(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
16 July 2015 (16.07.2015)

WIPO | PCT

(10) International Publication Number
WO 2015/106230 A1

(51) International Patent Classification:
G04B 47/00 (2006.01)

(21) International Application Number:
PCT/US2015/011080

(22) International Filing Date:
13 January 2015 (13.01.2015)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
14/153,411 13 January 2014 (13.01.2014) US
14/252,216 14 April 2014 (14.04.2014) US

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(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU,

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WO 2015/106230 A1

(54) Title: SYSTEM AND METHOD FOR ALERTING A USER

(57) Abstract: The system and method provides users with customized alerts that are unique to each user and environment through the use of an application in communication with a smart wireless signaling puck, the puck vibrates and illuminates in response to alerts based on a customized vibration and illumination pattern from the smartphone and from time based commands stored in memory on the puck.

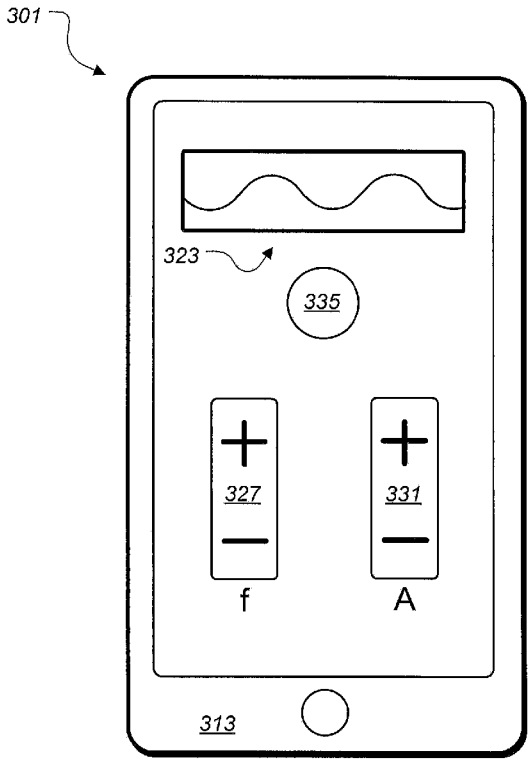

FIG. 3

TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:

— *with international search report (Art. 21(3))*

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

SYSTEM AND METHOD FOR ALERTING A USER

Technical Field

The present invention relates in general to the field of devices supporting those with the need to receive customized alerts in a variety of methods from a combination software application in conjunction with a wireless puck or device that vibrates and flashes in response to a variety of alerts, such as emergency and non-emergency alerts, from software running on smart phones, computers, and computer tablets.

Description of the Prior Art

There are many designs of systems for alerting users of an event. Typically, a user sets an alarm on their phone or alarm clock and when the time is right, the alarm clock or phone will alert them to the event. While there are many systems for alerting users well known in the art, considerable room for improvement remains.

Brief Description of the Drawings

The novel features believed characteristic of the application are set forth in the appended claims. However, the application itself, as well as a preferred mode of use, and further objectives and advantages thereof, will best be understood with reference to the following detailed description when read in conjunction with the accompanying drawings, wherein:

Figure 1A is a side view of a preferred embodiment of an alerting apparatus according to the present application;

Figure 1B is a top view of a preferred embodiment of an alerting apparatus according to the present application;

Figure 2A is a side view of an alternative embodiment of an alerting apparatus according to the present application;

Figure 2B is a top view of an alternative embodiment of an alerting apparatus according to the present application;

Figure 3 is a perspective view of a preferred embodiment of a software application according to the present application;

Figure 4 is a perspective view of a alternative embodiment of a software application according to the present application; and

Figure 5 is a perspective view of a alternative embodiment of a software application according to the present application.

While the system of the present application is susceptible to various modifications and alternative forms, specific embodiments thereof have been shown by way of example in the drawings and are herein described in detail. It should be understood, however, that the description herein of specific embodiments is not intended to limit the invention to the particular embodiment disclosed, but on the contrary, the intention is to cover all modifications, equivalents, and alternatives falling within the spirit and scope of the process of the present application as defined by the appended claims.

Description of the Preferred Embodiment

The system of the present application will be understood, both as to its structure and operation, from the accompanying drawings, taken in conjunction with the accompanying description. Several embodiments of the system are presented herein. It should be understood that various components, parts, and features of the different embodiments may be combined together and/or interchanged with one another, all of

which are within the scope of the present application, even though not all variations and particular embodiments may be specifically illustrated in each figure.

Referring to Figure 1A in the drawings, a preferred embodiment of an apparatus 101 for alerting a user according to the present application is illustrated. Apparatus 101 or puck 101 is a circular shaped device suitable for being placed preferably adjacent a mattress, under a mattress, or a pillow to alert a user to a specified event. The vibrations produced from puck 101 are suitable for vibrating a bed with enough force to awaken a sleeping adult. While many cellular phones can produce vibrations in response to phone calls and text messages, the vibrations produced by a cell phone are designed to alert a user carrying the phone. Vibrations produced by cell phones are not capable of awaking users when the cell phones is not adjacent the user as puck 101 is capable of. Furthermore, vibrations from current cell phones do not provide those that are deaf or hard of hearing with the ability to selective limit which alerts and phone calls vibrate the phone. It should be apparent that other locations, such as a night stand or other location where the puck 101 would be observed and/or felt, are suitable for use. For example a user carrying vibratory pad or puck 101 in their pocket is able to be notified of things that their phone couldn't notify them of, such as an alert from federal agency not sent as a text message. A user in a library places the puck 101 on a desk surface so that they can feel the alerts without disrupting other library visitors. A user in a car is provided with unique vibration to be alerted to specific things without regard to the amount of road noise by placing a puck 101 in a cup holder or in their lap. Puck 101 includes an upper surface 103a and a lower surface 103b. Where the upper surface 103a and the lower surface 103b meet is an outer surface 103c. Upper surface 103a or lower surface 103b includes a lid 104 that allows a user access inside the puck. For example, the user can remove the lid 104 to replace the power source or to change settings by flipping internally located switches, alternatively settings can be programmed remotely. While a circular shape has been shown, it should be apparent that other shapes are contemplated by this application, including but limited to a square shape, a rectangular shape, both with and without rounded corners. Alternatively, upper surface

103a and lower surface 103b are coated, molded, dipped, and/or formed in a friction increasing layer such as rubber. The friction increasing layer reduces the chance the puck is unintentionally moved. The surfaces of puck 101, such as upper surface 103a, may be constructed from various materials, including but not limited to plastic, wood, metal, laminates, or carbon fiber, and may come in different colors, and may include various graphics, images, or patterns that the user can choose from, in order to have a puck that is distinctive in style or that suits a user's decorating preferences.

Puck 101 may include a series of lights 105 located on the outer surface 103c for providing visual alerts to users by flashing lights. In alternative embodiments, the lights 105 are inside the surface 103c and the light Is piped to the surface by a translucent substance or diffuser. The lights 105 display various patterns and colors when an alert or alarm is triggered. For instance, red lights may flash in an emergency, but a series of green lights may flash in a pattern when a routine alarm or alert is triggered. The series of lights 105 are typically light emitting diodes (LEDs), however other types of lights are contemplated by this application. The lights 105 also provide configuration information to the user, for example if the puck needs to be recharged, the lights 105 then display a specific color or pattern to indicate to the user that the puck needs to be recharged.

Referring now also to Figure 1B in the drawings, a preferred embodiment of an apparatus 101 for alerting a user according to the present application is illustrated.

