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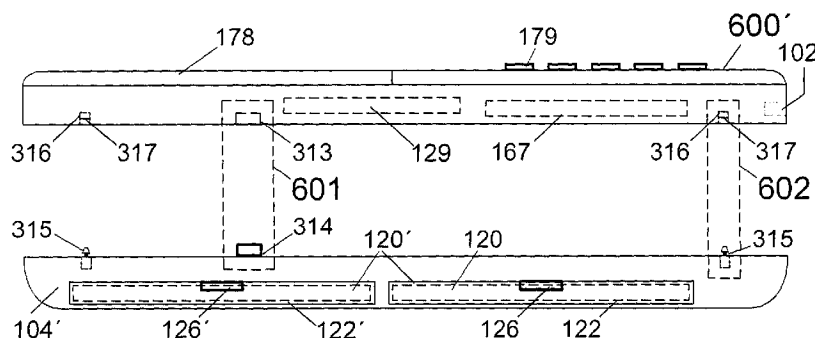
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SPORT OR ANOTHER EQUIPMENT CONVENIENT FOR ADDING BY ADDITIVE EQUIPMENT

Fig. 11



(57) Abstract: An addition of auxiliary functions to the multimedia equipment not included inside. These functions can be function of physiological data processing, extended and/or uninterrupted operations with regard to monitored and processed data. Auxiliary functions are implemented by the auxiliary equipment and circuits solutions physically placed in the original equipment or out of it but mechanically and electrically connected by it, whereas can it formed one compact unit. The parts, which are necessary to be during operation changed to get uninterrupted functions, are user friendly and simply exchangeable from the aspects of users.



Additive Equipment to Basic Equipment with Advantage in Form of Multimedial, Health, Sport or another Equipment Convenient for Adding by Additive Equipment

Technical field

The invention concerns the functions extension of multimedia equipment by auxiliary devices situated on them or separately. Solutions are elaborated also for sensing data of heart rate and transferring it into portable ECG or into a small size device for imaging of data or curve of heart rate, possibly on cellular phone, placed on detachably on bracelet with respect to deployment of electrodes and cables on the body of checked person so as they do not bother to ordinary motion and activity. It should be also easy for installation, bearable from aesthetic point of view and bearable and suitable for non-interrupted sensing for unlimited time.

Contemporary technical status

Contemporary auxiliary equipment do not allow uninterrupted operation of multimedia devices and theirs auxiliary equipment, which are needed for monitoring of function, for instance physiological. ECG signals or displaying of heart rate are sensed by means of chest strap electrodes or single electrodes glued to skin or fastened by clips to limbs. The last named are not suitable for mobile use. Using of chest strap in mobile operation is uncomfortable to wear, and not aesthetic, because for installation there is necessary to remove clothing. Shifting of electrodes on skin causes jamming signals. Glued body contacts are very unpleasant at removing and the skin can be irritated. Contact cables for ECG are deployed in complicated way and are unarranged on the body, which is not aesthetic. The purpose of this invention is to find better deployment of electrodes so as the monitored person could watch heart signals uninterruptedly for long time.

Except inventions PV 2010-629, PV 2011-446 and PV 2011-581, the contemporary level of technology does not enable live monitoring of the course of hearth rate, arrhythmia, ECG and other biomedicine data in values, curves and graphs, especially at the same time. It does not enable such monitoring on units placed on wrist where it is immediate view. Units are not

removable. They do not enable battery exchange without interrupting the operation. They do not enable data transmission at the same time to more units with cooperating software, which would be able to process and display the measured values in the same way. The purpose of this invention is to eliminate all these drawbacks and improve solution in patents PV 2010-629, PV 2011-446 and PV 2011-581.

Substance of the invention

The drawback is removed by an auxiliary device to a multimedia device, where the multimedia device is created preferably by cellular phone or multimedia pocket computer or similar multimedia device, where multimedia device enables further described basic functions or some of them such as are voice and/or data communication on telephone or other wireless network, multimedia playback, taking snaps, or video recording, TV reception or/and radio broadcast, GPS determination, and contains basic units and/or parts such as control elements comprising with advantage push buttons or/and keyboard, or/and touch display, basic microprocessor unit, basic accumulator and other basic units allowing functions mentioned above, where auxiliary device contains at least one block composed of auxiliary mechanical, electric and electronic modules and units and/or parts preferably of control elements and storing mechanism of accumulator, which are mechanically, electrically and electronically connected with multimedia device, which extends basic functions of multimedia device by auxiliary functions which the auxiliary device, containing modules, units or parts enables, where multimedia device is preferably fully functional with basic functions for which it was designed and constructed even without connected auxiliary device.

In detachable and paired embodiment of auxiliary device connected to multimedia device from line-production, which means not factory adapted for connection with auxiliary device, is the auxiliary device detachably attached mechanically to the surface of multimedia device not factory adapted for connection with auxiliary device replacing it by the back cover situated currently at the opposite site of display or keyboard, serving for covering of parts such are, accumulator and/or SIM card and/or other parts for exchange of which the cover is removed, whereas the fastening elements are paired with fastening elements of cover of multimedia device. In general-purpose version the auxiliary device is removable connected to

the surface of multimedia equipment non-adapted from the factory for connecting auxiliary device with fixing elements with advantage with a clip, Velcro, screws or other elements.

Another possibility of connecting the general purpose version of auxiliary device is to fix it to the cover of multimedia equipment non adapted for fixing of auxiliary device with which is removed and replaced with a spare cover of multimedia equipment, or with another installed device, with advantage with other functions than removable auxiliary device, where the fixing elements are with advantage formed by depressions, clips, joining layers, Velcro, glue layer, or fixing by glue, screws, or other suitable manner or by combination of them. Advantage of fixing of auxiliary device to the cover of multimedia equipment is the availability of covers, which are produced as spare parts, and fixing auxiliary device on them enables easy possibility of connection of one or more types of auxiliary devices to multimedia equipment by simply exchange of basic cover.

A great advantage of multi-purpose auxiliary device is the possibility of its connection to any multimedia device from line production, which does not need to be adapted for using auxiliary device. Preferably with mechanical connection is connected also electronically by plugging connector into connector of multimedia device, or can be connected subsequently. In such a case. A “U” connector can connect multimedia and auxiliary devices. For multi-purpose version can be preferably used two connectors; one for multimedia device, second for auxiliary device joined with electric cable in order to avoid placing connector at the auxiliary device accordingly to connector position at the multimedia device. The particular auxiliary devices can be equipped with various functions and can be preferably placed accordingly to needs of various levels of extension functions of multimedia devices. The auxiliary devices are preferably placed on multimedia devices from line-production, which means that fixing elements are only for the back cover and not for auxiliary device. All electric and electronic units and parts for auxiliary functions are preferably situated in auxiliary device. This advantage is put into effect particularly when one acquires multimedia device where auxiliary functions are not needed in which manner it is cheaper in comparison when a part of units and parts for function extension would be installed in this multimedia device. An advantage of placing the auxiliary device on a line-produced multi-media device, where all electronics is contained in auxiliary device, which can bring down the price for acquiring the multimedia device in case when the auxiliary device is not acquired in the same time and can be bought anytime later. It is favorable in comparison with devices, which enable to install additional

devices, but units for them are partly or fully placed in multimedia devices, so that when one does not acquire auxiliary device, these units increase the price of multimedia device. This is also advantageous in comparison with multimedia devices which have additional equipment designed as permanent installation, where without it the multimedia device is not fully functional, or in case if not used would appear as incomplete or incompletely. In case when additional device were not used, the price of multimedia device uselessly would increase, because without it the multimedia device is incomplete.

Fixing elements made preferably for fixing the cover on multimedia device are fully or partly used for detachable fixing of auxiliary device, which is equipped with counterparts again fixing points on multimedia devices. Original fixing elements on line produced multimedia devices are advantageously used, or are adapted afterwards after they are produced, which enables cheap line-production of multimedia devices regardless if it will be used for connecting to auxiliary device which enables its line production in big series which make is cheaper in comparison with multimedia devices for which the connection with the auxiliary devices would be proposed in other way than by replacing the back cover where the fixing elements would be solved in different way already in the factory, which increases the price and is not produced for broad use and is suitable for applications with auxiliary devices. Another design of detachable auxiliary device is installation at factory adapted multimedia device for a specific auxiliary device, which forms common equipment, where is supposed that auxiliary device will be used with this multimedia device, or at least prevailing time and will be also commonly sold. In this case the advantage of savings will be lost in comparison with connection of auxiliary device with multimedia device from line production without adjustment for auxiliary device which can be named as optional equipment, on the other hand many benefits will be preserved, especially the exchange of accumulator without removing the auxiliary device and further extension of functions of multimedia device. In principle the cooperation and benefits of specific auxiliary device and putting blocks on, remain in principle the same as at paired or multi-purpose auxiliary device during the production. If the auxiliary device is not connected, the uncovered parts of multimedia device can be preferably covered by especially produced cover. Since it is taken into account with contemporary usage of auxiliary and multimedia devices, there a possibility exists to place a part or all electronic needed for proper operation in multimedia device. This is an advantage to use more auxiliary devices with different auxiliary functions for extension of multimedia device according to needs. Then can be saved units and parts, which are common for more auxiliary devices,

which need not be placed in all auxiliary devices. It is preferably possible at removable auxiliary device to use additional controlling elements at auxiliary device, where statuses are detected by auxiliary microprocessor and transmitted to basic microprocessor unit. It can be preferably used the pushbutton for emergency call, which is mechanical, sufficiently large, highly visible, placed on auxiliary device, so that the endangered person can immediately send an emergency call without complicated manipulation on display or keyboard of multimedia device comprising a cellular phone, where especially the touch screen need complicate manipulation for displaying the adequate push button, where push buttons are small and situated very dense. Respectively also reset button can be placed on the auxiliary device. In integrated version is the auxiliary device built into multimedia device without possibility of easy disconnection. The advantage of lowering the price of multimedia device is lost in case that all or some auxiliary modules, units or parts are at its acquisition not needed, because they are already built in a compact multimedia device in some certain version and after the product is finished, they cannot be changed by attaching of various auxiliary devices, but the advantage of extended functions in compact multimedia devices enabled by auxiliary modules, units and/or parts remains in the contrary with functions enabled by basic units in current multimedia devices. The issue is the extension of basic accumulator capacity by an auxiliary accumulator easy exchangeable during operation of multimedia device without removing the back cover of the multimedia device, which is enabled by storing mechanism of accumulator, which is in multimedia device firmly installed. The issue is also putting two or more microprocessor units, communication block, and "front end" unit for processing ECG curve and other auxiliary units and parts, as described at detachable auxiliary device. At next version is an auxiliary device detachable from compact multimedia device, where differently equipped auxiliary devices can be changed. Disassembling is more complicated then at detachable auxiliary device, but there is an advantage of making use of differently equipped auxiliary device according to demand and so lower the price because there are acquired only relevantly equipped auxiliary device, or nothing. Detachable auxiliary device is placed on printed circuit board and id removable separately or together with the board of basic modules, units and parts of compact multimedia devices. The detachable auxiliary device is preferably made in shape of a cassette, which can be inserted into the body of multimedia device. Advantage of this solution is in easy exchange of removable auxiliary device for another, differently equipped. Removed can be all or a part of auxiliary device. At all types of compact multimedia devices is preferably used storing mechanism of auxiliary accumulator for easy

exchange of discharged accumulator for charged one during uninterrupted operation of compact multimedia device for charging the basic accumulator without opening the back cover. At line-produced multimedia devices, the auxiliary devices enable add other functions, such as increasing capacity of basic accumulator by capacity of auxiliary accumulator placed in auxiliary device. In this function the auxiliary accumulator charges accumulator of multimedia device through an electronic unit made preferably by voltage converter or regulator by means of electric connection the auxiliary device with multimedia device. The auxiliary device preferably enables easy exchange of auxiliary accumulator without removing auxiliary device, by means of storing mechanism of accumulator comprising small door or a small lever, which simultaneously locks accumulator at the moment of inserting it, or by mechanism reacting to squeeze when inserted accumulator is pressed and by doing this, it is released and ejected and at new inserting is locked by a latch. This advantage is evident in contrary to the standard multimedia device without auxiliary device when exchange of accumulator is complicated and needs to remove the cover, which takes longer time. The basic accumulator preferably supplies the multimedia device during the replacement of auxiliary accumulator so that the replacement is realized without the interruption of operation of multimedia device. The easy replacement of auxiliary accumulator is further supported by the possibility of charging several auxiliary accumulators at the same time, which after charging can be carry in the pocket or in a case and be disposal for replacement of auxiliary accumulator in the auxiliary device connected to multimedia device during operation, which provides an advantage of any prolongation of uninterrupted operation. This means that in case of discharge of the basic accumulator, here is not necessary to search for source of charging or uneasy replace the basic accumulator with removing the back cover of the multimedia device and to interrupt the operation, or to replace the auxiliary device. This means savings due to the fact that in case of replacing the entire auxiliary equipment, for sake of replacing the discharged accumulator, the other auxiliary equipment must be kept in reserve for this purpose, but the auxiliary equipment is more expensive and larger than the accumulator also due to the fact that it also contains the electronics for charging, or other additional functions. The costs reducing solution is to keep in reserve and exchange only the auxiliary accumulators provided by the solution of the present invention. Placing the charging electronics in the multimedia device, as applicable in the current state of technology, increases the costs of multimedia device, which becomes evident, when the auxiliary equipment is not purchased for the multimedia device. The solution specified in this invention, where all the

electronics ensuring the functions of auxiliary equipment is located in the auxiliary device, thus representing the savings. Moreover, the solution of replacing the accumulator from the storing mechanism, preferably by small door, induces other advantage that the serially produced auxiliary accumulators may be used so as they can be utilized in their unchanged form of the specified utilization, thereby reducing significantly the purchase price of the accumulator compared to the price of accumulator, which would have to be manufactured specifically for this purpose, and so in much smaller series. In the auxiliary equipment, preferably beyond the accumulator, other units and parts extending the original functions of the massively produced multimedia device can be placed. The utilization of one or more auxiliary microprocessor units, which preferably operates with different operating systems than the basic microprocessor unit of multimedia device, thus allowing not only to extend the performance of basic microprocessor unit, but also working with a wider range of operating systems, programs and applications, induces a particular advantage. This allows, for example, in relation to multimedia device comprised of the cellular phone with the Symbian operation system in the basic microprocessor unit to use the Android operation system in the additional microprocessor unit of the additional device, hence to enable the operation or programs and applications in both OSs where by means of communication via connector interconnecting the multimedia device and the auxiliary equipment, preferably through a USB port, or multi-pin connector, or by means of interconnecting conductors in the auxiliary device integrated in the multimedia device. So it is possible preferably to control the auxiliary microprocessor from the multimedia device by use of control elements in the multimedia device and also displaying requested data from auxiliary microprocessor unit. Preferably it is possible to use even more microprocessor units and so extend the number of operational systems. In auxiliary device there is preferably situated a communication block, which extends communication functions of multimedia device. So, it can be with advantage used receiver 5,5kHz for reception pulses of heart beat or other signals from a chest strap working in low frequency band 5,5kHz, which has advantage in low power consumption in both, reception and transmission sides. For instance, the battery in chest strap for measuring heart rate and working on 5,5 kHz frequency has the live-time one year, which is the same at the reception end, whereas chest straps for measuring heart rate equipped with system Bluetooth work with the same battery only a few hours. The low energy consumption is resulting also at supplying receiver or transmitter 5,5 kHz in auxiliary device. Another advantage using transmission 5,5 kHz for hart rate data is that this signal can be received simultaneously by more devices

which enables contemporary displaying the heart rate and its graphical displaying on more devices. This is advantageous especially at using wristwatches for emergency displaying of heart rate and other functions derived of it with displaying of the same or adapted data on multimedia device, which is usually larger then wristwatch display, so it is operatively possible to watch heart rate and data derived of it on display at wristwatches and in the same time on multimedia device advantageously made by a cellular phone, which can be stored in a pocket or a small bag. The cellular phone can be taken out and switched on for current watching only in needs of more detailed information in case when data is out of limit and display of wrist watches does not provide as full information such as provides multimedia device with larger display. Extension of information can be used using further communication working preferably with further units using ANT, WIFI, Further Blue Tooth and other units using further communication systems and media. An auxiliary and basic microprocessor cooperate trough data connection by means of connector connecting multimedia device with auxiliary device preferably through USB or multipin connectors or with wires at auxiliary device integrated in multimedia device, which enables to use further functions of auxiliary device. One of further functions of microprocessor unit can be preferably ECG processing, where body signals sensed by electrodes and preprocessed in "front-end" unit situated preferably in chest strap are transferred by means of Bluetooth or similar communication protocol into communication block in auxiliary device, where this signal is processed in auxiliary microprocessor unit and send through data connection into basic microprocessor unit for further processing for displaying ECG curve on display of multimedia device, where control of display and choice of other functions can be done from display or keyboard of multimedia device. This enables with advantage watching the ECG curves, other values and further evaluation. It is an advantage, that received and processed and displayed ECG is mobile and the monitored person can carry it in a small bag or pocket with him/her and find out his/her state of health, especially when warning signal sounds in case when heart pulse or ECG or other monitored health functions, preferably detected and transferred by chest strap exceed allowed limits. Similarly is ECG processed by auxiliary device, where electrodes are connected with a cable with auxiliary device, which has an advantage in higher reliability and elimination of jamming of transfer through BT, where ECG can be processed in auxiliary device and control and display on multimedia device. In this case is "front-end" in auxiliary device. ECG and other health or other data is preferably transferred from auxiliary or multimedia device to remote server placed preferably in surveillance center or other data

storage, where from it is possible data display on a PC locally or by means of data network remotely.

The auxiliary device for the basic device, formed preferably by multimedia, health, sport or other one is preferably placed in a small bag, which can be fastened at waist, belt, in pocket or can be hanged on neck. Multimedia device can be embedded in the small bag, where it can be connected by means with multi-wire cable or connector or Bluetooth or other wireless medium. Auxiliary device embedded in the small bag contains auxiliary mechanical, electric or electronic modules, units or parts with controlling elements and/or or storing mechanism for accumulator which extends basic functions of multimedia device as described at auxiliary device fastened to multimedia device for instance in similar way as auxiliary accumulator placed in the small bag which charges the basic accumulator placed in multimedia device. Auxiliary accumulator is placed in storing mechanism from where it is easy replaceable during uninterrupted operation of multimedia device, which is backed-up by basic accumulator, which is charged by the auxiliary accumulator. In electronic part of auxiliary device situated in the small bag is placed one or more microprocessor units, which work on one or more operating systems, differently from the system of basic microprocessor unit in multimedia auxiliary device. They communicate with multimedia device, which with they are connected as mentioned above, and mediate preferably transfer of status of "panic button" and "reset button" and also with communication units 5,5 kHz for reception of heart rate pulses and a communication block with different communication media, preferably Bluetooth, ANT and other. The button "Panic" and "Reset" on the auxiliary device are preferably mechanic and of bigger size, i.e. easy accessible and reliable in comparison with keyboard formed by touch display, which is advantage in cause of emergency call. After pushing "Panic" button, a warning signal lasting a few second is triggered. If this signal is not cancelled during time when warning signal sounds by the "Reset" button, the system sends emergency call to preprogrammed phone numbers or surveillance center. To the USB connector for interconnection the small bag with the multimedia device by a cable, preferably another USB connector is fixed for contemporary charging the basic accumulator of the cellular phone. It allows also connection with a computer.

The auxiliary device in the small bag enables connection of an ECG in the chest strap wirelessly preferably by Bluetooth, whereas the so-called "front end" for ECG is preferably placed in the chest strap with the control unit with electrodes. Signal ECG is further processed

in microprocessor unit of auxiliary device located in the small bag. The front end of ECG can be placed preferably in chest strap which is saving energy and enables longer accumulator operation..The data transfer from ECG or heart beat pulses or other medical or other data can be preferably realized by means of mobile operator network from the multimedia device or auxiliary device located in the small bag, or from chest strap with help of a unit for data transfer into mobile operator network by means of SIM card in communication module. On the body are preferably deployed only ECG electrodes, which are connected by cables with auxiliary device in small bag where is located a complete electronic device for heart pulse or ECG evaluation. The shape of ECG curve is displayed together with heart rate, which allows more detailed observing of regularity or for longer time, for instance 30sec, where for ECG is displayed smaller time period, for instance 5sec in order to enable distinguishing the ECG shape. Displaying can be made on multimedia device or local computer, or remote computer by means of data network as live data from current measurement, or recorded data from memory of auxiliary device located in the small bag, or from server or computer.

Also microprocessor, or microprocessors located in microprocessor unit work preferably on diverse systems, differing from protocol in multimedia device, which offers the advantage to work with more databases. The printed circuit board with microprocessor units or communication modules or other units is preferably removable, which enables to use another printed circuit board according to the needs or in case of failure. Multifunction multimedia device is inserted into the small bag which can be preferably equipped with removable inlet attachment with extending pitch for easy inserting, which is favorable especially in case when the small bag is placed in a pocket where is a clip fastening it. In the multimedia device, it is preferably put a mechanical element with contacts which freely and without resistance fit into counterparts located in the small bag. This allows easy connection the multimedia device into the small bag.

Location of 5,5kHz receiver in the small bag enables contemporary receiving heart rate in wristwatch working on this frequency and receiving this signal preferably from the chest strap of multimedia device, which is connected to the small bag by elongated cable or wirelessly.

At the same time is enabled simultaneously reception of both heart rate and signal ECG by cellular phone located on a bracelet, which is joined by means of Bluetooth placed in the small bag on multimedia device. Signal for cellular phone on the bracelet is possible to send preferably from multimedia by means of Bluetooth. An elongated cable for connection of

multimedia with the small bag can be composed of a twisted cord, or cable on a spinning reel located out or inside of the small bag.

It is possible to use preferably the display of multifunction device for displaying data, curves and pictures produced by auxiliary device in the small bag and use control elements in multimedia device for control microprocessor units, preferably ECG or heart rate monitor placed in auxiliary device in the small bag. Small bag contains preferably a display, located preferably on a printed circuit board where microprocessor units, communication modules and control elements are placed. It is also pull it out from the small bag for displaying data or pictures, or display can be placed on a separate removable board. Display is preferable located on the small bag and is visible even unless is removed from the small bag. In version with touch display it is possible to control from the display also units in the small bag as well as multimedia device, which is of course possible preferably also by mechanical push button "PANIC" and "RESET" which are placed on the small bag so as they are accessible without pulling out display or electronic units.

Auxiliary device fastened to the multimedia device or inserted in it as mentioned above, or placed in the small bag, can be preferably placed in multimedia device composed of a cellular phone, or by a healthy device located in the bracelet, where all described functions are applied also in this case. Connection with the basic device is preferably realized through connector USB on the bracelet, or on other part of the cellular phone. The auxiliary device is fixed on the bracelet from the body or to the body below the cellular phone. In case off the body is from the connector on the bracelet conducted to the case of auxiliary device. In version "at the body" is preferably lead from the connector placed "off the body" by a cable into the case of auxiliary device where it is situated. In the version "below cellular phone" is preferably lead by a cable from the connector as described. In adapted multimedia device is the cable installed into multimedia device or bracelet, so it is not visible. The case of auxiliary device preferably contains storing mechanism of auxiliary accumulator which is easily removable through small door without interrupting the operation. The auxiliary accumulator charges preferably the basic accumulator. On printed circuit board blocks and units of electronic devices and microprocessor and communication are located. All is located in mentioned case. All of them are with advantage replaceable so it is possible blocks equipped in accordance with needs. If USB connector is placed in other part than on the bracelet, the basic device is connected with an appropriate cable to the auxiliary device. On the top of the case for

auxiliary device in version at the body or below hand which is placed at the bottom part of the bracelet, preferably a display is placed, which can display data processed by one or more processor units of auxiliary device or in the basic device. Preferably one or more microprocessor units and also other units can be controlled by cellular phone or they have their own control elements. This is advantageous at "PANIC" and "RESET" buttons, which are preferably located on the case of the auxiliary device and so they can be of bigger size and distinctly separated from other control elements. This prevent erroneous call for help or reset in case if "PANIC" was pushed and is evaluated that emergency signal should not be sent off. The multimedia device in the bracelet is preferably placed on a sliding mechanism which is preferably adapted for easy removal of multimedia device, which enables the multimedia device slide out to hand when is necessary to watch display or to slide it back to forearm in order to hide it below the shirt if it is not necessary to watch the display. Multimedia device preferably constituted by a cellular phone on a bracelet can be used for evaluation of ECG which is preferably placed on chest strap likewise described at auxiliary device placed in small bag. Connection is preferably ensured by Bluetooth transmitted from chest strap where ECG is located including front end or multimedia is on the bracelet connected with a connector by cable. In this case front end can be located at microprocessor, located in a cellular phone on a bracelet and detectors on the body connected by a cable. In case of wire connection it is possible to place the complete control unit of ECG into cellular phone at the bracelet and on the body there are only electrodes partly on chest strap. ECG can be placed in a special unit preferably at a bracelet near the cellular phone at the bracelet whereas with electrodes is connected by cable or Bluetooth. Scanning of heart pulses is done by five electrode system, where 3 electrodes are preferably situated on the chest strap below chest nipple and 2 further electrodes are on area of shoulder sockets preferably fastened on braces where are connected with the chest strap by a cable covered by aesthetic appearance by braces. This version offers a three lead ECG record. For one lead ECG record can be used 2 electrodes located on the chest strap below chest nipple where can be added in the middle third electrode for zero reference voltage. For highlighting display of wave P is preferably placed another further electrode in shoulder socket connected by a cable with a connector with chest strap, which can be disconnected in case if wave P is not needed. In both cases one and three lead is cable lead to the bracelet or ECG preferably from chest strap where are connected all electrodes through a cable laid around the neck and further on arm. In this way

it is achieved that after putting on the shirt or blouse the chest strap as well as electrodes and all camel network is not visible from outside.

For quality measuring it is necessary electrodes with contacts provide with a thin layer of conducting gel. For a chest strap mentioned above there are designed electrodes with a popper system fastening which are in shipping cartridges in which they are fastened to the strap by clicking on and then when the strap is in proper position around the body the cartridge is removed which reveals the contact surface provided with a layer of contact gel. Subsequently the strap pushes into working position on the body of monitored person. Alternatively can be used electrodes glued on conducting surface of chest strap, whereas the shape of gluing part of the contact ensures, that at increasing pressure the gel leaks through the middle part and makes contact with the body of monitored person.

The storing mechanism of the accumulator enables easy exchange of accumulator for another charged without opening and removing the back cover of multimedia or health device or exchange of all auxiliary device or its part preferably without interruption the operation. This is enabled by means of a module of charging and supplying with which it preferably comprises a block of accumulator filled in by a further auxiliary device. Fastening mechanism of accumulator or block of accumulator is replaceable so as they can be used in different, preferably more modern models of multimedia or health or auxiliary devices and saves expenses for their acquisition by using them from older models. The exchange is easy to do by inserting, screwing, clicking on and inserting contemporary into counterpart connector. The fastening mechanism of accumulator is preferably based on principle of small doors which ensures by clicking them, or on principle of moving away a latch ensuring the accumulator, or by automatic ensuring accumulator at inserting and releasing by repeatedly pushing, where the side of accumulator makes the wall which covers the aperture for inserting accumulator in case when there are not used doors.

Hinges of doors are made of metal or plastic and are preferably equipped by pivot hinges or hinges are preferably made of a flexible resilient material preferably plastic which is used for the rest and in place of hinges is made thinner. As an electrode of ECG or pulse monitor it can serve preferably a contact with conducting elastic material, preferably conducting gel i.e. a gel electrode. Electrode is fastened on a pressure chest or leg element, braces or pressure clothing or harness. Electrode is removable and exchangeable for a new one by means of its fixing mechanism, which can be preferably based on a principle of press stud or by gluing by means

of a foil or by another suitable manner. Advantage of placing the electrode by means of fixing mechanism on pressing element is that the electrode is not glued on skin which can produce possible allergic reactions and painful removing, but it is fastened on pressing belt, preferably elastic, which can press the electrode to the skin by suited preset pressure for reliable contact which improves the conductivity or adherence of gel material.

Storing mechanism for auxiliary parts enables to use the same part on more models, preferably new models and so save expenses for its acquisition. Removable fastening is ensured by inserting, snapping, screwing or gluing or by another way. The auxiliary device is mounted on multimedia device by means of fastening mechanism of the auxiliary device. This enables fasten the auxiliary device on different types of multimedia devices, preferably also new ones, which brings the advantage that also for new types can be used the present devices and so save expenses for acquisition in case of changing the type.

A next example of fastening mechanism is fixing of auxiliary device by screws or gluing on the back cover of multimedia device, whereas the leveling the bumpiness out of the cover can be carried out by a flexible underlayment fixed by screws or glued. The auxiliary device is preferably smaller in terms of area than multimedia device, which enables to use a great spectrum of multimedia devices. Electric interconnection is preferably made by means of electric cable on one side with a USB connector which is inserted into connector of multimedia device where it is inside covered a reserve of electric cable for adaptation for different types of multimedia devices.

The present chest straps for sensing heart rate or ECG have deficiency in jamming caused by motion of the body, when a part of the strap with electrodes surrounding the body moves which changes the contact. This drawback can be eliminated a sliding chest strap consisting preferably of parts with sensing electrodes with fixative part which surrounds chest and freely slides on fixative part with which is not mechanically joint and by body motion is not shifted on skin. For better slippage there is used sliding material, preferably on both parts of the strap. Principle of sliding strap is used preferably also with braces which are connected with chest strap and by its elasticity press the sensing part with electrodes located in area of shoulders in order to comprise together with electrodes on chest strap a system of electrodes for 3 lead ECG and further 2 electrodes and 2 additional electrodes on leg strap they form 12 lead ECG. Electrodes are connected by electric cable with a board of electronics which serves for processing heart signals for ECG or/and a curve of heart rate, which is located preferably in

the small bag near waist or in the pocket or on wrist where electric cable is preferably laid through the sleeve and placed preferably on the bracelet with sliding mechanism where from which can be removed for easy manipulation. Connecting with the board of electronics enables elongated twisted cord or spinning reel. Connection with multimedia device, PC and servers is ensured wirelessly.

Industrial usability

Proposed design has high industrial usability taking into account the strengthening trend of expansion of mobile multimedia devices, because this design increases usable value for the user.

Example of invention embodiment

On Fig. 1 is example of connection of an auxiliary device, not adapted multimedia device 600 not adapted for connecting of auxiliary device 100 by individually constituted cellular phone 100 not adopted from line production for connecting auxiliary device with removable cover 101 connected with cellular phone 100 by fastening elements 602 made by hitches 128 of cover fitting into counterparts 127 made by depressions on cellular phone 100 where cover is situated at the adverse side of display 178 and keyboard 172 covering SIM card 177 and accumulator 129 placed inside of the cellular phone. On the cellular phone 100 is situated a connector 102 for connecting USB cable, inside is situated further accumulator 129, unit 328 and basic communication block 328. The unmodified multimedia equipment 600 is made with advantage as well by multimedia pocket computer or similar multimedia equipment containing further described functions or some of them, such as mobile communication by means of internet, communication on mobile phone network or other data communication media, multimedia playback, photo-camera, TV camera, GPS detection with virtual keyboard equipped with keyboard and display or touch display.

Fig. 2 shows a multimedia device 600 not adapted formed by cellular phone 100, not adapted with removed back cover 101 and auxiliary device 104 individual, which extends functions of not adapted multimedia device 600. Connection of auxiliary device 104 on multimedia device 600 made by cellular phone 100 is such a way that auxiliary device 104 is situated instead of removed cover 101. This solution preferably enables its easy electric, electronic and mechanic disconnection from auxiliary device 104. When there is no intention to use functions provided by auxiliary device 104 it can be removed and instead of it to use the cover 101 of the multimedia device. It is possible to acquire the auxiliary device only in case when is needed to strengthen the capacity of basic accumulator of the multimedia device, or to use functions of auxiliary device 104. It is not necessary to acquire auxiliary device at the same time as multimedia device, it can be purchased later according needs. In this case it is acquired only multimedia device which results in saving, because all electric, electronic and mechanic parts for operating, connecting and interface for multimedia device are preferably placed in auxiliary device 104. The price of acquisition of multimedia device is limited only at these

units and parts which needs the multimedia device for its function and is lower than if the multimedia device contained also parts for cooperation with the auxiliary device. In this example, there is in the part of the auxiliary device 104 exceeding the shape of the cellular phone 100 situated a connector 105 USB, which is at mechanic connection of the auxiliary device 104 to the cellular phone inserted into counterpart 102 of cellular phone 100. The connector 105 is mounted flexibly using a flexible element 148, which after inserting the connector 102 at snapping the cellular phone 100 to auxiliary device 104, as shows multimedia device 600 ensures electric connection with the multimedia device. The storing mechanism 603 of accumulator with small door 22 for exchange of discharged accumulator 120 of auxiliary device 104 by a charged one ensures easy access to accumulator and easy exchange of accumulator and at the same time its locking by a lock 126 of door of accumulator 126 against sliding out. At the auxiliary device 104 is situated another connector 106 preferably USM connector common for external communication of the auxiliary device and the multimedia device with preferably external PC, which can be used as a source of 5V for charging of accumulator 120 of the auxiliary device from external source. Preferably can be used a data switch 107 of external USB for switching data stream transferred by internal USB connector 105 either from the processor of auxiliary device, or from connector 106. Detail 500 depicts a composition made of multimedia device formed by cellular phone 100 with connected auxiliary device 104. Detail 501 depicts a view in direction "S1" and detail 502 depicts a view in direction "S2". Pushbuttons 110 and 111 described at detail 501 enable to transfer into multimedia device hints and LEDs 08 and 109 preferably situated inside pushbuttons can signal the reaction to hints. Pushbutton 110 serves for emergency calls and pushbutton 111 for resetting. Pushbuttons are located at easy accessible place at auxiliary device 104 which has advantage for immediate use of them in comparison with situation with using pushbuttons on touch screen of cellular phone 100, where it would be necessary first manipulate for displaying it on screen. On detail 502 is showed connecting element 601 made of connector 106, further is depicted door 122 with hinge 119 an lock of door 126 and connector 106. Discharged accumulators 120 in auxiliary device 104 can be preferably replaced by charged ones without interruption the operation of multimedia device. Operating accumulators 129 can be charged by means of storing mechanism of accumulator 603 without removing the auxiliary device 104 from the multimedia device 600 preferably made by cellular phone 100. So it is not necessary to charge accumulator by relevant cable to USM connector 106 and this connector remains free for use. The user is not forced to charge the

cellular phone 100 through connector 102 from charger and in this way the phone is still ready for use. Another advantage of auxiliary device is a lot of functions, which support and extend the possibility of multimedia device 600. Advantage is also usage of not adapted cellular phones from line production. The auxiliary device 104 is clapped on the multimedia device 600 instead of the back cover. Connection and disconnection of auxiliary device may be done during the operation of multimedia device 600 without losing any ability of multimedia device 600. Advantage after connection of auxiliary device is continuous uninterrupted operation of multimedia device 600 without necessity of charging its internal accumulator 129 by external charger, which is ensured by auxiliary accumulators 120 located in auxiliary device 104 whereas in auxiliary device 104 can be used accumulators from line production currently available on the market.

Fig. 3 This picture shows detail 503 of an example of connection of a special auxiliary device 104, on which are made grooves with not adapted multimedia device 600 made of cellular phone 100. It is shown the fixing elements on the not adapted multimedia device 600. On setting the auxiliary device 104 to cellular phone 100 and mutual pressing the click the fixing elements 128 into counterparts 127 made by suspension dome in cellular phone and so it is created a compact but disassembly possible mechanic connection of both mechanic parts as shown on detail 503. B this connection are both devices firmly mechanically joined. This compact unit consisting of joined multimedia device and auxiliary device can be easily carried in case or pocket.

Fig. 4 shows the embodiment of auxiliary device with door 122 placed on side which hides inserted accumulator 120. The flexible fixing of connector 105 to the auxiliary device 104 using elastic elements 148 is not changed. Further it is shown secondary display 325, preferably a touch display controlled by secondary pushbuttons 701, which can serve for other reasons which can permanently monitor important information for instance the curve of heart rate even at activity of cellular phone 100 displayed on Fig.2, for instance to accept a phone call which is displayed on display 178 on Fig.1. Advantage is also the possibility to watch two different activities running on cellular phone 100 and the auxiliary device 104.

Fig. 5 illustrates block diagram of module 199 continuously charging of basic accumulator 129, which is part of modified auxiliary device 104a. This example illustrates charging of the basic accumulator 129 of cellular phone 100 and the auxiliary accumulator 120 at the same time from the charger 131, which simultaneously supplies the electric circuits of module 199 and also multimedia equipment 600 consisting with advantage of a cellular phone 100. In case when external source 113 is not connected, it is running recharging of the basic accumulator 129 of cellular phone 100 at the same time from the auxiliary accumulator 120, which is placed in the auxiliary device in the way, that is at first the voltage of auxiliary accumulator 120 modified by voltage converter 132 to voltage by the specification for charging multimedia device, often 5V. Via second connector 105 USB of auxiliary device 104a and connector 102 USB of multimedia device with advantage formed by cellular phone 100 is this voltage used for recharging of the basic accumulator 129 via charger 130 of multimedia equipment. The advantage of this solution is based on fact that it is possible to use in the auxiliary device accumulators with different voltages regardless of voltage for recharging multimedia equipment accumulator. The auxiliary accumulator 120 placed inside in the auxiliary device is possible after discharging easily and quickly replace by another charged accumulator or recharge it from external source 113. Replacement of the auxiliary accumulator 120 of module 199, in which auxiliary device is placed inside can be realized during operation without removal of auxiliary device 104 or phone cover and without operation interruption of multimedia device preferably formed by cellular phone 100, because during auxiliary accumulator 120 replacement of auxiliary device, its operation is supplied from the basic accumulator 129. The auxiliary accumulator 120 can be replaced without limitation of operation and without separation of multimedia device with advantage formed by cellular phone 100 and auxiliary device 104a. The auxiliary accumulator 120 placed in auxiliary device can be recharged from external source 113 which is connected through next connector 106 to the charger 131, which ensures recharging by the way of the auxiliary accumulator 120 specification. All electronics related to accumulator recharging preferably placed in auxiliary device 199. The voltage states during accumulator recharging which is placed inside auxiliary device and presence of voltage on the voltage converter output is indicated by indicators 181, 182 and 183 which evaluate this voltages and with the advantage are monitoring this states and indicates by means of LED of various colors. Indicator 181 signals presence of connection to external voltage on next connector 106, in addition indicator 182 shows recharging of the auxiliary accumulator 120 situated in auxiliary device 199. The

correct function of voltage converter 132 and thus indirectly state of auxiliary accumulator 120, which is placed in auxiliary device, shows voltage indicator 183.

Fig. 6 illustrates block diagram of auxiliary device 104, illustrated on Fig. 2 and Fig. 4, electronics and all functions of which are placed on board of electronics 123' on the auxiliary device board of electronics. Auxiliary accumulator 120 placed in auxiliary device 104 can be very easily replaced by the use of small door 122 for the auxiliary device, without interruption of multimedia device operation and without separation of multimedia device from auxiliary device, is used for auxiliary device supplying through circuit 326, in which is auxiliary accumulator 120 placed and also used for charging of basic accumulator 129, which is placed inside the multimedia device. Auxiliary accumulator 120 can be in auxiliary device 199 placed directly on the board 123' of electronics or can be with this board connected and be recharged without removing it from auxiliary device 104 by the external power supply through next connector 106 of external USB of auxiliary device and charger 131. Continuous recharging of the basic accumulator 129, illustrated on Fig.1, of multimedia equipment 600 is ensured from voltage converter 132 and linked up USB connectors 105 and 102. This enables uninterrupted operation of multimedia device without necessity to recharge basic accumulator 129 by the external charger. The possibility to connect USB cable for data transfer is the main function of USB connector 102 of multimedia device, which is by connection with multimedia device and auxiliary device covered and is used by auxiliary device except charging the accumulator of multimedia device end as well for data transfer between microprocessor 133 of multimedia device and multimedia device which would limit using the cable of multimedia device for connecting USB cable. The problem of multimedia device connector USB covering solve the data switch 107 of external USB, which switches data path of multimedia device connector 102, which is inserted into the second connector 105, between microprocessor 133 and next connector 106 of auxiliary device, so next connector 106 can from the point of view of data transfer and USB cable connection fully substitute function of multimedia equipment connector 102, for example for PC connection. Preferably it is possible to place into auxiliary device 104a next modules and circuits, namely block 149 of communication modules which ensure data transfer by next communication protocols, which are in multimedia auxiliary device not available. This data is evaluated by microprocessor of auxiliary device 133 and is transferred into multimedia device and alternatively into next device. The block 149 of communication modules with advantage includes module 134 for

signal transmission in the frequency band 5,5 kHz, which receives and transmits into cellular phone 100 data, which ordinary cellular phone is not able to receive. This data is preferably heart rate data, transmitted by chest belt, further a block of transmission 135 using Bluetooth Low Energy (BLE), ANT, alternatively Bluetooth (BT) and next communication protocols with advantage module 136 of RF transmission (band 800-900 MHz), module 137 of WiFi transmission and also module 138 of ZigBee protocol transmission.

Up to date multimedia equipment, for example cellular phones with touch display, have available for multimedia equipment applications control only virtual keyboard and icons displayed on touch display, which is not I the time of multimedia equipment sleeping regime active. Touch display operation is very energy demanding that is why it is required to operate multimedia equipment in the regime of automatic sleeping, as long as it is possible. But multimedia equipment activation, which is in the sleeping regime, requires from user a few operation, what is lengthy and makes substantial trouble in the moment in which it is necessary call for help for person with loss of consciousness health problem, loss of spectacles, in darkness and similar. This problem is solved by push buttons 110 and 111 placed on auxiliary equipment 104a. The advantage over current state is prompt accessibility and identification of push buttons by touch even in dark and immediate multimedia equipment activation, even if it is in the sleep regime. Push buttons 110 and 111 activate microprocessor 133 of auxiliary equipment, which immediately activate corresponding applications in multimedia equipment regardless if is in this moment the multimedia equipment active or in the sleeping regime. The advantage of push buttons 110 and 111 using for calling for help in the case of emergency, at what time is instantly after multimedia equipment activation send message to specified location including case that the multimedia equipment is in the energy saving sleeping regime. The advantage for fast help calling by the use of multimedia equipment is using push the buttons 110 and 111 on the auxiliary equipment with advantage labeled Panic and Reset, which in cooperation with microprocessor 113 of auxiliary equipment and its software, indicators 108 and 109 with advantage LED and acoustic signalization 112, controlled by microprocessor 133. With advantage is after the press of push button 110 by which is assigned function panic going on starting of acoustical and optical warning announcing that was activate request to send call for help by the acoustic signalization 112 and optical signalization by indicator 108 with advantage red color LED alert by blinks activation of request to call for help. During the period of which is warning

signals activated it is possible to cancel the activation of request to send call for help by the use of push button 111 with advantage labeled Reset. After this the indicator 108 stops blinking and also stops warning signal of acoustic signalization. If the request to send call for help was not canceled by push button Reset, the blinking of indicator 108 is changed to permanent lighting until multimedia equipment accept request to send call for help. Acceptance of request to send call for help the multimedia equipment confirms, the indicator 108 stops lighting, stops acoustic signalization and for short time is lighting indicator 109 with advantage green color LED confirms call for help acceptance. Push buttons 110 and 111 in addition reduce energy consumption because both multimedia equipment and auxiliary equipment 104a can be in the sleeping regime also in the case of probability of incident requires urgent call for help.

