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(54) **BABY BREATHING MONITOR AND SYSTEM THEREOF**

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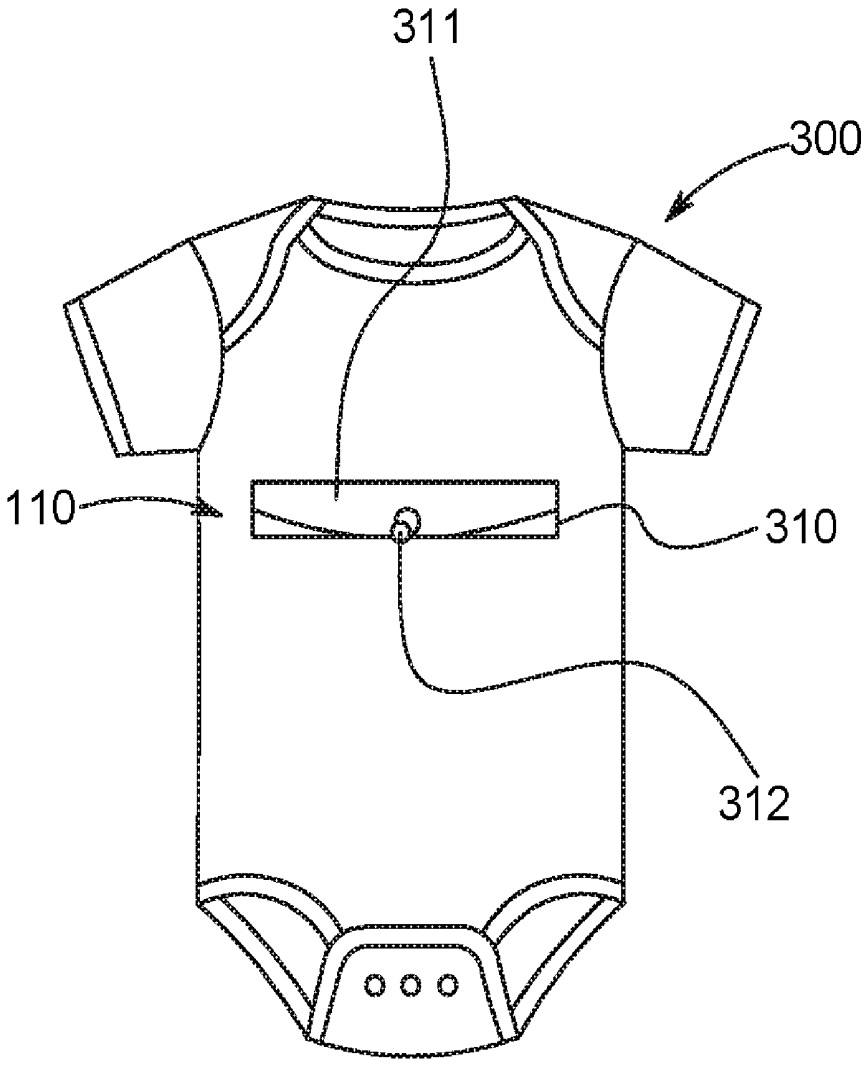
(57) **ABSTRACT**

A baby breathing monitor system, including a baby breathing sensor to be installed within a shirt to monitor a breathing of a baby, and a baby breathing monitor to communicate with the baby breathing sensor and to alert a user when the baby breathing sensor detects that the breathing of the baby has ceased.