Located inside the puck 101 is a vibration system 111. Vibration system 111 includes an eccentric rotating mass system having a motor 115, a rotatable shaft 119, and a weighed member 123. Shaft 119 is mechanically coupled to the motor 115. Rigidly attached to the shaft 119 is the weighed member 123. When the motor 115 is commanded to spin, the motor causes the shaft 119 to spin. The spinning shaft 119 in turn causes the weighed member 123 to rotate relative to the puck 101 which produces a vibration in the puck 101. The amount of vibration can be adjusted by the speed and acceleration of the motor 115 along with the amount of weight and the balance of the weight in the weighed member 123. Other embodiments of the vibration system 111

include a linear resonant actuator with a weighted member, a piezoelectric crystal, and/or a stepper motor with a weighted member. In those embodiments with a linear resonant actuator the vibration system can provide feedback to the system by measuring the vibrations induced into the linear resonant actuator by the user handling the device, for example the user could stop the alert by shaking the puck 101. Additionally, vibration system produces patterns of vibrations that meet emergency notification requirements as specified by governing bodies.

In the preferred embodiment, the puck includes a rechargeable battery pack 127. Alternative embodiments of the puck allow for the battery pack to be easily replaceable, such as a 9-volt battery. The pack 127 provides the puck with power and is electrically coupled to the various electrical subsystems of the puck 101. In an alternative embodiment the weight in the weighed member 123 could be partial or completely comprised of a battery pack. This allows the puck to be smaller and weigh less because the weight of the required power storage unit can serve as the required weight for the weighed member 123. The vibration system would then need a slip ring (not shown) to electrically couple the rotatable battery to the electrical system. In the embodiment including a linear resonant actuator the weighted member battery would use a slackened wiring harness to electrically couple the battery to the rest of the system. Typically puck 101 includes a charging port 129 for electrically coupling an external charging device to the puck 101 for charging of battery pack 127. Charging port 129 is preferably a female micro universal serial bus adapter. Puck 101 includes a battery monitoring system configured for monitoring the rechargeable replaceable battery pack 127. The battery monitoring system provides visual and vibratory feedback to the user regarding the conditions of the rechargeable replaceable battery pack 127. The conditions of the rechargeable replaceable battery pack 127 include: the amount of stored energy in the rechargeable replaceable battery pack 127; the health of the battery cells in the rechargeable replaceable battery pack 127; and/or the need for replacement of the rechargeable replaceable battery pack 127. Visual feedback from the battery monitoring system includes flashing either a specific light, such as a red LED

and green LED, or a pattern of flashing lights, such as a slow decrease in intensity. Vibratory feedback includes having the vibration system 111 produce a specific pattern of vibrations to alert the user to the conditions of the rechargeable replaceable battery pack 127.

Puck 101 includes a plurality of sensors 133, located both interior and exterior to the puck, enabling the puck 101 to measure the environment located near the puck and conditions a distance away from the puck. The plurality of sensors 133 includes motion sensors, buttons, accelerometers, three dimensional sensors, distance measuring devices, strain gages, touch sensors, thermocouples, breathing sensors, moisture sensors, microphones, and other sensors that relay conditional information. The sensor or sensors that measures noise include accelerometers, strain gages, potentiometers, and piezo-electric materials all configured to measure sound and the vibrations of sound such as crying, knocking, yelling, glass breaking, and shouting. The motion sensor allows the puck 101 to register that the user is moving in close proximity to the puck, so that a mother's phone can be alerted to a child in a bed moving around. This allows a user to interact with the puck 101 without actually having to touch the puck 101. The accelerometers allow the puck to measure the amount of movement of the puck relative to a coordinate system. For example, the puck 101 can measure the motion of the mattress or pillow it is adjacent to by measuring accelerations of the puck 101. This provides the puck 101 with a feedback loop that the alerts are starting to awaken the user. The strain gages are used by the puck 101 to measure the force applied to the puck similar to a touch sensor or to allow the user to interact with the puck. For example, the harder a user compressed the puck 101 as measured by the strain gages increases the amount of alerting by the puck 101. An alternative embodiment of puck 101 includes a global positioning system for positional data, this reduces the likelihood of the puck being lost, and also it provides the software application with location information to tie the other sensor output with. Puck 101 is able to communicate with sensors outside of the puck 101 directly though wired and wireless connections, as well as, relayed communications though the smart device. For example, the user could have

a sensor, mounted to their door, for detecting knocking and that sensor can cause the puck 101 to vibrate to a specific pattern and/ or flash a pattern of lights.

Puck 101 includes a speaker 137 to allow the puck 101 to generate audible alerts. Puck 101 includes a switch 139 that allows a user to acknowledge an alert or activate a snooze from the puck 101 by depressing the switch 139. While the switch has been indicated on the top of the puck, it should be apparent that the switch could be located on other surfaces of the puck 101 or recessed into a surface to prevent accidental activation of the switch. Furthermore, it should be apparent that multiple switches could be used, for example the outer surface 103c or other surfaces could be a pressure sensitive switch enabling the user to merely touch the puck 101 to acknowledge the alert. Alternatively, a strain gage is used in addition or in place of switch 139. Strain gage measures between the upper surface 103a and outer surface 103c and or lower surface 103b and outer surface 103c. This allows a user to twist or torque the puck 101 slightly to acknowledge the alert. Preferably switch 139 only functions after the puck has vibrated for a set period of time to reduce unintended hiatuses of the alerts. Puck 101 can utilize an accelerometer to determine when the puck has been flipped over twice in a short amount of time, for example 5 seconds, and activate a snooze feature, or turn off the alert or alarm, based on flipping the puck twice.

Puck 101 includes a communication system 143. In the preferred embodiment the communication system includes a radio transmitter, a radio receiver, and electrical antennas, such as antenna 145, coupled to them in order for the puck 101 to send and receive wireless information. The preferred wireless configuration provides the puck 101 with the ability to communicate via a Bluetooth adapter to other Bluetooth enabled devices via the Bluetooth, however other wireless configurations are contemplated by this application. For example, the puck, in other embodiments with other wireless protocols, includes a cell phone receiver and transmitter with a SIM card and/or a WIFI interface so that the puck 101 can connect to the global internet. The communication system 143 allows the puck 101 to be in electrical communications with external

devices such as smart phones, computers, controllers, and external sensors. Communication system 143 provides the puck 101 with a handshaking system to the smart device. The handshaking or paring of puck to smart device prevents unauthorized users access to the puck 101.

Controller 155, typically located on a circuit or PC board, is electrically coupled to the various subsystems of the puck 101 including the communication system 143, the speaker 137, switch 139, and the plurality of sensors 133, rechargeable and/or replaceable battery pack 127, the charging port 129, the lights 105, and the vibration system 111. Controller 155 takes commands from the software in conjunction with the smart device via the communication system 143 to activate the vibration system 111, the lights 105, and the speaker 137. Controller activates the lights 105 to indicate the rechargeable and/or replaceable battery pack 127 needs to be recharged or replaced. Lights 105 in an alternative embodiment include a red light as a low battery indicator and a blue light for indication of a wireless link between the puck 101 and the smart phone or smart device. A smart phone or smart device includes a screen for displaying information to a user, a processor, local data storage on the smart phone, a wireless interface for connecting the smart phone with other devices on a network, and a wireless interface for connecting the smart phone to the puck 101, and an alerting system for receiving notifications from the smart phone and others across the network. The notifications or alerts could be in the form of text messages, timers, alarms, pushed events, calendars updates, emails, social media notifications such as Facebook and Twitter updates, phone calls, video chats, emergency alerts, and weather alerts. An alternative embodiment includes non-volatile memory for storage of events, alerts, timers, vibration patterns so that the puck 101 can alert a user in the case the smart device is turned off or the wireless communication system is not functional.

Referring now also to Figure 2A and 2B in the drawings, alternative embodiment of an apparatus 201 for alerting a user according to the present application are illustrated. Puck 201 is similar to puck 101 with the similar battery, similar sensors,

similar communication system, and similar controller with memory. Puck 201 in contrast to the puck 101 is designed to be a smaller unit with less maintainability than puck 101. The battery of puck 201 is not readily replaceable by the user. Furthermore, the battery of puck 201 is charged by wireless induction of power without use of a plug located on the puck 201. Without having a charging port on the puck 201, the likelihood of moisture invasion of the puck is greatly diminished.

