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Grady(10) **Pub. No.: US 2007/0114974 A1**(43) **Pub. Date: May 24, 2007**(54) **FM TRANSMITTER AND POWER SUPPLY /
CHARGING ASSEMBLY FOR MP3 PLAYER****Publication Classification**(76) Inventor: **Jeff Grady**, Durham, NC (US)(51) **Int. Cl.****H02J 7/00**

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Correspondence Address:

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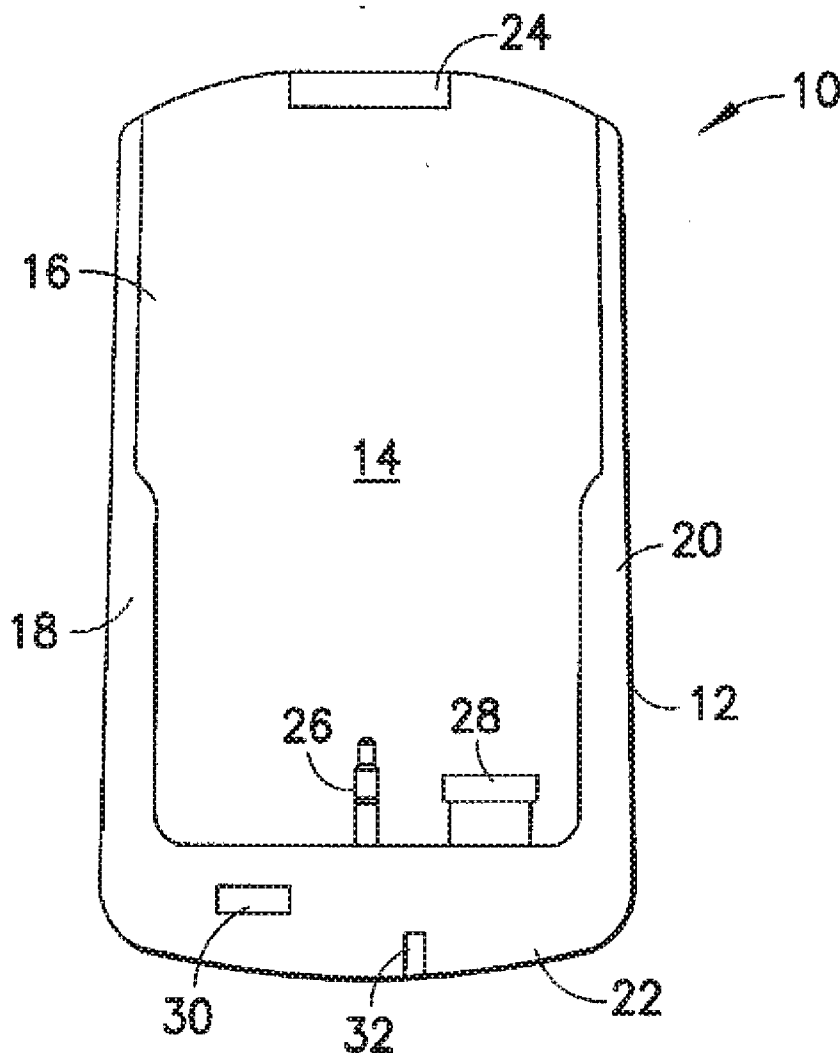
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ABSTRACT

An FM transmitter and power supply/charging assembly is electrically coupleable with an MP3 player. The assembly includes a modular docking unit having a main body portion with a docking cavity therein, wherein the main body portion contains the FM transmitter and power/charging circuitry, with coupling means in the docking cavity for connecting the MP3 player with the FM transmitter and power/charging circuitry, to accommodate FM transmission by the FM transmitter of audio content when played by the MP3 player in the docking cavity of the modular docking unit, and adapted for transmitting electrical power through the modular docking unit and the power/charging circuitry therein, for charging of a battery of the MP3 player and/or powering of the MP3 player.

(21) Appl. No.: **11/615,758**(22) Filed: **Dec. 22, 2006****Related U.S. Application Data**

(63) Continuation of application No. 10/615,108, filed on Jul. 8, 2003, which is a continuation-in-part of application No. 10/197,367, filed on Jul. 17, 2002, now Pat. No. 6,591,085.



