an end view showing attachment of an earpiece to the first alternate temple of the fifth embodiment of the present invention, taken substantially along the line 35-35 shown in Fig. 34.

Fig. 36 is a partial sectional view showing attachment of an earpiece to the first alternate temple of the fifth embodiment of the present invention, taken substantially along the line 36-36 shown in Fig. 34.

Fig. 37 is a perspective end view of the first alternate temple of Fig. 33, with the earpiece removed.

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Fig. 38 is a side view of a second alternate temple for the fifth embodiment of the present invention.

Fig. 39 is a top view of the second alternate temple for the fifth embodiment of the present invention, taken substantially along the line 39-39 shown in Fig. 38.

Fig. 40 is a side view of a third alternate temple for the fifth embodiment of the present invention.

Fig. 41 is a side view of a fourth alternate temple for the fifth embodiment of the present invention.

Figs. 42-48 show various details of the earpiece mounting means of the fifth embodiment.

Fig. 42 is a sectional view showing a first embodiment of the earpiece mounting means with the earplug barb at a first angle.

Fig. 43 is a sectional view showing the first embodiment of the earpiece mounting means with the earplug barb at a second angle.

Fig. 44 is a perspective view showing the first embodiment of the earpiece mounting means separated from the temple of the fifth embodiment of the present invention.

Fig. 45 is a perspective view of a second embodiment of the earpiece mounting means.

Fig. 46 is a sectional view showing the inner groove for rotation of the earpiece mounting means within the rear of the temple of the fifth embodiment of the present invention.

Fig. 47 shows a comfort plug after removal from the rear of the temple of the fifth embodiment of the present invention.

Fig. 48 is a sectional view showing the comfort plug of Fig. 47 as inserted into the rear of the temple of the fifth embodiment of the present invention.

Fig. 49 is a rear perspective view of a first version of an aural earplug for the fifth embodiment of the present invention.

Fig. 50 is a front perspective view of the first version of the aural earplug shown in Fig. 49.

Fig. 51 is a sectional view of the first version of the aural earplug shown in Figs. 49 and 50, as taken along a diameter, it being understood that the earplug is substantially cylindrically symmetrical.

Fig. 52 is a sectional view of a variation of the first version of the aural earplug shown

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in Figs. 49 and 50 as taken along a diameter, it being understood that the earplug is substantially cylindrically symmetrical.

Fig. 53 is a sectional view showing the earplug of Figs. 49-51 placed onto the earplug barb shown in Fig. 42.

Fig. 54 is a perspective view of a semi-aural earplug of the present invention.

Fig. 55 is a sectional view of the semi-aural earplug shown in Fig. 54 as taken along a diameter, it being understood that the earplug is substantially cylindrically symmetrical.

Fig. 56 shows a perspective and schematic view of a first version of audio earpieces with ear microphones for use with the fifth embodiment of the present invention.

Fig. 57 shows a perspective and schematic view of a second version of audio earpieces with ear microphones for use with the fifth embodiment of the present invention.

Fig. 58 is a schematic of the audio earpieces with ear microphones shown in Figs. 56 and 57.

Fig. 59 is a perspective view from one direction of an adjustable comfort disk earpiece for use with the fifth embodiment of the present invention.

Fig. 60 is another perspective view of the adjustable comfort disk earpiece shown in Fig. 59.

Fig. 61 is a rear perspective view of a semi-aural earplug with integral earpiece mounting means for use with the fifth embodiment of the present invention.

Fig. 62 is a rear perspective view of a first aural earplug with integral earpiece mounting means for use with the fifth embodiment of the present invention.

Fig. 63 is a rear perspective view of a second aural earplug with integral earpiece mounting means for use with the fifth embodiment of the present invention.

Fig. 64 is a perspective view of a sixth embodiment of the present invention without audio earpieces.

Fig. 64A is a perspective view showing an audio earpiece with ear microphone for the sixth embodiment of the present invention.

Fig. 65 is a side view showing a wearer wearing the sixth embodiment of the present invention.

Fig. 66 is a transverse sectional view showing the temple length adjustment means of the sixth embodiment taken substantially along the line 66-66 shown in Fig. 64.

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Fig. 67 is a side view showing a wearer wearing the fifth embodiment of the present invention.

Fig. 68 is a side view of a well-known human ear showing the parts thereof.

Fig. 69 is a front view of a seventh embodiment of the present invention with attached earplugs shown in dotted outline.

Fig. 70 is a rear view of the seventh embodiment of the present invention with attached earplugs shown in dotted outline.

Fig. 71 is a perspective view of the seventh embodiment of the present invention from one side with attached earplugs shown in dotted outline.

Fig. 72 is a perspective view of the seventh embodiment of the present invention from another side with attached earplugs shown in dotted outline.

Fig. 73 is a side view of the seventh embodiment of the present invention, the view from the other side being a substantially similar mirror image, with attached earplugs shown in dotted outline.

Fig. 74 is a top view of the seventh embodiment of the present invention with attached earplugs shown in dotted outline.

Fig. 75 is a bottom view of the seventh embodiment of the present invention with attached earplugs shown in dotted outline.

Fig. 76 is a front view of a eighth embodiment of the present invention with attached earplugs shown in dotted outline.

Fig. 77 is a rear view of the eighth embodiment of the present invention with attached earplugs shown in dotted outline.

Fig. 78 is a perspective view of the eighth embodiment of the present invention from one side with attached earplugs shown in dotted outline. The similar perspective view from the other side is a mirror image.

Fig. 79 is an underside perspective view of the eighth embodiment of the present invention with attached earplugs shown in dotted outline.

Fig. 80 is a top view of the eighth embodiment of the present invention with attached earplugs shown in dotted outline.

Fig. 81 is a bottom view of the eighth embodiment of the present invention with attached earplugs shown in dotted outline.

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Fig. 82 is a side view of the eighth embodiment of the present invention, the view from the other side being a substantially similar mirror image, with attached earplugs shown in dotted outline.

Fig. 83 is a partial sectional view of the rear of the temple of the seventh embodiment of the present invention, showing the temple length adjustment means.

Fig. 84 is a transverse sectional view of the temple of the seventh embodiment of the present invention, taken substantially along the line 84-84 shown in Fig. 83.

Fig. 85 is a bottom view of the temple as removed from the seventh embodiment of the present invention.

Fig. 86 is a partial sectional view of the rear of the temple of the eighth embodiment of the present invention, showing the temple length adjustment means.

Fig. 87 is a transverse sectional view of the temple of the eighth embodiment of the present invention, taken substantially along the line 87-87 shown in Fig. 86.

Fig. 88 is a portion of the transverse sectional view shown in Fig. 87 of the temple of the eighth embodiment of the present invention, with the front temple portion removed to show features hidden in Fig. 87.

Fig. 89 is a side view showing a wearer wearing a ninth "overglasses" embodiment of the present invention. The view from the other side is substantially a mirror image.

Fig. 90 is a top view of the ninth embodiment of the present invention.

Fig. 91 is a front view of the ninth embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

All embodiments have many common structural similarities, as will be explained and disclosed herein. All embodiments are eyewear having a front transparent panel or single or dual lens (clear or tinted for sunlight and glare protection and/or for eye protection during welding) that is supported on a wearer's head by a nose bridge and by at least one earpiece or earplug that is received into the concha of the wearer's ear and/or into the ear canal. The earpiece or earplug is attached to a rear end of its respective temple of the eyewear, and, unlike prior art, the temple for the earpiece or earplug is not supported over the wearer's ear, being only supported by the earpiece or earplug received into the wearer's ear without having any corresponding temple portion extending over the wearer's ear.

A basic understanding of the well-known external anatomy of the human ear is helpful

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for understanding the present invention. Referring to Fig. 68, a well-known human ear **E** is shown. The external ear consists of an expanded portion of cartilage called the pinna or auricle **205**, which is of a generally ovoid form. The ear canal **C** opens within the bowl or concha **207**, which is a capacious cavity formed within the pinna. The concha is partially spanned by opposing protrusions, the tragus **208** and the antitragus **209**, separated by a wide notch.

Earplugs and earpieces are of several general forms. So-called "aural" earplugs and earpieces insert into the ear canal of the wearer and substantially block the ear canal. So-called "semi-aural" earplugs and earpieces are partially inserted into the ear canal and also block the entrance of the ear canal in the concha. So-called "supra-aural" earplugs and earpieces block the entrance to the ear canal in the concha without entering the ear canal itself. Still another form of earpiece, a "support-only" comfort pad earpiece that does not block the ear canal but instead only rests in the concha of the wearer's ear, can also be used with the various embodiments of the present invention as shown, for example, in Figs. 46-48 and 59-60, to support the eyewear of the present invention from the wearer's ear without blocking the ear canal, as hereinafter described. It shall be understood that the terms "earplugs" and "earpieces", as used herein, have a scope that encompasses all of these forms of earplugs and earpieces, including the aural, semi-aural, supra-aural, and support-only comfort pad earpiece forms, and the term "earpiece", as used herein, shall be understood to be defined to be the generic term for all of these earpieces and earplugs.

A key difference between the first embodiment (shown in Figs. 1-9A) and the second and third embodiments (i.e., the improvements shown in Figs. 10-21A) is that the second and third embodiments provide for audio capability through earpieces (earphones and earplugs with audio capability), while the first embodiment lacks such audio capability. In all of the first three embodiments, however, the eyewear is supported from the earpieces that are received into the ear, and no support is provided by any over-the-ear supports as are customary in prior art eyeglasses. A fourth embodiment, also described, has one temple that includes an earloop for hooking or looping over one of the wearer's ears.

Accordingly, the first embodiment will now be explained by referring to Figs. 1-9A, and the first embodiment is seen to comprise an eyesight and hearing safety apparatus **20**. Referring to Figs. 1 and 2, eyesight and hearing safety apparatus **20** is seen to comprise a front

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guard portion 22 having a left front guard portion end 24 and a right front guard portion end 26. The front guard portion 22 includes a front transparent panel 28 for protecting the eyesight of a human being. The front transparent panel 28 is preferably constructed from a well known clear plastic material suitable for viewing therethrough. The front guard portion 22 includes a well known bridge portion 30 for supporting the front guard portion 22 on the nose of a human being. The front guard portion 22 preferably includes an elongated front member or browpiece 32. The front transparent panel 28 is disposed adjacent to the elongated member 32 and is preferably attached thereto. The elongated member 32 is preferably constructed in the shape of a curve and includes the well known bridge portion 30 depending therefrom. The bottom surface of the elongated member 32 has a first groove (hidden) and the top surface of the bridge portion 30 has a second groove (hidden). The first and second grooves are for securing the front transparent panel 28 as is well known in the art. The elongated member 32 preferably includes the left front guard portion end 24 and the right front guard portion end 26. Further details concerning the construction and operation of the elongated member 32 will be described hereinafter.

Referring to Figs. 1 and 6, the eyesight and hearing safety apparatus 20 is seen to further comprise a first earpiece or earplug 38 and a second earpiece or earplug 40 for supporting the front guard portion 22 from a respective auditory canal when the human being is wearing the apparatus 20 to protect the eyesight and hearing of the human being. The first and second earplugs 38, 40 are preferably constructed to each have multiple curved elements 42 for snugly engaging the auditory canal. The diameter of each curved element 42 decreases as the particular curved element 42 is located closer to the end which first engages the auditory canal. Each earplug 38, 40 preferably further includes an attachment stem 43 for attaching the earplugs 38, 40 to the eyesight and hearing safety apparatus 20. Each earplug 38, 40 is preferably constructed from a well known rubber material.

Referring to Fig. 1, the eyesight and hearing safety apparatus 20 is seen to further comprise a first temple 44 having a first attachment end 46 and a first support end 48. The first attachment end 46 is attached to the left front guard portion end 24, preferably by well known hinge means, such as first hinge 50. The first earplug 38 is attached to the first temple 44, preferably adjacent the first support end 48. The first temple 44 is constructed to have a shape so that the first earplug 38 can be inserted into the left auditory canal of the human

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being and so that the first earplug **38** will support the front guard portion **22** when inserted into the left auditory canal of the human being.

Referring to Fig. 1, the eyesight and hearing safety apparatus **20** is seen to further comprise a second temple **52** having a second attachment end **54** and a second support end **56**. The second attachment end **54** is attached to the right front guard portion end **26**, preferably by well known hinge means, such as second hinge **58**. The second earplug **40** is attached to the second temple **52**, preferably adjacent the second support end **56**. The second temple **52** is constructed to have a shape so that the second earplug **40** can be inserted into the right auditory canal of the human being and so that the second earplug **40** will support the front guard portion **22** when inserted into the right auditory canal of the human being.

The first and second earplugs **38, 40** and the bridge portion **30** cooperate to support the front guard portion **22** on the head of the human being. The bridge portion **30** supports the front guard portion **22** on the nose of the human being. When inserted into the left auditory canal, the first earplug **38** supports the first temple **44**, preferably adjacent the first support end **48**. The first temple **44** is attached to the left front guard portion end **24** so that the first earplug **38** supports the left side of the front guard portion **22**. Similarly, the second earplug **40** supports the second temple **52**, preferably adjacent the second support end **56**. The second temple **52** is attached to the right front guard portion end **26** so that the second earplug **40** supports the right side of the front guard portion **22**.

Preferably, the first and second temples **44, 52** are formed so that the first and second support ends **48, 56** are laterally displaced towards each other, so that the first and second support ends **48, 56** are displaced lower than the respective first and second attachment ends **46, 54**, and so that the first and second support ends **48, 56** are angled slightly upward to facilitate in placing the first **38** and second **40** earplugs into the respective auditory canal of the human being.

Referring to Figs. 1 and 2, the elongated member **32** preferably is resilient so as to allow the front guard portion **22** to flex slightly outward in response to an applied outward pressure while the apparatus **20** is being placed on or removed from the head of the human being. While on the head of the human being, the resilience of elongated member **32** creates an inward pressure respectively at the left and right front guard portion ends **24, 26**, and this inward pressure is transmitted along the first and second temples **44, 52** to comfortably secure

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the first and second earplugs **38, 40** in the respective auditory canal. The elongated member **32** is preferably constructed from a well known resilient material such as, for example, plastic.

First and second temples **44, 52** are resilient, and transmit the inward pressure created by the resilience of elongated member **32** to rear temple portions **88, 124** which, in turn, exert an inwardly-directed force acting through earplugs **38, 40** (i.e., forcing the earplugs **38, 40** toward each other through the wearer's head), with the inwardly-directed force through each earplug being preferably at least about one Newton (about 3.6 ounces Avoirdupois) and with the inwardly-directed force through each earplug preferably being about 6 ounces Avoirdupois (1.67 Newtons) so as to comfortably secure the eyewear onto the wearer's head during physical activity. If earpiece **38, 40** is an aural, semi-aural, or supra-aural earplug, then this force also seals the earplug to the ear canal.

Preferably, the bridge portion **30**, the first earplug **38**, and the second earplug **40** provide the only means of supporting the front guard portion **22** when the human being is wearing the apparatus **20** to protect the eyesight and hearing of the human being. The eyesight and hearing safety apparatus **20** does not require the temples **44, 52** to include portions to support the apparatus **20** on the top of the ears, nor does the apparatus **20** require a strap to support the apparatus **20** around the back of the head of the human being. If the first and second earplugs **38, 40** are removed and the apparatus **20** is worn by the human being, the first and second support ends **48, 56** will apply an uncomfortable pressure against the ears of the human being, thus, deterring wearing of the apparatus **20** without the first and second earplugs **38, 40**. Additionally, without the first and second earplugs **38, 40**, the front guard portion **22** will not be firmly secured in place as will be the case when the first and second earplugs **38, 40** are inserted into the respective auditory canals of the human being.

Referring to Figs. 1, 5, and 6, the first temple **44** preferably includes a first means of attaching the first earplug **38** to the first temple **44**. The first means of attaching preferably comprises a first aperture **60** extending through the first temple **44** adjacent the first support end **48**. The first aperture **60** preferably has a first slot **62** through which the attachment stem **43** of the first earplug **38** can be forced so that it is secured in the first aperture **60**. While secured in the first aperture **60**, the first earplug **38** is preferably attached to the first temple **44** at a fixed first predetermined location of attachment along a length of the first temple **44**. The first earplug **38** is preferably attached to the first temple **44** to have a position which is

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substantially non-adjustable along the length of the first temple 44 with respect to the first predetermined location of attachment.

Once the first earplug 38 is secured in the first aperture 60, the first earplug 38 can be removed by forcing the attachment stem 43 of the first earplug 38 through the first slot 62 in the opposite direction. The removed first earplug 38 can then be cleaned or replaced as is necessary. The first means of attaching could comprise other well known means for attaching the first earplug 38 to the first temple 44 such as, for, example, a screw or an end plug extending through the first aperture 60 and into the first earplug 38.

Referring to Figs. 1, 6, and 9, the second temple 52 preferably includes a second means of attaching the second earplug 40 to the second temple 52. The second means of attaching preferably comprises a second aperture 64 extending through the second temple 52 adjacent the second support end 56. The second aperture 64 preferably has a second slot 65 through which the attachment stem 43 of the second earplug 40 can be forced so that it is secured in the second aperture 64. While secured in the second aperture 64, the second earplug 40 is preferably attached to the second temple 52 at a fixed second predetermined location of attachment along a length of the second temple 52. The second earplug 40 is preferably attached to the second temple 52 to have a position which is substantially non-adjustable along the length of the second temple 52 with respect to the second predetermined location of attachment.

Once the second earplug 40 is secured in the second aperture 64, the second earplug 40 can be removed by forcing the attachment stem 43 of the second earplug 40 through the second slot 65 in the opposite direction. The removed second earplug 40 can then be cleaned or replaced as is necessary. The second means of attaching could comprise other well known means for attaching the second earplug 40 to the second temple 52 such as, for, example, a screw or an end plug extending through the second aperture 64 and into the second earplug 40.

Referring to Figs. 1, 3, and 4, the first temple 44 preferably includes first horizontal adjustment means 66 for horizontally adjusting the first earplug 38 to a selected horizontal position. First horizontal adjustment means 66 preferably includes a first front temple portion 68. The first front temple portion 68 has an end which serves as the first attachment end 46 of the first temple 44. The first front temple portion 68 is preferably constructed in the shape of

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a sleeve having a rectangular cross section. The first front temple portion **68** has a first receiving end **70** and a first channel **72** extending longitudinally from the first receiving end **70** and into the interior of the first front temple portion **68**. Referring to Fig. 4, a first outward side **74** of the first front temple portion **68** has a first hole **76** extending therethrough. First horizontal adjustment means **66** preferably further includes a first resilient member **78** having a first resilient member attachment end **80** and a first resilient member tab end **82**. The first resilient member attachment end **80** is attached to the first outward side **74** of the first front temple portion **68**, adjacent the first attachment end **46**. Fig. 3 shows the first resilient member **78** in its normal in-use position, while Fig. 4 shows the first resilient member **78** in a lifted position. The first resilient member **78** includes a first pin **84** which removably extends through the first hole **76**. The first resilient member **78** includes a first tab **86** adjacent the first resilient member tab end **82**. The first pin **84** can be retracted from the first hole **76** by lifting the first tab **86** away from the first outward side **74** of the first front temple portion **68** as shown in Fig. 4. The first resilient member **78** is constructed from a well known resilient material, such as a resilient plastic or metal.

Referring to Fig. 5, the first temple **44** preferably includes a first rear temple portion **88** including a first arm **90** having a first arm end **92** being connected to a first deformable shape retaining member **94** at the first arm end **92**. The first deformable shape retaining member **94** preferably includes the first support end **48** and is attached to the first earplug **38** (shown in Fig. 1). First horizontal adjustment means **66** preferably includes the first arm **90**, and the first arm **90** is sized for receipt into the first channel **72** (shown in Fig. 3). The first arm **90** has a first plurality of apertures **96** for selectively receiving the first pin **84** (shown in Fig. 4) to horizontally position the first earplug **38** (shown in Fig. 1). Referring to Figs. 1, 3, 4, and 5, the horizontal position of the first earplug **38** can be changed by first lifting the first tab **86** to retract the first pin **84** from the first hole **76** and one of the first plurality of apertures **96**. Next, the horizontal position of the first earplug **38** can be changed so that another one of the first plurality of apertures **96** is aligned with the first hole **76**. Finally, the first tab **86** is released, the first pin **84** is forced into the selected one of the first plurality of apertures **96** by the first resilient member **78**, and the first earplug **38** is secured into the selected horizontal position.

Referring to Figs. 1, 5, and 5A, the first temple **44** preferably includes first vertical

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adjustment means **98** for vertically adjusting the first earplug **38** to a selected vertical position. First vertical adjustment means **98** preferably includes the first deformable shape retaining member **94** which is selectively adjustable to vertically position the first earplug **38**. The first deformable shape retaining member **94** is preferably constructed by including a first wire **100** inside a flexible material, such as a suitable plastic or rubber material. The first deformable shape retaining member **94** is attached to the first arm end **92**. The first arm **90** and the first deformable shape retaining member **94** form the first rear temple portion **88** which preferably has a shape substantially in the form of an S or Z. Notably, the first deformable shape retaining member **94** is preferably constructed laterally inwardly with respect to the first arm **90**. The first deformable shape retaining member **94** can be can be vertically adjusted to selectively vertically position the first earplug **38** by applying sufficient force to the first deformable shape retaining member **94** in the desired vertical direction. The first deformable shape retaining member **94** will remain in the vertically adjusted position until sufficient force is applied to position the first deformable shape retaining member **94** to a different vertical position. Figs. 5 and 5A show the first deformable shape retaining member **94** adjusted to two different vertical positions.

Referring to Figs. 1, 7, and 8, the second temple **52** preferably includes second horizontal adjustment means **102** for horizontally adjusting the second earplug **40** to a selected horizontal position. Second horizontal adjustment means **102** preferably includes a second front temple portion **104**. The second front temple portion **104** has an end which serves as the second attachment end **54** of the second temple **52**. The second front temple portion **104** is preferably constructed in the shape of a sleeve having a rectangular cross section. The second front temple portion **104** has a second receiving end **106** and a second channel **108** extending longitudinally from the second receiving end **106** and into the interior of the second front temple portion **104**. Referring to Fig. 8, a second outward side **110** of the second front temple portion **104** has a second hole **112** extending therethrough. Second horizontal adjustment means **102** preferably further includes a second resilient member **114** having a second resilient member attachment end **116** and a second resilient member tab end **118**. The second resilient member attachment end **116** is attached to the second outward side **110** of the second front temple portion **104**, adjacent the second attachment end **54**. Fig. 7 shows the second resilient member **114** in its normal in-use position, while Fig. 8 shows the second

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resilient member **114** in a lifted position. The second resilient member **114** includes a second pin **120** which removably extends through the second hole **112**. The second resilient member **114** includes a second tab **122** adjacent the second resilient member tab end **118**. The second pin **120** can be retracted from the second hole **112** by lifting the second tab **122** away from the second outward side **110** of the second front temple portion **104** as shown in Fig. 8. The second resilient member **114** is constructed from a well known resilient material, such as a resilient plastic or metal.

Referring to Fig. 9, the second temple **52** preferably includes a second rear temple portion **124** including a second arm **126** having a second arm end **128** being connected to a second deformable shape retaining member **130** at the second arm end **128**. The second deformable shape retaining member **130** preferably includes the second support end **56** and is attached to the second earplug **40** (shown in Fig. 1). Second horizontal adjustment means **102** preferably includes the second arm **126**, and the second arm **126** is sized for receipt into the second channel **108** (shown in Fig. 7). The second arm **126** has a second plurality of apertures **132** for selectively receiving the second pin **120** (shown in Fig. 8) to horizontally position the second earplug **40** (shown in Fig 1). Referring to Figs. 1, 7, 8, and 9, the horizontal position of the second earplug **40** can be changed by first lifting the second tab **122** to retract the second pin **120** from the second hole **112** and one of the second plurality of apertures **132**. Next, the horizontal position of the second earplug **40** can be changed so that another one of the second plurality of apertures **132** is aligned with the second hole **112**. Finally, the second tab **122** is released, the second pin **120** is forced into the selected one of the second plurality of apertures **132** by the second resilient member **114**, and the second earplug **40** is secured into the selected horizontal position.

Referring to Figs. 1, 9, and 9A, the second temple **52** preferably includes second vertical adjustment means **134** for vertically adjusting the second earplug **40** to a selected vertical position. Second vertical adjustment means **134** preferably includes the second deformable shape retaining member **130** which is selectively adjustable to vertically position the second earplug **40**. The second deformable shape retaining member **130** is preferably constructed by including a second wire **136** inside a flexible material, such as a suitable plastic or rubber material. The second deformable shape retaining member **130** is attached to the second arm end **128**. The second arm **126** and the second deformable shape retaining member

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130 form the second rear temple portion 124 which preferably has a shape substantially in the form of an S or Z. Notably, the second deformable shape retaining member 130 is preferably constructed laterally inwardly with respect to the second arm 126. The second deformable shape retaining member 130 can be can be vertically adjusted to selectively position the second earplug 40 by applying sufficient force to the second deformable shape retaining member 130 in the desired vertical direction. The second deformable shape retaining member 130 will remain in the vertically adjusted position until sufficient force is applied to position the second deformable shape retaining member 130 to a different vertical position. Figs. 9 and 9A show the second deformable shape retaining member 130 adjusted to two different vertical positions.

The first and second temples 44, 52 can be adjusted by using the respective horizontal adjustment means 66, 102 and the respective vertical adjustment means 98, 134. In this manner, the first and second earplugs 38, 40 can be positioned to be secured in the auditory canals of human beings with different sized and shaped heads. The eyesight and hearing safety apparatus 20 will be securely held in place and the human being can be very physically active.

Referring to Figs. 1 and 3, the eyesight and hearing safety apparatus 20 preferably includes a first side transparent panel 138 being disposed adjacent the first temple 44 and preferably being attached to the first front temple portion 68 by means well known in the art. Referring to Figs. 1 and 7, the eyesight and hearing safety apparatus 20 preferably includes a second side transparent panel 140 being disposed adjacent the second temple 52 and preferably being attached to the second front temple portion 104 by means well known in the art. The first and second side transparent panels 138, 140 are preferably constructed from a well known clear plastic material suitable for viewing therethrough.

Referring to Fig. 6, each earplug 38, 40 preferably includes a ball 142 being attached at one end to the attachment stem 43 and having an earplug aperture 144 at the other end. The earplug aperture 144 leads to a reception cavity (hidden) constructed inside the ball 142.

Referring to Figs. 1 and 6, the eyesight and hearing safety apparatus 20 preferably includes suspending means 148 for suspending the apparatus 20 from the neck of a human being. Suspending means 148 preferably comprises an elongated securing tiepiece 150. The elongated securing tiepiece 150 is preferably constructed from rubber, but, may be constructed from woven fibers, leather, plastic, or any other well known suitable material.

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Suspending means **148** includes detaching means **152** for detaching suspending means **148** from the apparatus **20** in response to an applied force. Detaching means **152** preferably comprises a first retaining element **154** attached to one end of the elongated securing tiepiece **150** and a second retaining element **156** attached to the other end of the elongated securing tiepiece **150**. The first and second retaining elements **154, 156** are constructed to be removably received into the earplug aperture **144** and reception cavity of each respective earplug **38, 40**. When the first and second retaining elements **154, 156** are received in the respective reception cavities, the eyesight and hearing safety apparatus **20** can be removed from the head of the human being, and the human being can suspend the apparatus **20** from his or her neck. If the apparatus **20** should accidentally become caught in a piece of machinery, one or both of the retaining elements **154, 156** will be removed from the respective reception cavity due to the force of the machinery pulling on the apparatus **20**. In this manner, injury that could be caused by the machinery is prevented. The first and second retaining elements **154, 156** can be constructed from well known materials such as rubber or plastic.

Now that the first embodiment of the invention has been explained, the improvements of the second, third, and fourth embodiments can be described.

A second preferred embodiment of the present invention is shown in Figs. 10 and 12-21A, with identifying reference designators marked similarly to the first embodiment, except with the prefix "**2.**". Likewise, a third preferred embodiment is shown in Fig. 11, with identifying reference designators marked similarly to the first and second embodiments, except with the prefix "**3.**". It shall be understood that many aspects of the first, second, and third embodiments are substantially the same, and only the differences will be treated in detail.

Now referring to Figs. 10-21A, the second and third embodiments **2.20** and **3.20** are seen to have a front portion **2.22** or **3.22**, respectively, each including a front transparent panel **2.28** or **3.28**, respectively, for protecting the human being's eyesight. As shown in Fig. 10, the front transparent panel **2.28** of the second embodiment may be well-known protective glass or plastic similar to that in well-known "safety glasses", and as described hereinbefore for the first embodiment **20**, and this protective panel **2.28** may also be tinted or polarized, in a manner well-known to those skilled in the art, for protection of the wearer's eyes from some undesired portions of the spectrum. It shall be understood that the second embodiment may also, if desired, include the left and right side guard transparent panels of the first embodiment,

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but not shown in Fig. 10. As shown in Fig. 11, the front transparent panel **3.28** of the third embodiment **3.20** may instead be well-known corrective lenses that also may be tinted or polarized to protect the wearer's eyes while also correcting the wearer's vision.

The front transparent panels **2.28, 3.28** of the second and third embodiments include left front portion ends **2.24, 3.24**, respectively, and right front portion ends **2.26, 3.26**, respectively, with a left temple, **2.44** or **3.44**, respectively, being attached to the respective left front portion end **2.24** or **3.24**. It shall be understood that the second and third embodiments each also include a right temple, **2.52** or **3.52**, respectively, and, because of similarities between the left and right temples of each embodiment, a description of the left temple alone will suffice for both, it being understood that similar features on the right temple will simply be a mirror image of those same features on the left temple. However, it shall be understood that the optional and retractable microphone boom, hereinafter described, need be included on only one of the temples.

Temples **2.44** and **3.44** include a substantially fixed-length left shape-retaining member **2.94** or **3.94**, respectively, and, because of the substantial similarity between the shape-retaining members **2.94** and **3.94**, a description of one, hereinafter given, will suffice for both.

Second and third embodiments **2.20** and **3.20** each also include left earpieces **2.38** or **3.38**, respectively, and right earpieces **2.40** or **3.40**, respectively. It shall be understood that these earpieces can be "mixed and matched" to suit the particular needs of the wearer. A common feature of the improvement of the second and third embodiments of the present invention is that at least one of the left and right earpieces of those embodiments includes earphone means, such as well-known earphone means **2.204**, for converting an electrical signal into audible sound. The left and right earpieces are adapted for supporting the front portion of the apparatus from the human being's respective left and right auditory canals when the human being is wearing said apparatus, in a manner hereinafter described, with the second and third embodiments having no means for supporting the apparatus from the human being's ears other than said left and right earpieces. In other words, contrary to known prior art devices, there is no support portion of the respective temples that passes over the wearer's ear to support the apparatus.

As shown in Figs. 10, 11, and 11A, earpieces **2.38, 2.40, 3.38, 3.40**, and **3.40'** have many similar features, and the appropriate choice of earpiece may be made by the wearer.

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Although the earpieces shown in Figs. 10 and 11 all include earphone means for converting an electrical signal into sound, with the earphone means being in communication through a longitudinal bore (e.g., bore **2.203** or **3.203**, respectively) therethrough to the respective left or right auditory canal of the wearer, there are variations in the earpieces. For example, the earpiece **3.40** is similar to the earplug **40** of the first embodiment in that it is pluggingly received into the auditory canal of the wearer for substantially blocking outside noises from transmission into the wearer's ear, thereby protecting the wearer's hearing. However, unlike the earplug **40** of the first embodiment, the earpiece **3.40** includes earphone means within its retaining element **3.156** that is removably received into the earpiece **3.40** in a manner similar to the removable receipt of retaining element **156** into earplug **40**. Thus, earpiece **3.40** acts not only as a protective earplug, blocking outside noises from the wearer's ear, but also acts as an earphone, while still allowing the securing tiepiece **3.150** to become detached for safety from the earpiece **3.40** in a manner hereinbefore described. As in the first embodiment, earpiece **3.40** is preferably made of soft, flexible rubber or high-density foam so as to sealingly plug the wearer's auditory canal from outside noises.

Earpieces **2.38**, **2.40**, and **3.38** are substantially the same, and a description of earpiece **2.38** will suffice for all of them. The common feature of earpieces **2.38**, **2.40**, and **3.38** is that they do not plug the wearer's ear from outside sounds, but instead allow those sounds to pass by not being sealingly and pluggingly received into the wearer's auditory canal, instead being retained in the wearer's outer ear at the mouth of the auditory canal.

The retention of the earpiece **2.38** within the wearer's ear can be explained by reference to Figs. 12 and 13. As is well-known in human anatomy, in front of the bowl or concha **2.207** of the ear **E** and projecting backward over the meatus is a small pointed eminence, the tragus **2.208**. Opposite the tragus **2.208**, and separated from it by a deep notch, is a small tubercle called the antitragus **2.209**. As shown in Figs. 12 and 13, earpiece **2.38** rests in the bowl or concha **2.207** at the mouth of the auditory canal **C** of the wearer, and is held in place by opposing cartilage flap protrusions of the tragus **2.208** and anti-tragus **2.209** of the wearer's ear **E**. The covering of earpiece **2.38** is preferably made of soft, flexible rubber or low-density foam so as to provide extended-wear comfort for the wearer while also allowing outside sounds and noises to be heard.

Referring again to Figs. 10-11 and Figs. 14-21A, further details of the improvements

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of the second and third embodiments can now be described.

Earpiece **2.38** includes an attachment stem **2.43** for attaching earpiece **2.38** to its respective shape-retaining member in fixed relation thereto. Attachment stem **2.43** has a plurality of longitudinally-spaced grip portions, e.g., grip portions **2.210** and **2.212** for longitudinally adjusting the inward to outward position of the earpiece **2.38**. Substantially fixed-length deformable shape retaining member **2.94** includes grip means **2.214**, similar to the C-shaped grip at support end **48** of the first embodiment, for selectively engaging one of the grip portions **2.210**, **2.212**, etc., of attachment stem **2.43** as especially shown in Fig. 14.

Grip means **2.214** includes first and second opposed fingers **2.215** and **2.216** that form a transverse aperture **2.60** extending through first temple **2.44** adjacent first support end **2.48** with a first slot **2.62** between opposed fingers **2.215** and **2.216** through which the selected grip portion **2.210**, **2.212**, etc., of attachment stem **2.43** of earpiece **2.38** can be forced so that it is secured in the first aperture **2.60** at the chosen position. While secured in the aperture **2.60**, earpiece **2.38** is thus preferably attached to deformable shape-retaining member **2.94** of first temple **2.44** at a fixed first predetermined location of attachment along a length of the first temple **2.44**.