Puck 201 includes a plurality of light emitting diodes (LED) 205 arranged around the outside edge of the puck. Typically, each LED 207 is comprised of three individual LED each with their own color. Typically, there is a red, green, and blue LED closely packed into a single LED 207. Having the ability for the puck 201 to individually control each color of each LED 207 allows the puck to produce a variety of optical patterns of various colors in response to various events. For example, the more important the event, the brighter the intensity of the LED's 205. Additionally, the pattern of lights can be made to match the pattern of vibrations from the integral shaker of puck 201.

While single pucks have been illustrated, it should be apparent that multiple pucks can be combined into a single system. This allows a single smart device to set alerts for multiple pucks. For example, a mother could set alerts from her smart phone for herself and her three children, each having their own pucks. Since each would get a different alert they would not have to be woken up at the same time as would be the likely result of a single alarm clock for three children. A combined base would allow a user to charge multiple pucks concurrently. In addition to the multiple pucks, the smart device can be programmed to activate alarms on Bluetooth or Wi-Fi enabled clocks with speakers, lights, and or displays for messages. This feature provides the user with the ability to coordinate a group of alarms and devices. For example, a mother could set alerts from her smart phone for herself and her three children, each having their own pucks and an alert for her husband's Bluetooth clock to sound at 3:00pm to start dinner. This feature prevents the user from having to go to several devices separately and set several alarms. Furthermore, each puck can relay information to another puck form a

mesh network. For example, first puck is in communication with smart device and second puck. However, second puck is out of range of direct communication with smart device, first puck can relay data between second puck and smart device so long as first puck and second puck are in communications with each other.

Referring now also to Figure 3 in the drawings, a preferred embodiment of a software application 301 on smart device 313 according to the present application is illustrated. To interface with the puck 101, software application 301 allows a user to select events, times, alarms, alerts, triggers, and such, so that the puck alerts the user to the various events as programmed by the user and the user's friends and family. As shown, the software application 301 is programmed to be executed on a smartphone 313, however it should be apparent that other devices such as tablets, computers, smart televisions, smart watches, and other smart devices like wi-fi/Bluetooth enabled clock and other notifications systems, visual notification systems, and such that are able to be paired with the puck 101 and be interfaced with it.

Software application 301 includes the ability by the user to adjust the event triggering the alert and the type of alert. Possible events for triggering alerts include time based events, remote sensors like door knock sensors, emails, text messages, social media alerts, phone calls, messages from fire alarms, messages from smoke alarms, and messages from carbon monoxide alarms. Alerts are based upon both internal events and external events. Internal events are alerts set by the user on the smart device. External events are alerts sent from sources external to the software in conjunction with the smart device such as emails, text messages, instant messages, social media updates, etc. In conjunction with a listening or noise sensing device, the software application 301 can trigger an alert based upon audible inputs, such as a ringing phone, a fire alarm sounding, a smoke alarm sounding, a carbon monoxide alarm sounding, a radon gas alarm sounding, shouting by a person, snoring, knocking, screaming, crying, etc. Software application 301 allows a user to set a plurality of events related to the various alerts and then configure which methods of alerting are

appropriate for each event. Software application 301 includes the ability of the user to import contacts and calendars, or choose from contacts and calendar events stored on the smart device, for triggering alerts customized with various intensities, repetitions, and patterns of vibrations and lights. For example, the user sets a single 3 second light vibration for each time the software application 301 registers a text message and also configures software application 301 to generate the biggest vibration along with loud sounds and bright flashing lights in response to the software application 301 registering a fire alarm was triggered or a severe-weather alert. Software application 301 allows the user to designate an alert as an "emergency" alert which automatically triggers the strongest vibration and the most noticeable LED patterns. Additionally, the software allows a user to only generate events if the message was from a known contact, such as a relative, to reduce erroneous alerts from spam and such. Since the smart device is connected to other devices such as smart phones, other individuals could send text messages to vibrate and or flash the puck at inconvenient times for the user, such as at 2:30am. Software application 301 includes the ability for users to set custom notifications. Custom notifications include rules for allowing and blocking messages, texts, video phone calls, and phone calls from certain contacts and people to vibrate and/or flash the puck 101. The user would create a list of people or types of alerts in the software application 101, the list would be used by the software application 301 to only allow messages, texts, and calls from people on the list or certain types of alerts to vibrate and/or flash the puck 101 and block those alerts from anyone not on the list. In conjunction with the list, the user could set up a time to allow certain messages, texts, and calls from those on the list and those off the list to vibrate the puck. These custom notifications prevent unwanted access to the puck 101 from strangers and from allowing certain people from unnecessarily waking the user. Software application also connects puck 101 to a system capable of receiving mass notifications from local, state, and federal governments. For example, FEMA sends a message to residents of a low lying area near the ocean about flooding due to a hurricane and the puck 101 in conjunction with software application 301 vibrates and alerts user of the flooding. The message from FEMA in some embodiments is in the form of a widespread SMS/Text message

directed to a list of user that provided their contact information to FEMA or alternatively in a form such as a notice where FEMA doesn't have a contact number or an email address of the user, like a bulletin. The aforementioned system for receiving mass notifications from local, state, and federal governments would be an Internet-based service consisting of additional software hosted externally which would act as a clearing house or directory of emergency alert services, and which would provide the ability for the user to more easily identify, select, and enroll in alerts from one or more emergency management agencies (e.g. FEMA). The aforementioned service would also allow the user to join a group notification system where a third party (e.g., a hospital) could notify participating doctors on staff by sending them an alert notification on their respective pucks. The vibration ability of cell phones is limited and not readily customizable, furthermore important alerts from cell phones can be unacknowledged because of the high amount of irrelevant alerts on modern cellphones, whereas a stand-alone puck provides users notice that certain alerts are important because the puck produced them. Another example of use is in Israel, where users of the puck can rely on the puck heightened vibrations in response to air raid alerts, both in audible form from an external sensor and in electronic form from an electronic message such as a text or email, from the government.

Software application 301 includes a visual representation 323 of vibration output of the puck 101. Visual representation 323, through light emitted from the LED's or wirelessly connected smart light-bulb, provides a user with the ability to visual see the vibration pattern or the expected vibration output over a time period. The user can customize the vibration pattern by adjusting: the duration of the vibration output of the puck, including the start time, stop time, snooze amount, auto shutoff snooze, snooze repetition, intensity, and duration of the vibration. Furthermore, the user can make the pattern repeat, ramp up, ramp down, a square pattern, a sinusoidal pattern, a saw pattern, etc. For example, the user can set the puck 101 to produce minimal vibrations at the start of the alert but as time passes the intensity of the vibration is increased in response to the passing of time. Software application 301 allows a user to manually

adjust the frequency 327 and the amplitude 331. Icon 335 is a representation of the puck 101 on the display of the smart device 313. As the user adjust the vibratory output of the puck, the smart device 313 can activate the vibration feature of the smart device 313 to give the users a physical representation of the expected output of the puck 101. Furthermore, the icon 335 displays the quality of the wireless connection between the smart device 313 and the puck 101. User is able to select the icon 335, thereby producing a vibration from the puck 101, therefor testing the system. This feature allows the user and the system to realize the puck is not in communication with the smart device 313. This prevents a user from missing an alert because the puck is out of range or out of charge. The smart device can be configured to prevent an alert from being set if no puck 101 is connected or if no alert can stored in the memory of the puck itself. Additionally, if the connection with the puck 101 is corrupted or lost, the smart device will alert the user of the lost connection. The nature of the notification will appear on a home screen on the smart device 313, notifying the user of the act nature of the alert, e.g. emergency vs. a personal call.

Preferably the software application 301 sets the configuration for puck 101 and doesn't need to remain in communications with the puck for certain events. Therefore, if the smart device is unavailable the puck would still alert the user to the specified event. The configuration information sent to the puck 101 includes at least: when to alert, the type of alert; and the duration of alert. Alternatively, the puck 101 only vibrates in direct response to commands from the software application 301 running on the smart device 313.

