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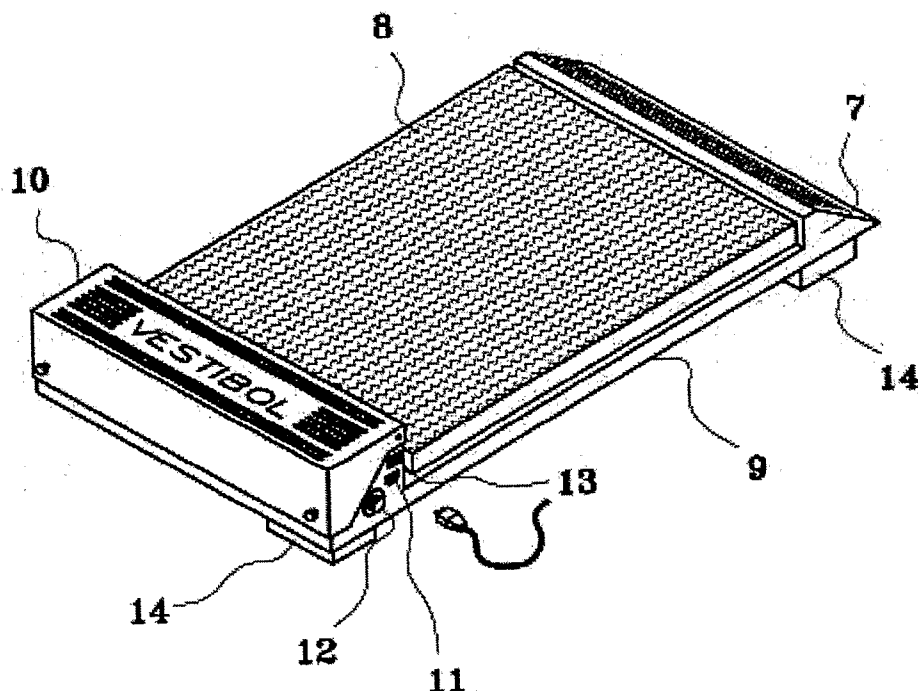
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(54) Title: SYSTEM AND DEVICE FOR LOW-FREQUENCY VESTIBULAR STIMULATION TO ROCK INFANTS TO SLEEP



(57) Abstract: This invention consists of a system and device that send a baby to sleep by reproducing the movement of a car, or other vehicle, travelling at a constant speed on a straight route. In particular, this device takes the shape of a plane where the pram, or other baby receptacle, is placed and moved reproducing the above-mentioned motion.

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“SYSTEM AND DEVICE FOR LOW-FREQUENCY VESTIBULAR STIMULATION TO ROCK INFANTS TO SLEEP”

DESCRIPTION

Technical Field

The present invention concerns the technical sector relative to the production of accessories for infants. In particular, it consists of a system and device aimed to send and/or help an infant to sleep. The device object of this invention can have different shapes, among them the shape of a plane where the cradle, cot, pram, or any other infant receptacle, is placed.

Background Art

Various devices are used to send children to sleep, particularly infants who fall asleep often with difficulty or anyway stay awake for a long time without particular reason.

To this end, there are on sale items that make sounds, such as lullabies or other tunes, with the purpose to send the baby to sleep thanks to the music. Nevertheless, these items, known for many years, are not very useful unless when the baby is calm and is already falling asleep. On the contrary, they are absolutely insufficient, or they even have the opposite effect, when the baby is irritated and can't fall asleep.

Another method is to rock the baby moving the pram where he/she sleeps. In order to imitate this movement, there are devices that are applied to the pram, the cradle, the car seat or whatever, having the function to rock them like if someone is moving vertically or horizontally them. Nevertheless, also these systems rarely succeed because the same means is not effective. As a matter of fact, everybody knows that even when you rock the pram, few times the baby falls asleep.

This invention aims at solving the above-mentioned and other drawbacks, supplying a system and a device capable of sending the infant to sleep, creating a particular movement certainly effective.

Disclosure of invention

In order to understand this invention, it's necessary to make a scientific premise.

Numerous parents have realized by their experience that when the baby is travelling by car at a constant speed certainly falls asleep. Anyone has had a child who fell asleep with difficulty knows that the same child, travelling by car in his/her car seat, falls asleep in few minutes, except for other temporary or particular bothers.

What it's known is that a range of external stimulations can entail in the human a series of corresponding answers from the Central Nervous System (CNS). These stimulations, according to their intensity and frequency, can facilitate the sleep or entail completely opposite effects. Let's take the example of a hearing stimulation: high volume sounds with variable and fast frequencies draw the attention of the subject, therefore they involve the opposite effect of calm and sleep, which are in contrast facilitated using a low volume in intensity and frequency (e.g. the traditional lullaby, regardless its origin, has however a low and repetitive melody).