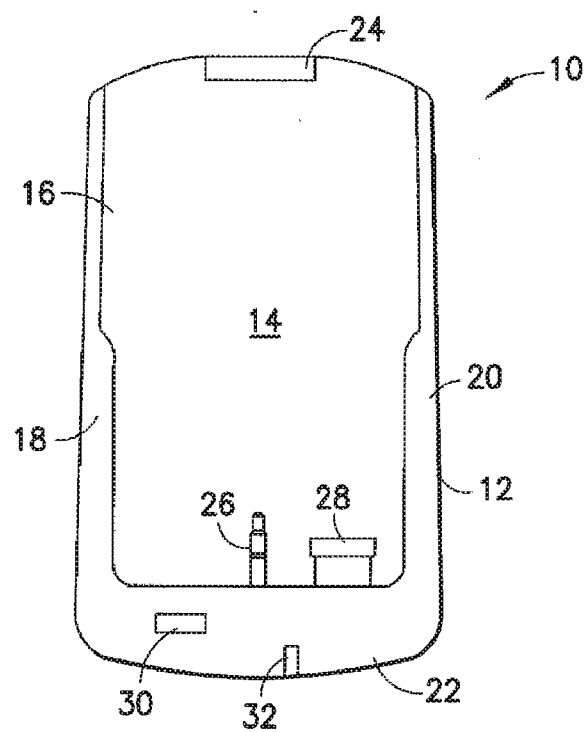


FIG._1

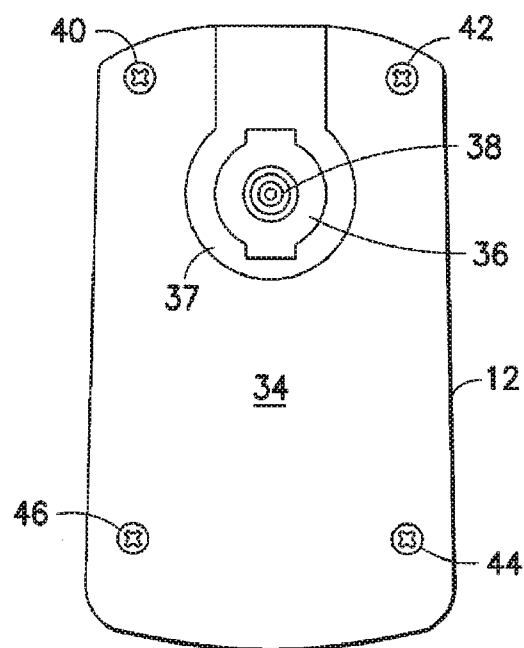


FIG._2

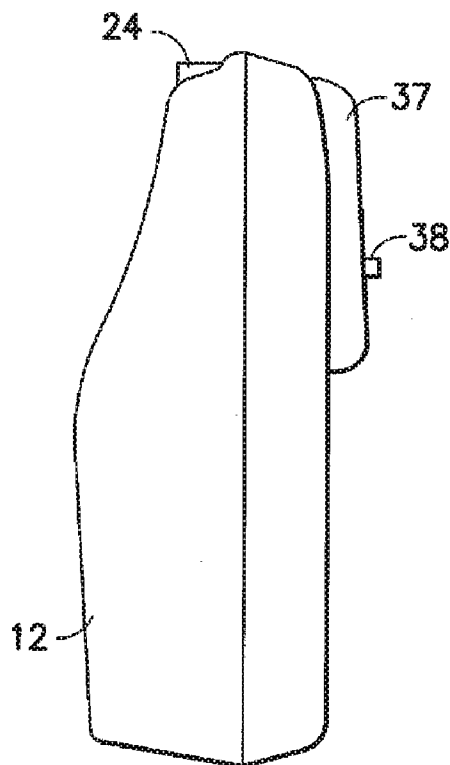


FIG._3

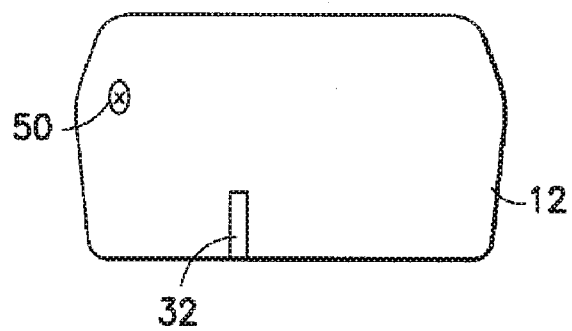


FIG._4

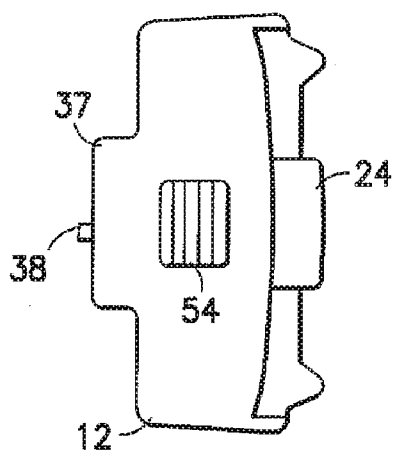


FIG._5

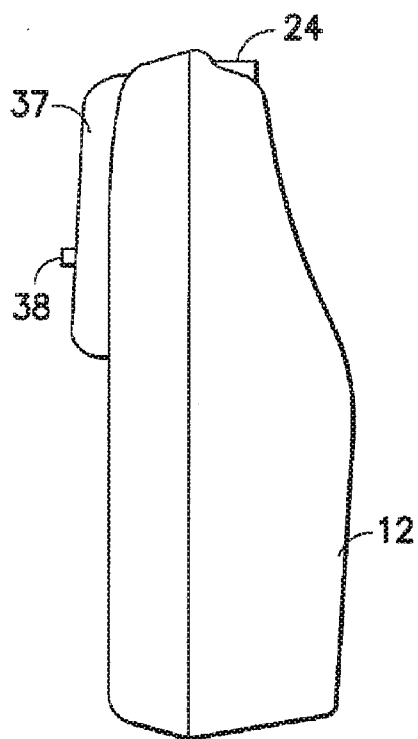


FIG._6

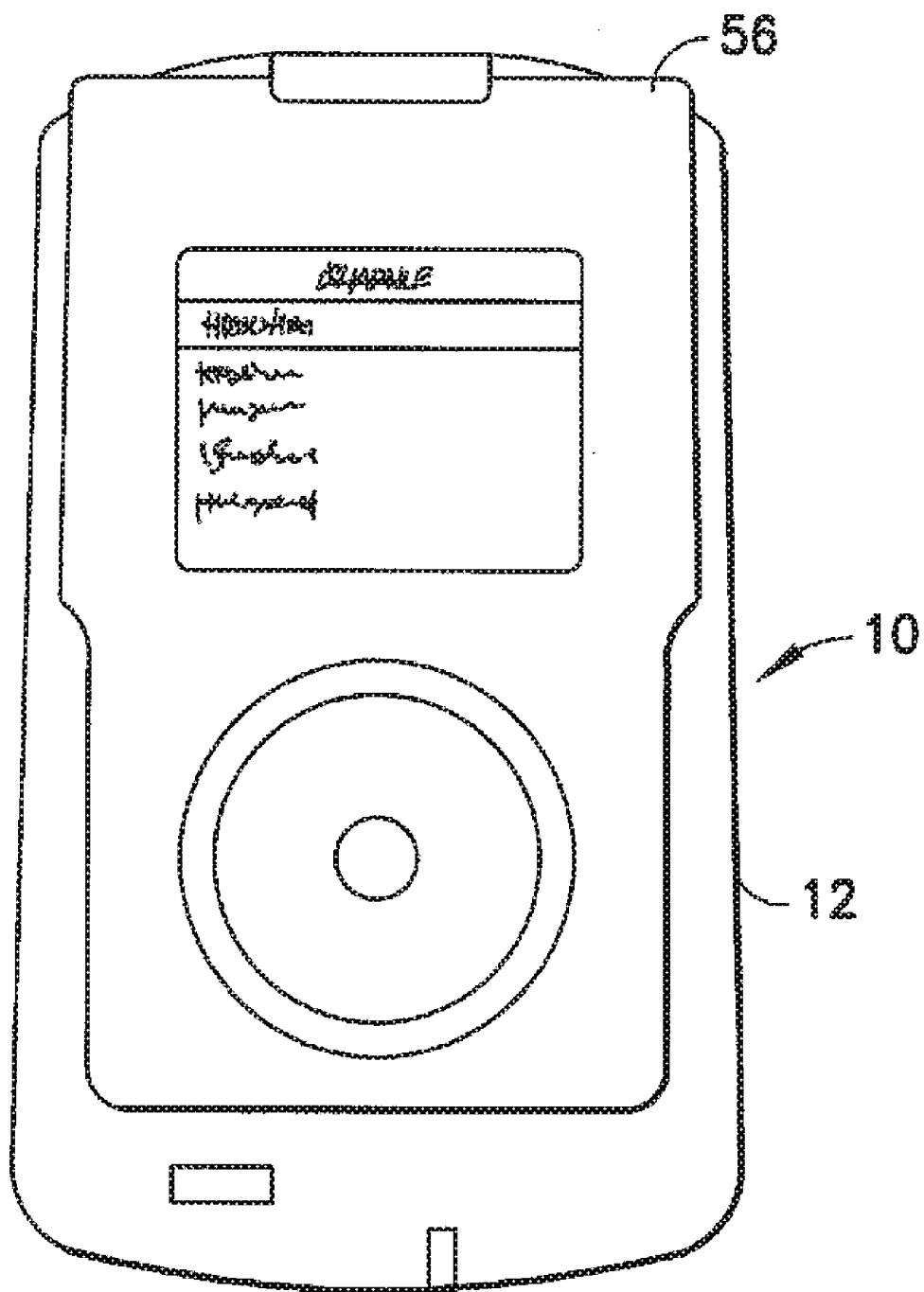


FIG. 7

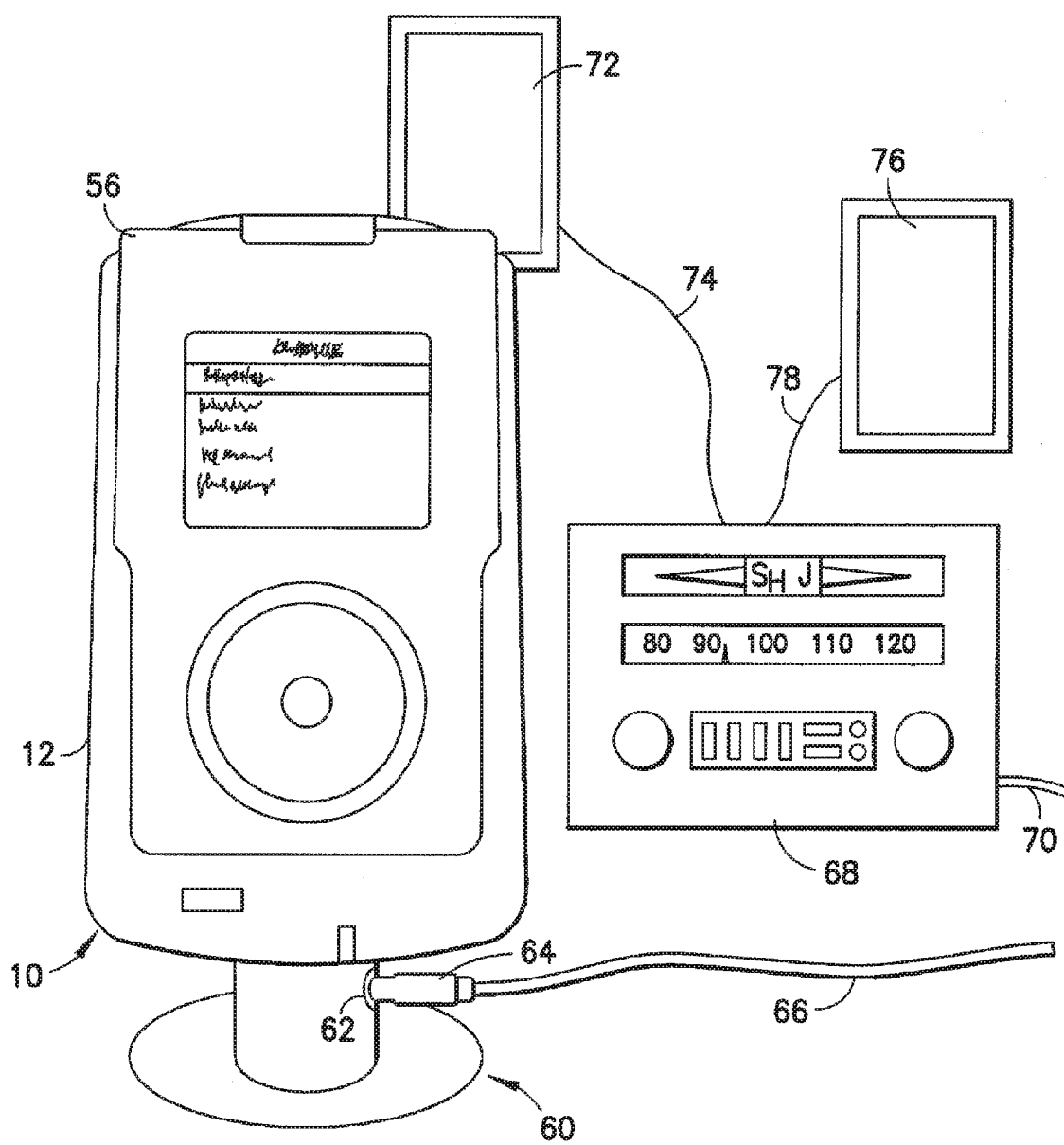


FIG._8

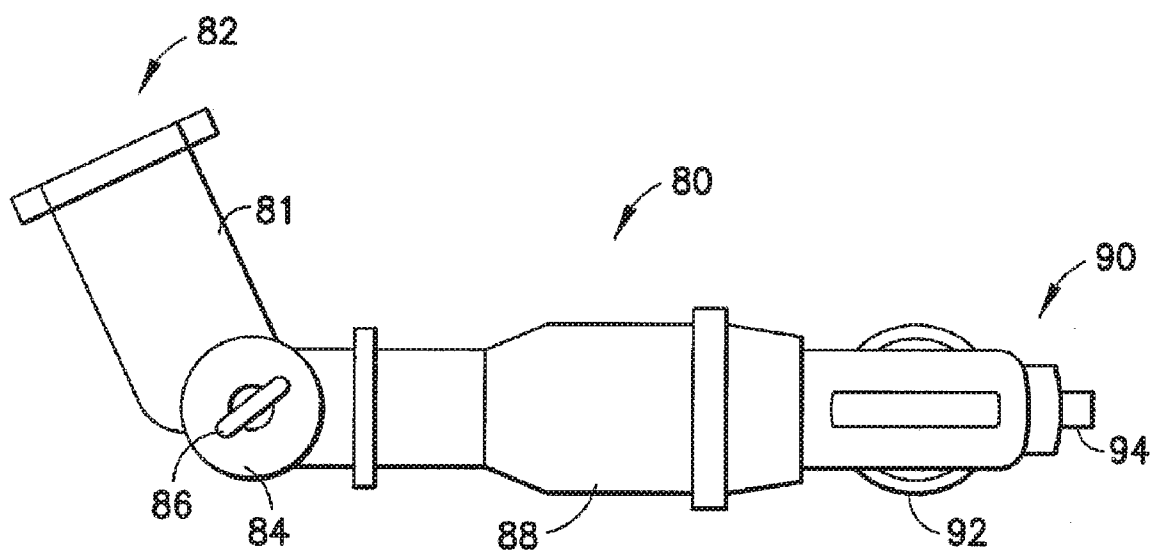