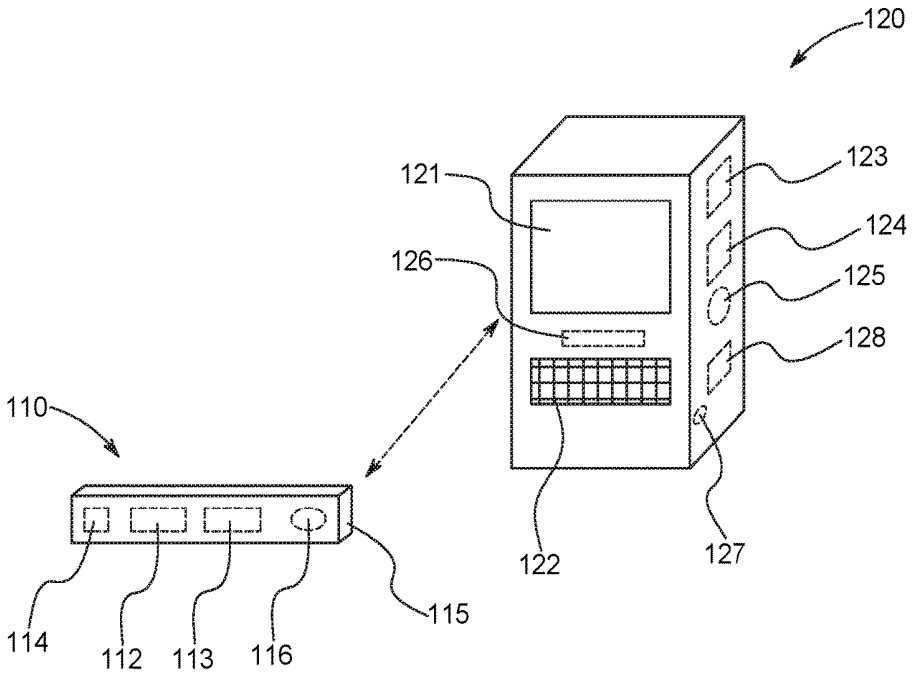

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FIG. 1A

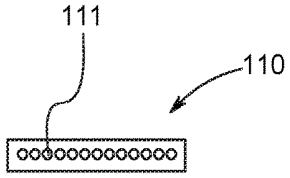
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FIG. 1B

