

(12) **UK Patent Application** (19) **GB** (11) **2 417 166** (13) **A**

(43) Date of A Publication **15.02.2006**

(21) Application No: **0417998.2**
(22) Date of Filing: **12.08.2004**

(71) Applicant(s):
Simon Richard Daniel
Abbotswood, Rowhills, FARNHAM,
Surrey, GU9 9AU, United Kingdom

Christopher Verity Wright
Friggsmill, 116 Bath Road, STROUD,
GL5 3NX, United Kingdom

(72) Inventor(s):
Simon Richard Daniel
Christopher Verity Wright

(74) Agent and/or Address for Service:
Simon Richard Daniel
52 Oakington Road, Maidavale, LONDON,
W9 2DH, United Kingdom

(51) INT CL:
H04R 1/10 (2006.01) **B65H 75/34** (2006.01)
B65H 75/44 (2006.01)

(52) UK CL (Edition X):
H4L LEUD
B8M MB1 MB3 M18

(56) Documents Cited:
GB 2400773 A **GB 2365692 A**
WO 2003/103335 A1 **US 6370401 B1**

(58) Field of Search:
UK CL (Edition W) **B8M**
INT CL⁷ **B65H, H04M, H04R**
Other:

(54) Abstract Title: **A headset assembly**

(57) A portable audio headset assembly comprises a central module 2 having a pair of sockets 8 to receive a pair of demountable earpieces 3, controls 4,5 and associated control circuitry, a clip for making the central module wearable, a microphone, a rechargeable battery and a connection allowing audio data to be received from, and transmitted to, a nearby audio device. The demountable earpieces may be operatively connected to the central module by retractable wires or by wireless transmissions. The headset assembly may be worn as a necklace or attached to the user's belt, a wristband or eyeglasses. The headset assembly may be configured so as to be generally face-shaped in appearance with the sockets and/or demountable earpieces being decorated 7,10 so as to appear to be eyes and the controls having the form of a mouth.