In the same way, in visual stimulation, the quick passage of images in front of the subject draws his/her attention, therefore it involves the opposite effect of a quiet rest; once again a dynamic stimulation, the one of our interest, should occur with boring and repetitive frequencies.

It has been tested that said dynamic stimulation, called vestibular, by boring and repetitive impulses (about 60 beats per minute), acts on a particular zone of neurons called Serotonergic Reticular Substance, which leads to the first phase of the sleep.

This zone, as above-cited, can be activated by hearing/visual stimulations (TV), only hearing (lullaby), or vestibular (rocking the pushchair or travelling by car).

All these stimulations, when suitably fulfilled, can facilitate the sleep, but the most effective is however the vestibular one. Which is proved by the fact that the baby falls asleep in the car neither for the view of the external landscape (we get the same result either by night or day), nor for the hearing stimulation (different cars making different noises make no distinction). The main cause of the sleep is the vestibular stimulation, like it occurs on other means of transport such as the train or the boats producing the same effects.

Considering that, it's however necessary that the intensity of the stimulations is confined within a defined degree, high enough to be effective, but not too much high to cause the opposite effect.

The inside of the ear is the zone where this impulse is captured and later transformed. In fact, this zone comprises not only the receptors of the hearing, but also a range of important receptors for stimulations of movement, balance and change of gravity and linear acceleration. These receptors send their impulses, through the so-called vestibular nerves (making part of the eighth layer of Cranial Nerves), to a series of neurons specialized in definite functions and integrated each other, present both in the cerebrum and in the cerebellum. According to the type, but also to the intensity of the impulse, we'll have different answers that in our case may even cause the opposite effect.

As a matter of fact, vestibular impulses of high intensity and frequency can cause the so-called "carsickness", or seasickness, airsickness, etc.

Intense motions caused by sudden acceleration and braking of car (pitch) or intense lateral accelerations caused by continuous changes of directions (roll), through the vestibular

routes, stimulate the cerebellum, which in its turn, at this intensity, stimulates the neurons of the sickness centre, thus entailing general disorder, salivation, sickness.

On the contrary, in a linear movement, almost constant, with a nearly straight route (without roll), the effects completely change: in this case the car produces a series of small movements caused by the unevenness of the ground; said practically imperceptible movements, modulated by the shock-absorbers, actually reach some centimetres.

This movement, similar to the movement of a horizontal plane having actuators at the angles, is indeed responsible of the vestibular stimulations that make an adult fall asleep (often drowsiness may cause car accidents) and even more a child.

Physiologically, this kind of movements, at such an intensity, stimulate a group of neurons called "Serotonergic Reticular Substance", which leads to the first phase of the sleep.

This premise was essential for the correct regulation of the movements on this invention. It's in fact very important to register the exact data in order to create a support or other device having the above-mentioned dynamic characteristics. Therefore, it's necessary to register the data on a plane (seat) in movement, at almost constant speed and on straight route. The purpose of this invention is to reproduce faithfully the movement of the plane by means of any instrument offered by current technology. The described solutions are some practical examples of this invention but are not to be considered restrictive.

The advantages of the present invention essentially consist of the fact that it's possible to send the baby to sleep in a natural and safe way, without the aid of medicines and without irritating him/her; that the baby falls asleep in a short time; that this device can be produced in a simple and economical way.

Brief description of drawings

These and further advantages, purposes and characteristics of the present invention will be more and better understood by every expert in this field reading the following description

and referring to the enclosed drawings, given as practical examples of the invention but not to be considered restrictive.

Fig. 1 shows the plan relating to the registration of the data to be transferred to the central panel. This drawing, even if schematic, is very important for the correct working of this invention, because the motion of the plane (1) indicated by letters (A-B-C-D) and representing an ideal plane of the car, is exactly registered during a real journey, therefore we avoid any mistake due to a possible insertion in the central panel of data resulting from the abstract of hypothetical space variations of the same plane. On the contrary, the space/time variations of the plane are gradually registered by four three-axes accelerometers (4), located at the sides of the seat (2), indicated by letters (A1-B1-C1-D1). Since these accelerometers are connected to the plane (1) of the car, the space variations registered by each point will exactly reproduce the movement perceived inside the car, conveniently travelling on a uniform straight route. In the same way, the registration will be also exact if these points are located at the angles of the front seats (3). Then, the data are entered in a simple PC (5) that, equipped with specific software, transfers them in the suitable central panel (6) that will move the device object of the invention.

