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(54) Title: MODULE SPECIFIC INTERFACE FOR CELLULAR PHONES

(57) Abstract: A system for connecting between at least one radio communication transceiver (212) and at least one conventional telephone including: (a) at least one detachable adaptor (112), each adaptor having (i) a cellular transceiver docking connector (124), the connector operatively connected to the radio communication transceiver, and (ii) an interface module operatively connected to the docking connector, wherein the module is designed and configured for utilization of at least one protocol that enables information transfer between the conventional telephone and the transceiver.

MODULE SPECIFIC INTERFACE FOR CELLULAR PHONES

FIELD AND BACKGROUND OF THE INVENTION

The present invention relates to auxiliary equipment for radio communication transceivers, and, more particularly, to an inventive universal adaptor and an inventive docking station for connecting various types of cellular telephones with a conventional telephone or telephone line, and to a telephone system utilizing such an adaptor to provide communication and auxiliary telephone services between cellular telephones and conventional telephones or telephone lines.

There is growing concern about the safety of hand-held cellular telephones, because they emit microwave radiation near the user's brain. Near the antenna, power densities as high as 300 W/m^2 are common. Studies have shown that long term exposure to radiation power densities as low as 5 W/m^2 can produce mutations in cell cultures.

One efficient method of reducing radiation while at the same time, making the use of cellular phones more convenient, is to connect a cellular phone to a plain old telephone (POT) or the like by means of a cellular phone docking station, such that incoming cellular calls can be received on the POT, and outgoing cellular calls can be conducted from the POT. A prior art device featuring a combination charging circuit and docking station **110** for hand-held cellular transceivers is shown in FIG. 1. Device **110** enables the coupling of hand-held cellular transceiver **212** with a standard telephone-type communication device **108**, such as a facsimile, modem, plain old telephone or any other device that would normally be coupled to a standard telephone wall jack.

One deficiency of currently-known docking stations is that they are generally appropriate for a cellular transceiver of a particular manufacturer (and often, for a specific model). The mechanical connections, voltage, protocols, etc. tend to vary from model to model and from manufacturer to manufacturer, particularly in view of the constant improvements in the performance and capability that are designed into cellular transceivers.

Consequently, a docking station that is purchased today may be inappropriate for the model of tomorrow, or for the cellular transceiver of a guest or colleague. It would be advantageous to have a system in which a docking station would be suitable for use in conjunction with any present-day, commercially-available cellular transceiver, or with any cellular transceiver that becomes commercially-available in the future.

Moreover, when conventional telephone lines and/or service are down, unreliable, or slow, the functioning of companies, hospitals, police stations and various kinds of organizations may be crippled. Sophisticated internal telephone networks are essentially of no use with regard to communication with the outside world. It would be of great advantage to have a system that enables incoming calls to various cellular transceivers to be connected and routed through such internal telephone lines or networks to the appropriate destination, even when the conventional telephone service is impaired or not functioning. It would also be of great advantage to have a system enabling outgoing calls to be routed from a telephone unit connected to the internal telephone network to an external telephone or telephone line. This would allow even large internal networks to communicate with external phones in a substantially normal fashion, despite local problems with the conventional telephone company service.

SUMMARY OF THE INVENTION

According to the present invention there is provided a system for connecting between at least one radio communication transceiver and at least one conventional telephone including: (a) at least one detachable adaptor, each adaptor having (i) a cellular transceiver docking connector, the connector operatively connected to the radio communication transceiver, and (ii) an interface module operatively connected to the docking connector, wherein the module is designed and configured for utilization of at least one protocol that enables information transfer between the conventional telephone and the transceiver.

According to another aspect of the present invention there is provided a

method for routing a call to and from at least one radio communication transceiver, the method including: (a) providing a system including: (i) at least one radio communication transceiver; (ii) a detachable adaptor for each transceiver, each adaptor having: (A) a cellular transceiver docking connector, the connector operatively connected to the radio communication transceiver, and (B) an interface module operatively connected to the docking connector, the module designed and configured for utilization of at least one protocol that enables information transfer between the conventional telephone and the transceiver; (iii) a transceiver docking station for each transceiver; (iv) a system controller unit for controlling operation of the system, and (v) a plurality of conventional telephones, each of the telephones operatively connected to the system controller unit, such that each transceiver is operatively connected to at least one docking station and at least one adaptor; (b) connecting each radio communication transceiver, via the adaptor, to the transceiver docking station for each receiver, and (c) routing a call between the radio communication transceiver and at least one of the conventional telephones by means of the system controller unit.

According to further features in the described preferred embodiments, the call is an incoming call from the transceiver to at least one of the conventional telephones.

According to further features in the described preferred embodiments, the call is an outgoing call from one of the conventional telephones to one of the transceivers.

According to still further features in the described preferred embodiments, the system further includes a conventional telephone switchboard, one or more calls being normally routed by the switchboard, and the routing is performed solely according to a pre-determined condition.

According to still further features in the described preferred embodiments, the pre-determined condition is selected from at least one of the group consisting of disabled telephone company service, partially disabled telephone company service, overloaded telephone company service, and a manual override of a telephone company service.

According to still further features in the described preferred embodiments, the radio communication transceiver is a cellular transceiver.

According to still further features in the described preferred embodiments, the system further includes: (b) a transceiver docking station, operatively connected to the adaptor.

According to still further features in the described preferred embodiments, the detachable adaptor further includes: (iii) a docking station connector for connecting between the adaptor and the docking station.

According to still further features in the described preferred embodiments, the docking station includes: (i) a mechanical interface operatively connecting to the docking station connector, and (ii) a controller, operatively connected to the interface, for identification of the transceiver and for operation of at least one protocol.

According to still further features in the described preferred embodiments, the docking station includes: (i) a mechanical interface operatively connecting to the docking station connector, and (ii) a controller, operatively connected to the interface, for identification of the transceiver and for selection and operation of at least one protocol based on the identification.

According to still further features in the described preferred embodiments, the docking station is a modular docking station.

According to still further features in the described preferred embodiments, the controller is further designed and configured to determine and implement a voltage based on the identification.

According to still further features in the described preferred embodiments, the system further includes a plurality of modular transceiver docking stations, each of the modular docking stations operatively connected to one of each adaptor.

According to still further features in the described preferred embodiments, each adaptor further includes: (iii) a docking station connector for connecting between each pair of adaptor and docking station.

According to still further features in the described preferred embodiments, each of the modular docking stations includes: (i) a mechanical interface operatively connecting to the docking station connector, and (ii) a controller, operatively connected to the interface, for identification of the transceiver and for operation of at least one protocol.

According to still further features in the described preferred embodiments, each of the modular docking stations includes: (i) a mechanical interface operatively connecting to the docking station connector, and (ii) a controller, operatively connected to the interface, for identification of the transceiver and for selection and operation of at least one protocol based on the identification.

According to still further features in the described preferred embodiments, at least two of the modular docking stations are connected in series.

According to still further features in the described preferred embodiments, the modular docking stations are operatively connected to a system control unit.

According to still further features in the described preferred embodiments, each of the modular docking stations is equipped with a first connector for receiving an external power supply and an external communication, and with a second connector for transmitting power from the external power supply and transmitting the external communication to at least one other modular docking station.