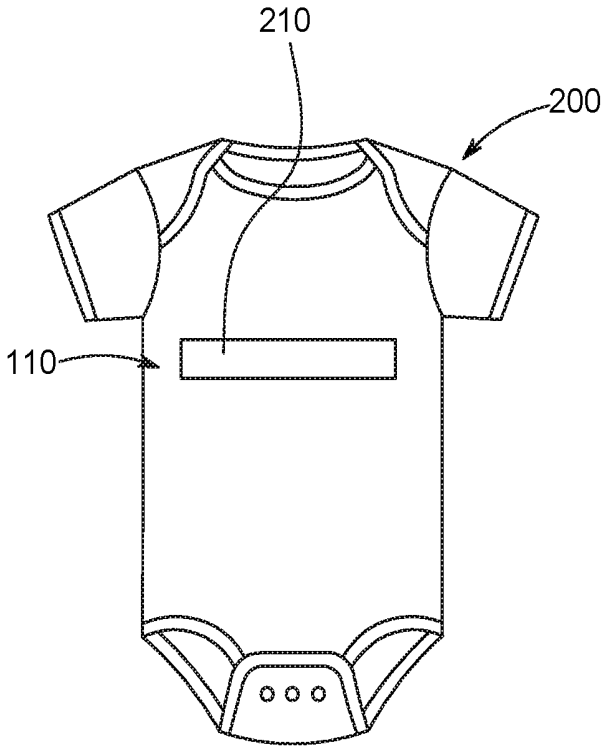

FIG. 2

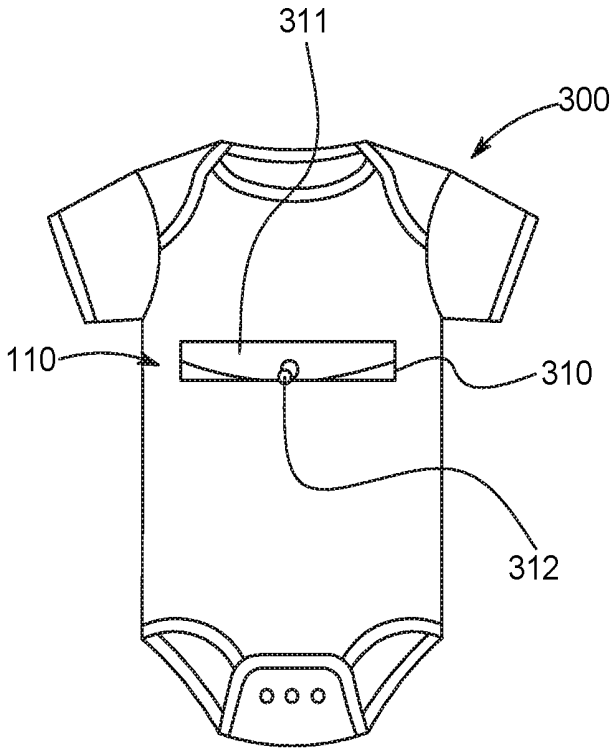

FIG. 3

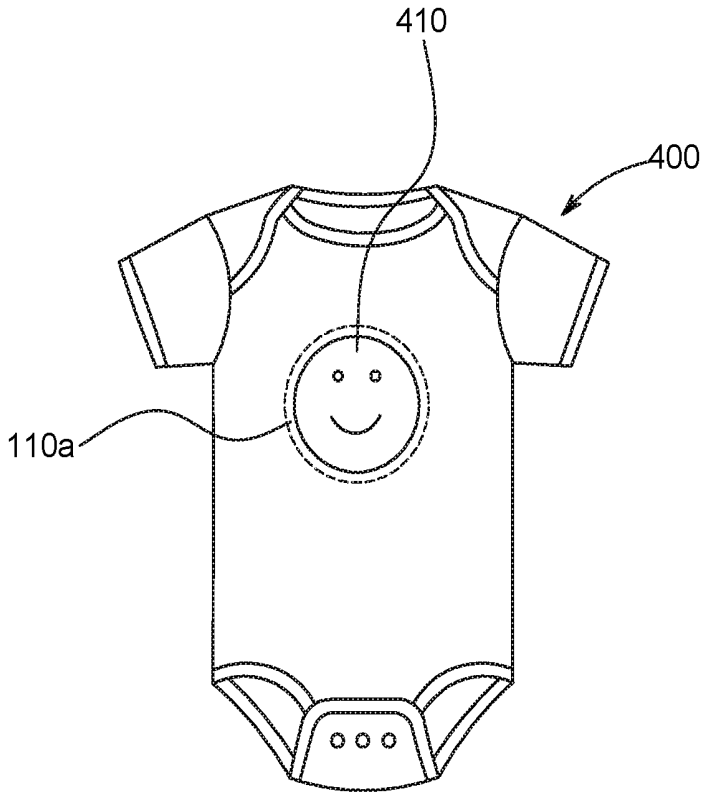

FIG. 4

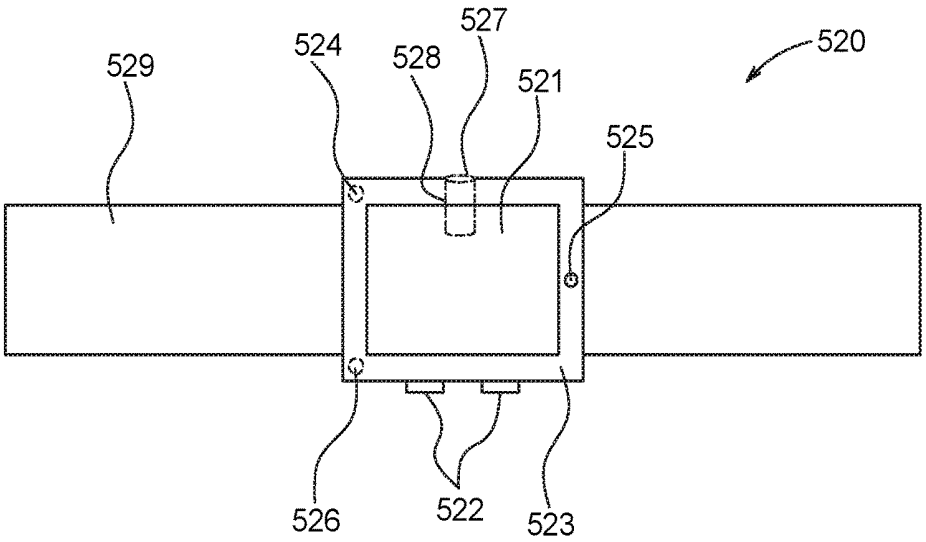
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FIG. 5A