Fig. 2 shows the assembled device (7) having in this case the shape of a plane – just an example to illustrate the working concept.

In the solution herein described, this invention has preferably a compact shape, but at the same time it's large enough to contain an infant's cot, so as to be possibly put away without problems. It's supplied with a 220V socket (11) that, suitably transformed, powers the central panel (6) – not depicted in the drawing – holding the data registered directly on the car.

A rheostat (12) permits the modulation of the power, necessary to regulate the apparatus at first according to the weight it has to support and move. The weight of a pram or a cot can

considerably change the answers of the apparatus. Obviously, the apparatus is also supplied with a switch for turning it on. In this illustrative solution, the controls are placed at the end of the apparatus, on the cover (10) containing the central panel (6). The cover (10), hinged for the insertion of the central panel and its maintenance, is however connected to the fixed base (9), made of plastic material and equipped with anti-vibrations rubber feet (14) for a good hold on the floor. On this base the mobile plane (8) is placed, dynamically connected to the base (9) by means of electric mechanisms hereinafter described.

Fig. 3 shows the fixed base (9), hiding the upper mobile plane in order to better illustrate the electromechanical mechanism. Since this mechanism is expected to be silent, as well as to have a ready answer to the impulses and functional supply, we have chosen electromagnetic actuators (15), which make use of the principle of the solenoid, even if we have not discarded the use of either pneumatic or hydraulic or electric actuators.

Said actuators are connected to the base and placed at its four angles; they are connected as well to the exits (a/b/c/d) of the central panel (6) storing the data entered by the software of the PC. The actuators will be modulated with parameters, considering the different factors (reciprocal distance, pitch field, etc.), so that the upper mobile plane has exactly the same performance as the plane A-B-C-D of the car.

The assembling between the base (9) and the mobile plane (8) is depicted in the next **Fig. 4**, which shows a side view of the apparatus, with the pram over at rest. This figure shows the pram without the wheels, only with the cradle, but it can be positioned also with the wheels.

Details "X" and "Y" show that the coil (17) of the solenoid (15), supplied with external covering (19), is placed at the lower end of the track.

The actuators (15) are connected to the lower fixed base (9) and firmly fixed in their position by means of screws (18). In order to guarantee a safe coupling with the upper mobile plane (8), we make use of a rubber boss (20) that is stiff enough but, at the same time, permits the necessary shift (α) caused by the variable angulations the mobile plane takes during work. A spring (21) is placed between the boss (20), connected to the mobile plane (8), and the coil (17) of the actuator, connected to the base (9). The spring is intended to give, together with the weight, another component of vertical tension, so as to have an immediate answer also in this direction.

The dynamic is illustrated in the next **Fig. 5** with relative details.

Once the pram, cradle, seat or whatever else is placed on the mobile plane (8), an engine, naturally powered (11), will proceed to modulate the power by means of the rheostat (12), so as to create on the actuators (15) a magnetic field sufficient to lift the coil (17) at a middle track. This operation is obviously valid for all four actuators. In this way, the mobile plane (8) will be lifted from the rest position and every angle will have the possibility to further raise and go down.

This motion is synchronized thanks to the central panel that starts a continuous cycle of movements equivalent to the ones of the pilot car. The upward movement will indeed take place thanks to the principle of the solenoid that, through the magnetic field created by the covering, shifts the coil along the axis.

On the contrary, the opposite movement can be obtained by the movement of the coil downwards inverting the flow of current and, consequently, the magnetic field.

One way to carry out the invention

In a practical solution, this device consists of a fixed plane, not bulky but large enough to comfortably support a pram, a pushchair or even an infant's cot.

One side of this plane is equipped with a ramp for transporting the pram on the mobile plane, which has the same bulk, length and wideness as the parallel lower fixed base. Important characteristic of this invention is not only the precision of its movement, necessary to get the above-described stimulations, but also, obviously, its silence.

As a matter of fact, it's useless to conceive a noisy plane when the aim of the invention is the sleep of the child; in addition, this device may be fitted for example in blocks of flats, where the noise can disturb not only the parents but also the neighbours.

Technically, the motion to apply to the four angles of the mobile plane can be realized with different types of actuators, but it's preferable to adopt an electrical solution, both for its silence and effectiveness, making use of transducers employing electromagnetic energy (solenoids). Considering that the four actuators uniformly support not only the weight of the plane, but also the weight of a pram, pushchair or cot, and even the weight of the baby, the total weight is compatible with the employ of these mechanisms.

In addition, electric power is commonly present in houses and can be directly applied (with all safety measures) to this invention without the need of further apparatus, necessary in fact with different solutions.