According to still further features in the described preferred embodiments, each of the modular docking stations includes has a bypass switch, such that upon activation of the switch, the power from the external power supply and the external communication are bypassed to a subsequently-disposed station of the modular docking stations.

According to still further features in the described preferred embodiments, the first connector and second connector of the modular docking stations connected in series are complementary connectors.

According to still further features in the described preferred embodiments, the complementary connectors are connected to form a male-female connection.

According to still further features in the described preferred embodiments, the system further includes: (c) a telephone unit operatively connected to the docking station.

According to still further features in the described preferred embodiments, the telephone unit includes: (d) a computer connection and/or (e) a fax connection and/or (f) a connection to an internal phone system.

According to still further features in the described preferred embodiments, the

system includes a plurality of pairs, each of the pairs including a detachable adaptor and a docking station.

According to still further features in the described preferred embodiments, each of the pairs has an operative communication connection to a system controller unit.

According to still further features in the described preferred embodiments, each operative communication connection is in a parallel configuration.

According to still further features in the described preferred embodiments, each operative communication connection is in a series configuration.

According to still further features in the described preferred embodiments, the system further includes (c) a telephone unit including: (i) at least one conventional telephone receiver.

According to still further features in the described preferred embodiments, the telephone unit further includes: (ii) a keyboard for making telephone calls, and (iii) a display operatively connected to the keyboard.

According to still further features in the described preferred embodiments, the telephone unit further includes: (iv) a receptacle for a cordless telephone receiver, the receiver being operatively connected to the conventional telephone receiver.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention is herein described, by way of example only, with reference to the accompanying drawings. With specific reference now to the drawings in detail, it is stressed that the particulars shown are by way of example and for purposes of illustrative discussion of the preferred embodiments of the present invention only, and are presented in the cause of providing what is believed to be the most useful and readily understood description of the principles and conceptual aspects of the invention. In this regard, no attempt is made to show structural details of the invention in more detail than is necessary for a fundamental understanding of the invention, the description taken with the drawings making apparent to those skilled in the art how the several forms of the invention may be embodied in practice.

In the drawings:

Figure 1 is a pictorial diagram of a prior-art cellular interface connected to a standard telephonic type communication device;

Figure 2 is a block diagram of a prior-art cellular interface;

Figure 3 is a schematic illustration of a universal adaptor of the present invention, adapting between a transceiver and a transceiver docking station;

Figure 4 is a basic block diagram of a novel transceiver docking station, for use in conjunction with the above-described universal adaptor;

Figure 5 provides a schematic illustration of a modular docking station of the present invention;

Figure 6 provides a schematic illustration of modular docking stations connected in series to a controller;

Figure 7 provides a schematic illustration of an alternative embodiment in which modular docking stations are connected in parallel to a controller;

Figure 8 provides a schematic illustration of two rows of modular docking stations connected in series to a controller, the rows being connected via a flexible adaptor;

Figure 9 provides a schematic illustration of an inventive telephone unit having a receptacle for receiving the universal adaptor of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention is a system for connecting between a radio communication transceiver of substantially any variety and a conventional telephone line, using an inventive detachable adaptor that interfaces between the radio communication transceiver and a transceiver docking station.

The principles and operation of the present invention may be better understood with reference to the drawings and the accompanying description.

Before explaining at least one embodiment of the invention in detail, it is to be understood that the invention is not limited in its application to the details of construction and the arrangement of the components set forth in the following description or illustrated in the drawing. The invention is capable of other

embodiments or of being practiced or carried out in various ways. Also, it is to be understood that the phraseology and terminology employed herein is for the purpose of description and should not be regarded as limiting.

As used herein in the specification and in the claims section that follows, the term "conventional telephone" refers to a plain old telephone (POT), a wireless POT, an internal telephone line or system, and the like.

As used herein in the specification and in the claims section that follows, the term "radio communication transceiver" refers to an electronic device capable of sending and receiving radio signals. Cellular telephones fall within the definition of radio communication transceiver.

As used herein in the specification and in the claims section that follows, the term "cellular telephone" and the like refer to a communications device capable of communicating with a cellular communications network, as this term is further defined hereinbelow.

As used herein in the specification and in the claims section that follows, the term "cellular communications network" refers to a communications network which employs, at least in part, radio signals for communication of information and has communication cells. It will be appreciated that the cellular communications network can be of any type having, for example, digital capability, employing, e.g., TDMA (Time Division Multiple Access) or CDMA (Code Division Multiple Access) technology. An example of a network that is appropriate for use with the present invention is UMTS (universal mobile telecommunication system) which is a GSM-based third generation mobile network. UMTS, scheduled to be introduced in 2001 will build on and extend the capabilities of present day mobile technologies (like digital cellular and cordless) by providing increased capacity, data capability and a far greater range of services using an innovative radio access scheme and an enhanced, evolving core network allowing users to access remote systems through a band-width of up to 144 Kbps. Further detail relating to cellular communications networks can be found in a plurality of text books, an example of which is Cellular Telephones and Pagers, An Overview, Stephen W. Gibson, 1997,

Butterworth-Heinemann, USA, and in, for example, U.S. Pat. Nos. 5,812,950; 5,758,293; 5,490,285; 5,822,324; 5,131,020; 5,133,081; 5,481,546; 5,642,303; 5,850,610 and 5,841,971, which are incorporated by reference as if fully set forth herein.

The system shown in FIG. 2 is a conventional, prior-art interface for interfacing a cellular telephone **212** to a telephonic device **108**, allowing the telephonic device **108** to access communications via the cellular telephone **212**. The present invention can utilize this prior-art system, and, therefore, a description thereof would be beneficial for a complete understanding of the system of the invention. The prior-art system of FIG. 2 is described in U.S. Patent No. 5,715,296 to Schornack, et al., which is incorporated by reference for all purposes as if fully set forth herein, connects a standard telephone device **108** to the cellular telephone **212** via a cellular telephone interface **204**. The cellular telephone interface **204** is the actual physical connection that interfaces the cellular telephone **212** to the telephone device **108**, via the telephone company line interface **208**. All the necessary information and power to the cellular telephone is received and/or supplied through the cellular telephone interface **204**. Once power is applied, communication is established between the cellular telephone **212** and the CPU interface **201**. It uses a microprocessor, preferably an Intel 8051 type, to perform all its operations, such as initializing the cellular telephone **212**, setting all of the control signals (I/Os) to their initial states for a ringer circuit **203**, and a receive and transmit circuit **206**. The software is written in 8051 assembly language. All functions of the unit are controlled by CPU interface **201**. The CPU interface **201** communicates with the cellular telephone **212** via cellular interface **204** and controls the necessary hardware on board. This initializing is started by the Watchdog Timer & Reset circuit **200**, which is the circuit that jump-starts the operation of all the intelligence embedded into the system, and it will restart the operation of all the intelligence if it detects an improper state of the external hardware and/or internal timing sequences. During initialization, the CPU interface **201** sets all the necessary I/Os of the microprocessor to their default conditions required by the external hardware to function properly. The telephone interface **208** is preferably an FCC part **68** compatible RJ-11. At this point, if the telephonic device **108** connected

to the telephone interface **208** were to be taken offhook, a precision standard dial tone would be received by the telephonic device **108**.