Referring now also to Figure 4 in the drawings, an alternative embodiment of a software application 401 on smart device 413 according to the present application is illustrated. Software application 401 includes a visual representation 423 of vibration output of the puck 101. If the user has music stored on the smart device 413, the software application 401 gives the user the ability to select tracks of music from the stored music on the smart device 413, such as track A 427a, track B 427b, track C

427c, or track D track 427d. The user can scroll through a listing of their music and select the track to replicate in a vibration pattern that is compatible with the vibration system of puck 101. While music inherently is vibratory, if a song has a pattern at a high frequency such as 3,500 Hz a user typically cannot feel the pattern from vibrations without high amplitude. The system can then apply the musical waveform to the vibratory waveform such that output of the vibration system of the puck 101 is similar in beat to that of the selected music track. Additionally, the system is able to pattern vibratory patterns based upon musical notes or other patterns. For example, the system can convert a digital music file from an audible form into a sensory form. This process converts the frequencies of the audible file from their high frequencies, such as 500Hz-20,000, into low frequencies, such as 1-500Hz through frequency shifting. Therefore, the user can feel the pattern of the song as opposed to hear it. Shifting and scaling the music to provide musical inspired vibratory wake up patterns increases the quality of life for those that are deaf and hard-of-hearing as they cannot use a standard alarm radio to be awoken by their favorite music because they cannot hear the music over the speaker. Icon 435 is a representation of the puck 101 on the display of the smart device 413.

An alternative embodiment of puck 101 includes the ability of the user to adjust the duration, intensity, and the pattern of the vibration. Furthermore, the user is able to program the puck 101 via the smart device 413 with a specific pattern, for vibrations or lights, in response to a specific alert. For example, the user would typically set the vibration to max intensity, duration, and an abrupt on-off pattern repeating indefinitely for a fire alarm. The user would then reduce the intensity and duration and make the pattern less abrupt for alerting them that a visitor was at a door knocking. Alternatively, the pattern of the lights or vibrations can mimic the pattern of the source. For example, the pattern of vibration emitted by the puck 101 matches the vibrations of footsteps sensed or the light pattern of the LED's matches the cadence of a phone ringing therby helping someone both hearing and visually impaired.

Additionally, the system is able to utilize a feedback loop to determine how best to wake a user based upon their sleep cycle. The system utilizes the variety of sensors to measure the sleep pattern of the user. Typically, the system measures the user's restlessness with motion sensors, potentiometers, accelerometers, strain gages, and the temperature of the user with thermocouples. This also provides the system with the ability to check if the user is awakening in response to the vibrations. The system can modify the vibrations intensity to awaken the user if a lower setting doesn't appear to be working after a period of time. Typically, the system is programmed via a smartphone or tablet by way of a computer based software application. Additionally, the system can share data with enuresis or sleep apnea equipment to provide conditional information to the sleep apnea machine, as well as, receive a signal from the sleep apnea machine to alert the user with a specific vibration.

Referring now also to Figure 5 in the drawings, an alternative embodiment of a software application 501 on smart device 513 according to the present application is illustrated. Software application 501 includes a visual representation 523 of vibration output of the puck 101. The user of software application 501 can base alert on their calendar 527. Preferably calendar 527 is imported from their cloud based calendar and allows the user to remotely set the software application 501 to vibrate from an appointment set remotely to the smart device 513. The user is able to set different patterns for the different types of alerts. For example a text message alert might be shorter with less intensity and an alarm might be longer duration with maximum intensity. Software application 501 includes an icon 535 that is virtual representation of the puck 101 and vibrates as the puck 101 vibrates. Software application 501 is configured to allow a user to adjust the snooze settings, the time zone settings, repeat alerts and alarms, the type of waking, the duration, the gradients, emergency alert responses, and default settings for both the vibrations as well as the LED lights. The software application 501 is integrated with other software on the smart device 513. When the smart device receives a phone call the software application 501 sends a predetermined vibration and/or LED pattern to the puck 101. Specific contacts from the

smart device 513 are given specific vibration and LED patterns from the software application 501. The software application 501 could be of several different versions, such as a free version and a paid version, with various levels of features enabling the manufacturer the ability to customize the software to the type of customer.

The software application 501 provides the user the ability to select exactly how the puck 101 will react to the alarms or alerts (hereinafter described as simply "alerts"). The user can select whether the puck 101 will vibrate, flash, and sound an audible alarm, both in conjunction with and without other peripherals, based at least on the type of alert, the urgency of the alert, the time of the alert, what to do if the alert is not acknowledged in a certain period of time, the source of the alert. Furthermore, the user can customize the vibrations, the flashing, and the sounds based at least on the type of alert, the urgency of the alert, the time of the alert, what to do if the alert is not acknowledged in a certain period of time, and or the source of the alert. User is able to set a timer with a period of time and at the end of the time the puck 101 will vibrate to alert the user. For example, the user wishes to take an hour nap, they would set an hour timer and then be awoken by the vibrations and lights from the puck 101 in an hour. A mother is able to send a text message directly to the puck and vibrate so long as the puck had cell phone reception.

Referring now also to Figure 6a in the drawings, an alternative embodiment of a software application 601 on smart device 613 according to the present application is illustrated. First server 615 is a computer based system having a microprocessor in conjunction with local memory connected to a data network. First server 615 typically is maintained by a federal agency, such as FEMA, and utilized as a source for the public for emergency alerts. The emergency alerts can be in the form of a text message, a phone call, a video message, a webpage, a SMS message, an email, or a document. While only one server is shown, it should be apparent that multiple servers can be in communication with software application 601. It is expected that each federal and state agency would maintain control of their own servers such as first server 615. Software

application 601 transmits user data 617a to the first server 615, such as a zip code or GPS coordinates, and first server 615 transmits location specific alerts 617b to the software application 601. Software application 601 selectively determines which alerts from the first server 615 are then relayed 617c to the puck 101 for alerting the user. Additionally, alternative embodiments of puck 101 can receive alerts 617d directly from the first server 615 and bypass smart device 613 if for example the battery on the smart device is drained.

Referring now also to Figure 6b in the drawings, an alternative embodiment of a software application 601 on smart device 613 according to the present application is illustrated. In this alternative embodiment the puck 101 transmits data 617e back to the smart device 613 and the software application 601. The transmitted data 617e from the puck 101 includes: acknowledgement that the alert was received; conditional information such as temperature, humidity, orientation, accelerations, and strains; positional information such as latitudes and longitudes of the puck; and snooze signals. Furthermore, it should be apparent that transmitted data 617e can be further relayed back to first server 615 for data collection.

Referring now also to Figure 7a in the drawings, an alternative embodiment of a software application 701 on smart device 713 according to the present application is illustrated. First server 715 is a computer based system having a microprocessor in conjunction with local memory connected to a data network. First server 715 typically is maintained by a federal agency, such as FEMA or NOAA, and utilized as a source for the public for emergency alerts. While only one server is shown, it should be apparent that multiple servers can be in communication with software application 701. It is expected that each federal and state agency would maintain control of their own servers such as first server 715. Second server 719 is a computer based system having a microprocessor in conjunction with local memory connected to a data network. First server 719 typically is maintained as a clearinghouse specifically for alerting puck users. Software application 701 transmits user data 717a to the second server 719, such as a

zip code or GPS coordinates, and second server 719 transmits location specific alerts 717b to the software application 701. Software application 701 in conjunction with second server 719 selectively determines which alerts from the first server 715 are then relayed 717c to the puck 101 for alerting the user. Second server 719 receives alerts 717d from first server 715. Second server 719 transmits data, such as location information, 717e to first server 715.

Software application 701 in conjunction with second server 719 and first server 715 aggregates the alerts by creating a listing of possible alerts the puck user can sign up for based upon the location of the user. A user of the puck though the software application 701 selects which alerts to subscribe to through the smart device 713. Use of second server 719 by a user of the puck 101 is through a subscription model where the user pays a fee on an interval for the server to monitor and relay alerts from the first server 715 to the smart device 713. Furthermore, second server 719 stores enterprise wide alerts to send alerts to multiple pucks around the world concurrently. For example a hospital could notify all employees of an emergency call up by providing pucks connected to the second server 719. The hospital is able select a group of employees at a certain facility to all receive the same alert to report to work. Another example includes a news corporation providing alerts to users based upon news alerts.