The actuators are connected to a fixed central panel, located on the base, previously supplied with the data stored by the sensors of the car.

Thanks to the stored data, the central panel controls the four actuators simultaneously, by variation of power, so reproducing the exact movement registered on the car. It is equipped with a registering system in order to compensate the different capacities of load of the mobile plane; at first, it brings the mobile plane at the desired level, regardless of the load, thus lifting it constantly and in parallel to have dynamic possibility in the two directions (up/down). It can also be equipped with a timer in order to manage duration and time of working that change according to the baby.

The plane, electrically powered, is moved on the four angles by particular moving transducers that, by the methods hereinafter described, imitate the vibrations produced inside a vehicle travelling at a constant speed, with boring and repetitive frequencies, causing a “vestibular stimulation” sending the baby to sleep rapidly.

Obviously, this device, due to its natural purpose, has such a weight and size to be easily transported inside a house, a pleasant design, an extremely noiseless working, an electrical supply compatible with the standard appliances for civil use; in addition, this invention is conformed with all the safety measures provided by law and meeting the required certification (EC).

The suggested solution provides four sensors (three-axes accelerometers) at the angles of the seat of the car that is travelling; these sensors are capable of defining exactly the movement of a point in the space for the three dimensions, with all its physical characteristics (acceleration, wideness, frequency, etc.). The four sensors are connected to a single simple PC that, equipped with specific software for the complete registration of the data, will accurately register, for a definite period (e.g. 30'), the movement of the four angles of the plane in the unit of time, thus faithfully reproducing the motion of the supporting plane (seat).

Once these data are stored, it will be necessary to create an equivalent dynamic plane, controlled by a central panel where the data are transferred, equipped with four moving transducers placed at the corresponding angles. Said transducers will repeat the exact time-space dynamics supplied by the sensors, thus reproducing in cycle the same vestibular stimulations to the subject seating of the same plane.

Reduced to its essential structure and with reference to the figures of the enclosed drawings, a system for sending and/or helping an infant to sleep, according to this invention, comprises at least one means to reproduce faithfully the movement of the plane

of a car and/or other vehicle travelling at a constant not high speed on a straight route, causing vestibular stimulations that involve drowsiness; said means consists of any device that can be applied and/or integrated to a support where the baby is laid and is intended to move said support following the above-cited motion.

This invention also relates to any device capable of reproducing faithfully the movement of the plane of a car travelling at a constant not high speed on a straight route, causing vestibular stimulations that involve drowsiness; said device can be applied and/or integrated to a support where the baby is laid and is intended to move said support following the above-cited motion.

Conveniently, said device is made of a mobile plane, electrically moved, having compact size and moderate weight, but large enough to support a pram, car-seat or cot, which comprises;

- a mobile plane (8) of the car, including a central panel (6) with an entrance for the data and one or more exits for one or more actuators (15a, 15b, 15c, 15d) placed under the mobile plane; said central panel (6) reproduces the movement of a car travelling at a constant not high speed on a straight route and transfers it to said actuators (15) that are connected to the plane (8) and move it accordingly.

Conveniently, a rheostat (12) has the function to regulate initially the apparatus according to the applied load, taking the actuators in working position (middle lift of the coil).

The exact movement of the plane of a car can be registered by different methods.

For example, in order to register accurately the exact movement of the plane of a car on a horizontal line, considering even the least movement despite a uniform and straight route, it's possible to use:

- at least three, preferably four, three-axes accelerometers (4) placed on any seat of the car and at its angles, registering indeed any variation of the point in the space and, together, identifying the relative motion of the plane;
- means to store all the above-mentioned data, by a PC, or other apparatus, equipped with specific software and modulating by parameters the received data according to the position of the sensors and successive actuators.

Conveniently, the rhythm of the speed to give to the invention can be regulated.

This device reproduces faithfully the movement of a car or other means of transport travelling at a constant speed on a straight route; said movement acts on particular nerve tracts sending the baby to sleep in few minutes. This system is absolutely harmless and less invasive than the different systems having the same purpose (medicines, etc.).

Conveniently, this invention can be equipped with a timer, so as to be regulated for a prefixed period.

Conveniently, this invention is equipped with a rheostat for regulating the power according to the applied load.

Conveniently, this invention, thanks to its wide plane, can support either a pram or a cot.

Conveniently, this invention has compact sizes, in order to avoid excessive domestic bulks.

Conveniently, this invention is powered by 220V current, commonly used in all houses.

System for sending and/or helping an infant to sleep, comprising at least one means to reproduce faithfully the movement of the plane of a car and/or other vehicle travelling at a constant not high speed on a straight route, causing vestibular stimulations that involve drowsiness; said means consists of any device that can be applied and/or integrated to a support where the baby is laid, intended to move said support following the above-cited motion.