One deficiency of the above-described and other currently-known docking stations is that they are generally appropriate for a cellular transceiver of a particular manufacturer (and often, for a specific model). The mechanical connections, voltage, protocols, etc. tend to vary from model to model and from manufacturer to manufacturer, particularly in view of the constant improvements in the performance and capability that are designed into cellular transceivers. For example, the four pins that are used to communicate data to and from a cellular transceiver may be identical, in terms of size and location, to the four pins of a different type of cellular transceiver. However, because the kind of information transferred through one or more pins varies from one transceiver to another, a given docking station that is dedicated for one type of cellular transceiver is generally unsuitable for another type. Moreover, even if a current docking station design would be made to handle two or more types of cellular transceivers, such a docking station would be generally unsuitable for other types of transceivers – existing or future – that require different protocols, mechanical connections, etc.

A universal adaptor of the present invention, for adapting between a transceiver **212** and a transceiver docking station **112**, is provided in Figure 3. Universal adaptor **100** has an adaptor housing **102** having a transceiver receptacle **104** on a top surface **106**, for receiving transceiver **212**, and a docking station receptacle **124** on a bottom surface **126**, for receiving transceiver docking station **112**.

Within universal adaptor **100** is disposed an interface module **103**, which includes a PCB, preferably a multi-layer PCB, equipped with standard components (chips and/or dips, etc.). Interface module **103**, via transceiver receptacle **104**, identifies the transceiver presence and type and communicates the appropriate protocol between transceiver **212** and transceiver docking station **112**.

Transceiver docking station **112** is not identical to currently-known docking stations such as docking station **110** (Figure 1). A basic block diagram of novel transceiver docking station **112**, for use in conjunction with the above-described universal adaptor, is provided in Figure 4.

Although the various components of transceiver docking station **112** can be powered directly from a conventional, external power supply, it is preferable to have an internal power supply modulator **36** that provides a more steady current output to these components. These components preferably include a mechanical module-specific interface **32** externally connecting with docking station receptacle **124** (shown in Figure 3) of the universal adaptor, and through which, inter alia, is effected the charging of transceiver **212**; main controller **34**, which, as in conventional controllers, controls communications, runs protocols, etc.; and phone line module **38**, which is operatively connected to main controller **34**, and which provides an interface with a phone jack 40 and optionally, with one or more phone lines **42**. Mechanical module-specific interface **32** is operatively connected to main controller **34**. It must be emphasized that mechanical module-specific interface **32** is an interface that is designed and configured to connect with docking station receptacle **124** of universal adaptor **100**.

Main controller **34** includes a PCB assembly **37**, preferably a multi-layer PCB, equipped with standard components. Preferably, PCB assembly **37** is identical in design to the PCB assembly in interface module **103** disposed within universal adaptor **100** (see Figure 3). PCB assembly **37** includes a read and write chip **39**. Via read and write chip **39**, PCB assembly **37** reads data and/or commands obtained from, and writes data and/or commands to, the PCB assembly in communication unit **103**. In this way, it is possible for the two PCB assemblies to have identical data contents.

Because transceiver docking station **112** does not have the size constraints of universal adaptor **100**, PCB assembly **37** can be spread out so as to allow communications access to substantially any point in PCB assembly **37**. This is of particular advantage in systems having multiple docking stations, as will be discussed below.

Because a variety of transceivers can be used in conjunction with transceiver docking station **112** by means of the universal adaptor, main controller **34** must identify the identity of the transceiver inserted into the adaptor, and upon identification/verification, implement the appropriate protocol, voltage, etc., according to predetermined instructions.

Figure 5 provides a schematic illustration of a modular docking station **312** of the present invention. Figure 6 provides a schematic illustration of a series of three modular docking stations **312a-c** connected in series to a system controller unit **350**. Referring now to Figure 5, modular docking station **312** is generally cuboidal, containing a receptacle **308** on top face **302** for receiving universal adaptor **100** and transceiver **212** (both shown in Figure 3). On opposite sides of modular docking station **312** are disposed male connector **304** and female connector **306**. Female connector **306** is preferably a receptacle having a circular, oval, or elliptic cross-section. However, other cross-sections, including square and rectangular, are also possible. At the bottom of female connector **306** is disposed one or more contacts **314** that provide power and communication connections from female connector **306** of modular docking station **312** to a male connector of a succeeding modular docking station, shown in Figure 6.

Referring now to Figure 6, male connector **304** can be connected to a female connector **306** of another modular docking station or to a female connector of system controller **350**. System controller unit **350** controls the function of modular docking stations **312a-312c**. Female connector **306**, in turn, can be hooked up to a male connector of another modular docking station. Thus, a series of modular docking stations can be connected to a single controller using the above-described structure.

System controller unit **350** is equipped with a keyboard **352** (optionally including keys for programming, call-transferring, and special function keys) and a display **354**. Optionally and preferably, system controller unit **350** also includes receptacle **308** for receiving universal adaptor **100** and transceiver **212** (both shown in Figure 3).

Optionally and preferably, some of the functions of system controller unit **350** are substantially similar to system controller units in conventional telephony units, in which calls are routed to various internal lines, answering service is provided, etc. The system of the present invention allows an entire switchboard to function by coupling a plurality of cellular phones to POTs. Thus, system controller unit **350** is optionally and preferably equipped with conventional telephone receiver (with cord) **380**, and/or cordless telephone **382**, each of which can be docked in docking

receptacle **384**. Cordless telephone **382** can also be charged in docking receptacle **384**.

System controller unit **350** is equipped with a power supply connection **332**, an active internet or additional telephone line connection **334**, a computer connection **336**, a fax connection **338**, and a connection to an internal phone system **340** and/or to an internal switchboard **342**.

The unit provided in Figure 6 is ideal for back-up or parallel use when conventional telephone lines and/or service are down, unreliable, or slow, and as such, are particularly appropriate for use in hospitals and health centers, and in government, police, and military settings. Using the above-described unit, incoming calls to various cellular transceivers can be routed through internal telephone lines or networks to the appropriate destination, even when the conventional telephone service is not functioning. Similarly, outgoing calls can be routed from a telephone unit connected to the internal telephone network to an external telephone or telephone line via system controller unit **350**. Thus, even large internal networks can communicate with external phones in a substantially normal fashion, despite local problems with the conventional telephone company service.

The use of system controller unit **350** along with a plurality of docking stations (particularly when arranged in series) is also extremely advantageous in high-pressure settings in which conventional telephone service is unavailable, limited, or inconvenient, for example, exhibitions, outdoor concerts and rallies, etc.

It must also be emphasized that the functions of system controller unit **350** can be divided into two distinct units: a unit controlling modular docking stations **312a-312c**, and a unit controlling the switching/routing of calls to an internal phone line or system, fax, etc. In this case, system controller unit **350** includes a connector **356** and connector cable **331** for connecting to connector **330** of telephone unit **400** described in Figure 9 below. This is discussed in further detail below.

Referring again to Figure 6, system controller unit **350** sends signals in series to modular docking stations **312a-312c**. Each of modular docking stations **312a-312c** returns a signal to system controller unit **350**, in which is conveyed information such as transceiver presence (yes/no), transceiver identity, etc. Because modular docking

stations **312a-312c** do not have the size constraints of universal adaptor **100**, PCB assembly **37** can be spread out so as to allow communications access to substantially any point in PCB assembly **37**.