Fig. 7 shows block diagram of other auxiliary device, with board 123 of electronics where ordinary microprocessor 133, as presented in the Fig. 6, is substituted by microprocessor 139 with two USB ports, which can be used for connection with two USB connectors for controlling data flow transferred through these connectors. After inserting connector USB 102 of multimedia device into USB connector of auxiliary device the data stream is directed to the microprocessor or to the first USB connector 106 of two ports microprocessor which enables communication of multimedia device through connector 102 covered by auxiliary device and first USB connector 106 with another device connected with USB cable to auxiliary device. As an example of utilization of auxiliary module of receiver 134 of signal 5,5kHz situated in auxiliary device is illustrated as connection of chest strap 145 for sensing heart rate and transmitting it wirelessly in frequency band 5,5kHz. Another example of evaluation and further processing of heart rate by microprocessor in auxiliary device is utilization of chest strap 146 for sensing with wireless transmission using Bluetooth module with transmission module 135 of auxiliary device.

Fig. 8 illustrates extended block diagram for processing ECG signals by auxiliary device showing continuously the heart activity by means of auxiliary device and transferring results for graphic displaying and achieving to multimedia device through connector 105. It can be preferably monitored if the heart activity is normal, or if occurs irregularities in it or if it reveals acute or proceeded any heart defect, especially defect of myocardium, specially infarct

of myocardium and performs continuous screening of ischemic disease of heart at load and displays on display of cellular phone ECG curves, time slopes of heart pulses and that as long-duration program in conditions of common for patient for instance at sport. In this case auxiliary nodules and elements are used such as connector 140 for inputs of ECG leads and module 141 "Front End". Electrodes 143 ECG placed on body skin of patient sense the low voltage originated by the heart activity are connected through connector 140 to the input of auxiliary module 141 Front-End which amplifies the signals, filters, digitizes and adapts and transforms for consecutive processing by microprocessor 142.

Fig. 9 shows arrangement of auxiliary device for evaluation ECG signals, which are preprocessed by electronics situated close to ECG electrodes 143, for instance of a strap 147 with ECG electronics where is also placed a module 141 Front-End with communication module BT/BLE 144 ensuring wireless processed data transfer from module 141 into auxiliary transfer module 135 BT/BLE/ANT. Modules 141 and 144 are preferably fastened on chest strap so as the leads from contacts were as short as possible. Advantage of this arrangement is shortening of leads for reducing the level of signal jamming. The ECG electrodes can be with advantage as a part of strap with electronics. Using auxiliary module of microprocessors using one or more microprocessor the power can be enhanced and the data processing speed can increase. Microprocessor 158 and 159 communicate with other auxiliary units through microprocessor 142. In each microprocessor can be used different operational system such as Android, Windows Mobile, Symbian and in this way to optimize possibilities of auxiliary device with regards to requested applications.

Fig. 10 shows example of mechanic arrangement of auxiliary device 104 and layout of its main parts. Auxiliary accumulator 120 is inserted into storing mechanism 603 of auxiliary device 104 after opening the door 122 and is connected with connector 121. The door 122 acts after closing against the pressure spring 125 and ensures the accumulator 120 again sliding out. Further a board with electronics is fixed to the auxiliary device with small transparent hole for objective of photo camera and also a transparent hole 124 of multimedia device and so its speaker 801. As illustration of electronics blocks and modules layout are on the board 123 depicted module 199 for continuous charging of basic accumulator 129 which is placed under auxiliary accumulator 120 and charging the auxiliary accumulator 120, module of communication block 149, module of microprocessors and module 168 of auxiliary

units.

Fig. 11 shows multimedia device 600 designed for easy mechanic and electric removal and connecting one or more auxiliary devices 104 and 104' to multimedia device 600 with electronics 167 of multimedia device by fastening elements 602 designed for this purpose and situated on multimedia device placed on multimedia as well as auxiliary device. At auxiliary devices there are preferably placed dowel pins 315 which fit into appropriate holes 316 with a spring 317 situated on multimedia device. By this mechanical connection are both equipment mutual fixed so that during manipulations by multimedia equipment its position as well as position of all units and parts in it is assured against random moving. Electrical connection of multimedia equipment and auxiliary equipment is by the connecting elements 601 with advantage formed by linking connector 313 of multimedia equipment and its counterpart, what is linking connector 314 of auxiliary equipment. Connector 102 USB of multimedia equipment is not used for mutual electrical connection multimedia equipment and auxiliary equipment, is not covered and that is why it can be used by multimedia equipment. Auxiliary equipment is with advantage possible mechanically and electrically connect to multimedia equipment in the need expand multimedia equipment function. The auxiliary device 104 contains for instance only auxiliary accumulator 120 placed behind the door 120, where the block diagram is on Fig.2. The auxiliary device 104 contains besides auxiliary accumulator 120 another module for different functions, for instance the block diagram is in Fig.9, On auxiliary device there are besides the door 122 for inserting the auxiliary accumulator 120 placed control elements, preferably push buttons 110 and 111, switch 107 and indicators 108 and 109. In case when auxiliary device is not used is replaced by the cover. Detail 509 illustrates an example of version of dowel hole 316 of element created by a fitted pin 315 fast connected with auxiliary device 104 which fits into appropriate formed holes 316 with inserted transverse spring 317, which is firmly connected with multimedia device after inserting pin into hole the spring 317 snaps into fitted pin 315 and in this way comes to fastening the connection.. This can be used also for additional installation of fixtures on multimedia device after its fabrication.

Fig. 12 presents block diagram of permanent charging of internal accumulator 129 of multimedia device 600 on Fig.11, where its auxiliary accumulator 156 is situated in auxiliary device 104. Since the auxiliary device 104 is connected mechanically and electrically in this

case with multimedia device, the connection is easier. Electronic circuits 312 are charging accumulators 129 and 156 depending on their charge. Accumulators 129 and 156 are through connector 102 from external source. After disconnecting from power source electronic circuits are permanently charging internal accumulator 129 of multimedia device, whereas as the source of charging energy is used auxiliary accumulator 156 which is charging simultaneously electronic circuits 311 of multimedia device.

Fig. 13 illustrates an example of auxiliary device 104 consisting of block 608 of auxiliary device of and auxiliary accumulator 162 in storing mechanism 603 of accumulator 162, where it can be exchanged through door 163 ensured by a lock 164 whereas the auxiliary device 104 is integrated into a compact multimedia device 600'. This block 608 comprises preferably pushbuttons 110 and 111, indicators 108 and 109, microprocessor unit 158 and communication module 149. Compact multimedia 600'' consist of block 607 of multimedia device, basic accumulator 161 and display 196. Block 607 is composed of SIM card 177 and of basic microprocessor unit 327. The auxiliary device 104 integrated into multimedia device 600'' has the same function as described above, preferably ensured by easy replaceable auxiliary accumulator 162, which supplies multimedia device 600'' and simultaneously charges the basic accumulator 161, further the communication bock 149, which enables communication on different media, further microprocessor unit 158 which communicates with basic microprocessor unit 327 working on different operational system then the basic microprocessor unit 327 and so enables communication with its operational system and further modules which ensure functions mentioned above.

Fig. 14 shows layout of main parts of multimedia device 600'' alternatively supplied from auxiliary accumulator. There are operational accumulators 161 and auxiliary accumulators 162, electronics 167 of multimedia device and module 168 of auxiliary units of multimedia device.

Fig. 15 shows module 169 of charging electronics situated on the board 167 of multimedia device on Fig.14 module 169 of charging electronics ensures continual charging of operational accumulator 161 of multimedia device 600'' presented on Fig.14 from auxiliary accumulator 162. Charging of auxiliary accumulator 162 from external power source connected to connector 102 is realized from charger 165 of multimedia device and

simultaneously is charged operational accumulator 161 from charger 166 with voltage converter. After disconnection of external source, the operational accumulator is permanently charged without interruption from auxiliary accumulator 162 again by charger 166 with converter, which first steps up voltage from auxiliary accumulator 162 by converter to value needed for proper charging the operational accumulator 161 and simultaneously controls charging.

Fig. 16 presents block diagram of modules situated on board of electronics 167 of multimedia device 600. To the operational module 193 of multimedia device are connected modules 196 of display, keyboard module 197, block 149 of communication modules, preferably containing modules of transfer including modules 135 of BT/BLC/ANT transmission, module 136 of RF transmission, module 137 of WiFi transmission, module 138 of ZigBee transmission and auxiliary module 194 of microprocessors and 195 module of multimedia device. Operational accumulator 161 and auxiliary accumulator 162 are connected to electronics 170 of accumulators charging, which aside from charging of both accumulators provide also supply circuits of multimedia device, which is figured by arrow 198.

Fig. 17 presents a case 301 delimiting in auxiliary device space for embedding accumulator 120 with a spring 306 and contact of accumulator, which after inserting it is locked by door 122 pivoting around a hinge by means of a latch 304 snapping over projecting part.

Fig. 18 explains how at opened door 122 a bronze spring 306 which ensures connecting contacts of accumulator 307 shifts out the accumulator 120 from the housing 301 for easy manipulation with hand.

Fig. 19 clarifies the locking the accumulator 120 after its inserting into housing 301 of the auxiliary device 104 by a lever 308. Detail 504 illustrates locking of accumulator 120 by a lever 308 in closed position, where accumulator 120 is pressed to flexible contacts of housing 301 against contacts and ensured in housing 301 by a lever 309 pivoting around a hinge 119 and leaning against the side of housing 301. Turning the lever 308 by 90° at replacing the accumulator the lever tumbles out and pulling it accumulator 120 shifts out from the housing. As described above, in this manner can be discharged accumulators replaced by charged ones.

Fig. 20 illustrates mechanical connection of unmodified multimedia equipment 600 and modified auxiliary equipment 104a by the use of fixing element 602 which are pulled over by flexible clasp at suitable part.

Fig. 21 illustrates mechanical connection of multimedia device 600' and auxiliary device 104 by the use of fixing element 602 formed by coupling layer 318 which can be velcro fastening or paste layer. Electrical connection of both equipments after mechanical connection ensures connecting elements 601 formed by linking small cable 319 and two its connectors. Detail 510 on Fig. 21 illustrates a view in S direction to connecting element 601 formed by small cable with connectors, which enables electrical connection of auxiliary device and auxiliary device in the case that linked connectors are not placed above them

Fig. 22 illustrates mechanical connection of multimedia device 600' auxiliary equipment 1 device 104 using fixing elements 602 formed by mechanical coupling elements 320, with dowel pins 315 and partially cut hollows 316 with transverse spring, which is for instance sketched on Fig. 11. Electrical connection is ensured by a connecting elements 601 formed by linking small cable 319 with two connectors.

Fig. 23 illustrates mechanical connection of multimedia device formed by cellular phone 100 and auxiliary device 104 by inserting grooves of multimedia device into grooves of auxiliary device, which forms a firm, but separable connection, which displayed on Detail 321.

Fig. 24 illustrates mechanic embodiment of auxiliary device in shape of a housing 323 mechanically connected with multimedia device 600' by fixing elements 602 carried out by means of dowel pins 315, which are after insertion into partly cut hollows 316 with transverse spring 317 by this spring fixed. Electric connection is provided by connecting elements 601 formed by connectors 313 and 314. Board of electronics 123 on which circuits and elements of auxiliary device, extending functions of multimedia device 600 are situated is inserted through small door 329 into one of several connectors 324. Auxiliary accumulator 120 is put through small door 122. Detail 506 presents an example of situating the board 123 of electronics and auxiliary accumulator 120 in housing 323. The main accumulator is placed above thy auxiliary accumulator 120.

Fig. 25 illustrates a view to mechanical arrangement of auxiliary device 104 which is mechanically connected to multimedia device 600 by flexible fixing clips 322 which are fastened by glue or mechanically connected alternatively on entire surface or partly with the auxiliary device 104. Ends of flexible lugs are contoured so they fit tightly to edge of unmodified multimedia equipment 600'. This removable connection makes possible quick mechanical connection of both equipment by the press them into flexible lugs 322. In this case the auxiliary device and multimedia device have in mentioned example connectors for mutual interconnection over them and therefore it is possible connect them by connecting element formed by U-connector 341, presented as detail 511.

Fig. 26 shows mechanical connection of auxiliary device with multimedia device 600'' where auxiliary device is inserted into space 330 designed for this purpose in multimedia device. Detail 507 shows a view to multimedia device 600'' in direction S, where is figured space for inserting of auxiliary device. Detail is in direction to S1.

Fig. 27 illustrates configuration of multimedia equipment 600'' preferably with extended functions. In this case the auxiliary device is integrated with the multimedia equipment. The auxiliary units are not detachably connected with the multimedia on common board of electronics 331 of multimedia device with extended functions. Only the auxiliary accumulator is easily removable from the accumulator storing mechanism 603.

Fig. 28 illustrates again configuration of multimedia equipment 600'' with extended functions with the auxiliary device integrated not detachably with multimedia device on common board of electronics 332, which is replaceable as entity with utilization of connector 335. As well the auxiliary accumulator 162 is easy removable from the storing mechanism of accumulator.

Fig. 29 depicts repeatedly the configuration of the multimedia device 600'' with the advanced features, allowing for the auxiliary device to be placed in the multimedia device, located on the swap circuit board 334, to be connected to multimedia device via connector 335. The

circuits of multimedia device are placed on the solidly connected board 333. The additional accumulator 162 can be pulled out easily from the storage mechanism 603.

Fig. 30 depicts an example of solution for storage mechanism 603 of the accumulator that responses to the pressing at the moment when the pressure of spring 336 is overcome and the latch 344 lifted by inserting the accumulator 120. The accumulator 120, by means of its contacts, seats down to their counter contacts of the accumulator releasing mechanism 339 with securing it against release by the latch 344 pushed down by the spring 336. Pull out of the accumulator 120 occurs by means of pushing it down repeatedly. By doing this, the mandrel 343 is pressed down into the accumulator releasing mechanism, thus the lever 337 which is rotatable around the pivot 338, tilts; the latch 344 releases, and consequently, the accumulator 120 is ejected by the spring 342. A delaying element that forms part of the storage mechanism 603 causes the latch 344 is pressed down by the spring 336 upon expiry of time frame set so as to enable the accumulator is pulled out safely.

Fig. 31 depicts other option of design solution referred to in Fig. 11, using the additional accumulator 120 able to recharge simultaneously the accumulator 129 of basic multimedia device incorporated in the auxiliary device 104 with the circuits 167' to enable its recharging. Should the multimedia device 600' work without connecting the auxiliary device, having the cover attached instead, its accumulator 129, would be recharged by the circuits 167, forming part of the multimedia device.

Fig. 32 depicts an example of the compact multimedia device 600'' with the auxiliary device 104 including the mechanism 320 of the block 608 storing in the multimedia device 600''. In the referred example, there are microprocessor units 158 and 159 depicted in the block 608. The booster accumulator 162 inserted through the door 163, secured by the lock 164, forms other part of the auxiliary device 104. The easy and fast removable cartridge 610 shall be subject to insertion in the mechanism 320 of the block storage, it preferably contains the additional mechanical, electrical and electronic units, or elements, extending the functions of the multimedia device 600''.

Fig. 33 represents an option depicted at the previous figure, albeit using more simple block 612 storage mechanism 320' equipped by the panel. It is used preferably in relation to more

simple applications requiring smaller contingencies in comparison with those provided by the board 612.

Fig. 34 depicts the way of connecting the auxiliary device 104 to unequal cover 101 of the multimedia device 600, with the transparent slot 124 of the mobile phone camera remaining uncovered. The spring washer 628, which circumferences the perimeter of unequal cover 101, having the inside of the washer 629 in the relieved shape preferably unfilled, equalizes the unevenness. The auxiliary device 104, preferably connected with the cover 101 of the multimedia device, preferably by the screw 631, or more screws screwed in the nut 632, or more nuts mounted on the auxiliary device, or glued so that the washer 628 is glued to both the cover 101 and the auxiliary device 104. To get easily the back covers 101 of the multimedia device 600 in form of spare parts is preferable so that the original cover 101 may be used for bringing possibly the multimedia device 600 back to original conditions with the spare part used to this end. The connection between the connector 102 of the multimedia device, preferably via USB, the female connector and the auxiliary equipment 104 is made by the cable 319 preferably soldered to the PC board 636 soldered on the connector 102 to the male connector, whereby the length of connector assemblage 102, with the connected cable 319, is reduced in comparison with the existing assemblages of connectors. The cable 319 is preferably fixed to the rear cover 101 by gluing, with the connector clearance left for inserting the female connector 102. It is then led through the hole, padded out by the rubber insert 634 for the sake of securing the cable 319, further to the auxiliary device 104, with this cable soldered at the soldering point 635 of the circuit board 123 of the auxiliary device 104 by leaving spare 640 portion of the cable. This enables to set up the required length of cable of the auxiliary equipment 104 led to the USB connector 102, enabling the connection of multimedia devices of various size. Upon tightening the screw 631, the auxiliary device 104 moves from the level kept prior to tightening up as plotted to reach the level 639.

Fig. 35 depicts an example of the bag configuration 401 of two multimedia devices 600, enhancing its potential use upon connecting the multimedia device 600 by extending substantially its operation without interruption with continuous charging the accumulator 120 of multimedia device. Furthermore, the bag 401 contains the additional electronic devices placed on the circuit board 406 that support applications of the connected multimedia device. The bag 401 is preferably made of plastic, leather, or other suitable material, and it can store the multimedia devices. In the period of not using the multimedia device 600, it is stored in

the space 403, the second multimedia device is stored in the space 403', the space 405 is used to store the backup accumulator 120 and the clip 402 serves to attach the bag 401 to the clothes of user.

Fig. 36 depicts clearly the space 404 to store the connecting cable - twisted cord 407.

Fig. 37 depicts a configuration example of the bag 401, using it for connecting the multimedia device 600 with the module of electronics 410 by the twisted cord 407, enabling data connection and power supply. The twisted cord 407 serving to connect the multimedia device 600 with the circuit board 406 of the bag stored in the space 404 for the patch cord. This cord allows easy handling. The twisted cord 407 may be stretched out when used. Upon release, it returns back to its original short form. The adjusted multimedia device 600 is connected to the circuit board 406 of the bag 401 by the twisted cord 407 with the USB connector 408, led to the multimedia device 600, and the USB connector 409 of the circuit board 406. The case 420 of the accumulator 120 is located on the circuit board 406 as well as the module of electronics 410 to include all electronic circuits of the bag 401 expanding the possibilities of multimedia device 600 including the continuous recharging its accumulator.

Fig. 38 depicts the top view of the bag 401. The accumulator 120 is separated by the partition 411, and it is connected through the circuit board 406 with the electronics module 410 shown in the FIG. 37, interconnected to the multimedia device 600. The accumulator is stored in the case 420 fitting to the printed circuit of electronics. Upon pushing the latch 421 away to secure the accumulator 120 in the retracted position, it is pushed out by the spring 422 enabling an easy and fast replacement. The bag is equipped with the detachable clip 402 to enable the attachment to the clothes of user.

Fig. 39 depicts the location of the case 420 of the accumulator 120 on the circuit board 406. The accumulator 120 is preferably inserted in the case 420, and it is secured against the movement by the latch mechanism 421. The USB connector 428 is intended to connect the circuit board 406 with the connector 409 of the bag, hence with the multimedia device 600. According to needs, or in case of failure, the circuit boards 406, equipped differently, are preferably replaced in the bag 401 for a spare part.

Fig. 40 specifies the location of latch 421 in the case 420 of the accumulator 120, containing the connector 423 either to ensure electrical connection of the accumulator 120 with the

circuits either located on this board. Upon releasing the latch 421 manually, the spring 422 ejects the accumulator 120 out of the case 420. The electronic circuits, located on the circuit board 406, are marked like the module of electronics 410. The USB connector 106 serves to connect an external source of power to charge the accumulator 120, and it can also be used to communicate with an external PC, if the data signals of the USB connector 106 are connected to the electronic circuits of the electronic module 410. The advantage of solution lies in the fact that the circuit board 406 is electrically connected through the connector 428 only, hence to enable an easy replacement. It is therefore easy to place in the bag 401 and replace the circuit boards with various functions of the electronics module 410.

Fig. 41 depicts an option of leading and placing the twisted cord 407 outside the bag 401. In this case, the twisted cord 407, connecting the multimedia device 600 with the circuit board 406, extended by a passage created in the bottom part of bag 401; it depicts how the twisted cord 407 is led through the upper part of the bag 401. Moreover, the preferably removable inlet extension bit 433, enabling to speed up and facilitate the insertion of the multimedia device 600 into the bag 401 by its broadened end, is depicted.

Fig. 42 depicts how the twisted cord 407 with the connectors 408 and 409 is led and located and their connection to the circuit board 406 and the multimedia device 600. The buttons 110 and 111, preferably assigned by the Panic and Reset functions, as well as indicators 108 and 109, preferably the LED indicators, located in the buttons 110 and 111 are placed on the circuit board 406.

Fig. 42B depicts the option of using the twisted cord led outside the bag 401, if the multimedia device 600 had a connector located on side of the case. The connector 408 of the twisted cord, preferably a corner one, is inserted in the connector of multimedia device through the gauge 431 created to this end on side of the bag.

Fig. 43 depicts the detachable clip 402 to ensure the attachment in the pocket able to be removed or fixed by the screw 425 in the nut 445 connected firmly with the wall of the bag 401. The hole 427 serves as an access area for the clip assembly and disassembly.

Fig. 44 depicts the configuration of the bag 401, using the self-acting reel 412 and the cord 413 with the connector 414 and the connector 415 to enable the link of the multimedia device 600 to the electronics module 410 of the bag 401. By pulling out the multimedia device 600,

the connecting cord winds off the reel 412. By storing the multimedia device 600, the cord 413 itself is automatically re-winded on the reel 412 which is placed automatically on the bottom of the bag 401. The detail 514 depicts the side view of the bag 401.

Fig. 45B depicts the automatic connecting / disconnecting the multimedia device 600 to/from the circuit board 406 of the bag 401 simply by plugging it in the bag 401. The non-adapted multimedia device with the reduction connector 431 inserted in the USB connector 102 of that multimedia device may be used. The contacts of the reduction connector shall be inserted in the connector 432, designed for automatic guidance of the connector, preferably attached to the counter 411, connected to the circuit board 406 by the cable 433, as shown in the Fig. 45 B and Fig. 45C. In addition, the adjusted multimedia device prepared so as the connector intended for inserting it in the connector 432 forms its part with the latter's configuration being designed for automatic guidance of the connector so as the reduction connector 431 is not used.

Fig. 45C depicts a side view of the automatic connecting / disconnecting the multimedia device 600 to/from the circuits board 406 of the bag 401.

Fig. 45D illustrates a diminished version of the bag 401', which serves just for placing the accumulator 120 of the circuit board 406, with the multimedia device placed separately, e.g. in the same pocket, together with the bag 401'. The communication between the multimedia device 600 and the circuit board 406 is pursued by mean of the twisted cord 607, with the connectors on both ends, or the radio connection, preferably via Bluetooth, inserted in the connector 409, and similarly in the connector 102, preferably via USB of multimedia device. Wireless connection of multimedia device with the bag 401' may also be used, albeit the advantage of continuous accumulator charging of the multimedia device is lost.

Fig. 45E depicts an enhancement of possibilities of the multimedia device 600, placed in the bag 401, by mean of the additional display 434, preferably protected against scratching by the protective foil 435. The additional display 434, preferably a touch screen, is placed in the bag 401, and it is connected by cable, or via Bluetooth, with the circuit board 406. The bag 401 is attached to the belt of trouser by mean of the fixture mechanism 443, shown in the Fig. 45G and 45H, enabling easy pull out of the bag to allow viewing the display 434 through the hole 474 in the bag.

Fig. 45F depicts the bag 401", enlarged by the storage space for controlling the removable additional display 434', preferably a touch screen, interconnected wirelessly via Bluetooth, or the extendable cord, preferably the twisted cord 407 with the circuit board 406. Take out the multimedia device 600, or the additional display 434 is enabled by the cutout 805 in both sides of the bag 401", with the different width of the multimedia device 600 and the additional display 434 making it possible to distinguish both devices by touch.

Fig. 45G depicts an example of the fixture mechanism 443 to enable the bag 401 fast pinning/unpinning from the strap attached to the user's body so that the display 434, preferably a touch screen, may be viewed to control the auxiliary device. The lower part of the case 436 of the fixture mechanism, connected with the bag 401, contains the groove 440, with the sliding deadbolts 439 placed therein, put on the guiding rod 437, and pushed by the spring 438 towards extreme positions limited by the groove 440. The auxiliary display 434, visible through the hole 474 in the bag 401, depicted in detail 512, is mounted on the circuit board 406.

Fig. 45H depicts the pin/unpin procedure of the bag by mean of fixture mechanism. By sliding in the bag 401 in direction of arrow, connected firmly with the fixture mechanism, the deadbolts 439 are inserted in the eye 442, firmly attached to the belt 441. The beveling ends of deadbolts 439 cause that the pressure of spring 438 is overcome and compressed to allow inserting them in the eye 442, and subsequently latching the deadbolt 439 in the groove 444. Unpin the bag is easy upon releasing the deadbolts 439 by pressing them in direction of horizontal arrows.

Fig. 45I depicts the removable circuit board 406" of the auxiliary device, preferably equipped with the display 434 and the additional removable accumulator 129 placed in the bag 401, where the circuit board 406" with the basic accumulator 120 is preferably connected to the bag 401 by mean of the twisted cord 407', whereas the multimedia device 600 is connected to the bag 401 by the twisted cord 407, or preferably the circuit board 406' with other wireless connecting devices, preferably via Bluetooth, or the network of mobile operator, or other appropriate media. In this case of wireless connection, the twisted cords are preferably disconnected. The circuit board 406" is preferably placed in the case 649, with the hole therein enabling the view to the display 434, creating by this a separate unit of the auxiliary device 218. The circuit board 406", preferably containing the display 434 is preferably worn

separately without the bag 401. In this case, it is wirelessly linked with the multimedia device 600 and other devices. As an example of other wirelessly linked device, there is a link of the chest belt 147 depicted here for the sake of processing the ECG heart signal via Bluetooth to process the heart pulse by mean of the induction circuit in 5.5 kHz band.

Fig. 45J The circuit board 406", preferably equipped with the display 434, is placed in the bag 401, or it may even be used without the bag 401, by placing it in the pocket 230 as an example. In this case, it is linked wirelessly to other device, preferably the ECG, or the heart pulses 146, chest strap 145, by mean of the multimedia device 190, the PC 418, or via the network of mobile operator 803 to the server 663. In the storage mechanism of the accumulator 339, enabling its replacement and the basic accumulator 120, it preferably contains the additional accumulator 129, which is replaceable in the operation. In case the circuit board 406" is intended for processing the ECG heart signals, it is required to link it, in a galvanic way, to the ECG electrodes 143 by the cable 234, led under the shirt, around its end, through the top end of trousers in the pocket 230, preferably to the clip 402, with the extendable cord 407 attached thereto, preferably the twisted one, or the cord with the reel 412 of the cable connecting the circuit board 406 with the electrodes 143'.

The detail 515 depicts an example of distribution of electrodes of the three-lead ECG sensing, i.e. placing the electrodes 143 on the chest belt 147 with the shoulder straps 232" with the electrodes 231. The interlink of ECG sensing electrodes 143 is also depicted particularly with the circuit board 406", serving in the current example to process the ECG signals, placed in the pocket 230 by mean of the clip 402, the cable 234, preferably by the multi-core and extendable cord 407, or alternatively, the circuit board 406 is preferably placed in the bag 401, linked to by the cable 234'. The electrodes 231, placed on the shoulder straps 232, are linked to by the cable 643, preferably a multi-core one, connected to the cable 234, preferably a multi-core one, in the chest belt 147, linking the electrodes 143. The electrodes 143 placed on the chest belt 147, amounting to 2 to 3 electrodes 143, and may be used separately for the single-lead ECG, albeit without shoulder straps 232 in that case. The three-lead ECG may be achieved in connection with the shoulder straps 232 equipped by the electrodes 231. By adding other two electrodes 143 in the chest belt, totally amounting to 5 pcs, and the electrodes 231', preferably attached to the elastic leg belt 147' on the ankles linked to by the cable 603', the 12-lead ECG may be achieved. Alternatively, the electrodes 231' may be placed under the waist. They are depicted as the electrodes 231" in these positions. The

electrodes 231' may preferably be linked to with the chest belt 147' by the cable 643' without the shoulder straps 232, preferably by mean of the connectors 644, similarly with the cables 643' by mean of the connectors 644'. From that place, the multi-core cable 234 leads the electrodes through the independent cores in the circuit desk 406". The electrodes 231 are placed on the top of shoulder, or closely thereunder, to enable the elastic shoulder straps be pressed towards the skin to achieve good contact, preferably without glue. This is also enabled by the elastic chest belt 147 and the leg belts 147'. The removable and replaceable electrodes 227, preferably the popper ones and/or glued to the belt, and/or the gel ones, enabling good contact with the skin, albeit without gluing them thereto, using the electrodes pushed towards the skin by the elastic belts 147, 147', and the shoulder straps 232, are preferably used instead of the firmly fixed electrodes 231, 143, 231".

Alternatively, the circuit board 406' may be placed on the wrist on the bracelet and connect it by the cables 233 with the shoulder straps 232, further linked to by the cables 643 with the belt 147. The circuit board 406', preferably includes the display 434, preferably a touch screen, to control it thereby. By mean of wireless connection, preferably via Bluetooth, or in case it is created by the mobile phone on the bracelet 236, alternatively by the cable 646, or preferably placed in the mobile phone on the bracelet 236, it is preferably linked to with the multimedia device 600. The principle of chest belt preferably applies with the sliding sensors 209 stored not only for the chest part described in the Fig. 63, but also for the shoulder straps with the fixing shoulder straps 204" pressed by the sensing belts 201". Alternatively, the circuit board 406 is preferably inserted in the bracelet mobile phone 236, placed on the retractable mechanism 664, depicted in the Fig. 54 with the possibility of withdrawal. In such a case, the metallic link to with electronics, secured by spare cable 233, or the extendable cord.

Fig. 46 depicts the block scheme of the electronics of the auxiliary device 104 with the function of continuous recharging accumulator of the multimedia device 600 via the connector 428 without other additional functions. The continuous recharging battery of the multimedia device, via the USB connector 428, enables the continuous and uninterrupted operation of the multimedia device 600 linked to the connector 428 without the necessity to recharge the accumulator of multimedia device by mean of external charger from the network or the notebook, hence to enable the continuous operation of or viewing the given application. Other USB connector 106, reaching the 5V voltage, as a rule, upon connecting it by the cable

to the PC, or the charger with the USB connector, enables to charge the accumulator 120 of the bag, and in the same time, through the electronics circuits of the bag, recharge the accumulator of multimedia device. To this end, the accumulator 120, having a substantially larger capacity in comparison with the capacity of accumulator, forming part of the multimedia device 600, applies. The charger 131 of the accumulator 120 with the transformer, being part thereof, transforming the 5V voltage from the USB connector 106, achieved by connecting it to the PC connector, or from the network source, up to the value required to charge the accumulator 120. The voltage transformer 132 is transforming the voltage of accumulator of the multimedia device.

Fig. 47 depicts the block scheme of the electronics of the auxiliary device to enhance the capacity of accumulator of the multimedia device 600. In addition thereto, it provides other enhancing functions. The voltage transformer 132' of the accumulator 120 is added to achieve the value required to supply the microprocessor 133, the receiver 134 and the block 135 of BT/BLE/ANT transfers. The receiver 134 of signals transmitted in 5 kHz band may be preferably used to receive signals from the chest belt transmitting data on the heart rate of person using the belt, and similarly the block 135 of transfers BT/BLE/ANT enables the communication with the device transmitting data this way. Thus, the electronics of the bag 401 enables both the two-way wireless communication with the multimedia device 600, and the two-way communication through the connector 428. The data transmitted this way may be assessed by the microprocessor 133, and the results transmitted via the connector 428 to the multimedia device 600, preferably able to view the screen in numeric or graphic form on the display.

Fig. 48 depicts the block scheme of the electronics of auxiliary device, strengthening the capacity of accumulator of the multimedia device 600, it includes the communication block 149, preferably encompassing the receiver 134 of signals in the 5kHz band, the block 135 of BT/BLE/ANT transfers, the module 136 of RF transfers, the module 137 of Wi-Fi transfers and the module 138 of ZigBee transfers. The receiver 134 of signals in the 5 kHz band, or the block 135 of BT/BLE/ANT transfers may be used, e.g. for the reception of signal from the chest belt processed in the microprocessor 133 and transmitted through the block 135 of BT/BLE/ANT transfers, or the twisted cord, or the cord placed on the reel together with charging 5V voltage in the multimedia device. The possibility to receive and assess data on the heart rate sensed by the chest belts of various producers is an advantage. An important

part of the communication block 149 is the block 804 of the GSM communication, enabling the network communication even if the multimedia device was not in active mode. The block 804 contains particularly the SIM card as well as the microphone and the speaker 801 of the voice communication. In addition to the communication block 149, the block scheme depicts the buttons 110, 111 and indicators 108 and 109, preferably the LED ones. These buttons, preferably assigned with the Panic and Reset functions enable to submit the additional instructions of fast activation of mobile phone via the microprocessor 133 such as setting the alarm that is, with the current technology, not feasible to set it in addition fast enough as the application of touch screen of the multimedia device, created preferably by mobile phone, is time consuming for this purpose. The pushed button 110, e.g. with the assigned Panic function, may be assessed by the microprocessor 133 as an emergency request. To reduce the occurrence of false alarms caused accidentally by pressing the button 110, the indicator 108, e.g. the red LED diode, flashes for few seconds in the adjustable time period. In the same time, the warning acoustic signal is made preferably by the speaker 801. At this time, the alarm mode may be canceled by the button 111, preferably with the Reset function upon expiry of this period of time, unless reset, the microprocessor 133 sends via the connector 428 to the multimedia device 600 the data signal instructing to send preferably the SOS messages prepared in advance and saved to the central prevention desk, or other place prepared to react fast to this emergency call. The communication block 149 is preferably amended by the GSM communicator 463 with the speaker 801 and the microphone 802 to be also preferably used for an emergency calling for the sake of backup by the multimedia device in case of its malfunction. The emergency voice phone communication is preferably pursued, via GSM or other network of the mobile operator, if needed.

Fig. 49 the block scheme of the auxiliary device, intended to process the analog signals of ECG curve by the Front End module 141, placed on the circuit board 406, and their further processing by the microprocessor 142 upon digitization. The ECG leads 430 led from the sensing electrodes 143 are connected to the connector 140, to the Front End unit, to amplify the signals on one hand, filter the interfering signals, and upon digitization, they are digitized by the latter. The signals in the digital form are advanced to the microprocessor 142, whereas, upon being processed, they are led to the connector 428, and further to the multimedia device 600. Moreover, the block scheme depicts the blocks of continuous accumulator charging 120 of the multimedia device 600 through the connector 428.

Fig. 50 depicts the block scheme of other option to process the ECG signals by using the auxiliary device forming part of the bag. In this case, the electrodes 143 are placed on the ECG belt 419 to enable their connection, and the Front End circuit 141. The ECG sensing signals are amplified and filtered as well as digitized directly on the ECG belt 419. The ECG signals pre-processed in this way are sent wireless through the module 144 to the BT/BLE/ANT block 135 of transfers, located in the electronics of the bag to be transmitted therefrom to the microprocessor 142 for further processing the ECG signal. The second microprocessor 142' and other microprocessor 142'' may preferably be used to extend the functions. These microprocessors preferably operate with various protocols different from the protocol of multimedia device, bringing about the advantage of working with more databases and programming languages. Other option includes the use of the ECG belt 419', preferably reinforced by the module 446 of the electronics for processing ECG signals completely so that the comprehensive ECG curve in form of data is transmitted to the circuit board 406 to be subject to imaging it. The connection is wire or wireless, preferably via Bluetooth.

Fig. 51 depicts an example of extending the functions of the multimedia device 600 by mean of the auxiliary device located in the bag 401 to assess the pulse rate, or ECG, by the chest belt 145 with the possibility of emergency call by pushing the button 110, with the option of resetting the reset button 111. The multimedia device 600 is linked to with the bag 401 by the twisted cord, enabling both the two-way communication, and the continuous charging accumulator of multimedia device. The chest belt may transfer wireless the sensing data to the communication block 149 of the bag 401 by mean of routine communication protocols so that the belts of various producers using various communication protocols may be linked to. Simultaneously, this data are preferably transmitted to the watch 416 with a receiver, preferably operating at 5.5 kHz induction frequency, or 2.4 GHz. The data transmitted to the electronics of the bag 401 is processed by the microprocessor 133, transferred thereafter to the multimedia device 600 to be viewed and controlled, and preferably also in the wrist mobile phone 417 via radio signal, preferably by the BT transfer module, or other suitable communication medium.

Fig. 52 depicts an example of extending functions of the multimedia device 600 on sensing and assessing ECG with the wireless link to the ECG belt 419. The data serving simultaneously to assess the pulse rate are wireless transferred in the electronics circuits of the bag 401, the ECG belt 419, the multimedia device 600, and preferably the PC 418 as well,

through the block 432 of transfer, preferably pursuant to the Bluetooth protocol with the multipoint function, or master function. Alternatively, the chest belt 145 transferring data of the pulse rate in 5 kHz band instead of the ECG belt 419 is communicating with the bag 401. Furthermore, the data between the bag 401, and the bracelet 417, are transferred, preferably by the Bluetooth receiver. The data information is transferred to the surveillance central desk 447, preferably through the network of mobile operator 803 to assess it further. Alternatively, the data are transferred from the ECG belt 419 by mean of the wire circuit 633.

Fig. 53 depicts an example of enhancing the functions of the multimedia device 600 by assessing the ECG signals, transferred from the ECG belt 419 in the electronic circuits of the bag 401 by using the two-core, or four-core cord 433, whereas two wires to transfer data and other two wires may be used for continuous recharging accumulator of the ECG belt 419.

Fig. 54 depicts the bracelet 620 with the eject () mechanism for the ejecting attachment of multimedia device 600, adjusted or non-adjusted, preferably with the groove ducts 621, used for moving the sliding sledge 622 thereon, with the position fixed in the limit positions by the small stopping ball 623 pressed on by the spring placed in the bottom part of the sledge 622 snapping shut in the stopping depressions 624 on the surface. The sledges 622 contain the groove 625 with the small rail 626 snapping shut therein; the sledges 622 eject out of the bracelet is ensured by the end stops 627, 627'. The multimedia device 600 is plotted in the ejecting position, while the detail 513 depicts the retracting position. The advantage is the ability to wear the multimedia device in the standby position, on the bracelet, hidden under the shirt, and in case of use to eject it in the visible position. To pull out the multimedia device 600, if required, it shall preferably be adjusted by the ejecting mechanism 664, and it preferably removes the stopper 627, and upon the resistance of the stopping depression on the surface 624' is overcome, the multimedia device 600 may be pulled out from the sledge 622 for free use. Easy insertion in the groove 625 preferably enables the extended lead-in 637. The described design of the ejecting mechanism 664, preferably adjusted for pulling out the multimedia device 600, serves just an example so that it may be executed by other appropriate mechanism.

Fig. 55 depicts the side view of the ejecting mechanism 664 with the placement of the multimedia device 600 made visible, may be non-adjusted, preferably on the movable sledges 622 with them mounted to the rear cover of the multimedia device 600, additionally

mechanically interconnected by a suitable joint such as screw, glue, dry zip or alike. The multimedia device 600 adjusted already at the factory is preferably used so that the back cover contains grooves and the rear wall adjusted this way assumes the function and replaces the moveable sledges 622. The advantage is the possibility of inserting the multimedia device 600 into the sleeve of coat or jacket fast, thereby hiding it when not used and pulling it out fast, if required.

The multimedia device 600 preferably wears the attached auxiliary device 104, depicted in the previous figures, with the circuit board 406, the additional accumulator 129 removable through the door 466 upon extrusion by the spring 422, preferably mounted on the rear cover 101 of non-adjusted multimedia device consisting of the mobile phone.

Fig. 56 depicts the wrist mobile phone 451 with the control elements 461, having an advantage over the standard solution particularly in enhancing the possibility by using the auxiliary device 104 to include the additional accumulator 120, 129 and the additional circuit board 406, placed under the cover 459' of the adjusted mobile phone 451, or non-adjusted mobile phone replacing that original cover 459". In both cases, the auxiliary device 104 is removable and preferably replaced by the original cover 459", if not required for further use. The wrist mobile phone 451 is attached to the bracelet consisting of two parts particularly the fastener part of the wristband 452, and the wristband portion 458, preferably ended by the plug 457 of the USB connector with the contacts of the plug linked to inside the wrist with the mobile phone 451. When fastening the wristband 458, the lower part thereof is enhanced by the fastener 455, and secured by the thorn 456. Upon fastening the wristband on the hand, the USB plug 457 is inserted into the semi-closed loop 453, forming this way the cover of the plug 457. The replacement accumulator may be pulled out easily through the door 466. The eyelet 454 serves to attach one portion in fastening the wristband 458.

Fig. 57 depicts the block scheme of the internal arrangement of the wrist mobile phone 451 according to Fig. 56 with the possibilities enhanced by using the additional accumulator 129 and the circuit board 449 of the auxiliary electronics. The mentioned arrangement of the wrist mobile phone deals with the issue of limiting operation time for a single charge of its basic accumulator 120, and by doing this also the applicability of the mobile phone as charging the accumulator in the walking movement is almost impossible. The referred solution to the issue of limiting operation time lies in the use of the additional accumulator 129 placed and

mechanically fastened in such a way enabling the replacement fast and easy of the discharged additional accumulator 129 for the other recharged one, easily carried in the holster of the pocket during the day. The additional accumulator 129 is replaceable easily through the door 466 in the cover 459' preferably made of polyurethane, or a similar elastic material, to enable the door 466 forming one single mechanical unit with the cover 459' by replacing the door hinge at the bending point by the weak wall of the cover 459'. The power stored in the accumulator 129 is used by the charger 449 to charge continuously the accumulator 490, supplying the electronics 448 of the mobile phone even if not charged due to replacement of the accumulator 129. The LED 498 induces the signal by starting to flash at the moment of discharged accumulator 129, and thus also its voltage reduction below the minimum recharging capability value when the accumulator 490 stops recharging, and consequently the need incurred to replace the discharged accumulator 129 for the charged one. The possibility of direct charging of the additional accumulator 129 by external charger that can be connected to by the USB plug 457 of the lower part of the wristband 458 remains intact. The circuit board 449 also may preferably include other circuits to enhance the functions of the wrist mobile phone as shown in Fig. 46 to 50.

Fig. 58 depicts the enhancement of possibilities of the wrist mobile phone 451, preferably non-adjusted by the auxiliary device 104, extending the period of operation of the wrist mobile phone 451, and enabling the provision of other functions as well. The wrist mobile phone 451 is depicted together with the attached cover 459 of the auxiliary device pulled on the bracelet. The wrist of the mobile phone 451 comprises of two parts, the upper part of the wristband 452 and the lower part of the bracelet 458. The lower part of the bracelet 458 winds up by the plug 457 of the USB connector, linked to by the wires, placed in a hidden form in the part of the bracelet 458, with the electronics located inside the mobile phone 451. Should not the mobile phone 451 be worn on to the hand of user, the plug 457 of the USB connector would be intended for inserting it to the USB connector of the external charger, or to the PC USB connector of the external PC, or other multimedia device. The fastening of the bracelet is secured by the thorn 456 in fastening the bracelet, together with the cover 459 worn on the hand, when the USB plug 457 is inserted in the connector 473, linking by this the electronics of the wrist mobile phone 451 with the electronics of the cover 459. In the bottom part of the figure, there is the detail 518 depicting storage mechanism of the accumulator (), preferably with the additional accumulator 129 that can be pulled out by the door 466 of the cover 459'

to be secured against the ejection by the latter upon insertion. Moreover, the additional circuit board is depicted....and the display...Moreover, the location of the hole 474 to slide the bracelet through the cover 459, and the location of the USB connector 473, connected to the circuit board, inside the cover 459, is depicted. An easy mechanical and power connection and disconnection of the electronics of the auxiliary device to/from the electronics of the wrist mobile phone 451 without modification the mobile phone is an advantage.