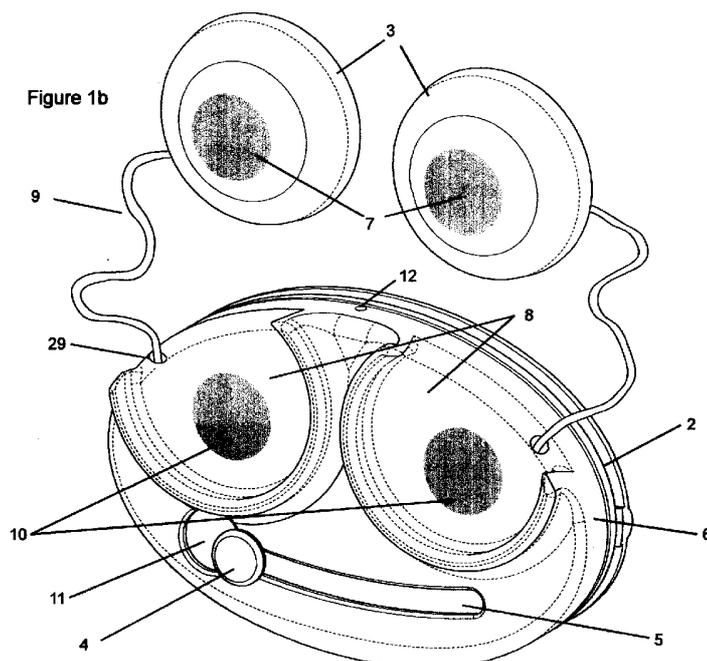


Figure 1a

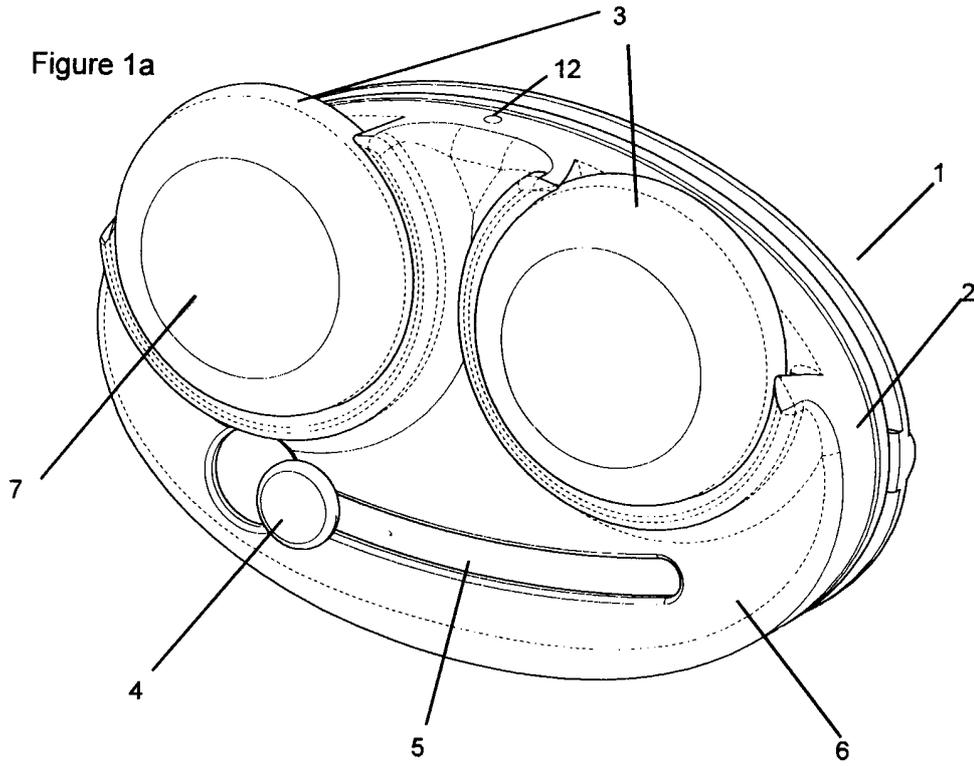


Figure 1b

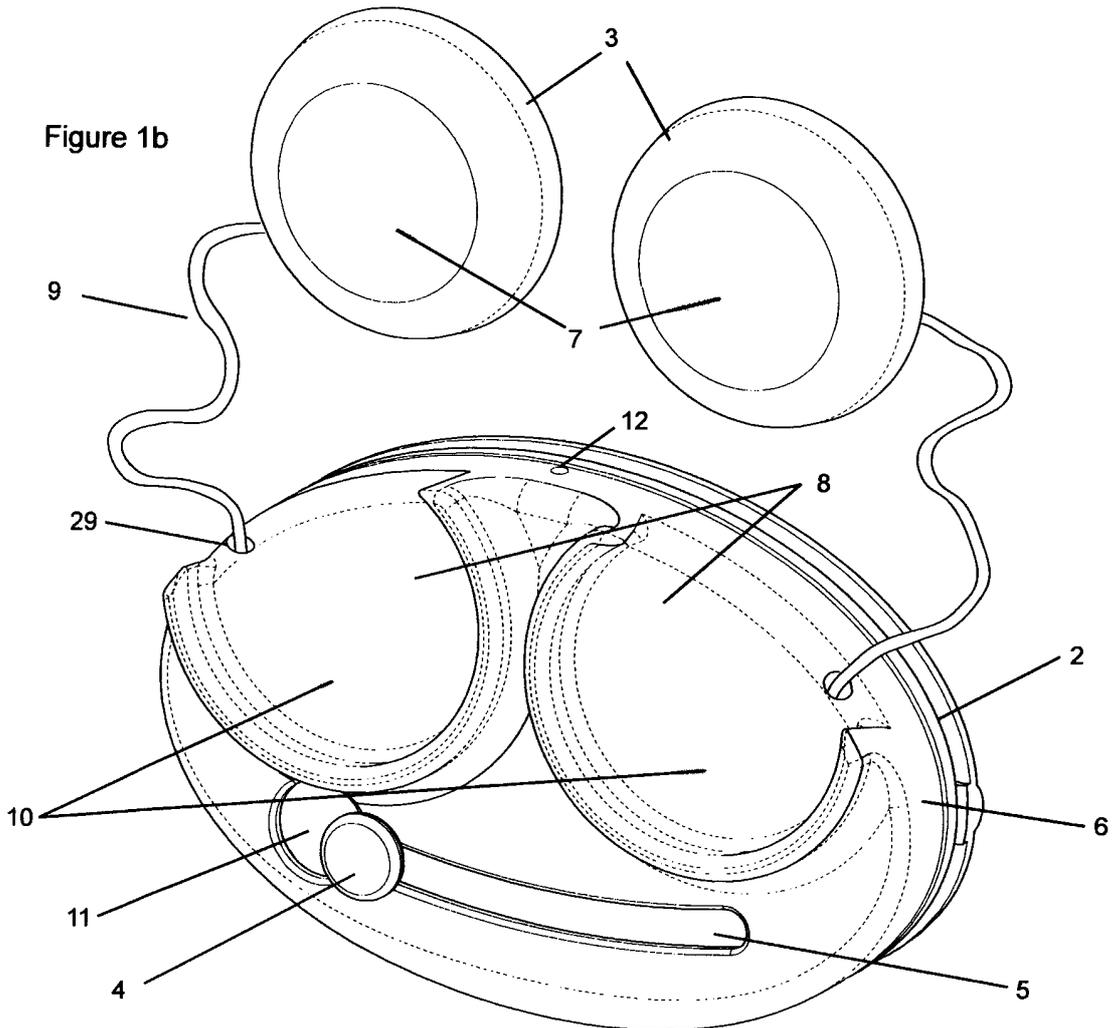


Figure 2a

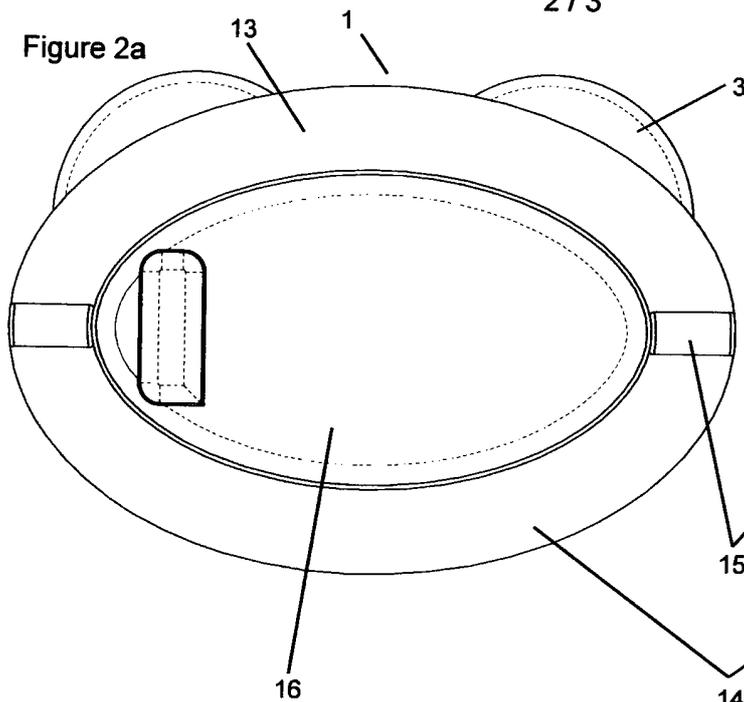


Figure 2b

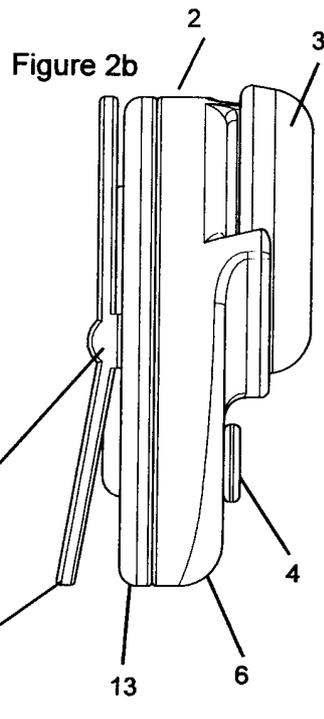


Figure 2c

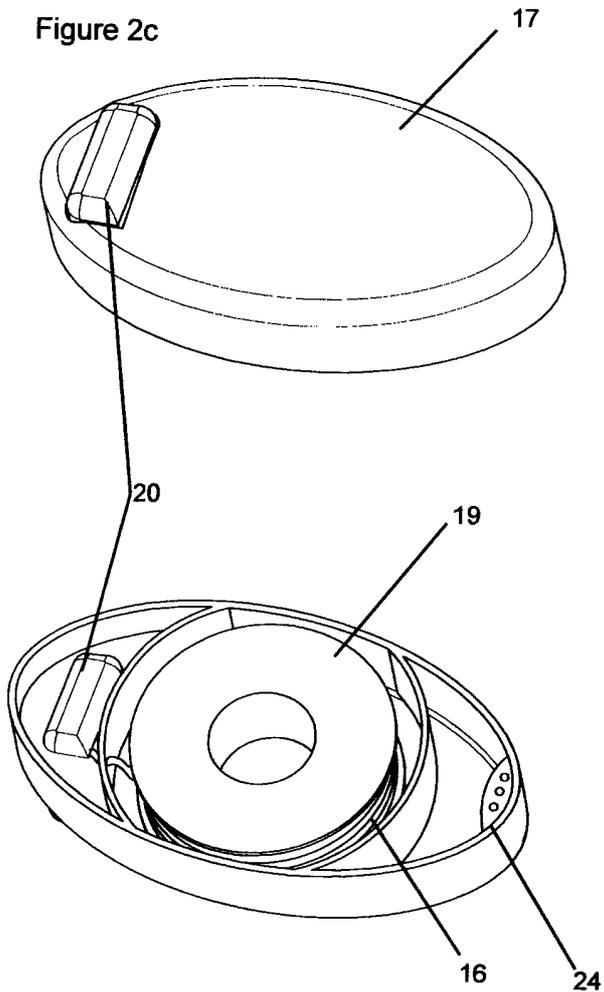


Figure 2d

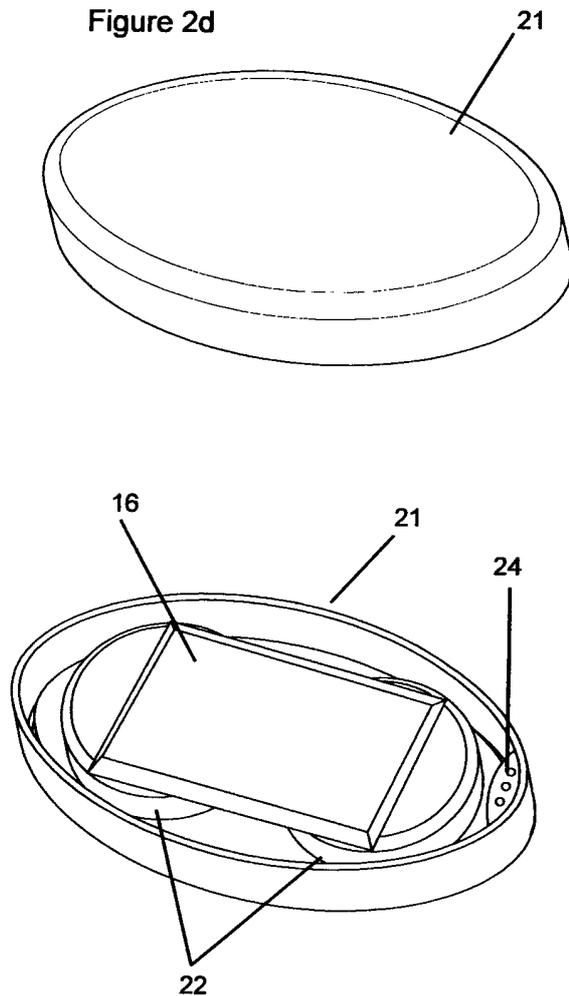


Figure 3a

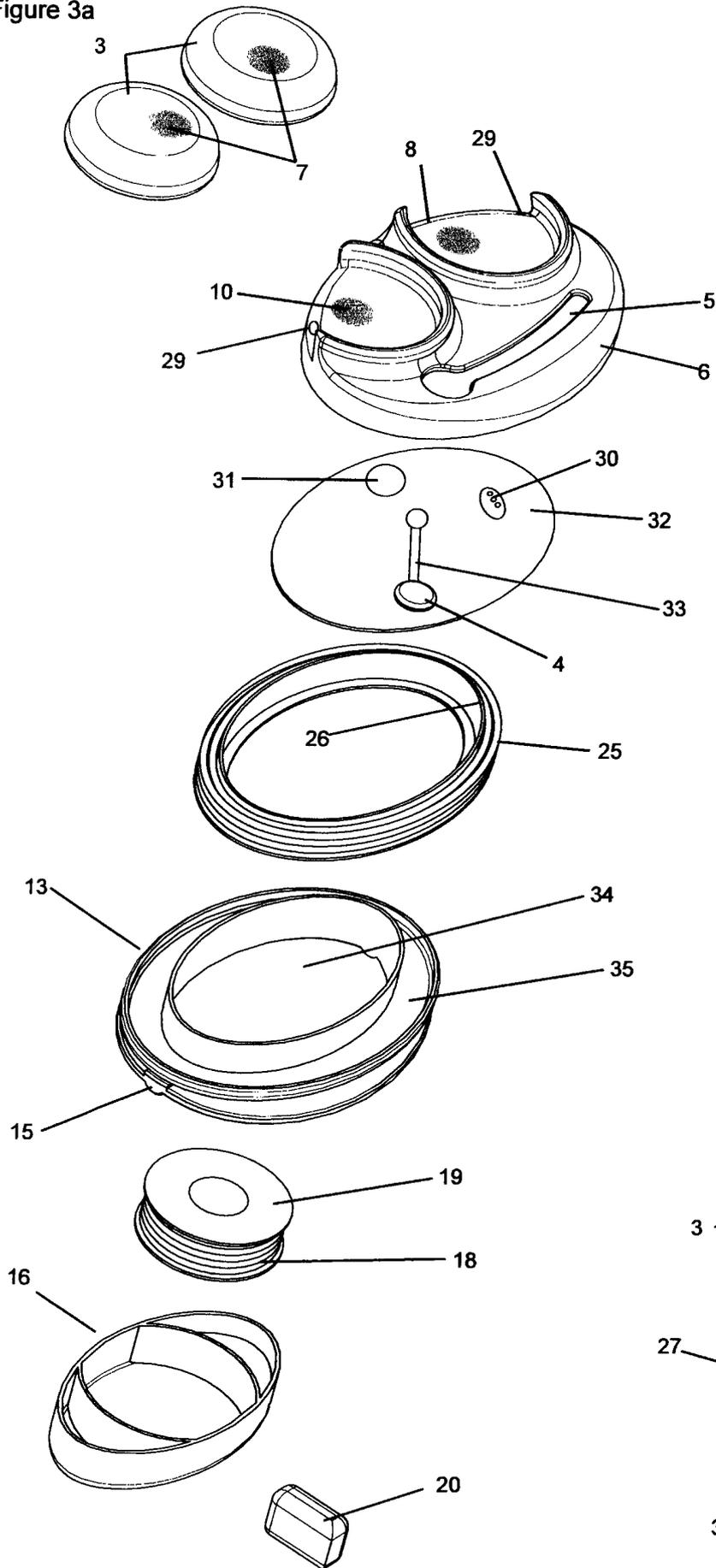


Figure 3b

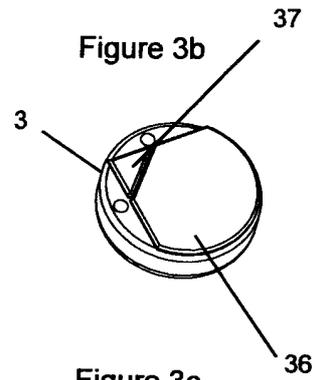


Figure 3c

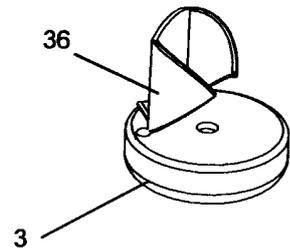
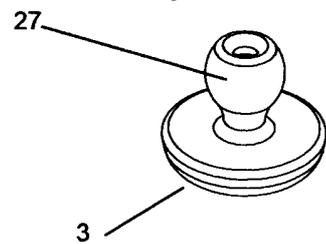


Figure 3d



MODULAR FACE SHAPED PORTABLE AUDIO HEADSET ASSEMBLY**BACKGROUND OF THE INVENTION****1) Field of the Invention**

The invention relates to a fun portable audio headset for application with portable audio devices such as media players or mobile phones, that forms an overall cartoon like face, where the eyes are demountable and become deployed earpieces via a retractable wire or wireless connectivity means, a small ear hole acts as a microphone, and the tongue acts as a sliding button for control purposes. The overall device capable of being wearable as a necklace by fastening the deployed earpieces, clipped onto clothing or a wristband, or hung over an ear, as well as being a highly portable compact device easily stored in a pocket. The device containing an interchangeable physical or wireless connectivity means for communicating with a nearby portable audio player or phone device, or connectivity slot for directly attaching a removable compact audio module. The overall device supporting interchangeable decorative face plates or covers that enable the user to personalize the face to say form a bee, frog, cat, mouse, bear or general animal face image.