The inward and outward transverse position of earpiece **2.38**, however, may be adjusted by moving grip means **2.214** from one grip portion **2.210** to another grip portion **2.212** as shown in Fig. 14. Choosing a different grip portion causes earpiece **2.38** to be moved inwardly and outwardly, as desired, for holding the apparatus in place and for being comfortably received into the ear of the user. When the first earpiece **2.38** is secured within aperture **2.60**, earpiece **2.38** can be removed by forcing the attachment stem **2.43** of the first earpiece **2.38** outwardly through the first slot **2.62**. The removed earpiece **2.38** can then be engaged by a different grip portion **2.210**, **2.212**, etc., as is necessary.

It should be further understood that one of the earpieces of the second or third embodiments could lack earphone means, if desired, and simply plug the wearer's ear similar to the earplug function provided by earplugs **38** or **40** of the first embodiment, although such earplugs preferably would still have the longitudinally-spaced grip portions hereinbefore described. See, for example, earplug **3.40'** of so-modified third embodiment **3.20'** as shown in Fig. 11A as compared with Fig. 11. Likewise, the earplug/earphone **3.40** of Fig. 11 has similar longitudinally-spaced grip portions to those hereinbefore described for earpiece **2.38**,

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so as to allow similar inward and outward adjustment of the position of the earpiece **3.40**.

At least one of the temples may include microphone boom means **2.218** for placing a well-known microphone **2.220** in proximity to the human being's mouth while the human being is wearing the apparatus **2.20**. Preferably, microphone boom means **2.218** is reciprocatingly received within temple **2.44** as by preferably being received into rear temple portion **2.88** of deformable shape-retaining member **2.94**. Microphone boom means **2.218** has a proximal end **2.226** and a curved distal end **2.228**, with the remote tip **2.230** of distal end **2.228** including a well-known microphone **2.220** for receiving a person's voice and transforming it into an electrical signal.

The electrical signal from microphone **2.220** travels along microphone wire **2.232** to a junction connector **2.234**. Likewise, the electrical signal to earphones **2.38** and **2.40** also travel along earphone wires **2.238** and **2.239** to junction box **2.234**. A well-known multiple-contact male electrical plug **2.236** is received into a mating electrical jack **2.237** in junction connector **2.234**, and provides electrical connection, through multi-conductor wires **2.235** and second multiple-contact male electrical plug **2.241** to well-known electronic audio means **2.240** (such as, for example, a well-known cellular telephone, radio receiver, tape cassette, compact disc player, or two-way radio, etc.).

Microphone boom means **2.218** is preferably reciprocatingly received within rear portion **2.88** of temple **2.44**, and substantially straight proximal end **2.226** slides within a longitudinal bore or cavity **2.246** formed within rear portion **2.88** as shown especially in Figs. 17-21A. When in the fully retracted position shown in Fig. 18, curved distal end **2.228** is closely received into a recess **2.248** within the knee **2.222** of rear portion **2.88** and held slightly therewithin by a pair of opposing nibs **2.249** that extend from either side of recess **2.248**. The proximal end **2.226** of microphone boom means **2.218** is retained within a lower portion of longitudinal bore or cavity **2.246** by a pair of opposing ribs **2.250** that extend from either inner side of bore **2.246**, with a gap between ribs **2.250** for allowing wire **2.232** to pass therethrough so that wire **2.232** is allowed to track the reciprocation of microphone boom means **2.218**.

When in an extended position as shown in Fig. 10, for example, microphone boom **2.218** is then rotated (compare Figs. 20 and 21 with the rotated position shown in Figs. 20A and 21A) so as to place microphone **2.220** in a region proximate the wearer's mouth. As

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microphone boom **2.218** rotates, a radially-extending cam **2.242** on proximal end **2.226** of boom **2.218** contacts with a sidewall of longitudinal bore **2.246** (see Fig. 21A) so as to retain boom **2.218** locked in the rotated and extended position. To retract the microphone boom, it is first rotated in the opposite direction and then reciprocatingly slid into the temple portion **2.88** as shown in Fig. 18.

Each of temples **2.94** and **2.52** include horizontal adjustment means, **2.66** and **2.102**, respectively, that are variants of the first and second horizontal adjustment means **66** and **102**, respectively, of the first embodiment. Horizontal adjustment means **2.66** and **2.102** are substantially the same, being mirror images of each other, and a description of adjustment means **2.66** will suffice for both.

Referring especially to Figs. 10, 16, and 19, horizontal adjustment means **2.66** comprises a front temple portion **2.68** and a rear temple portion **2.88**. Front temple portion **2.68** is preferably constructed in the shape of a sleeve having a substantially rectangular cross section into which rear temple portion **2.88** is slidably received, and further comprises a first attachment end **2.46**, a first receiving end **2.70**, and a first channel **2.72** extending longitudinally from the first receiving end **2.70** into the interior of the first front temple portion **2.68**. First rear temple portion **2.88** includes first deformable shape retaining member **2.94** having a first arm **2.90** slidably received into the first channel **2.72**. In contrast to the first embodiment which showed a plurality of holes on the first arm **90** with a pin removably extending therethrough, the first arm **2.90** of the second embodiment has a plurality of concave dimples **2.254** along one side thereof for receiving the convex protrusion **2.258** located on the interior surface of channel **2.72**. When the arm **2.90** is slidingly inserted into the receiving end **2.70** of the front temple portion **2.68**, the arm **2.90** extends into the first channel **2.72** and one of the concave dimples **2.254** is then snugly engaged by the convex protrusion **2.258**, thereby causing the rear temple portion **2.88** to be held into the selected and desired horizontal position. The horizontal length of the first temple **2.44** and the horizontal position of the first earpiece **2.38** can be changed as desired by pulling or pushing on the first arm **2.90**, thereby forcing the convex protrusion **2.258** to deform the wall of temple portion **2.68** and then engage another concave dimple **2.256** at a different selected horizontal position. To provide additional stiffness to arm **2.90** as it slidingly reciprocates within channel **2.72** during adjustment, the internal stiffening wire **2.100** of shape retaining member **2.94** may

extend into arm **2.90** as shown in Fig. 19.

A fourth embodiment **4.20** of the improvements of the present invention is shown in Fig. 22, with identifying reference designators marked similarly to the first, second, and third embodiments, except with the prefix "**4.**". It shall be understood that many aspects of the first, second, third, and fourth embodiments are substantially the same, and only the differences will be treated in detail.

Fourth embodiment **4.20** includes a front transparent panel **4.28** similar to either of front transparent panels **2.28** or **3.28**, heretofore described in detail, it being understood that panels **2.28** or **3.28** could interchangeably be used with the fourth embodiment. Fourth embodiment **4.20** includes a first temple, here shown as right temple **4.52**, with right temple **4.52** having a well-known earloop means **4.270** for hooking or looping attachment over a first ear (here, the right ear) of the wearer, and right temple **4.52** preferably includes horizontal adjustment means **4.102**, substantially similar to horizontal adjustment means **2.102** and **2.66**, hereinbefore described, for slidable horizontal adjustment of the temple **4.52**. Fourth embodiment **4.20** includes second temple, here shown as left temple **4.44**, that is substantially the same as temple **2.44** of the second embodiment and including an earpiece **4.38** with included earphone means. It shall be understood that the earpiece **4.38** may either be similar to earphone earpiece **2.38**, hereinbefore described, or to earplug-type earphone earpiece **3.40**, hereinbefore described, with similar attachment to temple **4.44**. It will be noted that, while temple **4.52** is supported from the wearer's first ear by earloop **4.270**, the other temple **4.44** has no means for supporting the fourth embodiment **4.20** from the wearer's second ear other than by earpiece **4.38**.

A fifth preferred embodiment **5.20** is shown in Figs. 23-63 and 67, with identifying reference designators marked similarly to the prior embodiments, except with the prefix "**5.**" It shall be understood that many aspects of all embodiments are substantially the same, and only the differences will be treated in detail. Figs. 23-32 show the common features of all variations of the fifth embodiment. Figs. 33-41 show variations of the rear end of the temples of the fifth embodiment. Figs. 42-55 show variations of earpieces / earplugs and earpiece mounting and adjustment variations, while Figs. 56-58 show a variation of the fifth embodiment in which audio earpieces and an ear microphone may be used with the fifth embodiment.

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The eyewear 5.20 of the fifth embodiment comprises a front guard portion 5.22 including a resilient elongated member or front frame browpiece portion 5.32 and first and second temples 5.44, 5.52 slidably attached to the browpiece portion 5.32. The front end 5.46, 5.54 of the temples 5.44, 5.52 are slidably received onto browpiece portion 5.32 of the frame by first and second temple spread-and-length adjustment means 5.158, 5.160 for adjusting the spread and length of the temples so as to accommodate the differing physical features of different wearers and to provide wearing comfort for the wearers. Temple spread-and-length adjustment means 5.158, 5.160 are for selectively adjusting a spread distance 5.196 between temples 5.44, 5.52 and are for selectively adjusting a length distance 5.198, 5.199 between front transparent panel 5.28 and rear ends 5.48, 5.56 of first and second temples 5.44, 5.52 as the temples are slidably received for selective adjustment onto browpiece 5.32. The rear ends 5.48, 5.56 of the rear temple portions 5.88, 5.124 of the temples 5.44, 5.52 have an earpiece or earplug 5.38, 5.40 attached thereto remote from front guard portion 5.22, in a manner hereinafter described, and the earpiece or earplug 5.38, 5.40 is insertingly received into the ear E of a wearer, as shown, for example in Fig. 67, preferably into the ear canal C or concha 207 of the wearer's ear, thereby supporting the eyewear 5.20 on the wearer's head without having over-the-ear rear portions of the temple, as shown best in Fig. 67. Single or dual lenses (clear or tinted) of front transparent panel 5.28 are mounted to the browpiece portion 5.32 as by preferably being received into a groove or slot 5.260 in the browpiece portion 5.32 as shown especially in Fig. 32.

The lenses of front transparent panel 5.28 and eyewear 5.20 are supported on the wearer's nose by a nosepiece or bridge portion 5.30 attached to the lenses of front transparent panel 5.28. The earpiece or earplug 5.38, 5.40, by its receipt into the wearer's ear, thus supports its temple 5.44, 5.52 upon the wearer's head without having any corresponding temple portion extending over the wearer's ear.

The two temples 5.44, 5.52 are substantially mirror images of each other, and a description of one and its interconnection with browpiece portion 5.32 will suffice for both. Likewise, the structures of the first and second temple spread-and-length adjustment means 5.158, 5.160 are substantially mirror images of each other, and a description of one will suffice for both.

Referring to Figs. 30-32, first temple spread-and-length adjustment means can now be

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described. The front end 5.46 of temple 5.44 is constructed as a curled sleeve having a downwardly-opening slot 5.182 for allowing the front transparent panel or lens 5.28 to longitudinally slidingly pass therethrough. A substantially similar slot 7.182 can be seen in Fig. 85, which shows a bottom view of a temple of the seventh embodiment, hereinafter described. The front end 5.46 of temple 5.44 is slidingly received onto browpiece portion 5.32. To minimize torquing or twisting of the temple 5.44, the inside of the front end of temple 5.44 has a pair of ribs 5.262, 5.264 that run longitudinally inside temple 5.44 and extend radially inwardly so as to engage and be closely received into mating longitudinal slots 5.280, 5.282 within browpiece 5.32 as temple 5.44 is slidingly received onto browpiece 5.32.

Browpiece portion 5.32 has dimples 5.170 on its rearward side that selectively engage and extend into the respective forward adjustment apertures 5.166, 5.168 of temples 5.44, 5.52. By longitudinally sliding temples 5.44, 5.52 with respect to browpiece portion 5.32, the dimples 5.170 will selectively engage their respective adjustment apertures, thereby providing selected positions of adjustment.

Adjustment means 5.158, 5.160 for temples 5.44, 5.52 allow adjustment of the spread and horizontal length of the temples 5.44, 5.52 to accommodate the various physical features of the head of the wearer. It shall be understood that the forward ends 5.46, 5.54 of temples 5.44, 5.52 are similarly curved to match with and be slidably received upon browpiece portion 5.32.

Temples 5.44, 5.52 are preferably formed so that the rearward ends 5.46, 5.48 are inwardly displaced towards each other and lower than the browpiece portion 5.32, and are further angled slightly upward to facilitate placement of earpieces 5.38, 5.40 into the wearer's ears. This structural alignment and forming of the concha-supported temples is common to all embodiments of the present invention.

Earplug or earpiece 5.38, 5.40 is received onto a barb 5.184, 5.186 on respective rearward portions 5.88, 5.124 of temples 5.44, 5.52, with barbs 5.184, 5.186 preferably having enlarged tips 5.188, 5.190 for retaining the respective earplugs or earpieces thereon. It shall also be understood that the earpieces/earplugs 5.38 and 5.40 shown in Fig. 24 are shown in dotted outline so as to reveal the hidden structure of the barb on which the earpieces are received. It shall be further understood that earpieces/earplugs 5.38 and 5.40, as well as barbs 5.184 and 5.186, are but one variant of the barbs and earpieces that may be used with the fifth

embodiment, and other variations are described later.

Figs. 33-41 show variations of the rear end of the temples of the fifth embodiment. It shall be understood that all of these variations are equally applicable to both the left and right temples, with the form of the variation for the right temples being a mirror image of the left temples shown in Figs. 33-41, and, for this reason, a description of the left temple forms of variations will suffice for the right temple forms of the temple variations. It should be further understood that the front temple ends of all of these variations are identical for mating with browpiece portion **5.32** as heretofore described for temple **5.44.**

A first temple variation **5.44A** is shown in Figs. 33-37. The rearward portion **5.88A** of temple **5.44A** has a fixed, non-adjustable spherical tip **5.188A** on barb **5.184A** onto which an earpiece **5.38A** having a spherical cavity **5.266A** is received through a rearward-opening bore **5.268A**, thereby allowing earpiece **5.38A** to slightly and adjustably "rock" into proper comfort alignment as the eyewear is placed on a wearer's head with the earpiece **5.38A** resting in the concha of the wearer's ear.

Figs. 38-41 show three alternative temples **5.44B, 5.44C,** and **5.44D** that allow the temple to be supported over the ear in the conventional manner. Such alternative temples may be provided when, for some reason such as to allow use of a telephone concurrent with the present invention, only one temple is desired to rest in, not over, the ear, with the other temple being supported over the top of the ear. Fig. 38 shows a side view and Fig. 39 shows a top view of an alternative temple **5.44B**. The rear portion **5.88B** of temple **5.44B** loops over and downward behind the ear. Fig. 40 shows a side view of an alternative temple **5.44C**. The rear portion **5.88C** of temple **5.44C** rests atop the ear adjacent the scalp. Fig. 40 shows a side view of an alternative temple **5.44D**. The rear portion **5.88D** of temple **5.44D** hooks over and downward behind the ear. The present invention requires that at least one of the temples is not supported over the ear and is instead received into the concha of the respective ear and, with some variations of earplugs or earpieces, into the ear canal.

Figs. 42-55 show variations of earpieces / earplugs and earpiece mounting and adjustment variations. It shall be understood that all of these variations are equally applicable to both the left and right temples, with the form of the variation for the right temples being a mirror image of the left temple forms shown in Figs. 42-55, and, for this reason, a description of the left temple forms of variations will suffice for the right temple forms of the variations.

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The first preferred earpiece mounting means **5.252** is that shown in Figs. 23-29, 42-44, 46, and 53. In this first preferred variation, the rear end **5.48** of temple **5.44** has an enlarged bore **5.60** therethrough into which a cylindrical post **5.43** is received, with cylindrical post **5.43** having a circumferential ridge **5.272** therearound that engages an inner circumferential groove **5.274** within bore **5.60**. An angled barb **5.184** having a pointed tip **5.188** sits atop a frusto-conical base **5.276**, with frusto-conical base **5.276** having a top plane **5.278** that is perpendicular to the axis of barb **5.184** and preferably angled at a non-zero planar angle so that barb **5.184** is not perpendicular to the axis of post **5.43**. An earplug or earpiece **5.38** can be received onto barb **5.184** as shown in Fig. 53. It shall be understood that by rotating post **5.43** within bore **5.60** (compare Fig. 42 with Fig. 43), the angle of barb **5.184** can be adjusted for comfort within the wearer's ear.

Fig. 45 shows a variation of the earpiece mounting means in which barb **5.184A** has a spherical tip **5.188A** for receiving earplugs and earpieces of the type shown in Figs. 54 and 55. Otherwise, the variation is as shown in Figs. 42-44.

Figs. 47 and 48 show a variation of the earpiece mounting means in which no plugging or blocking of the ear canal is desired, and a "support-only" comfort pad or disk earpiece **5.43B** having only a circumferential ridge **5.272B** and no frusto-conical base and no barb is received into bore **5.60** so as to allow the eyewear to be comfortably worn on the head and for the temple to terminate in the concha of the ear without plugging the ear canal.

All of the variations of the earpiece mountings shown in Figs. 42-48 are preferably constructed of resilient plastic.

Figs. 49-55 show variations of earpieces and earplugs. It shall be understood that all of these variations are equally applicable for use with both the left and right temples, with the form of the variation for the right temples being a mirror image of the left temple forms shown in Figs. 49-55, and, for this reason, a description of the left temple forms of variations will suffice for the right temple forms of the variations.

Figs. 49-51 show a first version of an aural earplug **5.38** that would be used to enter and sealingly block the ear canal of the wearer. Earplug **5.38** is generally conical and is cylindrically-symmetrical, having a blunt nose **5.269** and a slight cavity **5.266** for mating receipt with tip **5.188** of barb **5.184** as shown in Fig. 53. It shall be understood that, as earplug **5.38** is forcibly urged onto barb **5.184**, tip **5.188** displacingly pierces earplug **5.38**

until earplug **5.38** is fully received onto barb **5.184** as shown in Fig. 53.

Fig. 52 is a cross section of a variant **5.38B** of aural earplug **5.38**. The only difference between earplug **5.38B** and earplug **5.38** is that the cavity **5.266B** within earplug **5.38B** extends further into the body of earplug **5.38B** than does the cavity **5.266** of earplug **5.38**. After placement onto barb **5.184**, earplug **5.38B** has substantially similar structure as shown in Fig. 53 for earplug **5.38**, although earplug **5.38B** would typically be used on a longer length barb than would earplug **5.38**.

Figs. 54 and 55 show a cylindrically-symmetrical semi-aural earplug **5.38C** as would be used to only partially enter the outer ear canal and would sealingly block the entrance to the ear canal at the concha. Earplug **5.38C** is seen to have a relatively shallow cavity **5.266C**, and thus would be suitable for use with a relatively shorter length barb than would earplug **5.38B**.

For all of the earpieces and earplugs shown in Figs. 34-36 and 49-55, the earplugs / earpieces are readily disposed for sanitary reasons or to allow sharing of eyewear **5.20** among different persons, and only the earplug / earpiece material is discarded.

Figs. 59-63 show variations of earpieces and earplugs in which the earpiece or earplug is integral with the cylindrical post with circumferential ridge. In all of the variations shown in Figs. 59-63 it should be noted that the cylindrical post is positioned off-axis of the earpiece / earplug so that rotation of the cylindrical post allows fine adjustment of the positioning of the earpiece/earplug within the wearer's ear because of the orbital movement of the earpiece / earplug about the axis of the cylindrical post as the cylindrical post is axially rotated within bore **5.60**. It shall be understood that all of these variations are equally applicable for use with both the left and right temples, with the form of the variation for the right temples being a mirror image of the left temple forms shown in Figs. 59-63, and, for this reason, a description of the left temple forms of variations will suffice for the right temple forms of the variations.

Figs. 59 and 60 show a variation of the earpiece mounting means in which no plugging or blocking of the ear canal is desired, and an enlarged "support-only" comfort pad or disk earpiece **5.38D** having a cylindrical post **5.43D** with only a circumferential ridge **5.272D** and no frusto-conical base and no barb is received into bore **5.60** so as to allow the eyewear to be comfortably worn on the head and for the temple to terminate in the concha of the ear without plugging the ear canal. Because the disk is off-axis of the post **5.43D**, rotation of post **5.43D**

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within bore **5.60** allows the disk to be adjusted for comfort.

Fig. 61 shows a cylindrically-symmetric semi-aural earplug **5.38E** that is molded around cylindrical post **5.43E** with a circumferential ridge **5.272E**. Because the earplug **5.38E** is off-axis of the post **5.43E**, rotation of post **5.43E** within bore **5.60** allows the earplug to be adjusted for comfort.

Figs. 62 and 63 show two similar cylindrically-symmetric aural earplugs **5.38F** and **5.38G** that differ only in the taper and thickness. Because the earplugs **5.38F, 5.38G** are off-axis of their respective posts **5.43F, 5.43G**, rotation of posts **5.43F, 5.43G** within bore **5.60** allows the earplugs to be adjusted for comfort.

Figs. 56-58 show a variation of the fifth embodiment in which audio earphone earpieces and an ear microphone may be used with the fifth embodiment. As with the second, third, and fourth embodiments, it shall be understood that the audio earphone earpieces can be mixed and matched with the other variants of earpieces so that none, one or both of the earpieces could have audio earphone earpieces. Likewise, none, one or both of the earpieces could have an ear microphone as hereinafter described, although Figs. 56-58 show the example situation where both earpieces are audio earphone earpieces and only one of the earpieces has an ear microphone.

Figs. 56 and 58 show well-known first earphone means **5.204** for converting a first electrical signal from well-known audio source **5.211** to sound within first earpiece **5.38H** and also show well-known second earphone means **5.206** for converting a second electrical signal from well-known audio source **5.211** to sound within second earpiece **5.38J**. Likewise, first earphone earpiece **5.38K** of Fig. 57 has similar well-known first earphone means therewithin for converting a first electrical signal from well-known audio source **5.211** to sound within first earphone earpiece **5.38K** and also has a second earphone earpiece **5.38L** with similar well-known second earphone means therewithin for converting a second electrical signal from well-known audio source **5.211** to sound within second earphone earpiece **5.38L**. It shall be understood that the well-known schematic diagram of Fig. 58 suffices for an understanding of both Figs. 56 and 58.

All of the earphone earpieces of Figs. 58 and 58 have similar mounting posts for receipt into, e.g., bore **5.60** as heretofore explained in detail, it being understood as hereinbefore explained that a description of the earpiece mounting for one temple suffices for

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both. As with the earpieces of Figs. 59-63, the mounting posts are preferably off-axis of the earphone earpieces **5.38H**, **5.38J**, **5.38K**, and **5.38L** so as to allow for comfort adjustment in a manner heretofore described.

One or both of the earphone earpieces may preferably include a well-known ear microphone **5.220** of the type disclosed in Mauney *et al.*, U.S. Patent No. 5,812,659 (issued September 22, 1998), now fully incorporated herein by reference; Konomi, U.S. Patent No. 4,588,867 (issued May 13, 1986), now fully incorporated herein by reference; and others. Such a well-known ear microphone is combined with the earphone to form a single unit without requiring a separate boom-mounted microphone.

Such a well-known ear microphone **5.220** also provides an added safety factor over a boom-style microphone. Certain work and recreational environments require communications via telephone, cellular telephone, two-way radio, intercom, or a public address system. Use of an ear microphone in such situations permits hands-free two-way communications while wearing the present invention.

Preferably, ear microphone **5.220** is mounted within a tapered housing as shown outboard of the earphone and on the mounting post of the earpiece as shown so as to pass through bore **5.60** during attachment of the earpiece mounting means therewithin, and the signal from ear microphone **5.220** passes over wires to well-known amplifier **5.213** for amplification thereby in a manner well-known to those skilled in the art. Ear microphone **5.220** acoustically isolates the earphone of the earpiece from the microphone, in a manner well-known to those skilled in the art, so as to avoid feedback.

Earphone earpiece **5.38H** is substantially identical to earphone earpiece **5.38J**, except that earphone earpiece **5.38J** does not have an ear microphone **5.220**. Likewise, earphone earpiece **5.38K** is substantially identical to earphone earpiece **5.38L**, except that earphone earpiece **5.38L** does not have an ear microphone **5.220**. Earphone earpieces **5.38H** and **5.38J** can either be of the well-known supra-aural shape that fit into the concha without entering the ear canal or can be of the well-known shape and construction that combine the noise attenuation benefits of an earplug with the introduction of audio into the ear canal of the wearer.

Earphone earpieces **5.38K** and **5.38L** are similar to earphone earpieces **5.38H** and **5.38J** except that earphone earpieces **5.38K** and **5.38L** are full ear speakers that fit over the

full ear and have a retainer extension portion **5.290** that is sized for and fits within the wearer's concha. The larger surface area of earphone earpieces **5.38K** and **5.38L** as compared to **5.38H** and **5.38J** provides additional comfort for the wearer and permits a larger diaphragm for the ear speaker, thereby producing better audio reproduction quality.

All of the variants of earplugs or earpieces **5.38, 5.40**, with the exception of "support-only" comfort pad or disk earpiece **5.43B**, are preferably constructed of unfoamed poly-vinyl chloride ("PVC") plastisol, although other materials may be used as well.

As shown in Figs. 27 and 53, the fifth embodiment is preferably constructed so that, for sanitary reasons, if the fifth embodiment is removed from the wearer's head and placed upside down on a table or plane **P**, or upright on a table or plane **P'**, the upward angle of the earplug or earpiece **5.38** is such that the earpiece **5.38** does not contact the surface of the table, thereby preventing dust and debris from collecting on the surface of earpiece **5.38** for future insertion into the wearer's ear when the eyewear is replaced on the wearer's head. The seventh embodiment **7.20**, hereinafter described, has this feature as well.

First and second temples **5.44, 5.52** are resilient and substantially shape-retaining, preferably being made of resilient plastic, and transmit the inward pressure created by the resilience of elongated browpiece portion **5.32** to rear temple portions **5.88, 5.124** which, in turn, exert an inwardly-directed force acting through earplugs **5.38, 5.40** (i.e., forcing the earplugs **5.38, 5.40** toward each other through the wearer's head), with the inwardly-directed force through each earplug being preferably at least about one Newton (about 3.6 ounces Avoirdupois) and with the inwardly-directed force through each earplug preferably being about 6 ounces Avoirdupois (1.67 Newtons) so as to comfortably secure the eyewear onto the wearer's head during physical activity. If earpiece **5.38, 5.40** is an aural, semi-aural, or supra-aural earplug, then this force also seals the earplug to the ear canal.

A sixth preferred embodiment **6.20** is shown in Figs. 64, 64A, and 65-66, with identifying reference designators marked similarly to the prior embodiments, except with the prefix "**6.**"

The sixth preferred embodiment **6.20** uses a well-known eyeglasses frontpiece or front guard portion **6.22** with hinged temple attachments **6.50, 6.58**, but the hinges on the temples of the sixth embodiments are constructed so that the temples **6.44, 6.52** are angled substantially downwardly from the horizontal (see Fig. 65), as contrasted with the

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substantially horizontal temples of well-known eyeglasses, so that the temples can be supported within the ear in the manner of the present invention rather than by being supported over the ear as in prior art eyeglasses.

Like the first through third embodiments, the sixth embodiment **6.20** comprises a front guard portion **6.22** including a resilient elongated member or front frame browpiece portion **6.32** and first and second temples **6.44, 6.52** hingedly attached to the browpiece portion **6.32**. The rear ends **6.48, 6.56** of the rear temple portions **6.88, 6.124** of the temples **6.44, 6.52** have an audio earphone earpiece **6.38, 6.40** attached thereto remote from front guard portion **6.22**. Each earpiece **6.38, 6.40** preferably has a retainer extension portion **6.290** that is sized for and fits within the wearer's concha, thereby supporting the eyewear **6.20** on the wearer's head without having over-the-ear rear portions of the temple, as shown best in Fig. 65. Audio earpieces **6.38, 6.40** operate in a well-known manner, similar to earpieces **5.38H** and **5.38J**, heretofore described, to provide audio sounds for the wearer. If desired, an alternate rear temple portion **6.88A** (see Fig. 64A) may be substituted for rear temple portion **6.88**, and rear temple portion **6.88A** is substantially similar to rear temple portion **6.88** except that rear temple portion **6.88A** is provided with a well-known ear microphone **6.220** similar to ear microphone **5.220** heretofore described. Single or dual lenses **6.28** (clear or tinted) comprise a front transparent panel and are mounted to the browpiece portion **6.32** in a manner well-known to those skilled in the art, as by being secured within the front frame of the eyewear, and the lenses **6.28** and eyewear **6.20** are supported on the wearer's nose by a nosepiece or bridge portion **6.30** attached to the lenses **6.28.**

The two temples **6.44, 6.52** are substantially mirror images of each other, and a description of one will suffice for both.

Temples **6.44, 6.52** respectively have rearward portions **6.88, 6.124** that are respectively slidably received over and onto the front portions **6.68, 6.104** of respective temples **6.44, 6.52**, and dimples (e.g., dimples **6.180** for temple **6.52** and **6.178** for temple **6.44**) on the inside side of front temple portions **6.68, 6.104** selectively engage and extend into the rearward adjustment apertures **6.174, 6.176** on the inside side of respective temple rearward portions **6.88, 6.124**. These first and second temple length adjustment means **6.66, 6.102** (best seen in Figs. 64 and 66), for respective temples **6.44, 6.52**, allow adjustment of the length of temples **6.44, 6.52** so as to permit the earpiece **6.38, 6.40** to align with the

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wearer's ear canal or concha, both vertically and horizontally, by adjusting the length distance between front lenses **6.28** and rear ends **6.48**, **6.56**.

Earpieces **6.38**, **6.40** are preferably constructed of unfoamed poly-vinyl chloride ("PVC") plastisol on their inner surface for contacting the wearer's ear, although other materials may be used as well.

The hinges **6.50**, **6.58** of temples **6.44**, **6.52** of the sixth embodiment are constructed so as to force the temples slightly inward toward the wearer's head and thereby exert inward pressure to retain the earpieces **6.38**, **6.40** within the wearer's ear. First and second temples **6.44**, **6.52** are resilient and substantially shape-retaining, preferably being made of resilient plastic, and transmit the inward pressure created by the hinges and by the resilience of elongated browpiece portion **6.32** to rear temple portions **6.88**, **6.124** which, in turn, exert an inwardly-directed force acting through earpieces **6.38**, **6.40** (i.e., forcing the earpieces **6.38**, **6.40** toward each other through the wearer's head), with the inwardly-directed force through each earpiece being preferably at least about one Newton (about 3.6 ounces Avoirdupois) and with the inwardly-directed force through each earpiece preferably being about 6 ounces Avoirdupois (1.67 Newtons) so as to comfortably secure the eyewear onto the wearer's head during physical activity. If earpiece **6.38**, **6.40** is an aural, semi-aural, or supra-aural earpiece, then this force also seals the earpiece to the ear canal.

A seventh preferred embodiment **7.20** is shown in Figs. 69-75 and 83-85, with identifying reference designators marked similarly to the prior embodiments, except with the prefix "**7.**". An eighth preferred embodiment is shown in Figs. 76-82 and 86-88, with identifying reference designators marked similarly to the prior embodiments, except with the prefix "**8.**" It shall be understood that many aspects of all embodiments are substantially the same, and only the differences will be treated in detail. It shall also be understood that the earpieces/earplugs **7.38**, **7.40**, **8.38**, and **8.40** shown in Figs. 69-88 are shown in dotted outline so as to reveal the hidden structure of the barb on which the earpieces are received.

Seventh embodiment **7.20** is similar to the fifth embodiment heretofore described except that the seventh embodiment **7.20** adds rearward first and second temple length adjustment means **7.66**, **7.102**, as hereinafter described. Seventh embodiment **7.20** also shows that the barbs, on which the earplugs / earpieces are attached, may be at a fixed angle rather than at adjustable angles as in the fifth embodiment, but it should be understood that the barbs

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on the fifth, seventh, and eighth embodiments may be either fixed or adjustable, using the rear temple portions described herein or their equivalents.

The eyewear **7.20** of the seventh embodiment comprises a front guard portion **7.22** including a resilient elongated member or front frame browpiece portion **7.32** and first and second temples **7.44, 7.52** slidably attached to the browpiece portion **7.32**. The front end **7.46, 7.54** of the temples **7.44, 7.52** are slidably received onto browpiece portion **7.32** of the frame by first and second temple spread-and-length adjustment means **7.158, 7.160** for adjusting the spread and length of the temples so as to accommodate the differing physical features of different wearers and to provide wearing comfort for the wearers. Temple spread-and-length adjustment means **7.158, 7.160** are for selectively adjusting a spread distance **7.196** between temples **7.44, 7.52** and are for selectively adjusting a length distance **7.198, 7.199** between front transparent panel **7.28** and rear ends **7.48, 7.56** of first and second temples **7.44, 7.52** as the temples are slidably received for selective adjustment onto browpiece **7.32**. The temples of seventh embodiment **7.20** may have a plurality of ornamental raised ridges **7.162, 7.164** thereupon. The rear ends **7.48, 7.56** of the rear temple portions **7.88, 7.124** of the temples **7.44, 7.52** have an earpiece or earplug **7.38, 7.40** attached thereto remote from front guard portion **7.22**, and the earpiece or earplug **7.38, 7.40** is insertingly received into the ear **E** of a wearer, preferably into the ear canal **C** or concha **207** of the wearer's ear, thereby supporting the eyewear **7.20** on the wearer's head without having over-the-ear rear portions of the temple, as shown best in Fig. 73. It shall be understood that the mounting of the seventh embodiment **7.20** on the wearer's head is substantially similar and has a similar appearance to the mounting and wearing of the fifth embodiment **5.20** shown in Fig. 67. Single or dual lenses (clear or tinted) of front transparent panel **7.28** are mounted to the browpiece portion **7.32** as by preferably being received into a groove or slot in the browpiece portion **7.32** in a manner substantially as shown in Fig. 32 for the fifth embodiment **5.20**, it being understood that Figs. 30-32 and the accompanying disclosure of the fifth embodiment **5.20** apply equally well to this seventh embodiment **7.20**, and the lenses of front transparent panel **7.28** and eyewear **7.20** are supported on the wearer's nose by a nosepiece or bridge portion **7.30** attached to the lenses of front transparent panel **7.28**. The earpiece or earplug **7.38, 7.40**, by its receipt into the wearer's ear, thus supports its temple **7.44, 7.52** upon the wearer's head without having any corresponding temple portion extending over the wearer's

ear.

The two temples 7.44, 7.52 are substantially mirror images of each other, and a description of one and its interconnection with browpiece portion 7.32 will suffice for both.