Fig. 59 shows an option enabling the attachment of the cover 459" of auxiliary device to the opposite side of the bracelet in comparison with Fig. 58 so as the display 640 faces the user. This can also be done by swapping the parts 452 and 458 of the bracelet in Fig. 58 of the adjusted mobile phone. In case no swap occurred, the conductor 470 glued to the bracelet, or attached otherwise, and led out of the connector 453 is required to link to with the electronics of the wrist mobile phone 451.

Fig. 60 depicts the storage mechanics of the accumulator 603, preferably with an example of placing the additional removable accumulator 465 and the electronics to control charging of the accumulator of the wrist mobile phone from the auxiliary device to the cover 459" of the auxiliary device. The additional accumulator 465 can be removed by the door 466 of the case 459", with those doors securing the latter against the ejection upon insertion. The pushing spring 467 facilitates the removal of the auxiliary accumulator 129. The power link of the contacts of the auxiliary accumulator 465 is secured by the contacts 468. The electronics 469 of the auxiliary case 459" ensures that the internal accumulator 120 of the wrist mobile phone can be recharged, and it also preferably includes the electronic circuits, expanding the possibilities of the wrist mobile phone 451, it is linked to with.

Fig. 61 depicts a wireless handset, preferably applicable to the wrist mobile phone, with its capabilities enhanced by using the additional accumulator 129 and the built-in speaker 495. The accumulator 490 of handset supplies the power to the electronic circuits of the handset put together in the panel 487; it can be recharged by external charger linked to in the connector 496. The operating period sufficient for one charge, and thus the use of a wireless handset is limited as well; any possible recharging in the walking movement is more than an issue. This issue is dealt with by the depicted configuration by using the additional accumulator 129 based and mechanically fixed so as to enable fast and easy replacement of the discharged accumulator 129 by the door 491, for other charged one, easily carried in the

pocket during the day. Should the accumulator 129 be replaced in time, the uninterrupted operation of the handset 481 would be provided by the accumulator 490. The accumulator 129 is located inside the holster 483 linked to by the power with the circuit board 486 by mean of the board 462 and the contacts 485 printed thereon. Should the holster 483 be made of polyurethane, or a similar elastic material, the door 466 might form one single mechanical unit with the door hinge replaced at the bending point by the weak wall of the holster 483. The board 486 of the auxiliary electronics controls the continuous charging of the accumulator 490 from additional removable accumulator 129; the LED 498 located in the front part of the holster 483 indicates the need to replace the discharged accumulator 129 for the other charged one. There is a speaker 495 located on the board 486 with the holes 493 in the holster 483 enabling the sound wave travelling better by mean of the speaker 495. The microphone forms part of the board 487 with the circular control device 489, together with the electronics to ensure the functions of the handset to include the Bluetooth link to the multimedia device, preferably with the wrist mobile phone. The board 487 is also equipped by the connector 496 to connect the headphones, with that connector applicable to charging the accumulator 490 as well. On the rear wall of the holster 483, there is the clip 484 placed to enable the handset be attached to the clothes of user. There is an advantage in comparison with the current state of technology, using the headphones hanging on the ear by the cable, or linked by Bluetooth to allow holding them in the hands as the standard mobile phone instead of hanging them on the ear.

Fig. 62 depicts the block scheme of the wireless handset with the capabilities enhanced by using two accumulators. The charger 497 of the accumulator 490 uses the electric power stored in the accumulator 129 to enable the accumulator 490 is recharged continuously with that accumulator to power the panel 487 even if not charged due to recent replacement of the accumulator 129. The LED 498 induces the signal by starting to flash at the moment of the discharged accumulator 129, and thus either the voltage reduced below the minimum recharging capability value when the accumulator 490 stops recharging, and consequently the need incurred to replace that discharged accumulator 129 for the charged one. The speaker 495 is connected in parallel to the connector 496 of the panel 487. The possibility of direct charging of the accumulator 490 by the external charger which can be connected via the connector 496 and the circuits of the panel 487, remains intact. The substantial extension of the operation period of the wireless handset without the need of external charging its

accumulator 490, having primarily the bridging role upon removal of the replaceable accumulator, is an advantage. The speaker 495 replaces the earphone which can alternatively be connected to via the connector 496.

Fig. 63 depicts the belt intended for continuous sensing the electric activity of the heart muscle, showing itself in the form of biomedical signals of very low voltage travelling on the surface of the body which can be sensed by using the electrodes placed in the appropriate points of the body of examined person, preferably for the heart rate and/or ECG measuring. In terms of achieving reliable contact of the electrodes sensing the biomedical signals, particularly for the long-term continuous sensing, it is important to minimize the occurrence of interfering signals caused by moving the contacts on the surface of body. Due to this, the position of contacts on the surface of body should not be changed due to the movement of the person in the sensing session. This problem is dealt with by the chest belt 209, with the sensors stored to allow the sliding movement, arranged according to Fig. 63, by replacing the commonly used belt with the electrodes, firmly attached to the fixing fastening belt, by mean of the system of two belts sliding mutually at each other's surface that is composed of the sensing belt 201 with the electrodes 202, and the fixing belt 204 surrounding the entire chest of the monitored person which presses the sensor belt 201, and thus its electrodes 202 towards the body surface 208 of the monitored person either. The individual electrodes are marked by the reference code of the electrodes 202, amended by the apostrophe ('), i.e. the electrode 202' up to the electrode 202'''. The flexible fixing belt is composed of three parts, particularly the part of the fixing belt 204', the part of the fixing belt 204'', and the part of the fixing belt 204'''. The first side of the sensing belt 201' with the electrodes 202 must have a surface that best adheres to the body 208 to avoid sliding the sensing belt 201 on the body, thus ensure the invariable reliable contact of the electrodes 202 with the body 208. The other way around, the other side of the sensing strip 201'', with the loops 203, must have a sliding surface, preferably made of Teflon, to achieve the slightest rubbing between its surface and the surface of the sliding part of the fixing belt 204'. With regard to the first side of the sensing belt 201' and the side 102', there are different requirements offered in this way. Due to this, they are preferably covered by the layers of different materials, and/or the sensing belt 201 is composed of two connecting layers of different materials. Similarly to the contact surface, the electrodes 202 may be composed of the electric power conductive material which are glued to, steamed to the sensing belt 201, and/or created directly on the first side of the sensing belt 201' made of

the electric power non-conductive material. The conductive and non-conductive plastic which, in the same time, may form the first side of the sensing belt 201', with the conductive regions made of the electric power conductive plastic, having the function of the electrodes, may preferably be combined. The sliding part of the fixing belt 204' is preferably made of the material with a low friction coefficient, e.g. Teflon, or it is coated by such a material, and it is connected to the sensing belt 201 by mean of several loops 203. The individual loops are marked by the reference code of the loops 203, with apostrophes such as the loop 203', or the loop 203''', firmly connected to the sensing belt 201, with them passed through on the sliding part of the fixing belt 204 thus creating the mutually slightly sliding connection. In the movement of the fixing belt 204, moving on the surface of the sensing belt, due to impact of the movement of the body, it slides on the sensing belt 201 so that the position of the sensing belt 201 against the body 208 remains unchanged. The sliding part of the fixing belt 204' is connected with the part of the fixing belt 204'' by the expandable clip 207, with that clip being expanded only at the passing part of the fixing belt 204' through on the loops 203, e.g. during the repair, and thus being constantly joined to when using the belt 204'. The other end of the part of the fixing belt 204' is connected to the fixed connection 212 to the part of the fixing belt 204'''. Other two parts of the fixing belt 204'' and 204''' are made of a flexible material, preferably the rubber-textile strip. The total length of the fixing belt 204, and thus also the pressure imposed to push the sensing belt 201 towards the body 208, can be set up in the mentioned example by the movable clasp 206, enabling to adjust and fix the length of the loop created by passing the fixing belt 204'' through on the clasp 206. The connection/disconnection of the part of the fixing belt 204'' of the part of the fixing belt 204''' is ensured by the two-piece disconnecting conjunction 205. Two or more contact surfaces, mechanically connected to the sensing belt 201, are electrically connected with one, or more sensors, e.g. the sensor 210, and the sensor 211, processing the biomedical signals sensed by the electrodes 202 for further processing. The electrodes 202 may be positioned on the sensing belt 201, or directly in the sensing belt 201, or the sliding part of the fixing belt 204'. There are possible different ways of using the electrodes 202 and the combination of connecting them to the sensors. In the depicted configuration, the electrodes 202' and 202''' are connected to the sensor 211, and the electrodes 202'' and 202''' are connected to the sensor 210.

Fig. 64 depicts the option of the previous configuration of the chest belt with the sensors stored so as to allow the sliding movement, with the sensor 210 integrated in the sensing belt 201, with the surface shaped so as to enable the sliding part of the fixing belt 204' to slide perfectly on the surface of the sensing belt 201. The auxiliary device 218 composed of the easy replaceable accumulator to supply the sensors 210 and 211 with power, or recharge their accumulators respectively, extends the operation time of the depicted sensors 210 and 211 without charging, or replacing the built-in accumulators of sensors. With advantage could be used other auxiliary device 218' too, which may contain the electronic circuits, e.g. for further processing of the sensed biomedical signals.

Fig. 65 depicts the disconnected fixing belt 204 in the straighten form, the conjunction 205 is disengaged, the part of conjunction 205', connected with the part of the fixing belt 204'', is detached from the conjunction part 205'' connected with the part of the fixing belt 204'''. The sliding buckle 206 is intended for setting the length of the fixing belt 204, and thus the pressure used to push the electrodes 202 to the body 208 through the sensing belt 201 either. Other depicted parts were described in Fig. 63.

Fig. 66 depicts a view of the sensing belt 201 from the side of loops 203 and the side of the electrodes 202. In this case, the sensor 210 is placed on the sensing belt 201.

Fig. 67 depicts a simplified chest belt with the sensors 210 and 211, preferably able to be used in combination with the shoulder straps 232, 204' so as the chest belts depicted in Figs. 63 to 66.

Fig. 68 depicts the block scheme of using the electrodes 202, and sensors 210 and 211 of the chest belt, preferably with the sensors 209 stored so as to allow the sliding movement, with an example of execution shown in Fig. 63. The mentioned configuration enables the assessment of bio-signals sensed by the selected electrodes, placed on the chest belt with two independent sensors stored so as to allow the sliding movement, and the results sent wireless by two or more independent transmission paths preferably by using different transmission protocols. The pair of the electrodes comprised of the electrode 202'' and the electrode 202''' is connected to the sensor 217 inputs placed in the independent sensor 210, together with the transmitter 214, preferably operating in 5 kHz band. The electrodes 202' and 202''' are connected to the inputs of other sensor 217', located in the second independent sensor 210, together with the

transmitter 215, preferably operating in 2.4 GHz band, preferably by use of the transmission Bluetooth protocol. The connection enables the sensors 217 and 217' to assess simultaneously the bio-signals, sensed by the pair of the electrodes, formed by the electrode 202'' and the electrode 202''', and via the second pair, consisting of the electrode 202' and the electrode 202'''', with the results transmitted for further use as a data by mean of the transmitter 214, and in the same time, through the transmitter 215. The jamming resistance may preferably be improved by the control unit 222 which compares the signals at the outputs of the sensors 217 and 217', and at the moment of assessing the failure, it disables the transmitter 214, or the transmitter 214'. The jamming resistance may similarly be improved by using the receiver 214', operating in 5 kHz band, and simultaneously the receiver 215', operating in 2.4 GHz band, with their output data being assessed by the control unit 222'.

Fig. 69 depicts the block scheme option just using the electrodes 202' and 202'''', connected with the parallel linked inputs of the sensor 210 and the sensor 211. In this case, the sensors 210 and 211 evaluate bio-signals sensed by one pair of electrodes 202' and 202'''', assessed by the various sensors 217 and 217', with the results transmitted by two independent transmitters 214 and 215. Furthermore, the auxiliary device 218, containing the readily replaceable accumulator 219, with the electronics 220, to supply the auxiliary devices by the power from the backup accumulator 219, is also depicted. Other auxiliary device 218', may also preferably be used, with the electronic circuits, e.g. for further processing of the sensed biomedical signals.

Fig. 70 depicts the block scheme of the probe 213 with communication block, preferably formed by the transmitter 214, operating in 5 kHz band, and the transmitter 215, operating in 2.4 GHz band, using the Bluetooth transmission protocol and the transmitter 216, operating in 2.4 GHz band using the ANT transmission protocol, and preferably other transmitters, operating in other protocols. The signals sensed by the pair of electrodes formed by the electrode 202' and the electrode 202'''' of the sensor 217.

Fig. 71 depicts the electrodes 227, preferably the popper, or the gel ones. Their conductive connection to the sensors ensures the link of the popper sleeve 221'' – the popper-thorn 221' system that can be dismantled, with the thorn 221' located on the side of the electrode, and the sleeve 221'' on the side of the pushing element 660, preferably of the chest or leg belt, shoulder straps, elastic clothes, or harness, particularly in its conductive part 653 linked to the

input of heart rate detector, or eventually the circuit board. The sleeve is preferably filled by the female part of the clip 648. The electrodes 227 are designed to have the contact surface 224 intended for contact with the human skin. The contact is improved by the conductive gel layer 223 laid on this surface. In the configuration of FIG. 71, there is the gel layer covered by the sensing cover foil 226. By pressing the finger on the foil, the electrode snaps in the counter connector, a sleeve in the belt 147. Thereafter, the cover foil 226 is removed and the electrode is put in the required position on the body of sensing person. In the configuration of FIG. 71 below, the electrode is pulled on in the plastic cartridge 225 to be removed upon the snapping the electrode on the belt. This configuration prevents the gel leakage from the contact surface at the handling and snapping the electrode in the belt.

The detail depicts the electrodes 227 with the thorn 221' mounted directly on the gel material 223 and fit in the sleeve 647 of the chest belt 201, preferably made of the elastic material. An easy removal capability and the high conductivity of the gel 223, and in the same time, the adhesion to the skin, hold in the belt on the body in the position without slippery, is an advantage.

Fig. 72 depicts the portion of the pushing element 660 to enable that the electrodes 202 are pulled on, and it provides the conductive connection to the body of the sensing person and the heart rate, or the ECG detector. The sensing portion of the electrode, i.e. the popper-thorn 221', connected with the skin, is preferably a metallic one and preferably laid by the conductive gel 652. In the pushing element, there is a conductive part of the pushing element connected with the electrode that creates the electrode fixing mechanism 654 described in the following figures.

Fig. 73 depicts the fixing mechanism of the electrode 654, composed of the conductive element of the pushing element 652, with the sleeve of conductive element 658 latched by the popper-thorn 221'. Before setting the electrode to the sensing position on the body, the plastic cover of gel of the electrode 656 is removed.

The plastic foil of the electrode 655 includes the composition with the popper-thorn 221', and it may preferably be furnished by an adhesive layer to secure stronger connection with the pushing element 660.

Fig. 74 depicts the execution of the gel electrode in the identical configuration of the fixing mechanism of the electrode 654. In this case, the plastic foil of the electrode 655 is omitted and the entire body of the electrode is created by the popper-thorn 221 with the contact body formed by the gel 652.

Fig. 75 depicts the solution of the electrode fixing mechanism of the covering shaped annulus 661, with its adhesive layer 659, revealed upon the electrode unpacking from the package and the cover foil removing, adheres to the conductive portion of the pushing element 653'. Upon removing the plastic cap of the electrodes 656', and pressing the electrode by the pushing element towards the body, the gel 652 leaks from beneath the covering shaped ring 661 to ensure the conductive contact link.

Claims**1. Auxiliary device to multimedia or health device**

characterized in that

multifunctional multimedia or health device (600) is provided with auxiliary device containing preferably auxiliary accumulator (120) and/or auxiliary accumulator (120) with appropriate mechanism for removable fastening of auxiliary accumulator (120) with electronics for its charging and recharging and auxiliary processor preferably and/or auxiliary communication module communicating by means of communicating media created with advantage at least by one communicating medium from following communication media, for instance Bluetooth, ANT, unit for communication through network of mobile operator and further auxiliary device containing preferably a board of electronics (406,446) for processing ECG and further receiver (134) 5,5kHz. whereas auxiliary device is preferably connected with multimedia device or health device by wires or wirelessly and fastened on multifunction multimedia firmly or/and removable or revolving or auxiliary device located in multimedia or health device removable or firmly, or is placed for instance in a small bag freely or with ensuring, or firmly, or on a bracelet or belt or chest strap firmly, removable or revolving whereas the auxiliary device contains preferably board of electronics (406) adapted for processing heart signals, which create with advantage discrete unit provided with a display and/or acoustic module providing informative or warning signals indicating the health status and other information.

2. Auxiliary device of claim 1

characterized in that

auxiliary accumulator (120) which is adapted in mechanism for removable fixing of auxiliary accumulator (120) for operational recharging accumulator of multifunction multimedia or health device (600), where malfunction of accumulator (120) is removed by its exchange in mechanism for its fixing by another one, fully functional without any functional limitation of operational accumulator of multimedia device (600).

3. Auxiliary device of claim 1 and 2

characterized in that

Space (403) is adapted for multimedia device (600) in a small bag (401) which is separated from space (405) for placing auxiliary accumulator (120) on board of electronics (406) of module of electronics (410), where casing (420) of auxiliary accumulator (120) connected electrically with board (406) is fixed firmly or removable and is provided with first connector (409) with connected cord (407) with multimedia device (600) not adapted through second connector (408) whereas on board (406) of electronics is also adapted connector (428) USB for connecting with multimedia device (600).

4. Auxiliary device of claim 1, 2 and 3

characterized in that

board (406) of electronics with case of auxiliary accumulator (120) and module (410) of electronics is electrically connected with connector (414) of adapted multimedia device (600), which is fastened directly on the bottom of space (403) for placing of multimedia device (600) of a small bag (401), whereas connector (414) or adjacent connecting element of multimedia device (600) is provided with connector interfaces () enabling a contact stop, which is firmly or removable adapted to the body of adapted multimedia device (600), or space (403) for placing multimedia device (600) is at its mechanic entry provided with extension (433) for easy inserting/putting of multimedia device (600) into the small bag (401) and the outer side of the space (405) is fastened by element (402) for attaching to clothing or belt preferably removable clips or a belt eye, or the casing (420) of auxiliary accumulator (120) is adapted for exchange of auxiliary accumulator (120) by providing the inner space with pushing and ejecting spring (422) of auxiliary accumulator (120) against locking latch (421) of case (420) whereas on the inner side of casing (420) of auxiliary accumulator (120) against the input aperture for inserting accumulator is adapted a connector (423) for connection of auxiliary accumulator (120) with a board (406) of electronics or board (406) of electronics is provided with next connector (106) USB for connecting external PC with a module (410) of electronics and external recharging of auxiliary accumulator (120) and/or connecting cord (407) in form of twisted flexible cable adapted for self-winding to original shortened length in space (404) for connecting cord at its inner leading or at external connecting is lead from the board of electronics (406) through a small hole in lower part of the small bag (401), whereas

arrangement of external leading can be done by leading the cord (407) to multimedia device (600) through a small lateral side aperture (431) in side of space (403) for placing multimedia device (600) and/or the small bag (401) is provided optionally with a display for displaying of data, pictures and graphs from auxiliary devices inside the small bag (401) with control elements, i.e. ECG where electric connection is ensured with auxiliary device, or display and control elements are situated on a tilting board in space (405) for placing auxiliary device.

5. Auxiliary device of claim 1, 2 and 3

characterized in that

multimedia device (600) is connected with the board (406) of electronics by a cord (413) in different version from springy self-winding cable, where automatic spinning reel (412) of cord (413) is adapted in space (404) for connecting cord of small bag (401) and multimedia device (600) is connected by cord (413) through connector (414) of multimedia device when the opposite end of cord (413) is connected through connector (415) with module (410) of electronics and board (406) of electronics and in space (403) for placing of multimedia device (600) of small bag (401) is adapted a mechanic stop (429) for definition of position for placing multimedia device (600).

6. Auxiliary device of claim 1, 2, 3 and 5

characterized in that

connector (414) of multimedia device is fixed directly at the bottom of space (403) for placing multimedia device (600) of small bag (401) and is by means of a cord (413) connected directly, without automatic spinning reel (412), with module of electronics (410) where connector (414) or adjacent connecting element of multimedia device (600) are provided by a interconnection connector () for enabling a contact stop.

7. Auxiliary device of claim 1 and 2

characterized in that

auxiliary accumulator (120) with electronics is adapted a in case (459) on the upper part of a bracelet, which is provided by a clasp (455) of buttoning and loop (454) for attaching free end of lower part (458) bracelet when fastening, where the free end of lower part (458) of bracelet is provided with a latch (457) of USB connector for connection with PC, charger or other

multimedia device (600), whereas the casing (459) is provided with, on side towards clasp (455) of buttoning, an electric outlet (473) of USB connector.

8. Auxiliary device of claim 1, 2, and 7

characterized in that

case (459) is at upper part of bracelet (452) attached sliding by means of aperture (474), preferably of wedge-shaped aperture, in its lower part is for conductive connection of USB connectors (457) and (473), or the casing (459) on the upper part (452) of bracelet sliding by means of aperture (474) preferably of wedge-shaped to the middle part of bracelet by means of fixing elements identical with cover (460) of accumulator of cellular phone (451) where is mechanically and electrically connectable with this cellular phone (451) by exchange, after removal its cover (460) of accumulator or case (459) situated in point of perimeter, does not enable connection to electronic of bracelet cellular phone (451) by help of USB connector or by exchange for cover (460) leads interchangeable so that leads are fixed to the body of bracelet, preferably glued or case (459) is at its upper side provided with mechanism () of fixing multifunction multimedia device (600) and/or a sledge mechanism () of optional shift of multimedia device (600) in axis of arm in direction of arm, where both fixings with auxiliary device in case (459) of auxiliary device or casing (459) of auxiliary device is on its lateral side optionally provided with a display for displaying data and pictures with control elements, where is ensured electric connection with auxiliary device in casing (459) of auxiliary device or in casing (459) device is removable adapted another casing for placing a spare accumulator (120, 465) and charging electronics of operational accumulator of bracelet cellular phone which is provided with closable small door (416), where pressure spring (417) for ejecting accumulator acts against closed door (416) locked by a latch and accumulator is connected by contacts (418) with the board of electronics (419) for recharging accumulator of bracelet cellular phone.

9. Auxiliary device of claim 1

characterized in that

is adapted for processing ECG signals and contains "Front end" (141) situated on board (406) of electronics, which is galvanic connected with electrodes (143) or the "Front end" (141) is placed galvanic separately, where "Front end" (141) is preferably placed on chest strap (419)

ECG and with the board (406) of electronics connected by means of wireless connection preferably by BT or BLE or ANT between module (144) and block (135).

10. Auxiliary device of claim 1

characterized in that

heart signals are sensed, processed and transferred by one or more ways created preferably by sensors (210, 211) with one or more transfer protocols, which enables identification of erroneous signal by visual comparison of projection of individual ways, or electronically preferable in control unit (222), which preferably blocks erroneous signal up and/or removes the jamming.

11. Auxiliary device of claim 1

characterized in that

the board of electronics (406') contained preferably in auxiliary device processes signals ECG or heart rate, placed preferably on wrist on bracelet and is connected preferably wirelessly by means of BT, BLE, ANT or with cable (646) with multifunction multimedia device on the bracelet (236) formed preferably by cellular phone, or the board (406) of electronics is placed on a belt or the board of electronics (406') in the pocket, connected with electrodes by a cable (234, 234'), or wirelessly with chest strap for sensing heart pulses (146) or ECG (231) and/or electrodes (231'), which preferably extends sensing of pulse of heart beat, or one lead ECG requiring at least 2 electrodes to multi lead, 3 to 12 lead ECG where board of electronics (406, 403', 406'') is connected through the network of mobile operator remotely at distant server (663) accessible for authorized users to surveillance centre, where board of electronics (406, 406, 406'') is preferably connected by wires or wirelessly with multimedia device (190, 600) formed preferably by a cellular phone or with medical device or with PC (418) or with watch (416) or bracelet (419).

12. Auxiliary device of claim 1

characterized in that

for sensing heart signals are used changeable electrodes with gel layer (652) fixed by snap fastener/popper (hollow – thorn) (221') with easy activation of the gel layer by removing foil (655) or by squeezing gel out from covering annular (661).