FIG._9

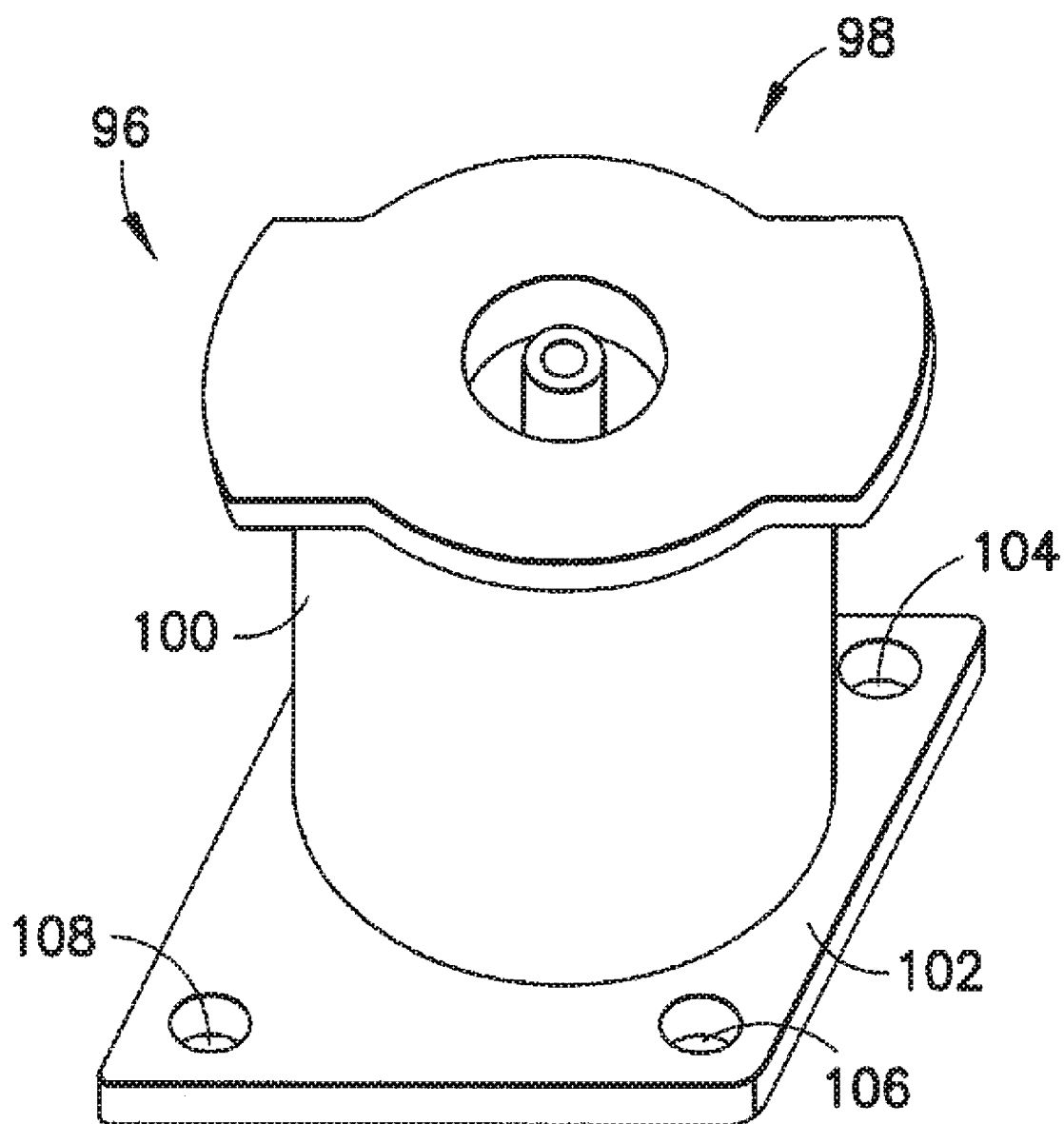


FIG. 10

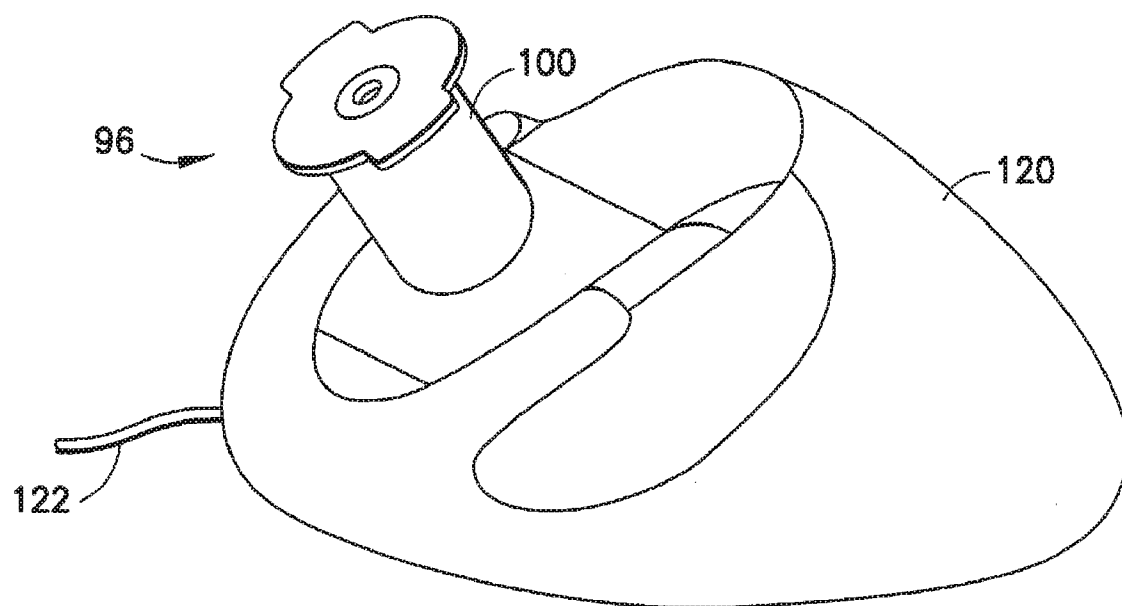


FIG. 11

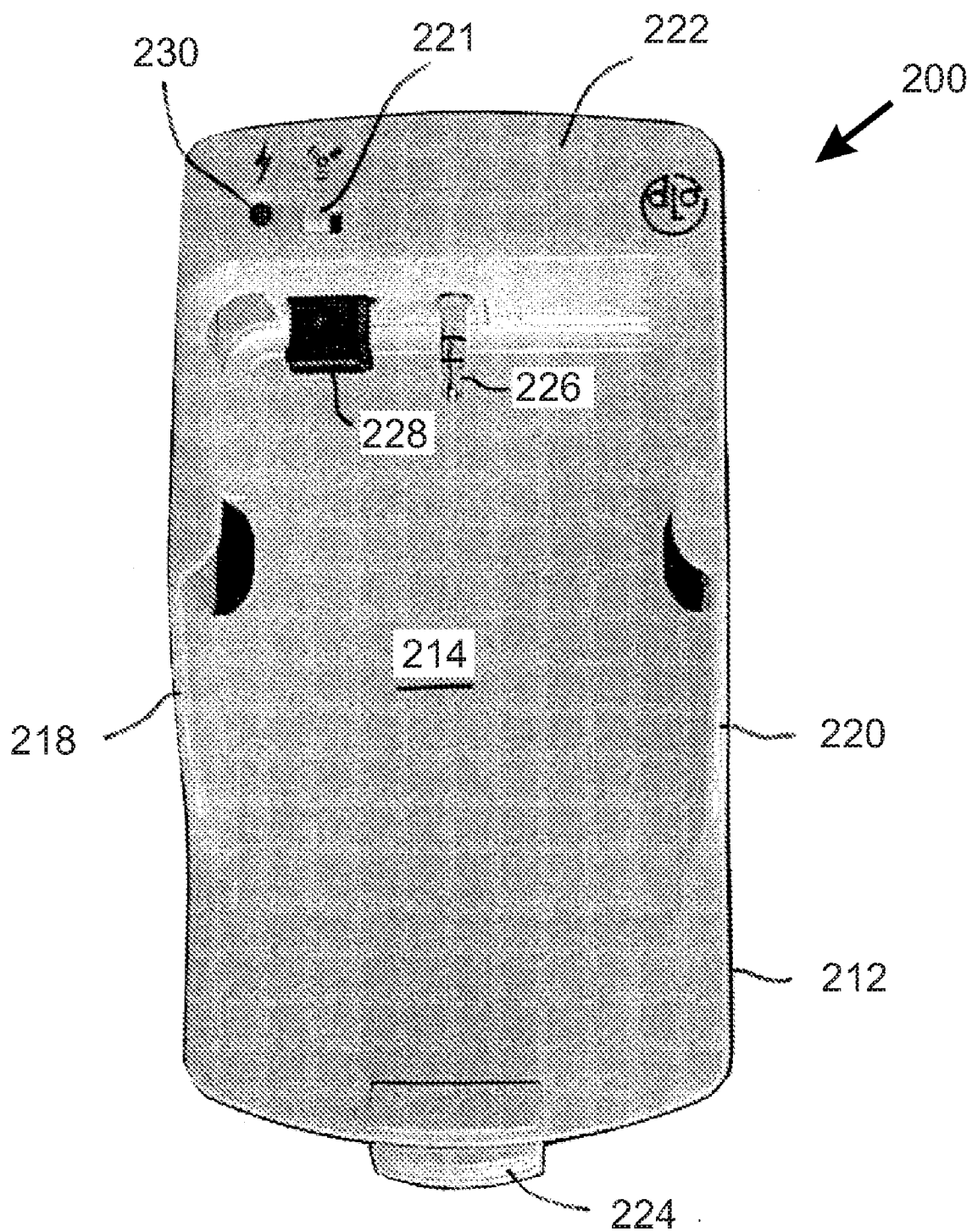


FIG. 12

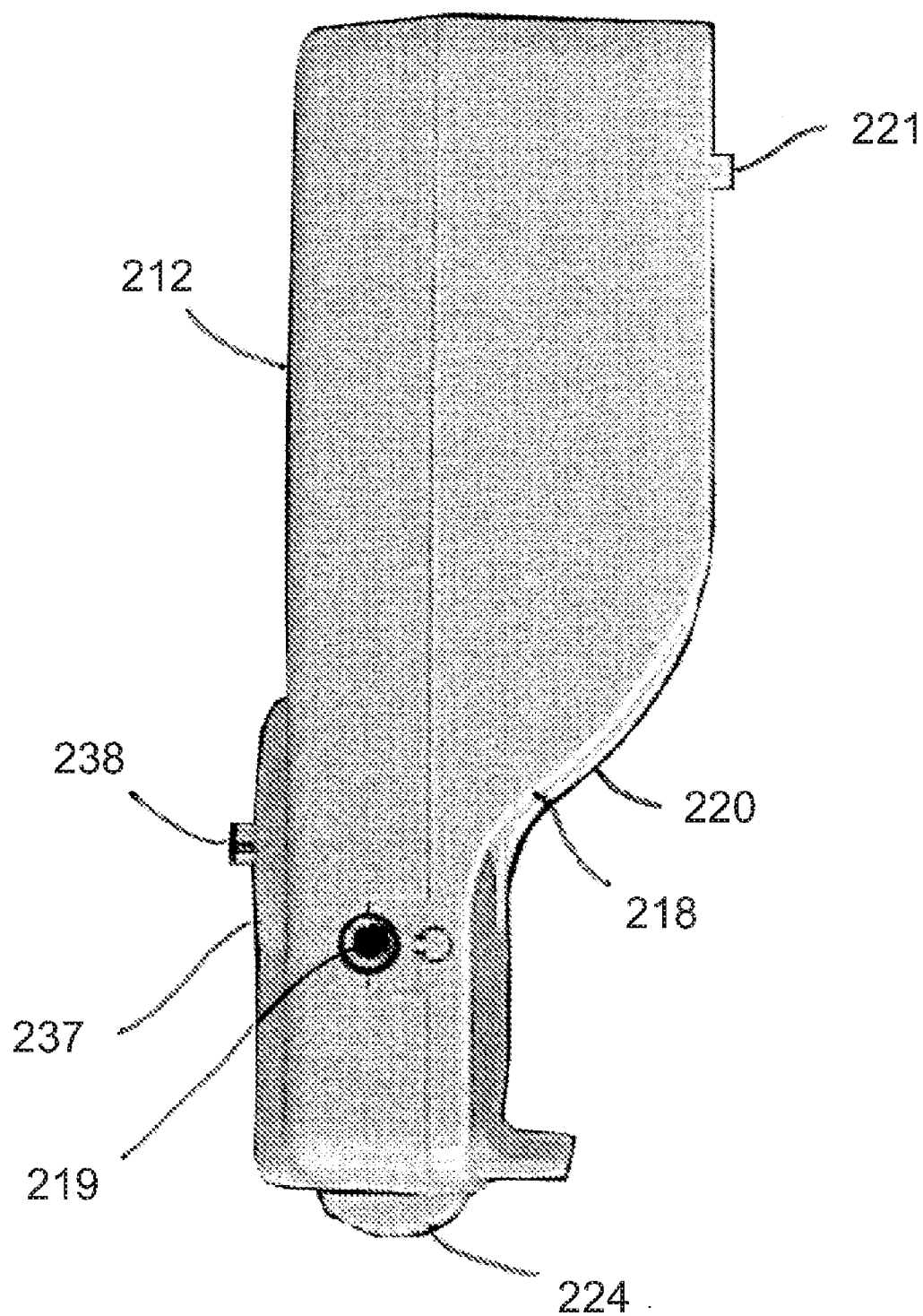


FIG._13

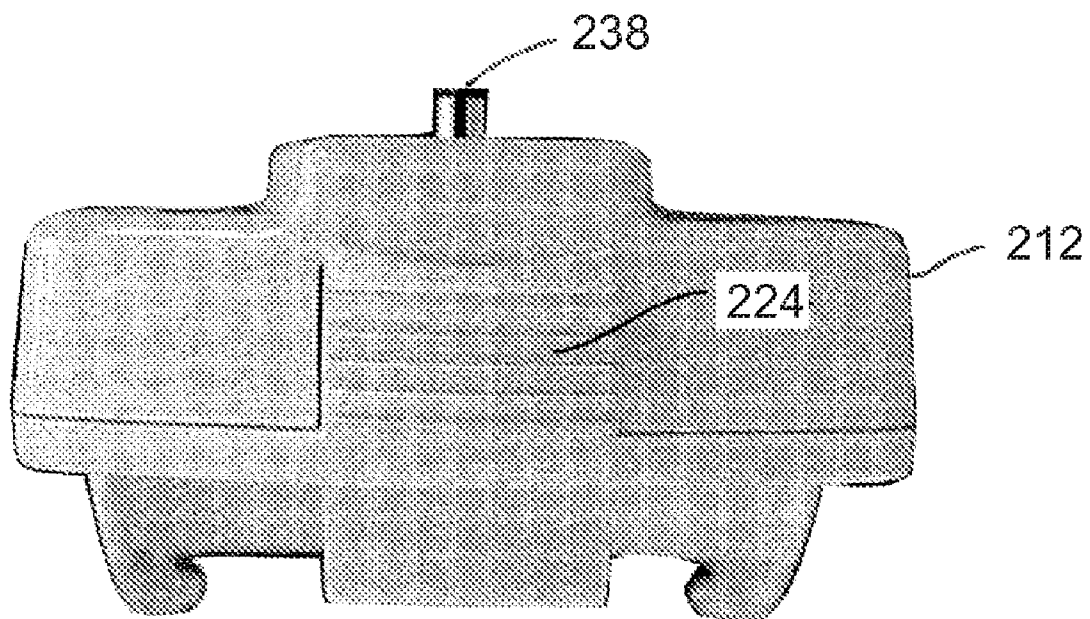


FIG. 14

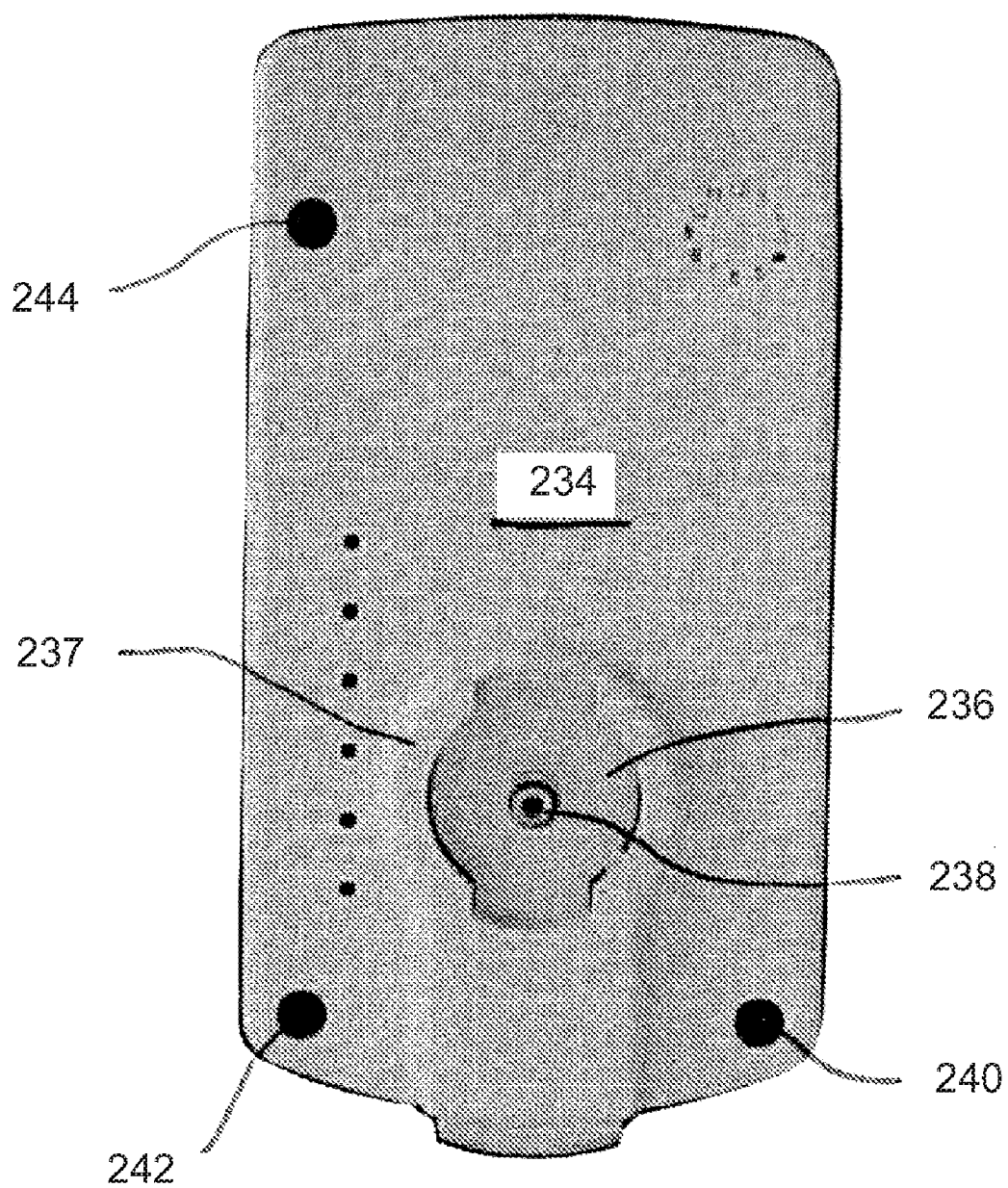


FIG._15

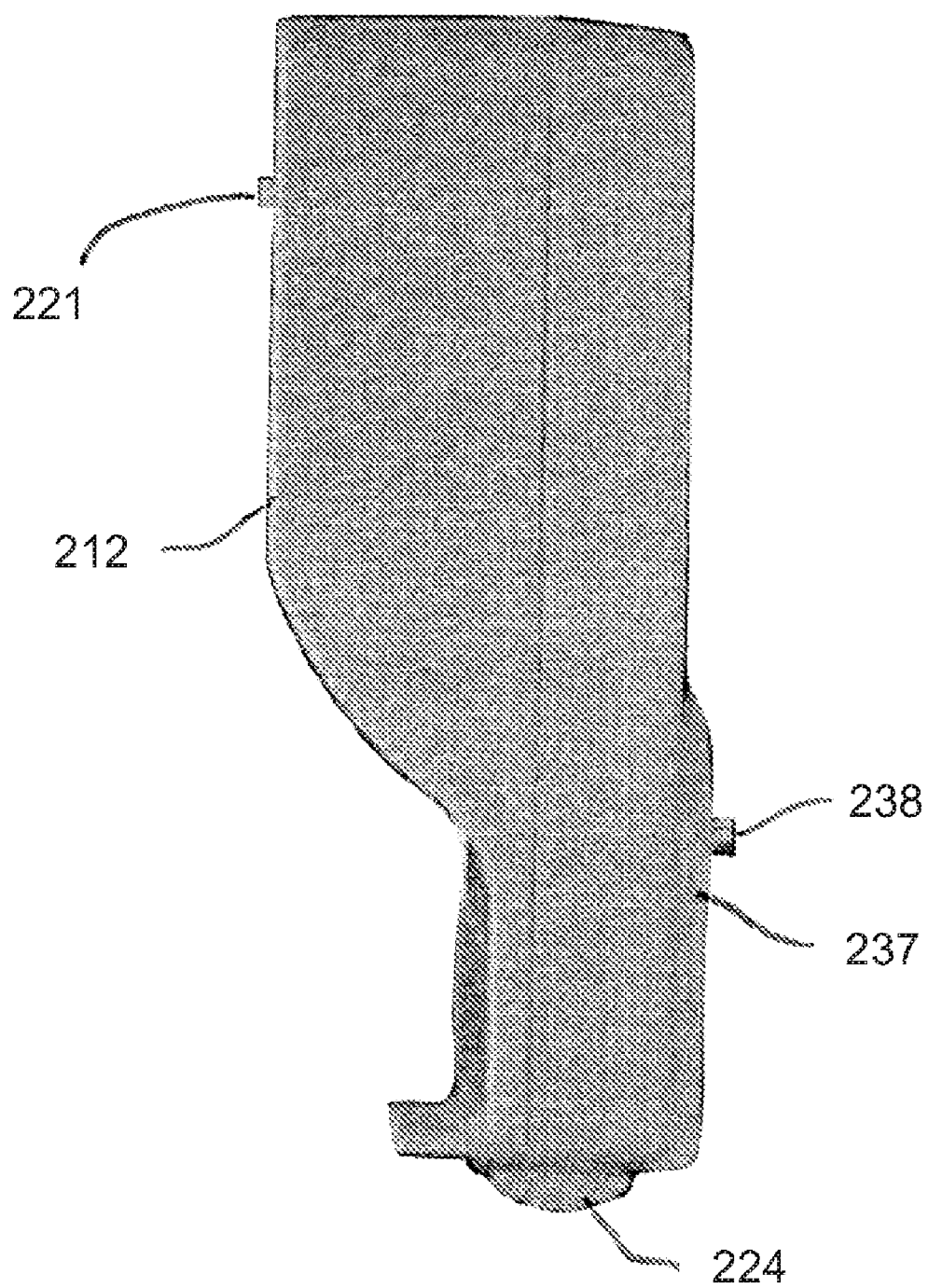


FIG._16

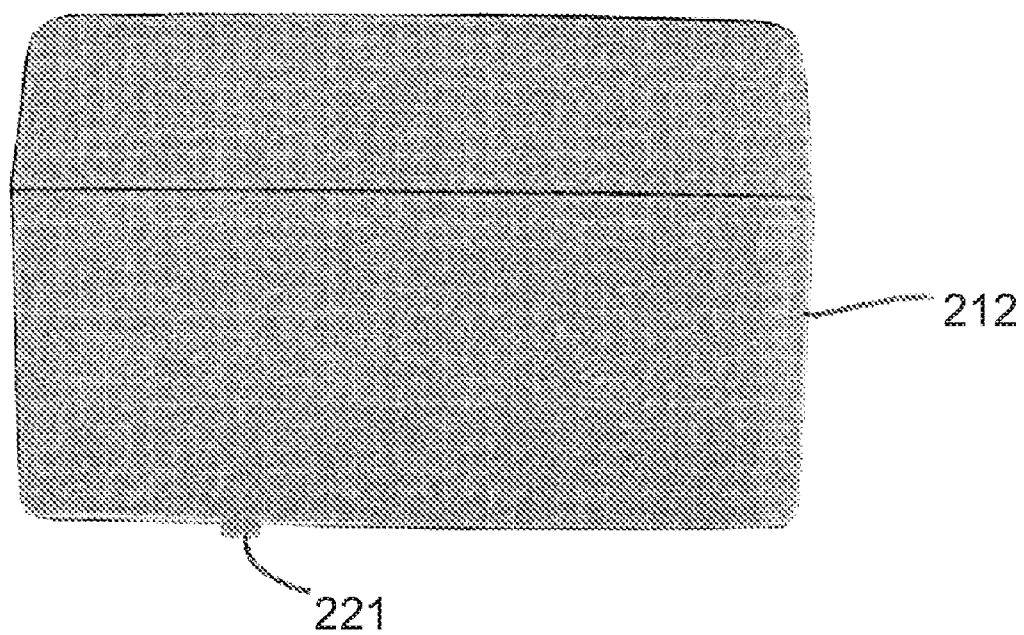