Browpiece portion 7.32 has dimples (not shown, but see related Figs. 30-32 of the fifth embodiment) on its rearward side that selectively engage and extend into the forward adjustment apertures 7.166, 7.168 on temples 7.44, 7.52, with temple spread-and-length adjustment means 7.158, 7.160 being substantially structurally similar to the temple spread-and-length adjustment means of the fifth embodiment shown in Figs. 30-32. Adjustment means 7.158, 7.160 for temples 7.44, 7.52 allow adjustment of the spread and horizontal length of the temples 7.44, 7.52 to accommodate the various physical features of the head of the wearer. It shall be understood that the forward ends 7.46, 7.54 of temples 7.44, 7.52 are similarly curved to match with and be slidably received upon browpiece portion 7.32, and each temple is provided with a slot 7.182 (as shown in Fig. 85 for temple 7.44) for allowing the temple to slide past the front transparent panel or lens 7.28 as the spread of the temples is adjusted.

Temples 7.44, 7.52 respectively have rearward portions 7.88, 7.124 that are respectively slidably received into the front portions 7.68, 7.104 of respective temples 7.44, 7.52, and dimples (e.g., dimples 7.178 for temple 7.44) on the inside side of temple rearward portions 7.88, 7.124 selectively engage and extend into the rearward adjustment apertures 7.174, 7.176 on the inside side of respective temple front portions 7.68, 7.104. These first and second temple length adjustment means 7.66, 7.102 (best seen in detail in Figs. 83-84 for length adjustment means 7.66), for respective temples 7.44, 7.52, allow adjustment of the length of temples 7.44, 7.52 so as to permit the earplug or earpiece 7.38, 7.40 to align with the wearer's ear canal or concha, both vertically and horizontally, by also adjusting the length distance 7.198, 7.199 between front transparent panel 7.28 and rear ends 7.48, 7.56. A nib 7.192 on each rearward temple portion (e.g., rearward temple portion 7.88 shown in Figs. 83-84) engages a lip 7.194 at the rearward-opening mouth of the corresponding front temple portion so as to retain rearward temple portion 7.88 within the front temple portion as the temple length adjustment means is extended to its limit.

Testing of human subjects has revealed that, as the head gets larger, the vertical distance from the center of the ear canal to the wearer's brow increases as does the horizontal

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distance from the wearer's brow to the center of the ear canal. The provision of both first and second adjustment means (i.e., first and second temple spread-and-length adjustment means **7.158, 7.160** and first and second temple length adjustment means **7.66, 7.102**) for each temple allows the respective earplug or earpiece **7.38, 7.40** to be correctly aligned with the wearer's ear canal for differently sized wearers.

Earplug or earpiece **7.38, 7.40** is received onto a barb **7.184, 7.186** on respective rearward portions **7.88, 7.124** of temples **7.44, 7.52**, with barbs **7.184, 7.186** preferably having enlarged tips **7.188, 7.190** for retaining the respective earplugs or earpieces thereon. The barbs **7.184, 7.186** may be angled slightly to mate with the ear canal of the wearer, and various rearward portions **7.88, 7.124** may be provided having different angles for barbs **7.184, 7.186** so as to accommodate differing human anatomies, whether by providing various rearward portions having different fixed angles for barb **7.184, 7.186** or whether by providing a rearward portion similar to that shown in Figs. 42-46 and Fig. 53 for the fifth embodiment of the present invention, it being further understood that the ear microphone and audio earpieces heretofore described for the fifth embodiment are equally applicable for use with the seventh embodiment. Earplug or earpieces **7.38, 7.40** are preferably constructed of unfoamed poly-vinyl chloride ("PVC") plastisol, although other materials may be used as well.

First and second temples **7.44, 7.52** are resilient and substantially shape-retaining, preferably being made of resilient plastic, and transmit the inward pressure created by the resilience of elongated browpiece portion **7.32** to rear temple portions **7.88, 7.124** which, in turn, exert an inwardly-directed force acting through earplugs **7.38, 7.40** (i.e., forcing the earplugs **7.38, 7.40** toward each other through the wearer's head), with the inwardly-directed force through each earplug being preferably at least about one Newton (about 3.6 ounces Avoirdupois) and with the inwardly-directed force through each earplug preferably being about 6 ounces Avoirdupois (1.67 Newtons) so as to comfortably secure the eyewear onto the wearer's head during physical activity. If earpiece **7.38, 7.40** is an aural, semi-aural, or supra-aural earplug, then this force also seals the earplug to the ear canal.

Figs. 76-82 and 86-87 show the eighth embodiment **8.20**, which is similar to the seventh embodiment heretofore described except that the eighth embodiment **8.20** omits the forward first and second temple spread-and-length adjustment means of the seventh embodiment, and only has rearward first and second temple length adjustment means **8.66**,

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8.102.

Like the seventh embodiment, the eighth embodiment 8.20 comprises a front guard portion 8.22 including a resilient elongated member or front frame browpiece portion 8.32 and first and second temples 8.44, 8.52 fixedly attached to the browpiece portion 8.32. Temples 8.44, 8.52 are fixedly attached to browpiece portion 8.32, preferably as a rearwardly-curving extension thereof. The rear ends 8.48, 8.56 of the rear temple portions 8.88, 8.124 of the temples 8.44, 8.52 have an earpiece or earplug 8.38, 8.40 attached thereto remote from front guard portion 8.22, and the earpiece or earplug 8.38, 8.40 is insertingly received into the ear E of a wearer, preferably into the ear canal C or concha 207 of the wearer's ear, thereby supporting the eyewear 8.20 on the wearer's head without having over-the-ear rear portions of the temple, as shown best in Fig. 82. Single or dual lenses (clear or tinted) of front transparent panel 8.28 are mounted to the browpiece portion 8.32 as by being received into a downwardly-facing groove or slot (not shown) in the browpiece portion 8.32 or preferably by being integrally molded with browpiece portion 8.32, and the lenses of front transparent panel 8.28 and eyewear 8.20 are supported on the wearer's nose by a nosepiece or bridge portion 8.30 attached to the lenses of front transparent panel 8.28. The earpiece or earplug 8.38, 8.40, by its receipt into the wearer's ear, thus supports its temple 8.44, 8.52 upon the wearer's head without having any corresponding temple portion extending over the wearer's ear.

The two temples 8.44, 8.52 are substantially mirror images of each other, and a description of one will suffice for both.

Temples 8.44, 8.52 respectively have rearward portions 8.88, 8.124 that are respectively slidably received over and onto the front portions 8.68, 8.104 of respective temples 8.44, 8.52, and dimples (e.g., dimples 8.180 for temple 8.52) on the outside side of front temple portions 8.68, 8.104 selectively engage and extend into the rearward adjustment apertures 8.174, 8.176 on the outside side of respective temple rearward portions 8.88, 8.124. These first and second temple length adjustment means 8.66, 8.102 (best seen in detail in Figs. 86-88 for length adjustment means 8.102), for respective temples 8.44, 8.52, allow adjustment of the length of temples 8.44, 8.52 so as to permit the earplug or earpiece 8.38, 8.40 to align with the wearer's ear canal or concha, both vertically and horizontally, by adjusting the length distance 8.198, 8.199 between front transparent panel 8.28 and rear ends 8.48, 8.56. A nib 8.192 on each front temple portion (e.g., front temple portion 8.104 shown in Figs. 87-88)

engages a lip **8.194** at the forward-opening mouth of the corresponding rear temple portion so as to retain front temple portion **8.104** within the rear temple portion as the temple length adjustment means is extended to its limit.

Earplug or earpiece **8.38, 8.40** is received onto a barb **8.184, 8.186** on respective rearward portions **8.88, 8.124** of temples **8.44, 8.52**, with barbs **8.184, 8.186** preferably having enlarged tips **8.188, 8.190** for retaining the respective earplugs or earpieces thereon. The barbs **8.184, 8.186** may be angled slightly to mate with the ear canal of the wearer, and various rearward portions **8.88, 8.124** may be provided having different angles for barbs **8.184, 8.186** so as to accommodate differing human anatomies, whether by providing various rearward portions having different fixed angles for barb **8.184, 8.186** or whether by providing a rearward portion similar to that shown in Figs. 42-46 and Fig. 53 for the fifth embodiment of the present invention, it being further understood that the ear microphone and audio earpieces heretofore described for the fifth embodiment are equally applicable for use with the eighth embodiment. Earplug or earpieces **8.38, 8.40** are preferably constructed of unfoamed poly-vinyl chloride ("PVC") plastisol, although other materials may be used as well.

Temples **8.44, 8.52** of the eighth embodiment are constructed so as to curvingly bend slightly inward toward the wearer's head and thereby exert inward pressure to retain the earplugs **8.38, 8.40** within the wearer's ear. First and second temples **8.44, 8.52** are resilient and substantially shape-retaining, preferably being made of resilient plastic, and transmit the inward pressure created by the resilience of elongated browpiece portion **8.32** to rear temple portions **8.88, 8.124** which, in turn, exert an inwardly-directed force acting through earplugs **8.38, 8.40** (i.e., forcing the earplugs **8.38, 8.40** toward each other through the wearer's head), with the inwardly-directed force through each earplug being preferably at least about one Newton (about 3.6 ounces Avoirdupois) and with the inwardly-directed force through each earplug preferably being about 6 ounces Avoirdupois (1.67 Newtons) so as to comfortably secure the eyewear onto the wearer's head during physical activity. If earpiece **8.38, 8.40** is an aural, semi-aural, or supra-aural earplug, then this force also seals the earplug to the ear canal.

As with the previous embodiments, to use the fifth, sixth, seventh and eighth embodiments, a wearer adjusts the adjustment means of the eyewear so that the earplug or earpiece is comfortably aligned with the wearer's ear canal when the eyewear is placed upon

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the wearer's head. The nosepiece is rested upon the wearer's nose, and the eyewear is retained on the wearer's head by the earplug or earpiece inserted into the wearer's ear(s). It is thus not possible to comfortably wear the eyewear without having ear protection as well because, if the earpieces are not placed within the wearer's ear, they will annoyingly project into the side of the wearer's face.

An "overglasses" ninth preferred embodiment is shown in Figs. 89-91, with identifying reference designators marked similarly to the prior embodiments, except with the prefix "9." It shall be understood that many aspects of all embodiments are substantially the same, and only the differences will be treated in detail. It shall also be understood that the earpieces/earplugs **9.38, 9.40** shown in Figs. 89-90 are shown in dotted outline so as to reveal the hidden structure of the barb on which the earpieces are received, and the wearer's standard glasses are shown in dotted outline beneath the overglasses ninth embodiment.

Overglasses ninth embodiment **9.20** provides the advantages and benefits of the present invention for those who also wear standard glasses. The frontpiece guard portion **9.22** of ninth embodiment **9.20** is substantially similar to the frontpiece of well-known overglasses safety goggles, having a front transparent panel **9.28** and with frontpiece guard portion **9.22** being sized for wearing over standard eyeglasses as shown in Fig. 89.

Front guard portion **9.22** of ninth embodiment **9.20** includes a resilient elongated member or front frame browpiece portion **9.32** and first and second temples **9.44, 9.52** hingedly attached to the browpiece portion **9.32** as by hinges **9.50, 9.58**. The rear ends **9.48, 9.56** of the rear temple portions **9.88, 9.124** of the temples **9.44, 9.52** have an earpiece or earplug **9.38, 9.40** attached thereto remote from front guard portion **9.22**, and the earpiece or earplug **9.38, 9.40** is insertingly received into the ear **E** of a wearer, preferably into the concha **207** or ear canal of the wearer's ear, thereby supporting the eyewear **9.20** on the wearer's head without having over-the-ear rear portions of the temple, as shown best in Fig. 89. Front transparent panel **9.28** is supported on the wearer's nose by a nosepiece or bridge portion **9.30** attached to front transparent panel **9.28**. The earpiece or earplug **9.38, 9.40**, by its receipt into the wearer's ear, thus supports its temple **9.44, 9.52** upon the wearer's head without having any corresponding temple portion extending over the wearer's ear.

The two temples **9.44, 9.52** are substantially mirror images of each other, and a description of one will suffice for both.

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Temples 9.44, 9.52 respectively have rearward portions 9.88, 9.124 that are preferably substantially similar to rearward portions 7.88, 7.124 heretofore described. Because of this great similarity with rearward portions 7.88, 7.124, the structural features of first and second temple length adjustment means 9.66, 9.102 will not be repeated because they are substantially the same as heretofore described in detail.

Earplug or earpiece 9.38, 9.40 is received onto a barb 9.184, 9.186 on respective rearward portions 9.88, 9.124 of temples 9.44, 9.52, with barbs 9.184, 9.186 preferably having enlarged tips 9.188, 9.190 for retaining the respective earplugs or earpieces thereon. The barbs 9.184, 9.186 may be angled slightly to mate with the ear canal of the wearer, and various rearward portions 9.88, 9.124 may be provided having different angles for barbs 9.184, 9.186 so as to accommodate differing human anatomies, whether by providing various rearward portions having different fixed angles for barb 9.184, 9.186 or whether by providing a rearward portion similar to that shown in Figs. 42-46 and Fig. 53 for the fifth embodiment of the present invention, it being further understood that the ear microphone and audio earpieces heretofore described for the fifth embodiment are equally applicable for use with the ninth embodiment. Earplug or earpieces 9.38, 9.40 are preferably constructed of unfoamed poly-vinyl chloride ("PVC") plastisol, although other materials may be used as well.

The hinges 9.50, 9.58 of temples 9.44, 9.52 of the ninth embodiment are constructed so as to force the temples slightly inward toward the wearer's head and thereby exert inward pressure to retain the earpieces 9.38, 9.40 within the wearer's ear. First and second temples 9.44, 9.52 are resilient and substantially shape-retaining, preferably being made of resilient plastic, and transmit the inward pressure created by the hinges and by the resilience of elongated browpiece portion 9.32 to rear temple portions 9.88, 9.124 which, in turn, exert an inwardly-directed force acting through earpieces 9.38, 9.40 (i.e., forcing the earpieces 9.38, 9.40 toward each other through the wearer's head), with the inwardly-directed force through each earpiece being preferably at least about one Newton (about 3.6 ounces Avoirdupois) and with the inwardly-directed force through each earpiece preferably being about 6 ounces Avoirdupois (1.67 Newtons) so as to comfortably secure the eyewear onto the wearer's head during physical activity. If earpiece 9.38, 9.40 is an aural, semi-aural, or supra-aural earpiece, then this force also seals the earpiece to the ear canal.

To use the overglasses ninth embodiment, a wearer first places his or her standard

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eyeglasses on his or her head in the usual manner with the temples of the standard eyeglasses supportingly extending and looping over the wearer's ears as shown in Fig. 89, then the wearer adjusts the temple length adjustment means of the ninth embodiment of the eyewear so that the earplug or earpiece is comfortably aligned with the wearer's ear canal when the eyewear is placed upon the wearer's head. The frontpiece guard portion of the overglasses ninth embodiment is placed over the wearer's glasses with the nosepiece of the ninth embodiment resting upon the wearer's nose, and the ninth embodiment of the eyewear is retained on the wearer's head by the earplug or earpiece inserted into the wearer's ear(s). It is thus not possible to comfortably wear the eyewear without having ear protection as well because, if the earpieces are not placed within the wearer's ear, they will annoyingly project into the side of the wearer's face.

Although the present invention has been described and illustrated with respect to a preferred embodiment and a preferred use therefor, it is not to be so limited since modifications and changes can be made therein which are within the full intended scope of the invention.

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CLAIMS

1. Eyewear for support by the ears of a human being, said eyewear comprising:

(a) a front guard portion including a front transparent panel;

(b) a first temple attached to said front guard portion, said first temple being substantially shape-retaining and having a rear temple portion remote from said front guard portion;

(c) a first earpiece angled slightly upward and attached to said rear temple portion of said first temple and adapted for supporting said first temple from a concha of a first ear of the human being by receipt of said first earpiece into the concha of the first ear, said first temple having no means of support extending over the top of the human being's first ear;

(d) a second temple attached to said front guard portion, said second temple being substantially shape-retaining and having a rear temple portion remote from said front guard portion;

(e) a second earpiece angled slightly upward and attached to said rear temple portion of said second temple and adapted for supporting said second temple from a concha of a second ear of the human being by receipt of said second earpiece into the concha of the second ear, said second temple having no means of support extending over the top of the human being's second ear; and

(f) spread-and-length adjustment means for simultaneously and selectively adjusting both a spread distance between said first and second temple, and a length distance between said front transparent panel and said rear ends of said first and second temples.

2. The eyewear as recited in claim 1, wherein said front guard portion comprises a resilient elongated browpiece portion, and said spread-and-

length adjustment means comprises said first and second temples slidingly engaged with said browpiece portion.

3. The eyewear as recited in claim 2, wherein said browpiece portion and said temples are correspondingly curved, such that upon increasing or decreasing adjustment of said temples, the temple spread distance and the temple length distance both increase or decrease accordingly in tandem to thereby automatically accommodate different sized heads.

4. The eyewear as recited in any one of claims 1 to 3, further comprising first and second temple length adjustment means, for adjusting the temple length separately from said spread-and-length adjustment means.

5. Eyewear for support by the ears of a human being, said eyewear comprising:

(a) a front guard portion including a front transparent panel;

(b) a first temple attached to said front guard portion, said first temple being substantially shape-retaining and having a rear temple portion remote from said front guard portion; said first temple including first temple length adjustment means for selectively adjusting said first temple's length;

(c) a first earpiece angled slightly upward and attached to said rear temple portion of said first temple and adapted for supporting said first temple from a concha of a first ear of the human being by receipt of said first earpiece into the concha of the first ear, said first temple having no means of support extending over the top of the human being's first ear;

(d) a second temple attached to said front guard portion, said second temple being substantially shape-retaining and having a rear temple portion remote from said front guard portion; said second temple

including second temple length adjustment means for selectively adjusting said second temple's length; and

(e) a second earpiece angled slightly upward and attached to said rear temple portion of said second temple and adapted for supporting said second temple from a concha of a second ear of the human being by receipt of said second earpiece into the concha of the second ear, said second temple having no means of support extending over the top of the human being's second ear.

6. The eyewear as recited in claim 5, in which said eyewear further comprises first and second temple spread-and -length adjustment means for selectively adjusting a spread distance between said first and second temples and for selectively adjusting a length distance between said front transparent panel and said rear ends of said first and second temples.

7. The eyewear as recited in claim 5, in which said eyewear further comprises first earphone means for convering an electrical signal to sound within said first earpiece.

8. The eyewear as recited in claim 7, in which said eyewear further comprises an ear microphone within said first earpiece.

9. The eyewear as recited in claim 7, in which said eyewear further comprises second earphone means for converting an electrical signal to sound within said second earpiece.

10. The eyewear as recited in claim 9, in which said eyewear further comprises an ear microphone within said first earpiece.

11. Eyewear for support by the ears of a human being, said eyewear comprising:

(a) a front guard portion including a front transparent panel;

(b) a first temple attached to said front guard position, said first temple being substantially shape-retaining and having a rear temple portion remote from said front guard portion;

(c) a first earpiece attached to said rear temple portion of said first temple and adapted for supporting said first temple from a concha of a first ear of the human being by receipt of said first earpiece into the concha of the first ear, said first temple having no means of support extending over the top of the human being's first ear; and

(d) a second temple attached to said front guard position and extending rearwardly therefrom.

12. The eyewear as recited in claim 11, in which said eyewear further comprises first earphone means forconverting an electrical signal to sound within said first earpiece.

13. The eyewear as recited in claim 12, in which said eyewear further comprises a microphone.

14. The eyewear as recited in claim 11, in which said first temple further includes first temple length adjustment means for selectively adjusting said first temple's length.

15. The eyewear as recited in claim 11, in which said second temple is substantially shape-retaining and has a rear temple portion remote from said front guard portion; and said eyewear further comprises;

a second earpiece attached to said rear temple portion of said second temple and adapted for supporting said second temple from a

concha of a second ear of the human being by receipt of said second earpiece into the concha of the second ear, said second temple having no means of support extending over the top of the human being's second ear.

16. The eyewear as recited in claim 15, in which said eyewear further comprises first earphone means for converting an electrical signal to sound within said first earpiece and second earphone means for converting an electrical signal to sound within said second earpiece.

17. The eyewear as recited in claim 16, in which said eyewear further comprises a microphone.

18. The eyewear as receited in claim 15, in which said first temple further includes first temple length adjustment means for selectively adjusting said first temple's length and said second temple further includes second temple length adjustment means for selectively adjusting said second temple's length.

19. Eyewear for support by the ears of a human being, said eyewear comprising:

(a) a front guard portion including a front transparent panel;

(b) a first temple attached to said front guard position and extending reawardly therefrom, said first temple having a rear temple portion remote from said front guard portion;

(c) a first earpiece attached to said rear temple portion of said first temple and adapted for supporting said first temple from a concha of a first ear of the human being by receipt of said first earpiece into the concha of the first ear, said first temple having no means of support extending over the top of the human being's first ear; and

(d) a second temple attached to said front guard position and extending rearwardly therefrom;

said first temple being resilient and said rear temple portion of said first temple exerting an inwardly-directed force acting through said first earpiece and toward said second temple, said inwardly-directed force acting through said first earpiece being at least about one Newton.

20. The eyewear as recited in claim 19, in which said eyewear further comprises first earphone means for converting an electrical signal to sound within said earpiece.

21. The eyewear as recited in claim 20, in which said eyewear further comprises a microphone.

22. The eyewear as recited in claim 19, in which said first temple further includes first temple length adjustment means for selectively adjusting said first temple's length.

23. The eyewear as recited in claim 19, in which said second temple has a rear temple portion remote from said frton guard portion; and said eyewear further comprises;

a second earpiece attached to said rear temple portion of said second temple and adapted for supporting said second temple from a concha of a second ear of the human being by receipt of said second earpiece into the concha of the second ear, said second temple having no means of support extending over the top of the human being's second ear;

said second temple being resilient and said rear temple portion of said second temple exerting an inwardly-directed force acting through said

second earpiece and toward said first temple, said inwardly-directed force acting through said second earpiece being a least about one Newton.

24. The eyewear as recited in claim 23, in which said eyewear further comprises first earphone means for converting an electrical signal to sound within said first earpiece and second earphone means for converting an electrical signal to sound within said second earpiece.

25. The eyewear as recited in claim 24, in which said eyewear further comprises a microphone.

26. The eyewear as recited in claim 23, in which said first temple further includes first temple length adjustment means for selectively adjusting said first temple's length and said second temple further includes second temple length adjustment means for selectively adjusting said second temple' length.

27. Eyewear for support by the ears of a human being substantially as herein described and illustrated with reference to any of the accompanying drawings.

The Patent Office

INVESTOR IN PEOPLE

SR

Application No: GB 0001851.5 **Examiner:** Andrew P Jenner
Claims searched: 1 - 4 **Date of search:** 25 February 2000

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.R): G2J: JS2A2

Int Cl (Ed.7): G02C, H04B

Other: Online: EPODOC, World Patents Index, JAPIO

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X, P	US 5781272 A SAFETY+PLUS INC.	5, 11 and 19

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Espacenet

CN2145478Y Glasses Radio

Applicants: KONG XIANGMIN [CN]

Inventors: XIANGMIN KONG [CN]

Classifications:
IPC ***H04B1/08;*** (IPC1-7): H04B1/08;

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Published as: CN2145478Y

Glasses Radio

Abstract

The utility model provides a glass type radio which is composed of a pair of glasses, a miniature radio and a telephone receiver. Each component of the glass type radio is arranged in a glass frame, and the miniature telephone receiver is arranged at the leg of the glasses. The utility model overcomes the defects that the connecting wires of the miniature radio and an earplug are too long and the use is inconvenient of the existing miniature radio and avoids the discomfort of the earplug which is inserted in the ear, and the utility model makes no interference with the hearing.

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H04B 1/08

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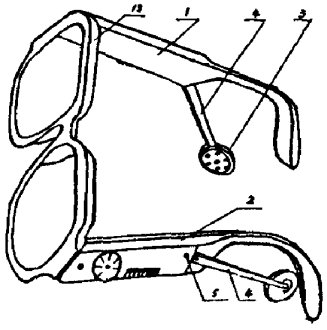
代理人 张传祥

说明书页数: 2 附图页数: 2

[54]实用新型名称 眼镜式收音机

[57]摘要

本实用新型提供了一种由眼镜，微型收音机及听筒组成的眼镜式收音机。收音机的各组成部分布置在眼镜框架内。微型听筒置于眼镜腿上，克服了现行微型收音机和耳塞连线过长，使用不方便的缺点，避免了耳塞机在耳朵里的不适感，且不妨害听力。



(BJ)第 1452 号

权　利　要　求　书

1．一种眼镜式收音机主要由眼镜框〔13〕、眼镜腿〔1〕和〔2〕、单片收音机芯〔8〕、调谐机构〔7〕、电源开关及音量控制器〔11〕、连接导线〔14〕和微型听筒〔3〕组成，其特征在于微型听筒〔3〕直接置于眼镜腿〔1〕和〔2〕靠近耳孔处，收音机的各组成部分及连接导线〔14〕都布置在眼镜腿〔1〕、〔2〕和眼镜框〔13〕内．

2．根据权利要求1所述的眼镜式收音机，其特征在于微粒听筒〔3〕通过软弹性支腿〔4〕予以固定，支腿〔4〕可以弯曲，在其一端开有长条孔用于调节听筒〔3〕与耳孔的距离．

Apple Inc.　Exhibit 1015　Page 1407

说　　明　　书

眼镜式收音机

本实用新型涉及一种以眼镜框架为壳体的微型收音机.

以往的微型收音机，其本体与听筒（耳塞）是用较长的导线连接，听筒戴在头上或将耳塞塞入耳窝内，它的缺点是导线长，使用不方便，耳朵有不适感且妨害听力.

本实用新型的任务是提供一种将眼镜与收音机、听筒做成一体的微型收音机.

本实用新型是把眼镜腿加宽加厚，将用微型器件组成的收音机芯、调谐机构、电源开关及音量控制器、钮扣电池布置在眼镜腿内的空腔中；耳塞式听筒通过一软弹性支腿固定在眼镜腿靠近耳朵处. 支腿由软弹性材料如软塑蛇皮管制成，可以弯曲。支腿一端开有长条孔，以达到调节听筒与耳朵的距离的目的. 连接导线在制作眼镜框时预先敷设在框内，装配时与相应部分连接.

由于本方案采用了一体化结构，省去了长的连接导线、给使用带来方便，听筒不与耳朵接触，所以无不适感，也不会妨害听力.

图 1 是　眼镜式收音机的整体布置示意图.

图 2 是　收音机与听筒的布置示意图.

图 3 是　盖板一.

图 4 是　电池与另一支听筒的安装示意图.

图 5 是　盖板二.

Apple Inc.　Exhibit 1015　Page 1408

下面结合附图和实施例对本实用新型作进一步详细说明.

图1中两支听筒3通过支腿4用螺钉5分别固定在眼镜腿1和2上.

如图2所示，将装有收音机芯8、调谐器7、电源开关及音量控制器11的线路板6放在眼镜腿2的空腔内，焊接好连接导线14、放好一支听筒、盖上图3所示的盖板一9，用两个螺钉5固定后再装上调谐器旋钮10.

如图3所示，先焊接好另一只听筒的导线，再将钮扣式电池12放在眼镜腿1的空腔内，盖上图5所示的盖板二，用螺钉5固定.

如图2和图4所示、支腿4上开有长条孔，用以调节听筒与耳朵的距离，当不收听时可以将两支听筒扳到适当位置.

眼镜片可以根据使用者的需要配置.

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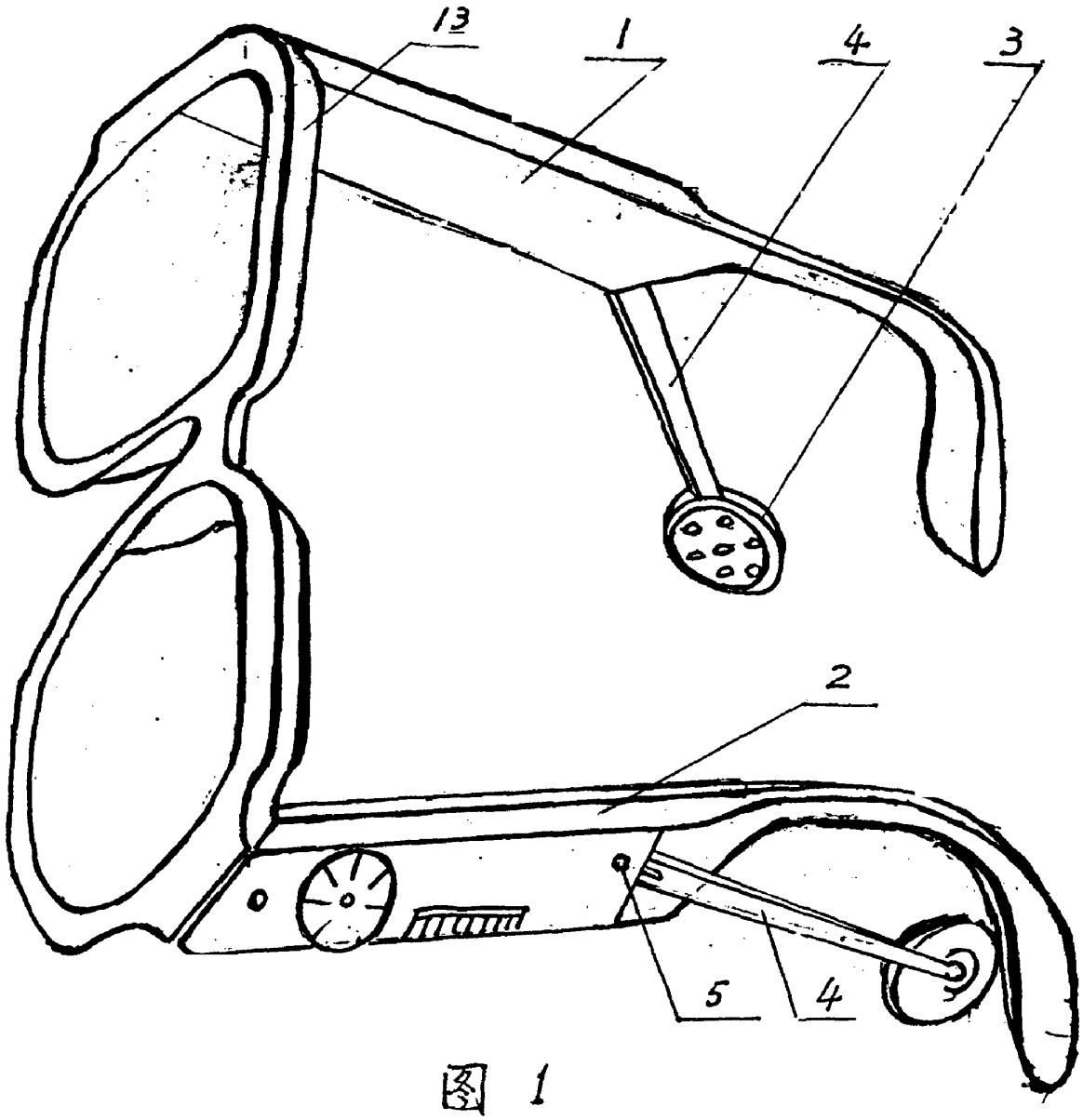


图 1

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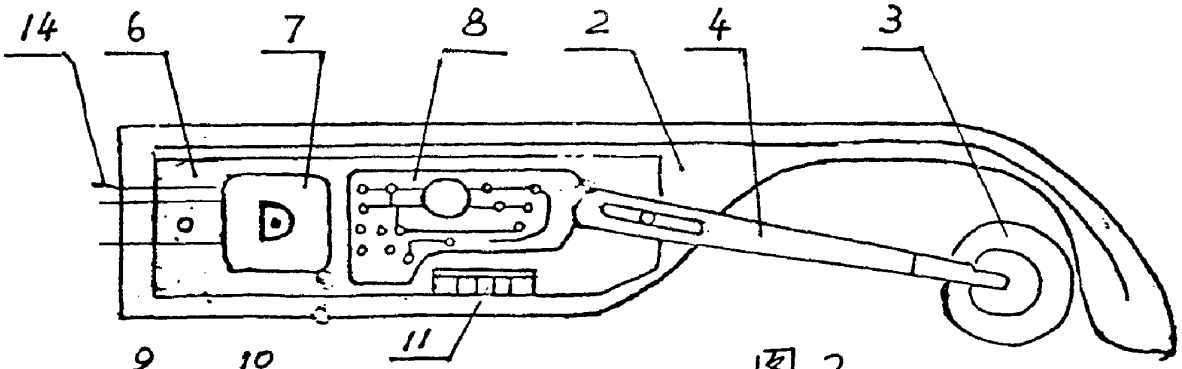


图 2

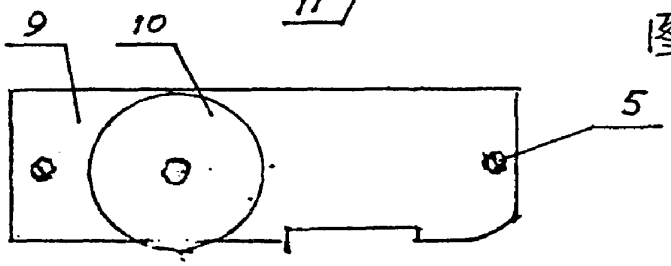


图 3

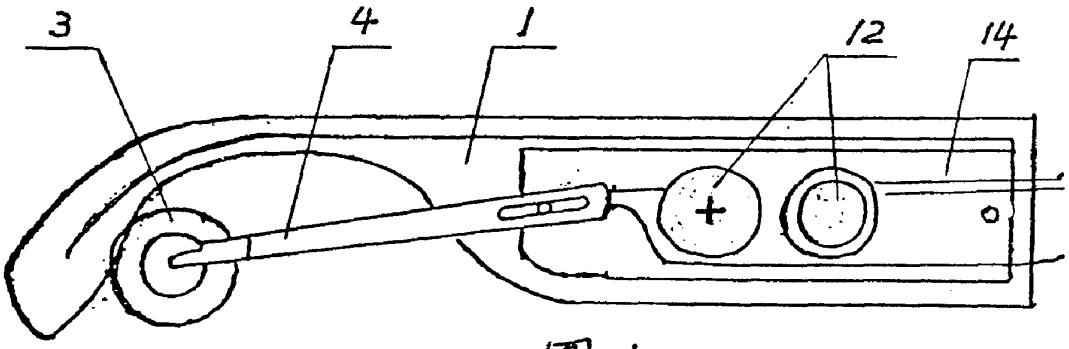


图 4

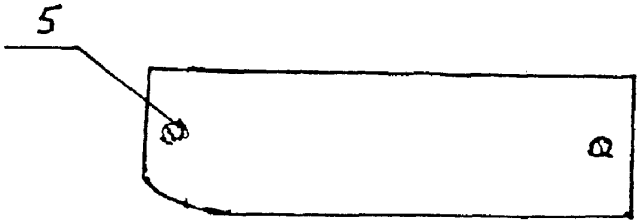


图 5

Apple Inc. Exhibit 1015 Page 1411

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G2J JS2AX1

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GB 2369194 A
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US 20030189824 A1
EP 1134491 A2
US 5722762 A
US 20030086054 A1

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UK CL (Edition X) G2J
INT CL[7] G02C
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(54) Abstract Title: **Eyewear with one or more light emitting diodes**

(57) Illuminated spectacles 10 comprising a frame (12) for retaining one or more lenses (22 and 24) and at least one light source 54, 56, 58 associated the frame (12), the light source being arranged to illuminate an area in front of the lens or lenses (22 and 24) and comprising one or more light emitting diodes 60 powered by one or more batteries and a switch (38) for selectively connecting and disconnecting the one or more light emitting diodes (60) from the one or more batteries. A jack or inductive coil 62 is preferably included for recharging the battery. Preferably contacts (50, 52 fig. 2) within the arms 18, 20 conduct current to to LEDs such that opening the arms 18, 20 automatically turns on the LEDs. A circuit is preferably provided for adjusting light intensity and monitoring battery charge.