Referring now also to Figure 7b in the drawings, an alternative embodiment of a software application 701 on smart device 713 according to the present application is illustrated. In this alternative embodiment the puck 101 transmits data 717f back to the smart device 713 and the software application 701. The transmitted data 717f from the puck 101 includes: acknowledgement that the alert was received; conditional information such as temperature, humidity, orientation, accelerations, and strains; positional information such as latitudes and longitudes of the puck; and snooze signals. Furthermore, it should be apparent that transmitted data 717f can be further relayed back to both first server 715 and second server 719 for data collection.

The systems and methods described above provide several distinct advantages over previous alerting systems. The system provides a user with a convenient alerting system that provides feedback to the system and is aware of the conditions in the environment surrounding the user of the puck, and the information being received in real time into the smartphone/computer/tablet control device. The system provides the user with a method of customizing the type of alert. Additionally, the system can customize the alerts and the various ways of notifying the user of an alert as it is triggered to each specific user.

The particular embodiments disclosed above are illustrative only, as the invention may be modified and practiced in different but equivalent manners apparent to those skilled in the art having the benefit of the teachings herein. It is therefore evident that the particular embodiments disclosed above may be altered or modified, and all such variations are considered within the scope and spirit of the invention. Accordingly, the protection sought herein is as set forth in the description. It is apparent that an invention with significant advantages has been described and illustrated. Although the present invention is shown in a limited number of forms, it is not limited to just these forms, but is amenable to various changes and modifications without departing from the spirit thereof.

Claims

1. A system for alerting users comprising:

a smart device for controlling alerts, the smart device having;

a screen for allowing users to input alerts and selecting vibratory patterns in response to the alerts; and

a first wireless system;

a first puck having;

a second wireless system for interfacing with the smart device via the first wireless system;

a vibration system configured for shaking the puck; and

a controller for activating the vibration system in response to a signal from the smart device.

2. The system according to claim 1, wherein the smart device is in electronic communication with a first server; and

wherein the first server stores emergency alerts.

3. The system according to claim 2, wherein the first puck is configured to acknowledge the alerts by flipping the first puck over.

4. The system according to claim 1, the first puck further comprising:

a feedback sensor for measuring a sleep pattern of the users;

wherein the controller adjusts the vibration system in response to the feedback sensor.

5. The system according to claim 1, wherein the smart device is configured for selectively limiting alerts from sources outside the smart device.

6. The system according to claim 2, the first puck further comprising:

memory coupled to the controller, configured for storage of alerts so that the controller can activate the vibration system without being connected to the smart device;

wherein the first puck is in direct electronic communication with the first server.

7. The system according to claim 1, the first puck further comprising:

at least a second puck;

wherein the smart device controls identical alerts for both the first puck and the second puck.

8. The system according to claim 1, wherein the smart device is configured for changing a musical track into a vibratory pattern for the vibration system.

9. The system according to claim 1, wherein communications between the first wireless system and the second wireless system is by Bluetooth.

10. The system according to claim 1, wherein communications between the first wireless system and the second wireless system is by Wi-Fi.

11. The system according to claim 1, further comprising:

an acoustic sensor located outside the first puck;

wherein the acoustic sensor is in communications with the system for alerting users;

wherein the vibration system is activated in response to a signal from the acoustic sensor; and

wherein a pattern of a vibration produced from the vibration system is based upon a pattern of the signal from the acoustic sensor.

12. The system according to claim 1, further comprising:

at least a second puck;

wherein the smart device controls separate alerts for both the first puck and the second puck.

13. The system according to claim 1, further comprising:

a radio connected alarm clock;

wherein the smart device controls separate alerts for both the first puck and the radio connected alarm clock.

14. A puck for alerting users comprising:

a communication system for interfacing with a smart device;

a vibration system configured for shaking the puck based upon a vibration pattern; and

a controller for activating the vibration system in response to a signal from the communication system;

wherein the smart device allows users to customize the vibration pattern.

15. The puck according to claim 14, further comprising:

a first server configured for storing alerts; and

a second server for aggregating alerts;

wherein the smart device is selectively supplied alerts from the second server.

16. The puck according to claim 14, further comprising:

a feedback sensor for measuring the sleep pattern of the users.

17. The puck according to claim 16, wherein the feedback sensor is an accelerometer.

18. The puck according to claim 14, further comprising:

memory configured for storage of alerts so that the controller can activate the vibration system without use of the communication system.

19. The puck according to claim 14, further comprising:
a plurality of sensors located remotely of the puck;
wherein the plurality of sensors provide alerts to the puck; and
wherein the plurality of sensors comprises at least two of the following sensors;
an acoustic sensor;
an accelerometer;
a thermocouple; and
a motion sensor.

20. A method for alerting a user comprising:
setting an internal event on a device;
establishing a communication channel between the device and a puck;
checking the communication channel between the device and the puck;
alerting the user if the communication channel between the device and the puck fails;
programming the puck to vibrate in response to the internal event based upon a vibration pattern; and
vibrating the puck in response to the internal event;
wherein the device allows a user to customize the vibration pattern.

21. The method according to claim 20, further comprising:
creating a list of contacts;
establishing a rule to limit external events from outside the device based upon the list of contacts;
receiving an external event from a external source having a sender;
setting the external event on the device if the sender of the external event is on the list of contacts; and
ignoring the external event if the sender of the external event is not on the list of contacts.

22. The method according to claim 20, further comprising:

importing a calendar;

wherein setting the internal event is based on information imported from the calendar.

23. The method according to claim 20, further comprising:

measuring a sleep pattern of the user; and

adjusting the vibration of the puck in response to the sleep pattern of the user.

24. The method according to claim 20, further comprising:

importing a musical track;

creating a music based vibration pattern based upon the musical track; and

adjusting the vibration of the puck in response to the music based vibration pattern.

25. The method according to claim 24, further comprising:

adjusting a frequency of the musical track to a puck compatible frequency.

26. The method according to claim 20, further comprising:

ending the vibrations from the puck by activating a switch on the puck.

27. The method according to claim 20, further comprising:

flashing a series of lighting elements located on a surface of the puck in response to the internal event; and

generating an audible alarm from the puck in response to the internal event.

28. The method according to claim 20, further comprising:

setting a first timer;

allowing the timer to run; and

vibrating the puck when the timer runs out.