Modular docking station **312** preferably includes a bypass switch **320** that allows modular docking station **312** to be bypassed, such that power and communication connections from the female connector of a preceding modular docking station can be transferred directly to a modular docking station succeeding modular docking station **312**. This feature is particularly important in the event of a malfunctioning modular docking station, which might otherwise cause all succeeding modular docking stations to be deactivated.

Modular docking station **312** preferably includes indication lights **316**, which indicate whether or not station **312** is receiving power, whether station **312** is operational, whether station **312** is currently in use (i.e., a call is in progress), etc.

An alternative system configuration, in which modular docking stations **312a** are connected in parallel to system controller unit **350**, is provided in Figure 7. System controller unit **350** is equipped with a keyboard **352** and a display **354**. Optionally and preferably, system controller unit **350** also includes receptacle **308** for receiving universal adaptor **100** and transceiver **212** (both shown in Figure 3). System controller unit **350** functions substantially like system controller units in conventional telephony units, in which calls are routed to various internal lines, answering service is provided, etc. The system of the present invention allows an entire switchboard to function by coupling a plurality of cellular phones to POTs.

Each modular docking station **312a** is connected in parallel to system controller unit **350** by means of cable **318**. Cable **318** is both a communication cable and a power supply cable. Such cables are somewhat thick and correspondingly expensive. Moreover, a large number of cables surrounding system controller unit **350** is undesirable. Hence, the series configuration illustrated in Figure 6 is presently preferred over the parallel configuration of Figure 7.

It should be noted that it is possible to use a parallel configuration (such as that of Figure 7) without necessitating a plurality of cables. For example, modular docking stations could be directly attached to the system controller unit around the perimeter of

the controller unit. This configuration is not practical, however, for large numbers of modular docking stations, and in addition, can make the overall system bulky and unwieldy.

Another configuration, provided in Figure 8, has six modular docking stations **312b** disposed in series, by way of example, with the width of each modular docking station **312f** being about ½ the width of system controller unit **350**. But, in contrast to the configuration provided in Figure 6, modular docking stations **312f** are disposed in two rows, with flexible adaptor **313** connecting between the two rows. Flexible adaptor **313** is equipped with a male fitting **315** on one end and a female fitting **317** end, fittings **315**, **317** being substantially identical to the male and female fittings of each modular docking station **312f**. System controller unit **350** optionally includes all of the features described in Figure 6. System controller unit **350** optionally includes a connector **356** and connector cable **331** for connecting to connector **330** of telephone unit **400** described in Figure 9 below.

Based on the above-described inventive features and further features described below, an inventive telephone unit is disclosed hereunder. Referring now to Figure 9, telephone unit **400** includes a keyboard **352** (including keys for programming, call-transferring, and special function keys) and a large display **354**. Telephone unit **400** also includes a receptacle **308** for receiving universal adaptor **100** and transceiver **212** (both shown in Figure 3).

Telephone unit **400** is equipped with a power supply connection **332**, a connection **330** to above-described controller **350**, an active internet or additional telephone line connection **334**, a computer connection **336**, a fax connection **338**, and a connection to an internal phone system **340** and/or to an internal switchboard **342**. When connected to telephone unit **400**, controller **350** controls the function of the various docking stations, but does not need to be equipped with conventional telephone receiver **380**, cordless telephone **382**, docking receptacle **384**, the dialing buttons of keyboard **352**, etc.

While the invention has been described with respect to a limited number of embodiments, it will be appreciated that many variations, modifications and other applications of the invention may be made.

WHAT IS CLAIMED IS:

1. A system for connecting between at least one radio communication transceiver and at least one conventional telephone, the system comprising:

(a) at least one detachable adaptor, each said adaptor having:

(i) a transceiver docking connector, said connector operatively connected to the radio communication transceiver, and

(ii) an interface module operatively connected to said docking connector, said module designed and configured for utilization of at least one protocol that enables information transfer between the conventional telephone and the transceiver.

2. The system of claim 1, wherein the radio communication transceiver is a cellular transceiver.

3. The system of claim 1, further comprising:

(b) a transceiver docking station, said docking station operatively connected to said adaptor.

4. The system of claim 3, wherein said detachable adaptor further includes:

(iii) a docking station connector for connecting between said adaptor and said docking station.

5. The system of claim 4, wherein said station includes:

(i) a mechanical interface operatively connecting to said docking station connector, and

(ii) a controller, operatively connected to said interface, for identification of said transceiver and for operation of said at

least one protocol.

6. The system of claim 4, wherein said station includes:

(i) a mechanical interface operatively connecting to said docking station connector, and

(ii) a controller, operatively connected to said interface, for identification of said transceiver and for selection and operation of said at least one protocol based on said identification.

7. The system of claim 6, wherein said controller is further designed and configured to determine and implement a voltage based on said identification.

8. The system of claim 6, wherein said station is a modular docking station.

9. The system of claim 1, further comprising:

(b) a plurality of modular transceiver docking stations, each of said modular docking stations operatively connected to one of each said adaptor.

10. The system of claim 9, wherein each said adaptor further includes:

(iii) a docking station connector for connecting between each pair of said adaptor and said docking station.

11. The system of claim 10, wherein each of said modular docking stations includes:

(i) a mechanical interface operatively connecting to said docking station connector, and

(ii) a controller, operatively connected to said interface, for identification of said transceiver and for operation of said at

least one protocol.

12. The system of claim 10, wherein each of said modular docking stations includes:

(i) a mechanical interface operatively connecting to said docking station connector, and

(ii) a controller, operatively connected to said interface, for identification of said transceiver and for selection and operation of said at least one protocol based on said identification.

13. The system of claim 10, wherein at least two of said modular docking stations are connected in series.

14. The system of claim 10, wherein said modular docking stations are operatively connected to a system control unit.

15. The system of claim 13, wherein each of said modular docking stations is equipped with a first connector for receiving an external power supply and an external communication, and with a second connector for transmitting power from said external power supply and transmitting said external communication to at least one other modular docking station of said modular docking stations.

16. The system of claim 15, wherein each station of said modular docking stations has a bypass switch, such that upon activation of said switch, said power from said external power supply and said external communication are bypassed to a subsequently-disposed station of said modular docking stations.

17. The system of claim 15, wherein said first connector of said modular docking stations and said second connector of said modular docking stations connected in series are complementary connectors.

18. The system of claim 17, wherein said complementary connectors are connected to form a male-female connection.

19. The system of claim 3, further comprising:

(c) a telephone unit operatively connected to said docking station.

20. The system of claim 19, wherein said telephone unit includes:

(d) a computer connection.

21. The system of claim 20, wherein said telephone unit further includes:

(e) a fax connection.

22. The system of claim 21, wherein said telephone unit further includes:

(f) a connection to an internal phone system.

23. The system of claim 3, wherein the system includes a plurality of pairs, each of said pairs including said detachable adaptor and said docking station.

24. The system of claim 23, wherein each of said pairs has an operative communication connection to a system controller unit.

25. The system of claim 24, wherein each said operative communication connection is in a parallel configuration.

26. The system of claim 24, wherein each said operative communication connection is in a series configuration.

27. The system of claim 26, wherein said docking station is a modular docking station.

28. The system of claim 26, further comprising

(c) a telephone unit including:

(i) at least one conventional telephone receiver.

29. The system of claim 28, wherein said telephone unit further includes:

(ii) a keyboard for making telephone calls, and

(iii) a display operatively connected to said keyboard.