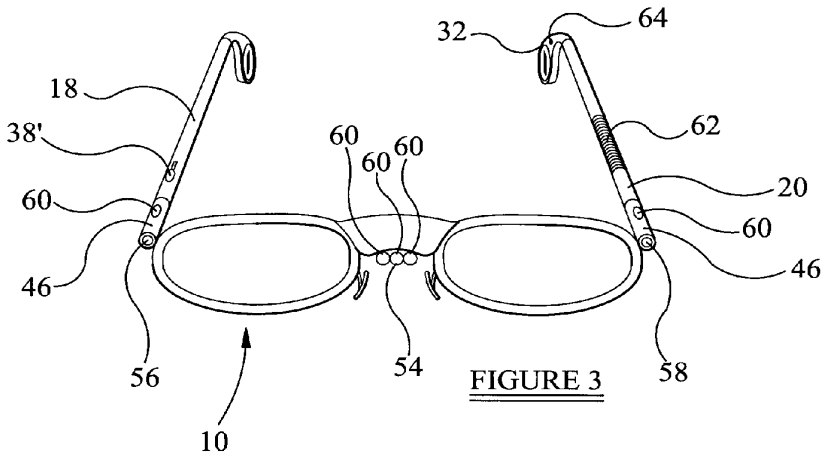


FIGURE 3

GB 2 411 009 A

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

This print takes account of replacement documents submitted after the date of filing to enable the application to comply with the formal requirements of the Patents Rules 1995

Original Printed on Recycled Paper

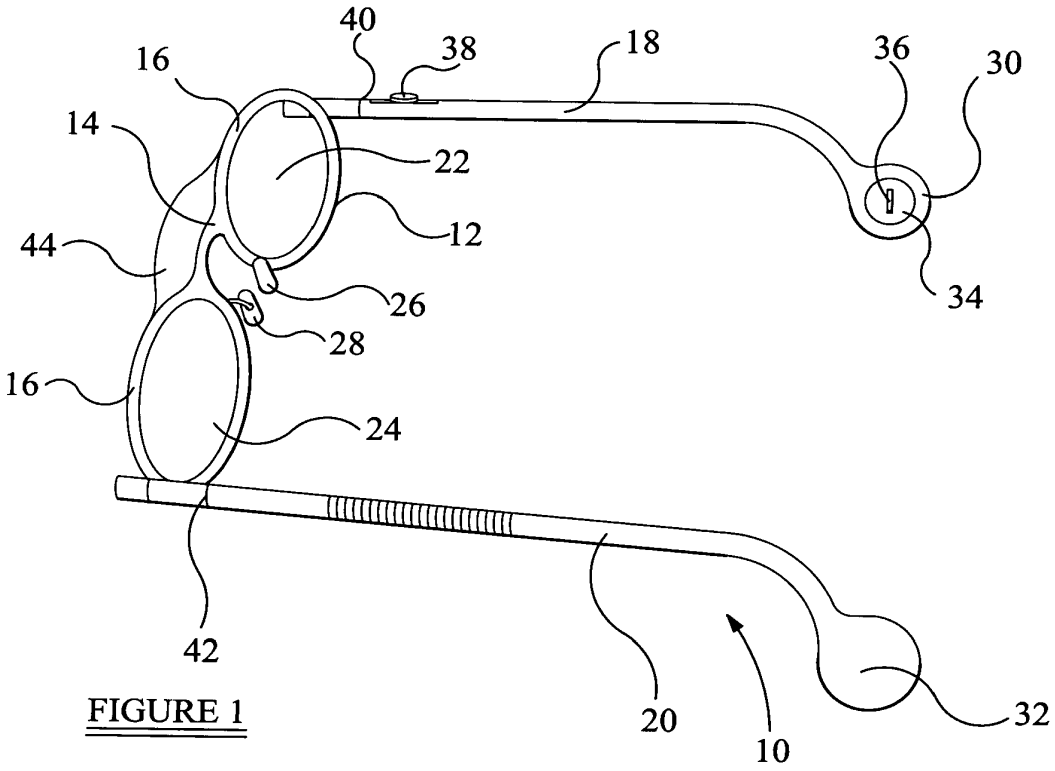


FIGURE 1

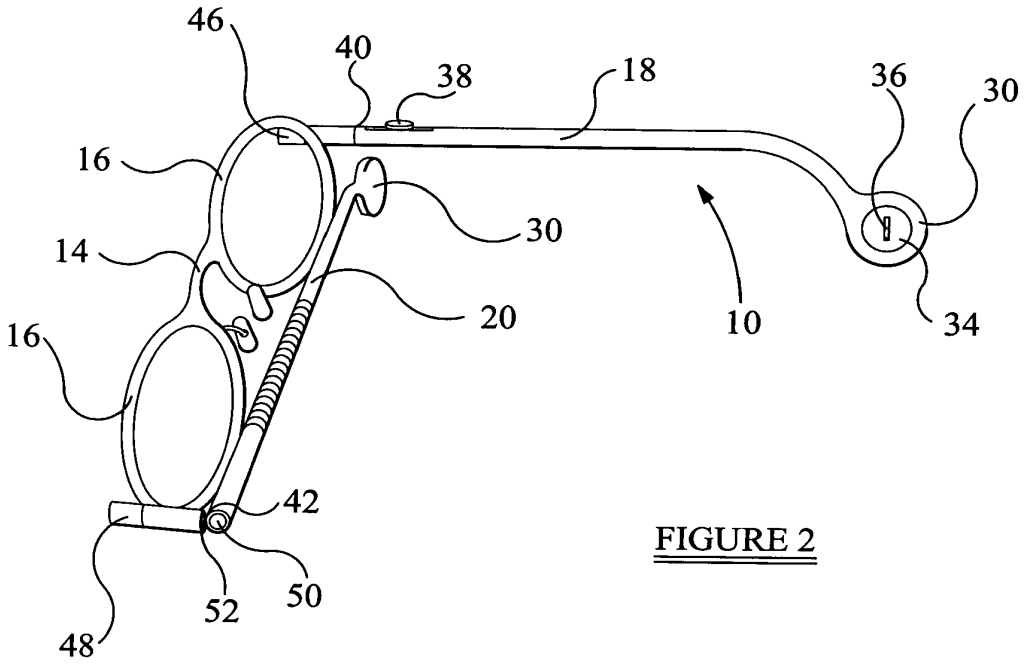


FIGURE 2

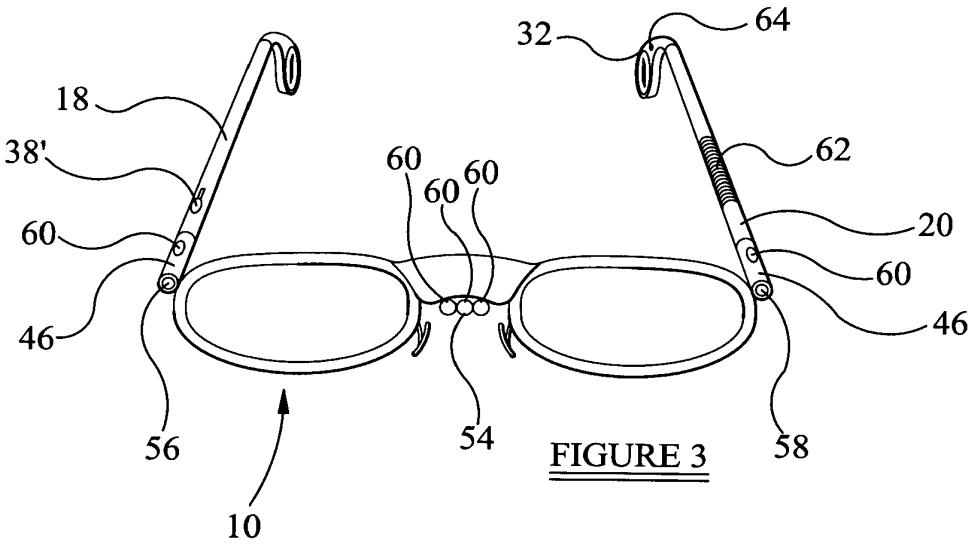


FIGURE 3

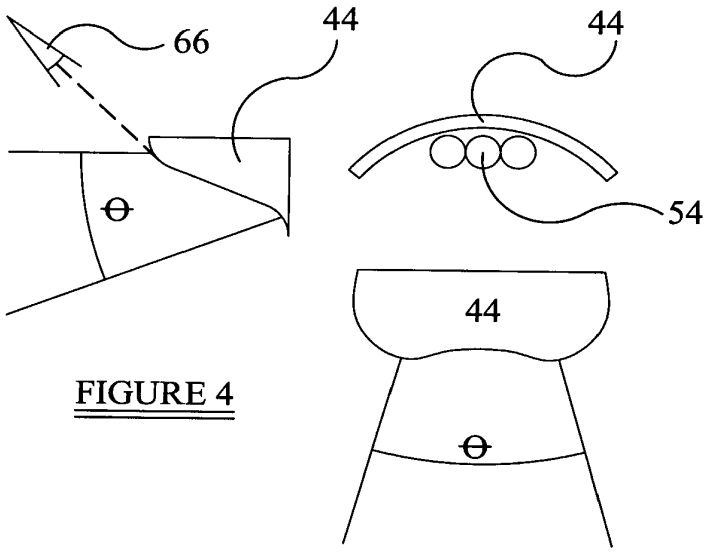


FIGURE 4

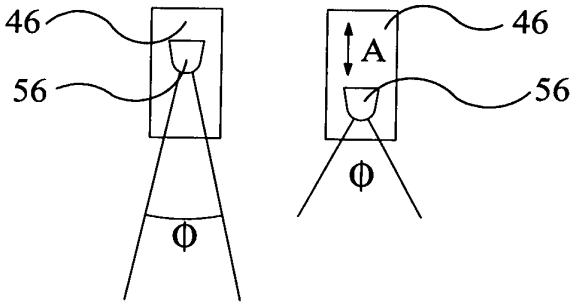


FIGURE 5

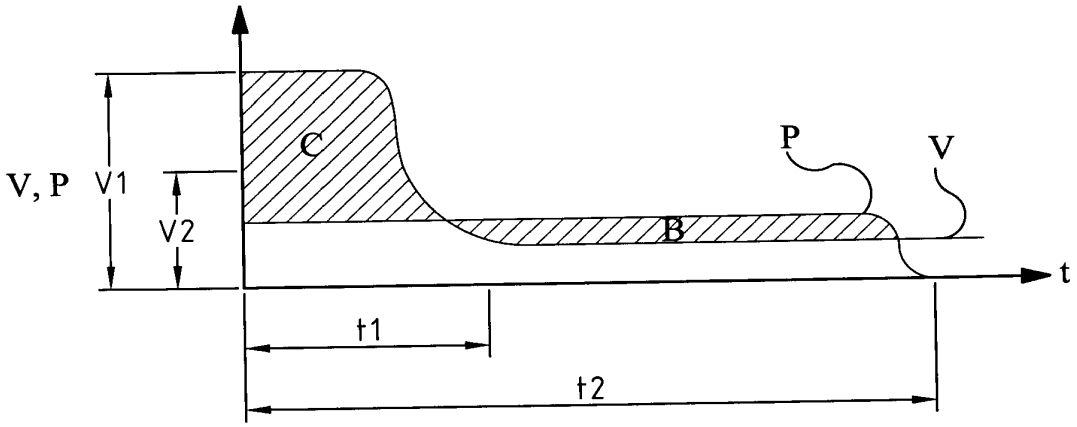


FIGURE 6

Title: Eyeglasses

Description:

The present invention relates to an eyeglass or and especially, but without limitation to, a pair of eyeglasses or spectacles and in particular to improvements in and relating to illuminated eyeglasses or spectacles.

Spectacles are worn to correct / compensate for a variety of eye defects. Commonly spectacles are worn for reading, i.e. to magnify or sharpen the text to make reading easier. Reading in a darkened room can cause eyestrain, which can worsen an eye defect and/or cause headaches. People with poor eyesight often require subjects to be well lit if they are to see them properly.

Illuminated spectacles are available and generally comprise a frame comprising a built-in light source, e.g. a battery powered bulb. Known illuminated spectacles are heavy (due to the weight of the batteries), cumbersome (due to the wiring associated therewith) and suffer from poor battery life (due to low battery capacity and/or high bulb power drain). Furthermore, the brightness and/or quality of the light emitted from known illuminated spectacles tends to be variable and the light emitted thereby can dazzle others nearby. Moreover, switching on and off of known illuminated spectacles can be difficult, owing to the small size of switch used, which is particularly problematic when the user of the spectacles has poor eyesight.

The present invention aims to provide a solution to one or more of the above problems.

Accordingly, the present invention provides an illuminated eyeglass comprising a carrier for one or a pair of lenses and at least one light source associated with the carrier, the light source being arranged to illuminate an area in front of the lens or lenses and comprising one or more light emitting diodes powered by one or more batteries, and switch means for selectively connecting and disconnecting one or more of the light emitting diodes from the one or more batteries.

The lens or pair of lenses may be arranged to be hand held, but preferably, the eyeglass of the invention is adapted to be worn on the head of a user such that the lens or pair of lenses substantially register with the eyes of the user. The carrier may comprise a bridge element for engaging directly or indirectly (eg: by more pieces carried thereby) with the nose of the user. The lens or lenses depend may be attached to the bridge element. Arms are preferably provided to engage with the ears of the user. The arms may connect directly to a respective one of the lenses or may connect to a cross member that spans between the arms. The bridge element may form part of the cross-section. The carrier comprises one or more of the bridge element, cross-member and the arms. Preferably, the arms include a hinge to permit them to fold from a position of disposed substantially perpendicular to the plane of the lenses - to a position lying substantially parallel to the plane of the lenses.

The light source of the invention may be provided at any convenient location on the frame, although it is envisaged that the light source will be positioned on or within the bridge element or on the generally forward facing end of the arms, where provided.

The light source comprises one or more light emitting diodes (LEDs), which may be of any suitable type. Preferably, the LED or LEDs are high intensity and/or narrow angle LEDs. Any colour LED or LEDs may be provided, although green or a white-green tint is preferred to improve black-on-white contrast (e.g. reading text on paper) and hence visibility.

The light source is preferably shaded to direct light substantially within the visible arc of the user, but to substantially reduce or prevent stray light directed outside the visible arc of the user. This feature may reduce the likelihood of dazzling other people in the vicinity of the user. The light source is preferably shaded using a shade element that depends from the carrier of the illuminated eyeglass. Preferably, the shade, where provided, is located above the light source to reduce substantially forward directed light emissions when the user's head is tilted down when in use. Additional side shades may be provided to reduce the amount of light being emitted sideways. The shade or shades may be arcuate.

Additionally or alternatively, the light source may comprise a light lens. The light lens may be a focussing or collimating lens such that the light emitted is directed in a substantially narrow cone to reduce the likelihood of dazzling persons nearby.

The light source is powered by a battery. Preferably, the battery is a rechargeable battery. Where the battery is rechargeable, recharging means (e.g. a power-in jack or inductive coil) is provided on or within the frame to facilitate charging. Any suitable rechargeable battery may be used, where desired, although high-power, high-cycle life batteries, e.g. Nickel-Cadmium, Nickel-Metal-Hydride or Lithium-Ion are preferred.

The battery or batteries are preferably located within the carrier of the illuminated eyeglass. Most preferably, the batteries are of small dimensions and/or substantially flat to enable them to be fitted inside the arms, of the carrier, where provided. Where the battery or batteries are fitted within the arm or arms of the frame, they are preferably located towards the extreme ends of the arm or arms such that they are accommodated behind the ear of the user when in use. The aforementioned arrangement conveniently balances or more evenly distributes the weight of the illuminated eyeglass and/or conceals the battery or batteries behind the ear and/or within the hair of the user.

A charging cradle may also be provided. The cradle, where provided, may comprise a jack or induction coil that interacts with a respective jack or induction coil provided in or on the illuminated spectacles. The illuminated eyeglass may thereby be conveniently placed in the cradle to recharge when not in use. The cradle may additionally comprise protective elements, e.g. a cover and/or a soft lining, to prevent accidental damage to the illuminated spectacles.

The switch may be of any suitable type. A slide switch may be provided on the frame for connecting/disconnecting the light source from the battery or batteries. The switch may comprise a variable resistor for controlling the brightness of the light source, although a separate variable resistor may be provided for this purpose.

Additionally or alternatively, the switch may comprise a micro-switch or contact switch located at or near to an end of the arms of the carrier, where provided. Thus, an electrical contact may conveniently be made when the

arms are opened, (i.e. when in use) and broken when the arms are closed (i.e. when folded when not in use). Such an arrangement may reduce the likelihood of accidentally leaving the light source switched on when not in use, and inadvertently draining the battery or batteries.

There may also be a control circuit for controlling the light output of the light source. The control circuit may comprise monitoring means, for monitoring the charge status of the battery or batteries and means for controlling the power directed to the light source. In this way, a more constant light source may be provided, i.e. by providing lower power for longer to compensate for the change in power output as the battery or batteries discharge.

The control circuit may additionally comprise any of the following features:

A dimmer circuit for reducing the light output of the power source.

Means for directing the power to different light sources e.g. to centrally located light sources for reading, to spaced apart light sources for general work, to a green light source for reading, or a white light source for general work. Other useful combinations and permutations can be easily worked out.

An audible/visual alarm to warn when battery power is low.

An indicator (e.g. a red, amber and green multicoloured LED) to indicate the charge status of the battery.

A motion detector (e.g. a mercury switch) to detect when the illuminated spectacles are not being used and/or means to automatically switch off the light source when not in use.

A charging indicator.

A preferred embodiment of the invention shall now be described, by way of example only, with reference to the accompanying drawings, in which;

Figure 1 shows a side perspective view of a pair of illuminated spectacles according to the invention;

Figure 2 shows a side perspective view of a pair of spectacles according to the invention having one arm folded;

Figure 3 shows a front perspective view of a pair of spectacles according to the invention;

Figure 4 shows a schematic representation of the shade of the invention; and

Figure 5 shows a schematic graph of the power output of the optional controller of the invention.

Referring now to Figure 1, a pair of spectacles 10 embodying the invention is shown generally comprising a carrier 12 in the form of a frame accommodating a pair of lenses 22,23 and having a bridge element 14, a cross member 16, two arms 18 & 20. The carrier 12 supports nose pads 26 & 28.

At extreme ends of the arms 18 & 20 are battery housings 30 & 32 for retaining a batteries (not shown). Each battery housing 30 & 32 has an inspection cover 34 which can be unscrewed using a coin in the coin slot 36 to facilitate inspection of and/or removal and replacement of the batteries.

A sliding switch 38 is provided on one arm 18. The switch 38 has three positions, namely "full power", "reduced power" and "off" for controlling the output of the light source.

The arms 18 & 20 are arranged to fold inwards about hinges 40 & 42. The bridge element 14 comprises an arcuate shade 44 for partially masking light emitted by the light source.

Figure 2 shows a similar pair of spectacles 10 except that a pair of shades 46 and 48 are provided at the outer ends of the cross members. The ends of the arms 18 & 20 are provided with electrical contacts 50 & 52, such that folding the spectacles as shown, breaks the connection between the batteries and the light source. A switch 38 is also provided to enable the spectacles 10 to be worn with the light sources switched off.

Figure 3 shows a front view of the spectacles 10 having three light sources 54, 56 & 58. The central light source 54 comprises three adjacent LEDs 60 that are arranged to direct light generally forwards. The central light source 54 is of a high intensity, narrow angle type suitable for reading and other similar tasks.

The spaced apart light sources 56 & 58 provide light over a wider angle and are more suited to general viewing. The light sources 56 & 58 are slidable within generally tubular shades 46 & 48 using sliders 60. The angle of the beams produced thereby can thus be narrowed by moving the light sources back inside the shades or widened by moving them towards the open ends of the shades. The switch 38' permits the user to select between central and spaced apart light sources depending on the particular situation.

Incorporated into one of the arms 20 is a wire coil 62 that enables the batteries to be recharged using an inductive field. A charging cradle (not shown) may be provided for this purpose.

Also shown in Figure 3 is a tri-coloured LED 64 located in the battery housing that is arranged to flash (e.g. to indicate charging) and to change colour (e.g. from green to amber to red) to indicate battery charge status as the batteries discharge.

Figure 4 shows, schematically, the arrangement of the central light source 54 and central arcuate shade 44 and how the angle θ of light is shielded from above and partially from the side. Thus the light emitted is substantially shielded from onlooker's eyes 66.

Figure 5 shows a similar arrangement for the spaced apart light sources 58 within their tubular shades 46. Here, the angle ϕ of light can be adjusted by moving the light source 56 within the shade as indicated by arrow A.

Finally, Figure 6 shows a schematic graph of battery voltage V and controlled power output P over time t. The battery voltage V is initially high, but decreases over time from a serviceable range V1 to an unserviceable range V2. The controller of the invention (which may be a circuit incorporated into any part of the frame) controls the voltage, and hence power P applied to the light source. Thus, the power consumption is lower for longer. The amount of power saved (area C) can be used to extend the life of the battery (area B) and to make the power output more consistent over a longer period. Thus the serviceable battery life t is extended from t1 to t2.

Claims:

1. An illuminated eyeglass comprising a carrier for one or a pair of lenses and at least one light source associated with the carrier, the light source being arranged to illuminate an area in front of the lens or lenses and comprising one or more light emitting diodes powered by one or more batteries, and switch means for selectively connecting and disconnecting the one or more of the light emitting diodes from one or more batteries.
2. An illuminated eyeglass as claimed in claim 1, wherein the light source comprises one or more LEDs.
3. An illuminated eyeglass as claimed in claim 2, wherein the one or more LEDs are high intensity LEDs.
4. An illuminated eyeglass as claimed in claim 2 or claim 3, wherein the one or more LEDs are narrow angle LEDs.
5. An illuminated eyeglass as claimed in any of claims 2 to 4, wherein the one or more LEDs have a green or white-green tint.
6. An illuminated eyeglass as claimed in any of claims 1 to 5, wherein the light source is shaded to direct light substantially within the visible arc of the user, but to substantially reduce or prevent stray light directed outside the visible arc of the user.
7. An illuminated eyeglass as claimed in claim 6, wherein the light source is shaded using a shade element that depends from the carrier of the spectacles.

8. An illuminated eyeglass as claimed in claim 7, wherein the shade is located above the light source to reduce substantially upwardly directed light emissions.

9. An illuminated eyeglass as claimed in claim 7 or claim 8, wherein additional side shades are provided to reduce the amount of light being emitted sideways.

10. An illuminated eyeglass as claimed in any of claims 7 to 9, wherein the shade or shades are arcuate.

11. An illuminated eyeglass as claimed in any of claims 1 to 10, wherein the light source comprises a light lens.

12. An illuminated eyeglass as claimed in claim 11, wherein the light lens is a focussing lens.

13. An illuminated eyeglass as claimed in claim 11, wherein the light lens is a collimating lens.

14. An illuminated eyeglass as claimed in any of claims 1 to 13, wherein the battery is a rechargeable battery.

15. An illuminated eyeglass as claimed in any of claims 1 to 14, further comprising a recharging means to facilitate charging.

16. An illuminated eyeglass as claimed in any of claims 1 to 15, wherein the battery or batteries are located inside the arms of the spectacle carrier.

17. An illuminated eyeglass as claimed in claims 16, wherein the battery or batteries are located towards the extreme ends of the arm or arms such that they are accommodated behind the ear of the user, when in use.

18. An illuminated eyeglass as claimed in any of claims 1 to 17, wherein the switch is a slide switch.

19. An illuminated eyeglass as claimed in any of claims 1 to 18, wherein the switch comprises a variable resistor for controlling the brightness of the light source.

20. An illuminated eyeglass as claimed in any of claims 1 to 19, wherein the switch comprises a micro-switch or contact switch that closes the circuit when the arms are opened and breaks the circuit when the arms are closed.

21. An illuminated eyeglass as claimed in any of claims 1 to 20, further comprising a control circuit for controlling the light output of the light source.

22. An illuminated eyeglass as claimed in claim 21, wherein the control circuit comprises monitoring means for monitoring the charge status of the battery or batteries.

23. An illuminated eyeglass as claimed in claim 21 or claim 22, wherein the control circuit comprises means for controlling the power directed to the light source to produce a substantially constant light source and to conserve battery power.

24. An illuminated eyeglass as claimed in any of claims 21, 22 or 23, wherein the control circuit further comprises a dimmer circuit for reducing the light output of the power source.

25. An illuminated eyeglass as claimed in any of claims 21 to 24, wherein the control circuit further comprises means for selectively directing power to different light sources.

26. An illuminated eyeglass as claimed in any of claims 21 to 25, wherein the control circuit further comprises an audible/visual alarm to warn when battery power is low.

27. An illuminated eyeglass as claimed in any of claims 21 to 26, wherein the control circuit further comprises an indicator to indicate the charge status of the battery.

28. An illuminated eyeglass as claimed in any of claims 21 to 27, wherein the control circuit further comprises a motion detector to detect when the An illuminated eyeglass are not being used.

29. An illuminated eyeglass as claimed in claims 28, wherein the control circuit further comprises means to automatically switch off the light source when not in use.

30. An illuminated eyeglass as claimed in claim 28 or claim 29, wherein the motion sensor comprises a mercury switch.

31. An illuminated eyeglass as claimed in any of claims 21 to 30, wherein the control circuit further comprises a charging indicator.

32. An illuminated eyeglass substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.

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Application No: GB0403182.9
Claims searched: 1-32

13

Examiner: Ben Munns
Date of search: 2 March 2005

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	1, 2, 6-8, 10, 14, 15, 21, 24 at least	GB 2369194 A (RICKETT) entire doc., including the claims
X	1, 2, 5, 11, 12, 14, 21, 24, 25 at least	EP 1134491 A2 (KANSAI) especially figures and paragraphs 13-23, 26, 39, 40, 58, 79, 80, 84, 94, 99
X	1-4, 18, 21 at least	US 2003/0086054 A1 (WATERS) especially figures and paragraphs 9, 44, 49 and 63
X	1-3, 11, 12, 20, 21, 23, 29 at least	US 2003/0189824 A1 (MEEDER) entire doc.
X	1, 2, 11, 12, 21 at least	US 6390640 B (WONG) entire doc.
X	1, 2, 11, 12, 14-16, 21 at least	US 5722762 A (SOLL) especially figures, col.2 lines 27-36, col.3 line 8 to col.4 line 24 and col.5 lines 13-57

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^{X} :

G2J

Worldwide search of patent documents classified in the following areas of the IPC^{07}

G02C

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The following online and other databases have been used in the preparation of this search report

EPODOC, WPI

Espacenet

JP2000197173A EYEGLASSES TYPE EARPHONE UNIT

Applicants: MATSUSHITA ELECTRIC WORKS LTD

Inventors: SUZUKI TAKEYUKI

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EYEGLASSES TYPE EARPHONE UNIT

Abstract

PROBLEM TO BE SOLVED: To prevent a position of a frame of the title earphone unit from being deviated even when the back part of a head of a user is in contact with a backrest of a chair or the like. SOLUTION: A frame 1 has a front part in front of a face, and a couple of temples 3 that are extended backward along a side head from both sides of the front and is formed to be eyeglasses. An earphone main body 4 is provided with a round ear speaker 4a whose part is inserted to an ear and a sheath 4b that is extended from the ear speaker 4a and to which part of a capable 8 is housed. The earphone main body 4 is energized forward by a curl cord 8a provided to the cable 8 and a rest part 7 consisting of a sheath holder 7a holding the sheath 4b of the earphone main body 4 along with a lengthwise direction of the temples 3 and of a hook holder 7b that hooks a connected part between the eye speaker 4a and the sheath 4b behind the sheath holder 7a is projected to an outer side face at a tail end of the temples 3.

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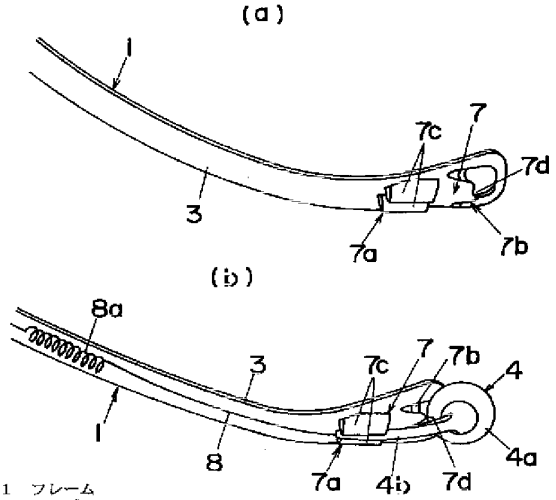
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(54)【発明の名称】　眼鏡型イアホン装置

(57)【要約】
【課題】後頭部を椅子の背もたれなどに当てた状態でもフレームの位置がずれないようにした眼鏡型イアホン装置を提供する。
【解決手段】フレーム１は顔の正面側のフロントと、フロントの両側部から側頭部に沿うように後方に延長された一対のテンプル３とを備え、眼鏡型に形成される。イアホン本体４は、耳内に一部が挿入される丸型のイアスピーカ部４ａと、イアスピーカ部４ａから延長されケーブル８の一部が収納されるシース部４ｂとを備える。イアホン本体４はケーブル８に設けたカールコード部８ａによって前方に付勢されている。テンプル３の後端部外側面には、イアホン本体４のシース部４ｂをテンプル３の長手方向に沿う形で保持するシース保持体７ａと、シース保持体７ａの後方でイアスピーカ部４ａとシース部４ｂとの結合部位を引掛保持する引掛保持体７ｂとからなるレスト部７が突設される。



1　フレーム
3　テンプル
4　イアホン本体
4ａ　イアスピーカ部
4ｂ　シース部
7　レスト部
7ａ　シース保持体
7ｂ　引掛保持体
8　ケーブル
8ａ　カールコード部

【特許請求の範囲】
【請求項１】　顔の正面側に少なくとも一部が当接するように配置されるフロントおよびフロントの両側部から側頭部に沿うように後方に延長された一対のテンプルを備える眼鏡型のフレームと、耳内に一部が挿入される丸型のイアスピーカ部およびイアスピーカ部から延長されケーブルの一部が収納されるシース部を備えるイアホン本体とを備え、イアホン本体をフレーム側に付勢するようにケーブルに張力を作用させる付勢手段が設けられ、イアホン本体のシース部をテンプルの長手方向に沿う形で保持するシース保持体と、シース保持体の後方でイアスピーカ部とシース部との結合部位を引掛保持する引掛保持体とからなるレスト部が側頭部付近でテンプルの後端部の外側面に突設されていることを特徴とする眼鏡型イアホン装置。
【請求項２】　前記付勢手段が前記ケーブルの一部に形成されたカールコード部よりなることを特徴とする請求項１記載の眼鏡型イアホン装置。
【請求項３】　前記イアスピーカ部には、鼓膜から輻射される赤外線量を非接触で検出する温度検出素子が内蔵されていることを特徴とする請求項１または請求項２記載の眼鏡型イアホン装置。
【発明の詳細な説明】
【０００１】
【発明の属する技術分野】本発明は、眼鏡型のフレームにイアホン本体を取り付けた眼鏡型イアホン装置に関するものである。
【０００２】
【従来の技術】近年、眼鏡型のフレームに液晶表示器などを用いたディスプレイ装置を組み込んだヘッドマウントディスプレイと称するディスプレイ装置が提供されている。この種のディスプレイ装置は個々人でしか映像を見ることができないから、音についても個々人で聴くのが望ましい。そこで、眼鏡型のフレームにイアホン本体を取り付けることによって、眼鏡型イアホン装置を構成することが考えられている。
【０００３】ところで、イアホン本体にはケーブルが接続されているから、イアホン本体を使用しないときにはケーブルが垂れ下がって見苦しく、またケーブルが他の部材に絡まることもあるから、不使用時にはイアホン本体をフレームに固定しておくのが望ましい。
【０００４】そこで、たとえば図９に示すように、フレーム１に設けたテンプル３の外側面に突出する係止突起１１と、テンプル３の後端に延長され後方に突出するクリップ片１２とを設けたものが提案されている。この構成では係止突起１１とクリップ片１２との間にイアホン本体を挟むことによって、イアホン本体をフレーム１に着脱可能に保持する。
【０００５】
【発明が解決しようとする課題】しかしながら、上述した構成では、イアホン本体をフレーム１に保持するためにクリップ片１２が後方に突設されているものであるから、いわゆるハイバックチェアのように背もたれ２１ａの上部に頭部Ｈを載せるような椅子や背もたれの上部に頭部載せ台を有するリクライニングチェアのような椅子に着座する際に眼鏡型イアホン装置を着用すると、クリップ片１２が椅子に当たってフレーム１が前方に押し出され、フレーム１の位置がずれることになる。とくに立体映像の表示を目的としたヘッドマウントディスプレイに適用するときには、フレーム１の位置がずれると、内蔵した表示装置と目との距離が変化することになって、立体視ができなくなる場合もある。
【０００６】また、最近ではマッサージ機において、リラックスの効果を高めたり、リラックスした状態から覚醒状態に戻すリフレッシュの効果を高めるために、この種の眼鏡型イアホン装置を用いることがあり、この種の目的で用いる場合には、使用者の生理状態を知る必要がある。そこで、生理情報を抽出するために、耳たぶにクリップ状の脈拍センサ（発光素子と受光素子とを対向させて配置した透過型のセンサ）を取り付けたり、額に脈拍センサ（発光素子と受光素子とを同じ向きに並設した反射型のセンサ）を接触させたりしている（特開平１０－１２７７６９号公報）。
【０００７】しかしながら、耳たぶに装着するセンサは使用者に違和感が生じることが多く、また、額に接触させるセンサでは装着バンドを必要としているから、頭部への装着作業が面倒であるという問題を有している。
【０００８】本発明は上記事由に鑑みて為されたものであり、請求項１に係る発明の目的は、後頭部を椅子の背もたれなどに当てた状態でもフレームの位置がずれないようにした眼鏡型イアホン装置を提供することにあり、請求項３に係る発明の目的は、使用者の生理情報を非接触で検出可能とすることにより、生理情報を検出する手段の装着を容易にするとともに装着中に違和感が生じないようにした眼鏡型イアホンを提供することにある。
【０００９】
【課題を解決するための手段】請求項１の発明は、顔の正面側に少なくとも一部が当接するように配置されるフロントおよびフロントの両側部から側頭部に沿うように後方に延長された一対のテンプルを備える眼鏡型のフレームと、耳内に一部が挿入される丸型のイアスピーカ部およびイアスピーカ部から延長されケーブルの一部が収納されるシース部を備えるイアホン本体とを備え、イアホン本体をフレーム側に付勢するようにケーブルに張力を作用させる付勢手段が設けられ、イアホン本体のシース部をテンプルの長手方向に沿う形で保持するシース保持体と、シース保持体の後方でイアスピーカ部とシース部との結合部位を引掛保持する引掛保持体とからなるレスト部が側頭部付近でテンプルの後端部の外側面に突設されているものである。この構成によれば、テンプルに