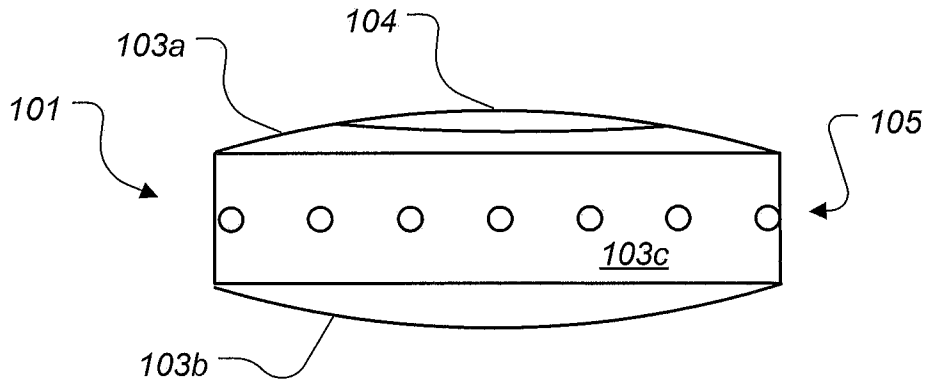
104
103a
101
105
103c
103b

FIG. 1A

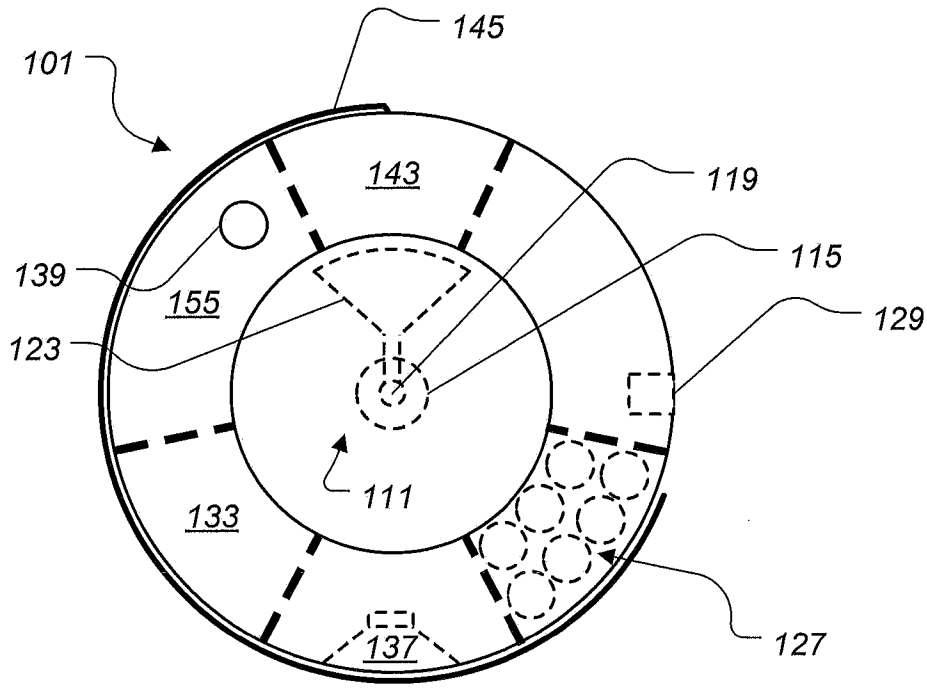
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FIG. 1B