30. The system of claim 29, wherein said telephone unit further includes:

(iv) a receptacle for a cordless telephone receiver, said receiver being operatively connected to said conventional telephone receiver.

31. A method for routing a call to and from at least one radio communication transceiver, the method comprising:

(a) providing a system including:

(i) at least one radio communication transceiver;

(ii) a detachable adaptor for each said transceiver, each said adaptor having:

(A) a cellular transceiver docking connector, said connector operatively connected to the radio communication transceiver, and

(B) an interface module operatively connected to said docking connector, said module designed and configured for utilization of at least one protocol that enables information transfer between the conventional telephone and the transceiver;

(iii) a transceiver docking station for each transceiver;

(iv) a system controller unit for controlling operation of the system, and

(v) a plurality of conventional telephones, each of said telephones

operatively connected to said system controller unit,

such that each transceiver is operatively connected to at least one said docking station and at least one said adaptor;

(b) connecting each of radio communication transceiver, via said adaptor, to said transceiver docking station for each receiver, and

(c) routing a call between the radio communication transceiver and at least one of said conventional telephones by means of said system controller unit.

32. The method of claim 31, wherein said call is an incoming call from the transceiver to at least one of said conventional telephones.

33. The method of claim 31, wherein said call is an outgoing call from one of said conventional telephones to one of the transceivers.

34. The method of claim 31, said system further including a conventional telephone switchboard, wherein said call is normally routed by said switchboard, and wherein said routing is performed solely according to a pre-determined condition.

35. The method of claim 34, wherein said pre-determined condition is selected from at least one of the group consisting of disabled telephone company service, partially disabled telephone company service, overloaded telephone company service, and a manual override of a telephone company service.

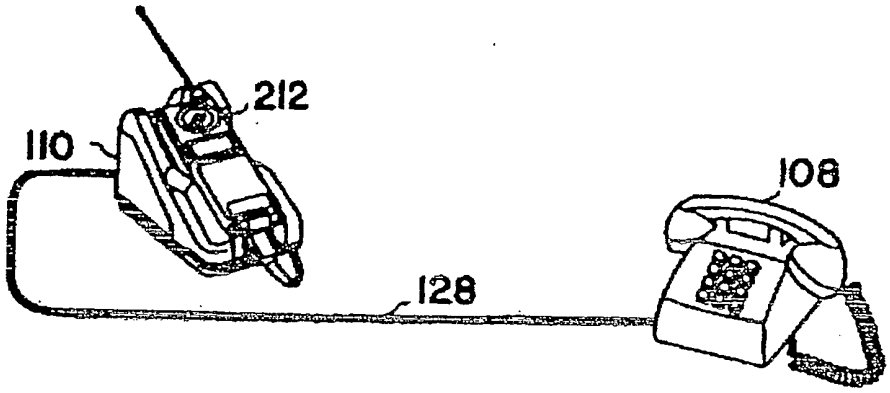


FIG. 1
PRIOR ART

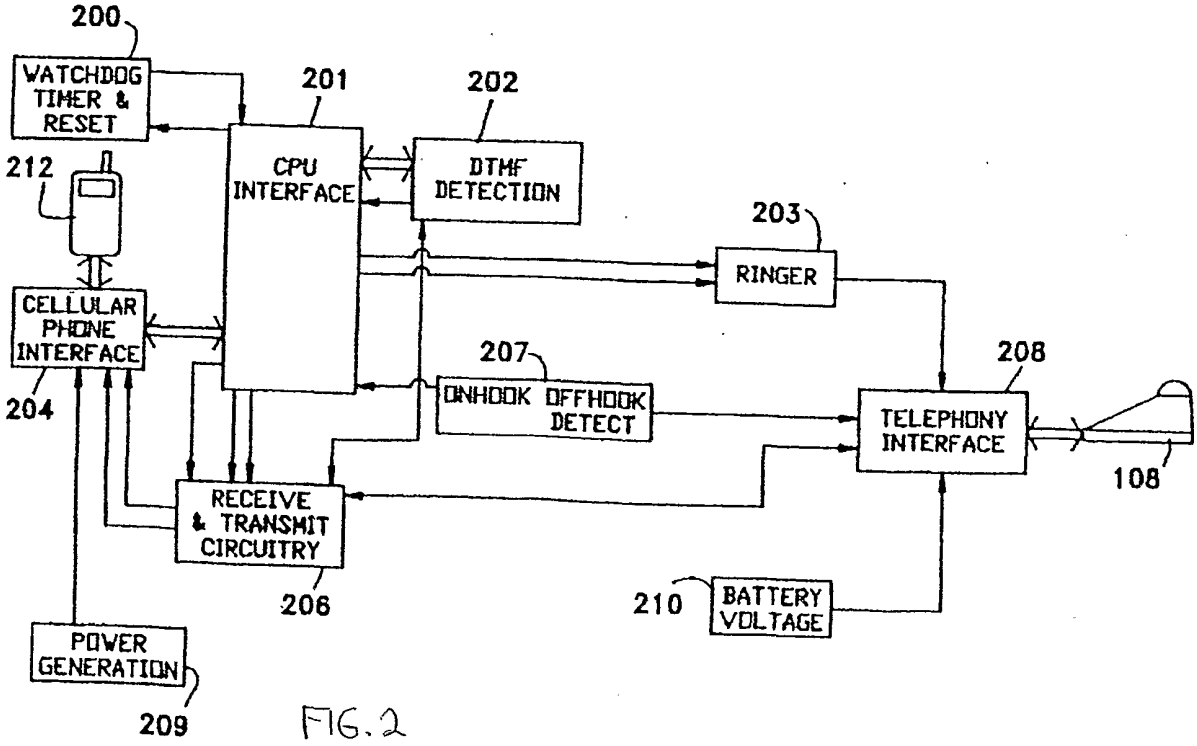
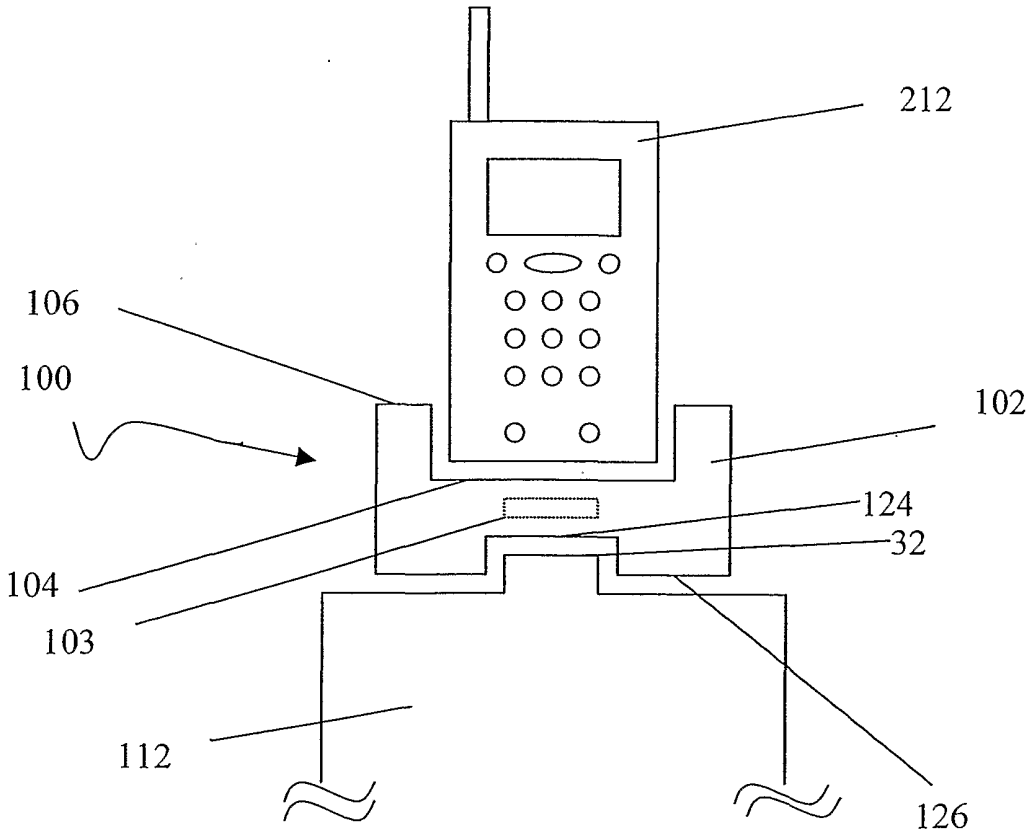