設けたシース保持体と引掛保持体とによってイアホン本体のシース部の両端部を保持し、かつイアホン本体のケーブルに作用する張力を利用してイアホン本体をテンプルに固定するから、従来構成のようなクリップ片が不要になり、テンプルの後端から後方に突出する部分が形成されないのである。その結果、後頭部を椅子の背もたれなどに当接させたとしてもフレームが位置ずれすることがない。このことから、たとえばマッサージ機能付きのリクライニングチェアと組み合わせて用い、リラックス用やリフレッシュ用の音楽をイアホン本体で聴かせるようにするような用途に用いる場合でも、フレームの位置がずれることによる違和感が生じないのである。あるいはまた、ヘッドマウントディスプレイに用いる場合には、表示装置の位置ずれがなく、適正な画像を視認させることができる。

【００１０】請求項２の発明は、請求項１の発明において、前記付勢手段が前記ケーブルの一部に形成されたカールコード部よりなるものである。この構成によれば、ケーブルにカールコード部を設けて付勢手段として機能させるから、別部品を用いる必要がなく、構成要素の増加がないとともに比較的低コストで提供することが可能になる。

【００１１】請求項３の発明は、請求項１または請求項２の発明において、前記イアスピーカ部には、鼓膜から輻射される赤外線量を非接触で検出する温度検出素子が内蔵されているものである。この構成によれば、鼓膜からの赤外線量を検出する温度検出素子がイアスピーカ部に内蔵されていることによって、イアホン本体を利用するために耳に装着すれば、使用者の生理情報としての体温の測定が可能になるのであって、生理情報を検出する手段の装着が容易であるとともに装着中の違和感も生じないのである。

【００１２】

【発明の実施の形態】以下に説明する実施形態では、本発明を図４に示すようなリクライニングチェア２１を備えたマッサージ機２０に適用した例を示する。ただし、マッサージ機２０に適用するのは一例であって、眼鏡型のイアホン装置として単独で使用したり、ヘッドマウントディスプレイと組み合わせて使用したりすることも可能である。

【００１３】マッサージ機２０には、背もたれ部２１ａと足載せ台２１ｂと頭載せ台２１ｃとを備えるリクライニングチェア２１を用い、図示しないリクライニング機構によって背もたれ部２１ａと足載せ台２１ｂと頭載せ台２１ｃとの傾斜角度が調節可能になっている。また、リクライニングチェア２１には図示しない振動機構、あるいは揉みや叩きを実現するマッサージ機構が背もたれ部２１ａや足載せ台２１ｂに内蔵されている。

【００１４】リクラインニング機構、振動機構ないしマッサージ機構の制御は図５に示すように、制御装置２２に設けたマッサージ機制御部２２ｂからの制御信号により行なわれ、マッサージ機制御部２２ｂの動作はシステム全体を制御するシステム制御部２２ａにより制御される。

【００１５】本実施形態における眼鏡型イアホン装置は、ヘッドマウントディスプレイと組み合わせて用いており、左右両眼にそれぞれ対応する液晶表示器を用いた一対の映像表示部５と、左右両耳用の一対のイアホン本体４とを眼鏡型のフレーム１に設けてある。つまり、図２に示すように、フレーム１は目の周囲を覆い顔の前面側に一部が当接するように配置されるフロント２と、フロント２の左右両側部から側頭部に沿う形で後方に延長された一対のテンプル３とを備える。テンプル３の後端部は耳の上部に掛けられるように後端部が他の部位よりもやや太幅に形成されるか耳に沿って曲成されている。

【００１６】映像表示部５により再生される映像信号やイアホン本体４により再生される音声信号（音楽、環境音、ナレーションなど）は、ビデオＣＤ、ＤＶＤなどの記憶媒体に記録されたものを再生装置２３によって読み出すことにより与えられる。マッサージ機２０に固定的に設定される操作手順や注意事項などのメッセージとなる音声信号は制御装置２２から発生させるようにしてもよい。

【００１７】システム制御部２２ａは映像音響制御部２２ｃを通して再生装置２３を制御している。たとえば、使用者の生理情報（脈拍、目の動きなど）を検出部２４により検出し、使用者が睡眠状態になったと判断したときには、イアホン本体４から送出する音量を低減したり再生装置２３の動作を停止させたりする。あるいはまた、リラックス、リフレッシュ、睡眠などのどの状態に導くかに応じて、生理情報に基づいたフィードバック制御を行うことも可能である。ここに、リラックスとは緊張を取り除くことを意味し、リフレッシュとはリラックス状態や睡眠状態から覚醒させることを意味する。また、記憶媒体には制御情報も格納され、制御情報を用いることによって映像や音声に合わせてマッサージ機２０を制御することもできるようになっている。

【００１８】制御装置２２にはスタートスイッチ２２ｄが設けられ、スタートスイッチ２２ｄの操作によってマッサージ機２０の動作が開始される。以後は、再生装置２３により記憶媒体から音声信号や映像信号が読み出されてイアホン本体４から音声が送出され、映像表示器５に映像が表示される。なお、この種のマッサージ機２０については、特開平９－３１３６１１号公報などに記載されている。

【００１９】ところで、本発明の特徴は、不使用時にイアホン本体４をフレーム１に保持させる構造にあり、具体的には図１に示すように、テンプル３の先端部外側面にシース保持体７ａを突設するとともに、シース保持体７ａの後方でテンプル３の外側面に引掛保持体７ｂを突

設してレスト部７を構成し、さらに図１（ｂ）のようにイアホン本体４から引き出されているケーブル８の一部にカールコード部８ａを形成してイアホン本体４をフレーム１のフロント２に近付く向きに付勢している点にある。イアホン本体４は、従来周知の形状であって、丸型に形成されていて耳に一部が挿入されるイアスピーカ部４ａを備え、イアスピーカ部４ａにおいて耳の外側に露出する部位の中心付近から耳に沿う形でケーブル８の一部を収納するシース部４ｂが延長されている。シース保持体７ａは一対の突片７ｃよりなり、両突片７ｃの間にシース部４ｂが保持される。シース保持体７ａはシース部４ｂをテンプル３に沿う形で保持する。また、引掛保持体７ｂはテンプル３に対して斜め後方に突出するように形成され、引掛保持体７ｂの先端部にはシース部４ｂの一部が嵌まる窪み部７ｄが形成されている。引掛保持体７ｂの先端部とテンプル３との間には、イアホン本体４におけるイアスピーカ部４ａとシース部４ｂとの結合部位が係合し、このことによってイアホン本体４をフレーム１側に付勢するようにケーブル８に作用している張力に抗してイアホン本体４をテンプル３に保持させることができる。

【００２０】上述した構成によれば、シース部４ｂをシース保持体７ａとしての一対の突片７ｃの間に嵌め入れ、かつイアスピーカ部４ａを引掛保持体７ｂに係止するだけでイアホン本体４をテンプル３に保持させることができるから、イアホン本体４のテンプル３への固定作業が容易である。また、イアホン本体４をテンプル３に沿って後方に引張ればイアホン本体４をテンプル３から外すことができるから、イアホン本体４をテンプル３から外して図２のように使用状態とするのも容易である。要するにテンプル３に対するイアホン本体４の着脱が容易に行えるのである。

【００２１】さらに、従来構成のようにイアホン本体４のイアスピーカ部４ａを前後から挟み込むようにしてテンプル３に保持させるのではなく、イアホン本体４をケーブル８により前方に付勢し、イアホン本体４の前方への移動を引掛保持体７ｂで係止する構造であるから、テンプル３にはイアホン本体４の後部側に突出する部分を設ける必要がない。つまり、図３に示すように、頭部Ｈに装着した状態においてテンプル３には後頭部よりも後方に突出する部分が形成されないから、背もたれ２１ａないし頭載せ台２１ｃに頭部Ｈが当接した状態においてテンプル３は背もたれ２１ａないし頭載せ台２１ｃに当接せず、フレーム１が頭部Ｈに対して位置ずれすることもない。

【００２２】ところで、上述したようにマッサージ機には生理情報を検出するための検出部２４が必要であって、本実施形態ではこの検出部２４として使用者の体温を検出する装置を採用している。つまり、使用者が睡眠状態か否かの判定には体温を用いることができることが知られており、たとえば、体温と睡眠状態とには次のような関係がある。

① 深部体温が高いと中途覚醒が多くなり、睡眠の質が落ちる。

② 睡眠中に深部体温が低下することは、睡眠の質を維持する上で重要である。

③ 睡眠中に体温が低下し、覚醒中に上昇することによって能率のよい活動と十分な休息が保証される。

【００２３】ただし、検出部２４を別途に装着するのでは、装着が煩わしくまた装着中に違和感が生じたりするから、検出部２４をイアスピーカ部４ａに内臓させている。ここに、イアホン本体４のイアスピーカ部４ａは一般には図６のような構造を有している。このイアスピーカ部４ａは、一部が耳内に挿入されるハウジング３０内に固定された円柱状の永久磁石３１を備え、永久磁石３１の軸方向に移動自在な円筒状のボイスコイル３２に振動板３３を取り付けたいわゆるダイナミックスピーカを構成している。

【００２４】これに対して本実施形態では、図７に示す構造を有するイアスピーカ部４ａを用いている。このイアスピーカ部４ａは、基本的には図６に示した構成のイアスピーカ部４ａと同様の構成を有しているが、ハウジング３０に、さらにサーモパイル３４とサーミスタ３５とを内蔵したものである。サーモパイル３４およびサーミスタ３５は永久磁石３１に対して振動板３３とは反対側に配置されている。また、ハウジング３０には鼓膜から輻射される赤外線をサーモパイル３４に導くことができるように、ガイド孔３６が形成されている。つまり、永久磁石３１および振動板３３にはガイド孔３６に対応する部位に開口が形成されている。さらに、ハウジング３０において耳内に挿入される部位は、中央部が周部よりも耳内側に突出する形状に形成され、鼓膜からの赤外線がガイド孔３６に導入されやすくなっている。サーミスタ３５はサーモパイル３４の温度を測定するために設けられている。

【００２５】サーモパイル３４およびサーミスタ３５は、鼓膜から輻射される赤外線量を測定することによって使用者の体温を測定するために設けられている。いま、温度がＴ（Ｋ）である鼓膜から輻射されるエネルギが、ガイド孔３６を通して温度がＴＥ（Ｋ）であるサーモパイル３４に入射するとすれば、サーモパイル３４からはσ（T^4 －TE^4 ）に比例した電圧を出力することが知られている。ただし、σはステファン－ボルツマン定数である。

【００２６】しかして、サーミスタ３５によりサーモパイル３４の温度ＴＥを検出し、サーモパイル３４の出力電圧と併せて用いると、鼓膜の温度を検出することができるのである。つまり、図８に示すように、サーモパイル３４の出力電圧およびサーミスタ３５を用いて検出した電圧をそれぞれ増幅器３７ａ，３７ｂにより増幅し、

さらにそれぞれＡ／Ｄ変換器３８ａ，３８ｂによってデジタル値に変換する。このようにして得られたサーモパイル３４の出力とサーミスタ３５の出力とをマイコンよりなる演算装置３９に与えて、上式に基づく演算を施すことにより鼓膜の温度を検出することができるのである。すなわち、イアスピーカ部４ａに内蔵した温度検出素子によって、使用者の体温を非接触で検出することが可能になる。

【００２７】

【発明の効果】請求項１の発明は、顔の正面側に少なくとも一部が当接するように配置されるフロントおよびフロントの両側部から側頭部に沿うように後方に延長された一対のテンプルを備える眼鏡型のフレームと、耳内に一部が挿入される丸型のイアスピーカ部およびイアスピーカ部から延長されケーブルの一部が収納されるシース部を備えるイアホン本体とを備え、イアホン本体をフレーム側に付勢するようにケーブルに張力を作用させる付勢手段が設けられ、イアホン本体のシース部をテンプルの長手方向に沿う形で保持するシース保持体と、シース保持体の後方でイアスピーカ部とシース部との結合部位を引掛保持する引掛保持体とからなるレスト部が側頭部付近でテンプルの後端部の外側面に突設されているものであり、テンプルに設けたシース保持体と引掛保持体とによってイアホン本体のシース部の両端部を保持し、かつイアホン本体のケーブルに作用する張力を利用してイアホン本体をテンプルに固定するから、従来構成のようなクリップ片が不要になり、テンプルの後端から後方に突出する部分が形成されないのであって、結果的に、後頭部を椅子の背もたれなどに当接させたとしてもフレームが位置ずれすることがないという利点がある。また、ケーブルに張力が作用していることによって、ケーブルを弛まないようにテンプルに沿わせておくことができ外観が美麗になる。さらに、ケーブルに作用する張力に対してイアホン本体を係止するだけでイアホン本体をテンプルに保持しているから、従来構成のようにクリップ片を用いてイアホン本体を係合させていた構成に比較すると、イアホン本体をテンプルに対して着脱するのが容易である。加えて、イアホン本体をシース保持体と引掛保持体との２箇所で保持しているから、イアホン本体をテンプルに沿わせた形で保持することができ、不使用時の外観が美麗である。

【００２８】請求項２の発明は、請求項１の発明において、付勢手段がケーブルの一部に形成されたカールコード部よりなるものであり、ケーブルにカールコード部を設けて付勢手段として機能させるから別部品を用いる必要がなく、構成要素の増加がないとともに比較的低コストで提供することが可能になるという利点がある。

【００２９】請求項３の発明は、請求項１または請求項２の発明において、前記イアスピーカ部には、鼓膜から輻射される赤外線量を非接触で検出する温度検出素子が内蔵されているものであり、鼓膜からの赤外線量を検出する温度検出素子がイアスピーカ部に内蔵されていることによって、イアホン本体を利用するために耳に装着すれば、使用者の生理情報としての体温の測定が可能になるのであって、生理情報を検出する手段の装着が容易であるとともに装着中の違和感も生じないという利点を有する。

【図面の簡単な説明】

【図１】本発明の実施の形態の要部を示し、（ａ）はイアホン本体を取り付けていない状態を示す要部斜視図、（ｂ）はイアホン本体を取り付けた状態を示す要部斜視図である。

【図２】同上の全体構成を示す外観斜視図である。

【図３】同上の動作説明図である。

【図４】同上を用いたマッサージ機を示す概略構成図である。

【図５】同上を用いたマッサージ機を示すブロック図である。

【図６】一般的なイアホン本体を示す断面図である。

【図７】本発明の実施の形態に用いるイアホン本体を示す断面図である。

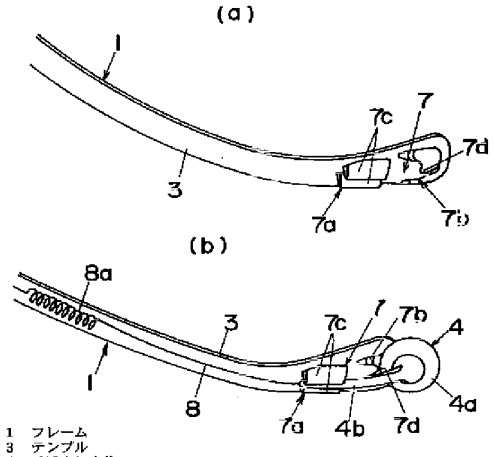
【図８】同上を用いた体温測定のための回路構成を示すブロック図である。

【図９】従来例を示す動作説明図である。

【符号の説明】

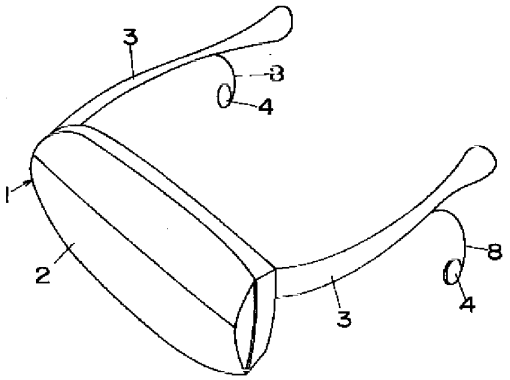
１　フレーム
２　フロント
３　テンプル
４　イアホン本体
４ａ　イアスピーカ部
４ｂ　シース部
５　映像表示部
７　レスト部
７ａ　シース保持体
７ｂ　引掛保持体
８　ケーブル
８ａ　カールコード部
３４　サーモパイル
３５　サーミスタ

【図1】

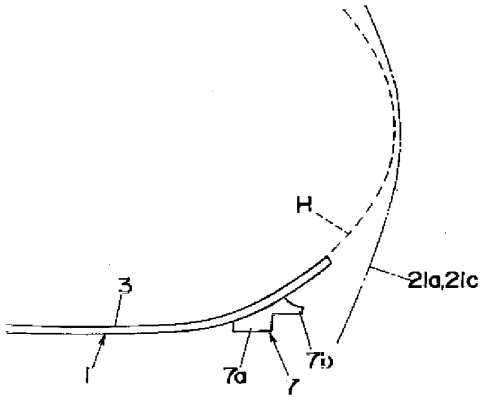


1 フレーム
3 テンプル
4 イアホン本体
4a イアスピーカ部
4b シース部
7 レスト部
7a シース保持体
7b 引掛保持体
8 ケーブル
8a カールコード部

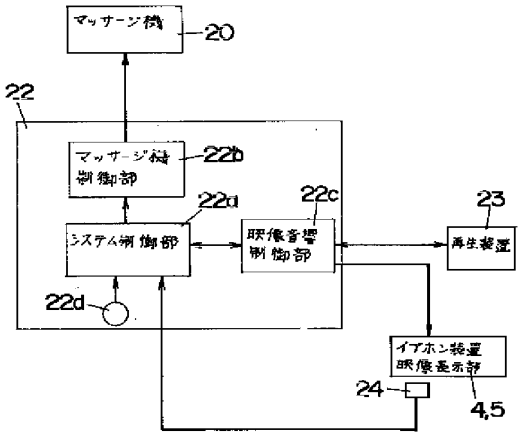
【図2】



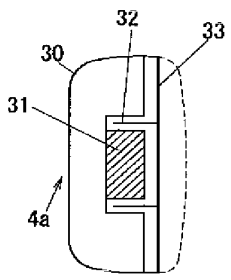
【図3】



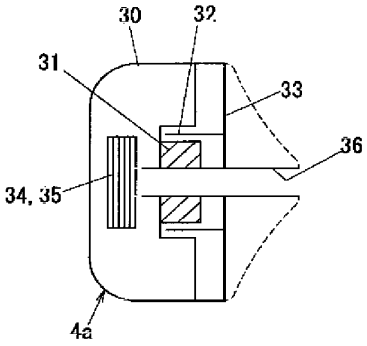
【図5】



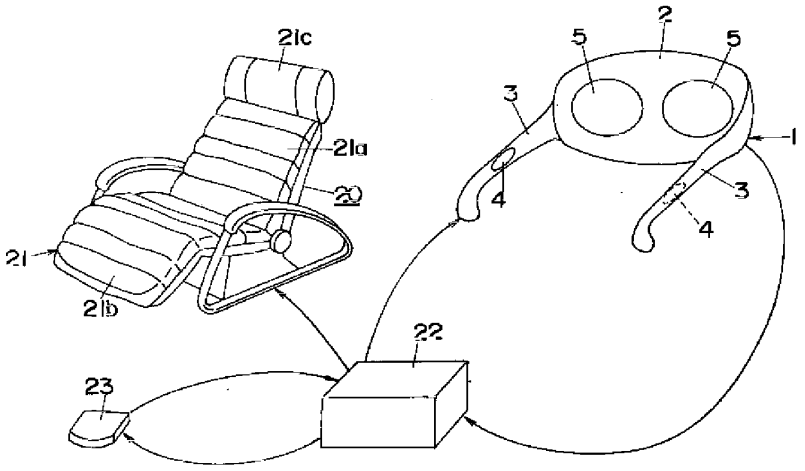
【図6】



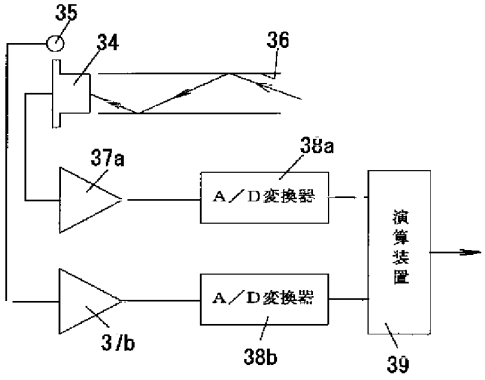
【図7】



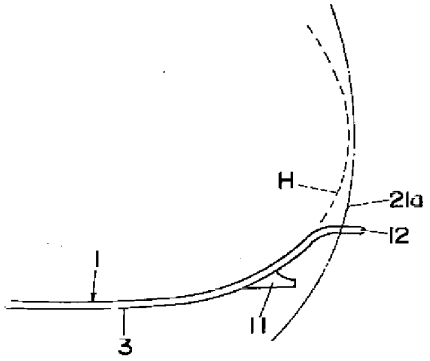
【図4】


21c
21a
20
21
21b
22
23
2
5
5
3
1
4
3
4

【図8】


35
34
36
37a
38a
A／D変換器
演算装置
A／D変換器
37b
38b
39

【図9】


H
21a
12
1
3
11

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(73) [Owner of utility model right]
[Identification Number]594171388
[Name]**, Inc. company

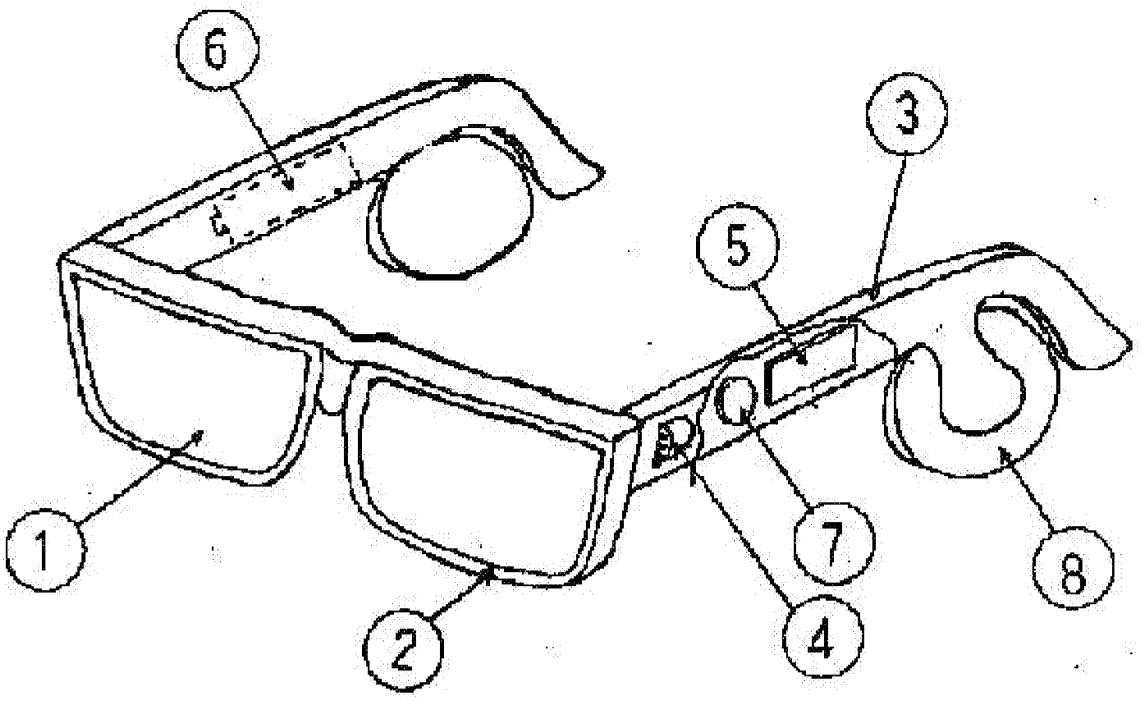
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[Name]Toshio Nozaki

(72) [Creator]
[Name]Ueda Masahiro

Overview Close —

(57) [Overview] (Modified)
[Problem] The temple of glasses -- an open air type head telephone -- and the structure of th e good hearing aid of tone quality with the sufficient wearing feeling which gave a sense of to getherness by making a micro horn, an electronic circuit, a cell, and connection lead wires att ach and build in the vine part of glasses.
[Means for solving] A headphone 8, a microphone 4, an electronic circuit 5, a battery 6 and a connection lead wire are attached to and built in the temple of spectacles.



Scope of Claims Close

[Utility Model Claims]

[Claim 1] In the structure of the hearing aid, a microphone is attached to the temple of spectacles, an open air type headphone is attached to a place corresponding to an ear, and an electronic circuit is incorporated in the temple part of the spectacles.

[Claim 2] The hearing aid according to claim 1, wherein lead wires for connecting the headphone, the microphone, the electronic circuit and the battery, which are attached to and incorporated in the temple portion of the glasses, are incorporated in the temple portion of the glasses and the upper portion of the glasses.

Detailed Description Close

[Detailed description of the device]

[0001]
[Technical Field of Invention]
The present invention relates to a configuration of a hearing aid with glasses.
[0002]
[Prior art]
Although this kind of hearing aid with glasses has an earphone type and a bone conduction ty pe conventionally, it is time and effort to wearing.
The wearing feeling and sound quality are not always sufficient. * in the place synotia of an ea rphone type
When the roughness or the like is attached, the sound quality may be greatly changed.
[0003]
[Problem to be solved by the device]
Since the open air type headphones are attached to the temples of the glasses, the sound qua lity is improved.
Wearing feeling is good. Therefore, a microphone, an electronic circuit, a cell, and connection l ead wires are also glasses.
To give a sense of unity by attaching to and incorporating in a temple.
[0004]
[Means for Solving the Problems]
A groove is formed in the upper part of the spectacle part, and a connection lead wire is built i n the groove.
They are put together as a listener.
[0005]
[Function]
There is also little sense of incongruity [as opposed to an ear by this composition], ** is eas y and the panel of glasses is a head.
About the same volume as a horn and tone quality are acquired.
[0006]
[Embodiment of the Invention]
Embodiments of the present invention will be described with reference to the accompanying d rawings. Fig.1 is a book.
In the external view of the invention, 1 is a lens of spectacles, 2 is a lens frame and 3 is a tem ple. 4 is Mai.
A microphone 5 is an electronic circuit, 6 is a battery, and 7 is a sound volume adjusting devic e. 8 ****
It is - * part. The elements 4 to 7 are provided inside each arm. FIG. 2
The wire 9 is fixed to the upper lens frame part by a rubber 10.

It is the Example carried out.

FIG. 3 shows a conventional earphone type hearing aid with glasses, in which reference numeral 11 denotes an earphone.

[0007]

[Effect of the device]

To eliminate a sense of incompatibility in wearing a hearing aid and to improve sound quality by a binaural effect.

This is what was done above.

Brief description of the drawings

Close

[Brief Description of the Drawings]

[Fig. 1]It is an outline view of the hearing aid with glasses of this design.

[Fig. 2]It is an attaching structure figure of the lead of the hearing aid with glasses of this design.

[Fig. 3]It is a configuration diagram of the conventional hearing aid.

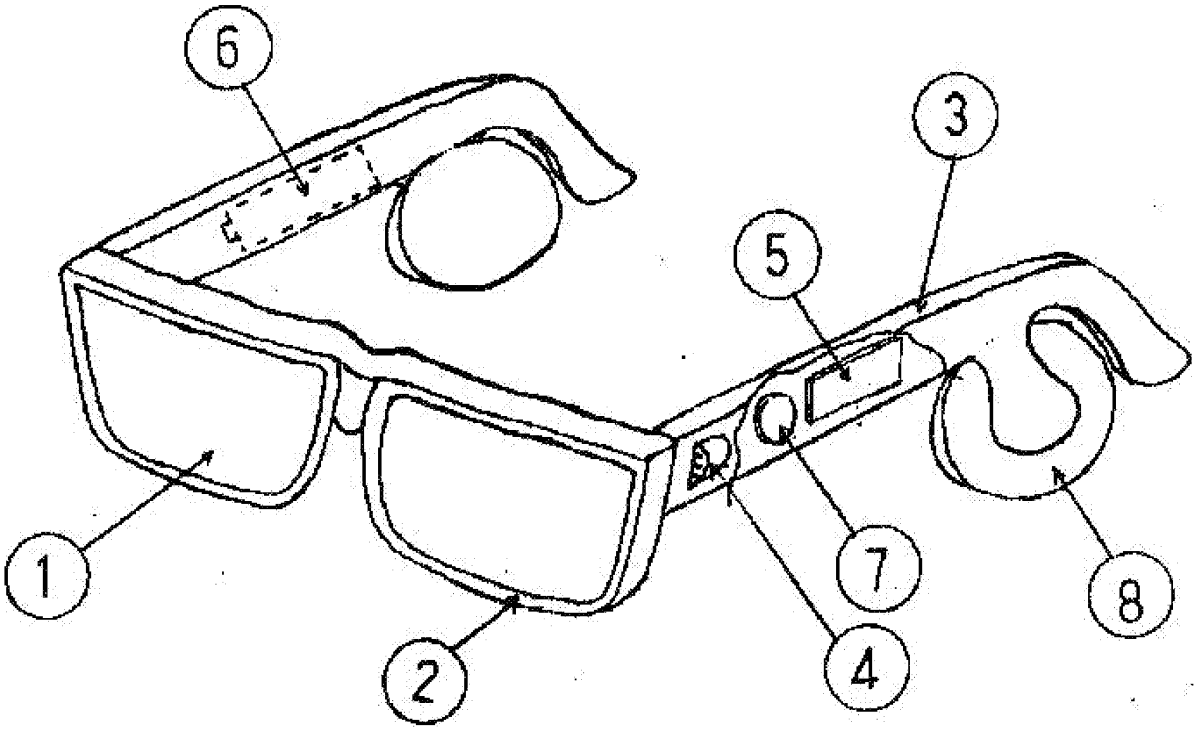
[Explanation of letters or numerals]

1 spectacle lens
2 Lens Frame
3 Vine
4 Micro Horn
5 Electronic Circuit
6 Cell
7 Volume Control Device
8 Head Telephone Part
9 Lead
10 Rubber
11 Earphone

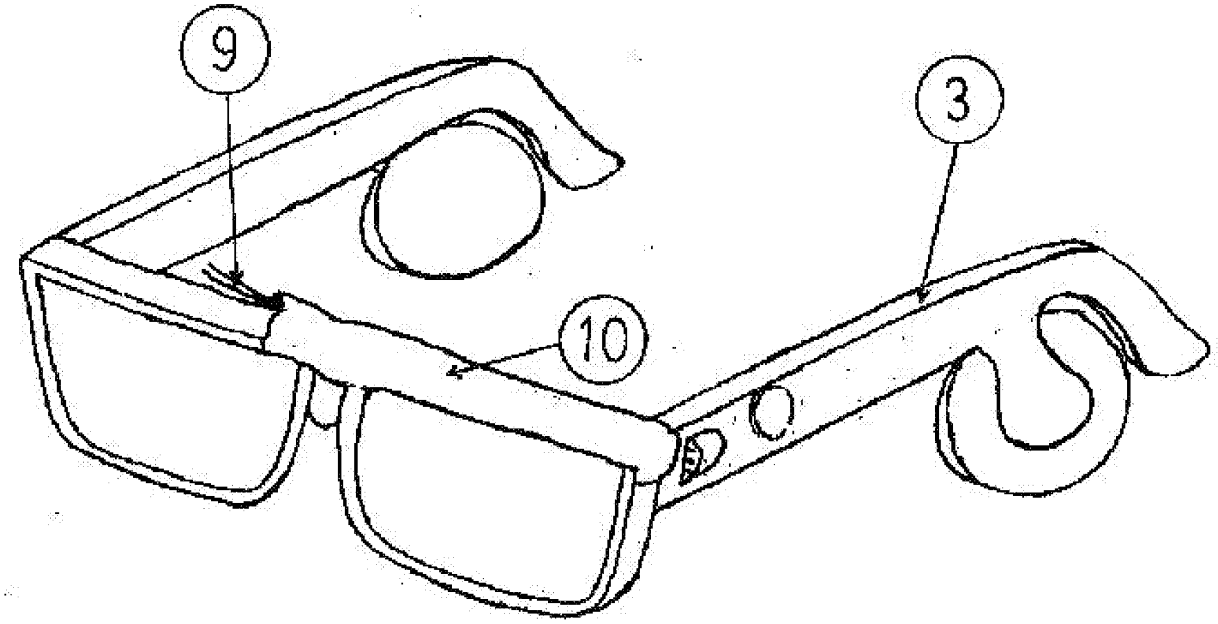
Drawings

Close

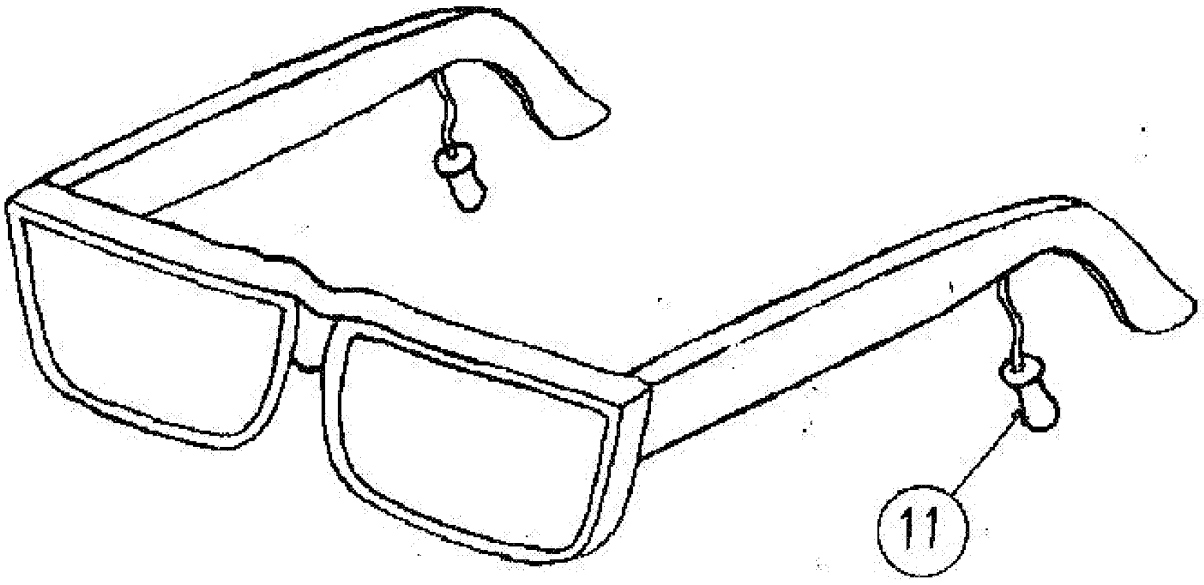
[FIG.1]