FIG. 17

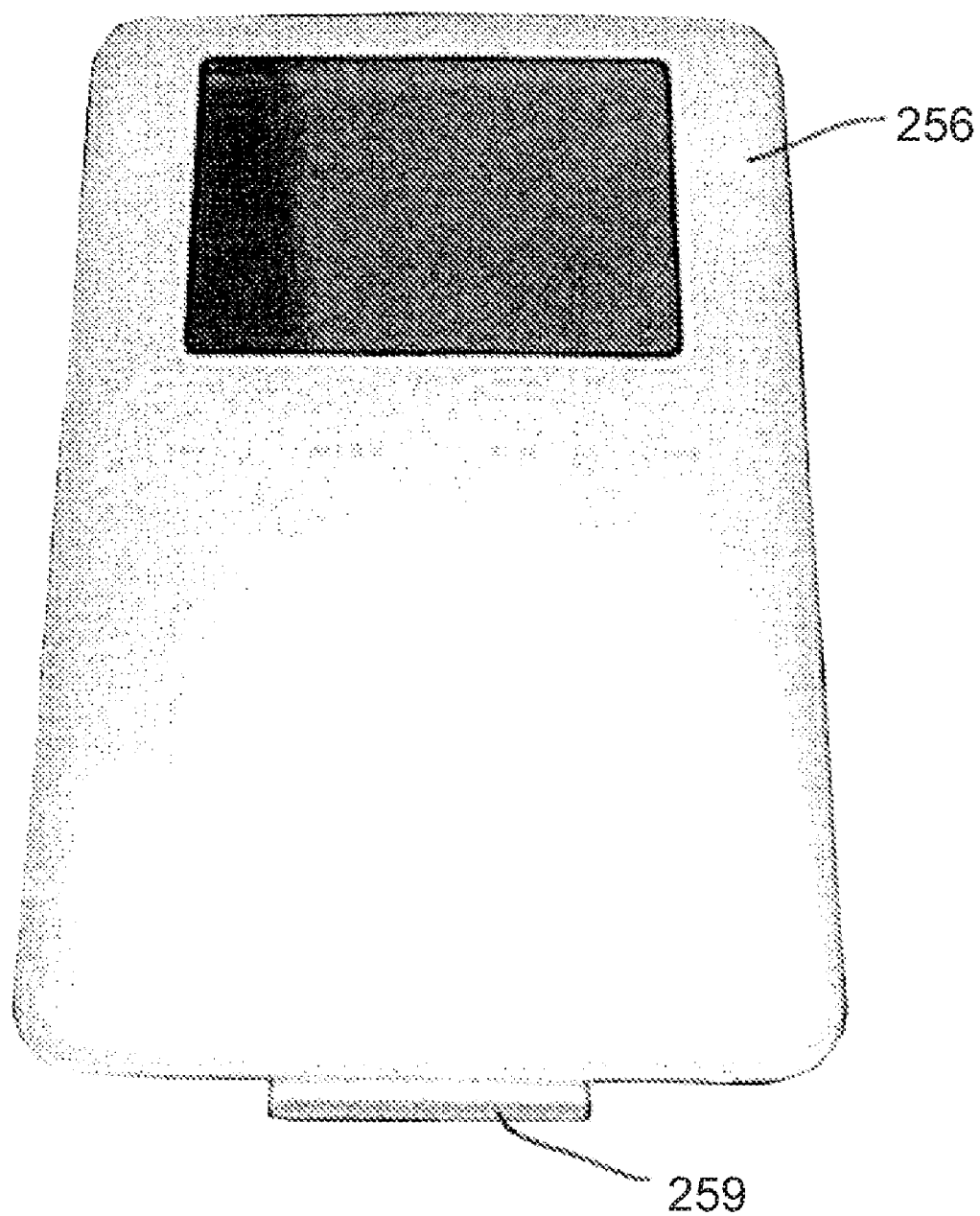
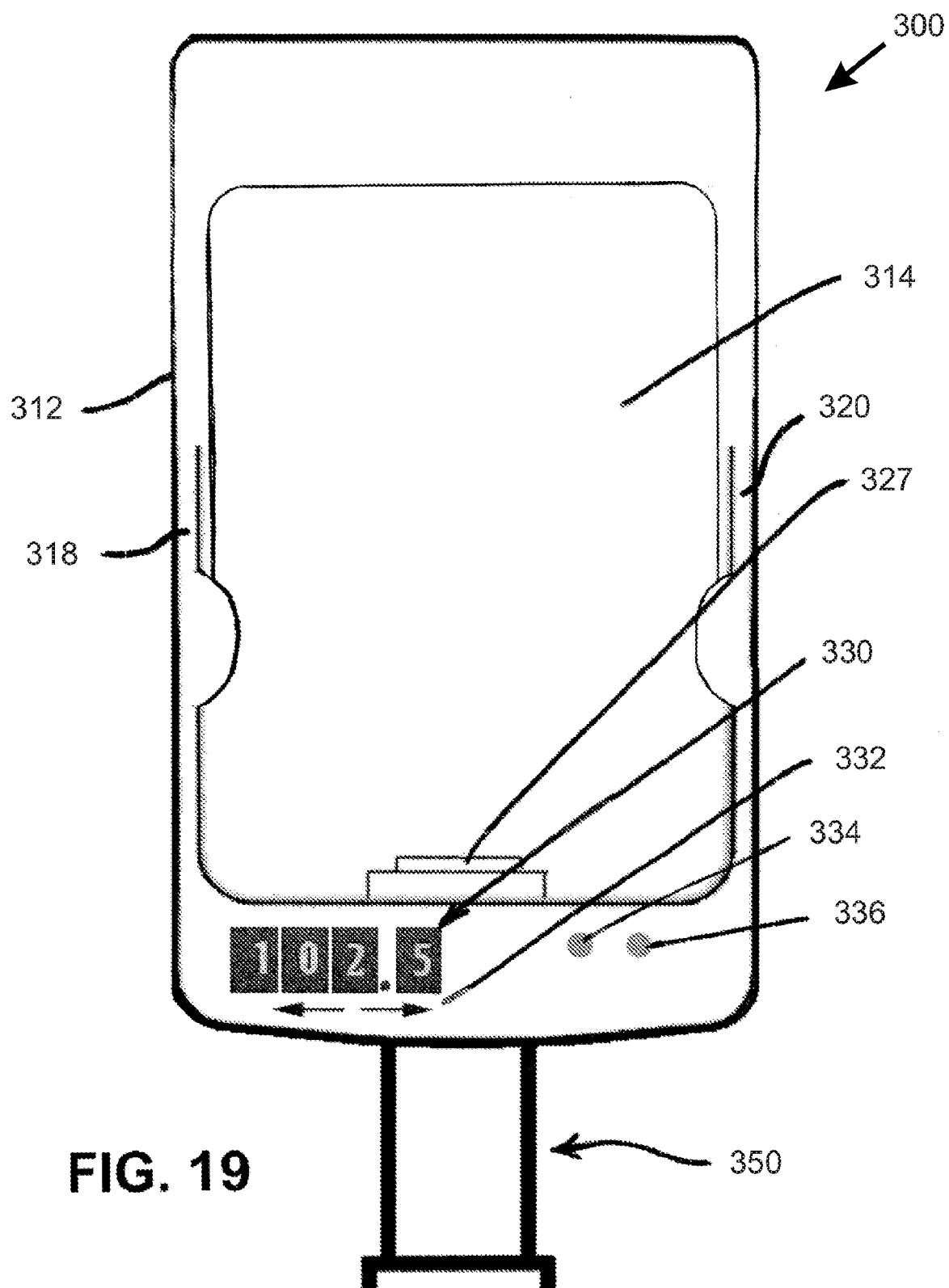


FIG. 18



FM TRANSMITTER AND POWER SUPPLY / CHARGING ASSEMBLY FOR MP3 PLAYER

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application is a continuation of U.S. patent application Ser. No. 10/615,108 filed on Jul. 8, 2003, which application is a continuation-in-part of U.S. patent application Ser. No. 10/197,367 filed on Jul. 17, 2002, and now issued as U.S. Pat. No. 6,591,085.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] This invention relates to accessories for MP3 players used for on-line downloading, storage and playing of music. More specifically, the invention relates to an FM transmitter and power supply/charging assembly for such MP3 players, and to a kit comprising such assembly in combination with other mounting/power/charging accessories.