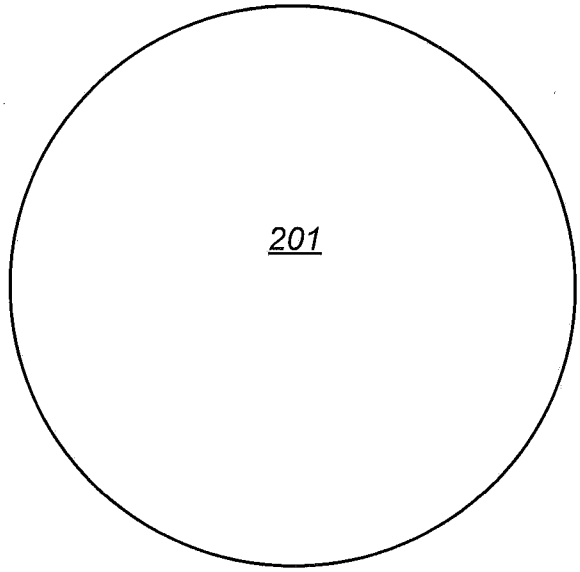


FIG. 2A

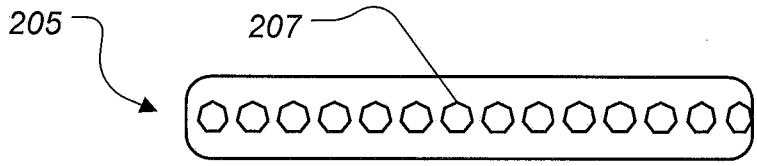


FIG. 2B

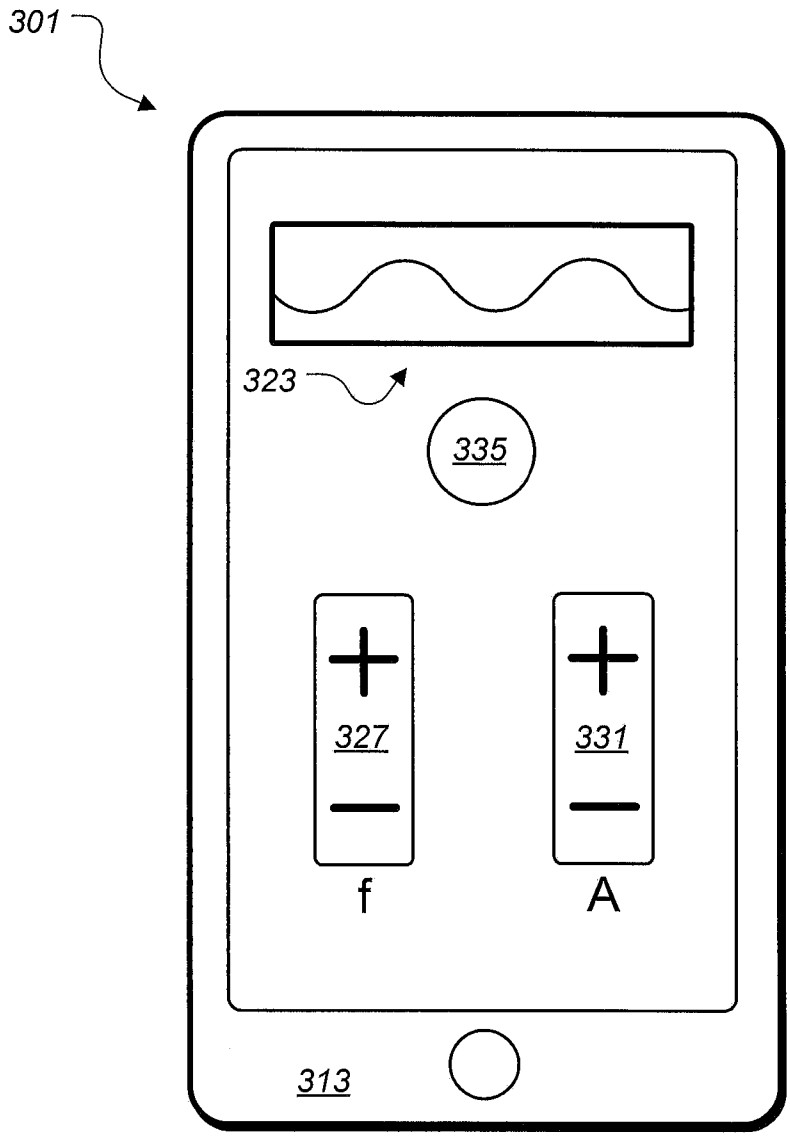


FIG. 3

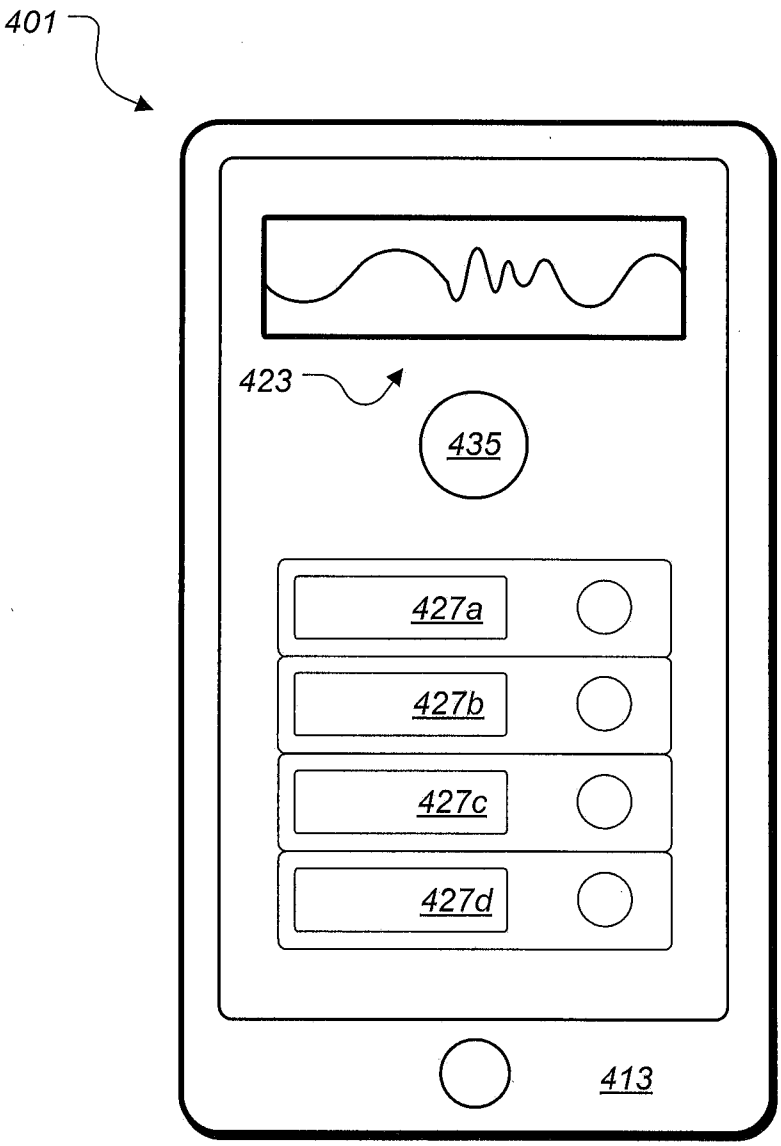


FIG. 4

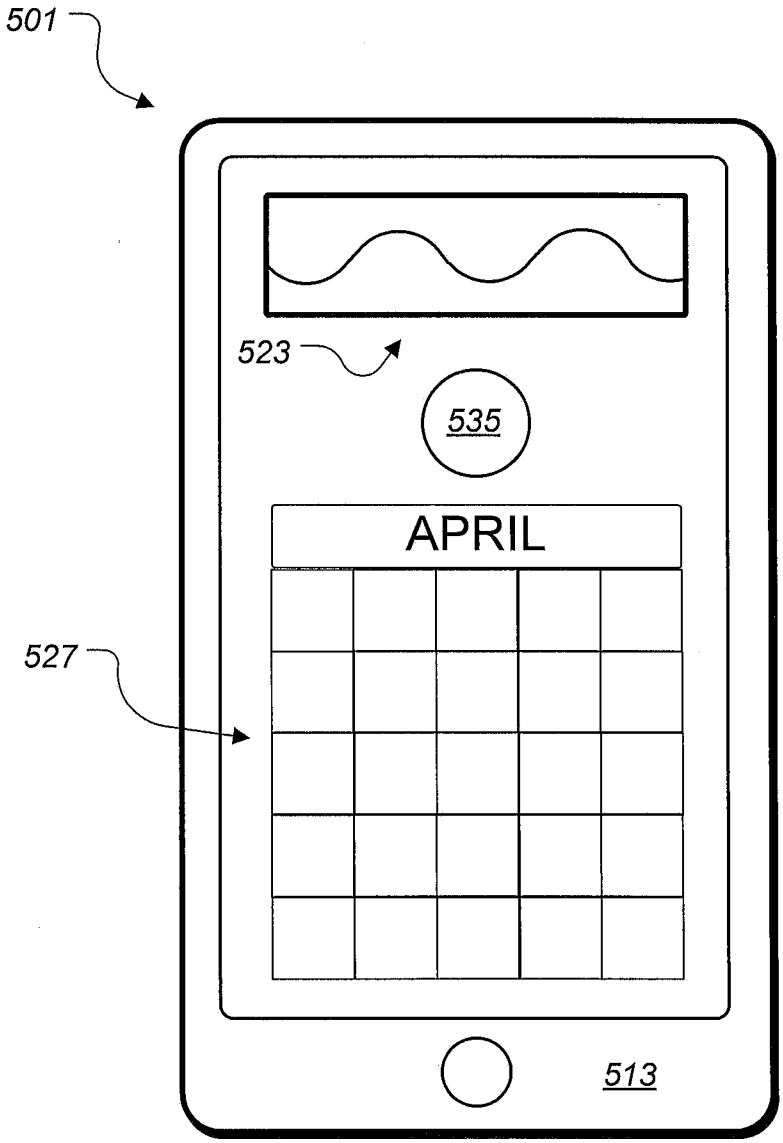
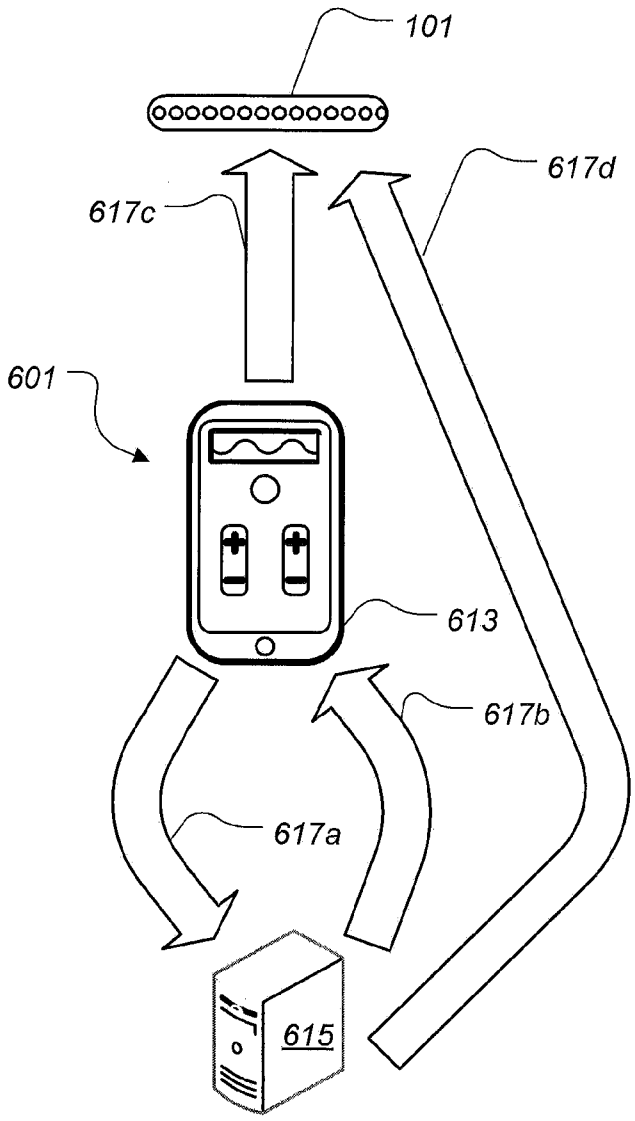


FIG. 5


101
617d
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601
613
617b
617a
615