Device capable of reproducing faithfully the movement of the plane of a car travelling at a constant not high speed on a straight route, causing vestibular stimulations that involve drowsiness; said device can be applied and/or integrated to a support where the baby is laid, intended to move said support following the above-cited motion.

Said device made of a mobile plane (8), suitable to support a pram, car-seat, cot or other baby receptacle, including a central panel (6) with at least one entrance for the data and at least one, preferably more than one, exit for one or more actuators (15a, 15b, 15c, 15d) placed under the mobile plane; said central panel (6) reproduces the movement of a car travelling at a constant not high speed on a straight route and transfers it to said actuators (15) that are connected to the plane (8) and move it accordingly.

Said device including a rheostat (12) for its initial regulation, which takes the actuators in working position (middle lift of the coil).

Said device including electromagnetic actuators (15).

Said actuators connected to the base (9) and placed at its four angles; they are connected as well to the exits (a/b/c/d) of the central panel (6) storing the data relating to the motion to give to the plane.

Said device wherein the assembling between base (9) and mobile plane (8) is guaranteed by a rubber boss (20) that is stiff enough but, at the same time, permits the necessary shift (α) caused by the variable angulations the mobile plane takes during work.

Said device including a spring (21) placed between the boss (20), connected to the mobile plane (8), and the coil (17) of the actuator, connected to the base (9).

System for moving the above-mentioned device that, once the pram, cradle, seat or whatever else is placed on the mobile plane (8), proceeds, naturally powered (11), to modulate the power by means of the rheostat (12), so as to create on the actuators (15) a magnetic field sufficient to lift the coil (17) at a middle track. In this way, the mobile plane

(8) will be lifted from the rest position and every angle will have the possibility to further raise and go down.

Said system wherein this motion is synchronized, following the rhythm given by the central panel that starts a continuous cycle of movements equivalent to the ones of the pilot car.

Said system wherein the central panel controls the actuators simultaneously, by variation of the power.

Said system wherein the movement of the coil downwards takes place inverting the flow of current and, consequently, the magnetic field.

Said system wherein the central panel is equipped with a registering system in order to compensate the different capacities of load of the mobile plane.

Said system wherein the central panel is equipped with a timer in order to manage duration and time of working that change according to the baby.

Device consisting of a fixed base equipped with a ramp for transporting the pram or other baby receptacle on the mobile plane.

Said system and device wherein the speed to give to the invention can be regulated.

Said system and device including a timer.

Said system and device including a rheostat for regulating the power according to the applied load.

Said system and device powered by 220V current, by battery or any other means.

Said system and device supplied with at least one switch for turning it on.

Said system and device wherein the controls are placed at the end of the device, on the cover (10) containing the central panel (6).

Said cover (10) hinged for the insertion of the central panel and its maintenance, and however connected to the fixed base (9), where the mobile plane (8) is placed, dynamically connected to it.

System for registering the movement of the plane of a car travelling at a constant not high speed, comprising:

- at least three, preferably four, three-axes accelerometers (4) placed on any seat of the car and at its angles, registering indeed any variation of the point in the space and, together, identifying the relative motion of the plane;
- means to store all the above-mentioned data, by a PC, or other apparatus, equipped with specific software and modulating by parameters the received data according to the position of the sensors and successive actuators.

In practice, the manufacturing details may however equally vary as regards shape, size, position of elements and type of materials used, but still remain within the range of the idea proposed as a solution and, consequently, within the limits of the protection granted by this patent for invention.

CLAIMS

- 1) System for sending and/or helping an infant to sleep, characterized in that it comprises at least one means to reproduce faithfully the movement of the plane of a car and/or other vehicle travelling at a constant not high speed on a straight route, causing vestibular stimulations that involve drowsiness; said means consists of any device that can be applied and/or integrated to a support where the baby is laid, intended to move said support following the above-cited motion.
- 2) Device characterized in that it is capable of reproducing faithfully the movement of the plane of a car travelling at a constant not high speed on a straight route, causing vestibular stimulations that involve drowsiness; said device can be applied and/or integrated to a support where the baby is laid, intended to move said support following the above-cited motion.
- 3) Device as claimed in claim 1 or 2, characterized in that it is made of a mobile plane (8), suitable to support a pram, car-seat, cot or other baby receptacle, including a central panel (6) with at least one entrance for the data and at least one, preferably more than one, exit for one or more actuators (15a, 15b, 15c, 15d) placed under the mobile plane; said central panel (6) reproduces the movement of a car travelling at a constant not high speed on a straight route and transfers it to said actuators (15) that are connected to the plane (8) and move it accordingly.
- 4) Device as claimed in claim 1, 2 or 3, characterized in that it includes a rheostat (12) for its initial regulation, which takes the actuators in working position (middle lift of the coil).
- 5) Device as claimed in claim 1, 2 or 3, characterized in that it includes electromagnetic actuators (15).
- 6) Device as claimed in claim 1, 2 or 3, characterized in that it comprises a fixed base (9) connected to an upper supporting mobile plane (8).