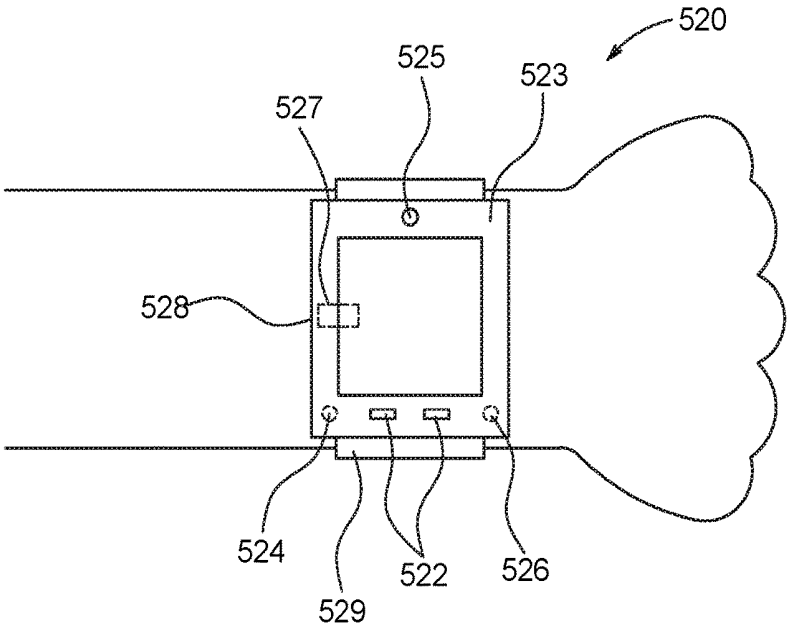
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FIG. 5B

BABY BREATHING MONITOR AND SYSTEM THEREOF

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present general inventive concept relates generally to a baby breathing monitor, and specifically, a baby breathing monitor and system thereof.

2. Description of the Related Art

[0002] Sudden infant death syndrome (SIDS) is the sudden unexplained death of a child less than one year of age. Although SIDS remains often unexplained, some professionals believe that infants simply cease breathing due to asphyxiation, or even cardiac arrest.

[0003] As such, there is a need for a baby monitor that monitors an infant's breathing, in order to prevent SIDS for infants in the future.

[0004] There is also a need for a baby monitor that alerts a user of different needs of an infant.

SUMMARY

[0005] The present general inventive concept provides a baby breathing monitor and system thereof.

[0006] Additional features and utilities of the present general inventive concept will be set forth in part in the description which follows and, in part, will be obvious from the description, or may be learned by practice of the general inventive concept.

[0007] The foregoing and/or other features and utilities of the present general inventive concept may be achieved by providing a baby breathing monitor system, including a baby breathing sensor to be installed within a shirt to monitor a breathing of a baby, and a baby breathing monitor to communicate with the baby breathing sensor and to alert a user when the baby breathing sensor detects that the breathing of the baby has ceased.

[0008] The baby breathing sensor may include at least one motion sensor disposed on a rear portion of the baby breathing sensor to detect a motion of the baby, a processor to receive and interpret the motion detection from the at least one sensor, and a transmitter to transmit a signal from the baby breathing sensor to the baby breathing monitor in response to the processor interpreting that the motion of the baby has ceased.

[0009] The baby breathing monitor may include a display unit to display an alert message to alert the user that the motion of the baby has ceased.

[0010] The display unit may include a touch screen to allow the user to input information regarding at least one reminder into the baby breathing monitor, the at least one reminder including at least one of a birthdate of the baby, feeding times of the baby, doctor appointments of the baby, and vaccination dates of the baby.

[0011] The display unit may display a reminder message to alert the user of the at least one reminder.

[0012] The baby breathing sensor may include at least one temperature sensor to sense a temperature of the baby.

[0013] The baby breathing sensor may include at least one vibration sensor to sense a heartbeat of the baby.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] These and/or other features and utilities of the present generally inventive concept will become apparent and more readily appreciated from the following description of the embodiments, taken in conjunction with the accompanying drawings of which:

[0015] FIG. **1**A illustrates a baby breathing monitor system, according to an exemplary embodiment of the present general inventive concept;

[0016] FIG. **1**B illustrates a rear view of a baby breathing sensor, according to an exemplary embodiment of the present general inventive concept;

[0017] FIG. **2** illustrates a baby breathing sensor installed within a shirt, according to an exemplary embodiment of the present general inventive concept;

[0018] FIG. **3** illustrates a baby breathing sensor installed within a shirt, according to another exemplary embodiment of the present general inventive concept;

[0019] FIG. **4** illustrates a baby breathing sensor installed within a shirt, according to another exemplary embodiment of the present general inventive concept; and

[0020] FIGS. **5**A and **5**B illustrate a baby breathing monitor embodied as a smart watch, according to various embodiments of the present general inventive concept.

