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(54) A DEVICE TO PRE-DETERMINE BABY CRY AND PROVIDE THEM TO CALM DOWN WITH WHITE NOISE

VORRICHTUNG ZUM VORBESTIMMEN VON BABYGESCHREI UND BERUHIGUNG MIT WEISSEM RAUSCHEN

DISPOSITIF PERMETTANT DE PRÉ-DÉTERMINER DES PLEURS DE BÉBÉS ET DE LES CALMER AU MOYEN D'UN BRUIT BLANC

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WO-A1-2016/164373
US-A1- 2013 123 572
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Description

TECHNICAL FIELD

[0001] The present invention relates to a device which provides babies to calm down without any parent intervention by making them listen to the white noise installed to its memory by pre-determining of their cry with the change in their breathing and the vibration occurs during crying.

PRIOR ART

[0002] Colic is a very common complaint in the first three months after the birth that is defined as uneasiness and never ending crying seizures that last for more than three weeks, at least three days a week, and three hours a day. This situation is seen in 5-25% of infants. It usually starts in the second to third weeks after birth, increases in the sixth to eighth weeks, and resolves by itself in the third to fourth months. Colic crying is different from normal crying; the baby can weep for hours without calming down. In very few children, crying lasts for 24 hours. Crying seizures are usually observed after lunch or in the evening. Usually, colic crying is repeated every day, sometimes it pauses overnight. During the seizures, a painful expression occurs on the face of the baby, the fists are tighten and the legs are pulled to the stomach. The characteristic seizure starts suddenly and loud and constant crying is observed. Babies with colic pain create a crisis situation in the family. It causes the stress in the family, it can even distort the family balance. Because the baby is crying, the parents are restless and unhappy. Babies and family cannot sleep either. It may negatively affect the working efficiency of the working parent and the growth and development of the baby. In a study of babies with colic, it has founded that white noise reduces babies' cry out, cry and the time they stay awake, but improve their nutrition and sleeping times (1). It other studies, it is also shown that white noise is effective on pain (2, 3). It is also noted in the literature that it is the relaxing effect of white noise (4).

[0003] Spencer et al. (1990) found that in their study with 20 babies, white-noise increases the sleep durations (5). Muenssinger et al. (2013) found that babies in the mother's womb reacted most to the white noise stimulus in their work with the fetuses (6).

[0004] White noise is also called white sound. White noise consists of a combination of sounds at all different frequencies. It can be described as a buzz of 20,000 different tones at once. White noise sounds like the frequency and signal of the wind coming through the trees, waterfall, radio waves or signals and frequencies that resemble ocean waves. Besides, it is found similar to the voices in the mother's womb by the baby because of the white noise's buzzing and continuous monotone sound. These voices are similar to the voices in the baby's mother's womb and comfort the babies. There is also a white noise CD prepared by musician Orhan Osman. This CD contains sounds such as heart beats, musical instruments and water sounds.

[0005] It has been observed that infants with colic calm down by listening to different frequency sounds such as hair drier, electric vacuum cleaner. In addition, various studies such as calming babies with colic, reducing sedation and anxiety during surgical operation, calming the baby during painful procedures, examining the effect on baby's movements in mother's womb via white noise have been done.

[0006] WO 2016/164373 A1 is considered as the closest prior art and discloses a device which evaluates a number of parameters, including galvanic skin response and environmental parameters to predict health concern such as an epileptic seizure and to provide the baby with white noise to calm it down.

[0007] US 2013/123572 A1 discloses a device which detects crying and plays white noise to calm the baby. No hint is given to predict crying by galvanic skin response and use this information to prevent the crying.

[0008] The problem to be solved by the present invention is to reduce baby crying originating in colic seizures.

BRIEF DESCRIPTION OF THE INVENTION

[0009] This problem is solved by the device according to the claim.

Thus, the invention is about applying electrodes, which comprise Galvanic Skin Response (GSR) sensors, to the abdominal region of a baby, thereby detecting cramp-like pains and sending a signal to the microprocessor and starts playing white noise. Thus, the process of calming babies with colic will be completed without the parental intervention, which is the object of the patent application.