Fig. 1

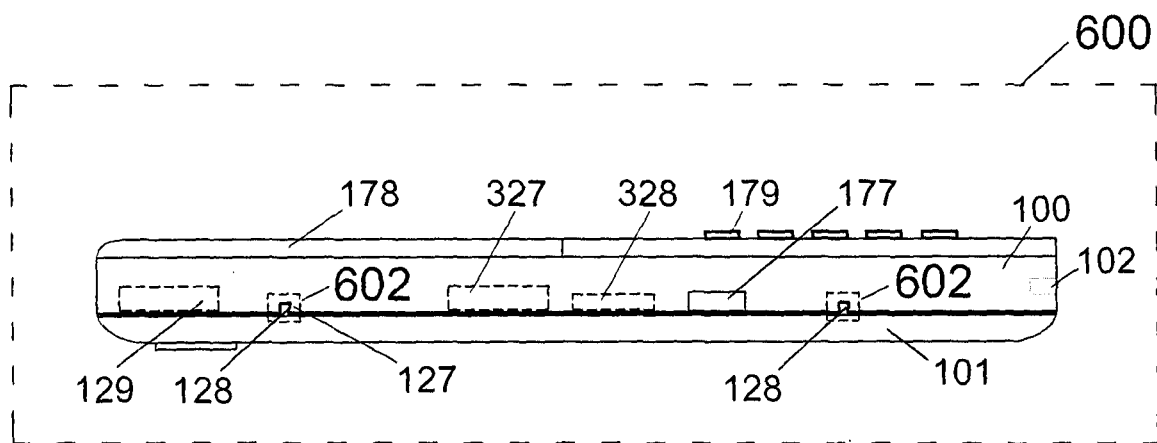


Fig. 2

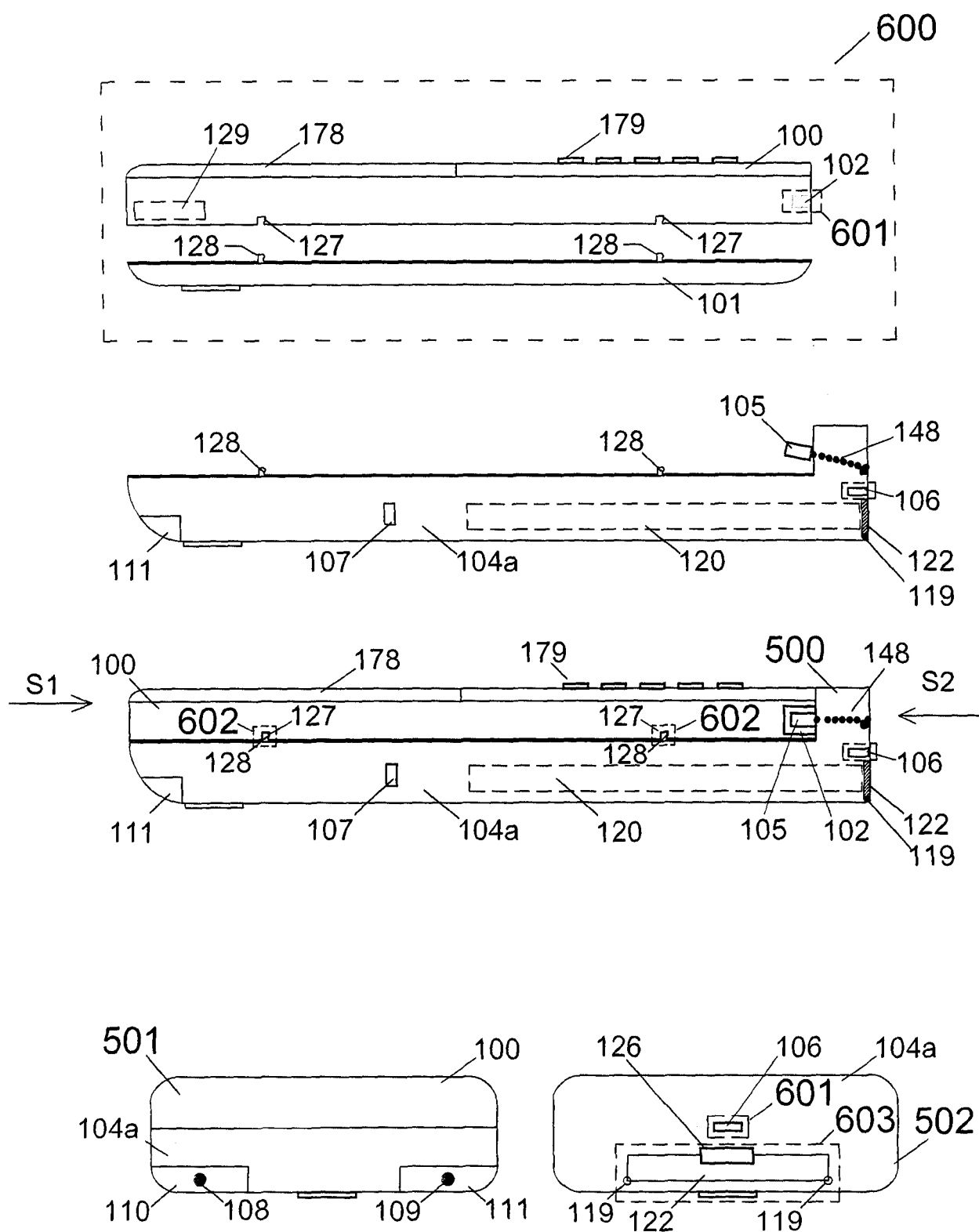


Fig. 3

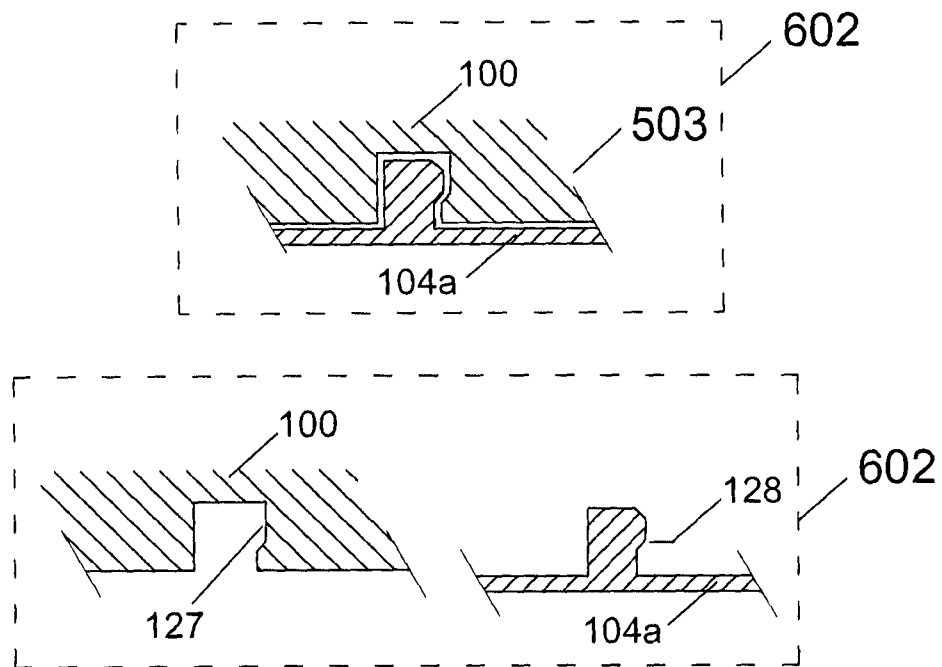


Fig. 4

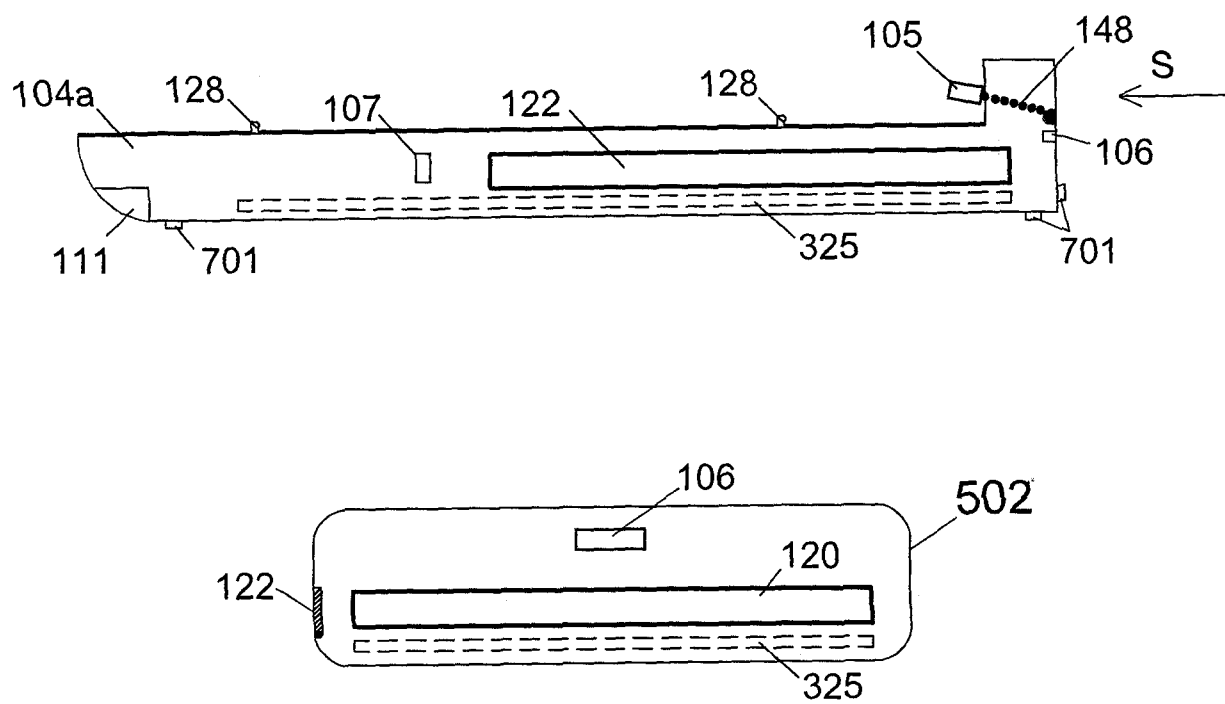


Fig. 5

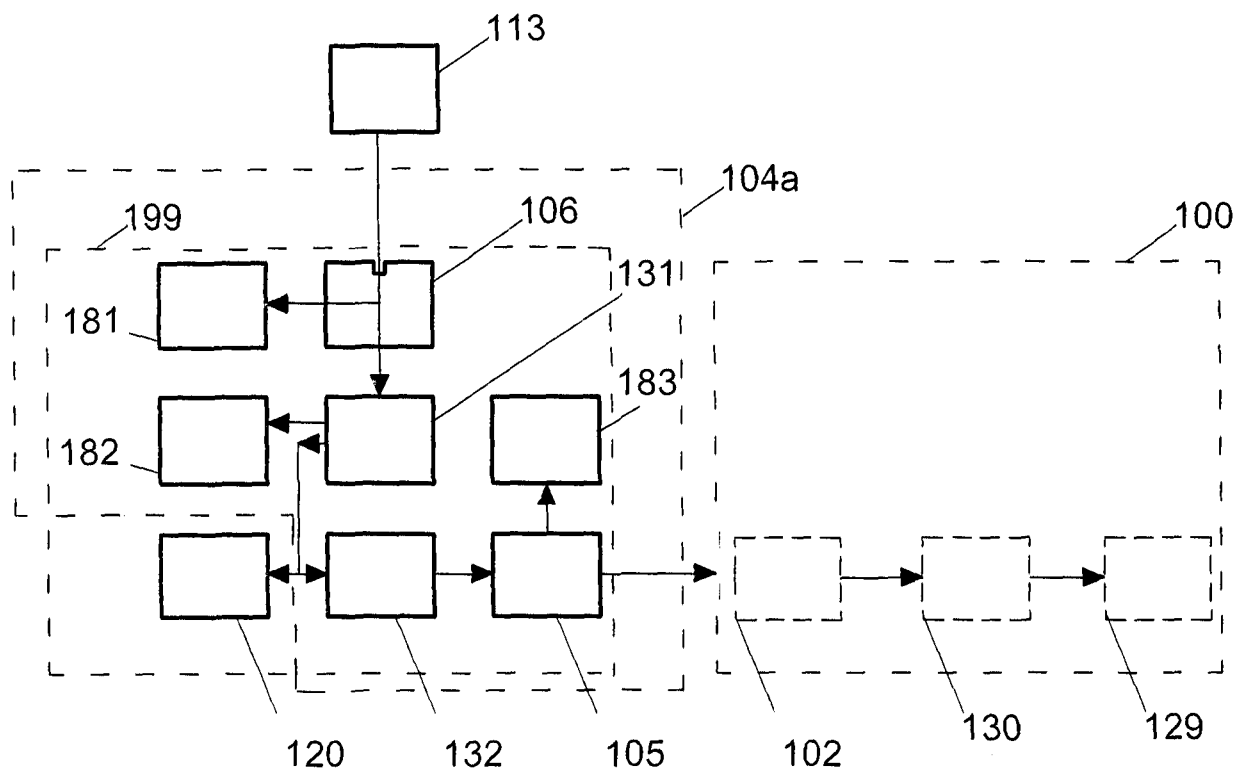


Fig. 6

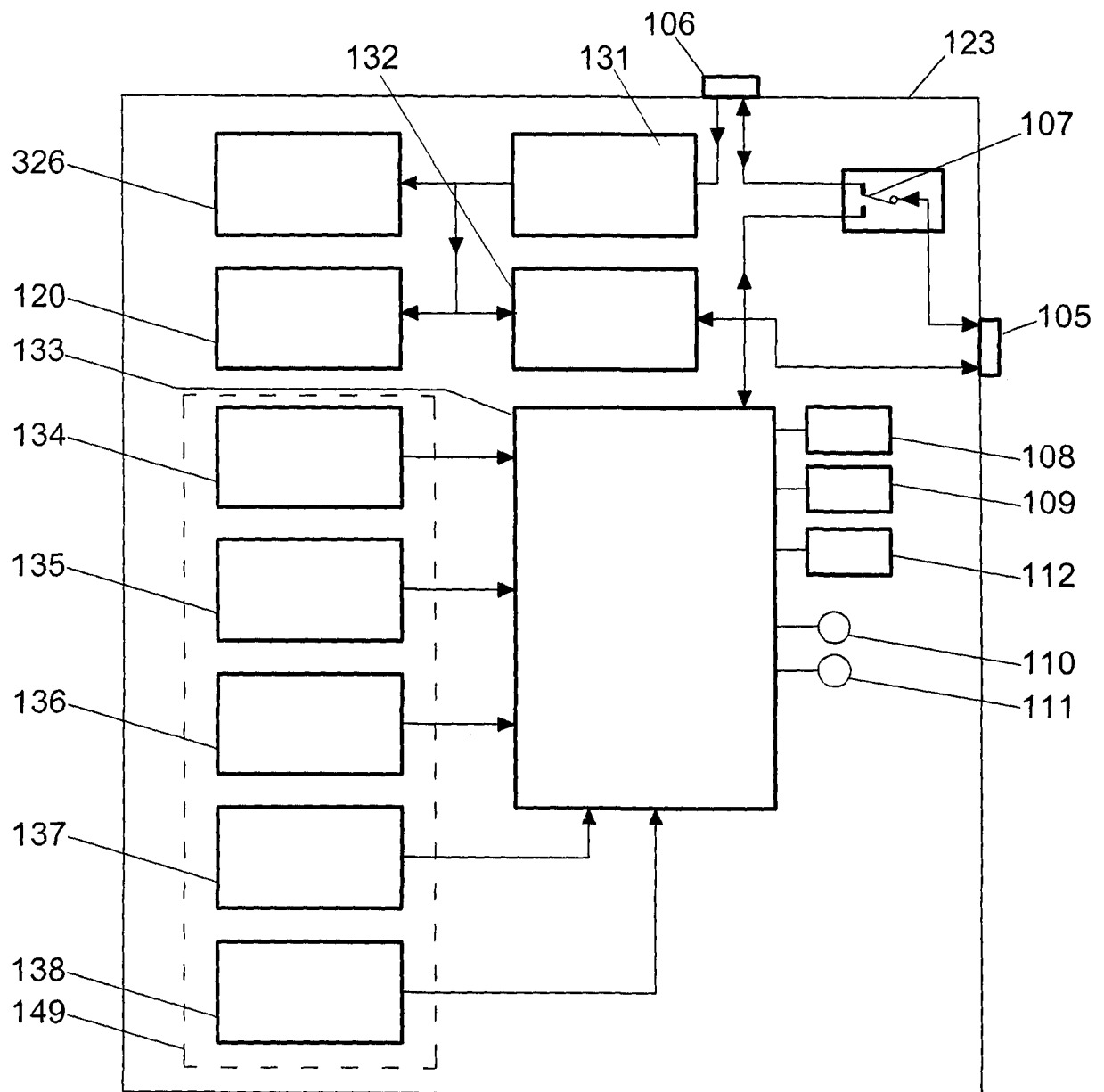


Fig. 7

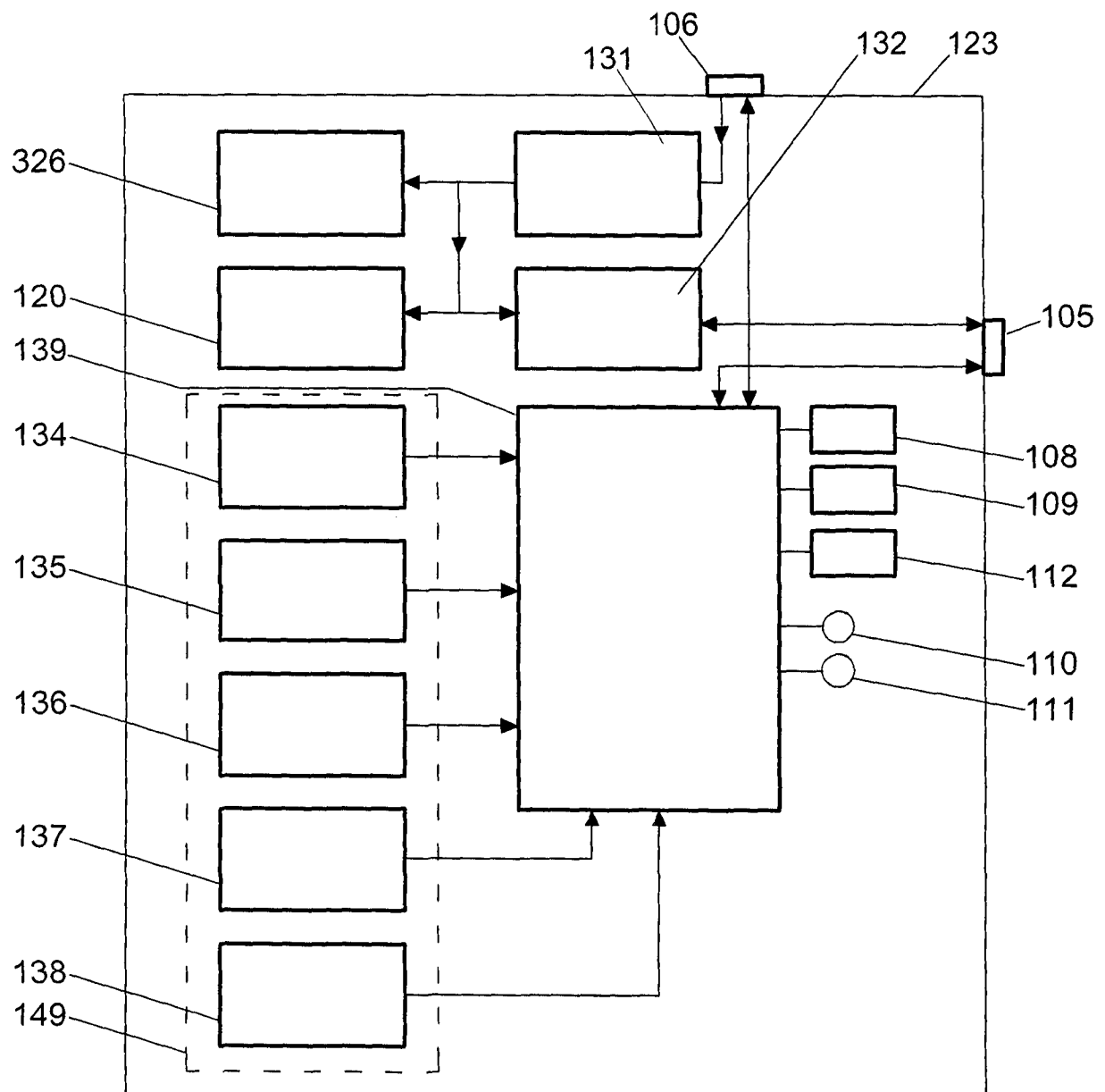


Fig. 8

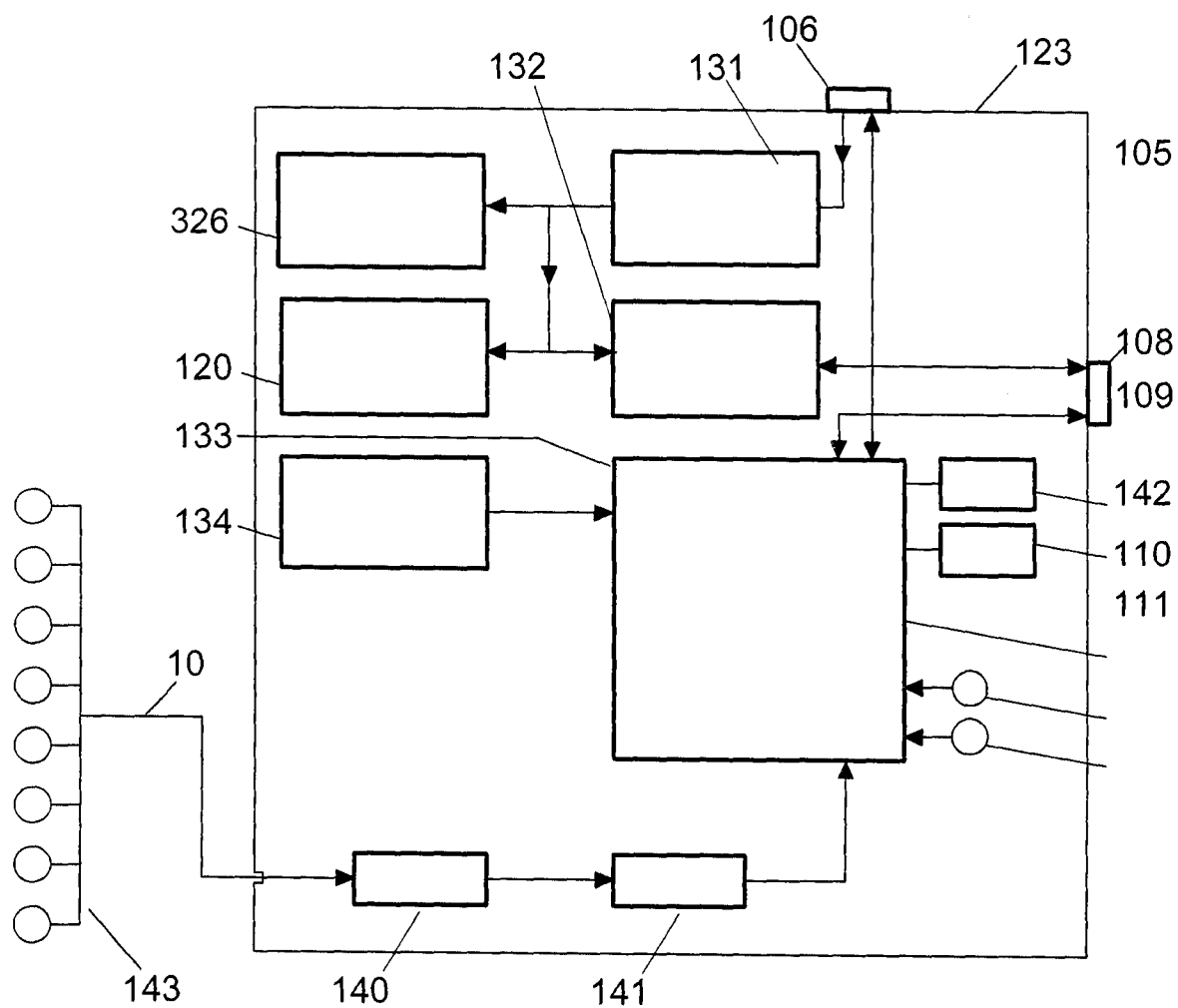


Fig. 9

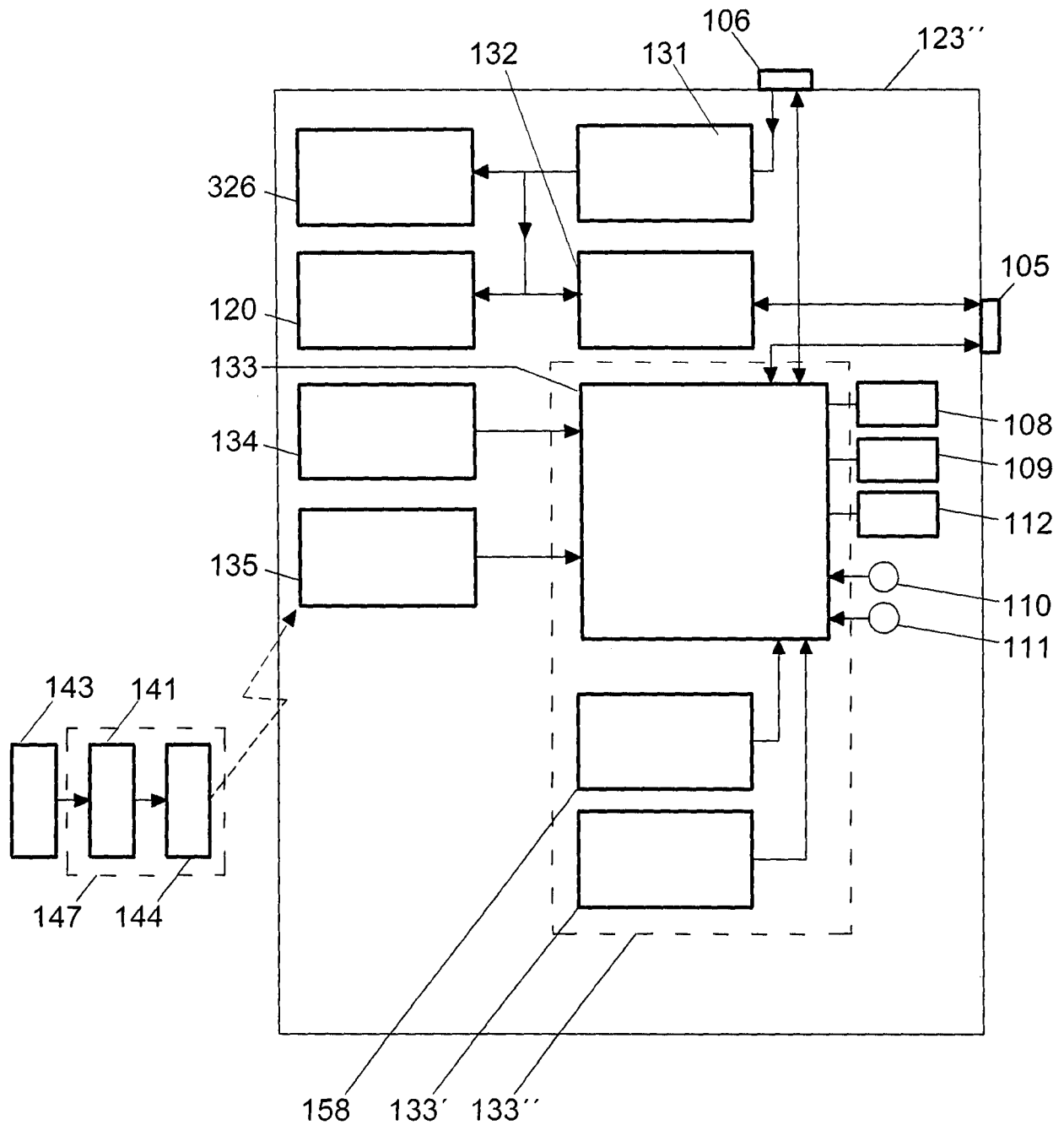


Fig. 10

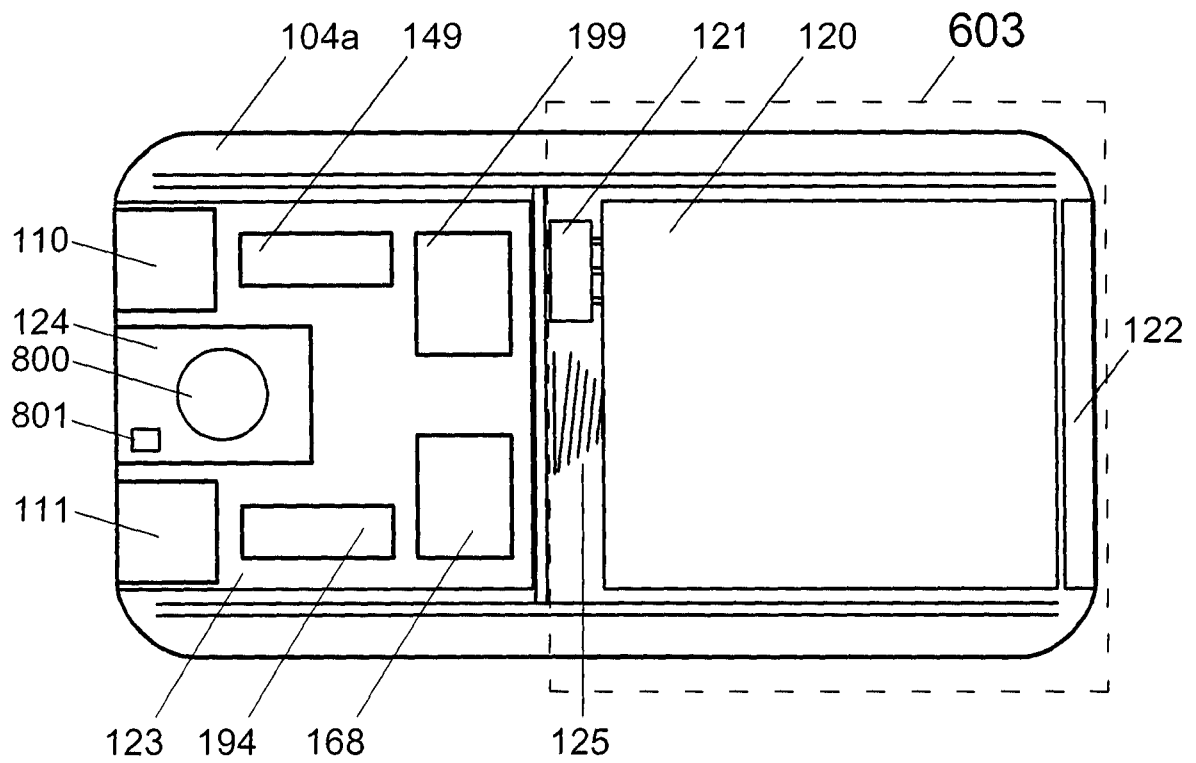


Fig. 11

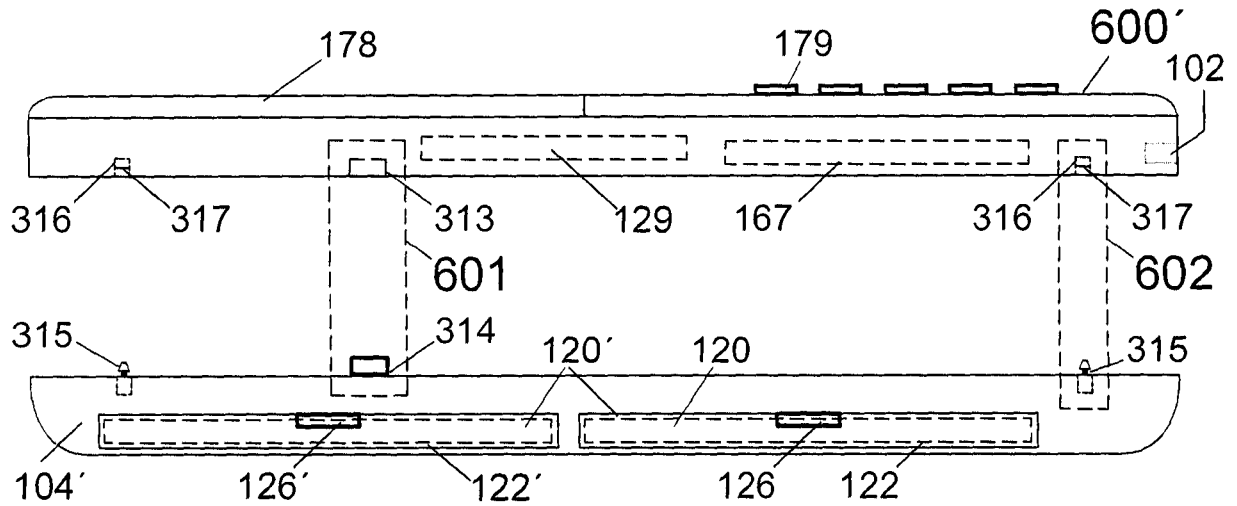


Fig 11a

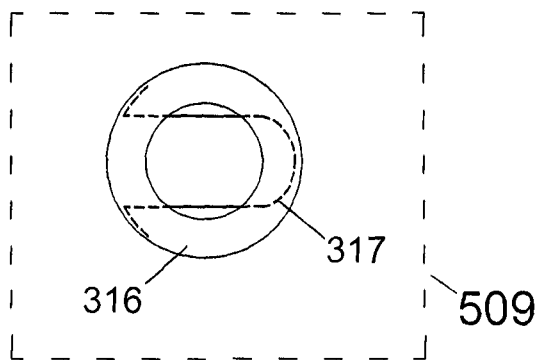
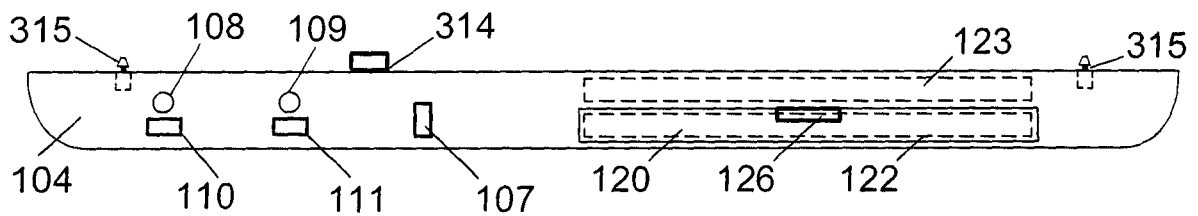