2) Description of the Prior Art

There is substantial and diverse prior art relating to audio headset implementations, covering in general different physical implementations of earpieces joined by a headband wire, earplug and earpiece designs connected to wires, retractable storage mechanisms, wireless module technology and sound dampening technology, as well as audio control units attached to wires and various mechanisms for hanging headset modules around a single ear. There is also diverse art relating to audio headsets combined with microphones or microphone clips to be used as communication headsets. There is also prior art on jewellery and ornamental design of faces from badges to watches and necklaces, and prior examples of devices such as mobile phones being adaptable to support interchangeable covers.

By way of example US 4,875,233 by Derhaag discloses a headphones headset, US 5,655,026 by Peters discloses an example ear receiver with ear clip, US 5,790,683 by Salzani discloses an example headphone and coupling means, US 6,230,029 by Hahn discloses an example of a modular wireless headset system, US 6,101,260 by Jensen discloses a communication headset, D,469,081, by Perszyk discloses an ornamental headset design, D448,016 discloses an ornamental design or wireless headphone, US 5,095,382 by Abe discloses a further earlier example of wireless headphone, US 6,738,487 by Nageno et al (assigned to Sony) a typical compact form of modern earphone connected by a wire, US 6,233, 345 by Urwyler discloses incorporating earphones on a pair of glasses, US 6,359,995 by Ou discloses a compact wireless earphone suitable for hanging from an ear, US 6,363,158 by Lu an adjustable hanging earphone, US 6,658,130 by Huang a retractable wire mechanism, D277, 317 by Eisenmenger a holder for supporting retractable earplugs.

In terms of jewellery and face designs US 3,839,821 by Forsman (1974) discloses a decorative badge shaped as a smiley face, US 5,862,615 by O'Rourke discloses an adjustable face shaped button for showing feelings, D464,584 by Tsukayama (2002) discloses an ornamental design of jewellery forming a smiley face.

To the best of the applicant's knowledge, the prior art, whilst suggesting some features and numerous variations of headset and earpiece implementations in general, the prior art has not disclosed some of the highly advantageous features of the present invention discussed herein. For example, none of the prior art examined discloses forming a headset in a modular manner, such that the connectivity means can be swapped between a wireless or physical module that is easily selected with a suitable connector, nor do they disclose retractable earpieces that are stored in a compact form on a casing with flat earplugs that fold out and curve in a deployed form, neither do they disclose forming the overall device to generally define a face, where the earpieces form a pair of removable eyes, nor the combination of using interchangeable covers to allow the user to personalize the headset to their preferred design.

SUMMARY OF THE INVENTION

The main object of the present invention is to provide a portable and convenient fun audio headset for widespread application with portable media players or mobile phones, that is highly portable and wearable such that it can be worn on clothing, hung over an ear, used as a necklace or attached to a wrist device, and can incorporate an interchangeable retractable wire or wireless connectivity module, where the overall assembly forms a fun and decorative face shape, suitable for user personalization to represent cartoon like animal faces.

The portable headset assembly of the present invention, in a preferred embodiment has a compact storage configuration and a deployed wearable configuration and comprises a generally elliptically shaped module that has a front portion supporting a pair of elliptically shaped sockets and a curved groove for supporting a control means, a rear portion supporting a connectivity slot and deployable mechanical means for making the device wearable, at least one hole for enabling audio reception, and internal components including a microphone, rechargeable battery and control circuitry, where said sockets support demountable preferred elliptically shaped units that act as earpieces and comprise an audio speaker mechanism, folding or shaped means for positioning comfortably within an ear and a connectivity means such as a retractable wire mechanism or wireless link to the central module, and said central module itself supports a removable sub-section unit that can interchangeably be either a retractable wire and universal connector to enable linkage with a nearby audio device or a wireless connectivity module, or a connectivity slot that enables the overall device to be mechanically and electrically connected to an accessory audio module such as a audio storage and player device or radio device.

Said demountable earpieces in a preferred embodiment support a folding semi-flexible material that pops up as the earpiece module is removed from the central module socket and is biased to provide a curved deployed profile and comfortable shape for securing within an ear, or is formed from a more rigid ear-plug piece suitable for storing in a deeper recess within the central module. Where said semi-flexible material may be a bi-stable material having integral fibres having different tensile and compressive strengths.

Said mechanical means for making the device wearable preferably include a clip connected to a sprung axis supported on the rear face of the central module that is suitable for clipping the overall device to an item of clothing such as a shirt collar or coat, and preferably a fold out curved rod

suitable for positioning the overall device and hanging over an ear, and preferably a electrical connector and mechanical clip mechanism on the rear that enables the overall device to be attached to a suitable receiver node on a watch strap or belt or a home docking cradle, for storage or battery recharging purposes. Said earpieces supporting a fastening mechanism, such that a pair of deployed earpieces can be reversibly fastened together to enable the overall device to be wearable as a necklace.

Said overall device generally defining a face that comprises the demountable earpiece units generally defining eyes, which support circular patterns on their outer surface representing the eye balls, and the central module having similar circular patterns within the socket on the front surface to represent eyes when the earpieces are deployed, and a curved groove in the centre of the front surface representing a mouth that could support a sliding button control or touch sensor mechanism, and holes in the side edges representing ears and enabling an internal microphone to function and receive audio input when the device is hung-around the neck, or supported on clothing or on a wrist, where the outer front surface is coloured or textured to represent an appropriate cartoon like face. Said front surface forming an interchangeable panel that is removable by sliding the control button to one side, and unclipping from the side casing, and can therefore be substituted with another similarly shaped panel of different ornamental design as preferred by a user. Similarly the earpiece units would preferably be comprised of an outer surface that is removable and customisable.