FIG. 2
PRIOR ART

FIG. 3



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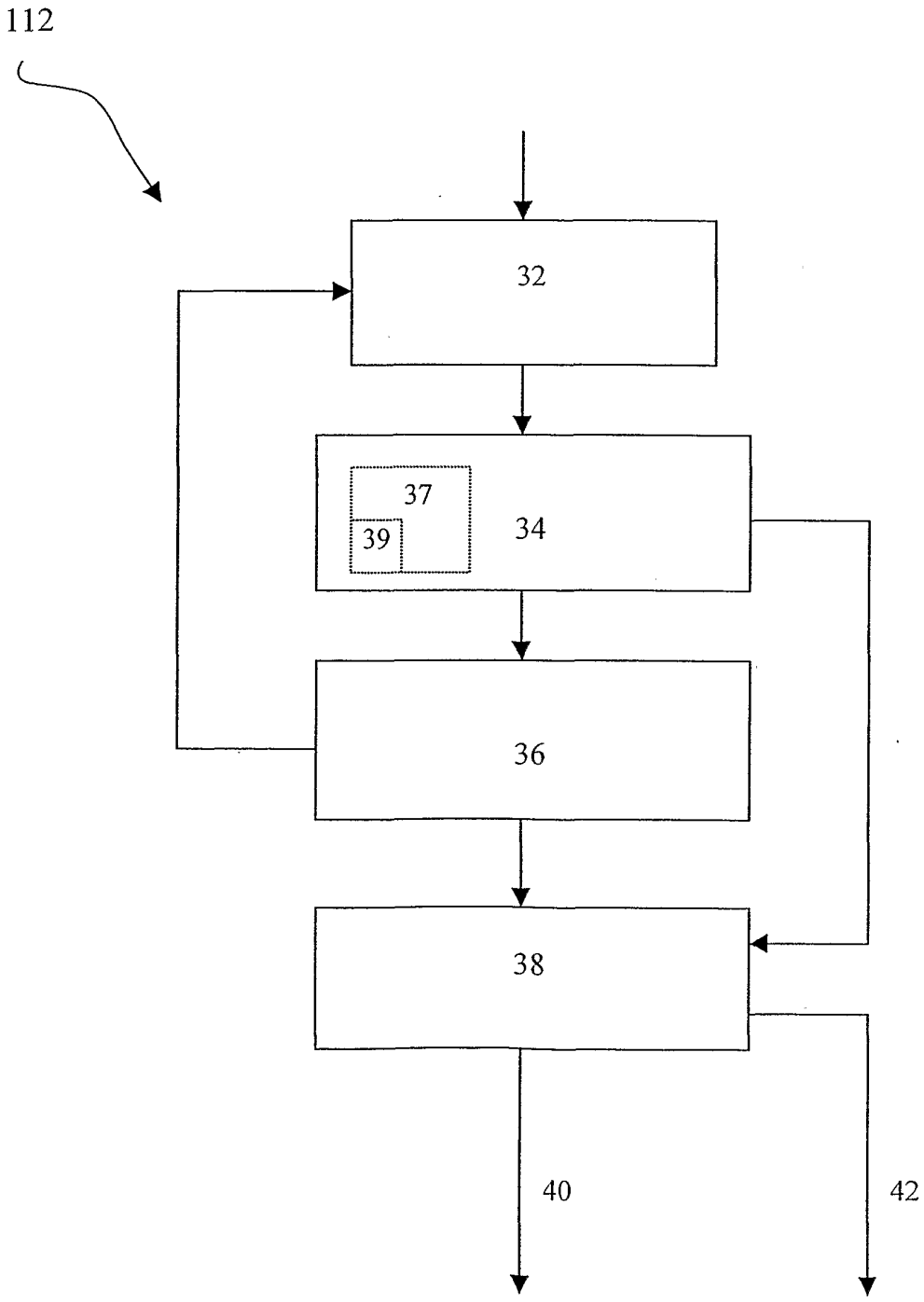