Fig. 12

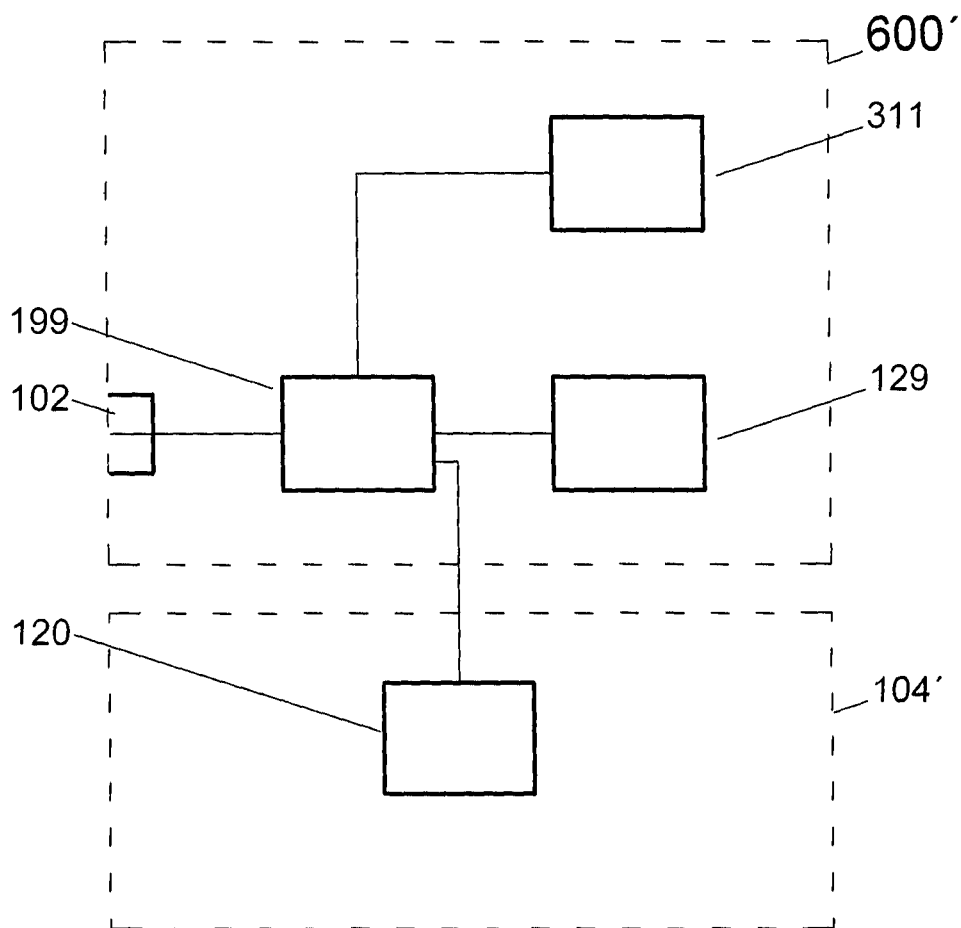


Fig. 13

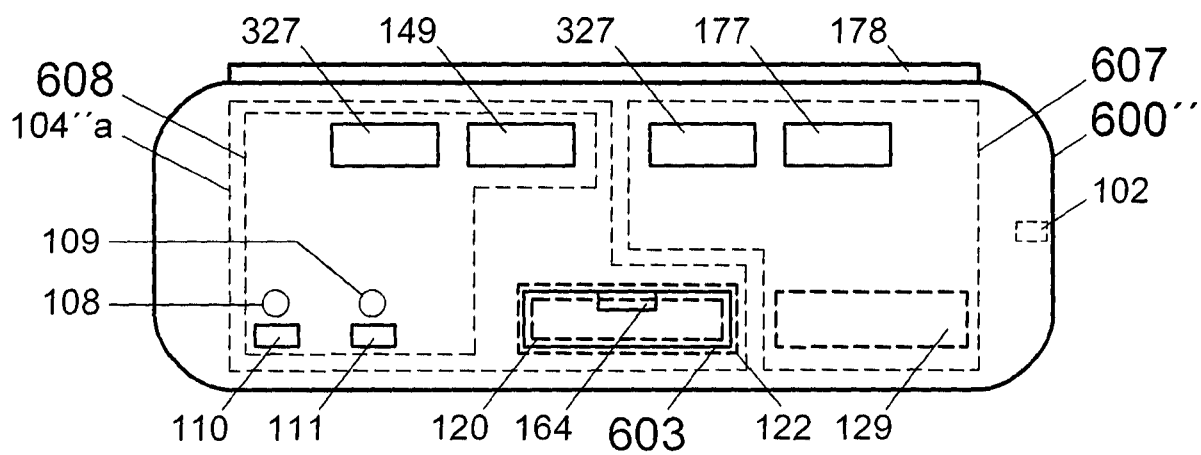


Fig. 14

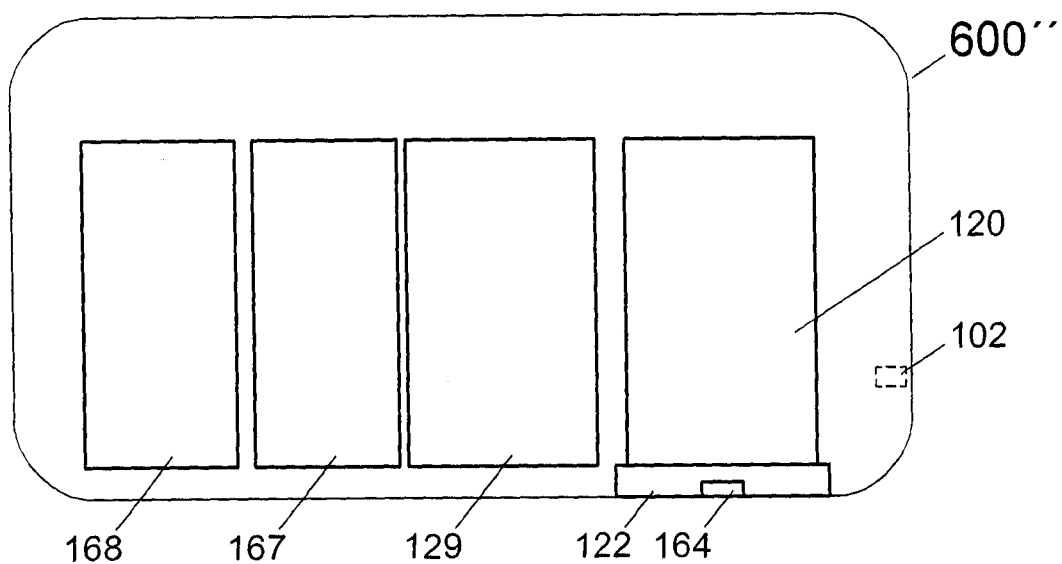


Fig. 15

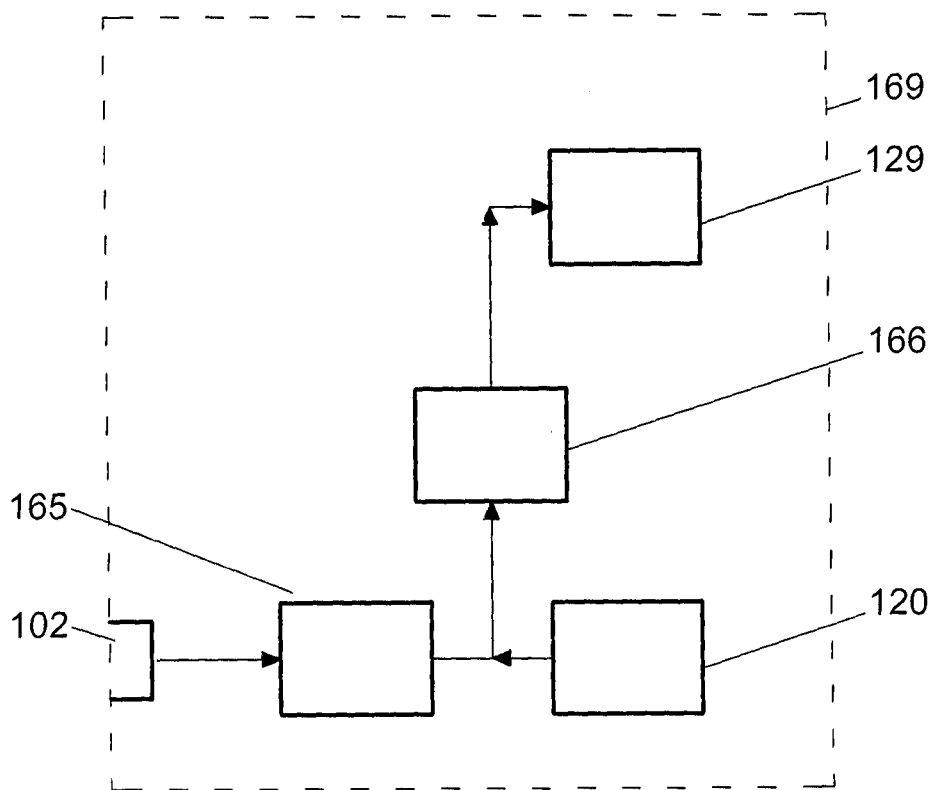


Fig. 16

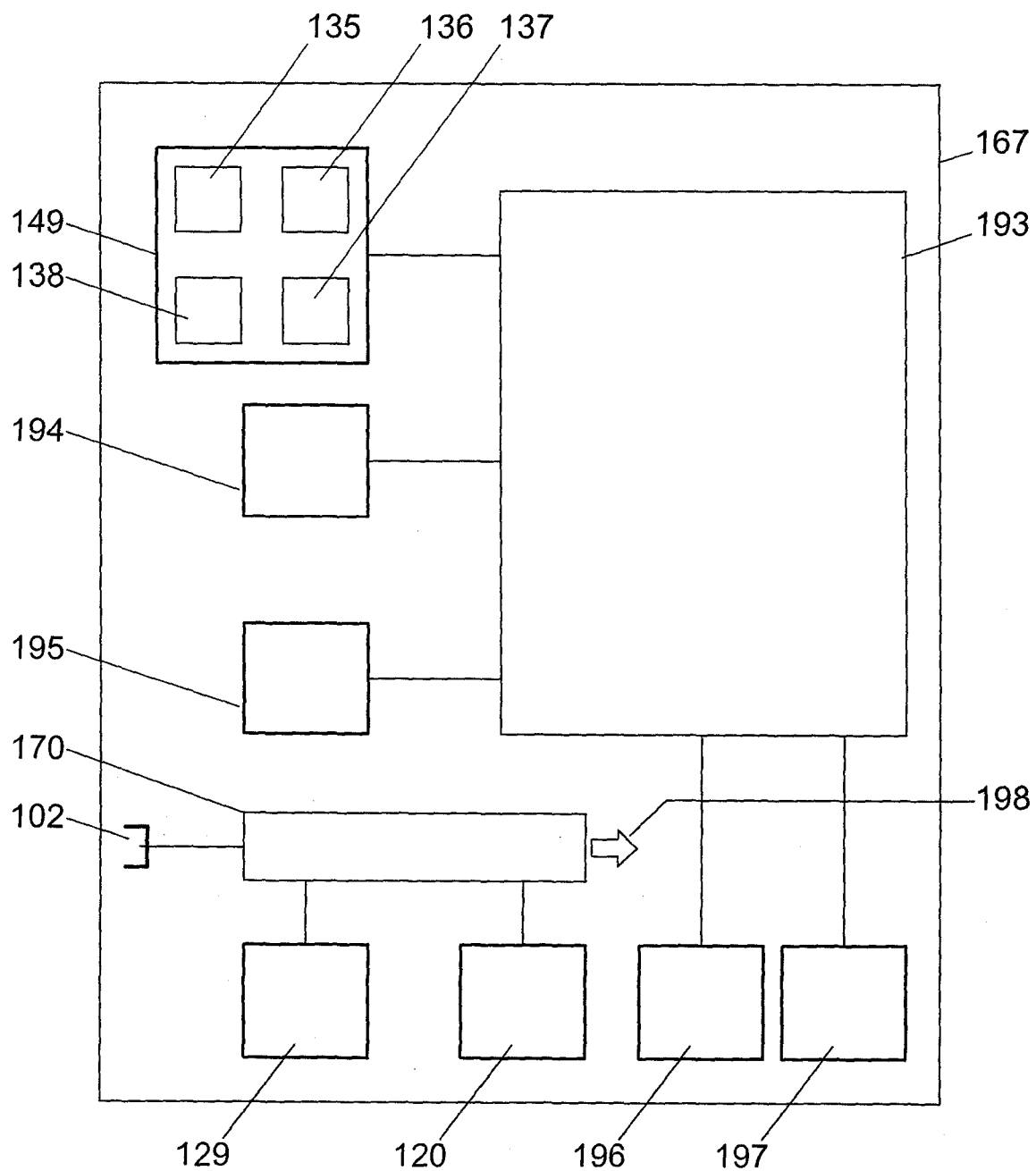


Fig. 17

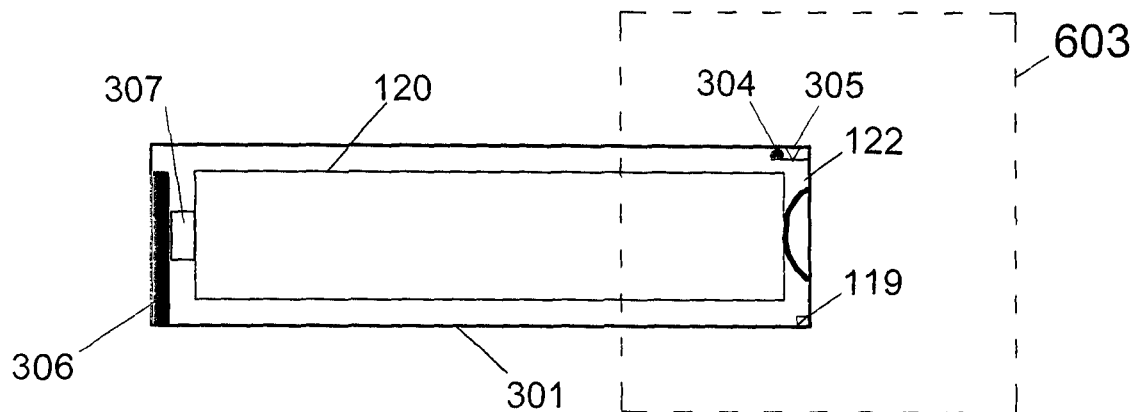


Fig. 18

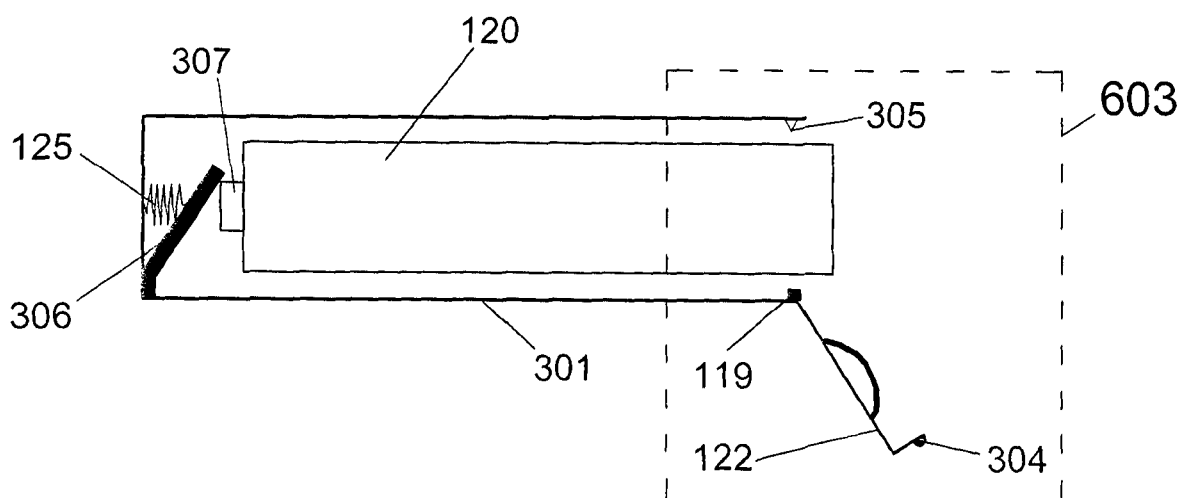


Fig. 19

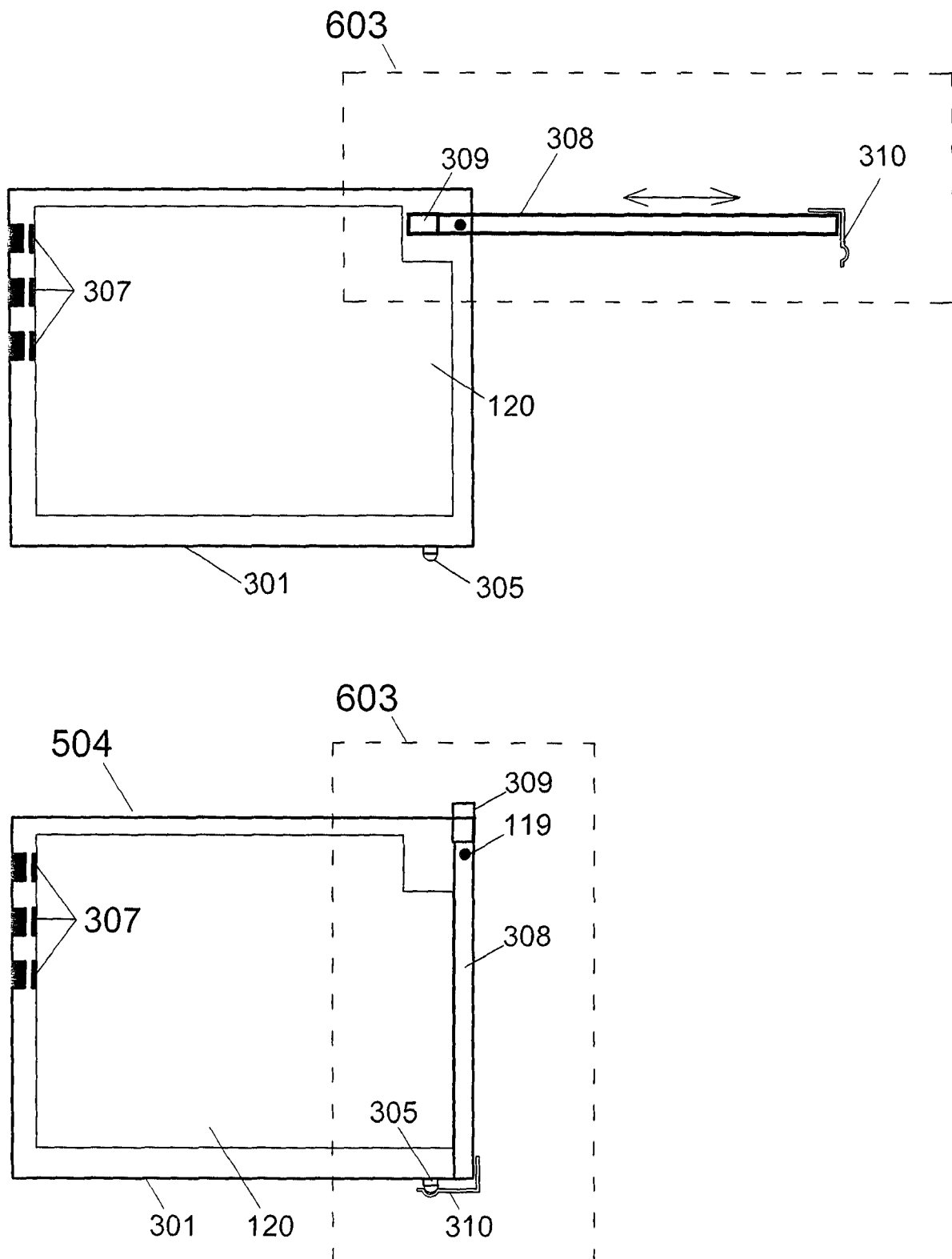


Fig. 20

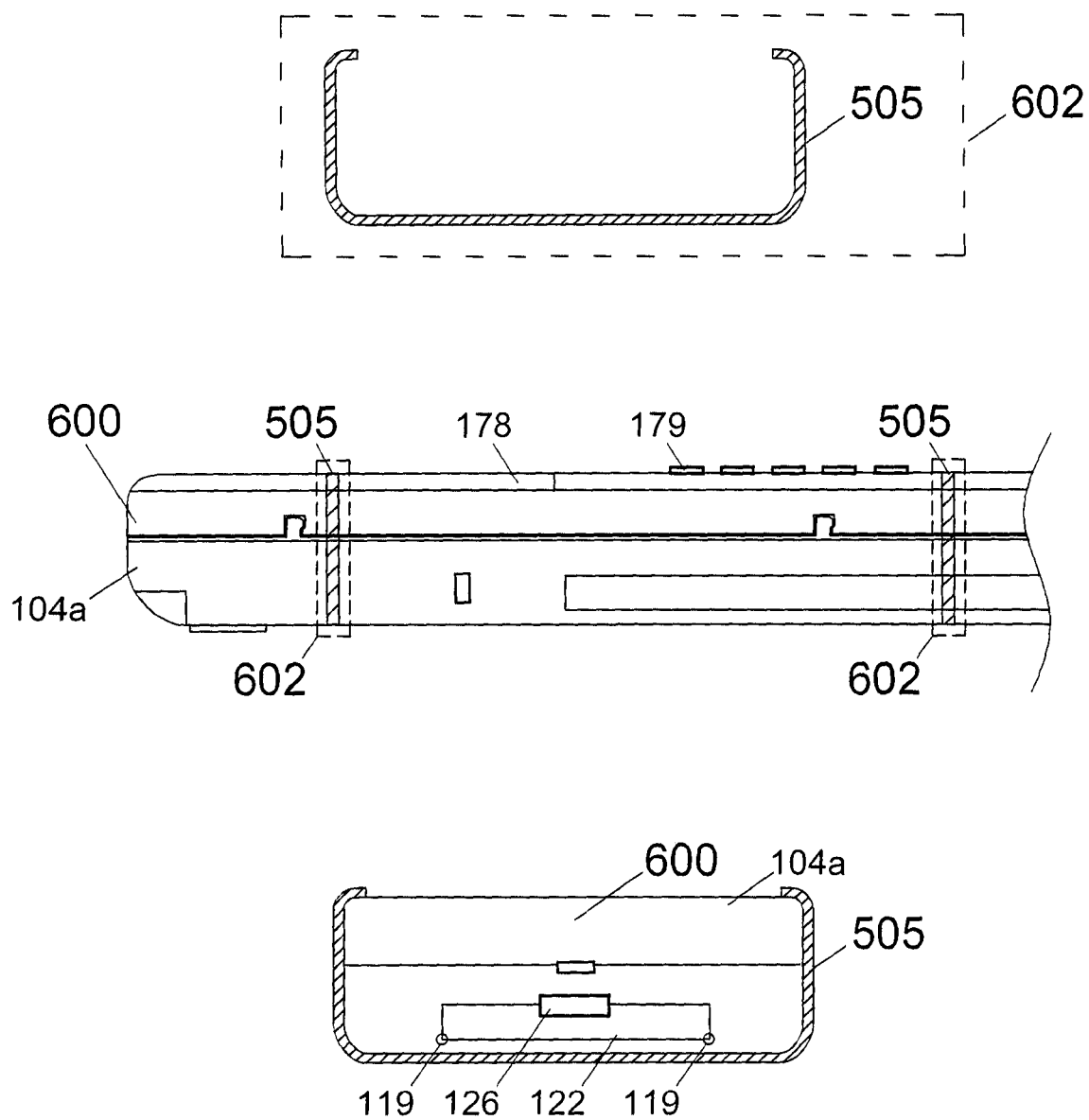


Fig. 21

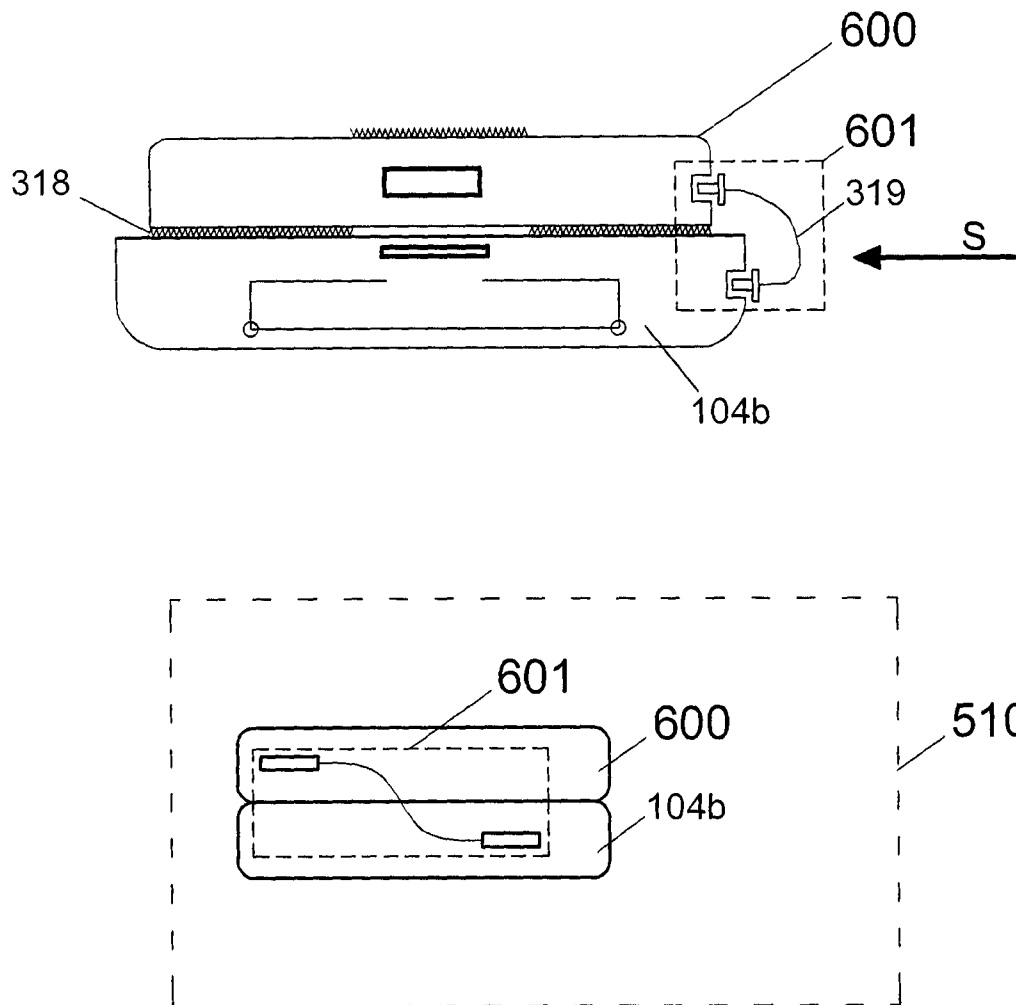


Fig. 22

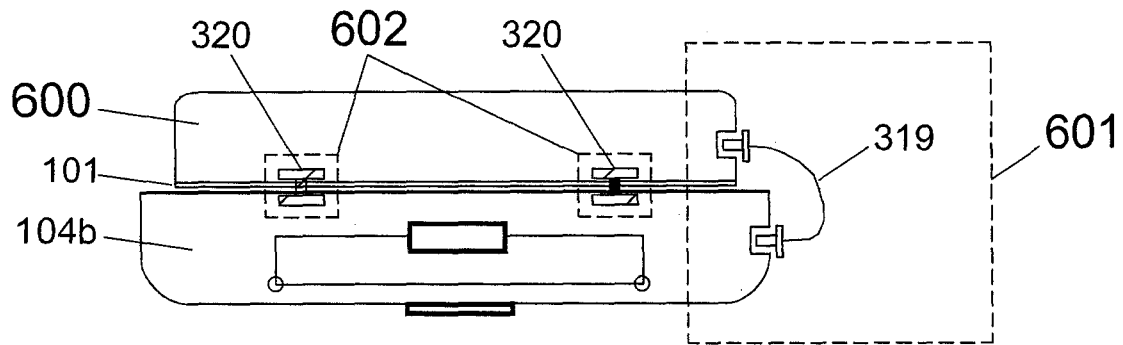


Fig. 23

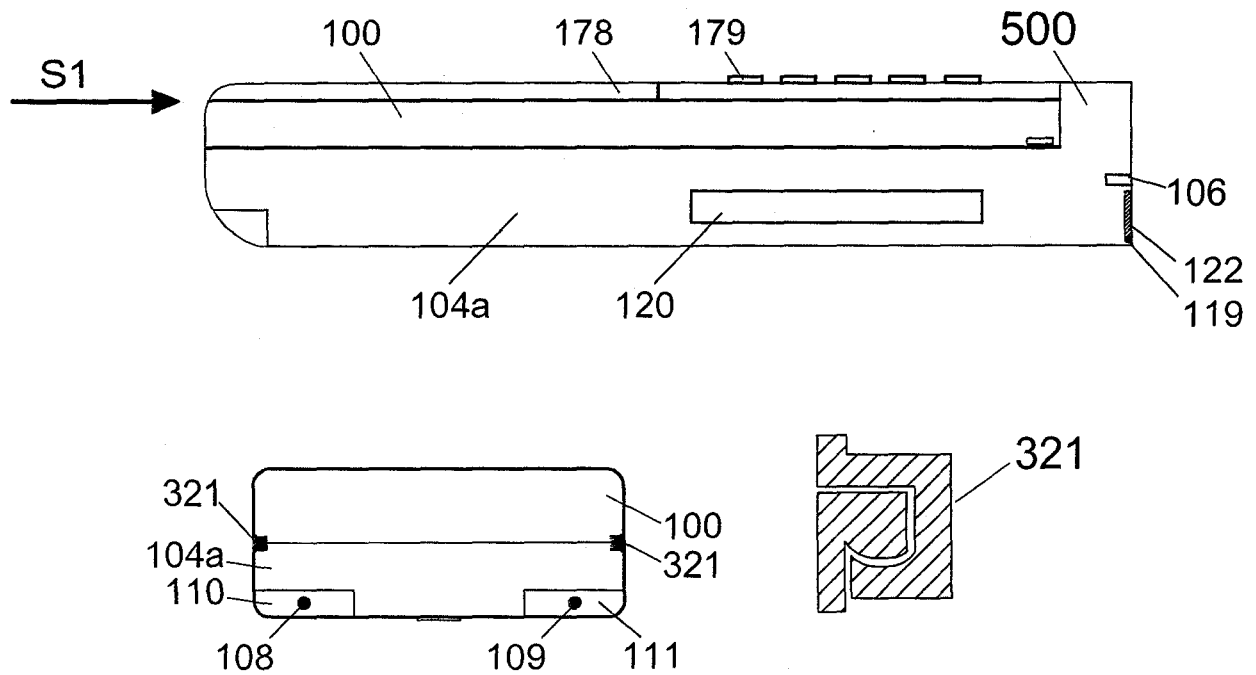


Fig. 24

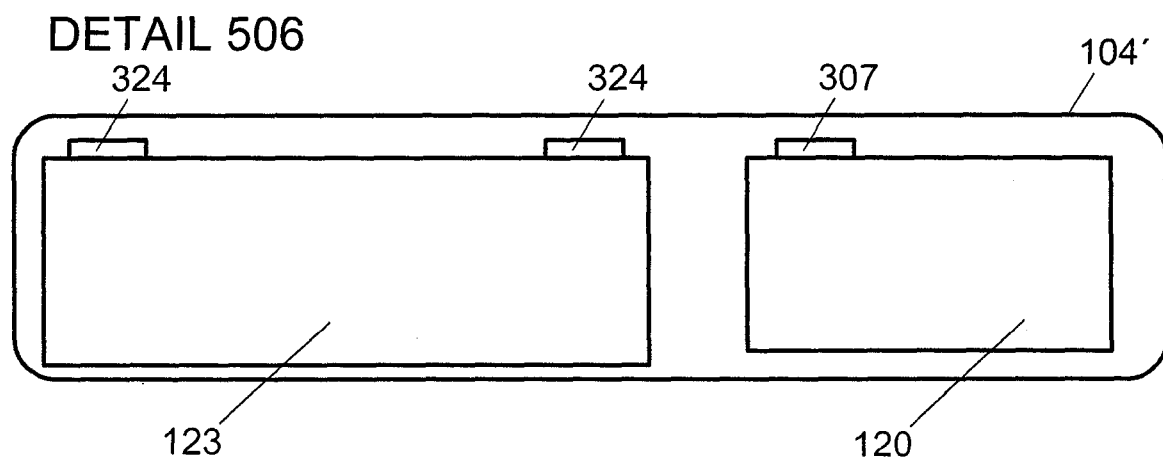
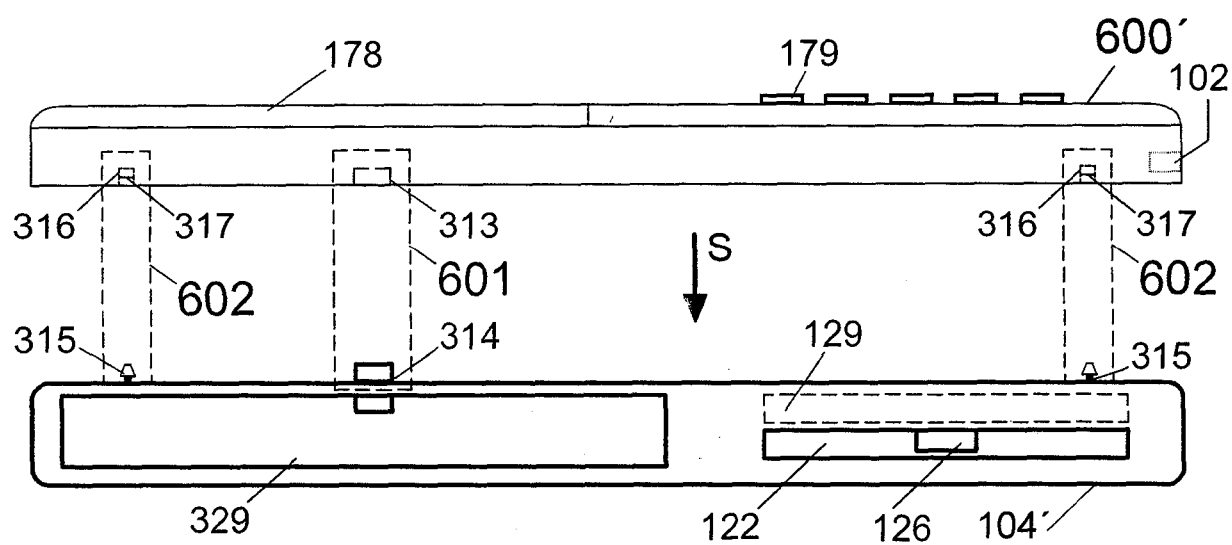