Said central module supporting a removable sub-section that provides the connectivity to an external device and providing a method by which the overall device could be purchased and customised with a retractable wire mechanism with a user appropriate universal connector, such as a large or small format USB, firewire, or custom connector for a mobile phone device, or standard audio headphone connector socket, as well as providing an easy method of upgrading the device with a wireless module. Said removable sub-section in a preferred configuration has an oval profile and connects within an oval shaped recess in the reverse of the module and supports a electrical connector plug to connect the unit to a corresponding connector plug on the central module to provide through connectivity for the two stereo connector audio lines, microphone and control means. By way of example the current form-factor could currently be built using available compact wireless modules, such as those produced by Philips or Zeevo, and combined with thin Lithium Ion Polymer rechargeable batteries shaped into an oval, or arranged as two standard circular battery units forming a figure 8 arrangement within the oval. A major benefit of the modular approach to external connectors, is that consumers can customise the device at point of purchase and then upgrade the device with wireless modules as and when they become commercially attractive to the consumer. Similarly the device could be produced directly with an integrated wireless contact without the benefit of upgrading. This ability to customize the connectivity at low cost is of particular relevance given the differences in preferred connectivity means and wireless standards across different countries, with a resulting supply chain and demand problem of predicting which connector types and standards are preferred.

A major benefit of the device assembly is that it provides a plurality of methods of use and wearability. The device being compact could be easily stored in a pocket, or attached to a wristband or belt, via a simple clip mechanism, or via an electrical and mechanical connector, that could enable the device to be recharged if the belt or watch supported additional battery units. Similarly the clip on the reverse of the device could enable the device to be clipped to an item of clothing for

storage or when in use with the earpiece wires extended, with the whole device being connected physically or wirelessly to an audio player. Similarly the clip mechanism could be extended to enable the device to be clipped onto a pair of sun-glasses with earphones extended, clipped onto a headband or hair-band, and optionally via a hanging mechanism over an ear, where one earpiece would be extended to the other ear around the back of the head. In the preferred embodiment the microphone reception properties would be optimized by clipping the device to an article of clothing near the neck, however in a further embodiment the microphone could itself be provided on a retractable wire, or simply incorporated into one of the retractable wires for an earpiece. By way of example, a removable earpiece could support a short length of retractable wire, and a microphone component formed as a bead, and connected to the retractable wire stored within the main central unit. Where said microphone bead would be stored in a recess at the side of the main module between the ear-piece when both wires were retracted.

The overall device could be easily combined with a similarly small and compact media player, such as a MP3 ^{player}, or Digital Radio module, that could generally define a body for the device and be formed of ornamental shape.

A further benefit is the user ability to customize the look and feel of the device at point of purchase, or by using an accessory pack of alternative face designs. Said face designs generally being distinguished by differences in the colour and texture of the front surface of the central module and by the colours of the earpiece covers, as well as by potential further customisation using a set of stickers – representing eye balls or eye-ball emotions. By way of example a combination of green earpiece units and a green front cover could represent a decorative ‘frog or Alien like face’, a yellow front cover with black earpiece units a ‘Bee like face’, yellow earpiece units a generic ‘Smiley Face’, a black cover and black earpiece units a ‘Cat like Face’, and a Black cover and white earpiece cover a ‘Panda Bear’ like face, similarly grey covers could represent a mouse, with further colours and texture combinations alternate cartoon like images. The variety of options therefore provides a mechanism for consumers, particularly children and young adults to customize and personalize the device or vary the device appearance during the week. This is of particular relevance with social pressures to rapidly upgrade new products and be seen with the latest device, as it provides a very low cost way for children to change the appearance of their device without feeling under pressure to purchase an expensive new device technology. The device could therefore create a social fad or craze as well as provide the benefit of core device re-use reducing obsolescence and product waste.

A further embodiment could incorporate into the front surface a more advanced surface material such as a thermo-chromic ink or electronic ink, Organic Light Emitting Device, NanoChromic material, or generally colour variable surface material that changes colour under electrical means, such that the overall device could be varied in colour and texture digitally via the control circuitry and preferably in sync with audio signals.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings illustrate presently preferred embodiments of the present invention and together with the detailed description serve to explain the principles of the present invention.

FIG. 1A shows a three dimensional view of the portable headset assembly in its stored configuration, and FIG 1B shows a three dimensional view of the portable headset assembly with the earpiece modules demounted and connected by retractable wire.

FIG 2A shows a reverse profile of the portable headset assembly, showing a hinge clip and connectivity mechanism. FIG 2B shows the sprung hinge clip as it might appear for attaching to clothing. FIG 2C shows an example of the connectivity mechanism being a retractable wire and mini USB connector. FIG 2D shows an alternate example of the connectivity mechanism being a wireless module.

FIG 3A shows an illustrative 3D explosion view of the device, showing vertically the earpiece module components, the central module front panel, inner retractable wire mechanism, reverse panel ring, and the interchangeable connectivity module. FIG 3B shows the reverse of an earpiece module in its stored form. FIG 3C Shows an example of an earpiece module with flexible ear-plug in a deployed configuration. FIG 3D shows an alternate example of an earpiece module with solid ear-plug.