DETAILED DESCRIPTION OF THE INVENTION

[0021] Various example embodiments (a.k.a., exemplary embodiments) will now be described more fully with reference to the accompanying drawings in which some example embodiments are illustrated. In the figures, the thicknesses of lines, layers and/or regions may be exaggerated for clarity.

[0022] Accordingly, while example embodiments are capable of various modifications and alternative forms, embodiments thereof are shown by way of example in the figures and will herein be described in detail. It should be understood, however, that there is no intent to limit example embodiments to the particular forms disclosed, but on the contrary, example embodiments are to cover all modifications, equivalents, and alternatives falling within the scope of the disclosure. Like numbers refer to like/similar elements throughout the detailed description.

[0023] It is understood that when an element is referred to as being "connected" or "coupled" to another element, it can be directly connected or coupled to the other element or intervening elements may be present. In contrast, when an element is referred to as being "directly connected" or "directly coupled" to another element, there are no intervening elements present. Other words used to describe the relationship between elements should be interpreted in a like fashion (e.g., "between" versus "directly between," "adjacent" versus "directly adjacent," etc.).

[0024] The terminology used herein is for the purpose of describing particular embodiments only and is not intended to be limiting of example embodiments. As used herein, the singular forms "a," "an" and "the" are intended to include the plural forms as well, unless the context clearly indicates otherwise. It will be further understood that the terms "comprises," "comprising," "includes" and/or "including," when used herein, specify the presence of stated features, integers, steps, operations, elements and/or components, but

do not preclude the presence or addition of one or more other features, integers, steps, operations, elements, components and/or groups thereof.

[0025] Unless otherwise defined, all terms (including technical and scientific terms) used herein have the same meaning as commonly understood by one of ordinary skill in the art to which example embodiments belong. It will be further understood that terms, e.g., those defined in commonly used dictionaries, should be interpreted as having a meaning that is consistent with their meaning in the context of the relevant art. However, should the present disclosure give a specific meaning to a term deviating from a meaning commonly understood by one of ordinary skill, this meaning is to be taken into account in the specific context this definition is given herein.

[0026] FIG. **1**A illustrates a baby breathing monitor system **100**, according to an exemplary embodiment of the present general inventive concept.

[0027] Referring to FIG. **1**A, the baby breathing monitor system **100** may include a baby breathing sensor **110** and a baby breathing monitor **120**.

[0028] The baby breathing sensor **110** may be constructed from ultra-lightweight material, in order to not obstruct a baby's breathing when a baby had the baby breathing sensor **110** placed upon a chest of the baby.

[0029] The baby breathing sensor **110** may communicate with the baby breathing monitor **120** using BLUETOOTH, WIFI, satellite, 3G, 4G, near-field communication, radio frequency communication, radio waves, or any other form of communication known to one of ordinary skill in the art.

[0030] The baby breathing sensor **110** may be placed upon a chest of a baby, either inside a shirt of the baby, or directly against the chest of the baby. In other words, the baby breathing sensor **110** is designed to be worn by the baby on a chest area thereof.

[0031] FIG. **1**B illustrates a rear view of the baby breathing sensor **110**, according to an exemplary embodiment of the present general inventive concept

[0032] Referring to FIGS. **1**A and **1**B, the baby breathing sensor **110** may include at least one sensor **111** disposed on a rear portion thereof, which may sense (i.e., detect) whether a baby wearing the baby breathing sensor **110** is still breathing, and a processor **112** to receive and interpret the detection from the at least one sensor **111**.

[0033] The at least one sensor **111** may be a motion sensor, a vibration sensor, a tactile sensor, an accelerometer-type sensor, a pressure sensor, and a temperature sensor, but is not limited thereto.

[0034] The baby breathing sensor **110** may also include a transmitter **113**, which may transmit a signal from the baby breathing sensor **110** to the baby breathing monitor **120**.