Fig. 25

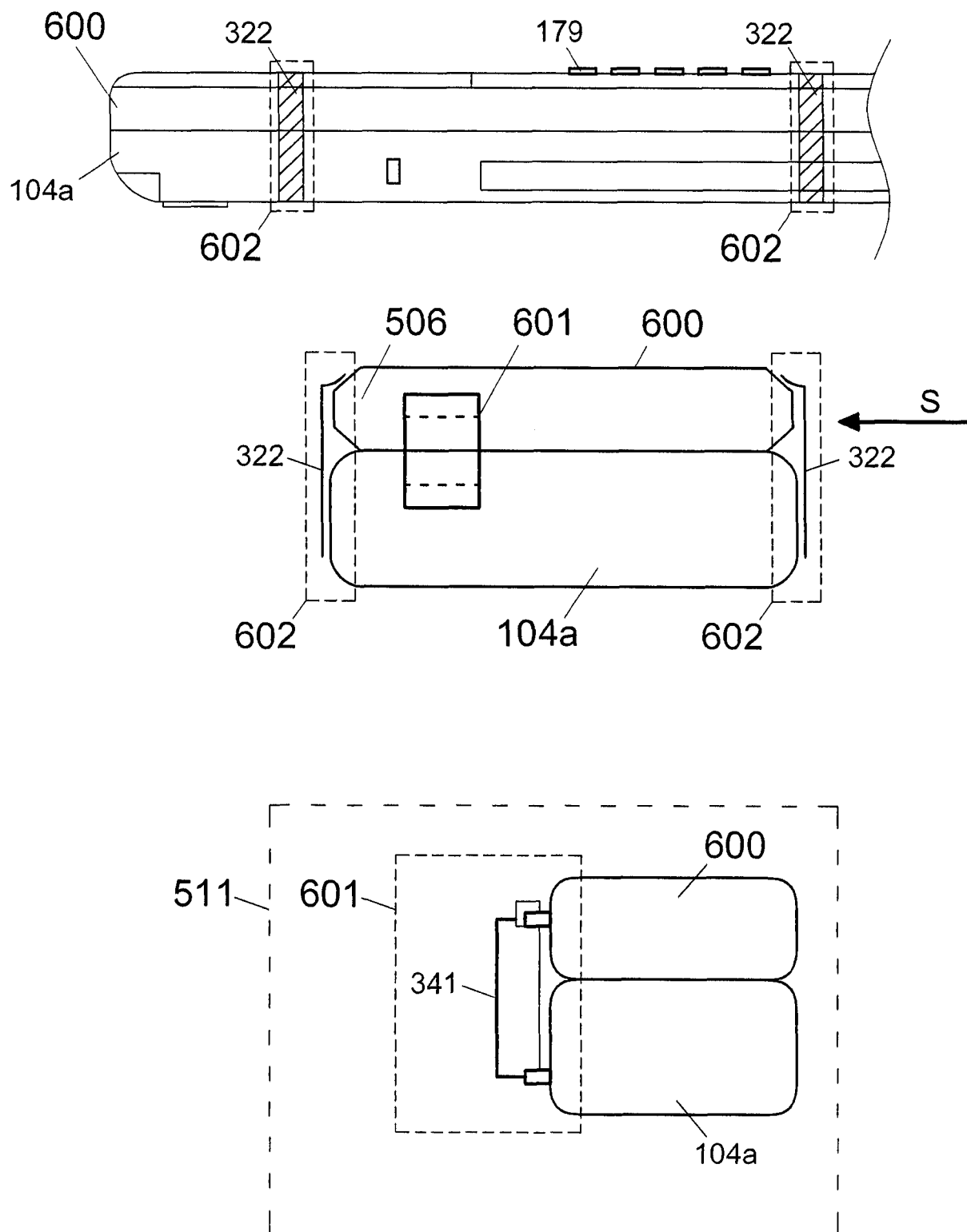


Fig. 26

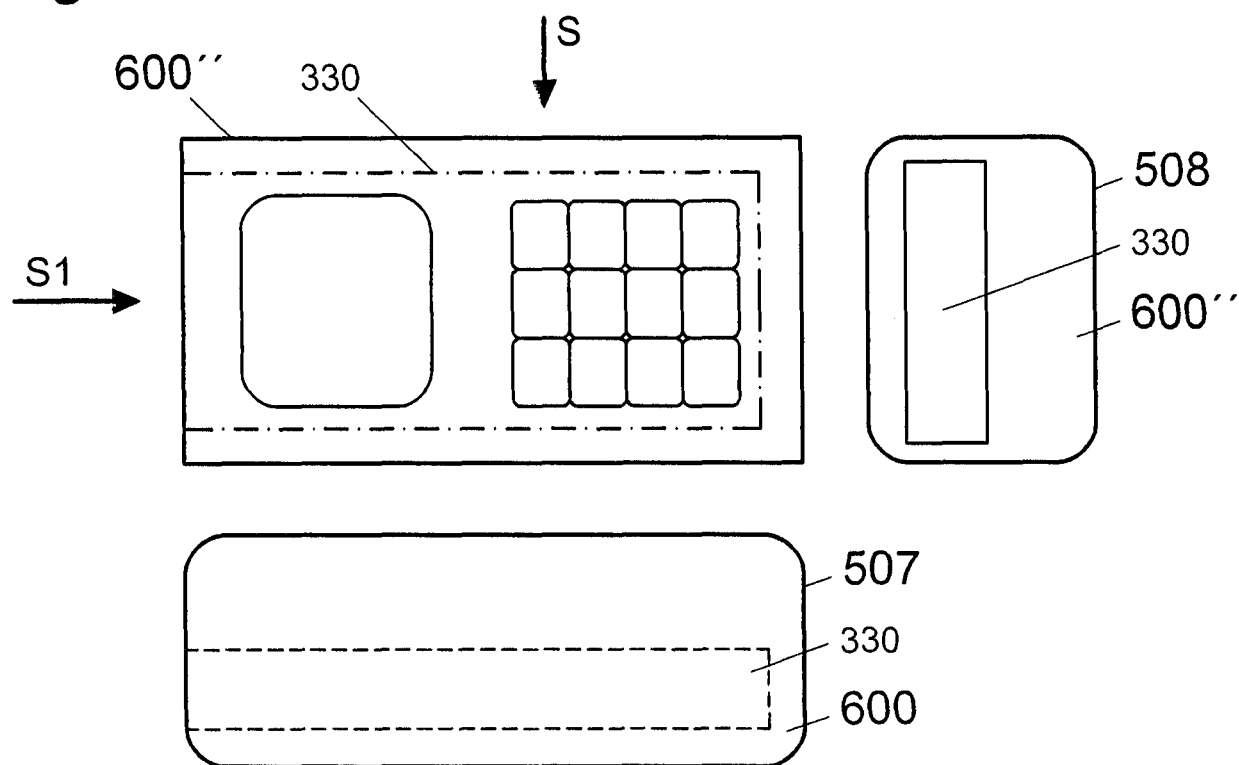


Fig. 27

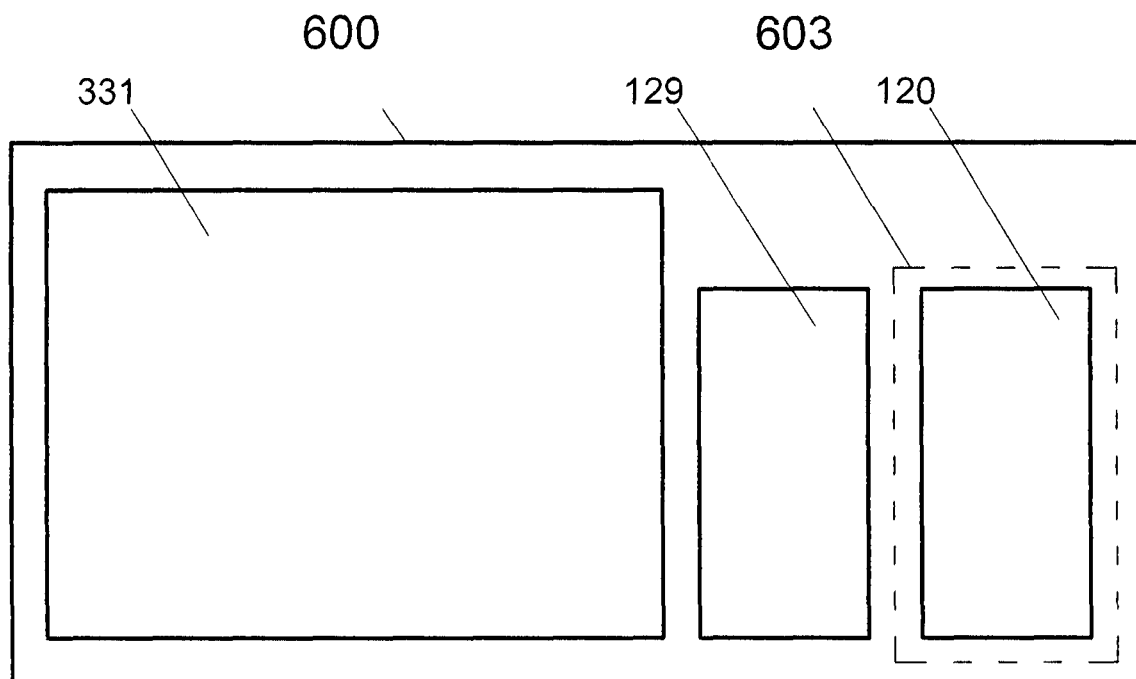


Fig. 28

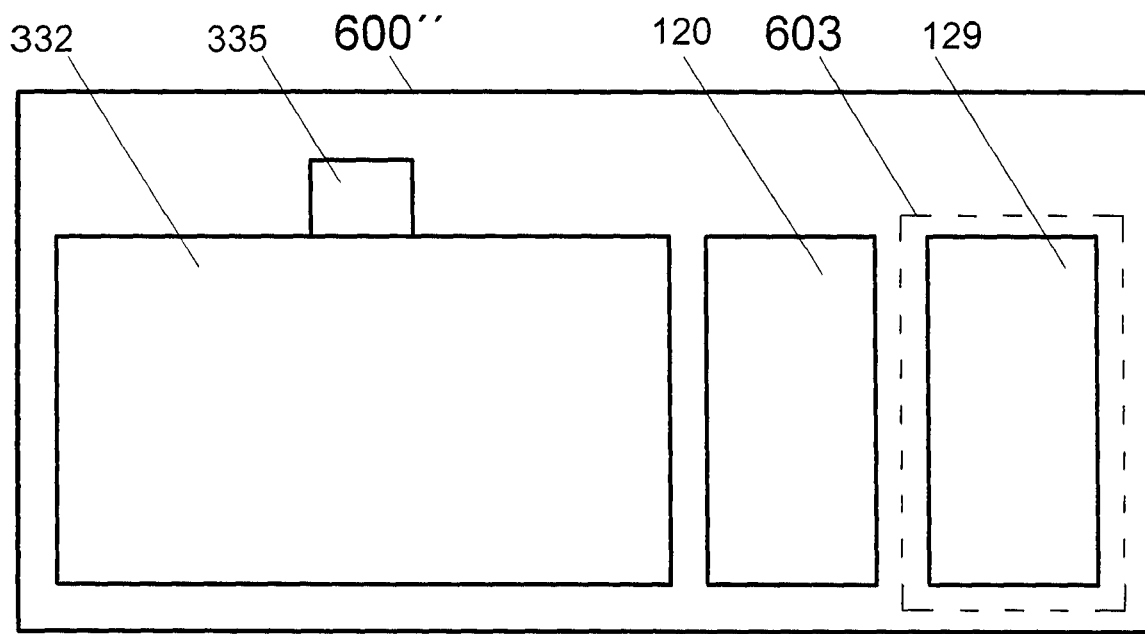


Fig. 29

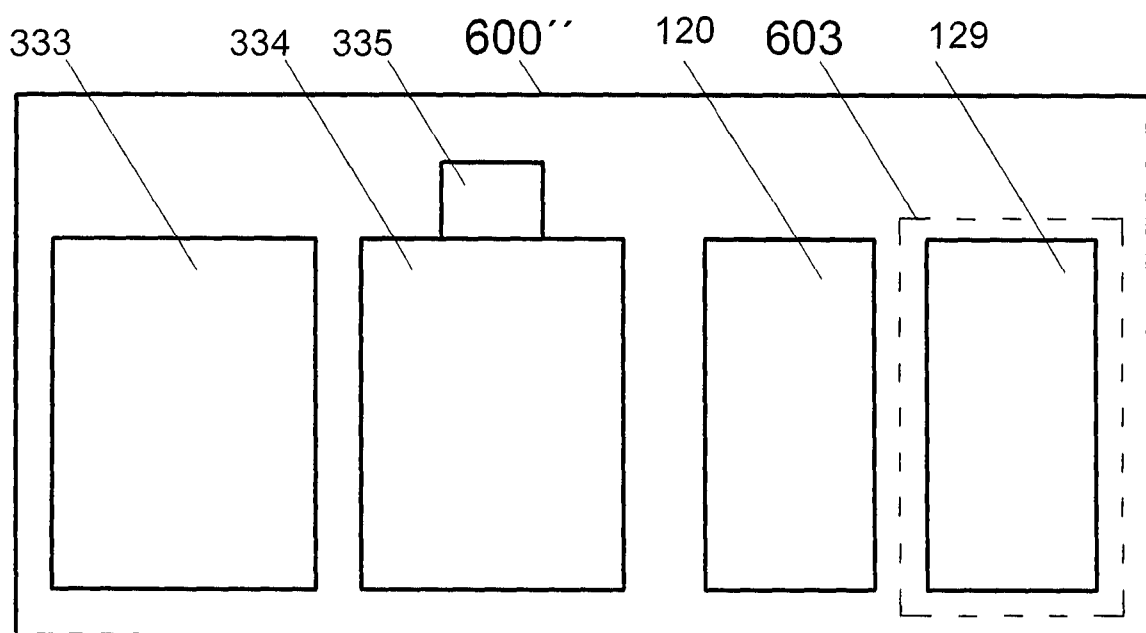


Fig. 30

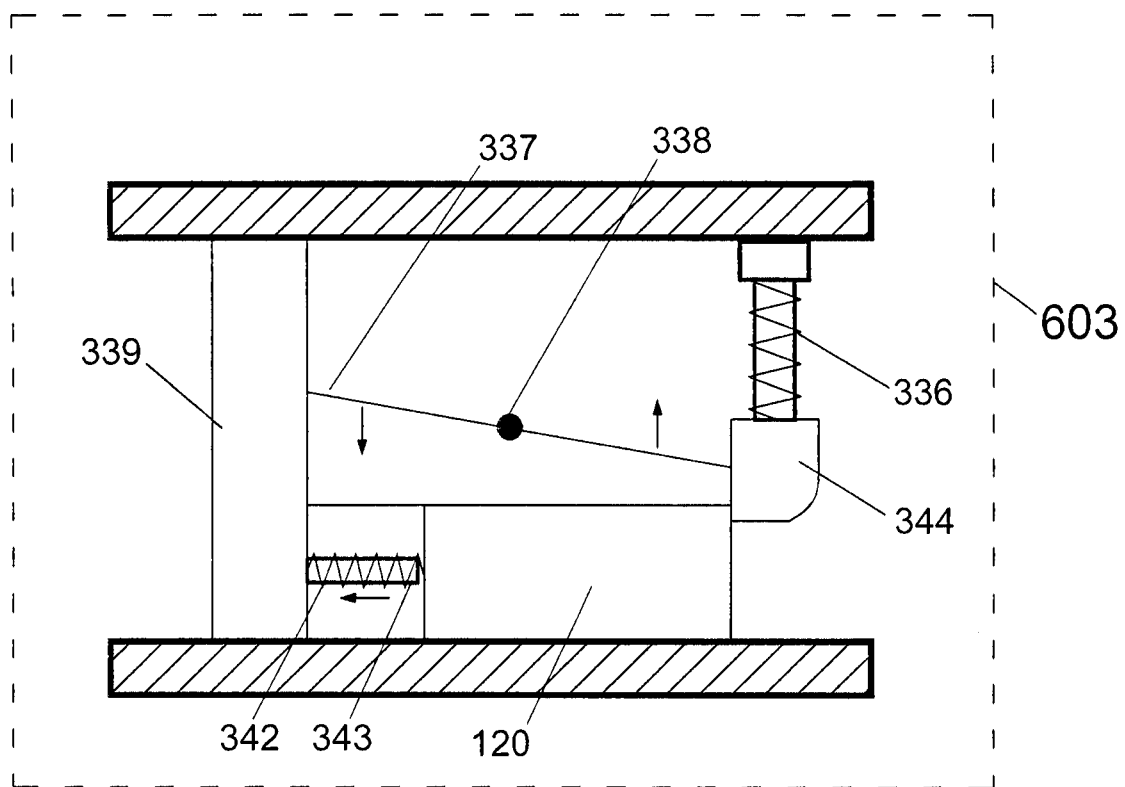


Fig. 31

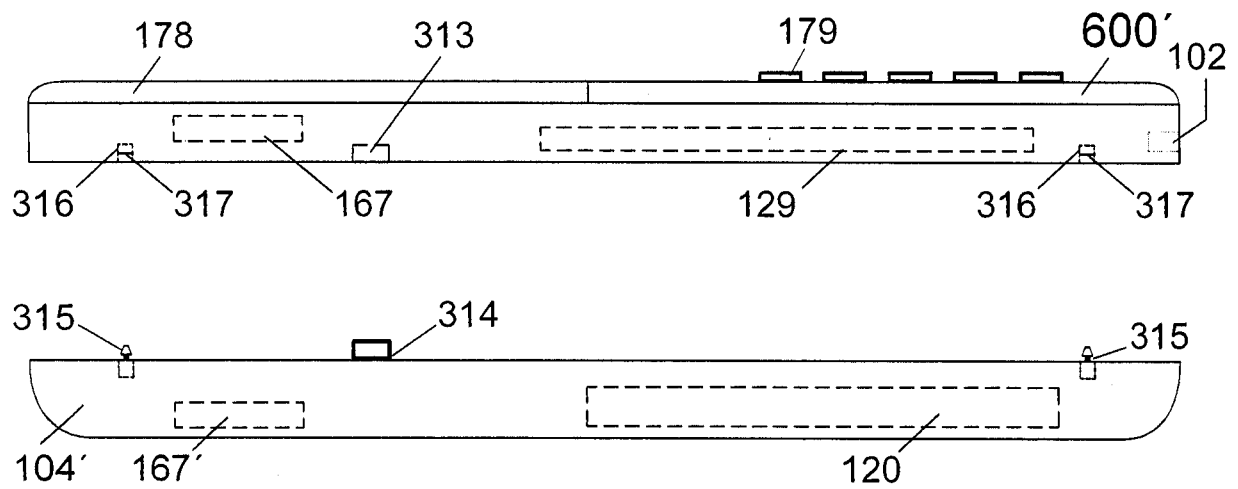


Fig. 32

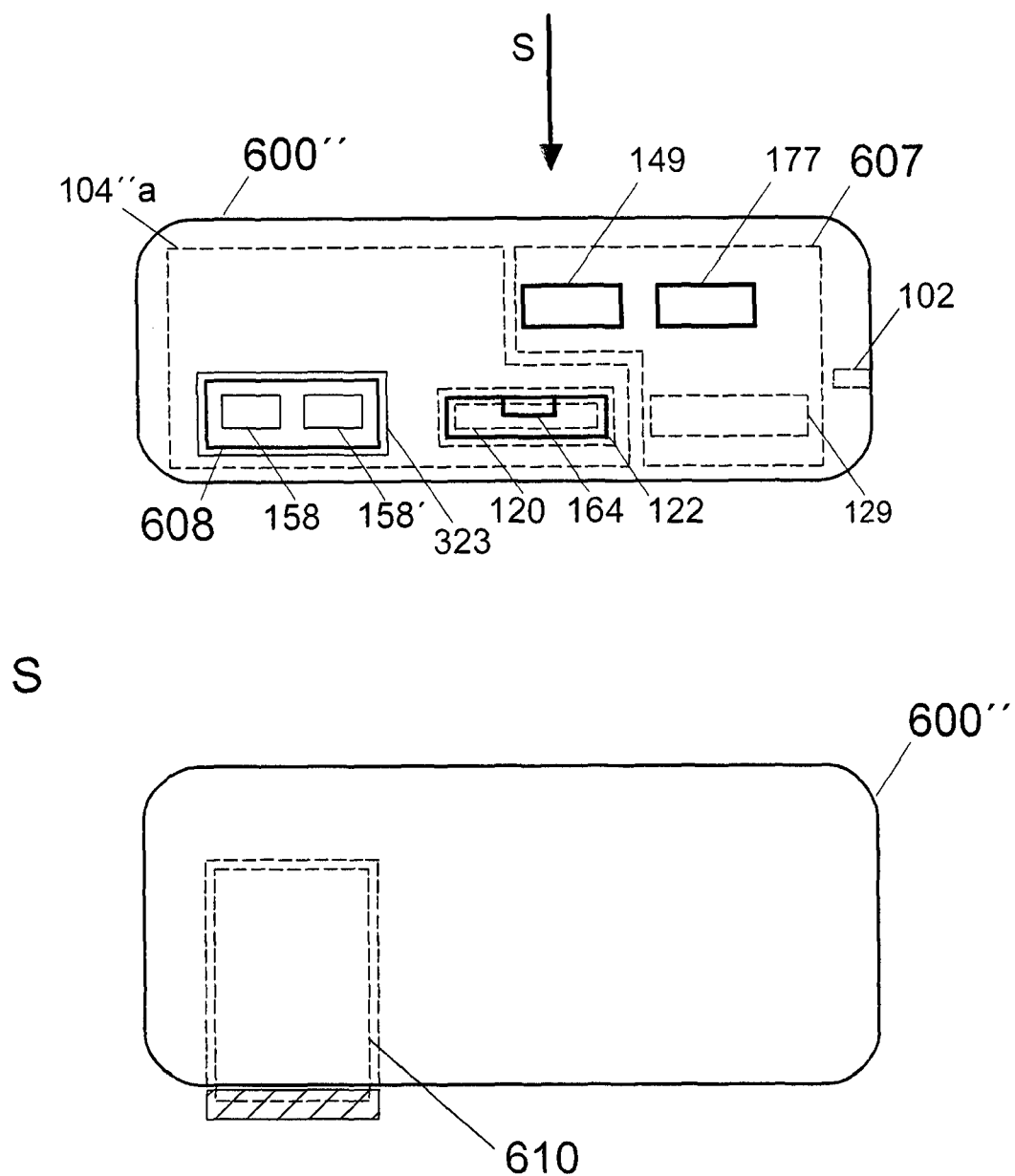


Fig. 33

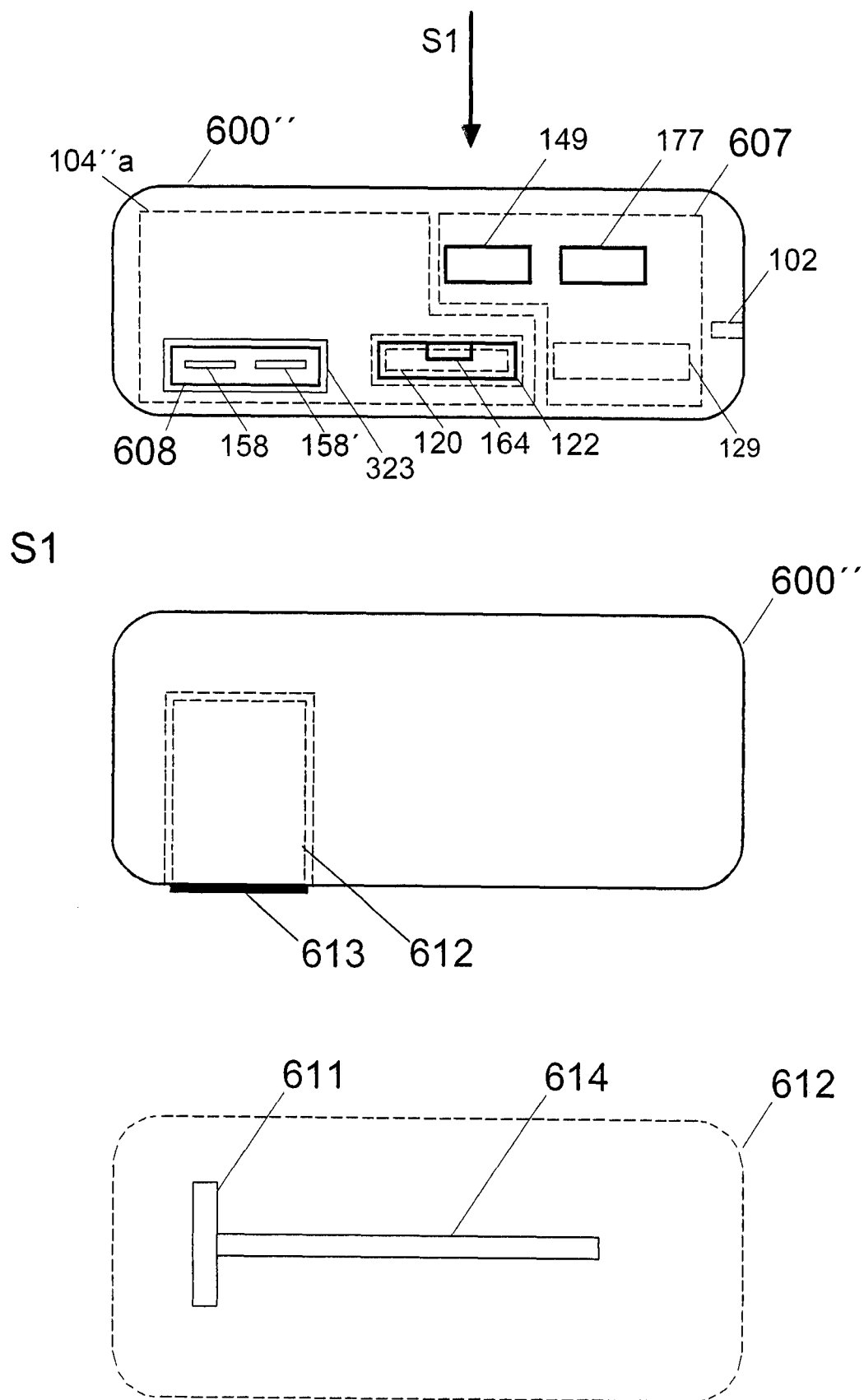


Fig. 34

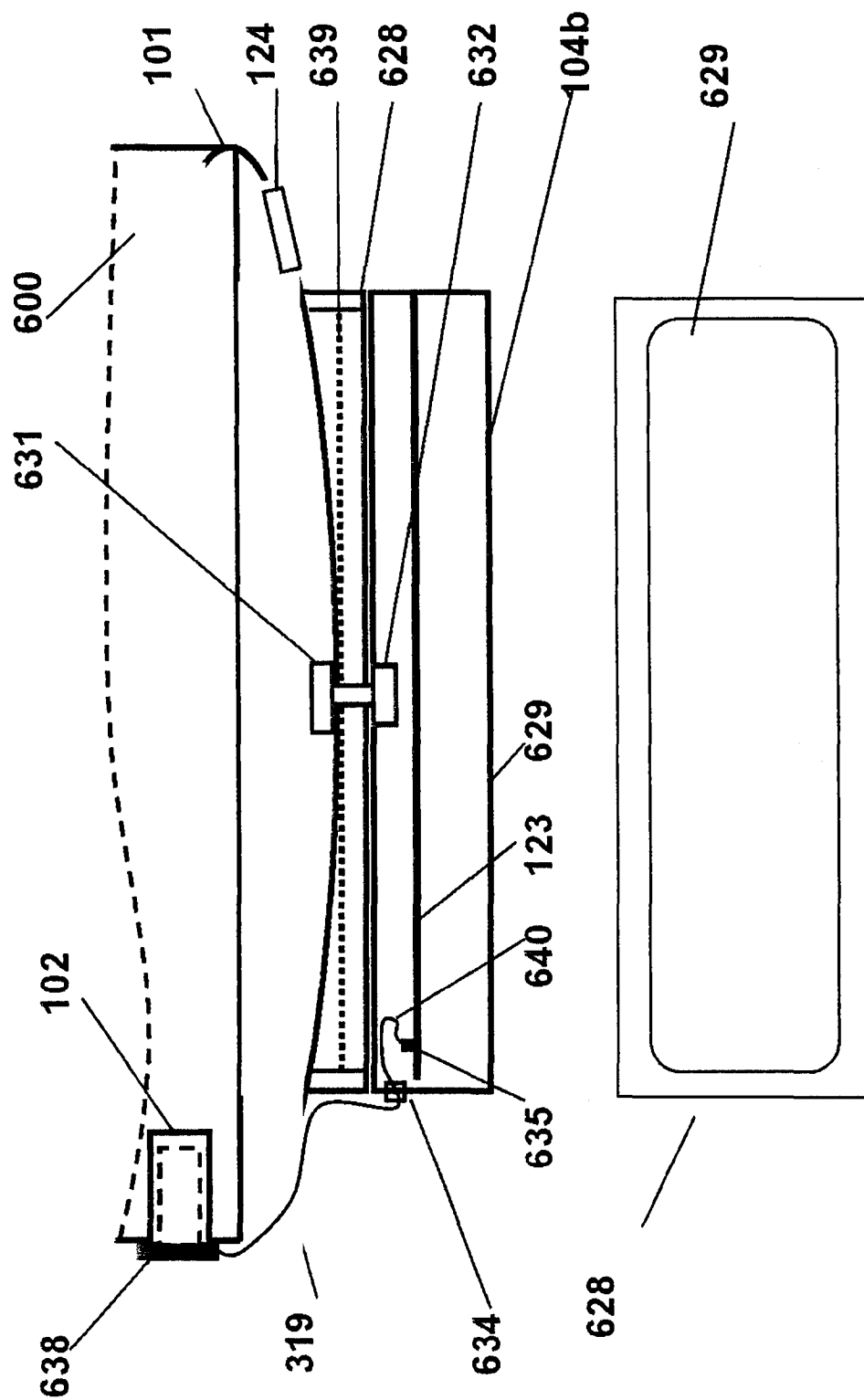


Fig. 35

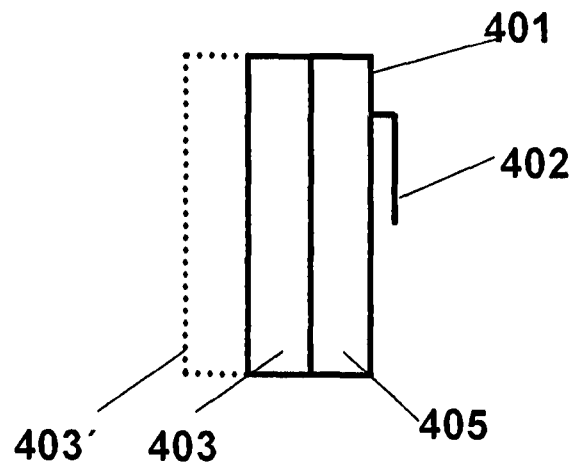


Fig. 36

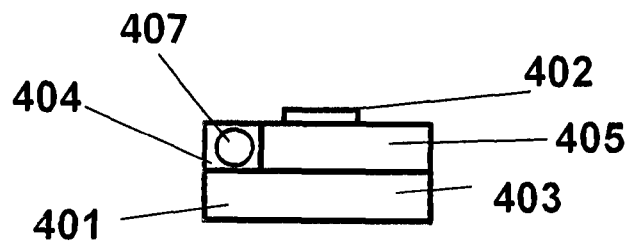


Fig. 37

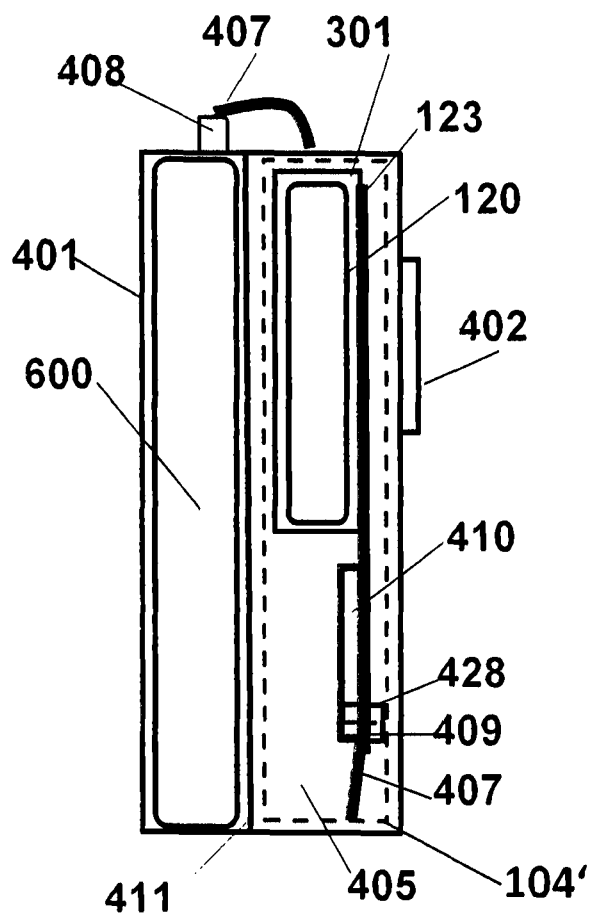


Fig. 38

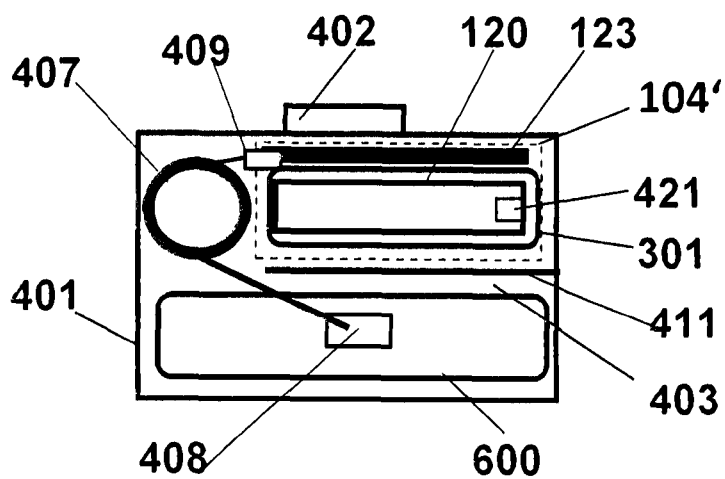


Fig. 39

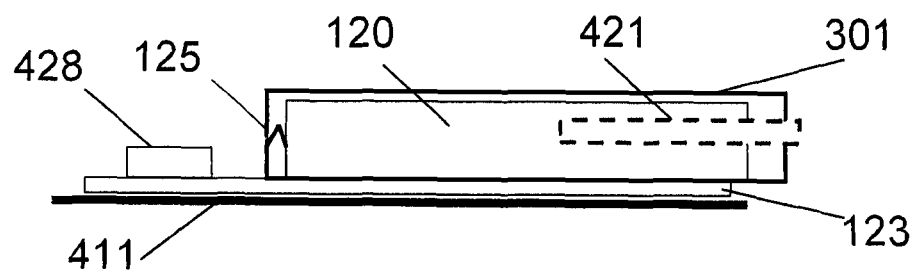


Fig. 40

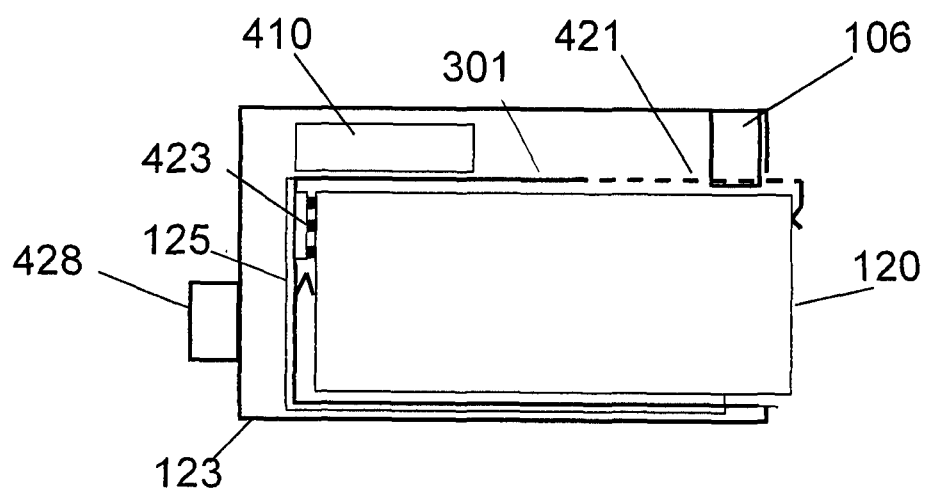


Fig. 41

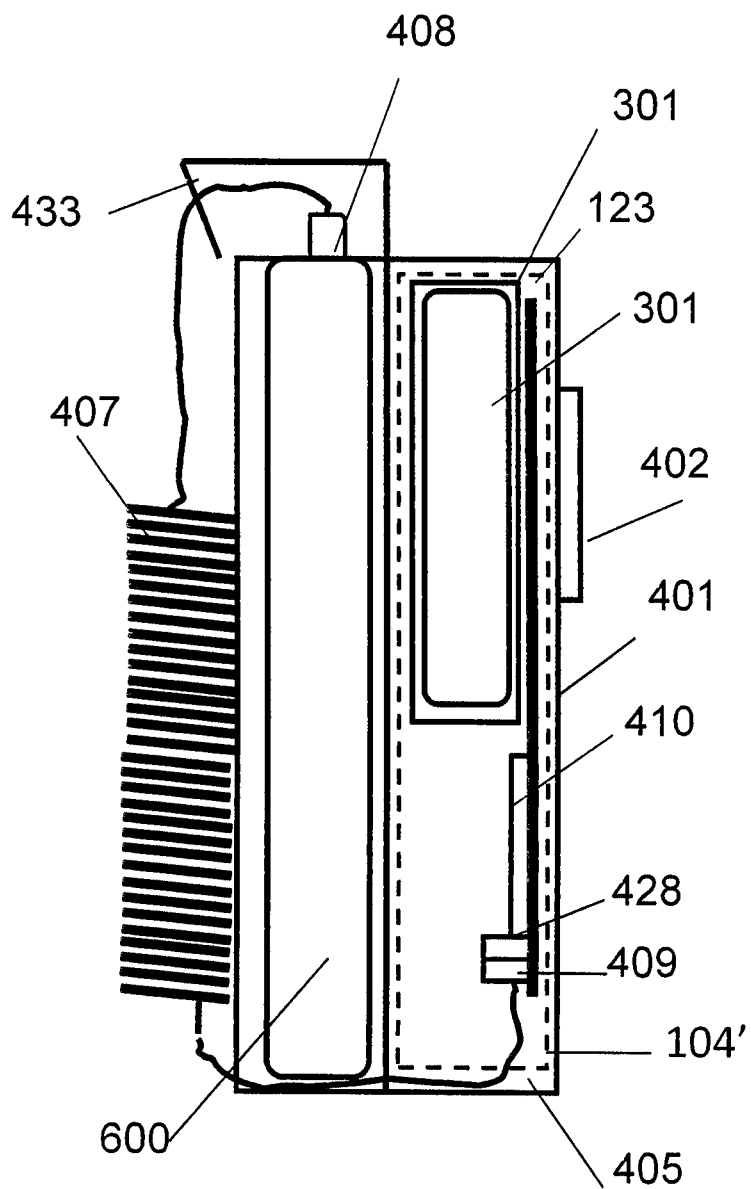


Fig. 42

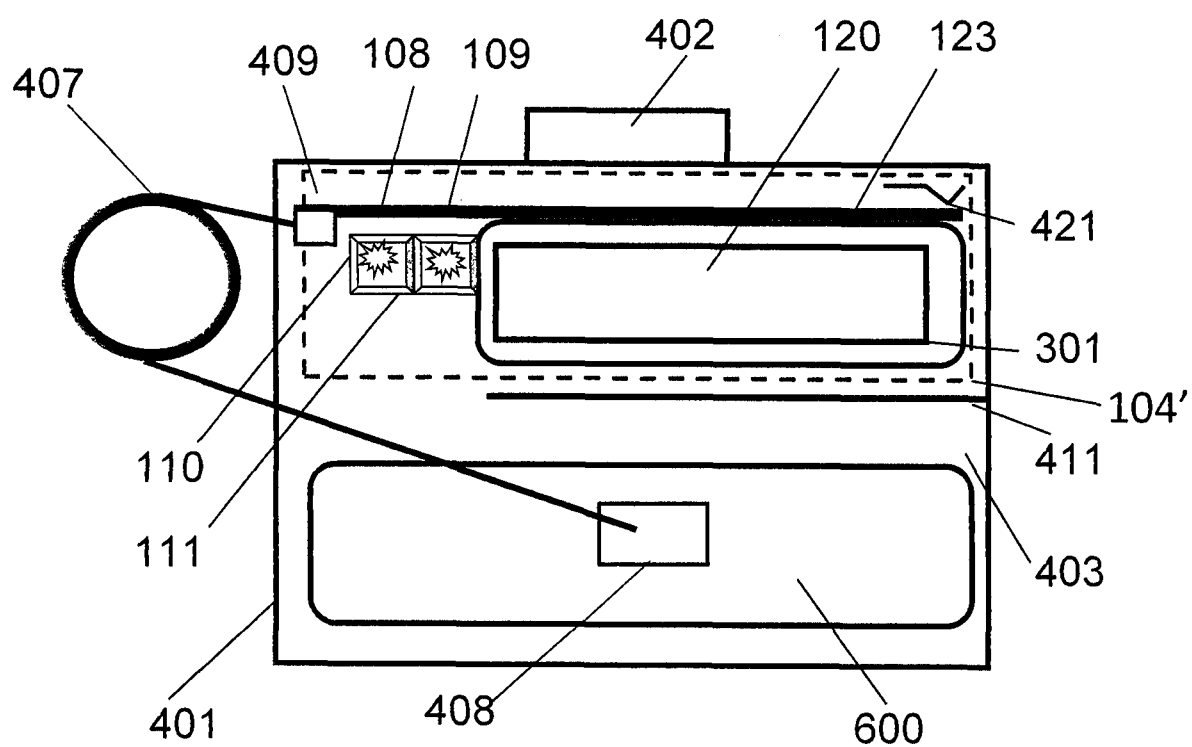


Fig. 42B

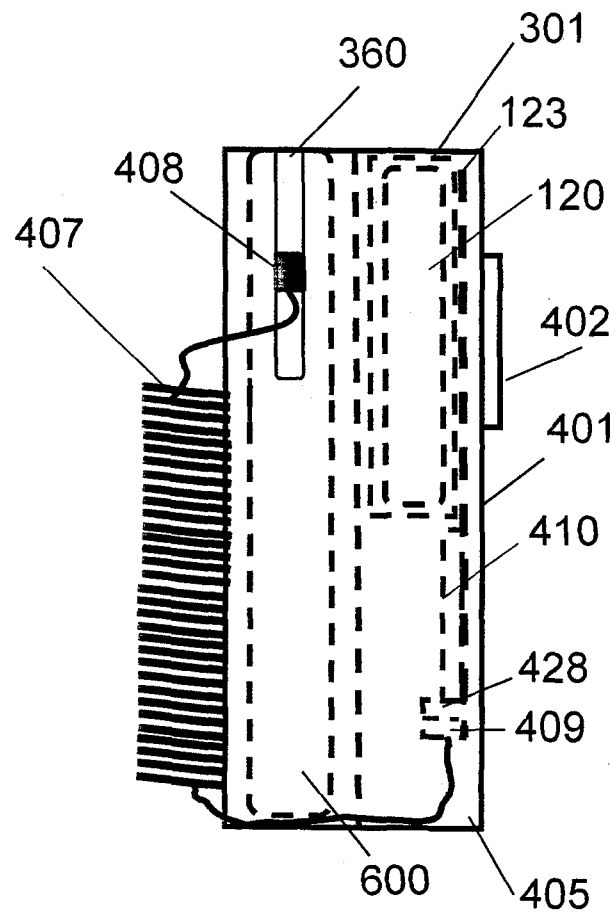


Fig. 43

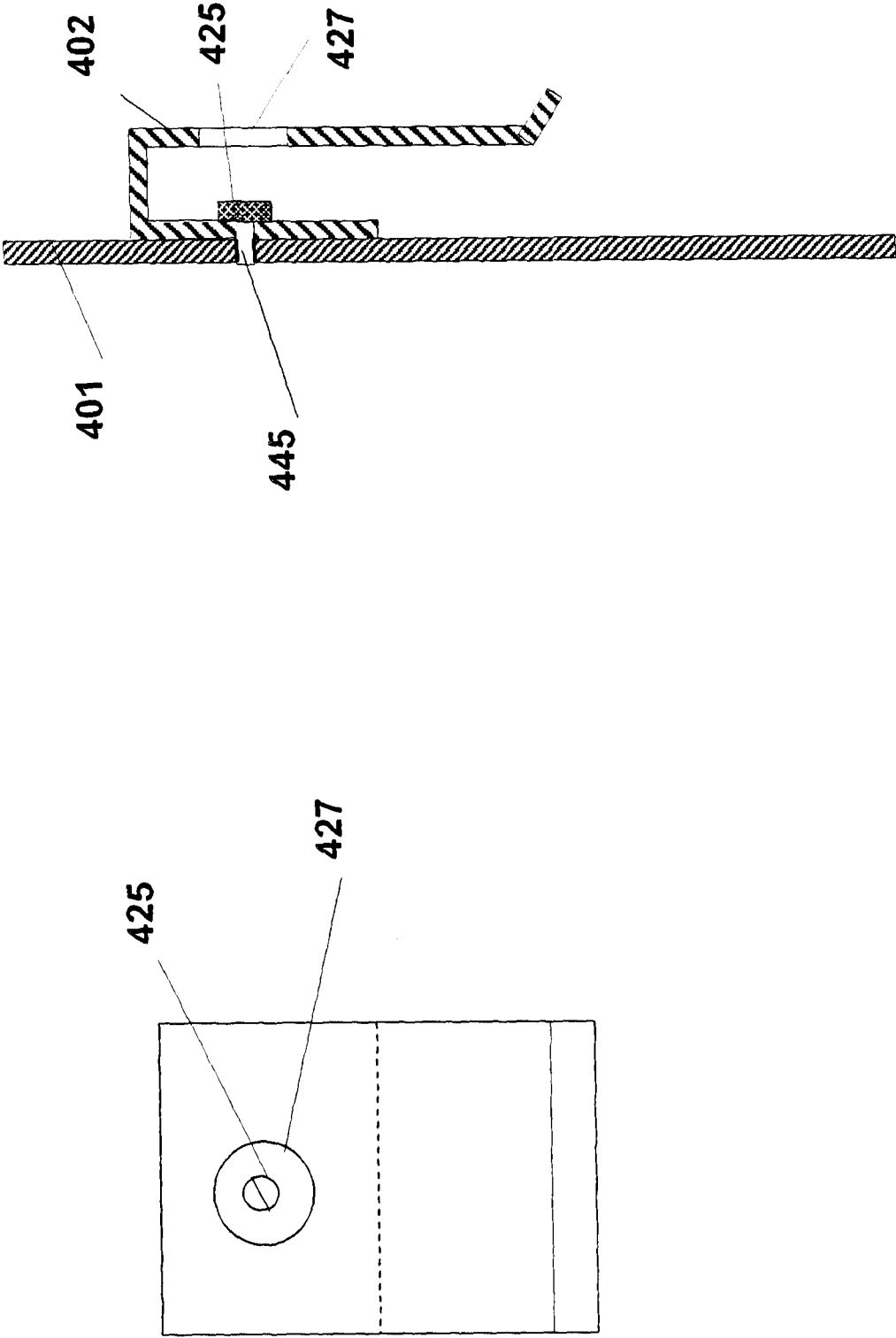


Fig. 44

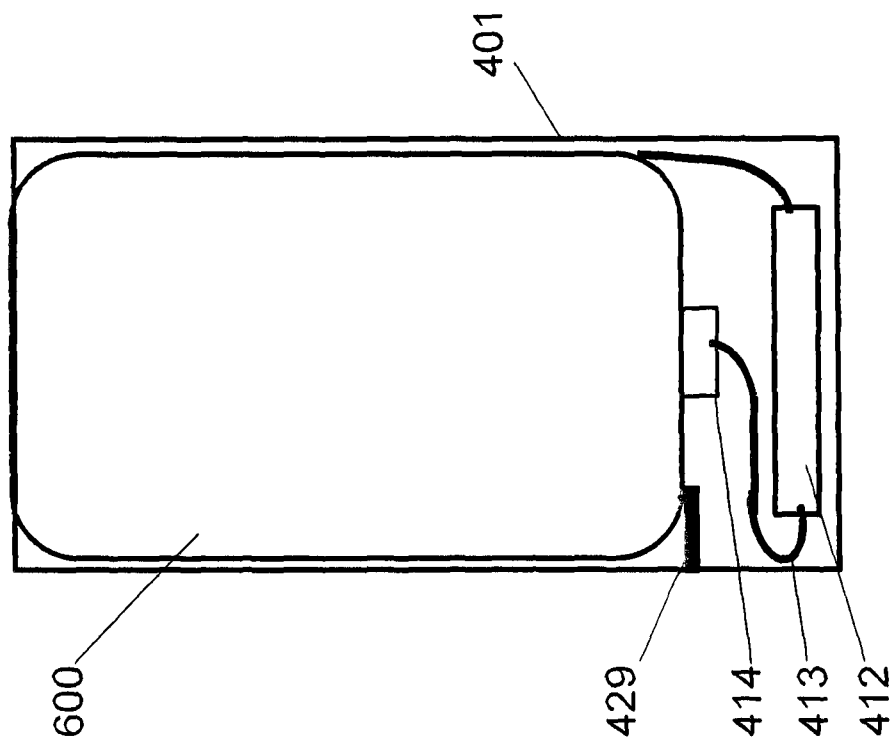


Fig. 45

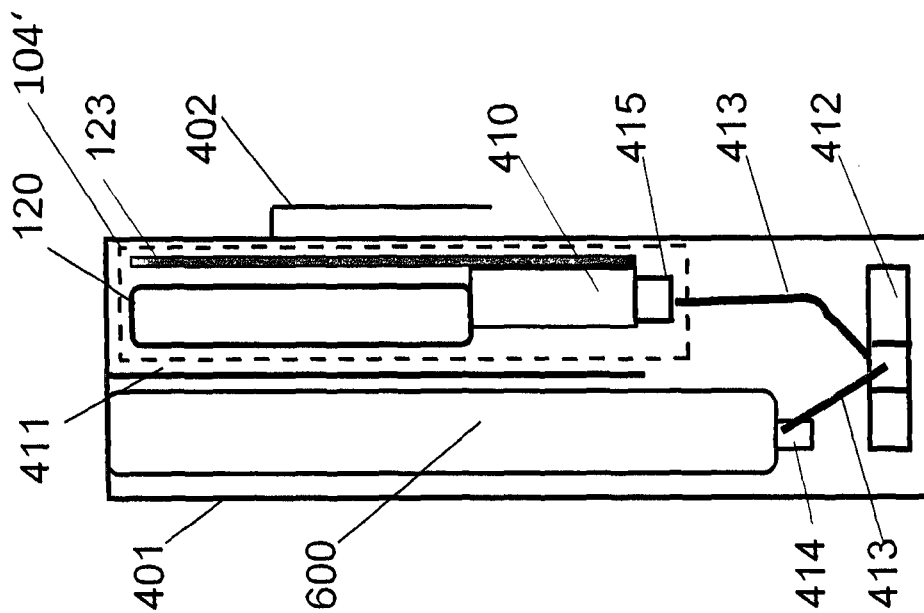


Fig. 45C

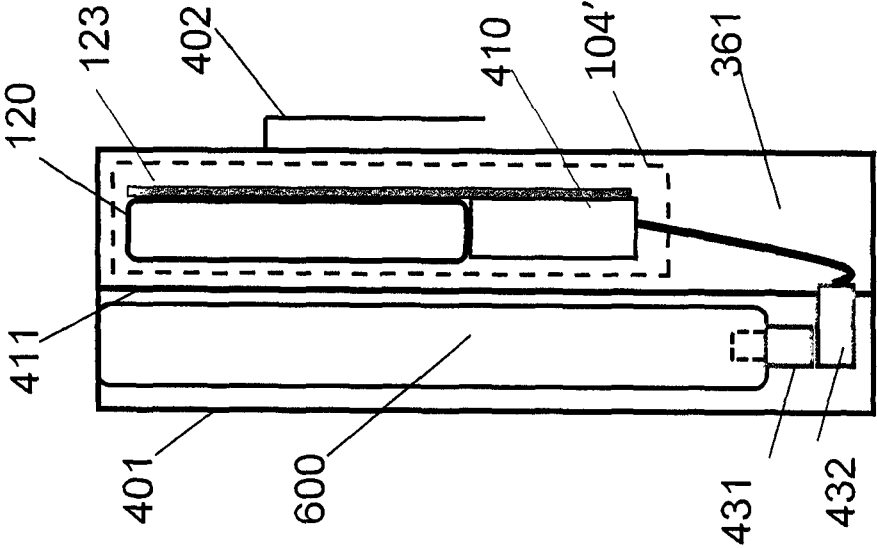


Fig. 45B

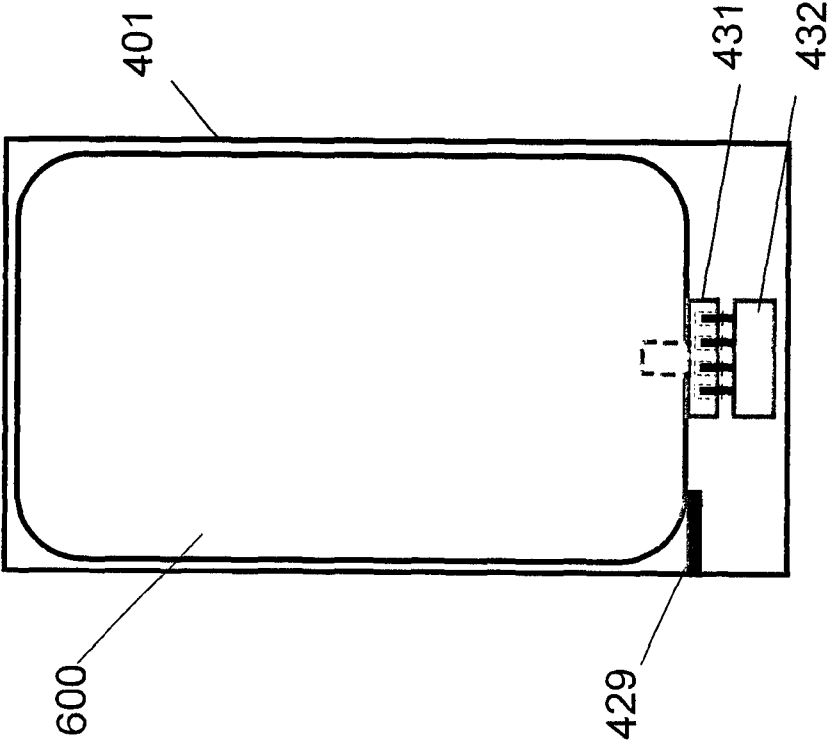


Fig. 45D

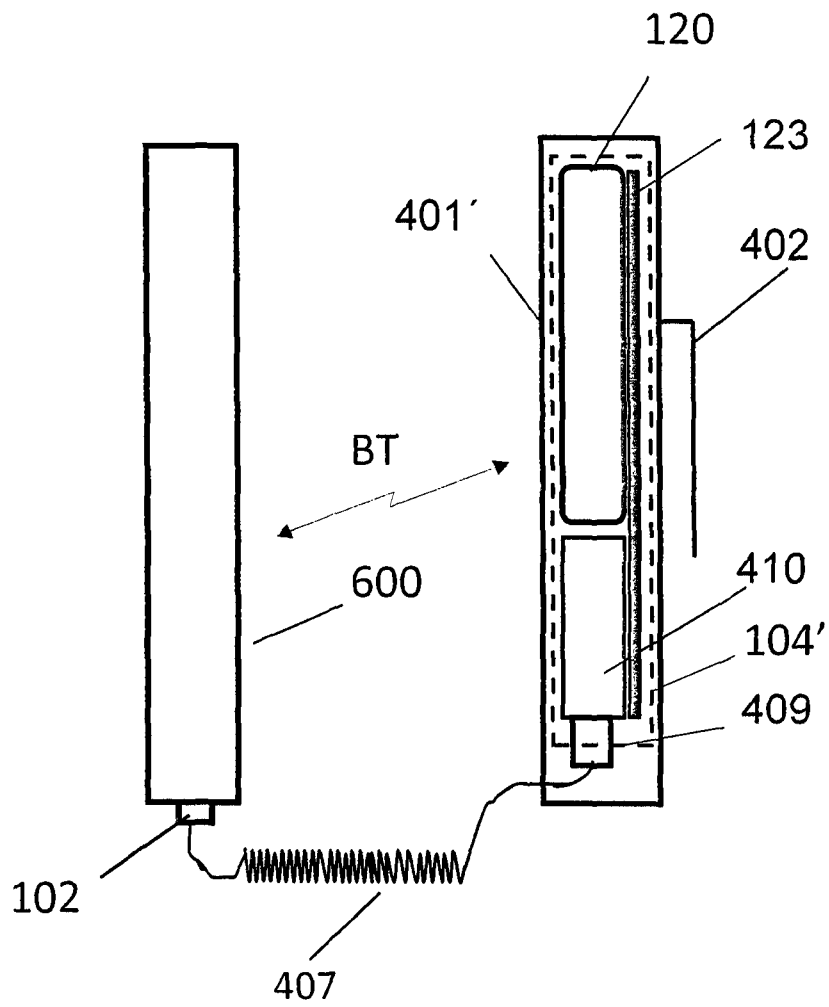


Fig. 45E

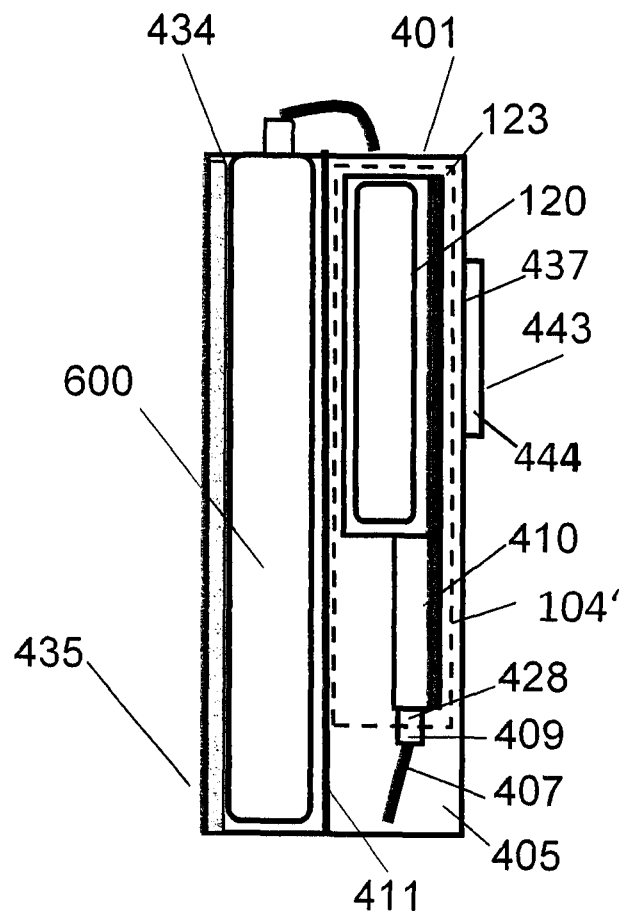


Fig. 45F

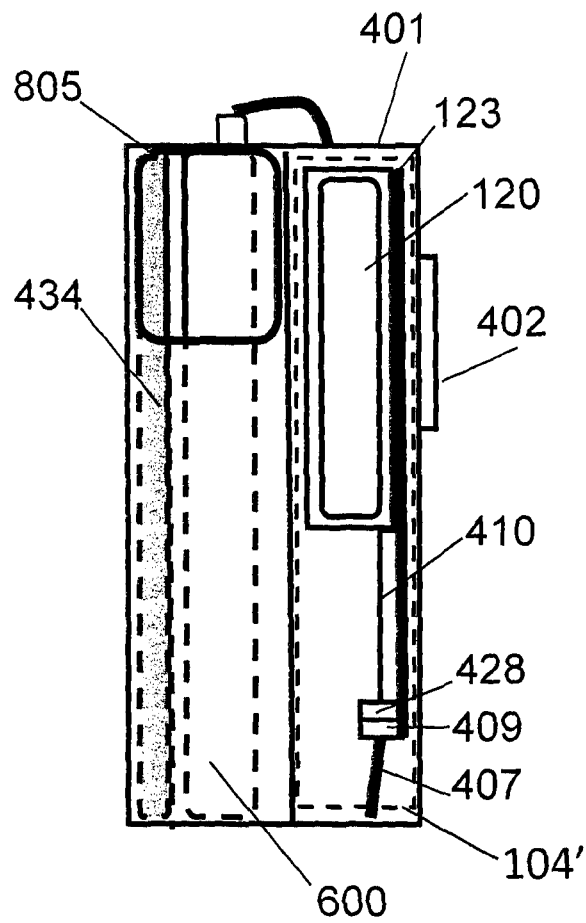


Fig. 45G

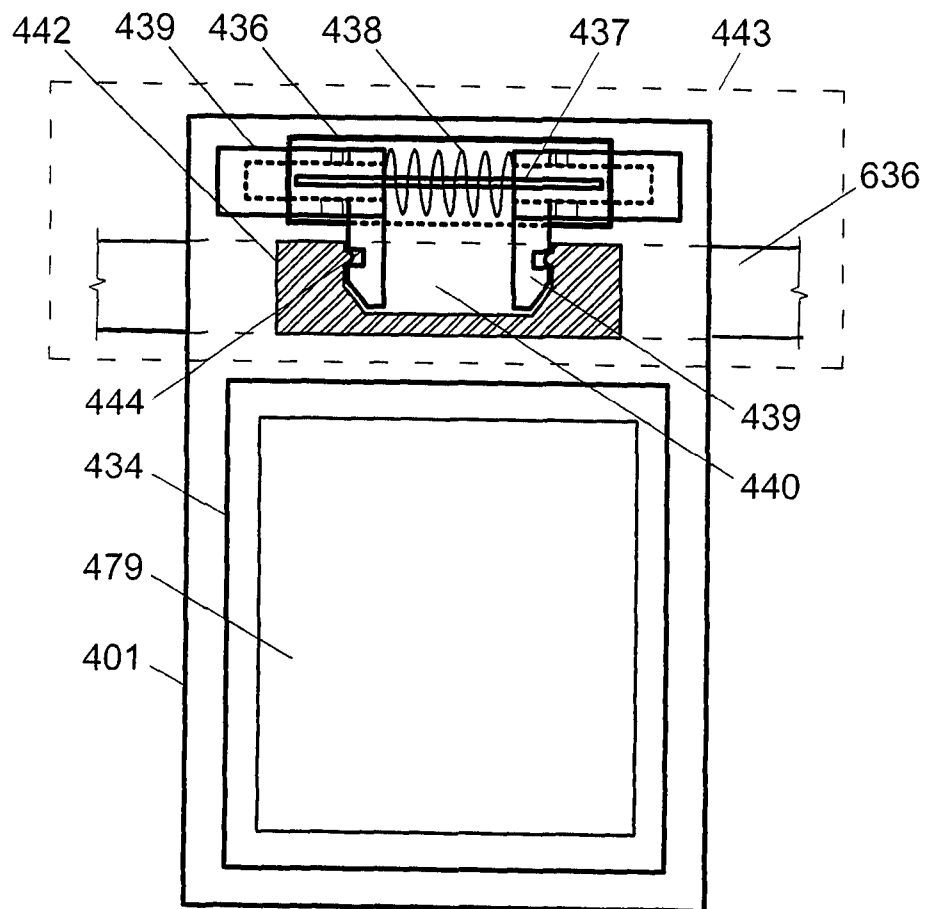


Fig. 45H

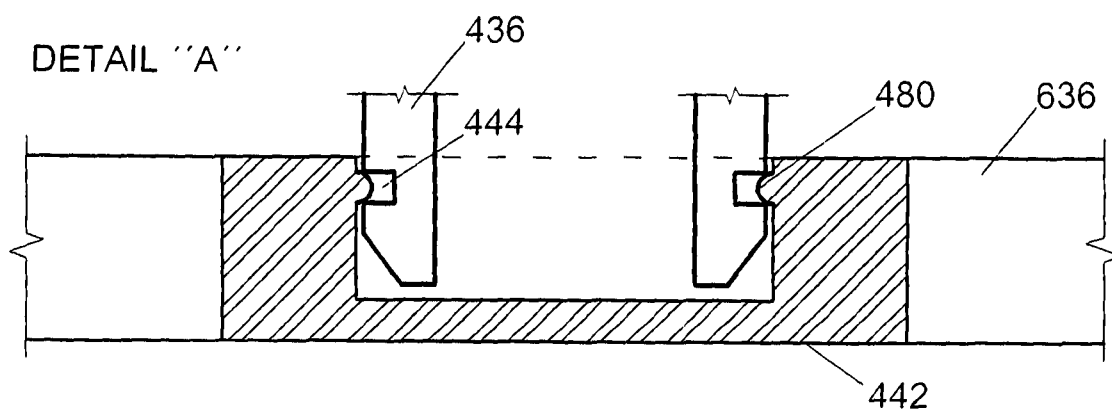
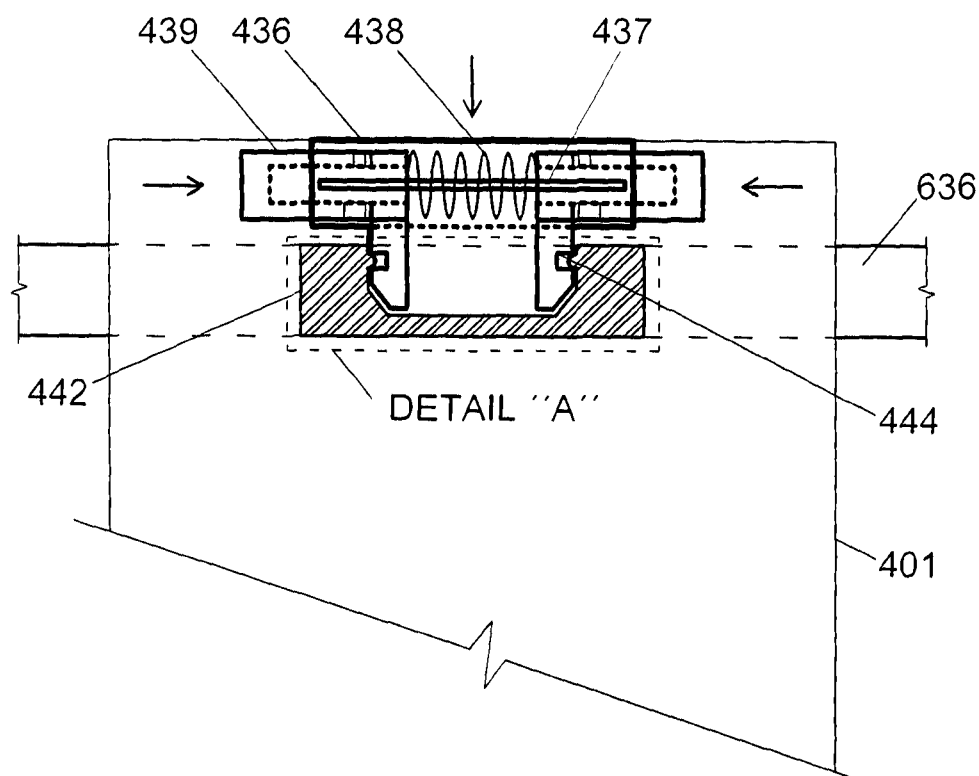


Fig. 45 I

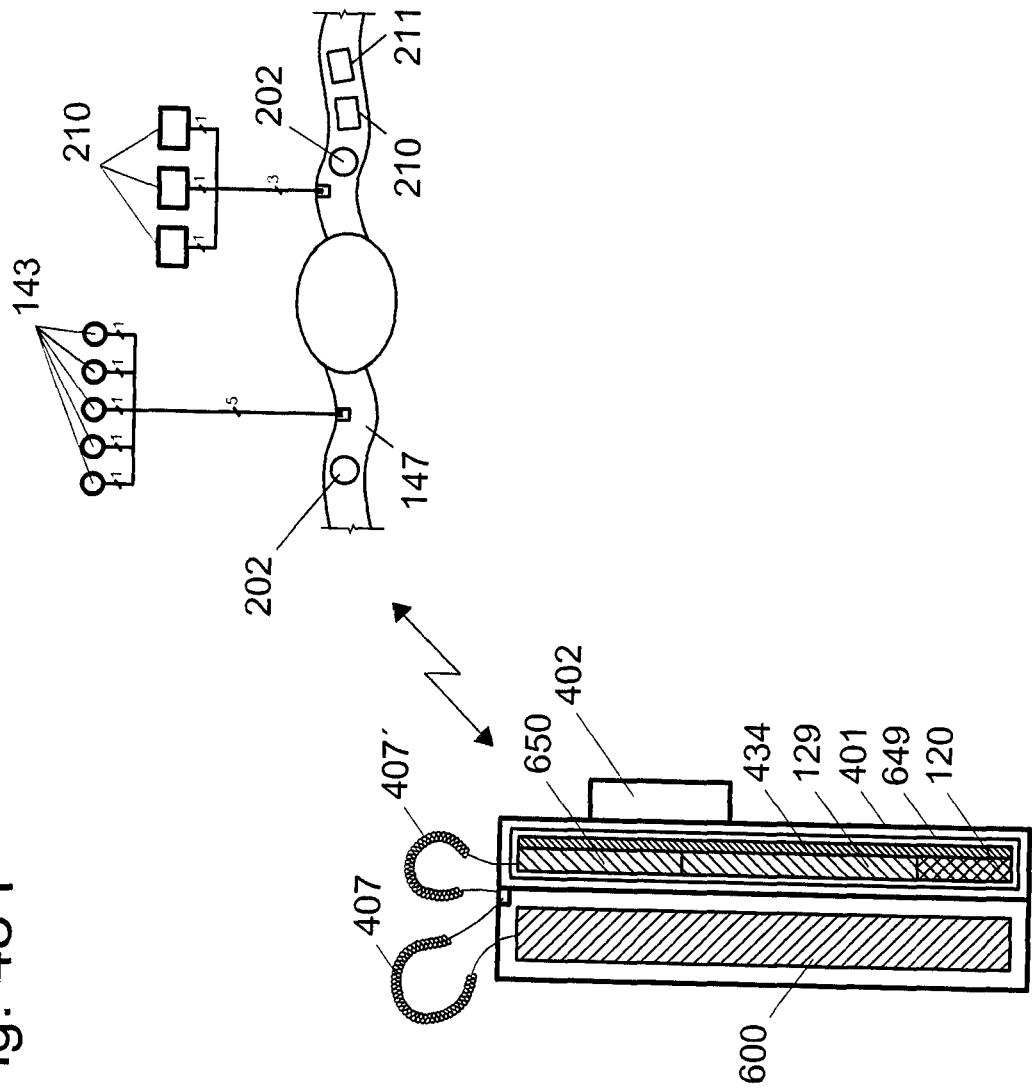


Fig. 45 J

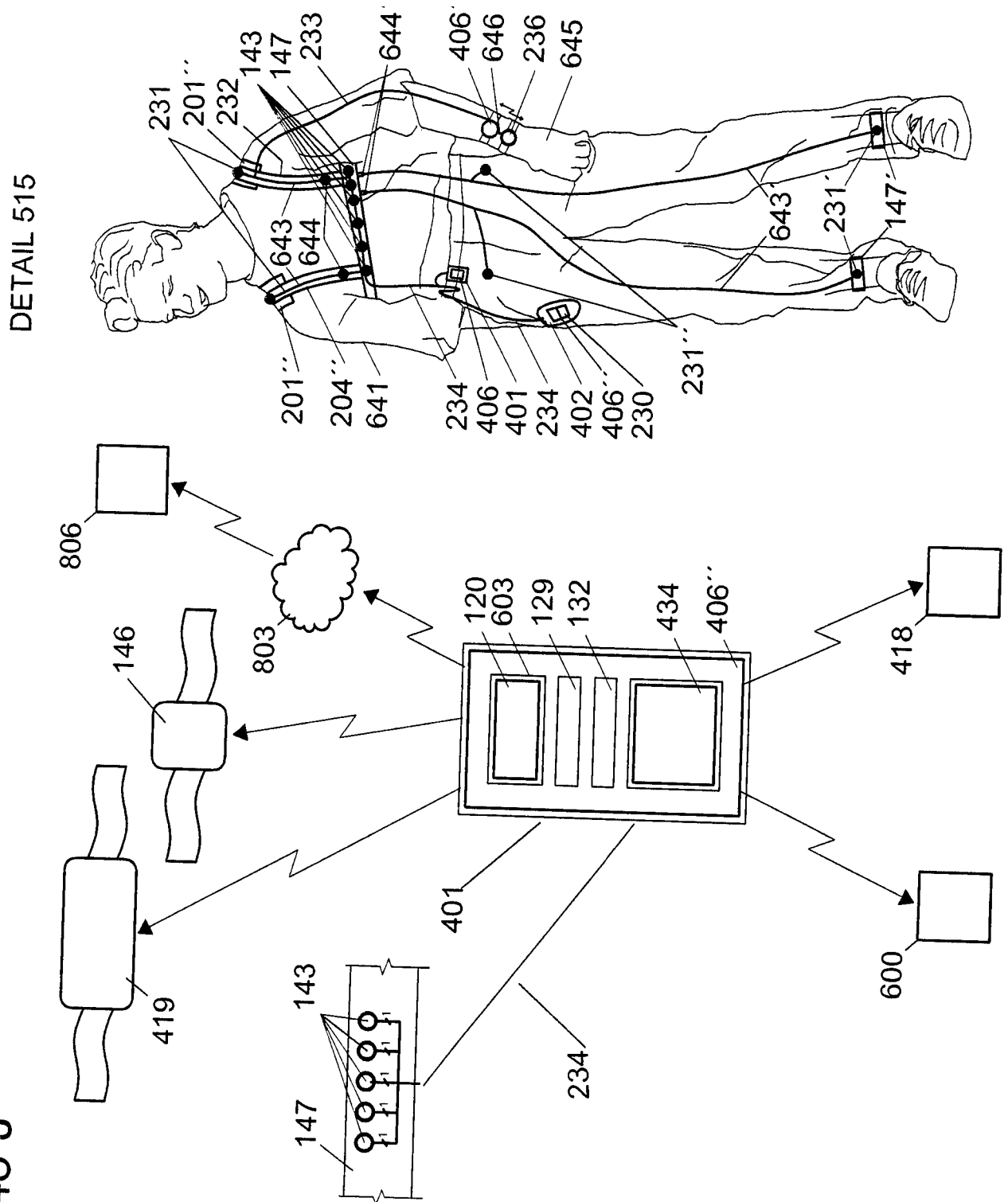
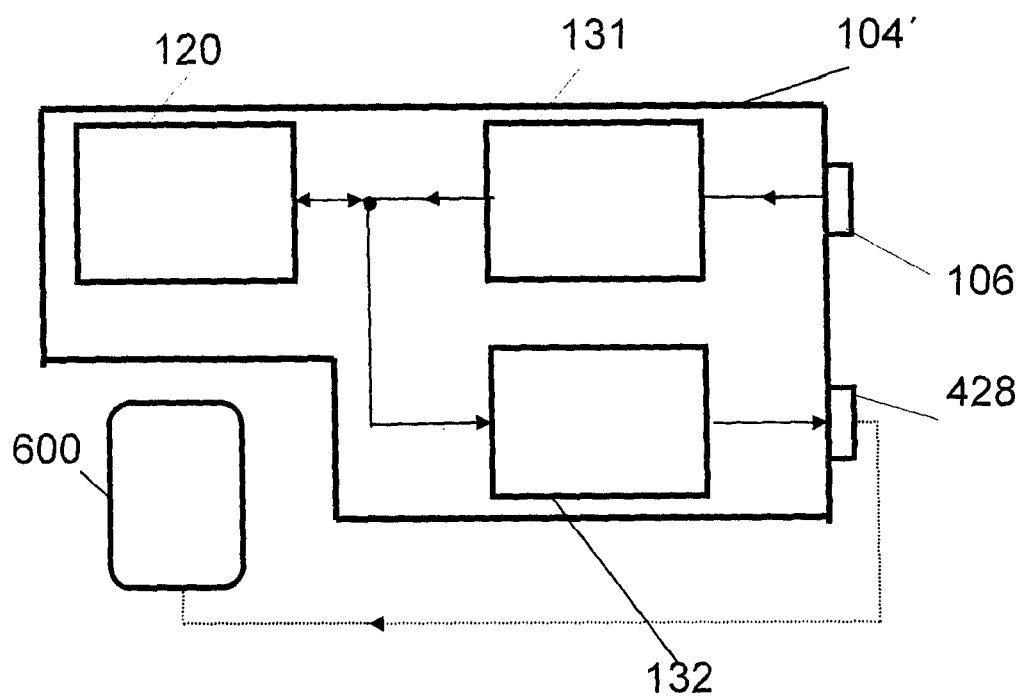