7) Device as claimed in claim 1, 2 or 3, characterized in that the assembling between base (9) and mobile plane (8) is guaranteed by a rubber boss (20) that is stiff enough but, at the same time, permits the necessary shift (α) caused by the variable angulations the mobile plane takes during work.

8) Device as claimed in claim 7, characterized in that it includes a spring (21) placed between the boss (20), connected to the mobile plane (8), and the coil (17) of the actuator, connected to the base (9).

9) Device as claimed in one or more of the above claims, characterized in that the actuators are connected to the base (9) and placed at its four angles; they are connected as well to the exits (a/b/c/d) of the central panel (6) storing the data relating to the motion to give to the plane.

10) Device as claimed in one or more of the above claims, characterized in that it includes a central panel (6) equipped with a registering system, in order to compensate the different capacities of load of the mobile plane.

11) Device as claimed in one or more of the above claims, characterized in that it includes a central panel equipped with a timer, in order to manage duration and time of working that change according to the baby.

12) Device as claimed in one or more of the above claims, characterized in that it consists of a fixed base equipped with a ramp for transporting the pram or other baby receptacle on the mobile plane.

13) System and device as claimed in one or more of the above claims, characterized in that the speed to give to the invention can be regulated.

14) System and device as claimed in one or more of the above claims, characterized in that it includes a timer.

15) System and device as claimed in one or more of the above claims, characterized in that it includes a rheostat for regulating the power according to the applied load.

16) System and device as claimed in one or more of the above claims, characterized in that it is powered by 220V current, by battery or any other means.

17) System and device as claimed in one or more of the above claims, characterized in that it is supplied with at least one switch for turning it on.

18) System and device as claimed in one or more of the above claims, characterized in that the controls are placed at the end of the device, on the cover (10) containing the central panel (6).

19) System and device as claimed in claim 17, characterized in that said cover (10) is hinged for the insertion of the central panel and its maintenance, and however connected to the fixed base (9), where the mobile plane (8) is placed, dynamically connected to it.

20) System as claimed in one or more of the above claims, characterized in that, once the pram, cradle, seat or whatever else is placed on the mobile plane (8), it proceeds, naturally powered (11), to modulate the power by means of the rheostat (12), so as to create on the actuators (15) a magnetic field sufficient to lift the coil (17) at a middle track. In this way, the mobile plane (8) will be lifted from the rest position and every angle will have the possibility to further raise and go down.

21) System and device as claimed in one or more of the above claims, characterized in that this motion is synchronized, following the rhythm given by the central panel that starts a continuous cycle of movements equivalent to the ones of the pilot car.

22) System and device as claimed in one or more of the above claims, characterized in that it includes a central panel that controls the actuators simultaneously, by variation of the power.

23) System and device as claimed in one or more of the above claims, characterized in that the movement of the coil of the actuators downwards takes place inverting the flow of current and, consequently, the magnetic field.

24) System for registering the movement of the plane of a car travelling at a constant not high speed, characterized in that it comprises:

- at least three, preferably four, three-axes accelerometers (4) placed on any seat of the car and at its angles, registering indeed any variation of the point in the space and, together, identifying the relative motion of the plane;
- means to store all the above-mentioned data, by a PC, or other apparatus, equipped with specific software and modulating by parameters the received data according to the position of the sensors and successive actuators.