[FIG.2]



[FIG.3]

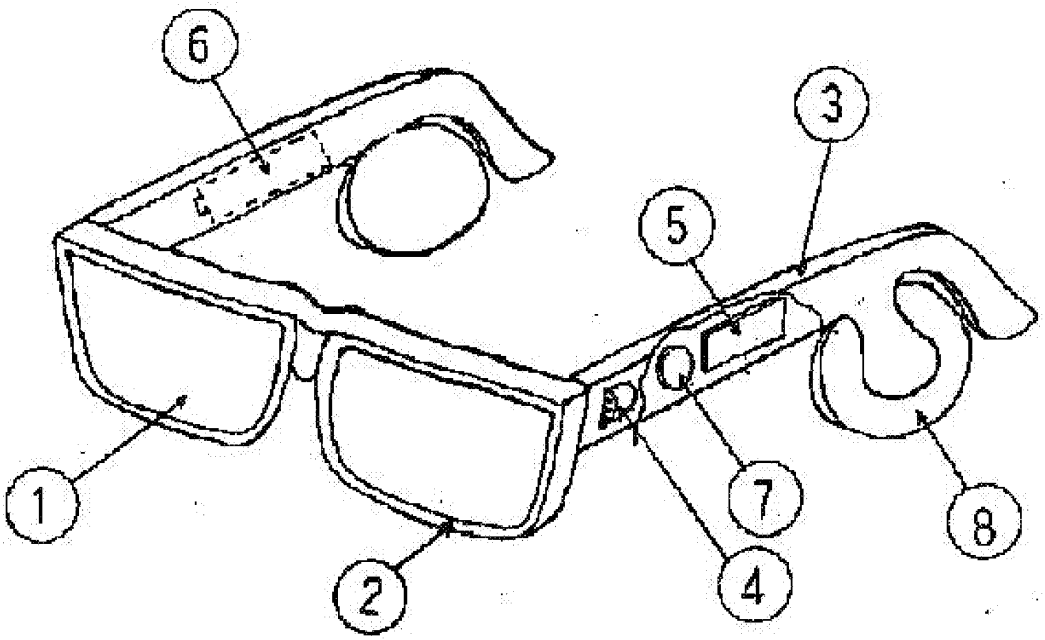


Drawings

Close —

Representative drawing | 1 | 2 | 3

Enlarge and Rotate



Representative drawing

1 of 1 Display

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(19)日本国特許庁（ＪＰ）　(12) **登録実用新案公報**（U）　(11)実用新案登録番号
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(45)発行日　平成13年５月18日(2001.5.18)　(24)登録日　平成13年２月21日(2001.2.21)

(51)Int.Cl.[7]	識別記号	ＦＩ	
Ｈ０４Ｒ　25/00		Ｈ０４Ｒ　25/00	Ｒ

評価書の請求　未請求　請求項の数２　書面　（全　４　頁）

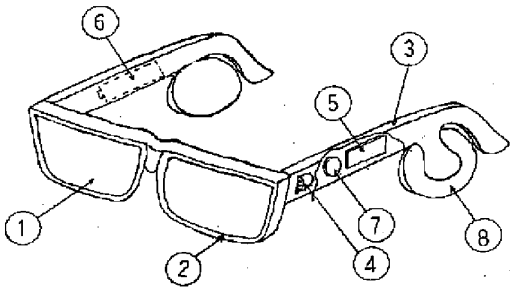
(21)出願番号　実願2000－8657(U2000－8657)

(22)出願日　平成12年10月30日(2000.10.30)

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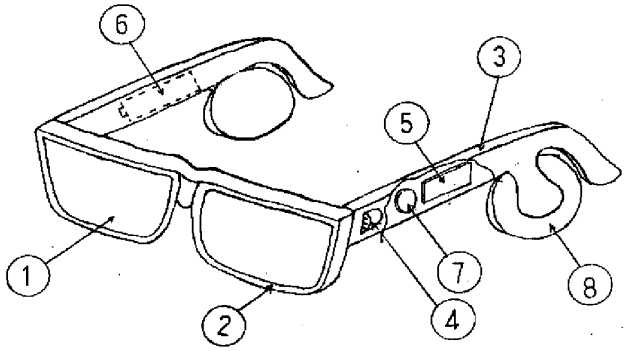
(54)【考案の名称】　補聴器

(57)【要約】　（修正有）
【課題】眼鏡のつるにオープンエア型ヘッドホーンを、且つ眼鏡のつる部にマイクロホーン、電子回路、電池及び接続リード線を取り付け及び内蔵させることにより一体感を持たせた装着感覚がよく音質のよい補聴器の構造。
【解決手段】眼鏡のつるにヘッドホーン８、マイクロホーン４、電子回路５、電池６及び接続リード線を取り付け及び内蔵させる構造。

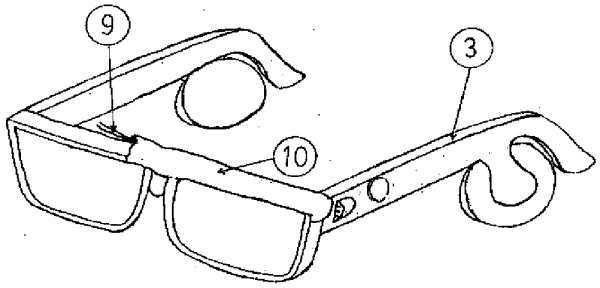


【実用新案登録請求の範囲】
【請求項１】眼鏡のつるにマイクロホンを取り付け、耳に当たるところにオープンエア型ヘッドホーンを取り付け、且つ眼鏡のつる部に電子回路を内蔵した補聴器の構造。
【請求項２】眼鏡のつる部に取り付け及び内蔵させたヘッドホーン、マイクロホーン、電子回路及び電池を接続するリード線を眼鏡のつる部及び眼鏡の上部に内蔵するようにした上記請求項１の補聴器。
【図面の簡単な説明】
【図　１】本考案の眼鏡付き補聴器の外観図である。
【図　２】本考案の眼鏡付き補聴器のリード線の取付け構造図である。
【図　３】従来の補聴器の構成図である。
【符号の説明】
１　眼鏡のレンズ
２　レンズ枠
３　つる
４　マイクロホーン
５　電子回路
６　電池
７　音量調節装置
８　ヘッドホーン部
９　リード線
１０　ゴム
１１　イヤホン

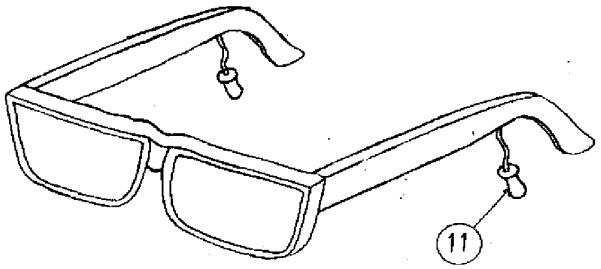
【図１】



【図２】



【図３】



【考案の詳細な説明】

【０００１】

【考案の属する技術分野】

本考案は眼鏡付きの補聴器の構成に関する技術である。

【０００２】

【従来の技術】

従来この種の眼鏡付き補聴器はイヤホーン式及び骨導式があるが、装着に手間どり装着感覚、音質も必ずしも充分でない。またイヤホーン式の場合　耳内のゴミ等が付くと音質が大きく変わることがある。

【０００３】

【考案が解決しようとする課題】

眼鏡のつるにオープンエア型ヘッドホーンを取り付けているので音質がよく装着感覚もよい。従ってマイクロホン、電子回路、電池及び接続リード線も眼鏡のつるに取り付け及び内蔵させて一体感をもたせることである。

【０００４】

【問題を解決するための手段】

眼鏡部の上部に溝を作り接続リード線を内蔵させる構造にし眼鏡一体化した補聴器としてまとめるようにした。

【０００５】

【作用】

この構成によって耳に対する違和感も少なく眼鏡のはめはずしが容易でヘッドホーン並みの音量、音質が得られる。

【０００６】

【考案の実施の形態】

上記考案の実施の形態を実施例について、図面を参照して説明する。図１は本考案の外観図で１は眼鏡のレンズで、２はレンズ枠、３はつるである。４はマイクロホーン、５は電子回路、６は電池、７は音量調節装置である。８はヘッドホーン部である。４～７の要素は、各々のつる内部に設けられている。図２はリード線９のつる部への内設の状態を示したもので上部レンズ枠部にゴム１０で固定

した実施例である。

図３は従来例のイヤホン式のメガネ付き補聴器で１１がイヤホンである。

【０００７】

【考案の効果】

本考案は補聴器の装着に対する違和感をなくし、かつ双耳効果による音質の向上をはかったものである。

Espacenet

CN2365848Y Glasses type earphone

Applicants: QIHONG CO LTD [CN]

Inventors: CHEN XIANDA [CN]

Classifications:
IPC ***H04R1/02;*** (IPC1-7): H04R1/02;

Priorities: CN99200278U 1999-01-08

Application: CN99200278U·1999-01-08

Publication: CN2365848Y·2000-02-23

Published as: CN2365848Y

Glasses type earphone

Abstract

The utility model relates to a glasses type earphone which has the structure that proper parts of a glasses body are respectively bonded with an earphone set by a proper bonding structure, wherein, earphones of the earphone set are respectively provided with cushions and keep a specifically relative structure relation with the glasses frame body. The glasses frame body can be worn in face like an ordinary pair of glasses, while the earphones are correspondingly arranged on ear parts of users so as to form the novel but practical glasses type earphone. The glasses frame is used for fixing the earphone, and the earphone can be hung when the pair of glasses are worn.

[19]中华人民共和国国家知识产权局

[51]Int.Cl[7]
H04R 1/02

[12]实用新型专利说明书

[21] ZL 专利号 99200278.8

[45]授权公告日 2000 年 2 月 23 日

[11]授权公告号 CN 2365848Y

[22]申请日 1999.1.8 [24]颁证日 1999.12.10

[73]专利权人 启弘股份有限公司
地址 中国台湾
[72]设计人 陈显达

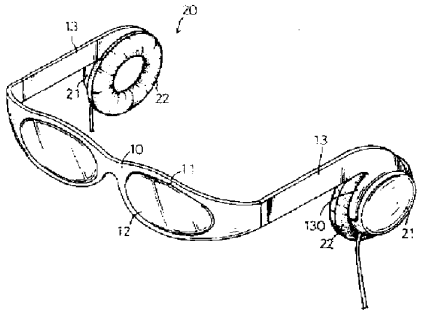
[21]申请号 99200278.8
[74]专利代理机构 中原信达知识产权代理有限责任公司
代理人 寿 宁

权利要求书 1 页 说明书 4 页 附图页数 8 页

[54]实用新型名称 眼镜式耳机

[57]摘要

一种眼镜式耳机，其主要是在一镜框本体的适当位置以适当结合结构分别上结 合设置有耳机组，该耳机组的耳机分别具有软垫，且与镜框本体具有特定的相 对结构关系，该镜框本体如一般眼镜结构般配戴于脸上，而耳机位置则对应设 置于耳部，以此构成一新潮而实用的眼镜式耳机。其利用眼镜镜框固定耳机，可在戴眼镜的同时可配掛耳机，而可兼顾实用性与商业性。



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权　利　要　求　书

1、一种眼镜式耳机，其特征在于其主要是在一镜框本体上结合设置有耳机组，该镜框本体如一般眼镜结构般配戴于脸上，而耳机位置则对应设置于耳部。

2、根据权利要求 1 所述的眼镜式耳机，其特征在于所述的镜框本体两端分别设置有两镜腿，该两镜腿上延伸形成设有半圆状枢设耳机组的耳机的连接部。

3、根据权利要求 1 所述的眼镜式耳机，其特征在于所述的镜框本体的两镜腿在端部处形成有一耳挂部，该耳挂部外侧端为半圆状的连接部。

4、根据权利要求 1 所述的眼镜式耳机，其特征在于所述的耳机组包括有两耳机，每一耳机是在一外壳内设有扬声器，并在内侧端设有软垫。

5、根据权利要求 1 或 3 所述的眼镜式耳机，其特征在于所述的耳机组其耳机的外壳上枢设有一固定架，该固定架的下端是呈 C 形状的连接部，并与耳机的外壳枢接，又固定架的上端延伸形成设有一固定部，该固定部与镜框本体的镜腿相结合。

6、根据权利要求 5 所述的眼镜式耳机，其特征在于所述的固定架的固定部是以螺合结构与镜腿相结合。

7、根据权利要求 1、2 或 3 所述的眼镜式耳机，其特征在于所述的镜框本体的两镜腿间共同枢设有一挂带。

8、根据权利要求 1、2 或 3 所述的眼镜式耳机，其特征在于所述的镜框本体为一般眼镜或太阳眼镜的镜框。

说　明　书

眼镜式耳机

本实用新型涉及一种声学领域发声器械中的耳机，特别是涉及一种利用眼镜的镜框固定耳机，而在配戴眼镜的同时亦可同时完成耳机配挂的特殊设计的眼镜式耳机。

早年在街头经常可见年轻人戴着耳机且不时摇头晃脑的景象，其为随身听盛行之时，然而此种景象在今天依然可见，所不同的是由ＣＤ取代了卡匣随身听，而不论是ＣＤ或是随身听，唯一不变的必备工具是装在耳朵上的耳机，就耳机的形式而言，近年来亦多有变化，从早年的耳罩式耳机到力求小巧的耳塞式耳机，其随着不同的消费倾向与社会型态而更替，以目前的产品发展趋势，随身听的耳机似乎又回到了传统的耳罩式设计，主要原因是应以舒适为着眼点。

事实上，ＣＤ随身听的消费对象为青少年及学生，此一群体的消费习惯除实用性外，更重视其商业性，所谓的商业性是指产品是否可引导流行或符合流行趋势，如未能满足此两种特性，即难以博得青少年或学生消费群体的青睐。但现有随身听耳机在整体设计上依然以实用性为重，其商业性稍嫌不足，故现有的耳机有必要作进一步改进。

有鉴于上述现有的耳机存在的缺陷，本设计人基于丰富的实务经验及专业知识，积极加以研究创新，经过不断的研究、设计，并经反复试作样品及改进后，终于创设出本实用新型。

本实用新型的主要目的在于，克服现有的耳机存在的缺陷，而提供一种新型结构的眼镜式耳机，使其利用眼镜镜框固定耳机，以便在戴眼镜的同时可配挂耳机，以兼顾实用性与商业性。

本实用新型的目的是由以下技术方案实现的。依据本实用新型提出的一种眼镜式耳机，其特征在于其主要是在一镜框本体上结合设置有耳机组，该镜框本体如一般眼镜结构般配戴于脸上，而耳机位置则对应设置于耳部。

本实用新型的目的还可以通过以下技术措施来进一步实现。

Apple Inc.　Exhibit 1015　Page 1453

前述的眼镜式耳机，其中所述的镜框本体两端分别设置有两镜腿，该两镜腿上延伸形成设有半圆状枢设耳机组的耳机的连接部。

前述的眼镜式耳机，其中所述的镜框本体的两镜腿在端部处形成有一耳挂部，该耳挂部外侧端为半圆状的连接部。

前述的眼镜式耳机，其中所述的耳机组包括有两耳机，每一耳机是在一外壳内设有扬声器，并在内侧端设有软垫。

前述的眼镜式耳机，其中所述的耳机组其耳机的外壳上枢设有一固定架，该固定架的下端是呈C形状的连接部，并与耳机的外壳枢接，又固定架的上端延伸形成设有一固定部，该固定部与镜框本体的镜腿相结合。

前述的眼镜式耳机，其中所述的固定架的固定部是以螺合结构与镜腿相结合。

前述的眼镜式耳机，其中所述的镜框本体的两镜腿间共同枢设有一挂带。

前述的眼镜式耳机，其中所述的镜框本体为一般眼镜或太阳眼镜的镜框。

本实用新型与现有技术相比具有明显的优点和积极效果。由以上技术方案可知，本实用新型主要是在一镜框本体的适当位置以适当结合结构手段分别设置有耳机，该耳机分别具有软垫，且与镜框本体具有特定的相对结构关系，使镜框本体如一般眼镜般配戴于脸上时，该耳机适可对应于耳部，以此构成一新潮而实用的眼镜式耳机，其利用眼镜镜框固定耳机，可在戴眼镜的同时可配挂耳机，而可兼顾实用性与商业性。其在技术发展空间有限的领域中，不论在结构上或功能上皆有较大改进，且在技术上有较大进步，并产生了好用及实用的效果，而确实具有增进的功效，从而更加适于实用，诚为一新颖、进步、实用的新设计。

本实用新型的具体结构由以下实施例及其附图详细给出。

图1是本实用新型较佳实施例的外观立体图。

图2是本实用新型较佳实施例的使用状态参考图。

图3是本实用新型又一较佳实施例的结构示意暨使用状态参考图。

图4是本实用新型再一较佳实施例的外观立体图。

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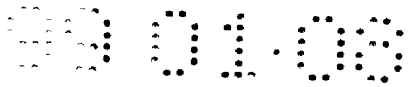


图 5 是本实用新型再一较佳实施例的使用状态参考图。

图 6 是本实用新型另一较佳实施例的外观立体图。

图 7 是本实用新型另一较佳实施例的分解立体图。

图 8 是本实用新型另一较佳实施例的使用状态参考图。

以下结合附图及较佳实施例，对依据本实用新型提出的眼镜式耳机其具体结构、特征及其功效，详细说明如后。

请参阅图 1 所示，本实用新型眼镜式耳机，其包括有一镜框本体 1 0 及附设于镜框本体 1 0 上的耳机组 2 0，其中：

该镜框本体 1 0，包括有两镜片槽 1 1、两分别设置于镜片槽 1 1 内的镜片 1 2 及分别设置于两端的镜腿 1 3；而前述镜框本体 1 0、镜片 1 2 及镜腿 1 3 可一体成型，在本实施例中，该镜片 1 2 是以独立元件结构形式镶嵌于镜框本体 1 0 的镜片槽 1 1 内，又两镜腿 1 3 亦以独立元件结构形式分别枢设于镜框本体 1 0 的两端。

在本实施例中，前述的两镜腿 1 3 在末端部分别延伸形成设有一半圆形状的连接部 1 3 0，该连接部 1 3 0 是供连结耳机组 2 0。

该耳机组 2 0，包括有两个耳罩式耳机 2 1，每一耳机 2 1 是在一壳体内设有扬声器（图中未示），并在内侧边设有一环状的软垫 2 2，其中耳机 2 1 的外壳部分是枢设于前述镜腿 1 3 的连接部 1 3 0 上。

前述镜框本体 1 0 的两镜腿 1 3 具有一适当间距，且外侧端的间距恒小于内侧端的间距，以此赋予两镜腿 1 3 一夹持力量。如图 2 所示，当使用时使用者将镜框本体 1 0 配戴于脸部，前端跨设于鼻梁上，至于耳机组 2 0 部分则利用两镜腿 1 3 的相对夹持力使两耳机 2 1 夹持于使用者的耳部。如此，不仅配戴了眼镜，亦同时完成了耳机组 2 0 的配挂。就实用性而言，使用者以单一结构可同时完成眼镜与随身听耳机的配挂，极为轻便实用，以商业价值而论，该兼具有眼镜及耳机功能的配戴组，显然极具商业吸引力，而可轻易博得特定消费族群的青睐。

又请参阅图 3 所示，是本实用新型又一较佳实施例，其基本构造与前一实施例大致相同，亦具备设有基本的镜框本体 1 0 及耳机组 2 0，不同之处在于镜框本体 1 0 的两镜腿 1 3 在端部处分别形成设有一耳挂部 1 3 1，并

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由耳挂部１３１的外侧端部延伸形成设有连接部１３０，其中耳挂部 131 是供跨设于使用者的耳上，使得镜框本体１０一如眼镜般的配戴方式，又连接部１３０仍是供枢设耳机组２０的耳机２１的外壳。

再请参阅图 4 所示，是本实用新型再一实施例，其是前述第一实施例的延伸设计，其基本构造与第一实施例完全相同，不同之处在于该镜框本体 10 的两镜腿１３间共同枢设有一挂带１４，该挂带１４是拱起呈半圆状，其不使用时是折向镜框本体１０且与其并排，使用时，则以逆时针方向折至约九十度位置，而如图 5 所示般跨设于使用者的头部处，除了可进一步固定镜框本体１０与耳机组２０外，亦具有发箍的作用。

另请参阅图 6 所示，是本实用新型另一较佳实施例，其包括有一镜框本体１０及附设于镜框本体１０上的耳机组２０，其中：

该镜框本体１０，包括有两镜片槽１１、两分别设置于镜片槽１１内的镜片１２及分别设置于两端的镜腿１３；在本实施例中，两镜腿１３的端部延伸设有一耳挂部１３１，供配挂于耳上。

又请配合参阅图 7 所示，该耳机组 20，包括有两耳机 21，在每一耳机 21 的外壳上分别枢设有一固定架２３，该固定架２３的下端是一呈Ｃ形状的连接部２３０，是供与耳机２１的外壳相枢接，又固定架２３上端延伸设有固定部２３１，固定部２３１是通过适当的结合结构手段与镜腿１３相结合，如螺合、胶合、嵌合、楔合等结构方式，在本实施例中，该固定部 231 是通过螺丝２３２螺合至镜腿１３的适当位置，以使耳机组２０结合至镜框本体１０上。

上述实施例的使用状态请参阅图 8 所示，该镜框本体１０是通过镜腿 13 上的耳挂部１３１如一般眼镜般的配挂于头上，而结合至镜腿１３上的耳机２１是对应覆设于耳上。

以上所述，仅是本实用新型的较佳实施例而已，并非对本实用新型作任何形式上的限制，凡是依据本实用新型的技术实质对以上实施例所作的任何简单修改、等同变化与修饰，均仍属于本实用新型技术方案的范围内。

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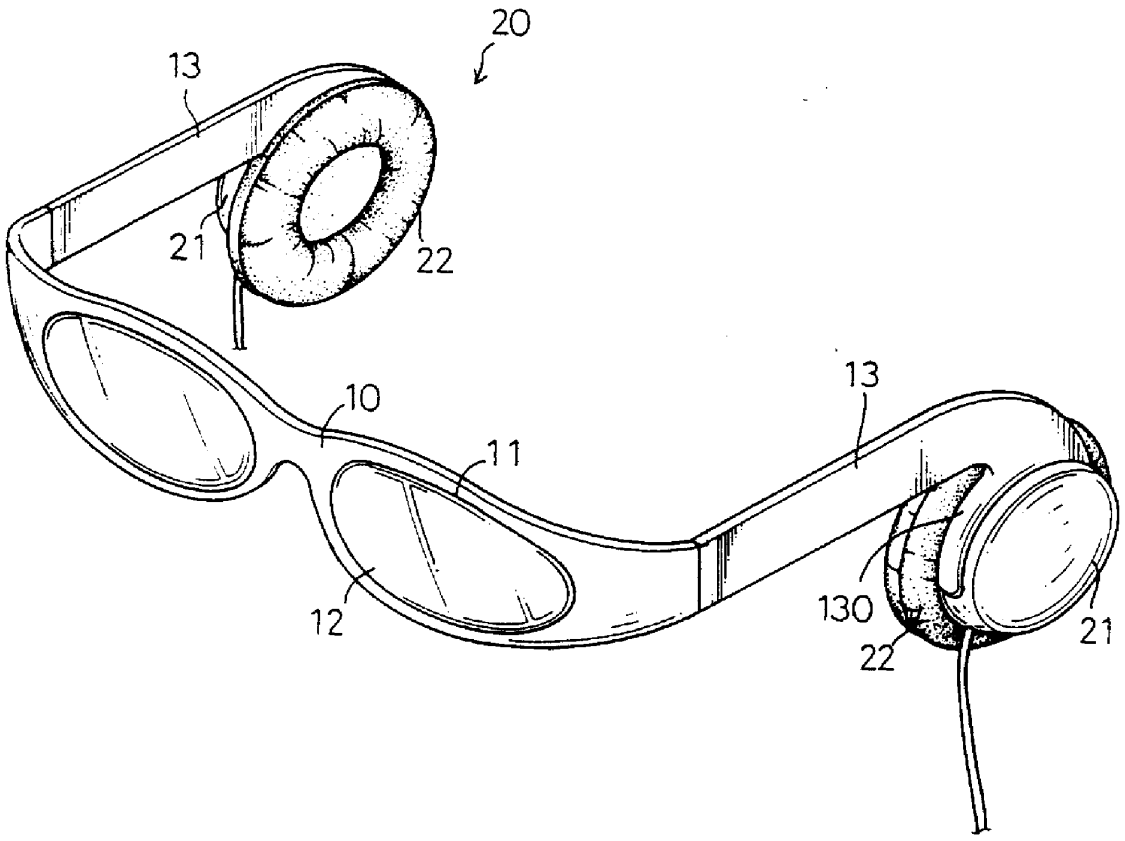


图 1

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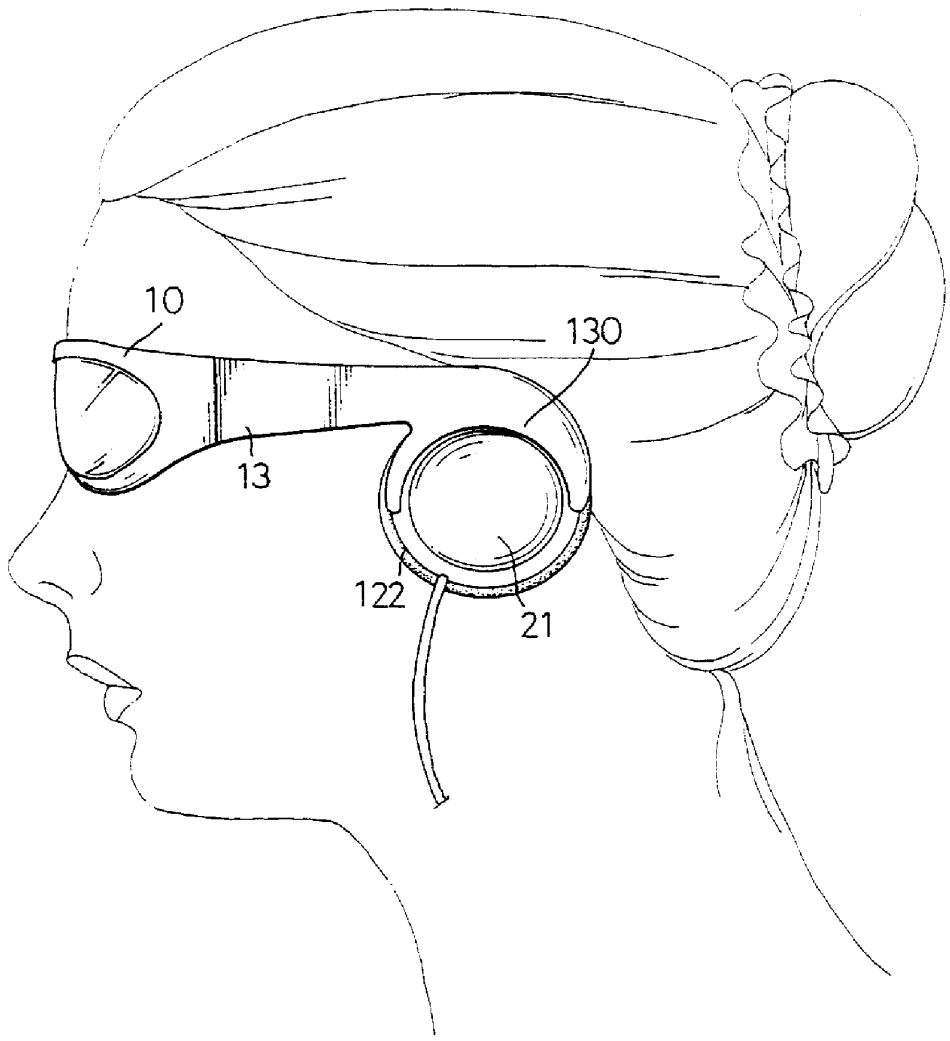


图 2

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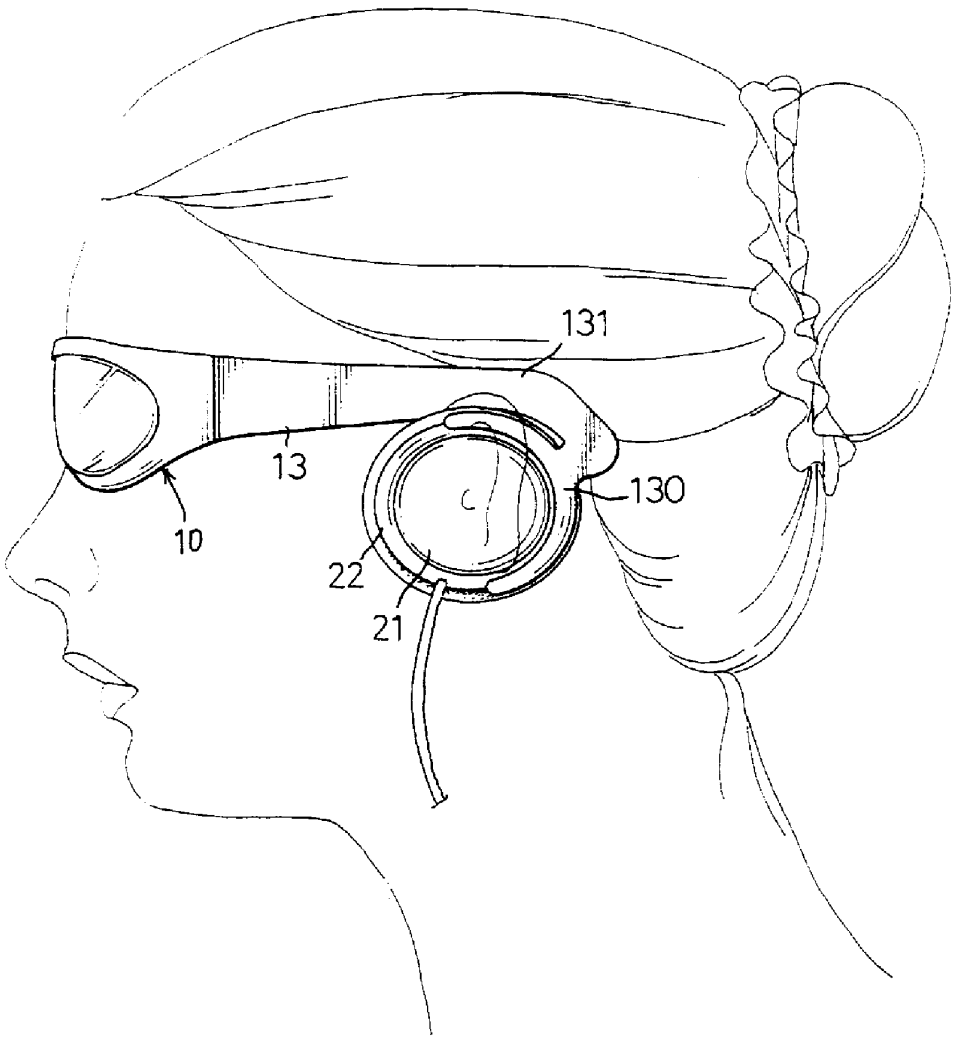