Fig. 46



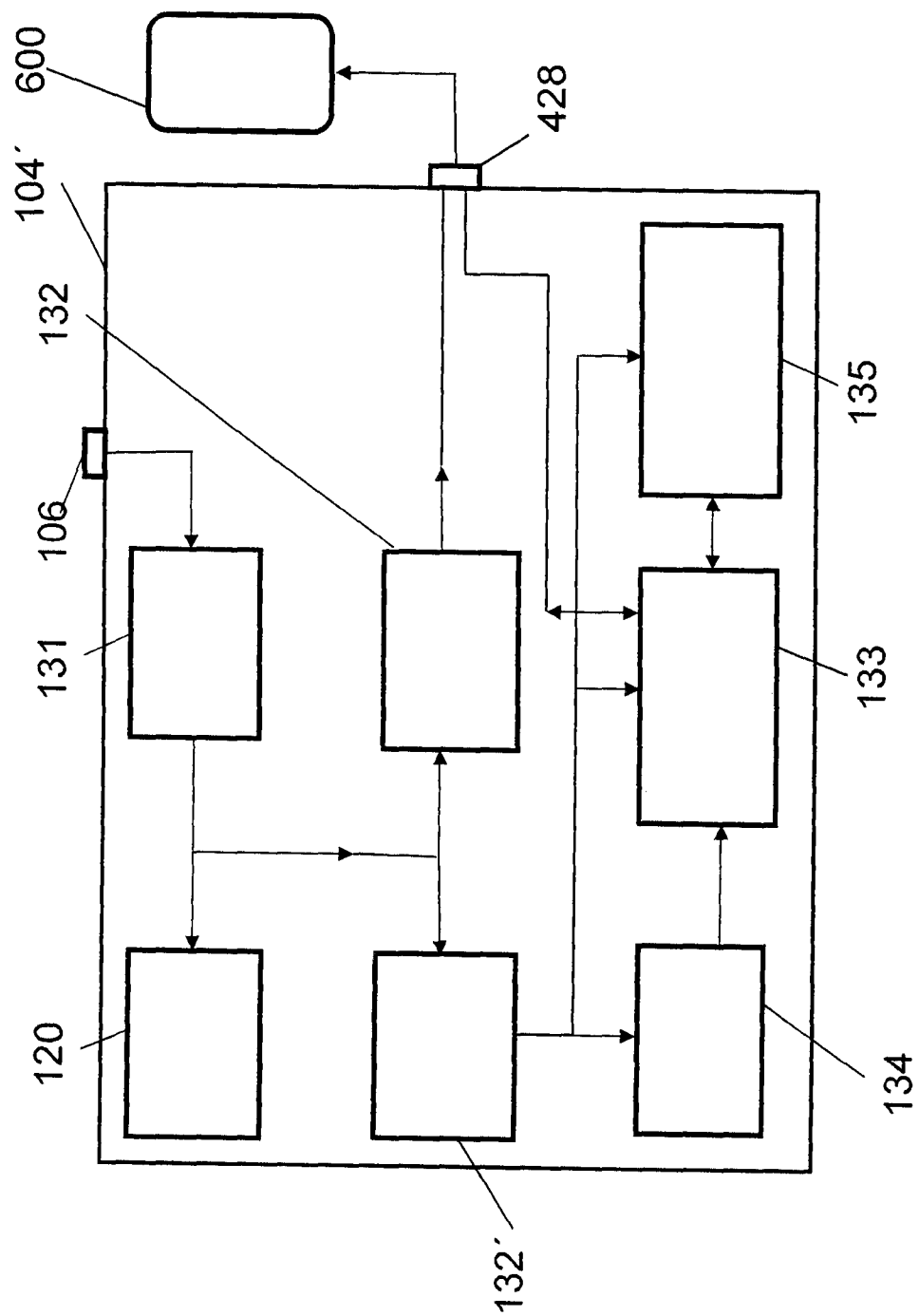


Fig. 47

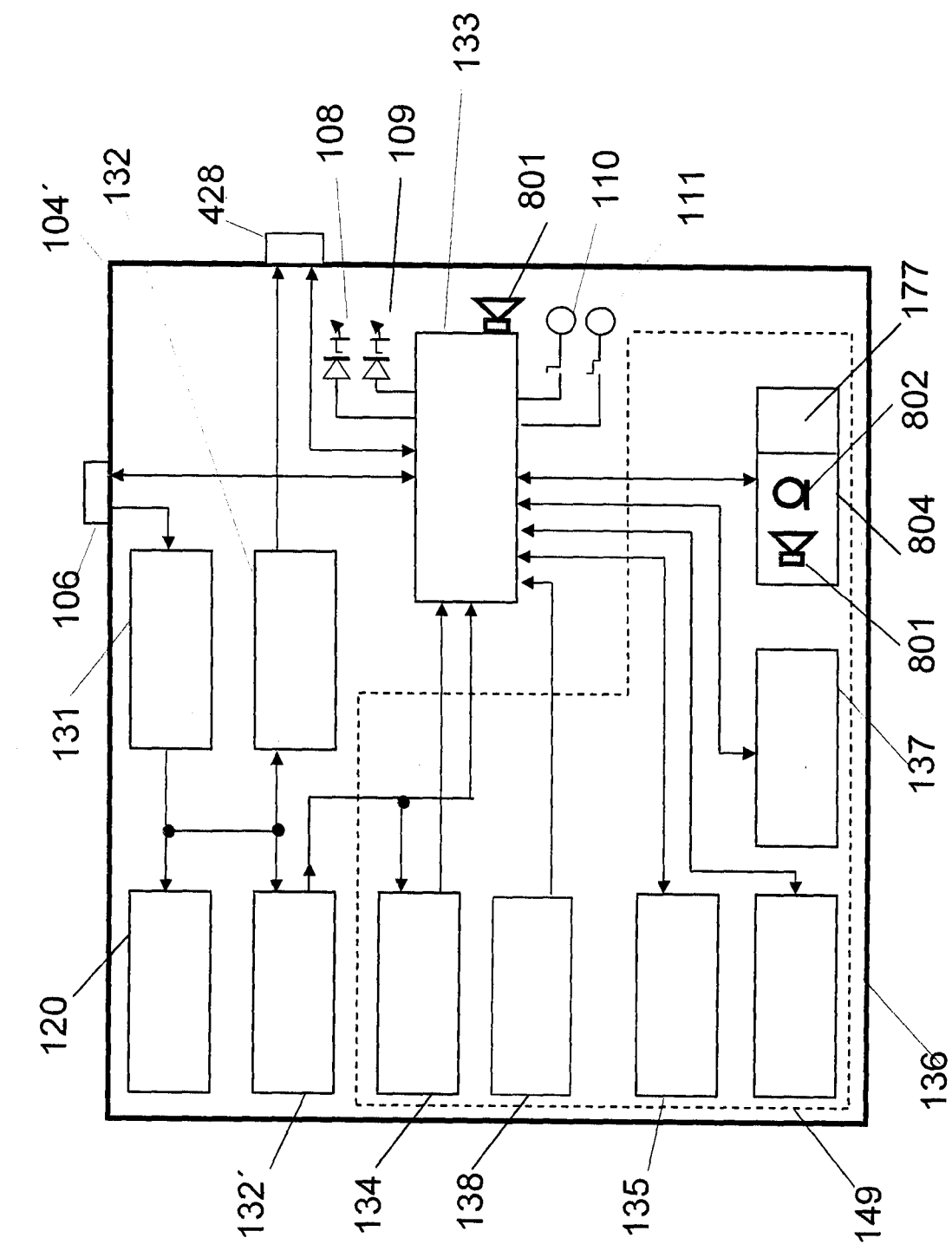


Fig. 48

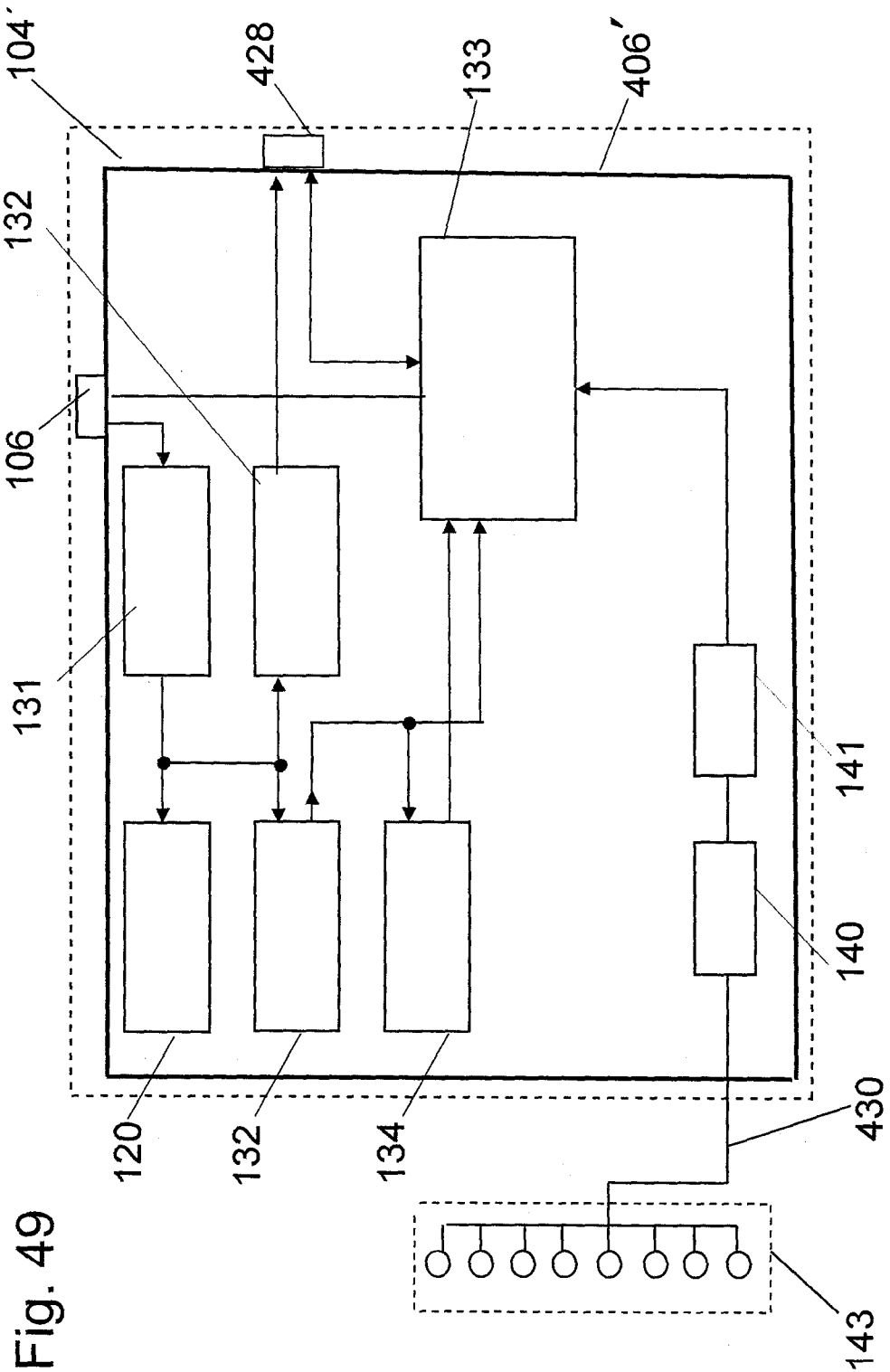


Fig. 49

Fig. 50

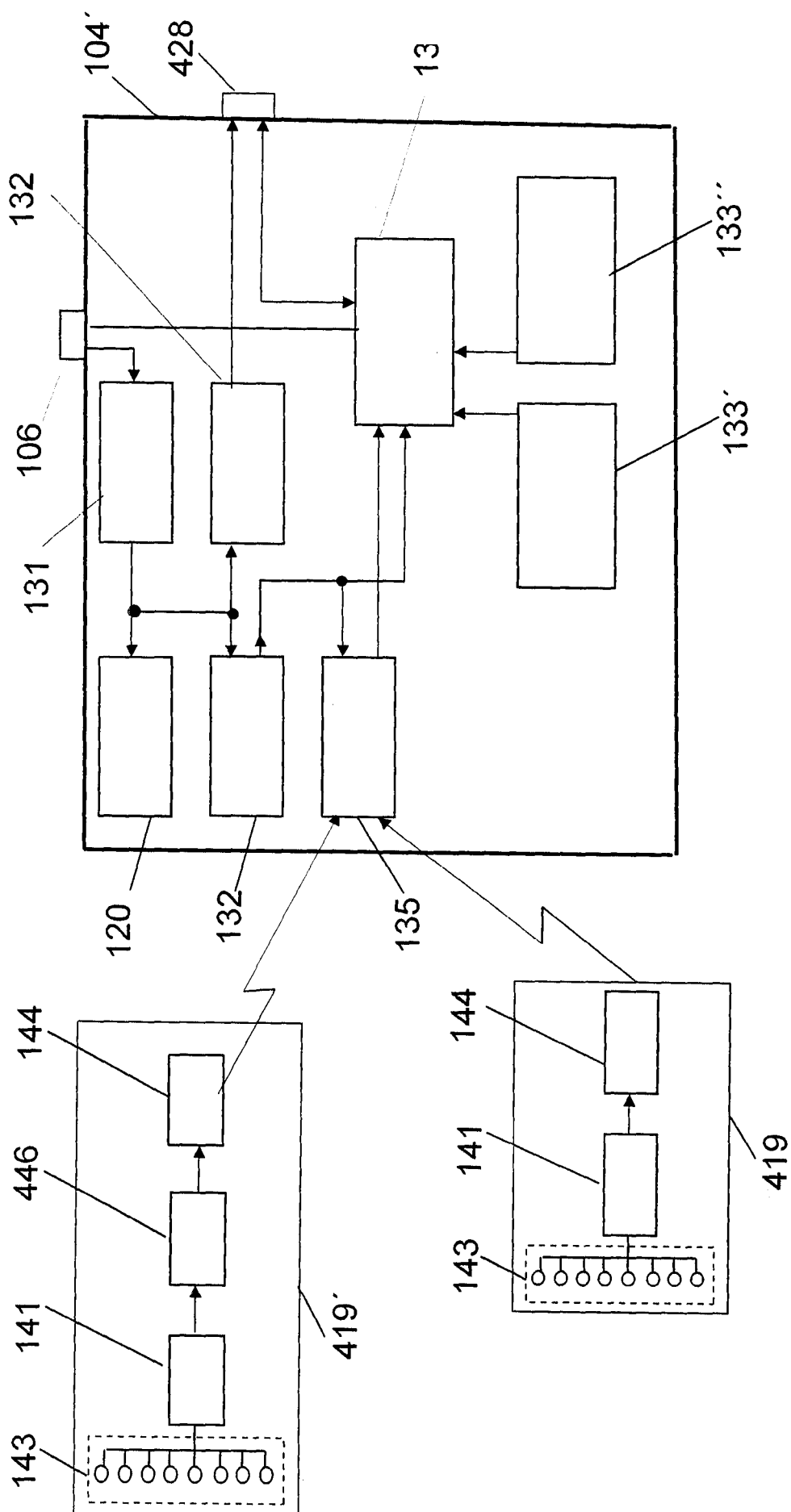


Fig. 51

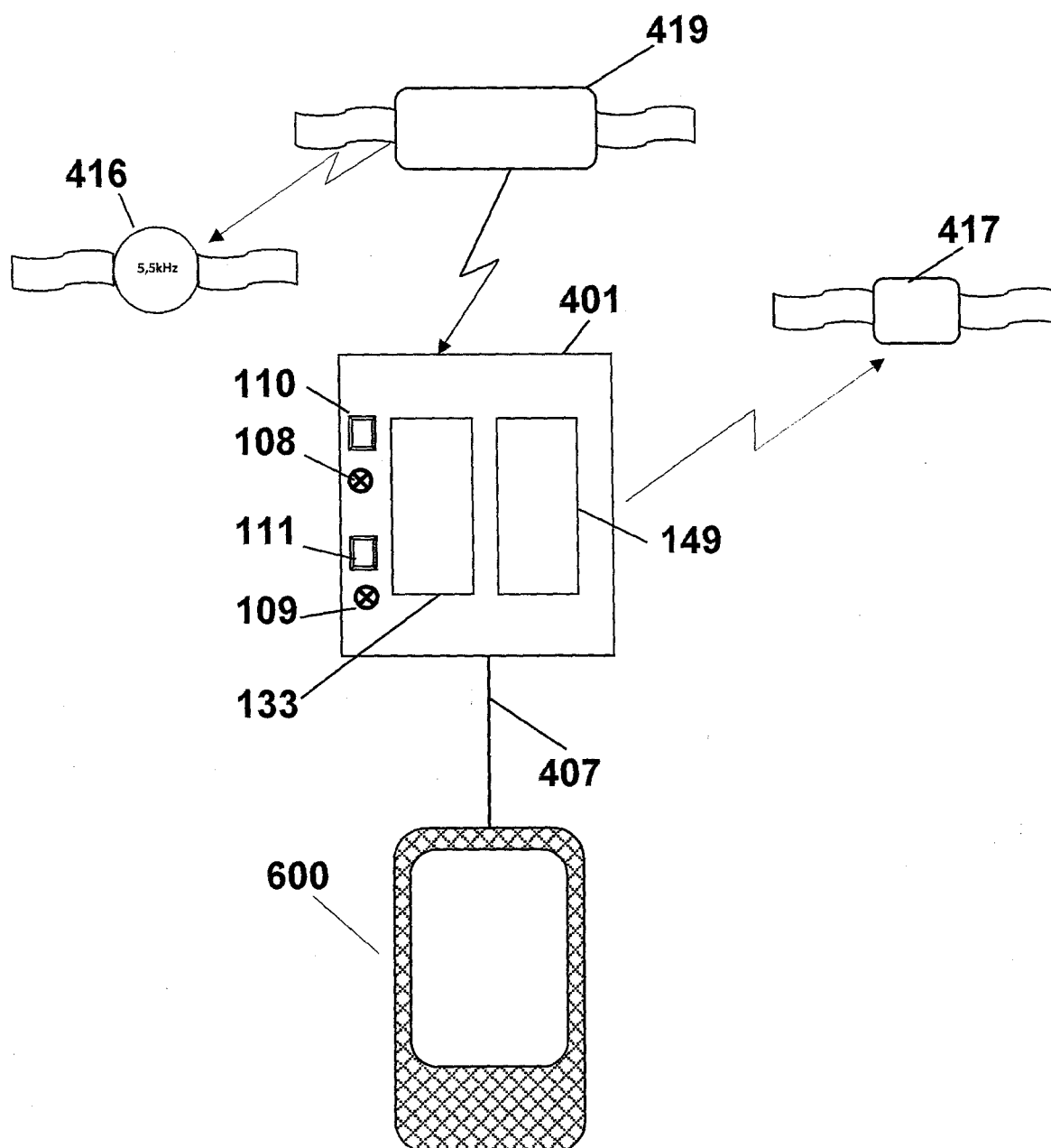


Fig. 52

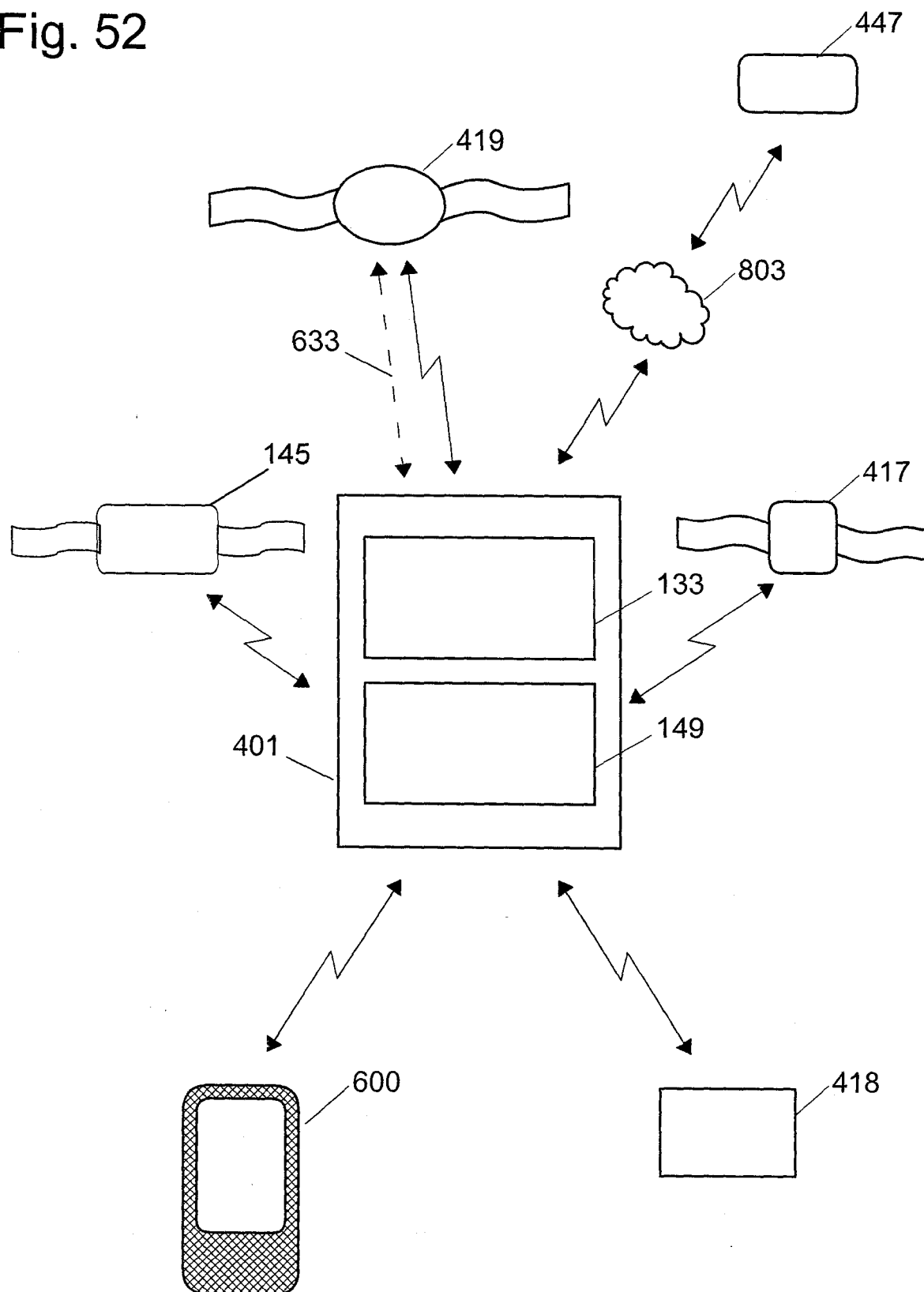


Fig. 53

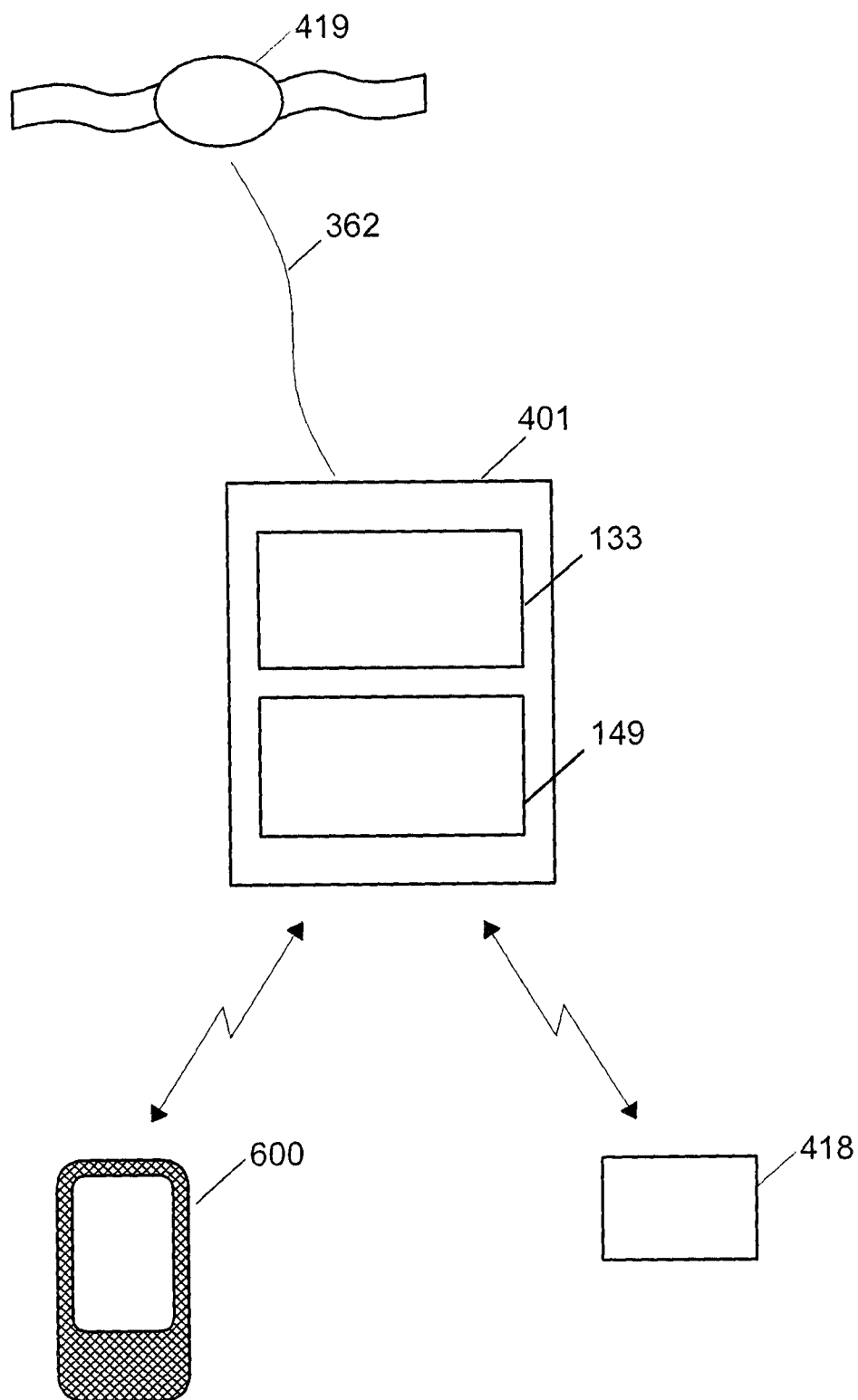
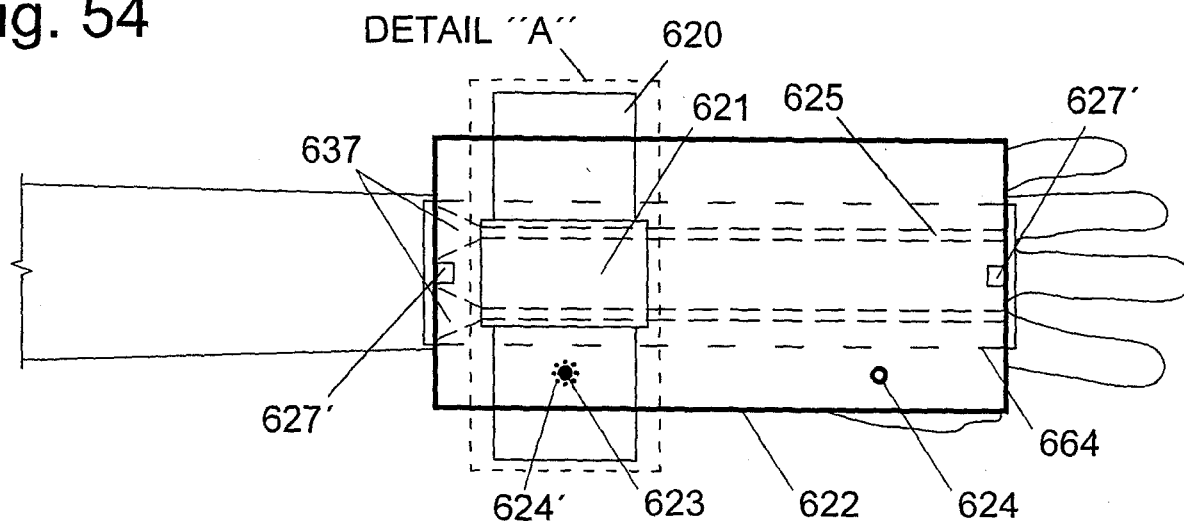
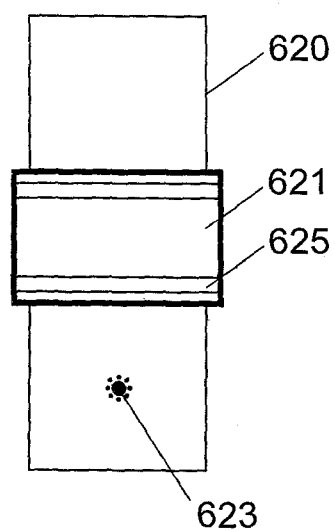


Fig. 54



DETAIL "A"



DETAIL 513

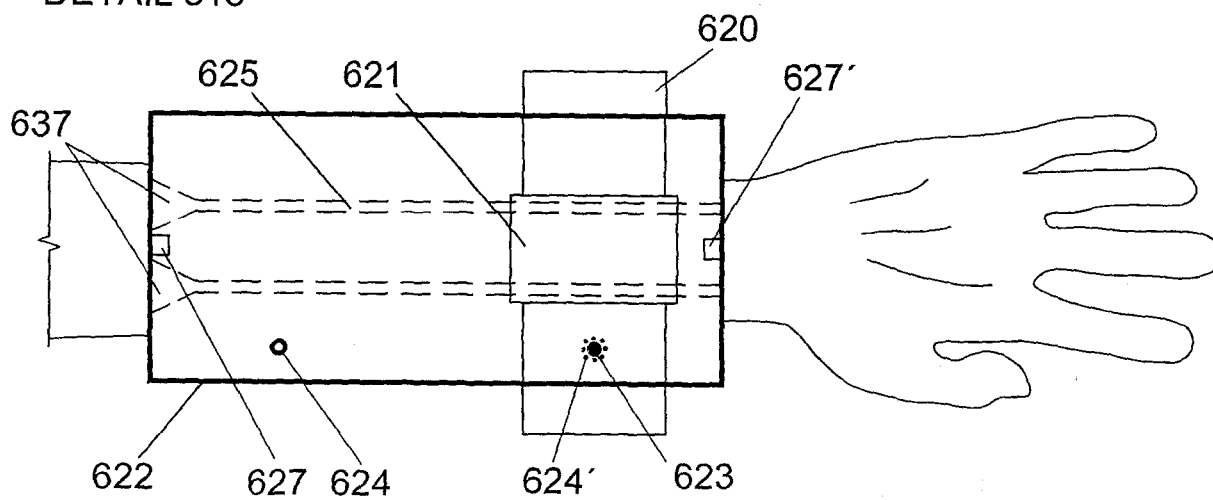
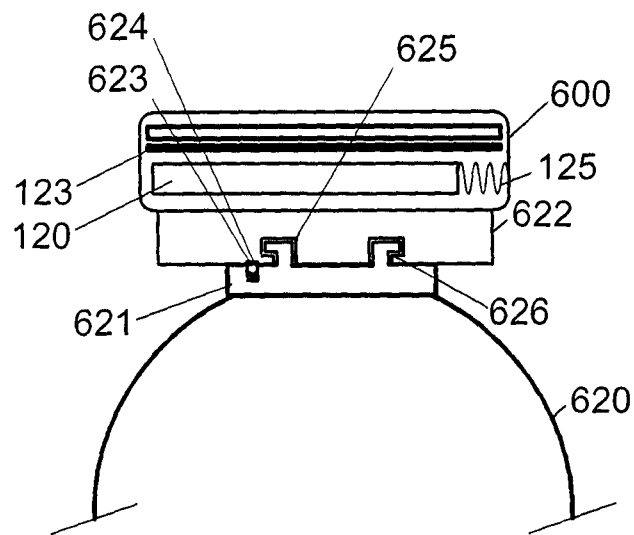


Fig. 55



DETAIL 517

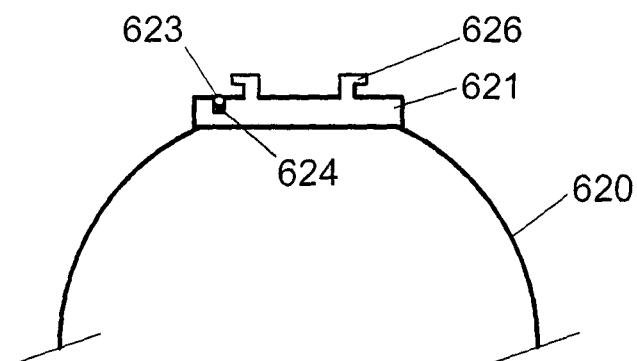


Fig. 56

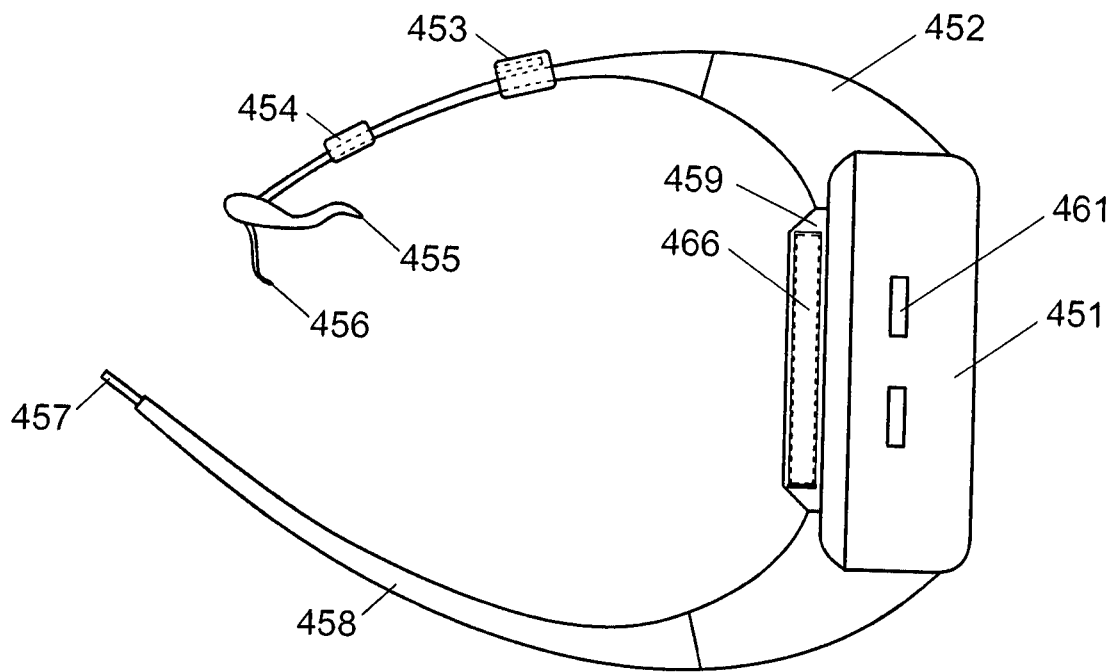


Fig. 57

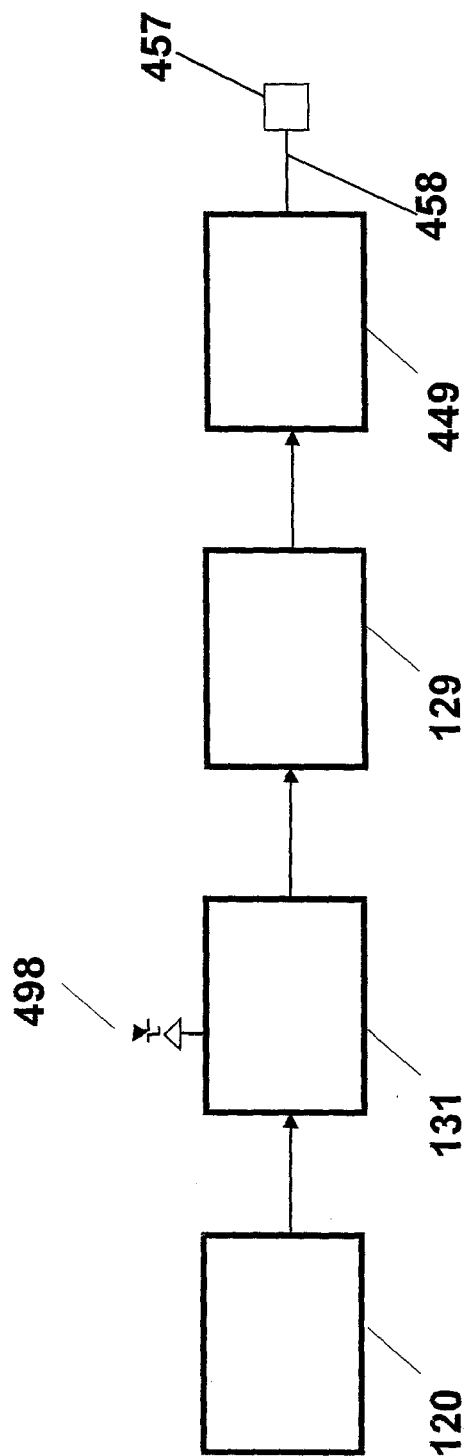


Fig. 58

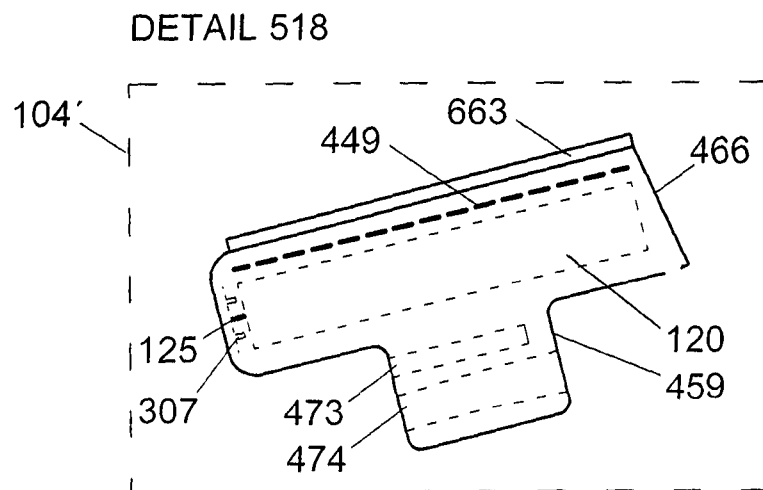
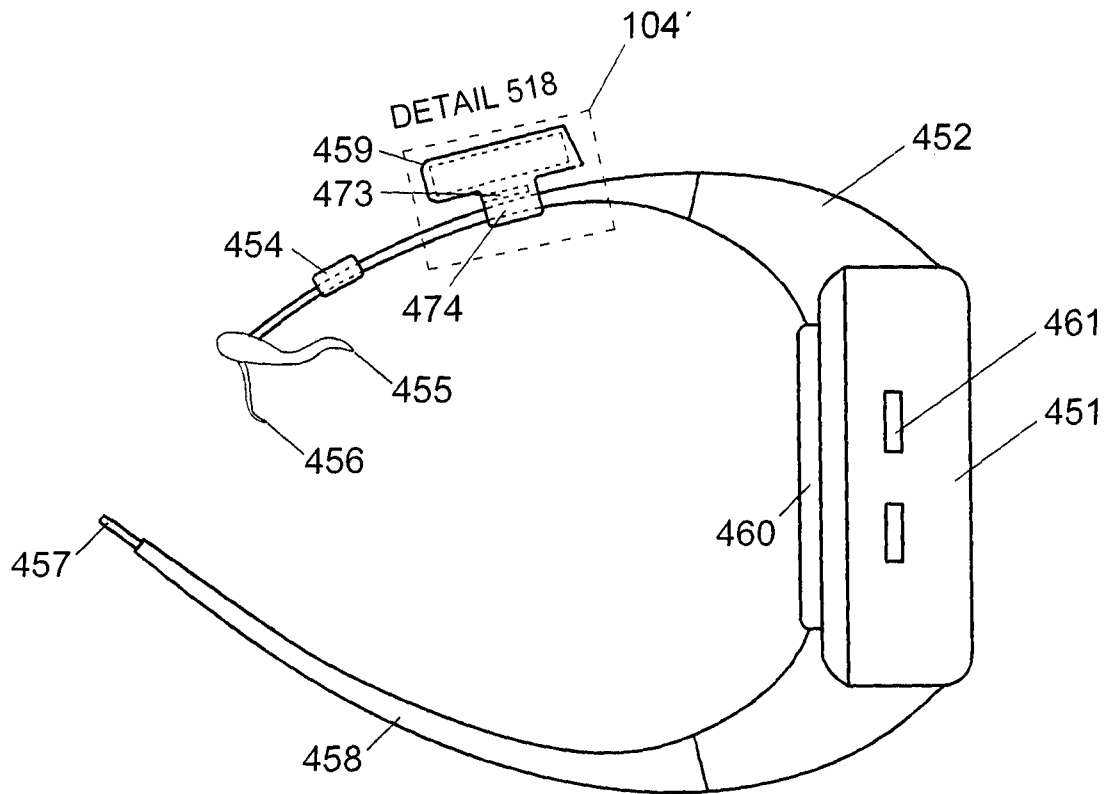