DETAILED DESCRIPTION OF THE INVENTION

A preferred embodiment of the invention will now be described with reference to the accompanying drawings herein:

Referring now to FIG 1A which shows a three dimensional view of the portable headset assembly 1 in its stored configuration and comprising a central module 2, demountable earpieces 3, control button 4 and curved slot 5 with an interchangeable front panel 6, where said demountable earpieces 3 support decorative surface ovals 7 generally defining ornamental eye balls. FIG 1B shows the overall portable headset assembly 1 in a deployed configuration, where earpieces 3 are detached from their storage position within sockets 8 on the front panel 6 and connected by retractable wires 9 passing into holes 29 in the sides of the central module 2, where front panel 6 also supports ornamental ovals 10, and curved slot 5 has a larger hole 11 at one end to facilitate removal of the front panel 6. A hole 12 is also shown in the side-casing representing a microphone sensor. In this embodiment FIG 1B represents a portable headset assembly containing an internal wireless connectivity module 21, such that the overall device connects with a third-party audio device or mobile phone using a common wireless protocol, such as Bluetooth.^{RTM}

Referring now to FIG 2A which shows a three dimensional view of the reverse profile of the portable headset assembly 1 which can be seen to be comprised from a rear section 13 supporting a clip mechanism 14 about a sprung axis 15, and supports an oval shaped central connectivity sub-section 16 that is illustrated as a retractable connector wire mechanism with connector 20 visible on the outer surface, but could be substituted with a wireless connectivity unit or direct mechanical and electrical connector for a third party device. FIG 2B shows a side profile showing an example hinge

mechanism 14 in more detail about a sprung axis 15, where pushing on one side would open an alternate side acting as a lever in a similar manner to half a clothes peg for easily attaching the overall device to an item of clothing. FIG 2C shows a reverse and top view of an example connectivity sub-section 16 being a retractable wire connector module 17 and comprising a wire 18, a sprung cylinder 19 and universal connector 20 that is illustrated as a mini USB connector but could be any connector, where larger connectors could be stored on the outer surface of the sub-section 16. FIG 2D shows a reverse and top view of example connectivity sub-section 16 being a wireless connector module 21 and comprising battery units 22 and a wireless module circuit board 23, and illustrative connector pins 24 for electrically connecting the sub-section to a circuit layer within the central module 2.

Referring now to FIG 3A which shows an illustrative 3D explosion view of the device, showing vertically the demountable earpiece modules 3 supporting ornamental eyes 7 and which could optionally contain a further retractable wire mechanism for short range adjustment, a front surface 6 of the central module 2 supporting sockets 8 for fastening the stored earpiece modules 3 and supporting an alternate ornamental eye circle 10 and side holes 29 for a connecting wire, and containing a curved groove 5 with button 4, generally defining a mouth and tongue. An internal circuit and connecting layer 32 is illustrated to support a microphone sensor 31, a mechanical lever sensor 33 pivoted and connected to a button 4 that slides within the groove 5 or could optionally be replaced with a touch sensitive slide area or LCD display, and a connector socket 30 for electronically connecting to pins 24 in a removable sub-unit 16 and would also provide an electronic connection to the modular earpiece wires 9. A retractable wire mechanism 26 would be implemented as a preferred elliptical arrangement within a ring shaped recess 35 on the rear portion 13 of the central module 2 and generally achieved through at least one flexible low friction rotating ellipse tube 26 connected to a clock spring or sprung elastic material, that is free to rotate around the central oval 34 that supports the removable connector module 16, and would support retractable wire assembly 25 of two earpiece wires 9 that would be unwound as the earpiece units are deployed. Optionally said rotating ellipse 26 could support a button protruding through an oval groove around the central oval 34 in the rear portion 13, with the central oval 34 then connected to the circuit layer 32, such that the wire mechanism could be mechanically wound by simply rotating this button. Similarly said retractable wire mechanism could be implemented with two vertically arranged oval or laterally arranged circular discs, one for each earpiece wire. Said rear portion 13 is shown with a central oval recess 34, clip mechanism hinge 15, and would mechanically support a removable connector module 16 which is illustrated as a retractable wire mechanism comprising a coil 19 and wire 18 linked to an external connector 20 that would be accessible and removable via a slot on the outer surface as shown in 2C. FIG 3B Shows a preferred example of the inward surface of an earpiece module 3 with flexible ear-plug 36 in a stored configuration comprising a hinge 37 and flexible material 36. FIG 3C shows this earpiece module in a deployed configuration where the flexible material 36 has popped up by the flexible hinge 37 and is biased to form a curved profile 36 suitable for comfortably positioning within an ear. FIG 3D shows an example of a solid earpiece 27 that could be stored via a recessed slot on the side of the central module 2 or within a recessed hole within the central module, achieved by modifying the oval 34 and using recesses on either side of the retractable wire coil in connector module 16, and require a smaller connector 20, or storage of said connector outside the central module 2.

Although the invention is described and illustrated with reference to one preferred embodiment of a portable audio headset assembly it is expressly understood that it is in no way limited to the disclosure of such preferred embodiments, but is capable of numerous modifications within the scope of the claims. By way of example the headset device could be implemented with a different compact configuration of wireless modules embedded in the earpiece modules directly and with different connectivity technologies. The earpieces could be implemented as solid extendable forms rather than with a semi-flexible earplug component or could be shaped as demountable ears. Similarly the device could be implemented with a surface screen and additional control mechanisms.