[0035] More specifically, if the at least one sensor **111** detects that the baby has stopped breathing, then the processor **112** controls the transmitter **113** to send a signal to the baby breathing monitor **120**.

[0036] As such, for example, if the at least one sensor **111** is embodied as a motion sensor and the baby breathing sensor is placed on the chest of the baby, then a ceasing of a breathing of the baby will cause the at least one sensor to detect that motion of the at least one sensor **111** has ceased. Accordingly, if the baby stops breathing and the baby breathing sensor **110** stops moving, the at least one sensor **111** sends a CEASED MOTION signal to the processor, which controls at least one speaker **114** to emit a noise and also controls the transmitter **113** to send a signal to the baby breathing monitor **120** to alert the user that the baby has stopped breathing.

[0037] The baby breathing sensor **110** may include a USB port **115** connected to a battery **116** to allow the battery **116** of the baby breathing sensor **110** to be easily recharged.

[0038] The baby breathing monitor **120** may include a display unit **121**, a keypad **122**, a processor **123**, a transmitter **124**, a receiver **125**, a speaker **126**, a USB port **127**, and a battery **128**.

[0039] The display unit **121** may be a touch screen, an LCD screen, a plasma screen, an LED screen, or any other type of display unit known to one of ordinary skill in the art.

[0040] The display unit **121** may allow a user to input information using the keypad **122** (or alternatively, the touchpad if the display unit **121** is embodied as such) regarding reminders into the baby breathing monitor, such as a birthdate of the baby, important scheduling information such as feeding times/doctor appointments/vaccination dates, and other optional important reminders. As such, when a reminder is triggered based on a particular date and/or time, the speaker **126** may emit an alert sound, and the display unit **121** may display an alert message regarding the reminder. Also, the display unit **121** may allow the user to access various web pages on the Internet.

[0041] The processor **123** may store the input information and/or the reminders in a storage unit **123***a*, and may control the display unit **121** to display the alert message and the speaker **126** to emit the alert sound.

[0042] The processor **123** may also control the transmitter **124** to send signals to the baby breathing sensor **110**, and may also process signals received from the baby breathing sensor **110** by the receiver **125**. In other words, the processor **123** may include software to allow for communication between the baby breathing monitor **120** and the baby breathing sensor **110**.

[0043] The USB port **127** may allow the battery **128** to be recharged. Alternatively, the baby breathing monitor **120** may be plugged into an electrical socket.

[0044] As another example, if the baby breathing sensor **110** is embodied as a vibration sensor, then a heartbeat of the baby may also be monitored to alert the user if the heartbeat of the baby ceases.

[0045] As yet another example, if the baby breathing sensor **110** is embodied as a temperature sensor, then a body temperature of the baby may also be monitored on the display unit **121**.

[0046] FIG. **2** illustrates the baby breathing sensor **110** installed within a shirt **200**, according to an exemplary embodiment of the present general inventive concept.

[0047] The shirt **200** may include a pocket **210** to allow the baby breathing sensor **110** to be inserted therein.

[0048] FIG. **3** illustrates the baby breathing sensor **110** installed within a shirt **300**, according to another exemplary embodiment of the present general inventive concept.

[0049] The shirt **300** may include a pocket **310** to allow the baby breathing sensor **110** to be inserted therein.

[0050] The pocket **310** may include a pocket cover **311** and a closing device **312** to secure the baby breathing sensor **110** inside the pocket **310**. The closing device **312** may be a snap, a zipper, VELCRO, a magnet, or any other type of closing device known to one of ordinary skill in the art.

[0051] FIG. **4** illustrates a baby breathing sensor **110***a* installed within a shirt **400**, according to another exemplary embodiment of the present general inventive concept.

[0052] The baby breathing sensor **110***a* may have a shape to be installed behind a patch **410** having a corresponding shape, as illustrated in FIG. **4**.

[0053] FIGS. **5**A and **5**B illustrate a baby breathing monitor **520** embodied as a smart watch, according to various embodiments of the present general inventive concept.

[0054] Referring to FIGS. **5**A and **5**B, the baby breathing monitor **520** may include a display unit **521**, at least one button **522**, a processor **523**, a speaker **524**, a camera **525**, a microphone **526**, a USB port **527**, a battery **528**, and a strap **529**.