[0004] 2. Description of the Related Art

[0005] Music players of widely varying type are ubiquitous throughout the world, and have evolved through various forms over the years, from portable single transistor radios in the 1950's to tape cassette players to compact disc players and more recently to MP3 players, which enable a user to download digital media (e.g., audio) material from an internet site and store same in storage medium of a player in a digital format (such as MPEG-1 audio layer 3, or "MP3") format for subsequent selective listening.

[0006] A number of MP3 players have been developed and are commercially available, including the Nomad jukebox commercially available from Creative Labs, SonicBlue's Rio volt, jukebox recorder commercially available from Archos Technology, and numerous others. A high-capacity MP3 player of such type is the iPod® MP3 player commercially introduced by Apple Computer, Inc. (Cupertino, Calif.) in 2001. The Apple iPod® has a capacity for approximately 1000 songs of commercial play length.

[0007] MP3 players of the aforementioned type rely on batteries for their portability, and are typically provided with a headset for user listening.

[0008] One problem associated with the small size and light-weight characteristics of such MP3 players, as requisite to their portability and ease of use, is battery life. Another problem is the personal character of the headphone-equipped MP3 player. The MP3 player may be equipped with a speaker, but its small size and light-weight characteristics limit the size of the speaker, making it less than desirable when it is desirable to transmit music to a group of persons, such as in a vehicle passenger compartment, or a room.

SUMMARY OF THE INVENTION

[0009] The present invention relates in certain embodiments to an FM transmitter and power supply/charging assembly for an MP3 player.

[0010] In one aspect, a FM transmitter and power supply/charging assembly comprises a unitary and modular docking

unit, in which the MP3 player is reposable in electrical communication therewith. The docking unit in a specific embodiment accommodating the iPod® MP3 player, the docking unit interconnects with the MP3 player via the MP3 player headphone and firewire ports. In other embodiments, accommodating MP3 players without firewire ports, the docking unit may interconnect with the MP3 player via the headphone and power port. The base docking unit contains within the unitary housing an FM transmitter and firewire power plug for the MP3 player. The base docking unit is provided with a matable plug coupling, for joining of the base docking unit to any of suitable power/charging components attachable thereto.

[0011] In another aspect, a base docking unit of the FM transmitter and power supply/charging assembly is provided as a component of a multi-accessory kit. The kit comprises, in addition to the base docking unit, a ratcheting arm coupleable with a cigarette lighter power socket, e.g., a conventional 12 volt socket, in which the arm also functions as a mounting device which is pivotably adjustable to spatially position the MP3 player and affixed docking unit in any of a variety of spatial positions, relative to the user. The kit optionally also includes a short adaptor coupleable with a power supply, e.g., in a desk mount or wall mount plate. The kit optionally further includes a desk mount that is engagable with the short adaptor, to provide a desk mountable conformation of the MP3 player, and/or a wall mount plate for wall mounting of the FM transmitter and power supply/charging assembly, so that the MP3 player may be disposed in the modular docking unit as wall mounted.

[0012] In another aspect, a docking and power supply/charging assembly electrically coupleable with a portable digital media player having a storage medium adapted to receive and store digital media files comprises: structure defining a docking cavity for receipt therein of a portable digital media player; at least one electrical coupling disposed in the docking cavity and adapted to engage the portable digital media player when the portable digital media player is received by the docking cavity; at least one power/charging circuit element connectable with said portable digital media player via the at least one electrical coupling element for transmission of electrical power there-through to charge and/or power the portable digital media player; and an adjustable mounting element affixed to a plug connector engageable with a cigarette lighter socket of a motor vehicle and adapted to maintain the portable digital media player in any of a plurality of spatial positions, the plug connector being in electrical communication with the at least one power/charging circuit element.

[0013] In another aspect, an audio transmitter and power supply/charging assembly electrically coupleable with a portable digital media player having a storage medium adapted to receive and store digital media files comprises: a cavity-defining body structure adapted to receive at least a portion of the portable digital media player, the body having at least one associated electrical connector adapted to engage the portable digital media player when the portable digital media player is received by the body structure; an audio transmitter connectable with said portable digital media player via the electrical connector and adapted to transmit audio content played by said portable digital media player to a separate audio player that is independent of said portable digital media player; and at least one power/

charging circuit element connectable with said portable digital media player via the at least one electrical connector and adapted to transmit electrical power therethrough to charge and/or power the portable digital media player.

[0014] In another aspect, a docking assembly electrically coupleable with a portable digital media player having a storage medium adapted to receive and store digital media files comprises: a body defining a docking cavity sized and shaped to receive at least a portion of the portable digital media player; at least one electrical coupling disposed in the cavity and adapted to engage the portable digital media player when the player is received by the body; at least one electrical circuit element adapted to conduct power from an external power source to the at least one electrical coupling; and a transmitter connectable with the portable digital media player via the at least one electrical coupling and adapted to wirelessly transmit media content from the portable digital media player to an external receiving device.

[0015] In another aspect, a method for broadcasting signals from a portable digital media player to an external receiving device is provided, the method comprising the steps of: providing a docking assembly comprising (a) a cavity-defining body adapted to receive the portable digital media player, (b) a transmitter adapted to transmit media content from the portable digital media player to the external receiving device, (c) an electrical coupling disposed in the cavity and adapted to engage the portable digital media player when the portable digital media player is received by the body, and (d) at least one electrical circuit element to conduct power from an external power source to the electrical coupling; inserting at least a portion of the portable digital media player into the cavity, wherein the electrical coupling engages the portable digital media player during the inserting step; and wirelessly transmitting a signal containing media content played by the portable digital media player to the external receiving device.

[0016] In another aspect, a method for broadcasting signals from a portable digital media player to an external receiving device is provided, the method comprising the steps of: providing a docking assembly comprising (a) a body adapted to retain the portable digital media player, (b) a transmitter adapted to transmit audio content from the portable digital media player to the external receiving device, (c) an electrical coupling disposed in or on the body and adapted to engage the portable digital media player when the player is received by the body, and (d) at least one electrical circuit element to conduct power from an external power source to the electrical coupling; operatively coupling the portable digital media player and the docking assembly in a single step of depressing at least a portion of the portable digital media player into or against the body to simultaneously engage the electrical coupling; and wirelessly transmitting a signal containing media content played by the portable digital media player to the external receiving device.

[0017] Other aspects, features and advantages of the present invention will be more fully apparent from the ensuing disclosure and appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] FIG. 1 is a front elevation view of an FM transmitter and power supply/charging assembly according to one embodiment of the present invention.

[0019] FIG. 2 is a rear elevation view of the FM transmitter and power supply/charging assembly of FIG. 1.

[0020] FIG. 3 is a right-hand side view, in elevation, of the assembly of FIGS. 1-2.

[0021] FIG. 4 is a bottom plan view of the assembly of FIGS. 1-2.

[0022] FIG. 5 is a top plan view of the assembly of FIGS. 1-2.

[0023] FIG. 6 is a left-hand side view, in elevation, of the assembly of FIGS. 1-2.

[0024] FIG. 7 is a front elevation view of the FM transmitter and power supply/charging assembly of FIG. 1, with an MP3 player mounted therein.

[0025] FIG. 8 is a schematic representation of an audio system including the modular docking unit of the FM transmitter and power supply/charging assembly according to one embodiment of the invention, having an MP3 player mounted therein, and arranged in FM transmitting relationship to an FM receiver having audio speakers attached thereto.

[0026] FIG. 9 is a pivotably adjustable ratchet adaptor, which is coupleable with a cigarette lighter power socket, e.g., a conventional 12 volt socket, wherein the outer coupling end of the adaptor is engagable with the port on the rear face of the docking unit of the FM transmitter and power supply/charging assembly, with the ratchet arm being pivotably adjustable to spatially position the MP3 player at a given orientation relative to a user.

[0027] FIG. 10 is a short adaptor coupleable with the coupling structure on the rear face of the docking unit of FIGS. 1-6, wherein the adaptor includes a wall mounting plate, accommodating wall mounting of the FM transmitter and power supply/charging assembly.

[0028] FIG. 11 is a desk mount device, in which the short adaptor of FIG. 10 may be reposed, to provide desktop access of a user to the MP3 player as reposed in the docking unit coupled with the adaptor mounted on the desk mount article.

[0029] FIG. 12 is a front elevation view of an FM transmitter and power supply/charging assembly, according to another embodiment of the present invention.

[0030] FIG. 13 is a left-hand side view, in elevation, of the assembly of FIG. 12.

[0031] FIG. 14 is a bottom plan view of the assembly shown in FIG. 12.

[0032] FIG. 15 is a rear elevation view of the FM transmitter and power supply/charging assembly of FIG. 12.

[0033] FIG. 16 is a right-hand side view, in elevation, of the assembly of FIG. 12.

[0034] FIG. 17 is a top plan view of the FM transmitter and power supply/charging assembly shown in FIG. 12.

[0035] FIG. 18 is a perspective view of an MP3 player having a connector adapted for coupling with a firewire port or a USB port.

[0036] FIG. 19 is a schematic front elevation view of an FM transmitter and power supply/charging assembly

according to another embodiment of the invention, arranged for mounting therein of an MP3 player of the type shown in FIG. 18.

DETAILED DESCRIPTION OF THE INVENTION, AND PREFERRED EMBODIMENTS THEREOF

[0037] The present invention, in one embodiment, provides an integrated FM transmitter and power supply/charging assembly for an MP3 player, that dramatically increases the utility of the basic MP3 player.

[0038] The FM transmitter in the assembly according to one embodiment of the invention transmits music played through the MP3 player to a range of FM frequencies, enabling FM reception of audio music signals that then can be played through an FM receiver, such as an FM radio receiver in a vehicle, a FM radio in proximity to the FM transmitter, and otherwise for extended area broadcast of the MP3 player-originated music.

[0039] As one example, the base dock unit of the FM transmitter and power supply/charging assembly may be deployed in an automobile or other vehicular environment, wherein the unit is powered by a power adaptor plugged into a cigarette lighter socket of the vehicle. The FM transmitter then transmits the MP3 player-originated music to the FM receiver in such vehicle, enabling the acoustic system of the vehicle to be employed for broadcast of the music to the interior passenger compartment of the vehicle.