CLAIMS

What is claimed is:

1. A portable audio headset assembly having a compact storage and wearable deployed configuration and forms a decorative face shape comprising;

a generally elliptically shaped central module that has a front portion supporting a pair of elliptically shaped sockets and a curved groove for supporting a control means, a rear portion supporting a connectivity slot and mechanical mechanisms for making the device wearable, at least one side hole for enabling audio reception, and internal components comprising a microphone, a rechargeable battery and control circuitry

where said sockets support demountable elliptical shaped units that act as earpieces and comprise an audio speaker mechanism, means for positioning comfortably within an ear and a connectivity means to the central module

where said central module supports a connectivity means for receiving and transmitting audio data with a nearby device

where said overall assembly generally defines a decorative cartoon face shape with said sockets and demountable earpieces generally defining the eyes, said curved control groove a mouth, and said front portion being of suitable ornamental design
2. A portable audio headset assembly according to Claim 1 where said connectivity means between the demountable earpieces and the central module is formed by retractable wires that can be stored around sprung coils within each earpiece unit and central module
3. A portable audio headset assembly according to Claim 1 and 2 where said connectivity means between the demountable earpieces is achieved through a compact wireless connectivity module that further supports a compact rechargeable battery
4. A portable audio headset assembly according to Claim 1 to 3 where said connectivity means between the central module and a nearby audio device is achieved through a sub-section encasing and containing a retractable wire attached to a physical universal connector
5. A portable audio headset assembly according to Claim 1 to 4 where said connectivity means between the central module and a nearby audio device is achieved through a sub-section containing a wireless connectivity module and battery unit
6. A portable audio headset assembly according to Claim 1 to 5 where said sub-sections are modular and interchangeable
7. A portable audio headset assembly according to Claim 1 to 6 where said connectivity slot on the central module can electrically connect and reversibly mechanically attach with a

- suitable docking point on a wristband device, belt or eye-glasses for purposes of storage and battery recharging
8. A portable audio headset assembly according to Claim 1 to 7 where said connectivity slot on the central module can electrically connect and reversibly mechanically attach a portable and compact modular audio unit
 9. A portable audio headset assembly according to Claim 8 where said modular audio unit provides radio reception and interface control
 10. A portable audio headset assembly according to Claim 8 where said modular audio unit provides data storage for digital audio content and interface control
 11. A portable audio headset assembly according to Claim 1 to 10 where said mechanical means on the rear portion of the central module provide a sprung mechanical clip to fasten the overall device to clothing
 12. A portable audio headset assembly according to Claim 1 to 11 where said mechanical means on the rear portion of the central module provides a further folding clip that allows the device to be comfortably attached to hair or hung over an ear
 13. A portable audio headset assembly according to Claim 1 to 12 where said central module front portion control groove forms a sliding control button comprised of a mechanical or touch-sensitive means
 14. A portable audio headset assembly according to Claim 1 to 13 where said earpiece module supports a hinged semi-flexible material that reversibly folds and pops up from a flat form as the earpiece is removed from the central module socket and is biased to provide a curved deployed profile with comfortable shape for securing within an ear cavity
 15. A portable audio headset assembly according to Claim 1 to 14 where said earpiece modules are shaped with an elliptical unit and a shaped earplug component that are storable within the sockets and by means of a recess in the sides of the central module
 16. A portable audio headset assembly according to Claim 1 to 15 where said earpiece modules can reversibly fasten together when deployed to enable the overall device to be worn as a necklace
 17. A portable audio headset assembly according to Claim 1 to 16 where said central module front portion is mechanically removable and interchangeable to provide alternate ornamental designs and colour
 18. A portable audio headset assembly according to Claim 1 to 17 where said central module front portion is formed from a thermo-chromic ink or electrically variable advanced thin-film display material, such as a nano-chromic or organic light emitting device material,

so as to provide a means of dynamically changing the surface colour and texture of the device

19. The ornamental design for a portable audio headset assembly according to Claims 1-18 substantially as herein described above and illustrated in the accompanying drawings
20. The ornamental design for a portable audio headset assembly according to Claims 1-19 where the demountable earpieces defining eyes support a plurality of circular design stickers on their front surface, together with similar circular designs being applied to the front-surface of the sockets on the central module and substantially as herein described above and illustrated in the accompanying drawings



INVESTOR IN PEOPLE

Application No: GB0417998.2

Examiner: Mr Mike Leaning

Claims searched: 1-20

Date of search: 22 December 2004

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
A,E	-	GB2400773 A (CALLAN) The whole document is relevant. A face-shaped (see figure 2) headset assembly comprising a module having sockets for a pair of earpieces, controls, a clip so it is wearable, a microphone, a charger socket (but no mention of a battery) and connections allowing audio signal transmission.
A	-	GB2365692 A (MOTOROLA LTD) Please see the figures. A headset assembly comprising a module having an earpiece which may be stored in a socket on the module, controls, a microphone, a battery and connections allowing audio signal communication with an associated device.
A	-	US6370401 B1 (BARANOWSKI et al.) Please see especially columns 2 and 3. A headset assembly comprising a module having a pair of earpieces, controls, a microphone, a rechargeable battery and connections allowing audio signal communication with an associated device.
A	-	WO03/103335 A1 (RUEGG) Please see figure 1. A headset assembly comprising a central, elliptical, module and a pair of earphones which may collectively be worn as a necklace.

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.



INVESTOR IN PEOPLE

Field of Search:

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

B8M

Worldwide search of patent documents classified in the following areas of the IPC⁰⁷

B65H; H04M; H04R

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

Online: WPI, EPODOC, JAPIO.