[0055] The display unit **521** may be a touch screen, an LCD screen, a plasma screen, an LED screen, or any other type of display unit known to one of ordinary skill in the art.

[0056] When the display unit **521** is embodied as the touch screen, the display unit **521** may allow a user to access various web pages on the Internet, input information thereupon regarding reminders into the baby breathing monitor, such as a birthdate of the baby, important scheduling information such as feeding times/doctor appointments/vaccination dates, and other optional important reminders. As such, when a reminder is triggered based on a particular date and/or time, the speaker **524** may emit an alert sound, and the display unit **521** may display an alert message regarding the reminder.

[0057] The at least one button **522** may be disposed on a side of the baby breathing monitor **520** as illustrated in FIG. **5**A, or alternatively, on a front face of the baby breathing monitor **520** as illustrated in FIG. **5**B.

[0058] The user may use the at least one button **522** to input information in a manner same as the display unit **521**.

[0059] The processor **523** may store the input information and/or the reminders in a storage unit **523***a*, and may control the display unit **521** to display the alert message and the speaker **524** to emit the alert sound.

[0060] The processor **523** may have software running thereon to allow for communication with the baby breathing sensor **110**, and may also process signals received from the baby breathing sensor **110**. In other words, the processor **523** may include software to allow for communication between the baby breathing monitor **520** and the baby breathing sensor **110**.

[0061] The camera **525** may allow a user to take pictures and/or video chat.

[0062] The microphone **526** may be used to allow the user to communicate with other baby breathing monitors **520**, or to allow audio to be transmitted during a video chat.

[0063] The speaker **524** may also allow audio to be heard during a video chat or during a communication from another baby breathing monitor.

[0064] The USB port **527** may allow the battery **528** to be recharged.

[0065] The strap **529** may allow the user to wear the baby breathing monitor **520**.

[0066] Although a few embodiments of the present general inventive concept have been shown and described, it will be appreciated by those skilled in the art that changes may be made in these embodiments without departing from the principles and spirit of the general inventive concept, the scope of which is defined in the appended claims and their equivalents.

1. A baby breathing monitor system, comprising:
- a baby breathing sensor to be installed within a shirt to monitor a breathing of a baby; and
- a baby breathing monitor to communicate with the baby breathing sensor and to alert a user when the baby breathing sensor detects that the breathing of the baby has ceased.

2. The baby breathing monitor system of claim **1**, wherein the baby breathing sensor comprises:
- at least one motion sensor disposed on a rear portion of the baby breathing sensor to detect a motion of the baby;
- a processor to receive and interpret the motion detection from the at least one sensor; and
- a transmitter to transmit a signal from the baby breathing sensor to the baby breathing monitor in response to the processor interpreting that the motion of the baby has ceased.

3. The baby breathing monitor system of claim **2**, wherein the baby breathing monitor comprises:
- a display unit to display an alert message to alert the user that the motion of the baby has ceased.

4. The baby breathing monitor system of claim **3**, wherein the display unit comprises:
- a touch screen to allow the user to input information regarding at least one reminder into the baby breathing monitor, the at least one reminder comprising at least one of a birthdate of the baby, feeding times of the baby, doctor appointments of the baby, and vaccination dates of the baby.

5. The baby breathing monitor of claim **4**, wherein the display unit displays a reminder message to alert the user of the at least one reminder.

6. The baby breathing monitor system of claim **1**, wherein the baby breathing sensor comprises:
- at least one temperature sensor to sense a temperature of the baby.

7. The baby breathing monitor system of claim **1**, wherein the baby breathing sensor comprises:
- at least one vibration sensor to sense a heartbeat of the baby.

* * * * *

专利名称(译)	婴儿呼吸监测器及其系统		
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IPC分类号	A61B5/113 A61B5/0205 A61B5/00		
CPC分类号	A61B5/1135 A61B5/02055 A61B5/742 A61B5/746 A61B5/6804 A61B5/0004 A61B5/08 A61B5/024		
外部链接	Espacenet USPTO		

摘要(译)

婴儿呼吸监测系统，包括安装在衬衫内以监测婴儿呼吸的婴儿呼吸传感器，以及婴儿呼吸监测器，以与婴儿呼吸传感器通信并在婴儿呼吸传感器检测到婴儿呼吸传感器时提醒用户婴儿的呼吸已经停止。