DETAILED DESCRIPTION OF THE INVENTION

[0010] The system that makes up the body produces some signs as it performs its various functions. These signs often do not convey easily understandable information out of the underlying complex biological structure. They need to be processed and interpreted in order to examine various events in the body. Bioelectric signals relate to nerve conduction, brain, heart and various muscle movements, and etc. Ionic currents are the result of electrochemical events in some cells. These currents are detected with the aid of electrodes, and after the signal processing, various diseases are diagnosed. To measure bioelectric potentials, we need transformers that convert electrical potential or current to ionic potentials and currents. Such a converter takes the form of two electrodes and measures the ionic potential difference between the points where the electrodes are applied.

[0011] In our patent application, which is subject to our invention, we use the Galvanic Skin Response sensor to measure the muscle contraction signals mentioned above. At least two electrodes containing the GSR sen-

sor are placed on the baby's body. These electrodes detect contractions for crying of the babies with colic during their sleep before they start crying. The start signal is automatically is given for white noise to be played to the babies. The contractions detected by the sensors are transmitted to the microprocessor as an information. Given the fact that each contraction is not likely to turn into a cry, information of a possibility of crying is transmitted to the microprocessor if there are more than 12 contractions per minute. The microprocessor starts babies to listen to the white noise through headphones placed on the baby's ears, which are recorded in memory or connected with an external media player. These headphones are placed in such a way that they will not create a weight on the baby's head and will not damage the skin.

[0012] The electrodes to be placed have the characteristics of measuring the difference between the width and the velocity of the measured waves, the depth and speed of the baby's breathing, and the measurement of the heartbeat. Thus, the user who defines the number of months of the baby through the keys in the device interface, the data to be obtained from the babies in the related month; compared with the data obtained as a result of the measurements mentioned above, in case of any irregularity, the user is informed by the voice and the digital display about the differences on measurements.

Claims

1. A device to pre-determine baby cry and provide the baby to calm down with white noise, comprising: at least two electrodes which comprise a GSR sensor to be applied on baby's body, and to evaluate the difference between the width and the velocity of the measured waves, the depth and speed of baby's breathing, and the measurement of the heartbeat and to transmit the information of a possibility of crying to microprocessor if there are more than 12 muscle contractions per minute; an earphone, the microprocessor adapted to start playing the white noise recorded in memory or connected with an external media player if the data gathered from the electrodes is a crying signal, and a digital screen.

Patentansprüche

1. Vorrichtung zum Vorherbestimmen eines Weinens eines Babys und Bereitstellen eines Beruhigens des Babys mit weißem Rauschen, Folgendes umfassend: wenigstens zwei Elektroden, die einen GSR-Sensor umfassen, der an dem Körper des Babys angebracht werden soll, und zum Bewerten des Unterschieds zwischen der Breite und der Geschwindigkeit der gemessenen Wellen, der Tiefe und Geschwindigkeit der Atmung des Babys, und der Messung des Herzschlags, und zum Übermitteln der Informationen über eine Möglichkeit des Weinens an einen Mikroprozessor, wenn mehr als 12 Muskelkontraktionen pro Minute vorliegen;
einen Kopfhörer, wobei der Mikroprozessor angepasst ist, um das in einem Speicher aufgezeichnete oder mit einem externen Mediaplayer verbundene weiße Rauschen abzuspielen, wenn die von den Elektroden gesammelten Daten ein Weinsignal sind, und einen digitalen Bildschirm.

Revendications

1. Dispositif de prédétermination de pleurs de bébé et permettant au bébé de se calmer avec un bruit blanc, comprenant : au moins deux électrodes comprenant un capteur GSR à appliquer sur le corps du bébé, et pour évaluer la différence entre la largeur et la vitesse des ondes mesurées, la profondeur et la vitesse de la respiration du bébé et la mesure du rythme cardiaque et pour transmettre les informations d'une possibilité de pleurs au microprocesseur s'il y a plus de 12 contractions musculaires par minute ;
un écouteur, le microprocesseur étant conçu pour commencer à jouer le bruit blanc enregistré dans la mémoire ou raccordé à un lecteur multimédia externe si les données recueillies à partir des électrodes sont des signaux de pleurs, et un écran numérique.

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- WO 2016164373 A1 **[0006]**
- US 2013123572 A1 **[0007]**

专利名称(译)	用于确定婴儿哭声和白噪声的设备		
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摘要(译)

本发明涉及一种装置，该装置通过使婴儿随着呼吸的变化而预先确定他们的哭泣并在哭泣期间发生振动，从而使婴儿听到安装在其记忆中的白噪声而无需任何父母干预。