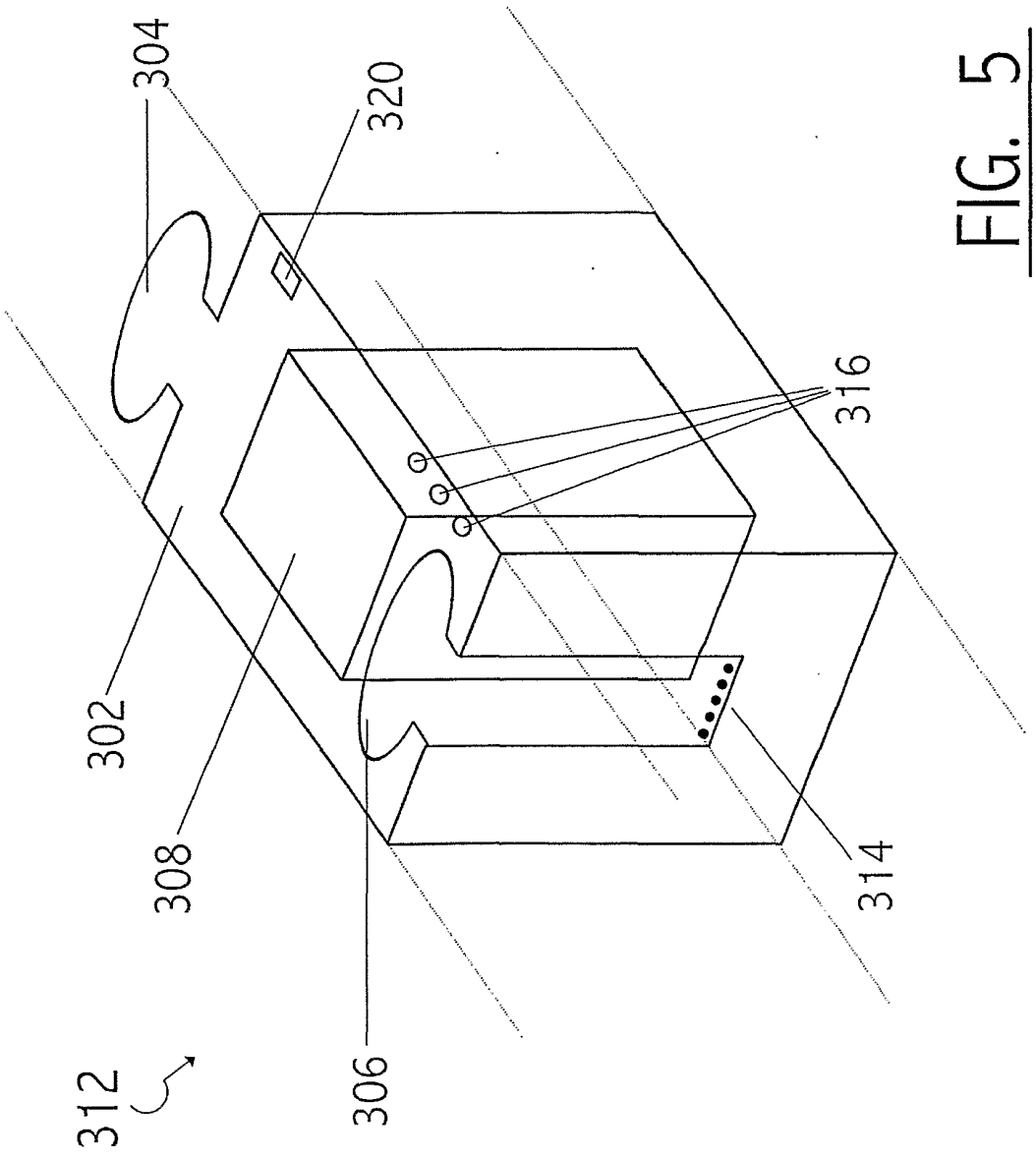

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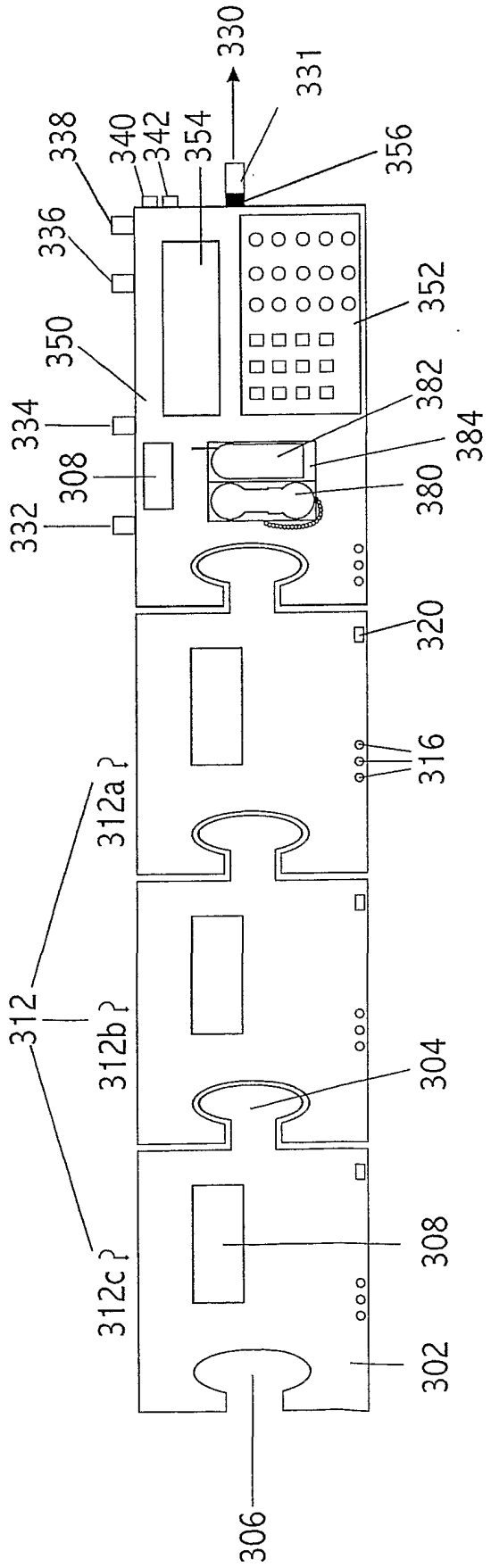
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FIG. 6