[0040] The FM transmitter and power supply/charging assembly may as hereinafter described more fully comprise an AC charger enabling the battery of the MP3 player to be recharged to a more fully charged state allowing its use to be lengthened while on battery power.

[0041] The FM transmitter and power supply/charging assembly may be provided in a kit including the base docking unit and various adaptor/charger/mount accessories, as hereinafter described.

[0042] Although the ensuing discussion is directed to an embodiment having specific use and applicability to the iPod® MP3 player, it will be recognized that the utility of the invention is not thus limited, but rather extends to and encompasses other MP3 players. Accordingly, although the iPod® MP3 player utilizes a firewire port for power connection purposes, other types of port and electrical connection means may be employed.

[0043] Referring now to the drawings, FIG. 1 shows a front elevation view of an FM transmitter and power supply/charging assembly 10 having a main body portion 12 including a back wall whose surface 14 together with side rails 18 and 20 define a cavity in which the MP3 player is selectively reposible. Such an FM transmitter and power supply/charging assembly, along with assemblies according to other embodiments, are sometimes referred to hereinafter as the modular docking unit(s).

[0044] As shown in FIG. 1, the modular docking unit is provided with a male connector element 26 matably engageable with the headphone port of the MP3 player, as well as a coupling 28 matably engageable with the firewire port of the MP3 player.

[0045] In the housing of the modular docking unit according to one embodiment is provided an FM transmitter, which transmits music played through the MP3 player to a range of FM frequencies. The FM transmitter may be of any suitable type, and operates to transmit music to an FM receiver in the vicinity of the MP3 player.

[0046] The FM transmitter may for example be provided having a tuning frequency in the FM band of 88-95 Megahertz (MHz) and a transmission range of 4-6 feet or more. Stereo transmitters of such type are readily commercially available, and are of appropriate size for incorporation in the modular docking unit.

[0047] The FM transmitter may simply transmit at a frequency fixed in the aforementioned 88-95 band, or the transmitter may be tunable to select a specific frequency within such spectrum.

[0048] In operation, the FM receiver receives the transmitted audio from the MP3 player transmitted by the modular docking unit, and the FM receiver, e.g., in a user's automobile, then is able to transmit the audio content to the vehicular sound system, e.g., by tuning the FM receiver to the frequency of the transmitter in the modular docking unit.

[0049] The modular docking unit in the interior of its housing also includes circuitry and components for charging the battery of the MP3 player, through the firewire power port or other electrical input port (e.g., USB or other port) to charge the MP3 player's battery, as well as providing power to the MP3 player when docked in the modular docking unit.

[0050] As shown in FIG. 1, the modular docking unit has on a lower portion 22 thereof indicator lights 30 and 32, which are configured for indicating when the MP3 player is charging or fully charged, and/or when the MP3 player is "ON."

[0051] The modular docking unit may also be provided with an ON/OFF switch, or selectively actuating the MP3 player, charging function of the modular docking unit, etc.

[0052] FIG. 2 is a rear elevation view of the MP3 player, showing the back wall surface 34, on which is provided a boss 37 forming a coupling cavity 36 including a power connector element 38. The housing of the modular docking unit may be of a 2-piece construction, with mechanical fastener elements 40, 42, 44 and 46 serving to couple the respective parts of the unit. Alternatively, the modular docking unit may be formed of a unitary molded material, having a port or opening therein for insertion and assembly of the interior components, including circuitry and components as described hereinabove.

[0053] FIG. 3 is a right-hand side elevation view of the modular docking unit, showing the retention member 24 at the upper portion of the housing. FIG. 4 is a bottom plan view of the modular docking unit, including a further mechanical fastener 50 for retaining interior assembly elements of the unit.

[0054] FIG. 5 is a top plan view of the modular docking unit, showing the retention member 24, which is selectively disengageable by thumb-actuatable release member 54.

[0055] FIG. 6 is a left-hand side elevation view of the modular docking unit, showing the symmetrical character of same relative to the view illustrated in FIG. 3.

[0056] FIG. 7 illustrates the FM transmitter and power supply/charging assembly 10 having an MP3 player 56 disposed in the cavity of the body 12.

[0057] FIG. 8 is a corresponding view of MP3 player 56 mounted in the body 12 of the FM transmitter and power supply/charging assembly 10. In this configuration, the modular docking unit is mounted on a pedestal 60 having an arm extending upwardly at the rear of the modular docking unit and coupling with the power element 38 on boss 37 (see FIGS. 2, 3 and 6). The pedestal 60 is provided with an electrical coupling 62 accommodating power plug 64 connected to power cord 66, providing power to the pedestal 60 for transmittal through contact 38 to the MP3 player by element 28, as shown in FIG. 1.

[0058] When the MP3 player is actuated to play the stored audio content, the corresponding signal is transmitted through coupling element 26 shown in FIG. 1 to the FM transmitter in the housing of the modular docking unit, generating an FM signal that is transmitted to FM receiver 68 powered by power cord 70. The FM receiver 68 in turn is coupled by speaker wires 74 and 78 to speakers 72 and 76, respectively. In such manner, the audio content played by the MP3 player 56 is transmitted by the FM transmitter to FM receiver 68 and outputted as sound output at speakers 72 and 76.

[0059] Concurrently, the MP3 player can be electrically charged to renew the battery power of the unit, so that when undocked from the modular docking unit, the MP3 player may be outfitted with earphones and deployed in a personal listening arrangement.

[0060] Although the FIG. 8 embodiment is shown as including a table-type FM receiver, it will be recognized that the arrangement is illustrative only, and is adaptable to automotive or vehicular sound systems including an FM receiver.

[0061] The modular docking unit as shown in FIGS. 1-6 may be coupled with a power source in any suitable manner.

[0062] FIG. 9 shows a ratchet-type adaptor 80 including engagement structure 82 matable with the cavity 36 shown in FIG. 2 on the modular docking unit. The coupling structure 82 is at the face of tubular member 81 which is pivotably mounted on spindle 84 which is positionable by means of the manual wing-nut 86, which is selectively manually tightenable or loosenable, to adjust the attitude of tubular member 81 relative to the main body 88 of the adaptor. The main body 88 is joined to a plug end 90 featuring electrical contact elements 92 and 94, for engagement of the plug end 90 with a corresponding socket, such as a cigarette lighter socket of a motor vehicle.

[0063] FIG. 10 shows another adaptor 96 having engagement structure 98 at the extremity of cylindrical member 100 mounted on plate number 102. The engagement structure 98 is engagable with the cavity 37 at the rear face of the modular docking unit (see FIG. 2).

[0064] The plate 102 shown in FIG. 10 is provided with mounting openings 104, 106 and 108, for wall-attachment of the adaptor, using mounting screws, nails, etc.

[0065] The adaptor shown in FIG. 10 permits the modular docking unit to be wall-mounted, whereby the MP3 player

may be selectively docked and undocked from the wall-mounted modular docking unit.

[0066] FIG. 11 is a perspective view of a desk mount article 120, in which the short adaptor 96 shown in FIG. 10 may be selectively reposed, or coupling with the desk mount article 120 joined to power cord 122.

[0067] The modular docking unit as shown in FIGS. 1-6 may thereby be coupled with the adaptor 96 of the desk mount article by engagement of the engagement structure with the cavity 37 and electrical coupling 38 as shown in FIG. 2.

[0068] FIG. 12 is a front elevation view of an FM transmitter and power supply/charging assembly 200, or modular docking unit, according to another embodiment of the present invention.

[0069] The modular docking unit 200 includes a main body portion 212 defining a cavity for selectively reposing the MP3 player therein. The cavity is bounded by back wall 214 and side rails 218 and 220. Extending into the cavity is a male connector 226, which may serve to couple the modular docking unit with the headphone jack of the MP3 player, as well as a coupling 228 matably engagable with the firewire port of the MP3 player. The cavity as shown is also bounded by laterally inwardly facing elements, which serve as inwardly extending tabs on the respective side rails, to assist in retaining the MP3 player in position in the cavity during audio play, storage or charging of the player.

[0070] On the upper portion 222 of the modular docking unit 200 in the position shown, is provided an LED power indicator light 230, and a firewire port adjustment switch 221, which serves to laterally reposition the coupling 228 in the cavity, so that the coupling is placed in register with the firewire port of the MP3 player.

[0071] On the lower portion of the modular docking unit 200 in the position illustrated in FIG. 12, a retractable security shelf member 224 is provided. The shelf member 224 can be selectively manually adjusted to a forward position to assist in retaining the MP3 player in the cavity of the unit, so that the MP3 player is positionally fixtured in the cavity of the modular docking unit during use or charging of the MP3 player.

[0072] In the ensuing FIGS. 13-17, all parts and structural features of the modular docking unit are correspondingly numbered to the same parts and structural features as shown in FIG. 12, for ease of reference.

[0073] FIG. 13 is a left-hand side view, in elevation, of the modular docking unit 200 of FIG. 12, showing the boss 237 on the rear surface of the unit and the protruding power connector element 238. A headphone jack 219 is provided on the side surface of the unit, as shown, for selective use of the modular docking unit in a headphones-engaged listening mode when an MP3 player is mounted in the unit.

[0074] FIG. 14 is a bottom plan view of the modular docking unit shown in FIG. 12, showing the retractable security shelf 224. The shelf member includes a ridged surface to facilitate engagement with the thumb or other digit of the user, in selectively extending the shelf forwardly to secure the MP3 player in position, or alternatively to retract the shelf so that the MP3 player can be removed from the modular docking unit.

[0075] FIG. 15 is a rear elevation view of the modular docking unit of FIG. 12, showing the boss 237 on the back wall surface 234. The boss 237 forms a coupling cavity 236 including the power connector element 238 therein. The housing of the modular docking unit of this embodiment can be of two-piece construction, wherein each of the front and back sections of the housing are secured to one another by means of mechanical fasteners 240, 242 and 244, as shown. The housing of the modular docking unit may alternatively be formed of single-piece construction, or otherwise formed and fabricated in a suitable manner facilitating the assembly of the unit.

[0076] FIG. 16 is a right-hand side view, in elevation, of the assembly of FIG. 12, showing the boss 237 on the back wall surface and the power connector element 238 protruding therefrom. The retractable security shelf 224 is shown at the bottom of the unit in the view illustrated, and the firewire port adjustment switch 221 is shown protruding from the upper end of the unit.

[0077] FIG. 17 is a top plan view of the modular docking unit shown in FIG. 12, with the firewire port adjustment switch 221 protruding from the front surface of the main body portion 212 of the unit.

[0078] FIG. 18 is a perspective view of an MP3 player 256 having a connector 259 adapted for docking with a firewire port or a USB port. The MP3 player 256 illustrated in FIG. 18 is an iPod® MP3 player, available from Apple Computer, Inc., Cupertino, Calif., although other MP3 players can be used with the modular docking unit according to various embodiments of the invention.