图 3

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99.01.08

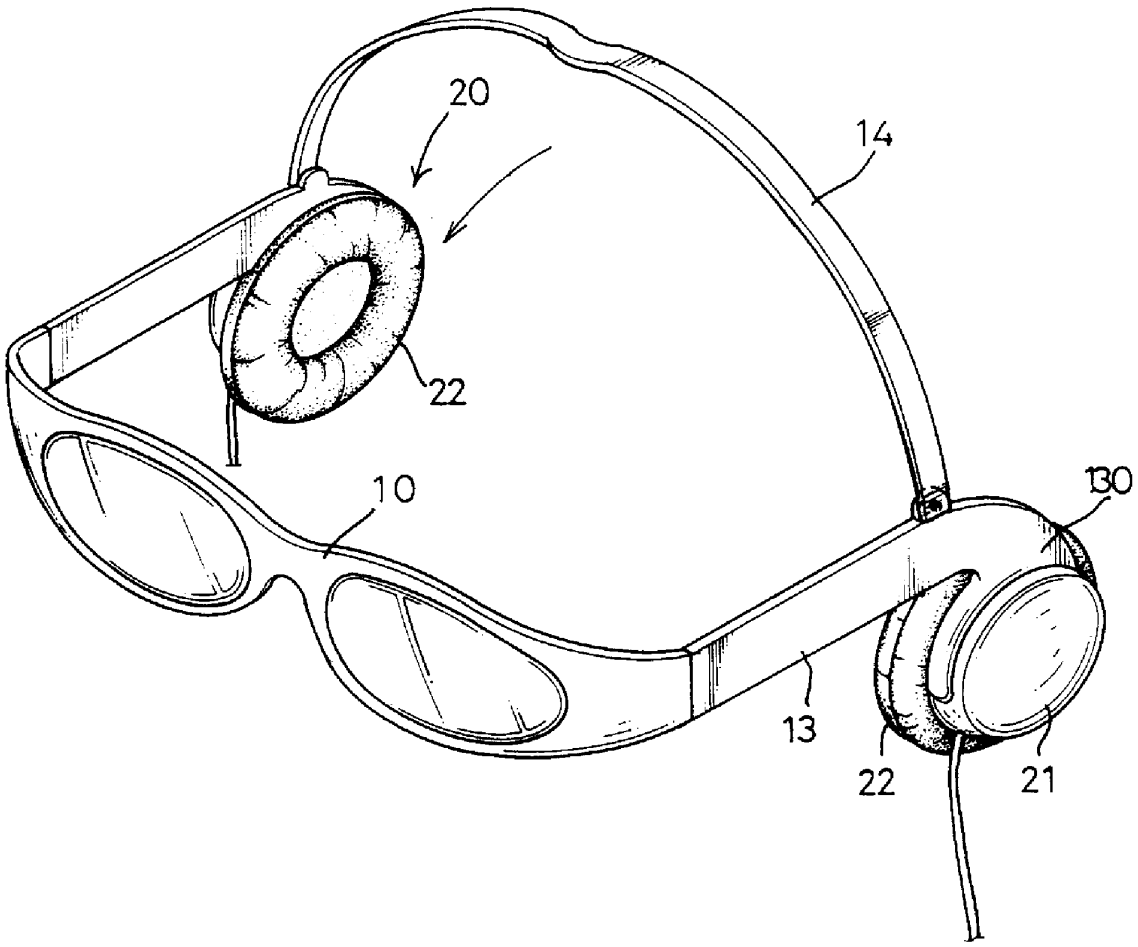


图 4

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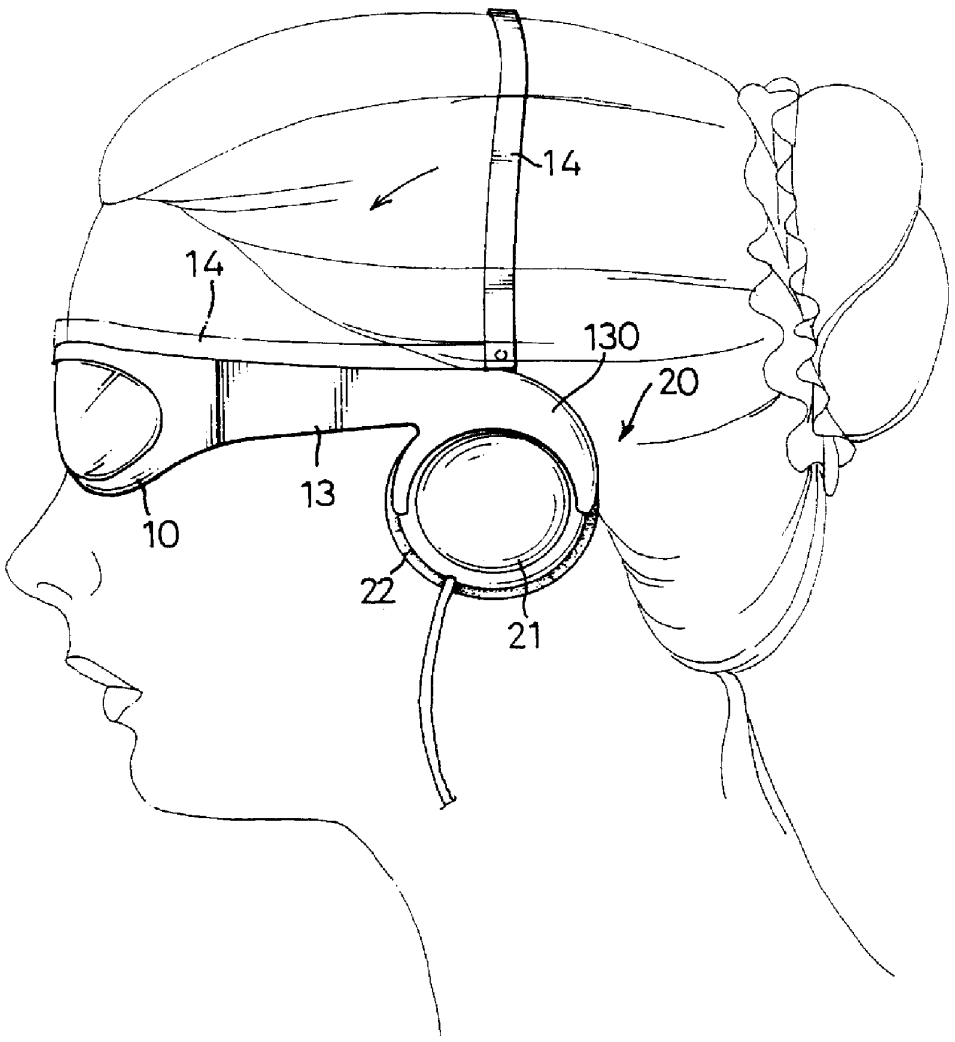


图 5

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01.08

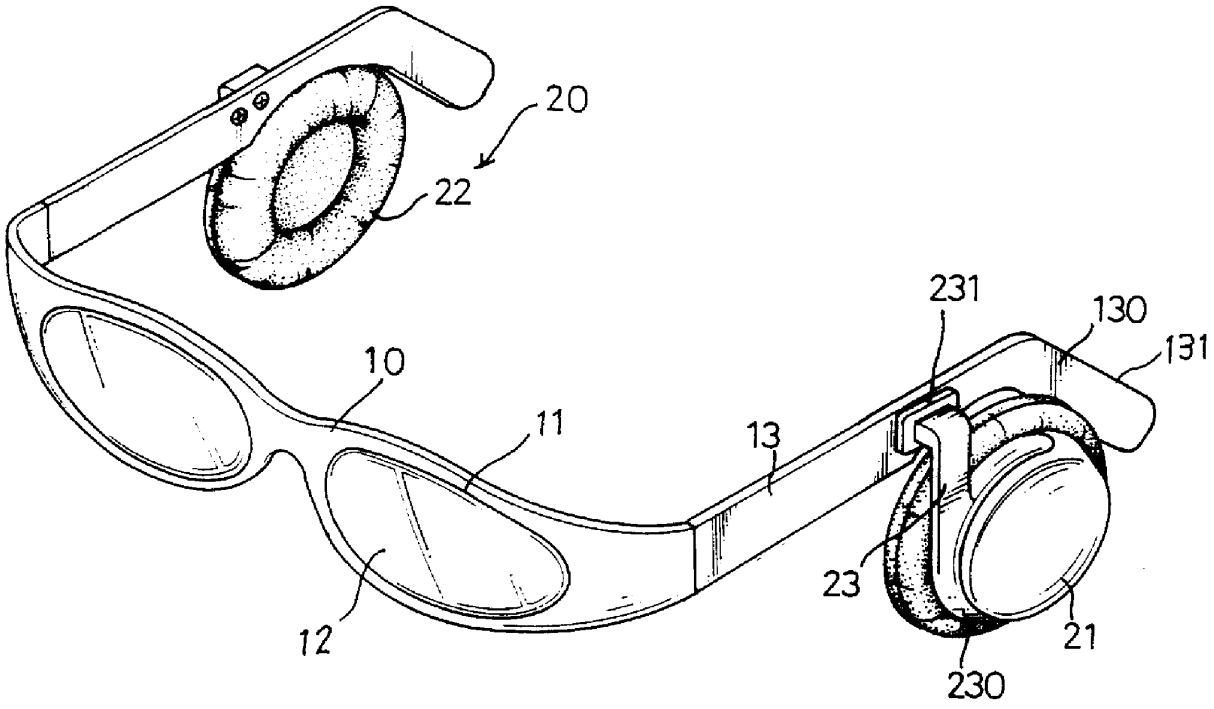


图 6

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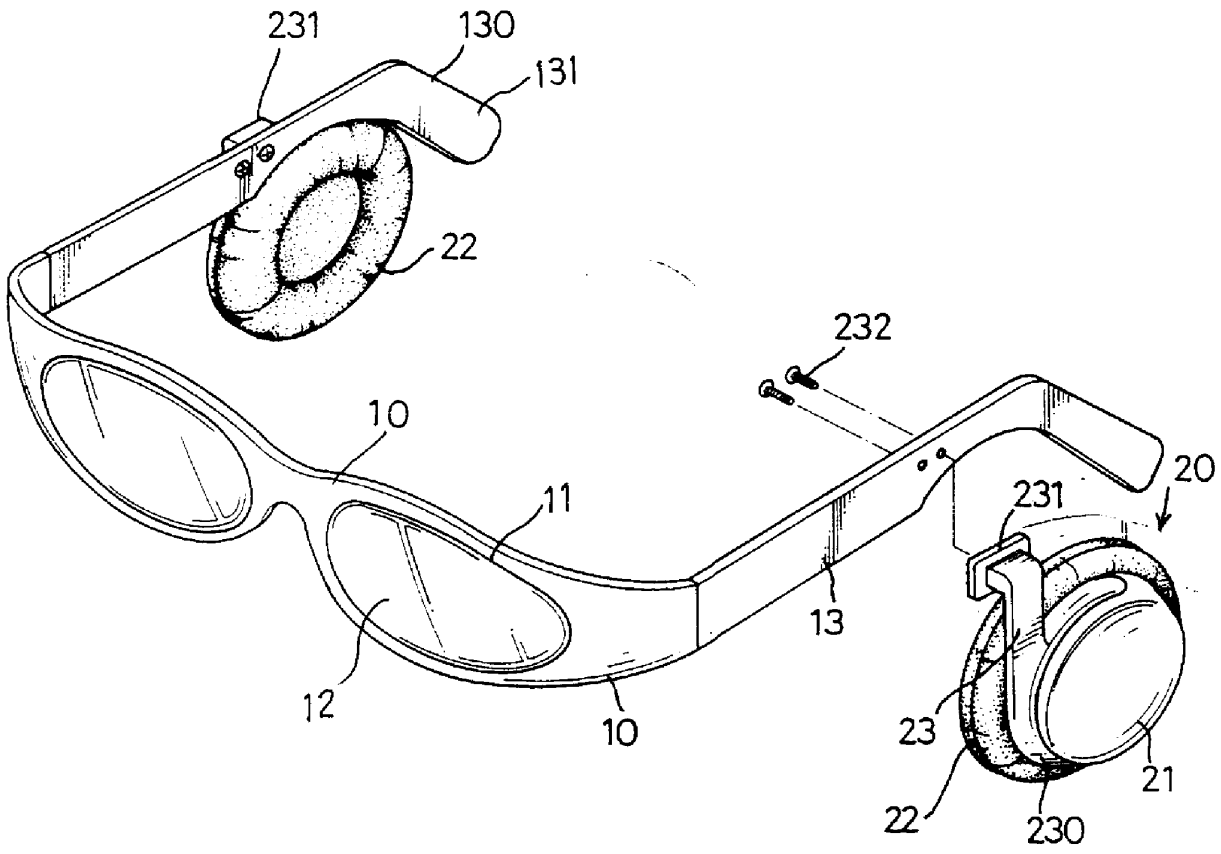


图 7

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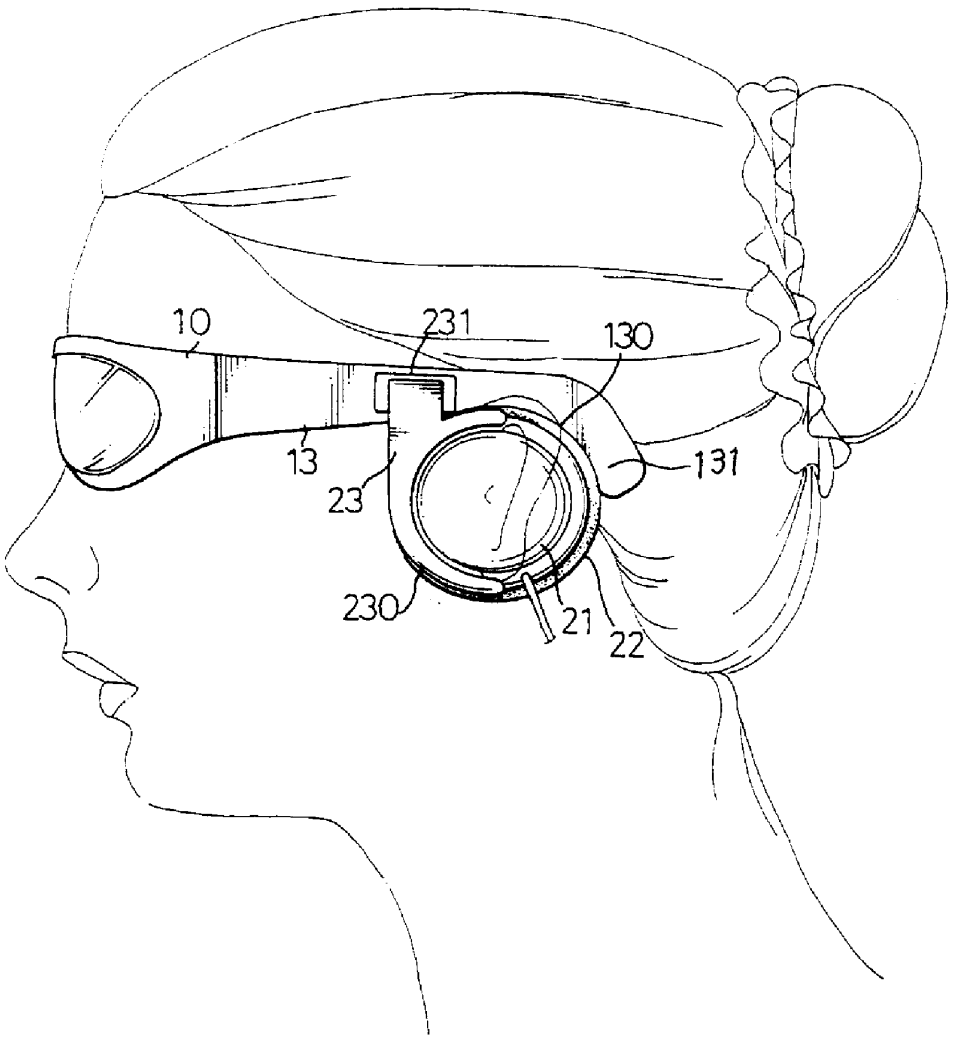


图 8

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(51) INT CL^7:
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DE 020009219 U	**DE 010124072 A**
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(58) Field of Search:
UK CL (Edition W) **G2J, H2H, H4J**
INT CL^7 **A45C, G02C, H02J, H04M**
Other: **ONLINE: EPODOC, JAPIO, WPI**

(54) Abstract Title: **Spectacles with integral hands free kit for mobile phone**

(57) A pair of spectacles incorporating and formed integrally with at least an earpiece 20, a microphone 22, a power source and a radio communication circuit.
In one embodiment, the spectacles function as a hands free kit for a remote unit such as a mobile phone or computer. A further embodiment incorporates a entire cellular phone into the frame of the glasses or sunglasses (see fig. 2). The lenses of the spectacles may be photochromic. Also disclosed is a carrying case or hard case (see fig. 3), which may serve as a means for recharging the battery of the spectacles or as the remote unit. The case may have means for displaying information or may be used as a navigation device.

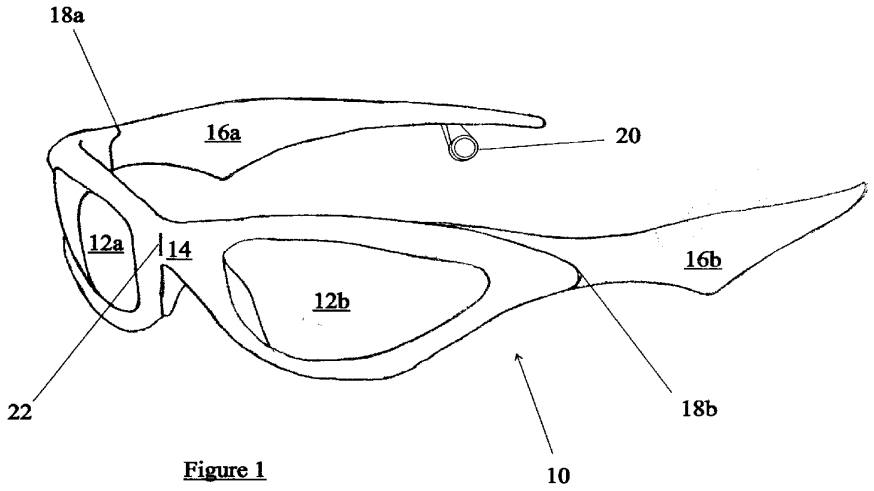


Figure 1

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

This print takes account of replacement documents submitted after the date of filing to enable the application to comply with the formal requirements of the Patents Rules 1995

Original Printed on Recycled Paper

GB 2 405 049 A

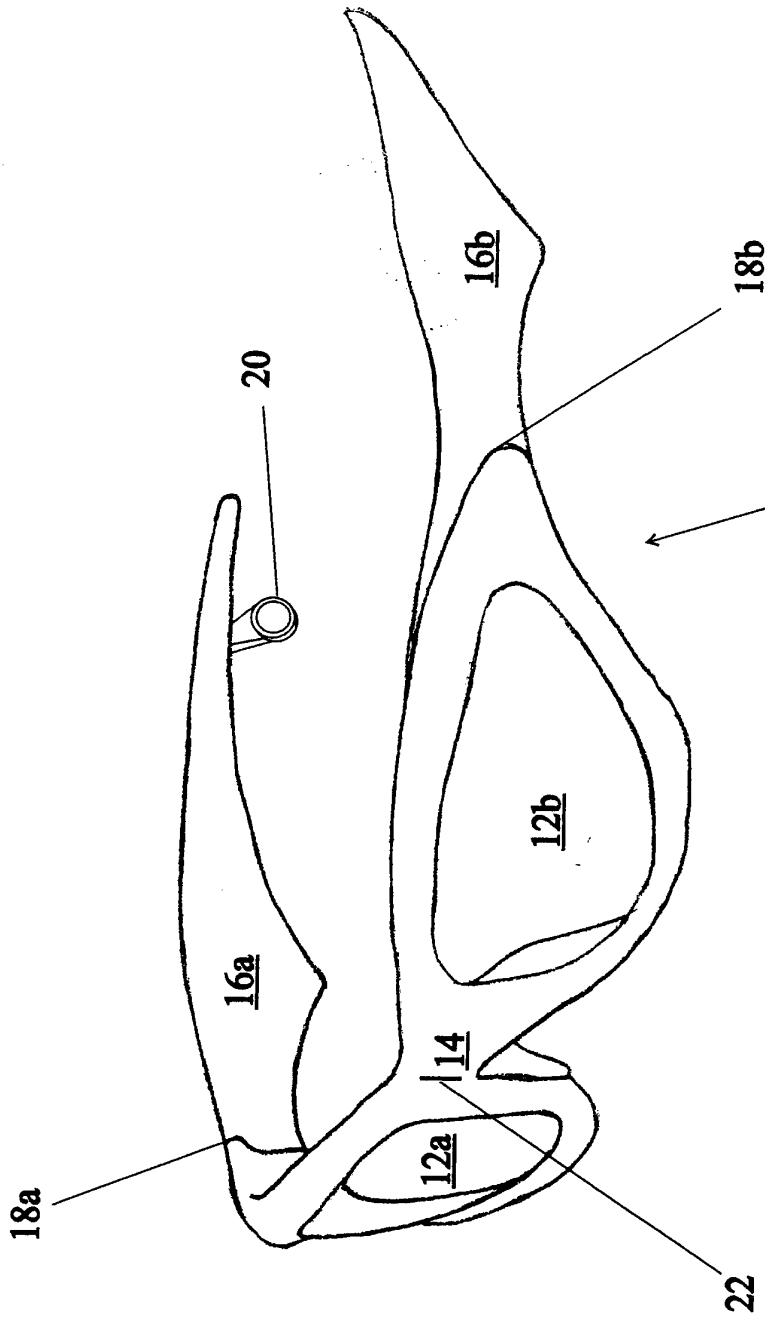


Figure 1

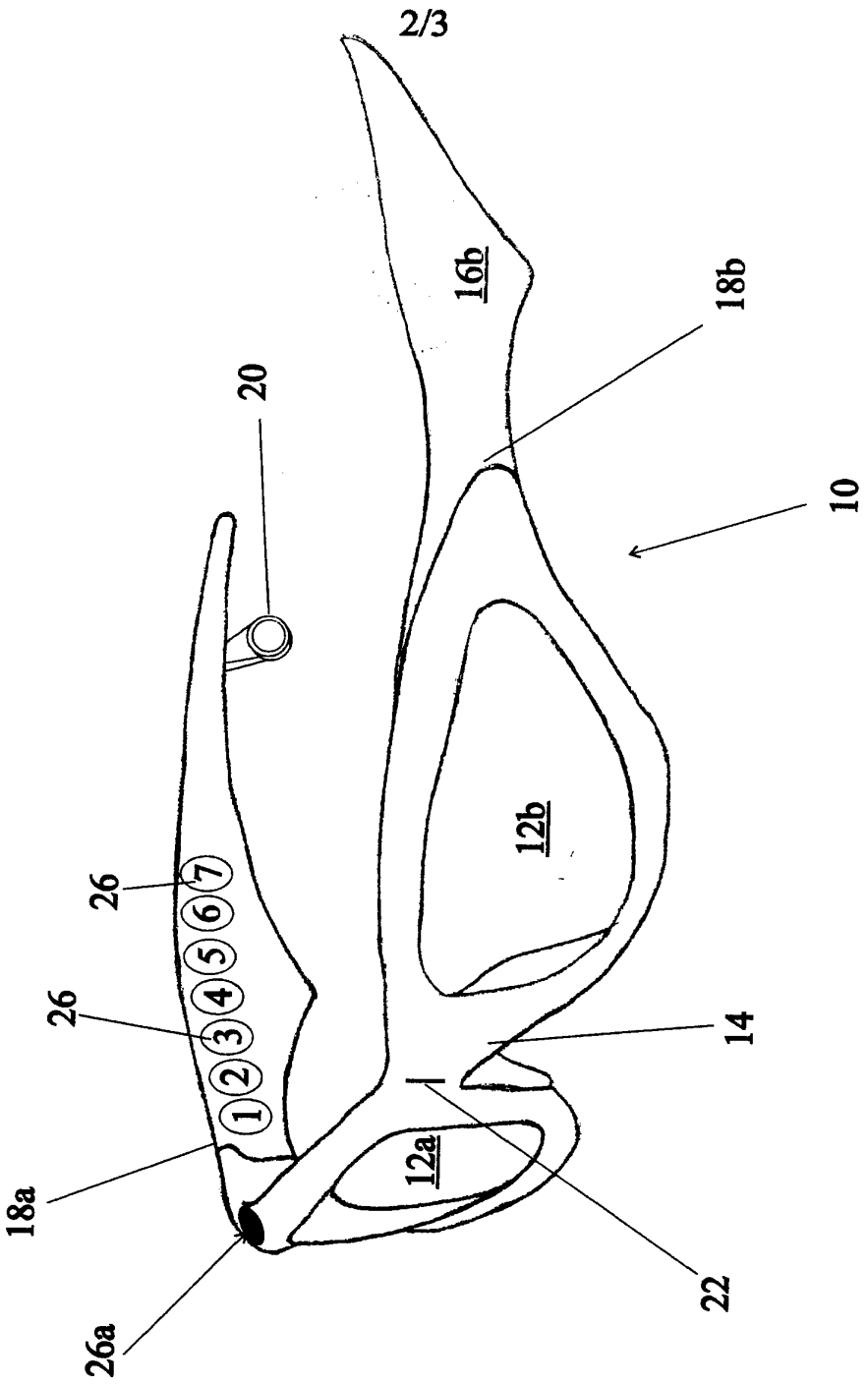


Figure 2

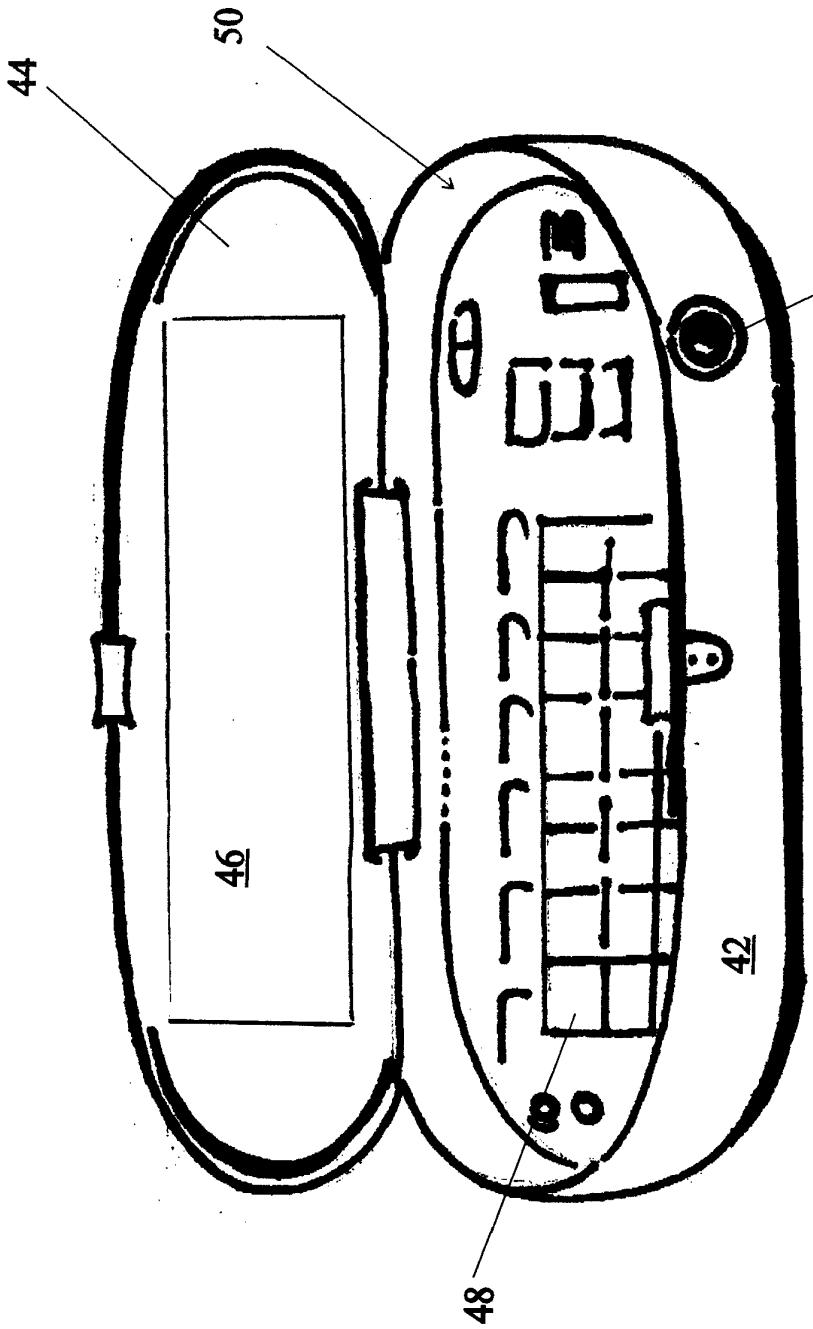


Figure 3

Hands Free Kit

This invention relates to a hands free kit for use with a mobile phone and to a telephone incorporating such a hands free kit. The term mobile phone is used herein to refer either to a cellular phone or to a wireless telephone extension that communicates with a base unit connected to a land line.

The popularity of cellular phones has led to several concerns regarding the safety of their use, these stem from concern regarding the possible danger of to exposure to electromagnetic radiation causing cancer with prolonged use of a cellular phone in close proximity to the ear.

Though the evidence regarding the health hazard caused by cellular telephones is inconclusive, there is a risk of road accidents if such phones are used while driving. A driver using one hand to hold a mobile phone to his head, compromises his ability to drive safely and legislation is being passed in many countries to make the use of hand held phones illegal while driving.

For these and other reasons, it has already been proposed to provide cellular phones with hands free kits. These consist of an earpiece which is often placed within the ear and a mouthpiece that hangs down on a wire to lie on the chest of the user. The wire may then connect into the phone unit. This has the advantage that no hands need be used to support the phone, leaving the driver unencumbered to control the vehicle. It also results in the phone being located away from the user's head. Since electromagnetic radiation intensity follows an inverse square law, remotely locating the phone will reduce the exposure of the user to electromagnetic radiation emitted by the phone.

This still leaves the problem that functions need to be controlled via the phone's keypad. However, voice recognition allows the answering and making of calls to be performed without viewing a screen or touching a keypad, which makes operation easier and safer when driving.

The advent of recent improved technology, namely Bluetooth®, has enabled a wireless connection between the phone and the hands free kit. The resulting hands free apparatus takes the form of an earpiece with workings which rest on the ear, having a boom which extends towards the mouth, for supporting a microphone.

While functionally adequate, such wireless hands free kits are somewhat bulky, and unattractive as well as being uncomfortable when used over long periods, due to their weight being supported entirely on one ear.

With a view to mitigating the foregoing problem, the present invention provides in its broadest aspect A pair of spectacles incorporating and formed integrally with at least an earpiece, a microphone, a power source and a radio communication circuit. The term spectacles is used herein to include sunglasses as well as prescription glasses.

Incorporating a microphone and earpiece in spectacles effectively creates a dual purpose fashion accessory that is both attractive and functional. Since spectacles, and in particular sunglasses are supported by the ears, it enables easy and comfortable positioning of a suitably placed speaker or earpiece.

It is preferred for the wireless link to be a radio link (i.e. a radio transmitter/receiver) mounted within the frame of the spectacles. Such a radio link should preferably have a weak transmitter (to reduce any radiation hazard) for communicating with a remote unit or handset located nearby

but it is conceivable that the spectacles may act as a self contained mobile or cellular telephone.

The remote unit with which the microphone and earpiece communicate need not necessarily be a mobile telephone, though that is believed to be the primary application for the present invention. It may alternatively be a PDA, a portable or desktop computer, all of which are currently available with Bluetooth® technology.

It is preferred for the lenses of the spectacles to be photo-chromic. Because photo-chromic lenses darken automatically when exposed to bright light, they enable the spectacles to be used under all lighting conditions.

Mobile phones often have screens for displaying relevant information. In an embodiment of the invention, an LCD display screen is incorporated into a lens of the spectacles.

The internal power source is preferably a rechargeable battery. A jack plug may be provided to enable the battery to be charged by a wired connection but, alternatively, power can be coupled into the spectacles to recharge the internal battery by means of an inductive loop.

The remote unit or handset with which the circuitry mounted in the spectacles communicates may suitably be designed as a case for the spectacles. Preferably, such a case may additionally include means for charging any internal battery of the spectacles.

It is possible to incorporate control buttons into the frame of the spectacles and these are preferably mounted on the inner side of the frame arms.

The present invention will now be described further by way of example with reference to the accompanying drawings in which:

Figure 1 is a perspective view of a pair of sunglasses embodying the a preferred embodiment of the invention,

Figure 2 is a similar perspective view of an alternative embodiment, and

Figure 3 shows a case for the spectacles of Figure 1.

The spectacles shown in Figure 1, in this example sunglasses 10, are outwardly conventional in appearance. They comprise two lenses, 12a and 12b intended to be positioned in front of the eyes of a user. The lenses are supported by a frame 14 shaped in the usual manner to support the weight of the sunglasses on the bridge of the nose. The frame, as is conventional, may be made of metal or a plastics material and its style may vary widely depending on the preference of the user, the spectacles illustrated being aimed at the sports market.

The frame 14 has two arms 16a and 16b folding about hinges 18a and 18b respectively. The hinges allow the sunglasses to be folded for easier storage when not in use. The arms 16a and 16b extend rearwards from the frame and rest above the ears of a user, to secure the lenses 12a and 12b in relation to the eyes.

A microphone 22 is incorporated into the bridge piece of the frame 14. Furthermore, an earpiece 20 intended for insertion into the ear of the user depends from either or both arms 16a and or 16/b depending on the user's preference.

In order to function as a hands free kit, sunglasses 10 require a signal and power. For this purpose, the frame 10 acts also to house a battery and a radio link (not visible in the drawing).

The radio link communicates with a mobile phone or a remote unit such as a PDA or a computer. This may be achieved via any of the several existing wireless protocols such as Bluetooth® or 802.11b.

Answering and making of calls with such arrangement can be achieved by means of voice activation which is commonly known in the art with reference to existing hands free kits.

A further embodiment of the present invention, shown in Figure 2, incorporates a entire cellular phone into the frame 14 of the sunglasses 10. Modern mobile phones have removed unsightly aerials and produced smaller technology which enables the microprocessor of the unit to be hidden within the frame, retaining the design of the sunglasses. Similarly to the simpler hands free sunglasses described by reference to Figure 1, known voice recognition technology may be employed in order to control the basic features of the phone.

Alternatively, in order to operate the phone, the embodiment of Figure 2 provides buttons 26, arranged on the inside of arms 16a and 16b. for further convenience, a primary function key 26a may be provided on the outside rim of the frames of the sunglasses. Such a button can be easily reached whilst the sunglasses are being used and may be programmed to provide the most important features of the phone simply by pressing one button.

Conventional mobile phones have an LCD display screen for indicating dialled numbers and other information such as battery and signal strength, such information may be displayed on a similar panel (not shown) located on the frame 14, or alternatively by using a lens 12a or 12b as an LCD display screen.

If a rechargeable battery is mounted in the frame of the spectacles, it can be recharged either by means of a wire connection. Conveniently the station used to recharge the battery may be designed as a carrying case for the spectacles. When using a case such as that shown in figure 3, an inductive loop 50 may be employed to charge the phone without the need for cumbersome connecting wires. The case 40 would merely derive its own power by a jack plug connection 52 with a mains power source.

The carrying case or hard case 40, as shown in figure 3, is conventional in design having a container section 42 and a lid 44. In addition to serving as a means for recharging the internal battery of the spectacles, it may act in the case of the embodiment of Figure 1 as the remote unit. Hence the carrying case may comprise a cellular phone. For such features and others described in more detail below, the case 40 would require its own power supply.

Where the sunglasses 10 incorporate a cellular phone, the hard case 40 is intended to act as more than simply a charger. Modern cellular phones have many functions such as settings for ringing tones and volumes, calendars, diaries, calculators, and web access via WAP and other protocols. With such control over functionality, simple voice control is not sufficient to enable access to all the features.

The hard case 40 may provide access to these functions by interacting with the sunglasses 10, either by wire or more preferably, wireless communication. The case doubles as the carrier of many of the functions of the phone and therefore is provided with means for data entry and retrieval. Such means may include a keyboard 48 and a display screen (or touch screen) 46, arranged conveniently around the inside of the container section 42 and lid 46.