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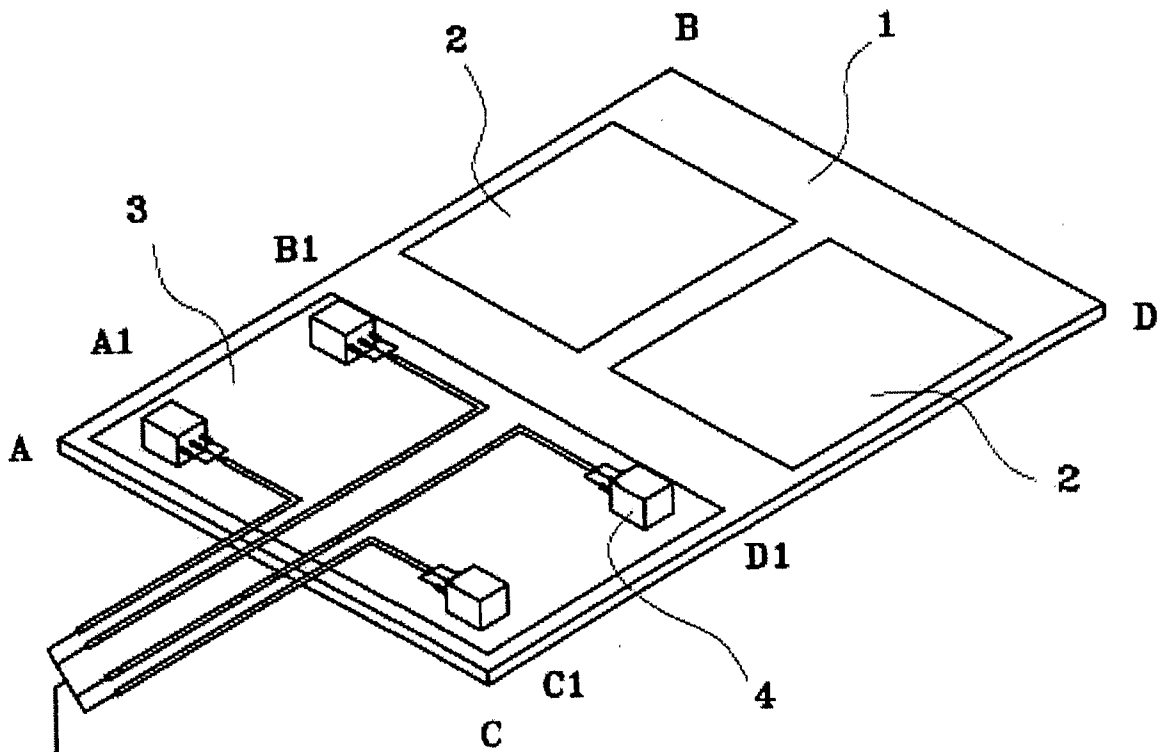
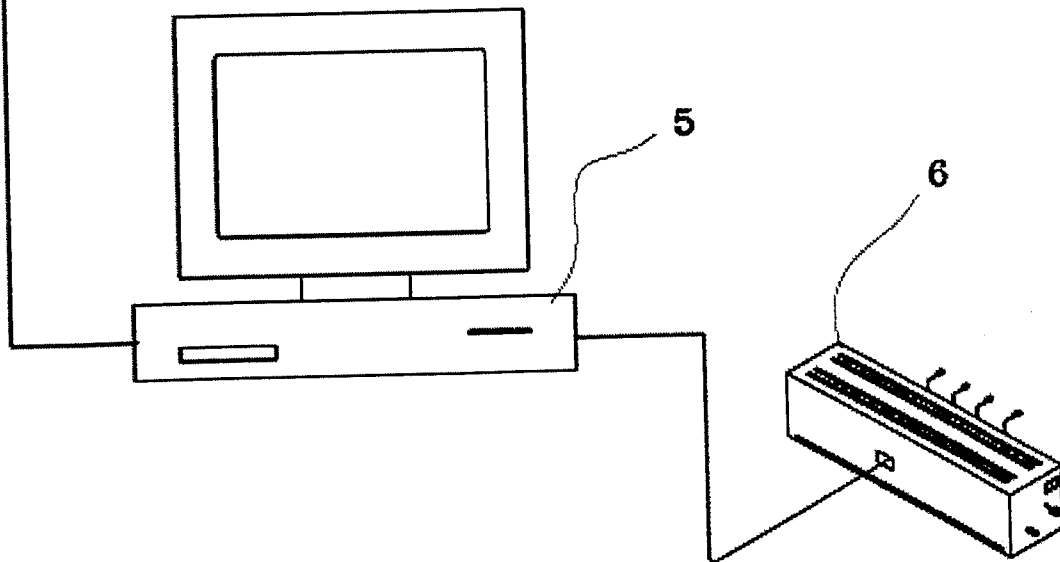