FIG. 6a

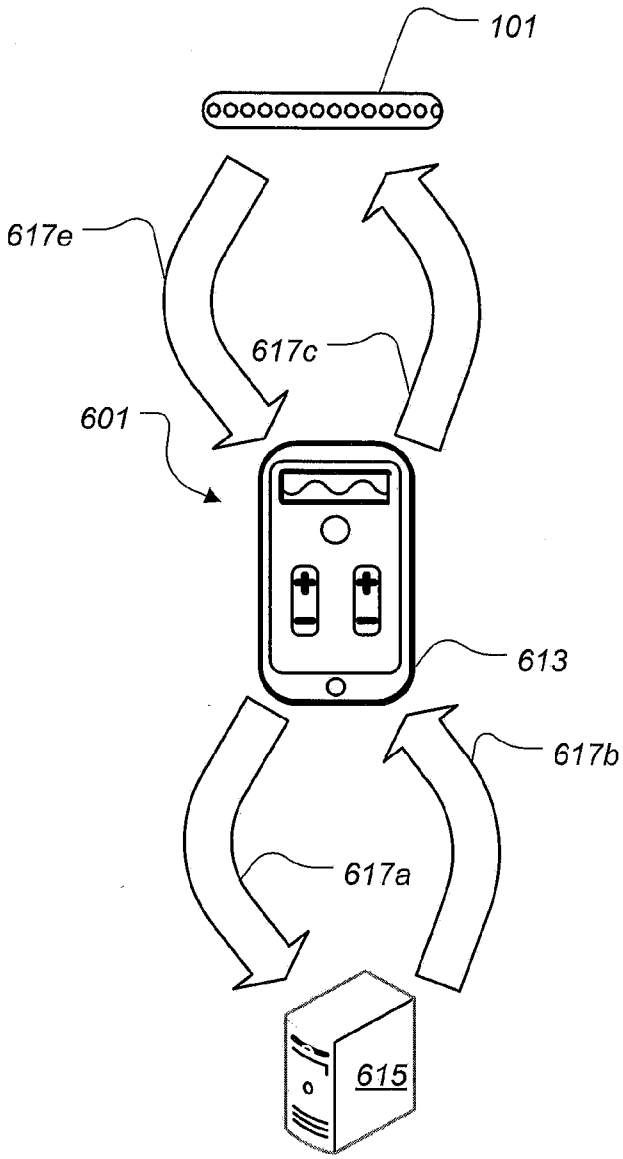
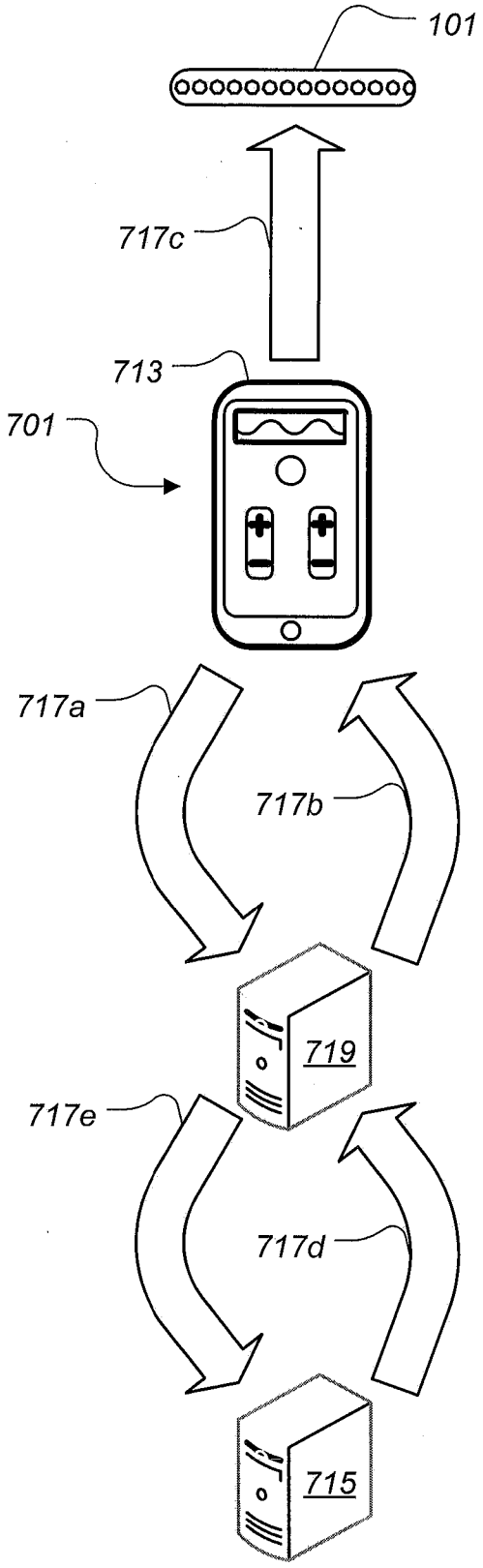

101
617e
617c
601
613
617b
617a
615

FIG. 6b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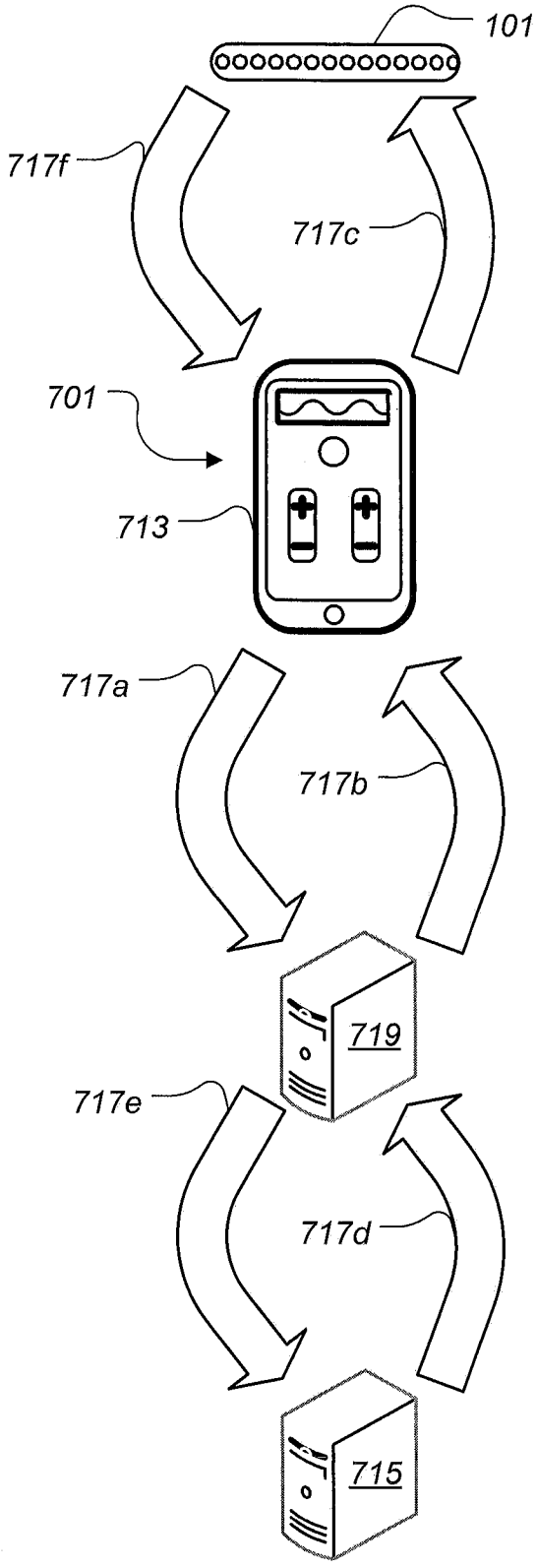
717c
713
701
717a
717b
719
717e
717d
715

FIG. 7a


101
717f
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701
713
717a
717b
719
717e
717d
715

FIG. 7b

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 15/11080

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - G04B 47/00 (2015.01)
CPC - A61J 7/0481, G04B 47/00, A61J 2007/0436
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)
IPC(8): G04B 47/00 (2015.01)
CPC: A61J 7/0481, G04B 47/00, A61J 2007/0436

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
USPC: 368/10 (keyword limited - see terms below)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
PatBase; GOOGLE; GoogleScholar; GooglePatents
Search Terms: alerting users, interface, puck, circular, vibration, smart device, display, acknowledge, measurement, feedback, sensor, wireless, pattern, shaking, sleep, adjust, feedback, round, bed, pillow, mattress,pattern, measure, detect

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y --- A	US 2006/0067165 A1 (Chan) 30 March 2006 (30.03.2006), entire document, especially; abstract, para. [0004], [0011], [0028], [0034], [0036], [0039], [0040], Fig. 1	1, 2, 4-6, 9, 10, 13-23, 26-28 --- 3, 7, 8, 11, 12, 24, 25
Y --- A	US 2003/0117272 A1 (Fegley et al.) 26 June 2003 (26.06.2003), entire document, especially; abstract, para. [0015], [0022], [0025]	1, 2, 4-6, 9, 10, 13-23, 26-28 --- 3, 7, 8, 11, 12, 24, 25
Y	US 2011/0021147 A1 (Tout) 27 January 2011 (27.01.2011), entire document, especially; abstract, para. [0021]	20-23, 26-28
A	US 2010/0145167 A1 (Im) 10 June 2010 (10.06.2010), entire document	1 - 28

☐ Further documents are listed in the continuation of Box C. ☐

* 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	Date of mailing of the international search report
13 May 2015 (13.05.2015)	10 JUN 2015
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-8300	Authorized officer: Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/210 (second sheet) (January 2015)