The hard case 40 can provide features not normally associated with a cellular phone. These include a GPS antenna and receiver, which combined with a database and software, can allow the user to find his way whilst driving, or alternatively as a pedestrian trying to navigate on foot around an unfamiliar city. This can be achieved by looking directly at the display in the case, or by viewing and listening to whatever instructions are transmitted to the sunglasses 10.

Further features may of course be employed such as internet access via the case 40 as well as the features of any PDA computer, with the added benefit that any or all the information can be conveniently uploaded, or displayed via wireless communication with the sunglasses 10.

With such hardware already in place, the hard case is capable of providing many more features, such as acting as a games console, or with provision of an aerial, and a suitable tuner, a radio or television. Equally with sufficient memory, either internal or in the form of memory sticks, the hard case may be easily configured to function as a portable MP3 player, or any other format of music or video. Again, use of the spectacles conveniently enables these features to be employed silently through the ear piece, therein avoiding offending surrounding people, yet conveniently without the use of wires.

Similarly, the case may also be capable of playing footage taken from by camcorder or acting as a portable display screen to view still pictures taken from a digital camera.

With the potential for this number of features, the case is a probably target for theft. With this in mind it would also be prudent to include security features. These

could consist of the use of personal identification numbers, or potentially finger print or retinal scanners.

Claims

1. A pair of spectacles incorporating and formed integrally with at least an earpiece, a microphone, a power source and a radio communication circuit.

2. A pair of spectacles as claimed in claim 1, wherein the radio communication circuit serves to establish a wireless connection between the earpiece and microphone and a nearby remote unit.

3. A pair of spectacles as claimed in claim 1 or 2, wherein the radio communication circuit serves to enable the spectacles to perform as a self-contained mobile or cellular telephone.

4. A pair of spectacles as claimed in any preceding claim, wherein the lenses of the spectacles are photochromic.

5. A pair of spectacles as claimed in any preceding claim, wherein a the power source is a rechargeable battery.

6. A pair of spectacles as claimed in any preceding claim, wherein the power source is provided by means of a solar panel.

7. A pair of spectacles as claimed in any preceding claim, having controls buttons for operating the remote communication circuitry, arranged on the inside edge of the arms for supporting the spectacles.

8. A pair of spectacles as claimed in any preceding claim, having a button capable of performing multiple functions.

9. A pair of spectacles as claimed in any preceding claim wherein the earpiece depends from an arm of the spectacles.

10. A pair of spectacles as claimed in any claim, further comprising a display screen, connected to the remote communication circuitry.

11. A pair of spectacles as claimed in claim 10, wherein the display screen is incorporated into a lens of the spectacles in the form of an LCD.

12. A pair of spectacles as claimed in any preceding claim having a jack plug socket for receiving a charging jack for charging the batteries in the spectacles.

13. A case for receiving a pair of spectacles as claimed in any claim depending from claim 5, having means for recharging the spectacles.

14. A case as claimed in claim 13, wherein charging is effected by means of an inductive loop.

15. A case as claimed in claim 13 or 14, further having means for communicating with the spectacles in order to upload or download information.

16. A case as claimed in claim 15, wherein the means for communicating is a wireless link.

17. A case as claimed in claims 13 to 16, further having means for displaying and means for inputting information.

18. A case as claimed in claims 13 to 17, further having a GPS aerial and receiver for enabling the case to be used as a navigation device.

19. A pair of spectacles constructed, arranged and adapted to operate substantially as herein described with reference to and as illustrated in the accompanying drawings.

Amended claims have been filed as follows

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Claims

1. A case for receiving a pair of spectacles of the type having means for recharging the spectacles of the type formed integrally with at least an earpiece, a microphone, a rechargeable power source and a radio communication circuit

characterised by

the case having means for recharging the power source of the spectacles.

2. A case as claimed in claim 1, where the means for recharging is a jack plug for insertion into a socket provided on the spectacles.

3. A case as claimed in claim 1 or 2, wherein charging is effected by means of an inductive loop.

4. A case as claimed in any preceding claim, further having means for communicating with the spectacles in order to upload or download information.

5. A case as claimed in claim 4, wherein the means for communicating is a wireless link.

6. A case as claimed in any preceding claim, further having means for displaying and means for inputting information.

7. A case as claimed in any preceding claim, further having a GPS aerial and receiver for enabling the case to be used as a navigation device.

8. A case as claimed in any preceding claim, in combination with a pair of spectacle formed integrally with at least an earpiece, a microphone, a rechargeable power source and a radio communication circuit.

9. A combination as claimed in claim 8, wherein the radio communication circuit serves to establish a wireless connection between the earpiece and microphone and a nearby remote unit.

10. A combination as claimed in claim 8 or 9, wherein the radio communication circuit serves to enable the spectacles to perform as a self-contained mobile or cellular telephone.

11. A combination as claimed in any of claims 8 to 10, wherein the lenses of the spectacles are photochromic.

12. A combination as claimed in any of claims 8 to 11, wherein the rechargeable power source is further recharged by means of a solar panel.

13. A combination as claimed in any of claims 8 to 12, wherein the spectacles are provided with controls buttons for operating the remote communication circuitry, arranged on the inside edge of the arms for supporting the spectacles.

14. A combination as claimed in any of claims 8 to 13, wherein the spectacles are provided with a button capable of performing multiple functions.

15. A combination as claimed in any of claims 8 to 14, wherein the earpiece depends from an arm of the spectacles.

16. A combination as claimed in any of claims 8 to 15, wherein the spectacles further comprise a display screen, connected to the remote communication circuitry.

17. A combination as claimed in claim 16, wherein the display screen is incorporated into a lens of the spectacles in the form of an LCD.

18. A case for receiving a pair of spectacles constructed, arranged and adapted to operate substantially as herein described with reference to and as illustrated in figure 3 of the accompanying drawings.

19. In combination, a case and a pair of spectacles, constructed, arranged and adapted to operate substantially as herein described with reference to and as illustrated in the accompanying drawings.

Application No: GB 0319038.6
Claims searched: 1-12

Examiner: Dr Susan Dewar
Date of search: 29 October 2003

Patents Act 1977 : Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance	
X	1,2,9	US 20020197961 A1	[WARREN] Whole document
X	1,2,5,9,12	WO 00/70390 A1	[MARCOLIN] Whole document
X	1,2,8-10	US 6091546 A	[SPITZER] See in particular column 10 lines 5-21 and Fig.1
X	1,2,5,7,9	US 6010216 A	[JESIEK] Whole document
X	1,2	EP 0868064 A	[DEUTSCHE] See in particular Abstract and Fig. 2.
X	1,2,9	DE 10124072 A	[BREU] See in particular Abstract and Fig. 1.
X	1,2,9	DE 20108121 U	[KOLLER] See in particular Abstract and Fig. 1
X	1,2,9,10	DE 20009219 U	[WOODWARD] See in particular Abstract and Fig. 1
X	1,2,9	DE 29916279 U	[NOWAKOWSKI] See in particular Abstract and Fig. 1

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC[V]:

H4J

Worldwide search of patent documents classified in the following areas of the IPC[7]:

H04M, G02C

The following online and other databases have been used in the preparation of this search report:

EPODOC, JAPIO, WPI

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Application No:	GB 0319038.6	**Examiner:**	Peter Keefe
Claims searched:	1–19	**Date of search:**	6 January 2004

Patents Act 1977 : Further Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
		NONE

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC[W]:

H2H, G2J

Worldwide search of patent documents classified in the following areas of the IPC[7]:

H02J, A45C

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WPI, PAJ, EPODOC

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Espacenet

DE20009219U1 Vorrichtung zur Datenübertragung zwischen einer Person und einer Basis

Applicants: WOODWARD CORP LTD [GB]

Inventors:

Classifications:

IPC ***G06F1/16; G06F3/00; G06F3/01; H04L12/56;*** *H04M1/60; H04Q7/32;* (IPC1-7): G06F3/00; G08C17/00; H04M1/62; H04M1/725; H04Q7/32;

CPC **G06F1/163 (EP); G06F3/013 (EP); H04B1/385 (EP);** H04B2001/3866 (EP); H04M1/6041 (EP);

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Vorrichtung zur Datenübertragung zwischen einer Person und einer Basis

Abstract

No abstract found. Please consult other publications of this patent family in "Available in", if displayed above.

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DESCRIPTION DE20009219U1

[0001]

The invention relates to a device for data transmission between a person and a base.

[0002]

There are many different types of such devices; the simplest is probably the usual telephone, whether with or without a cord.

E.g. hands-free systems for mobile phones, display glasses for wirelessly playing television programs, etc.

[0003]

Any station that is suitable for data exchange can serve as a basis, e.g.

B. Base stations for telephones, as mentioned, be it personal computers or database servers, etc.

[0004]

Another example is so-called

Hands-free systems for mobile phones, such as those found in... B. as described in US-PS 4,893,344. The hands-free device has an ear hook, such as the one found on a headset. B. as is known from dictation machines, to which an earphone is attached. From this comes a rod that is bent at the front and carries a small microphone. The signals between the microphone and earphones and the mobile phone are transmitted via a cable, whereby this cable has a plug at the end, which can be connected to a power source, for example. B. can be attached to the shoulder with the help of a Velcro strap. From there, another cable leads to the mobile phone.

[0005]

° *

[0006]

Although this hands-free device works satisfactorily, it is inconvenient and uncomfortable to constantly wear the device on your ear, e.g.

B. while driving a car.

[0007]

Hands-free systems have proven particularly useful in automobiles, where the mobile phone is inserted into a special holder, which includes a special loudspeaker and a sensitive microphone, so that the driver can speak directly into the mobile phone without taking his hands off the steering wheel and at the same time hear the caller or the person on the other end.

The person being called can hear the amplified loudspeaker tone.

Since the holder is usually arranged stationary in the motor vehicle, it is not possible to use the hands-free device in other locations.

[0008]

The invention is based on the object of providing a device for data transmission between a person and a base which can be implemented relatively easily and is universally applicable.

[0009]

This object is achieved according to the invention by the features of claim 1.

[0010]

Thus, according to the invention, devices for data input and data output are attached directly to the person, wherein a wireless transmitter/receiver device is also provided which is attached to the person and enables the exchange of data to and from the base.

The devices can be combined in one structural unit so that ζ.

B. a microphone and a transmitter or a display and a transmitter/receiver form a compact unit.

[0011]

The facilities for data input and output include:

E.g. a microphone and a loudspeaker, active sensors, microcontrollers or a display, etc.

The sender/receiver

[0012]

The preferred device is a small transmitter/receiver operating in the megahertz range, e.g.

B. operates at the frequency 433 MHz.

[0013]

The elements used are preferably self-sufficient and each have their own power supply and, if necessary, their own transmitter and/or receiver.

However, a common power supply and a common transmitter/receiver is not excluded. As a result of the development of microelectronics, the elements discussed here have become so small that they can be used in devices such as... For example, they can easily be glued or even implanted onto a person's facial skin without causing any discomfort.

[0014]

For example,

For example, a small microphone with an integrated transmitter can be glued to the cheekbones or near the temple or even to a tooth. Likewise, an earphone with integrated transmitter/receiver can be attached directly to the ear, etc.

[0015]

The mentioned elements can advantageously be integrated into glasses or glued onto existing glasses.

The glasses can contain e.g. For example, a display can be integrated into the edge of the glasses optics, via which optical data can be imported, for example from the Internet. It is also possible to import GPS data to determine the person's position. This is particularly advantageous in some recreational sports where the person is often not in areas where direct telecommunications is possible. The glasses can also be connected to an image recording device through which the wearer can see and via which the recorded field of view is transmitted to the base.

[0016]

The device according to the invention is particularly suitable as a hands-free device for a mobile phone.

Preference is given to

[0017]

the individual elements of the device are integrated into glasses or otherwise attached to them, whereby the signal connection to the mobile phone can be a conventional cable connection, but is preferably formed by the aforementioned transmitter/receiver operating in the megahertz range.

An infrared connection or a radio transmission, e.g. B. according to the Bluetooth protocol standard is possible.

[0018]

In a hands-free device for a mobile phone, the microphone on the glasses is positioned in such a way that either structure-borne sound or airborne sound is received, i.e. it is located close to or directly on a skull bone, e.g.

B. on the nasal bone or in the area of the temple or is located on the lower edge of the glasses near the mouth. However, the microphone can e.g. For example, it can also start from the temple of a pair of glasses and be placed on the cheekbones.

[0019]

The device according to the invention can also have a data carrier, possibly with a microcontroller, whereby this unit can be used in a variety of ways.

In this way it is e.g. For example, it is possible to acoustically switch a mobile phone on and off or to acoustically control telephone numbers stored in the mobile phone.

[0020]

The data carrier can also be used for data transfer, e.g.

B. can be used to send and receive messages to or from the Internet, or a connection can be established with a computer via the transmitter/receiver, for example. For example, medical data of the person can be transferred as part of a long-term medical examination; access control is also possible or, if a sum of money is stored on the data carrier, such as the electronic money cards known today, payment transactions, etc.

[0021]

Further embodiments emerge from the subclaims.

[0022]

The invention is explained in more detail in an embodiment with reference to the drawing, wherein the single figure shows a hands-free device according to the invention integrated into glasses.

[0023]

Figure 1 shows a pair of glasses 1, e.g.

B. safety glasses, sunglasses, etc., which has a frame bracket 2, two ear hooks 3 connected to it and also a transparent viewing panel 4 connected to the frame bracket and a nose holder 5 which is attached to a lower cutout of the panel 4.

A mini microphone 6 is built into the nose piece 5.

The microphone is either located in a place where it receives structure-borne sound, e.g. B. rests on the nasal bone. An arrangement at the lower end of the nosepiece is also possible: this microphone 6' then receives the speech sound via the air. In principle, it is also possible to glue or implant the microphone onto the hand or tooth of the glasses wearer.

[0024]

In the end area of the ear hooks 3 are small speaker capsules

[0025]

7

intended.

In one ear hook is a transmitter/receiver

[0026]

8

with an antenna and an amplifier, not shown here, operating in the 433 MHz band. Microphone 6, loudspeaker capsules 7 and transmitter/receiver are each self-sufficient, i.e., they have their own power supply, with communication between these elements preferably taking place wirelessly via a transmitter/receiver. For central supply, a power supply can be integrated into the ear hook

[0027]

9

be provided, e.g. B. is a small button cell, and which supplies the transmitter/receiver with its antenna and the amplifier circuit with energy. Alternatively, if there is enough space, a solar battery could be used instead of a button cell.

[0028]

Today's solar batteries generate enough power to power such transmitters/receivers, even in normal room light.

[0029]

Of course, the mobile phone must have a corresponding transmitter/receiver with a control circuit to control the mobile phone.

[0030]

In the other ear hook 3 there is also a small microcontroller 10 with a data carrier, which can be used to control the entire communication with the mobile phone.

The microcontroller 10 is also preferably self-sufficient or connected to the central power supply 9.

The viewing window 4 can still contain, for example,

For example, a small display 11, possibly also with a small additional data carrier 12, can be arranged in a corner in order to display visual information.

[0031]

Furthermore, it is conceivable to arrange an optic 13 (shown here only for the left lens) with a photo receiver and a transmitter on the lenses, which detects the environment in the direction of view so that the detected image is transmitted to the base.

The optics 13 can e.g. B. be transparent for the wearer of glasses so that he or she can also see the image. Such an arrangement can e.g. This can be advantageous, for example, during repair work, operations or the like. Experts can then examine the transmitted image at the base. It is additionally possible to arrange this optic on the spectacle frame 2, as indicated by 13'.

[0032]

The arrangement of the components described is basically arbitrary, as long as their purpose is fulfilled; some could, for example, also be housed in the frame bracket.

The components could also simply be glued onto the temples, the frame or the lenses.

[0033]

If the individual components do not communicate with each other wirelessly, they can also be connected to each other with cables, whereby only the cable 14 leading to the microphone and a similar cable 15 leading to the data carrier 12 are shown here.

[0034]

As an alternative to wireless transmission, it is of course possible to use e.g.

For example, it is possible to provide a cable connection 16 (which is shown here on the top of the right ear hook in the figure) on the underside of an ear hook, so that the signal information between the device and the mobile phone or another base is carried in the conventional manner by a cable.

[0035]

To dial the base or telephone of the person you are calling, it is possible to use the base, e.g.

To acoustically control a mobile phone, for example, and then also to acoustically dial the phone of the person being called; such voice controls are well known.

[0036]

Furthermore, the data carrier of the microcontroller or that of the display can also contain personal data, so that the device described can be used, as already mentioned above, for contactless access control or for payment transactions; the necessary signal exchange for this takes place via the transmitter/receiver.

[0037]

Within the scope of the invention, it is also possible to use self-sufficient sensors 17, which are only indicated in the figure and which, in addition to the actual sensor, also have a power supply and a transmitter or a transmitter/receiver.

The sensors can e.g.

For example, they can collect personal data such as skin temperature, brain waves, skin resistance, etc. and report this data to a base.

This can be done via the transmitter/receiver of glasses 1 or directly. If the sensors also have a receiver, the sensors can receive signals from the base, e.g. B. new

[0038]

conditioned or adjusted.

The sensors can be glued to the skin or, in special cases, implanted.

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CLAIMS DE20009219U1

1.

Device for data transmission between a person and a base, characterized by the following features: - devices (6, 7, 8, 9, 10, 11, 12) for data input and output to be attached to the person;

- a transmitter/receiver device (8) to be attached to the person and enabling data exchange to and from the base.

2.

Device according to claim 1, characterized in that the transmitter/receiver device is a wireless transmitter/receiver (8).

3.

Device according to claim 1 or 2, characterized in that the devices (6, 7, 8, 9, 10, 11, 12) for data input and data output are each self-sufficient in their energy supply and are combined with a transmitter and/or receiver device to form a structural unit.

4.

Device according to one of the preceding claims, characterized in that the devices for data input and data output comprise a microphone (6) and a loudspeaker (7).

5.

Device according to one of the preceding claims, characterized in that the devices for data input and data output comprise a display (11, 12) and/or a sensor (17) and/or an image recording device (13).

6.

Device according to one of the preceding claims, characterized in that the device comprises a microcontroller (10).

7.

Device according to one of the preceding claims, characterized in that the transmitter/receiver device is a transmitter/receiver operating in the megahertz range.

8.

Device according to one of the preceding claims, characterized in that the individual devices of the device can be glued onto the person or implanted into the person.

9.

Device according to one of the preceding claims, characterized in that it is a device for hands-free calling via a mobile telephone, wherein the individual devices are arranged on a pair of glasses (1).

10.

Device according to claim 9, characterized in that at least one microphone, one earphone and one signal connection device are integrated into the glasses.

11.

Device according to claim 10, characterized in that the signal connection device has a battery-operated, wireless transmitter/receiver (8) arranged on the glasses.

12.

Device according to one of the preceding claims, characterized in that it has a battery (9), namely a button cell or a solar battery, for the central energy supply.

13.

Device according to one of the preceding claims, characterized in that when using a microphone (6), this is arranged so that it rests on or near a skull bone of the person, or is arranged near the mouth of the person (6').

14.

Device according to one of the preceding claims, characterized in that the device (1) comprises at least one data carrier (10, 12).

15.

Device according to claim 14, characterized in that at least one data carrier is connected to a microcontroller (10).

16.

Device according to claim 15, characterized in that the microcontroller (10) controls the function of the device.

17.

Device according to claim 16, characterized in that the device is part of a system for payment transactions, or for access control, part of the Internet, a computer system or a positioning system.

18.

Device according to one of claims 9 to 17, characterized in that the glasses have a display (11) for displaying optical information in an edge region of their viewing window (4).

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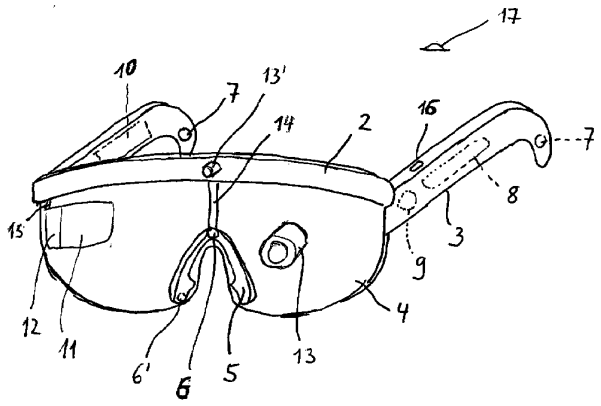
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(54) Vorrichtung zur Datenübertragung zwischen einer Person und einer Basis

(57) Vorrichtung zur Datenübertragung zwischen einer Person und einer Basis, gekennzeichnet durch folgende Merkmale:
– an der Person anzusetzende Einrichtungen (6, 7, 8, 9, 10, 11, 12) zur Dateneingabe und Datenausgabe;
– eine an der Person anzusetzende, den Datenaustausch zu und von der Basis ermöglichende Sende/Empfänger-Einrichtung (8).



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29.05.00

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Vorrichtung zur Datenübertragung zwischen einer Person und einer Basis

Die Erfindung bezieht sich auf eine Vorrichtung zur Datenübertragung zwischen einer Person und einer Basis.

Derartige Vorrichtungen sind vielfältig bekannt; die einfachste ist wohl das übliche Telefon, ob mit Schnur oder ohne Schnur, desweiteren z.B. Freisprechanlagen für Mobiltelefone, Display-Brillen zum drahtlosen Einspielen von Fernsehprogrammen etc.

Als Basis kann hierbei jede Station dienen, die zum Datenaustausch geeignet ist, seien es z.B. Basisstationen bei Telefonen, wie erwähnt, seien es Personalcomputer oder Datenbankserver etc.

Ein weiteres Beispiel sind sog. Freisprechanlagen für Mobiltelefone, wie sie z.B. in der US-PS 4,893,344 beschrieben sind. Die Freisprecheinrichtung weist hierbei einen Ohrbügel auf, wie er z.B. von Diktiergeräten bekannt ist, an dem ein Ohrhörer befestigt ist. Von diesem geht ein Stab aus, der im vorderen Bereich gebogen ist und ein Kleinmikrofon trägt. Über ein Kabel werden die Signale zwischen Mikrofon und Ohrhörer und Mobiltelefon übertragen, wobei dieses Kabel am Ende einen Stecker aufweist, der z.B. auf der Schulter mit Hilfe eines Klettbandes befestigt werden kann. Von dort führt ein weiteres Kabel dann zu dem Mobiltelefon.

DE 200 09 219 U1

Diese Freisprechvorrichtung funktioniert zwar zufriedenstellend; es ist jedoch unbequem und nicht komfortabel, ständig die Vorrichtung auf dem Ohr zu tragen, z.B. während man Auto fährt.

Gerade in Automobilen haben sich Freisprechanlagen bewährt, bei denen das Mobiltelefon in eine spezielle Haltevorrichtung eingesteckt wird, wobei eine spezielle Lautsprechervorrichtung und ein empfindliches Mikrofon vorgesehen sind, so dass der Fahrer, ohne die Hände vom Steuerrad zu nehmen, direkt in das Mobiltelefon sprechen kann und gleichzeitig den Anrufer bzw. Angerufenen durch den verstärkten Lautsprecherton versteht. Da die Haltevorrichtung in der Regel stationär im Kraftfahrzeug angeordnet ist, ist es nicht möglich, die Freisprechvorrichtung auch an anderen Orten zu verwenden.

Der Erfindung liegt die Aufgabe zugrunde, eine Vorrichtung zur Datenübertragung zwischen einer Person und einer Basis anzugeben, die relativ einfach realisiert werden kann und universell einsetzbar ist.

Diese Aufgabe ist gemäß der Erfindung durch die Merkmale des Anspruches 1 gelöst.

Somit werden gemäß der Erfindung Einrichtungen zur Dateneingabe und Datenausgabe direkt an der Person angesetzt, wobei dann ebenfalls eine an der Person anzusetzende, den Datenaustausch zu und von der Basis ermöglichende drahtlose Sende/Empfänger-Einrichtung vorgesehen ist. Die Einrichtungen können in einer Baueinheit zusammengefaßt sein, so dass z. B. ein Mikrofon und ein Sender oder ein Display und ein Sender/Empfänger eine kompakte Einheit bilden.

Die Einrichtungen zur Dateneingabe und Datenausgabe umfassen z. B. ein Mikrofon und einen Lautsprecher, aktive Sensoren, Mikrocontroller oder ein Display etc. Die Sende/Empfänger-

Apple Inc. Exhibit 1015 Page 1495

Einrichtung ist vorzugsweise ein kleiner Sender/Empfänger, der im Megahertz-Bereich z.B. bei der Frequenz 433 MHz arbeitet.

Die verwendeten Elemente sind vorzugsweise autark und weisen jeweils eine eigene Energieversorgung und ggf. einen eigenen Sender und/oder Empfänger auf. Eine gemeinsame Energieversorgung und ein gemeinsamer Sender/Empfänger ist jedoch nicht ausgeschlossen. Im Rahmen der Entwicklung der Mikroelektronik sind die hier angesprochenen Elemente so klein bauend geworden, dass sie z.B. ohne weiteres einfach auf die Gesichtshaut einer Person aufgeklebt oder gar implantiert werden können, ohne dass dieses störend wäre.

So kann z.B. ein kleines Mikrofon mit integriertem Sender auf die Wangenknochen oder in der Nähe der Schläfe oder sogar auf einen Zahn aufgeklebt werden. Ebenso kann ein Ohrhörer mit integriertem Sender/Empfänger direkt am Ohr befestigt werden etc.

Die erwähnten Elemente können vorteilhaft in eine Brille integriert sein bzw. auf eine vorhandene Brille aufgeklebt werden. In die Brille kann z. B. an dem Rand der Brillenoptik ein Display integriert sein, über das optische Daten etwa aus dem Internet eingespielt werden können. Auch eine Einspielung von GPS-Daten zum Bestimmen der Position der Person ist möglich. Dieses ist insbesondere vorteilhaft bei einigen Freizeitsportarten, bei denen sich die Person häufig nicht in Gebieten aufhält, in denen eine direkte Telekommunikation möglich ist. Ebenso kann mit der Brille eine Bildaufnahmeeinrichtung verbunden sein, durch die der Brillenträger hindurch sehen kann und über die das aufgenommene Blickfeld an die Basis übermittelt wird.

Besonders eignet sich die Vorrichtung gemäß der Erfindung als Freisprechvorrichtung für ein Mobiltelefon. Bevorzugt werden

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die einzelnen Elemente der Vorrichtung in eine Brille integriert oder anderweitig mit dieser befestigt, wobei die Signalverbindung zu dem Mobiltelefon zwar eine herkömmliche Kabelverbindung sein kann, jedoch vorzugsweise durch den erwähnten im Megahertzbereich arbeitenden Sender/Empfänger gebildet wird. Auch eine Infrarotverbindung oder eine Funkübertragung, z.B. nach dem Blue-Tooth-Protokoll-Standard ist möglich.

Bei einer Freisprechvorrichtung für ein Mobiltelefon ist das Mikrofon an der Brille so angeordnet, dass entweder Körperschall oder Luftschall empfangen wird, befindet sich also in der Nähe oder liegt direkt an einem Schädelknochen an, z.B. am Nasenbein oder im Bereich der Schläfe bzw. liegt am unteren Rand der Brille in der Nähe des Mundes. Das Mikrofon kann jedoch z.B. auch von einem Brillenbügel ausgehen und an den Wangenknochen angelegt werden.

Die Vorrichtung gemäß der Erfindung kann auch einen Datenträger ggf. mit einem Mikrocontroller aufweisen, wobei diese Einheit vielfältig genutzt werden kann. Auf diese Weise ist es z.B. möglich, ein Mobiltelefon akustisch ein- und auszuschalten oder in dem Mobiltelefon gespeicherte Telefonnummern akustisch anzusteuern.

Der Datenträger kann auch für eine Datenübertragung z.B. in das bzw. aus dem Internet verwendet werden, oder es kann über den Sender/Empfänger eine Verbindung mit einem Computer hergestellt werden, sodass z.B. medizinische Daten der Person etwa im Rahmen einer medizinischen Langzeituntersuchung übertragen werden; ebenso ist eine Zugangskontrolle möglich oder, sofern auf dem Datenträger entsprechend den heute bekannten elektronischen Geldkarten ein Geldbetrag abgespeichert ist, ein Zahlungsverkehr, etc.

Weitere Ausgestaltungen gehen aus den Unteransprüchen hervor.

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Die Erfindung ist in einem Ausführungsbeispiel anhand der Zeichnung näher erläutert, wobei in der einzigen Figur eine in eine Brille integrierte Freisprechvorrichtung gemäß der Erfindung dargestellt ist.

In der Figur 1 ist eine Brille 1, z.B. eine Schutzbrille, eine Sonnenbrille, etc., dargestellt, die einen Rahmenbügel 2, zwei mit diesem verbundene Ohrbügel 3 und ebenfalls eine mit dem Rahmenbügel verbundene durchsichtige Sichtscheibe 4 sowie einen Nasenhalter 5 aufweist, der an einem unteren Ausschnitt der Scheibe 4 mit dieser befestigt ist. In den Nasenhalter 5 ist ein Mini-Mikrofon 6 eingebaut. Das Mikrofon liegt entweder an einer Stelle, wo es Körperschall empfängt, z. B. liegt auf dem Nasenbein auf. Eine Anordnung am unteren Ende des Nasenhalters ist ebenso möglich: dieses Mikrofon 6´ empfängt dann über die Luft den Sprachschall. Es ist im Prinzip auch möglich, das Mikrofon auf die Hand oder etwa einen Zahn des Brillenträgers aufzukleben bzw. zu implantieren.

Im Endbereich der Ohrbügel 3 sind kleine Lautsprecherkapseln 7 vorgesehen. In dem einen Ohrbügel ist ein Sender/Empfänger 8 mit einer Antenne und einem Verstärker, die hier nicht dargestellt sind, eingebaut, der im 433 MHz-Band arbeitet. Mikrofon 6, Lautsprecherkapseln 7 und Sender/Empfänger sind jeweils autark, d.h., weisen ihre eigene Energieversorung auf, wobei die Kommunikation zwischen diesen Elementen vorzugsweise drahtlos über einen Sender/Empfänger erfolgt. Für eine zentrale Versorgung kann in dem Ohrbügel eine Stromversorgung 9 vorgesehen sein, die z.B. eine kleine Knopfzelle ist, und die den Sender/Empfänger mit seiner Antenne und der Verstärkerschaltung entsprechend mit Energie versorgt. Alternativ, sofern genügend Platz vorhanden ist, könnte anstelle einer Knopfzelle auch eine Solarbatterie verwendet werden.

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Die heutigen Solarbatterien erzeugen selbst bei normalem Zimmerlicht ausreichend Strom, um derartige Sender/Empfänger zu versorgen.

Auf Seiten des Mobiltelefones muss natürlich ein entsprechender Sender/Empfänger mit einer Steuerschaltung zum Ansteuern des Mobiltelefones vorhanden sein.

In dem anderen Ohrbügel 3 ist noch ein kleiner Mikrocontroller 10 mit einem Datenträger eingebaut, der bei der Steuerung der gesamten Kommunikation mit dem Mobiltelefon eingesetzt werden kann. Auch der Mikrocontroller 10 ist bevorzugt autark oder an die zentrale Stromversorgung 9 angeschlossen. In der Sichtscheibe 4 kann noch, z.B. in einer Ecke, ein kleines Display 11, gegebenenfalls ebenfalls mit einem kleinen zusätzlichen Datenträger 12 angeordnet werden, um hier visuelle Informationen einzuspielen.

Des weiteren ist denkbar, auf den Brillengläsern eine Optik 13 (hier nur für das linke Brillenglas gezeigt) mit einem Fotoempfänger sowie einem Sender anzuordnen, die die Umgebung in Blickrichtung erfasst, so dass das erfasste Bild an die Basis übertragen wird. Die Optik 13 kann z. B. für den Brillenträger durchsichtig sein, so dass dieser ebenfalls das Bild sieht. Eine solche Anordnung kann z. B. bei Reparaturarbeiten, Operationen oder dergleichen vorteilhaft sein. An der Basis können dann Fachleute das übertragene Bild begutachten. Es ist zusätzlich möglich, diese Optik an dem Brillenrahmen 2 anzuordnen, wie durch 13´ angedeutet.

Die Anordnung der geschilderten Komponenten ist im Grunde beliebig, sofern ihr Zweck erfüllt wird; einige könnten zum Beispiel auch im Rahmenbügel untergebracht werden. Die Komponenten könnten auch einfach etwa auf die Brillenbügel, den Brillenrahmen oder die Brillengläser aufgeklebt sein.

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Sofern die einzelnen Komponenten nicht drahtlos miteinander kommunizieren, können sie auch untereinander mit Leitungen verbunden sein, wobei hier nur die zu dem Mikrofon führende Leitung 14 und eine ebensolche zu dem Datenträger 12 führende Leitung 15 dargestellt sind.

Alternativ zu der drahtlosen Übertragung ist es natürlich möglich, an z.B. der Unterseite eines Ohrbügels einen Kabelanschluss 16 (der hier auf der Oberseite des in der Figur rechten Ohrbügels gezeigt ist) vorzusehen, sodass die Signalinformation zwischen der Vorrichtung und dem Mobiltelefon bzw. einer anderen Basis in herkömmlicher Weise durch ein Kabel erfolgt.

Zum Anwählen der Basis oder des Telefons eines Anzurufenden ist es möglich, die Basis, z.B. das Mobiltelefon, akustisch anzusteuern und dann auch etwa das Telefon des Anzurufenden akustisch anzuwählen; solche Stimmsteuerungen sind bekannt.

Im übrigen kann der Datenträger des Mikrocontrollers oder derjenige des Displays auch noch personenbezogene Daten führen, so dass die beschriebene Vorrichtung, wie oben bereits erwähnt, zur berührungslosen Zugangskontrolle oder für den Zahlungsverkehr benutzt werden kann; der notwendige Signalaustausch hierzu erfolgt wiederum über den Sender/Empfänger.

Im Rahmen der Erfindung ist es im übrigen auch möglich, in der Figur nur angedeutete autarke Sensoren 17 zu verwenden, die neben dem eigentlichen Sensor auch eine Energieversorgung und einen Sender bzw. einen Sender/Empfänger aufweisen. Die Sensoren können z. B. personenbezogene Daten erfassen, etwa die Hauttemperatur, Hirnströme, den Hautwiderstand etc. und diese Daten an eine Basis melden. Dies kann über den Sender/Empfänger der Brille 1 oder aber direkt erfolgen. Im Falle, dass die Sensoren auch einen Empfänger aufweisen, können die Sensoren etwa von der Basis Signale erhalten, z. B. neu

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