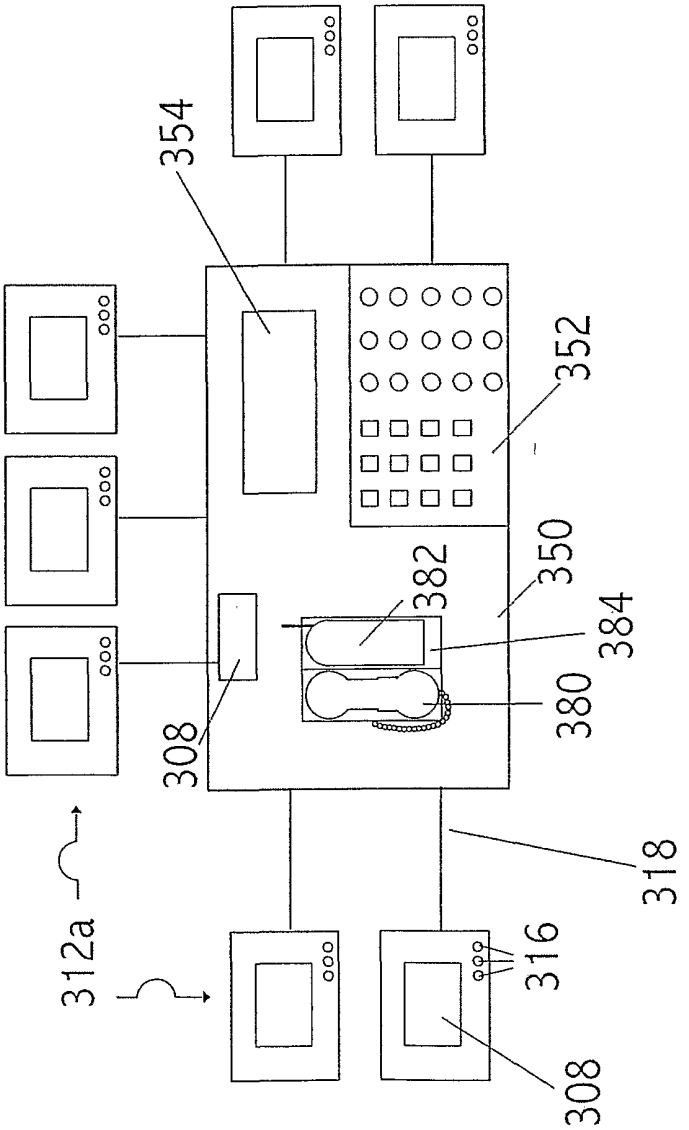

FIG. 7

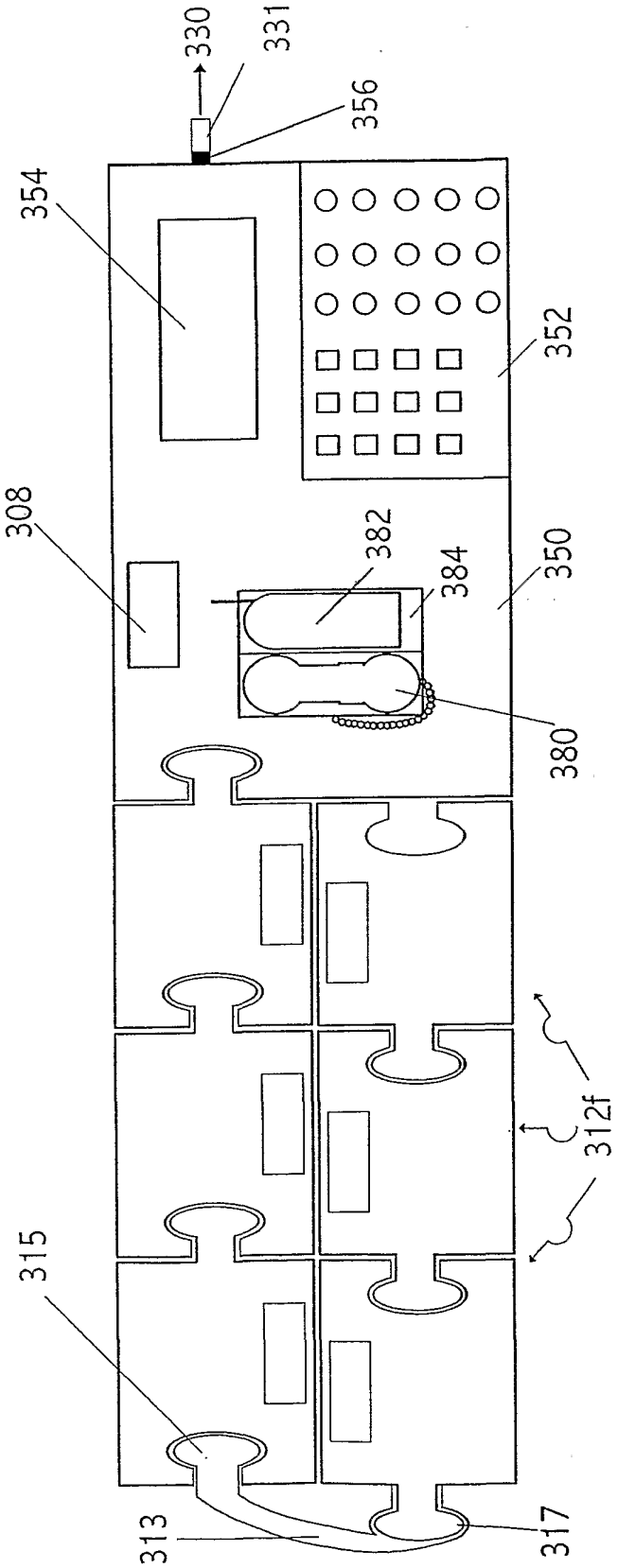

FIG. 8

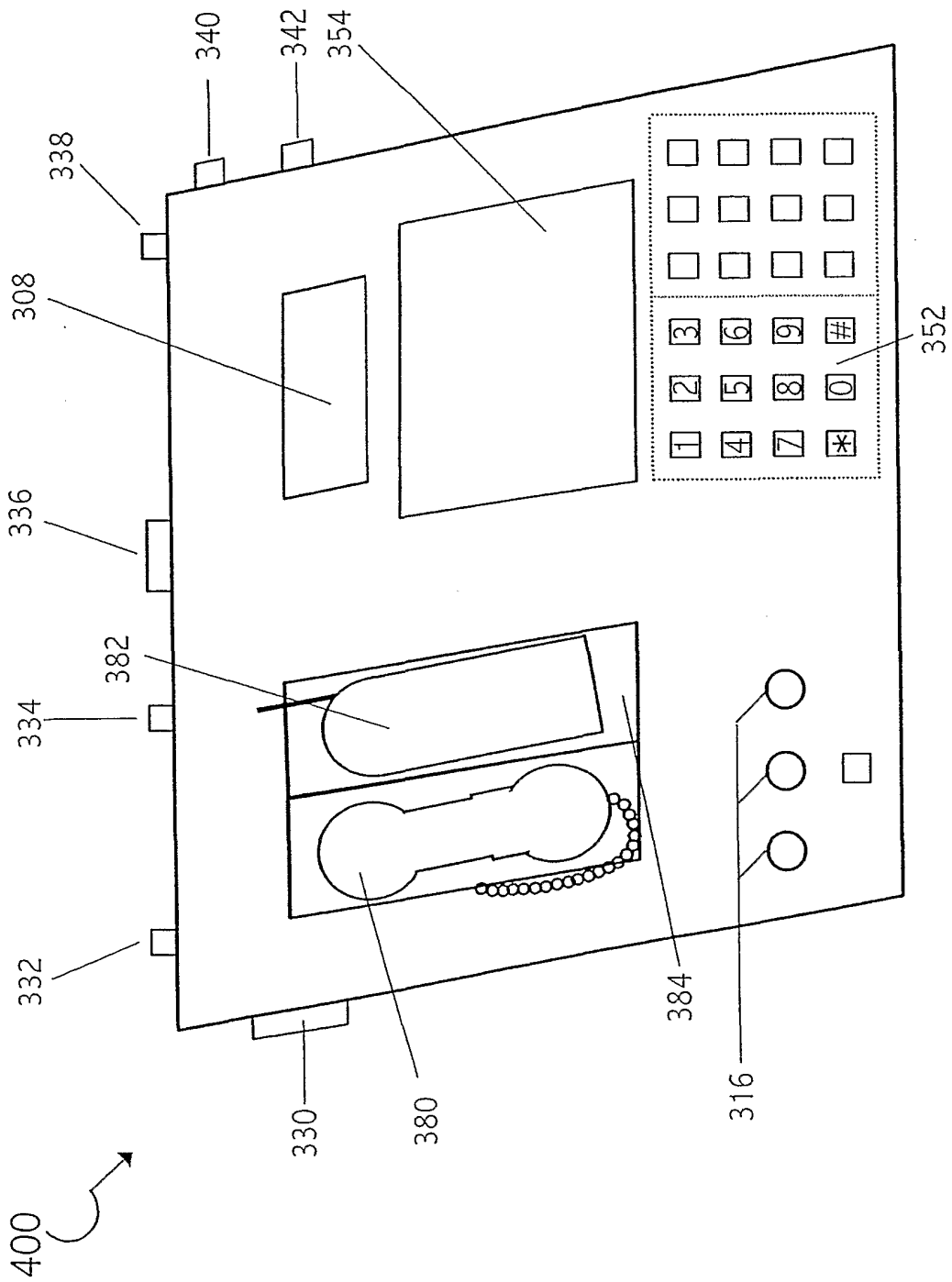
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FIG. 9

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US02/02807

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : H04Q 7/30, 7/32
US CL : 455/74,74.1,344,346,347,90,575,90,462,463

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
U.S. : 455/74,74.1,344,346,347,90,575,90,462,463

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
None

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
East

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,010,565 A (NASH et al.) 23 April 1991, see fig. 3, col. 7 lines 3-13,col. 6 lines 49-55 , col. 3 45-48.	1-13,15,17-19,23
A	US 6,295,460 B1 (NAGEL et al.) 25 September 2001, see col. 5 lines 62-66).	21,22

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:

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Date of the actual completion of the international search
18 April 2002 (18.04.2002)

Date of mailing of the international search report
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