Fig. 59

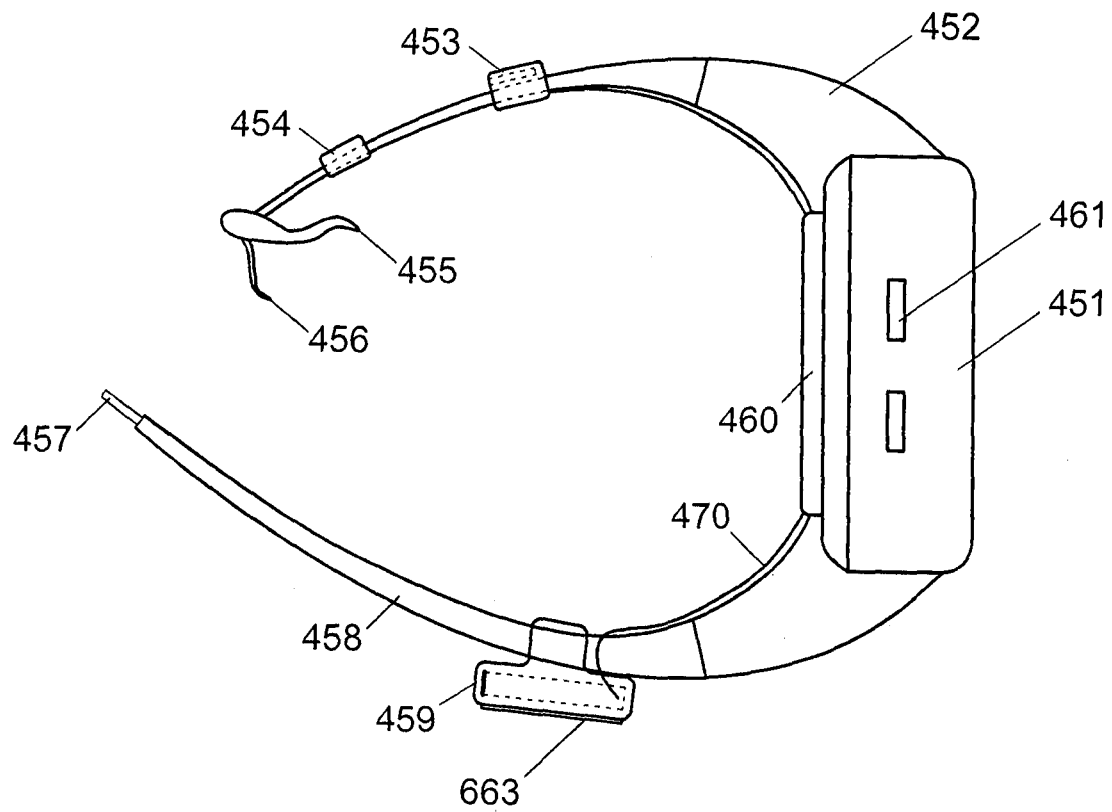


Fig. 60

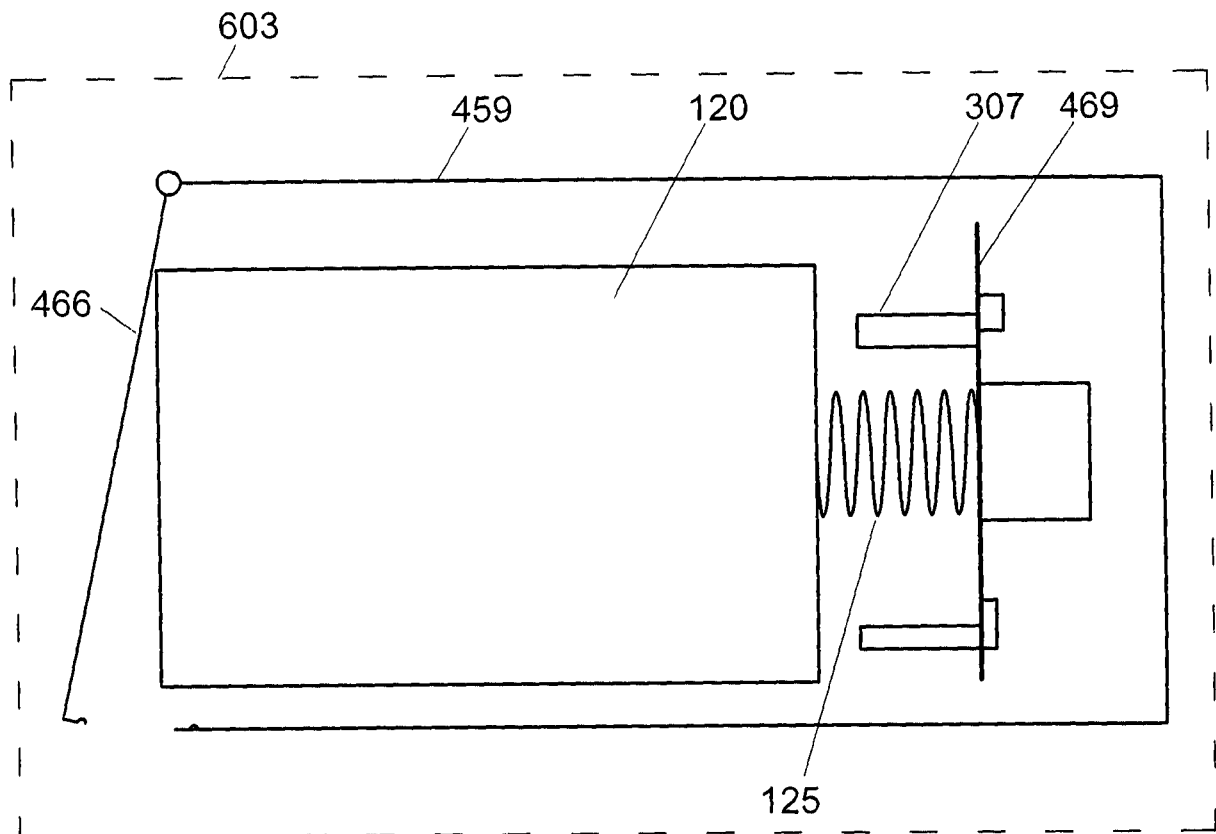


Fig. 61

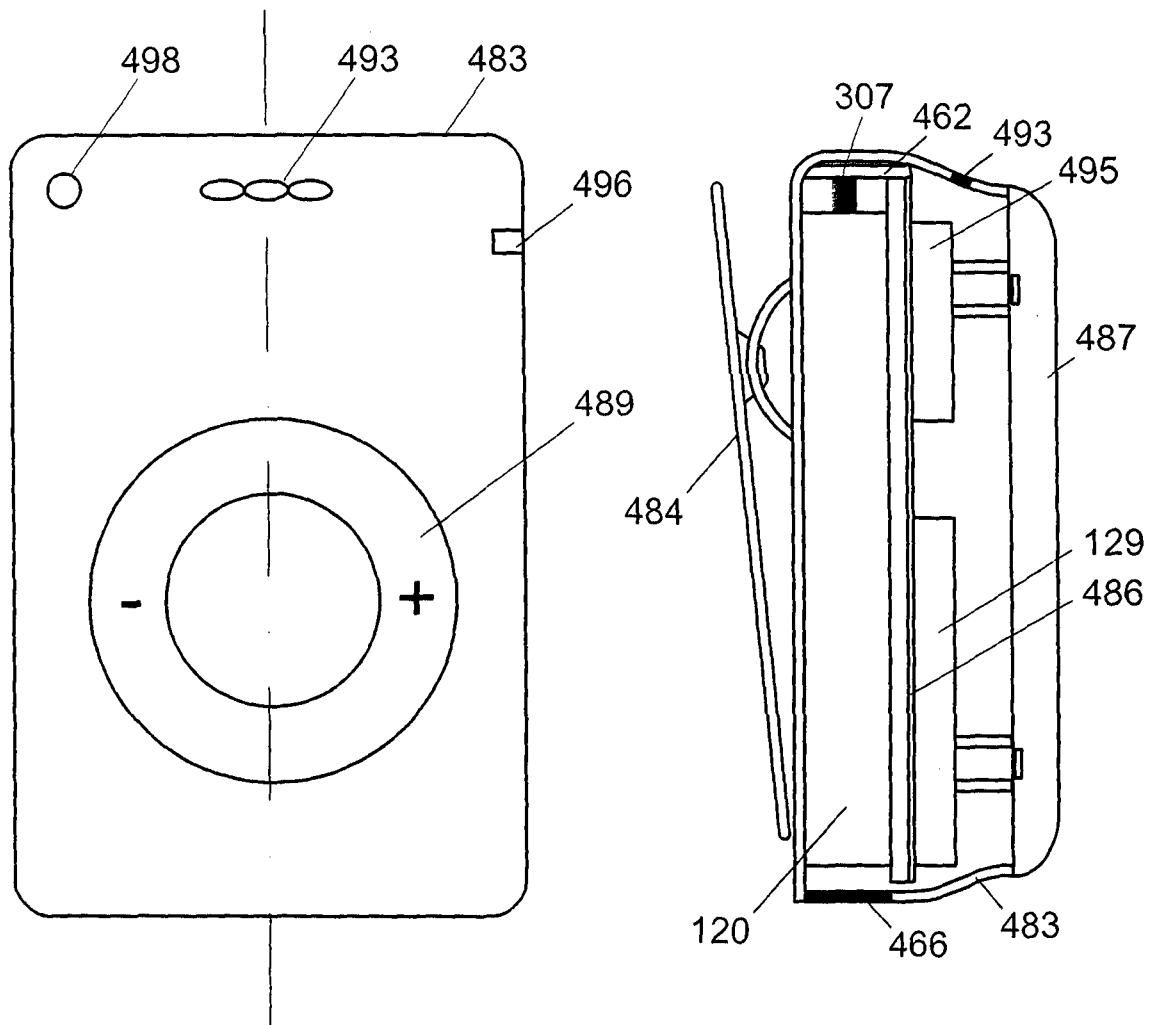


Fig. 62

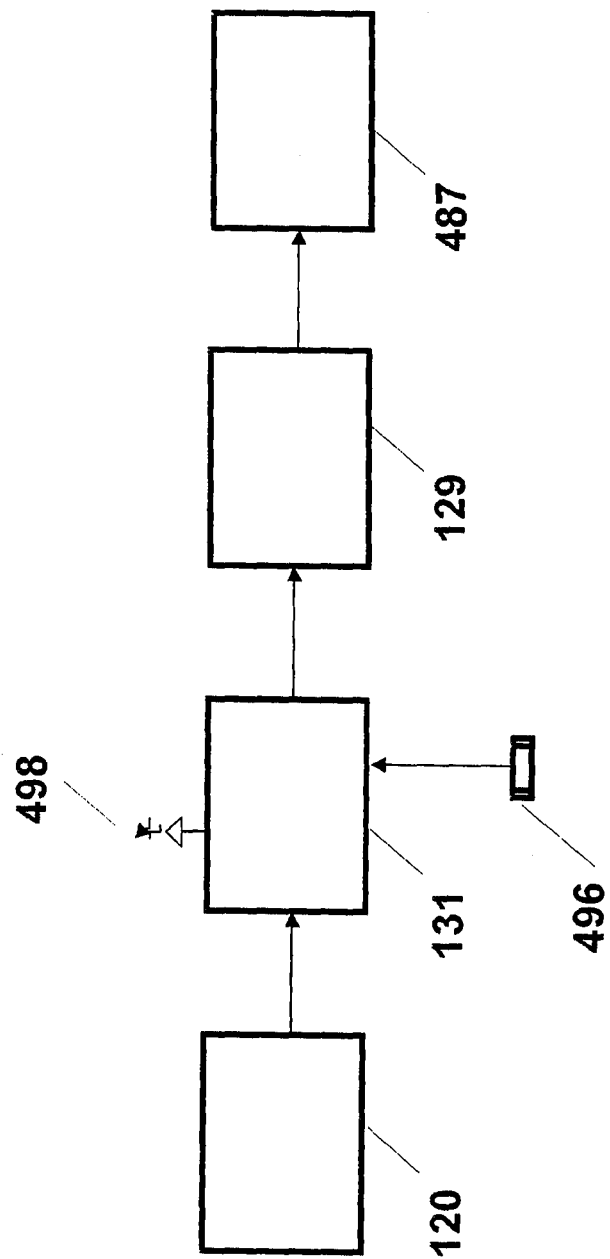


Fig. 63

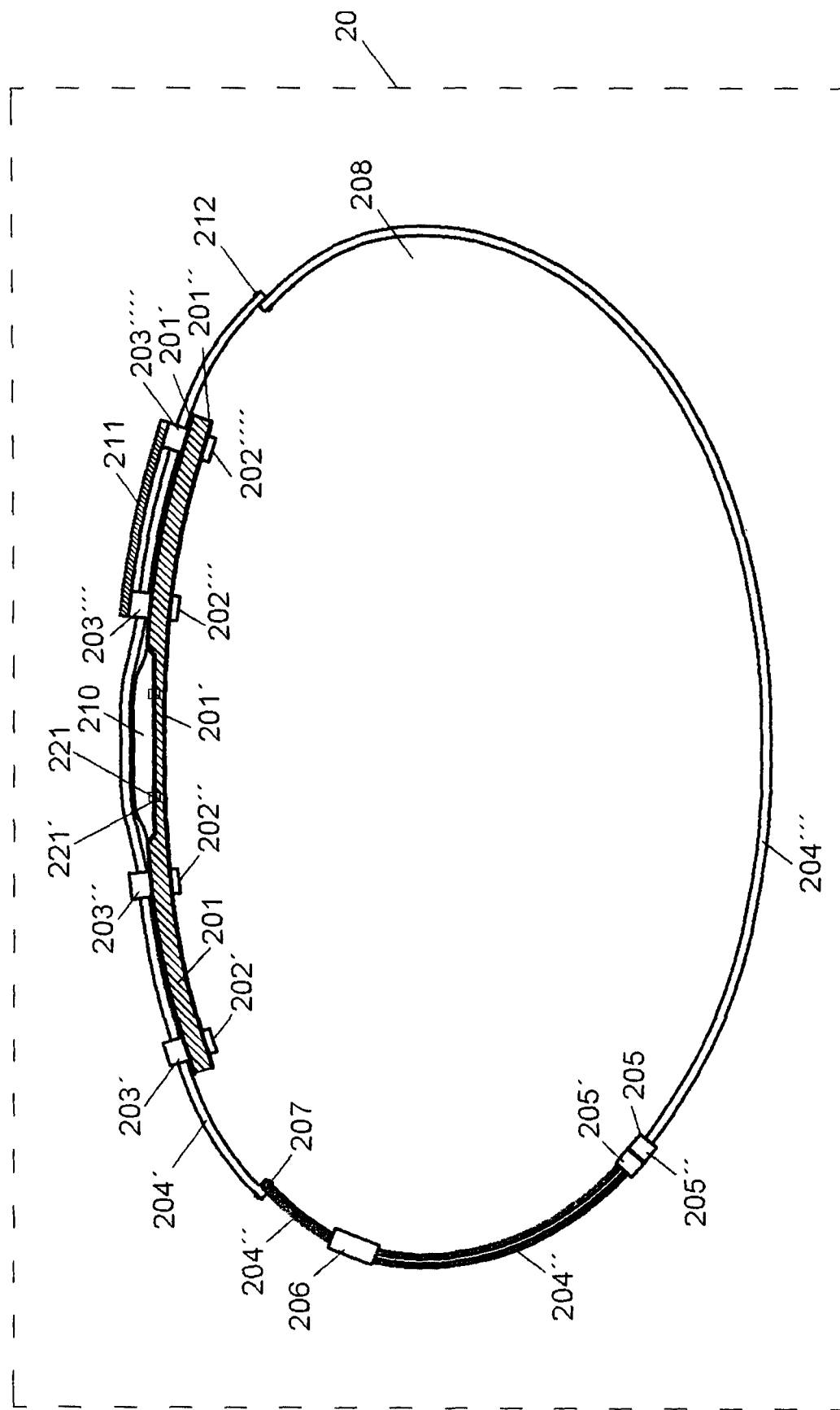


Fig. 64

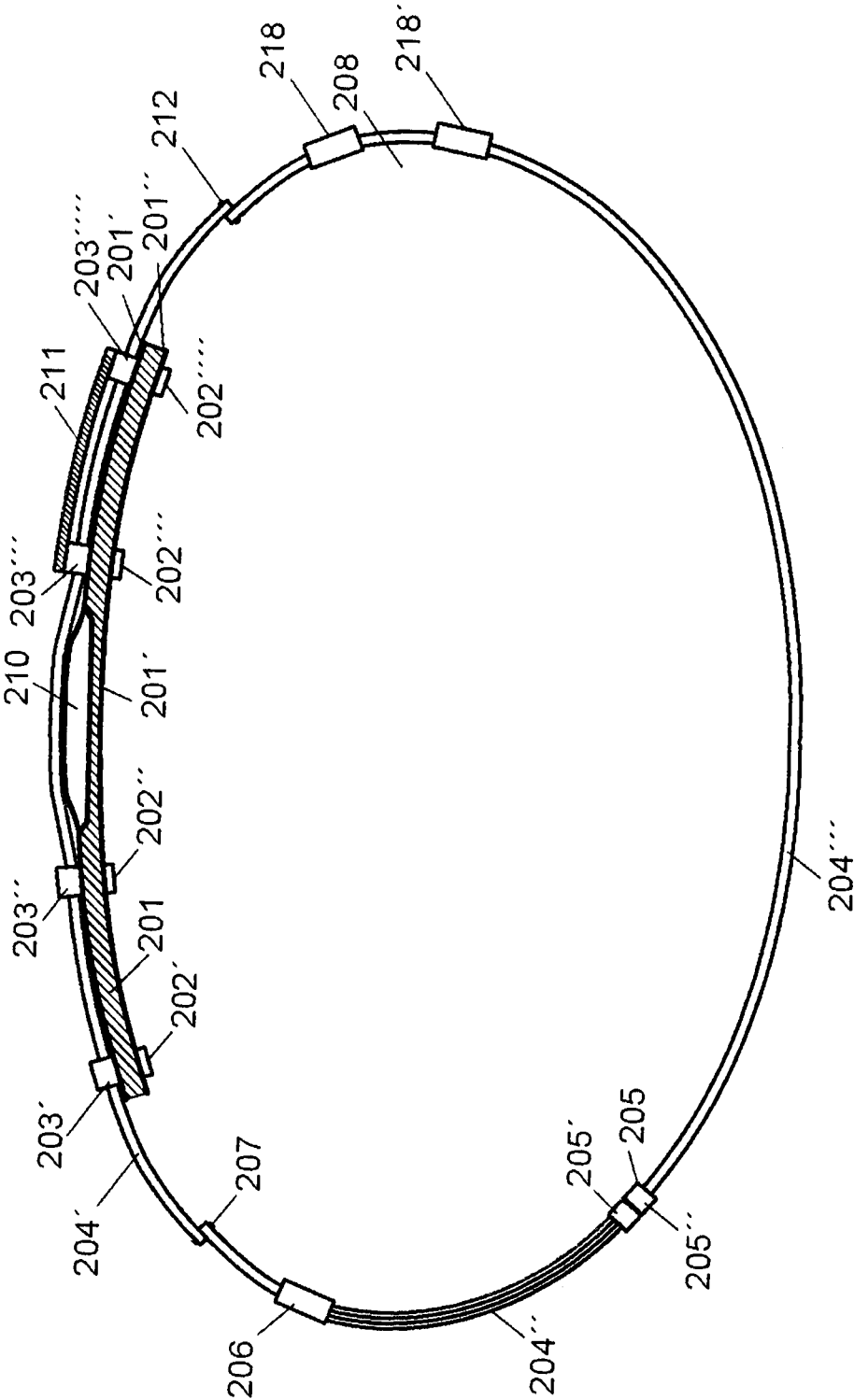


Fig. 65

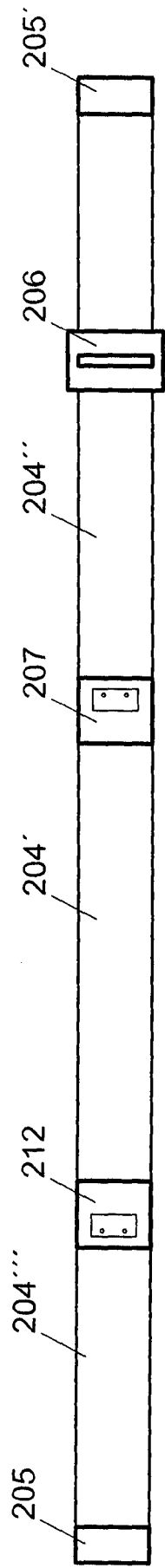
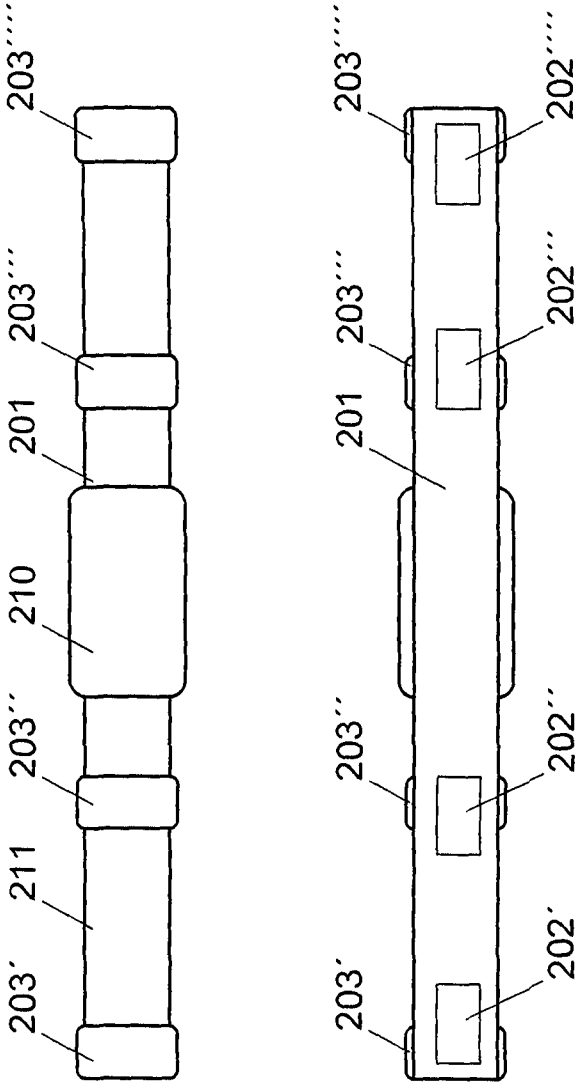


Fig. 66



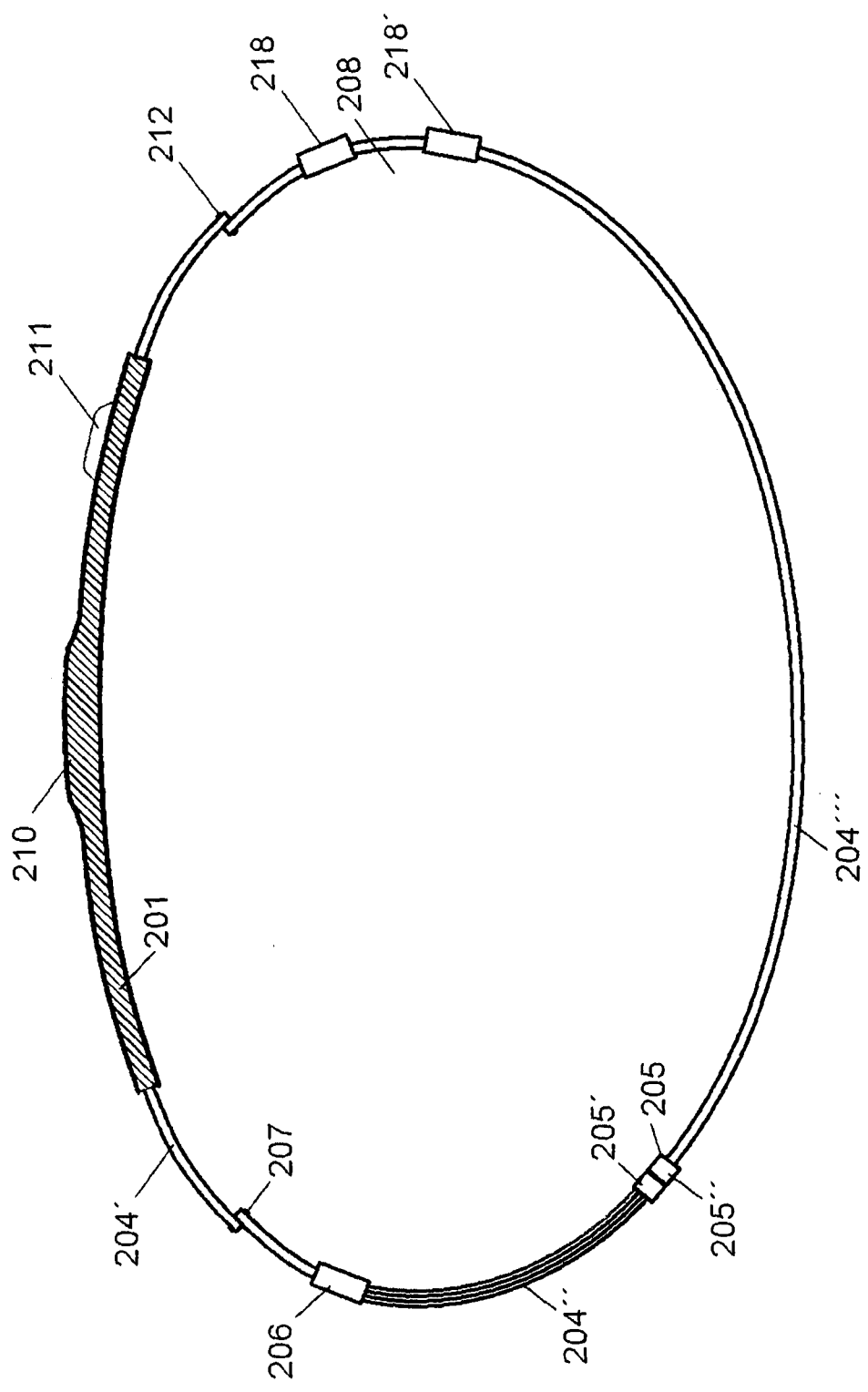


Fig. 67

Fig. 68

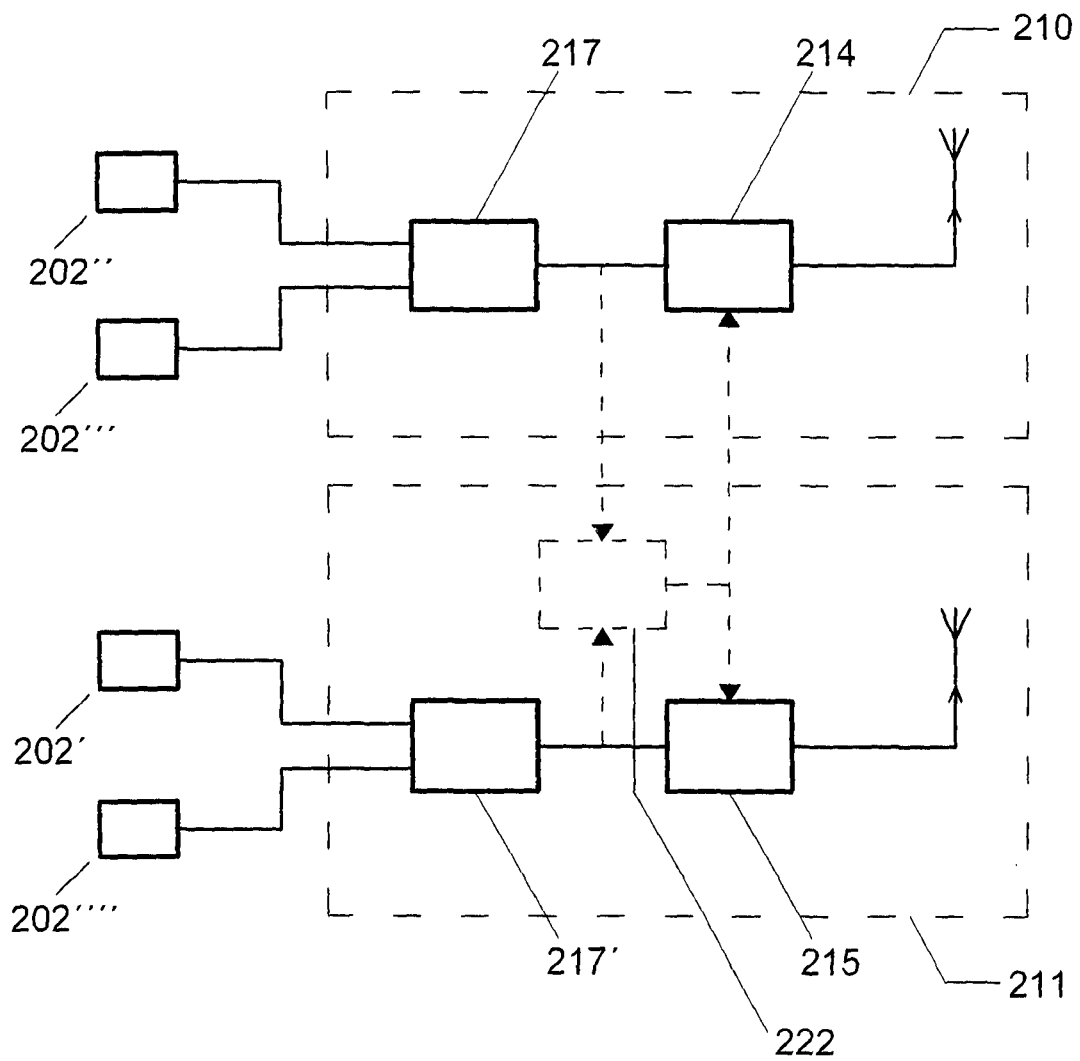


Fig. 69

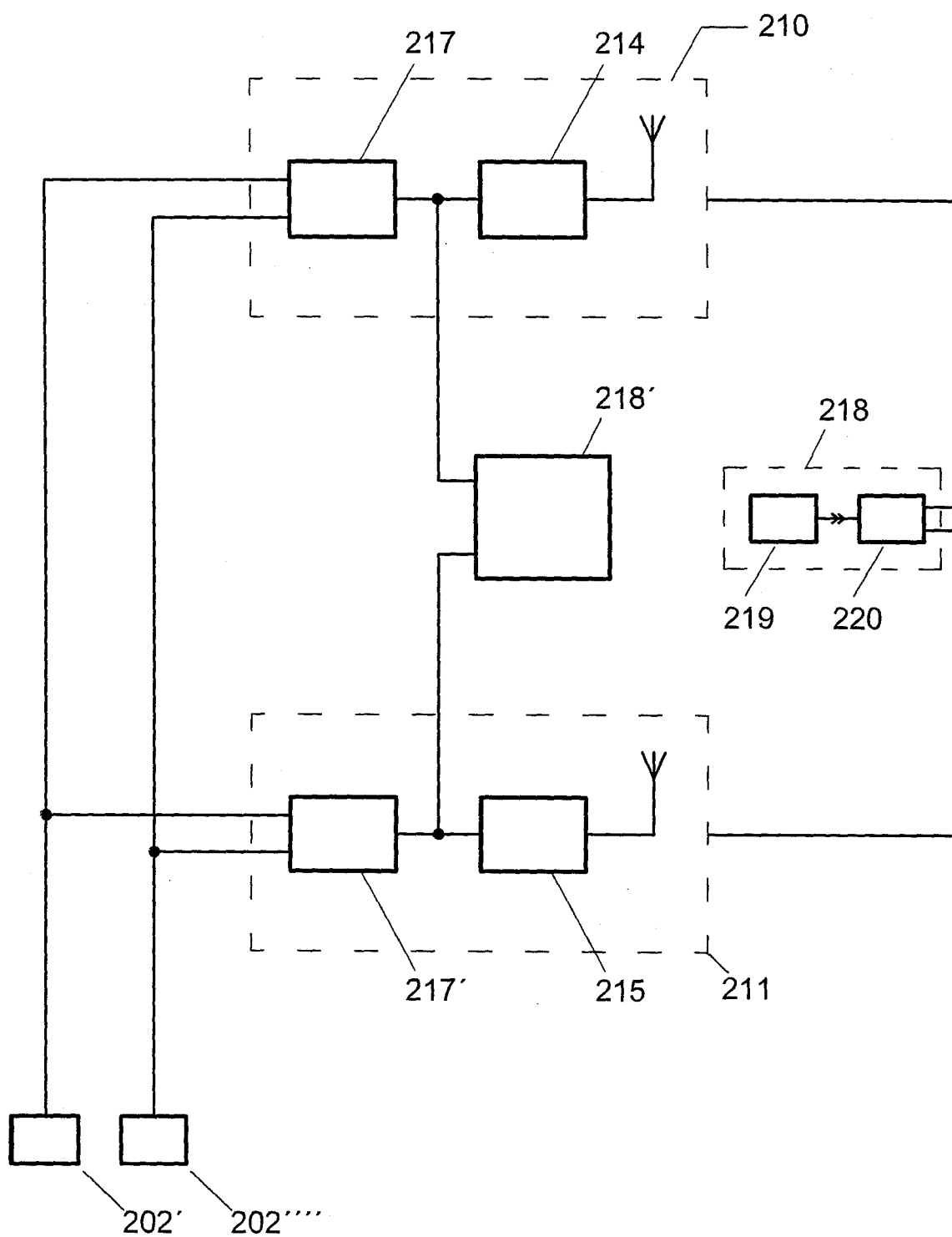


Fig. 70

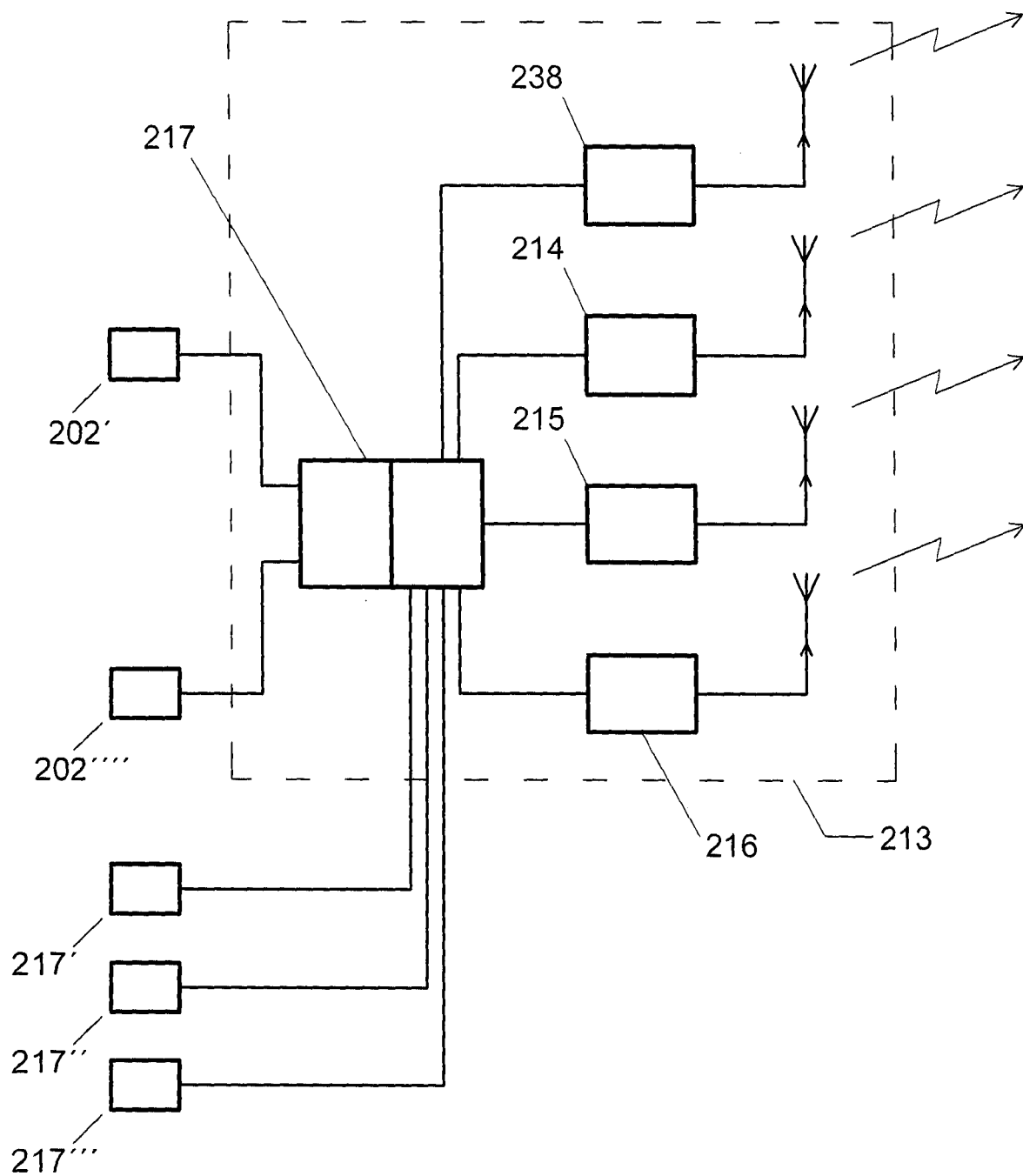
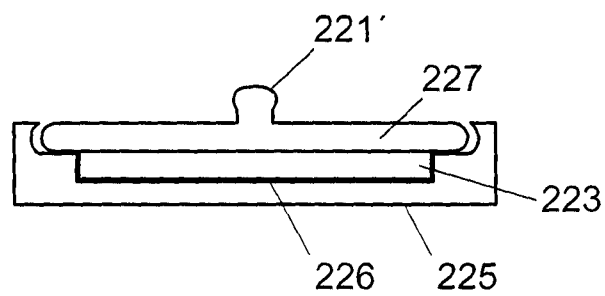
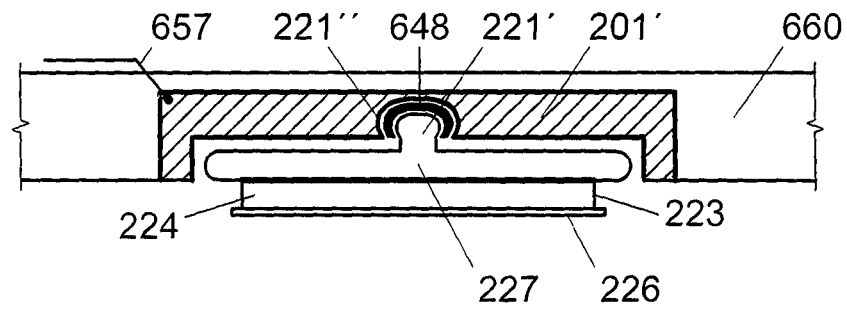


Fig. 71



DETAIL 516

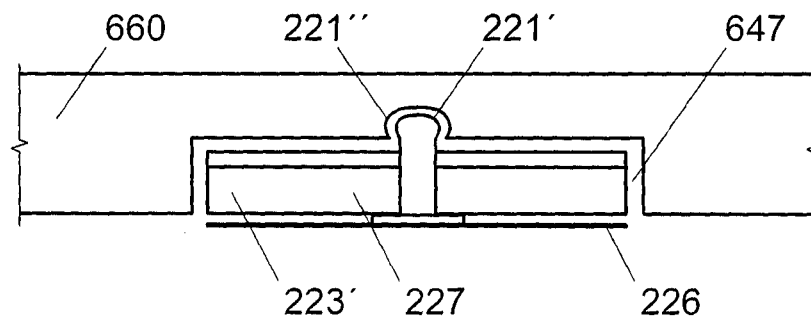


Fig. 72

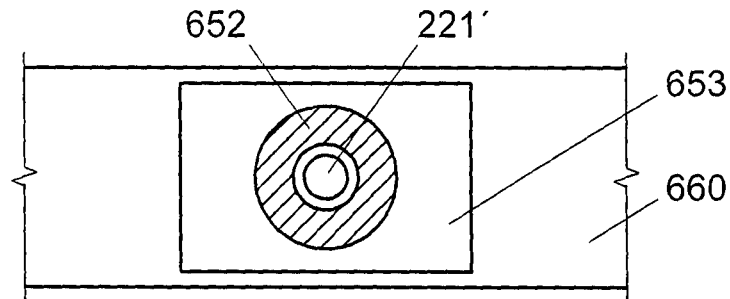


Fig. 73

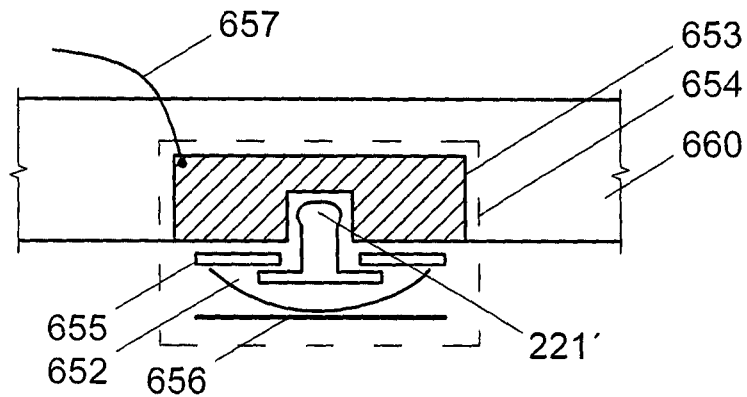


Fig. 74

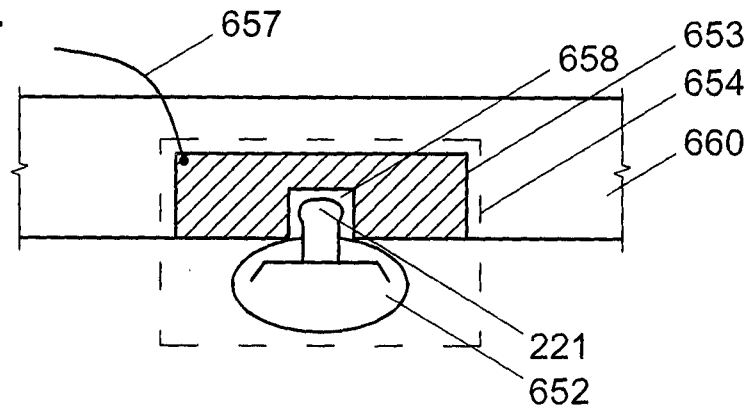
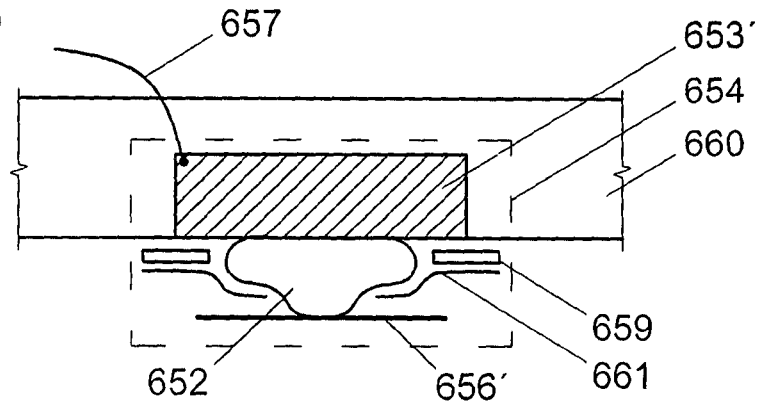
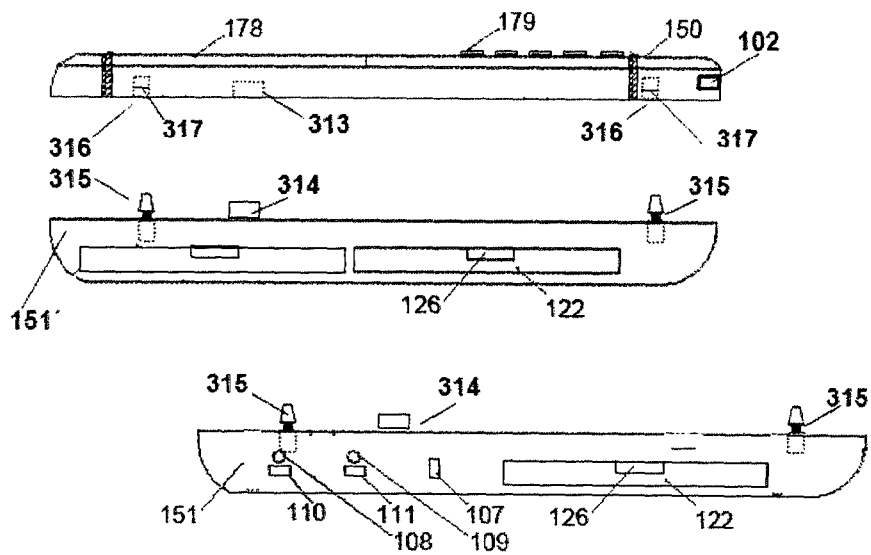


Fig. 75



Obrázek k anotaci

INTERNATIONAL SEARCH REPORT

International application No

PCT/CZ2014/000001

A. CLASSIFICATION OF SUBJECT MATTER

INV. A61B5/00 H04M1/02 H04M1/725
 ADD.

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)

A61B H04M A61N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

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

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2004/038942 A1 (MEDIVENTURE CO LTD [KR]; LEE MIN-HWA [KR]) 6 May 2004 (2004-05-06) figures 1, 2 page 10, line 2 - line 11 page 14, line 2 - line 4 page 15, line 1 - line 6 -----	1
X	WO 97/28736 A1 (NOKIA MOBILE PHONES LTD [FI]; HEINONEN PEKKA [FI]; OKKONEN HARRI [FI]) 14 August 1997 (1997-08-14) figures 2, 3 page 5, line 13 - line 22 page 8, line 15 - page 9, line 9 ----- -/--	1



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

27 March 2014

Date of mailing of the international search report

03/04/2014

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
 NL - 2280 HV Rijswijk
 Tel. (+31-70) 340-2040,
 Fax: (+31-70) 340-3016

Authorized officer

Schwenke, Stephanie

INTERNATIONAL SEARCH REPORT

International application No
PCT/CZ2014/000001

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2012/068337 A2 (RHYTHM CHECK INC [US]; SHENASA MOHAMMAD [US]; SIDDIQUI SHAHID K [US];) 24 May 2012 (2012-05-24) figure 2A paragraphs [0032], [0041] -----	1
X	WO 99/04687 A1 (PLATT HARRY LOUIS [AU]; JANKOV VLADIMIR [AU]) 4 February 1999 (1999-02-04) figure 1 page 4, line 4 - line 13 page 4, line 20 - line 21 page 5, line 11 - line 18 -----	1
X	US 2012/166680 A1 (MASOUD JAVAID [US] ET AL) 28 June 2012 (2012-06-28) figure 7 paragraphs [0074], [0094] -----	1
X	WO 2004/067085 A1 (HEALTHPIA CO LTD [KR]; LEE MIN-HWA [KR]; HAM CHUL-MAN [KR]) 12 August 2004 (2004-08-12) figure 6 page 24, line 16 - line 22 -----	1
X	US 2012/116184 A1 (SHIEH DAR-BIN [TW]) 10 May 2012 (2012-05-10) figure 12 paragraphs [0121], [0122], [0134] -----	1

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CZ2014/000001

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☒ Claims Nos.: 2-12(completely); 1(partially)
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
see FURTHER INFORMATION sheet PCT/ISA/210

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.2

Claims Nos.: 2-12(completely); 1(partially)

Independent claim alone 1 contains around twenty possible and/or ("at least one", "from following") combinations and nine variations of the terms "preferably", "for instance", "with advantage". It is impossible to establish the number of non-unitary inventions in this claim alone. The claims are drafted in such a way that the claims as a whole are not in compliance with the provisions of clarity and conciseness of Article 6 PCT, as it is particularly burdensome for a skilled person to establish the subject-matter for which protection is sought. The length of the description (49 pages) and drawings (72 pages) does not help to extract the essence of the application. The non-compliance with the substantive provisions is to such an extent, that the search was performed taking into consideration the non-compliance in determining the extent of the search (PCT Guidelines 9.19 and 9.25).

The search was based on the subject-matter that, as far as can be understood, could reasonably be expected to be claimed later in the procedure, namely an ECG monitor integrated in a battery pack for a commercially available mobile phone.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guidelines C-IV, 7.2), should the problems which led to the Article 17(2) declaration be overcome.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/CZ2014/000001

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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专利名称(译)	基础设备的添加剂设备，具有多种用途，健康，运动或其他设备的优点，可通过添加剂设备添加		
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摘要(译)

为多媒体设备添加辅助功能，不包括在内部。这些功能可以是关于被监视和处理的数据的生理数据处理，扩展和/或不间断操作的功能。辅助功能由辅助设备和电路解决方案实现，这些辅助设备和电路解决方案物理地放置在原始设备中或由其外部但通过它机械和电连接，而它可以形成一个紧凑的单元。在操作期间必须改变以获得不间断功能的部件是用户友好的并且可以从用户方面简单地交换。