[0079] FIG. 19 is a schematic front elevation view of a modular docking unit 300 according to another embodiment of the invention, arranged for mounting therein of an MP3 player of the type shown in FIG. 18. The modular docking unit 300 includes a housing 312 defining a cavity therein bounded by back wall surface 314 and the side rails 318 and 320 of the housing. At the bottom extremity of the cavity is positioned a dock connector 327 that mates with the connector 259 of the MP3 player 256 (see FIG. 18).

[0080] The modular docking unit 300 has on a lower portion of the housing, on a frontal surface thereof, a frequency indicator display 330, which in the drawing indicates a frequency of 102.5 megahertz (MHz) being transmitted by the transmitter in the docking unit. Below the frequency indicator display is a tuning control 332, which can be variously configured as a membrane switch, as a thumb-wheel control, or other control member that is selectively actuatable to increase or decrease the transmitter frequency, as desired.

[0081] To the right of the frequency indicator display 327 on the lower portion of the housing 312 is a power indicator 334, which may comprise an LED or other suitable element indicating the power "ON" or "OFF" status of the unit. Adjacent to the power indicator 334 is an FM transmitter indicator element 336 which may likewise comprise an LED or other suitable element indicating the "ON" or "OFF" status of the FM transmitter disposed in the housing.

[0082] The modular docking unit 300 of FIG. 19 is shown as coupled to a flexible 12-volt cigarette lighter adapter 350, to enable the unit to be powered from the electrical system of a vehicle, by plug-in of the adapter 350 into the cigarette

lighter of the vehicle. The connected modular docking unit 300 then is situated to receive the MP3 player in the cavity of the housing, and to be actuated to transmit audio from the MP3 player to the sound system of the vehicle in which the modular docking unit is mounted.

[0083] It will therefore be recognized that the FM transmitter and power supply/charging assembly of the present invention may be widely varied in specific structure, while providing FM transmission ability to the MP3 player docked therein, and concurrently providing charging capability to the MP3 player battery, as well as power during docked usage of the MP3 player.

[0084] The various adaptor units shown, as well as the associated mounting articles, may be provided as a kit together with the FM transmitter and power supply/charging assembly, to provide a package of alternative parts for varied deployment of the docked MP3 player.

[0085] While the invention has been described herein with respect to various illustrative aspects, features and embodiments, it will be recognized that the invention is not thus limited, but that the present invention extends to and encompasses other features, modifications, and alternative embodiments, as will readily suggest themselves to those of ordinary skill in the art based on the disclosure and illustrative teachings herein. The claims that follow are therefore to be construed and interpreted as including all such features, modifications and alternative embodiments, within their spirit and scope.

What is claimed is:

1. A docking and power supply/charging assembly electrically coupleable with a portable digital media player having a storage medium adapted to receive and store digital media files, said assembly comprising:

structure defining a docking cavity for receipt therein of a portable digital media player;

at least one electrical coupling disposed in the docking cavity and adapted to engage the portable digital media player when the portable digital media player is received by the docking cavity;

at least one power/charging circuit element connectable with said portable digital media player via the at least one electrical coupling element for transmission of electrical power therethrough to charge and/or power the portable digital media player; and

an adjustable mounting element affixed to a plug connector engageable with a cigarette lighter socket of a motor vehicle and adapted to maintain the portable digital media player in any of a plurality of spatial positions, the plug connector being in electrical communication with the at least one power/charging circuit element.

2. The assembly of claim 1, further comprising a radio frequency transmitter connectable with the portable digital media player via the at least one coupling and adapted to transmit media content played by the portable digital media player to an external receiving device.

3. The assembly of claim 2, wherein the radio frequency transmitter has selectively adjustable digital frequency tuning and the assembly further comprises a digital frequency indicator display for displaying the transmission frequency.

4. The assembly of claim 1, wherein the at least one electrical coupling element comprises any of a firewire coupling and a USB coupling.

5. The assembly of claim 1, wherein the portable digital media player is adapted to store and play MP3 format audio files.

6. The assembly of claim 1, wherein the assembly comprises a plurality of removably coupled parts.

7. The assembly of claim 1, further comprising a selectively disengageable retention element adapted to retain the portable digital media player in position in the docking cavity.

8. The assembly of claim 1, further comprising an auxiliary jack adapted to receive a male stereo mini plug.

9. The assembly of claim 8, wherein the auxiliary jack is in electrical communication with the at least one electrical coupling.

10. An audio transmitter and power supply/charging assembly electrically coupleable with a portable digital media player having a storage medium adapted to receive and store digital media files, said assembly comprising:

a cavity-defining body structure adapted to receive at least a portion of the portable digital media player, the body having at least one associated electrical connector adapted to engage the portable digital media player when the portable digital media player is received by the body structure;

an audio transmitter connectable with said portable digital media player via the electrical connector and adapted to transmit audio content played by said portable digital media player to a separate audio player that is independent of said portable digital media player; and

at least one power/charging circuit element connectable with said portable digital media player via the at least one electrical connector and adapted to transmit electrical power therethrough to charge and/or power the portable digital media player.

11. The assembly of claim 10, further comprising a plug connector engageable with a cigarette lighter socket of a motor vehicle, and an adjustable mounting element affixed to the plug connector, wherein the adjustable mounting element is adapted to maintain the assembly in any of a plurality of spatial positions.

12. The assembly of claim 10, wherein the audio transmitter has selectively adjustable digital frequency tuning, and the assembly further comprises a digital frequency indicator display for displaying the transmission frequency.

13. The assembly of claim 10, wherein the electrical connector comprises any of a firewire connector and a USB connector.

14. The assembly of claim 10, wherein the portable digital media player is adapted to store and play MP3 format audio files.

15. The assembly of claim 10, wherein the assembly comprises a plurality of removably coupled parts.

16. The assembly of claim 10, further comprising a selectively disengageable retention element adapted to retain the portable digital media player in position in the docking cavity.

17. The assembly of claim 10, further comprising an auxiliary jack disposed in or on the body structure and adapted to receive a male stereo mini plug.

18. The assembly of claim 10, wherein the auxiliary jack is in electrical communication with the at least one electrical coupling.

19. A docking assembly electrically coupleable with a portable digital media player having a storage medium adapted to receive and store digital media files, the assembly comprising:

a body defining a docking cavity sized and shaped to receive at least a portion of the portable digital media player;

at least one electrical coupling disposed in the cavity and adapted to engage the portable digital media player when the player is received by the body;

at least one electrical circuit element adapted to conduct power from an external power source to the at least one electrical coupling; and

a transmitter connectable with the portable digital media player via the at least one electrical coupling and adapted to wirelessly transmit media content from the portable digital media player to an external receiving device.

20. The assembly of claim 19, wherein the body comprises a plurality of removably coupled parts.

21. The assembly of claim 19, wherein the body includes a retention element adapted to retain the portable digital media player in position.

22. The assembly of claim 19, wherein the retention member is selectively disengageable.

23. The assembly of claim 19, wherein the at least one electrical coupling comprises any of a firewire coupling and a USB coupling.

24. The assembly of claim 19, further comprising a plug connector engageable with a cigarette lighter socket of a motor vehicle, and an adjustable mounting element affixed to the plug connector, wherein the adjustable mounting element is adapted to maintain the docking assembly in any of a plurality of spatial positions.

25. The assembly of claim 19 wherein the transmitter has selectively adjustable digital frequency tuning and the assembly further comprises a digital frequency indicator display for displaying the transmission frequency.

26. The assembly of claim 19, wherein the portable digital media player is adapted to store and play MP3 format audio files.

27. The assembly of claim 19, further comprising an auxiliary jack disposed in or on the body structure and adapted to receive a male stereo mini plug.

28. The assembly of claim 27, wherein the auxiliary jack is in electrical communication with the at least one electrical coupling.

29. A method for broadcasting signals from a portable digital media player to an external receiving device, the method comprising the steps of:

providing a docking assembly comprising (a) a cavity-defining body adapted to receive the portable digital media player, (b) a transmitter adapted to transmit media content from the portable digital media player to the external receiving device, (c) an electrical coupling disposed in the cavity and adapted to engage the portable digital media player when the portable digital media player is received by the body, and (d) at least

one electrical circuit element to conduct power from an external power source to the electrical coupling;

inserting at least a portion of the portable digital media player into the cavity, wherein the electrical coupling engages the portable digital media player during the inserting step; and

wirelessly transmitting a signal containing media content played by the portable digital media player to the external receiving device.

30. The method of claim 29, further comprising the step of conducting power from the electrical power source through the electrical coupling to the portable digital media player to power and/or charge the portable digital media player.

31. The method of claim 29, wherein the portable digital media player comprises a storage medium adapted to receive and store digital media files.

32. The method of claim 31, wherein the digital media files comprise MP3 format digital media files.

33. The method of claim 29, wherein the transmitter has selectively adjustable digital frequency tuning and the assembly has a digital frequency indicator display for displaying the transmission frequency, the method further comprising the steps of:

selecting a desired transmission frequency of the transmitter; and

selecting a reception frequency of the external receiving device corresponding to the transmission frequency of the transmitter.

34. The method of claim 29, wherein the electrical coupling comprises any of a firewire coupling and a USB coupling, the method further comprising the step of transferring a media signal from the portable digital audio player to the docking assembly through the firewire coupling and/or USB coupling.

35. A method for broadcasting signals from a portable digital media player to an external receiving device, the method comprising the steps of:

providing a docking assembly comprising (a) a body adapted to retain the portable digital media player, (b) a transmitter adapted to transmit audio content from the portable digital media player to the external receiving device, (c) an electrical coupling disposed in or on the body and adapted to engage the portable digital media player when the player is received by the body, and (d) at least one electrical circuit element to conduct power from an external power source to the electrical coupling;

operatively coupling the portable digital media player and the docking assembly in a single step of depressing at least a portion of the portable digital media player into or against the body to simultaneously engage the electrical coupling; and wirelessly transmitting a signal containing media content played by the portable digital media player to the external receiving device.

36. The method of claim 35, further comprising the step of conducting power from the electrical power source through the electrical coupling to the portable digital media player to power and/or charge the portable digital media player.

37. The method of claim 35, wherein the portable digital media player comprises a storage medium adapted to receive and store digital media files.

38. The method of claim 35, wherein the digital media files comprise MP3 format digital media files.

39. The method of claim 35, wherein the transmitter has selectively adjustable digital frequency tuning and the assembly has a digital frequency indicator display for displaying the transmission frequency, the method further comprising the steps of:

selecting a desired transmission frequency of the transmitter; and

selecting a reception frequency of the external receiving device corresponding to the transmission frequency of the transmitter.

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