Fig. 1



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Fig.2

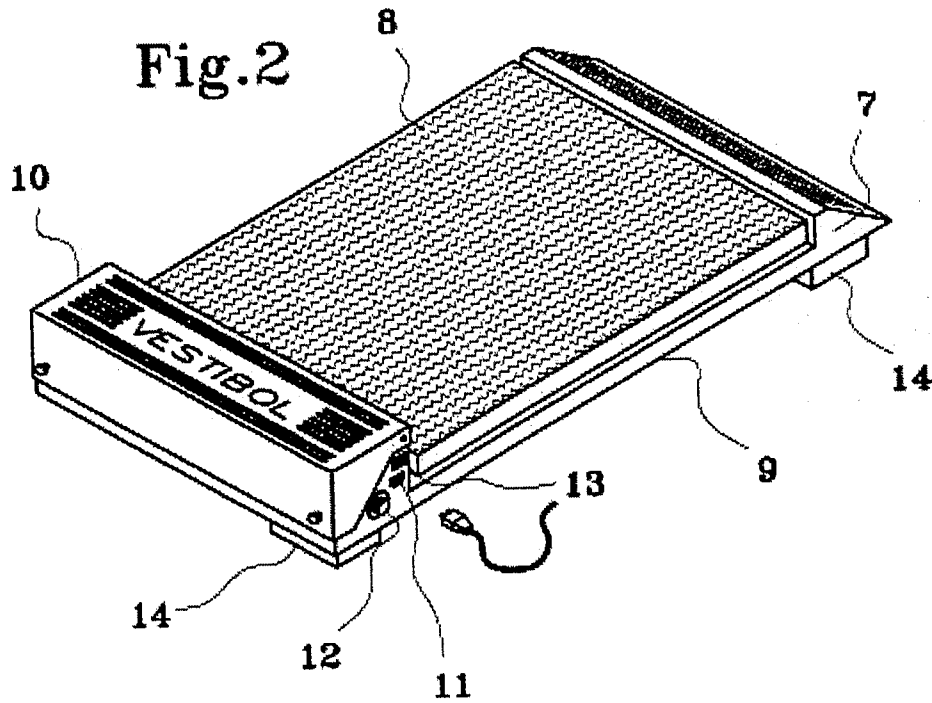


Fig.3

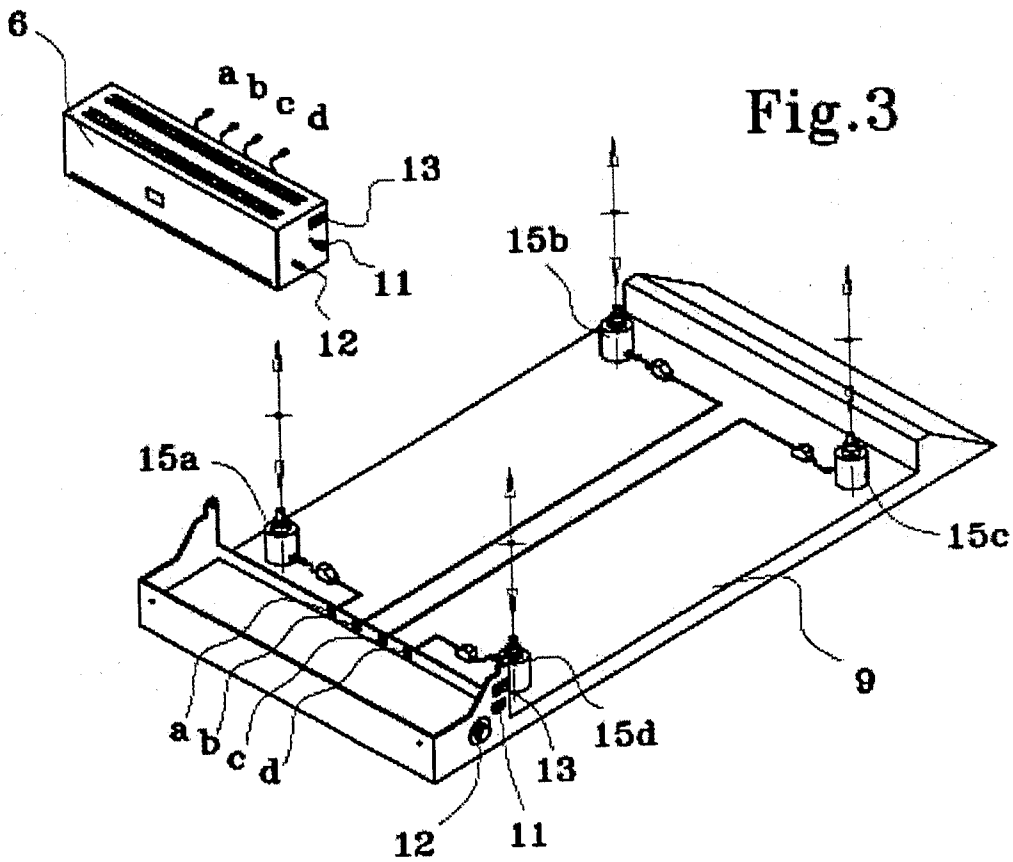


Fig.4

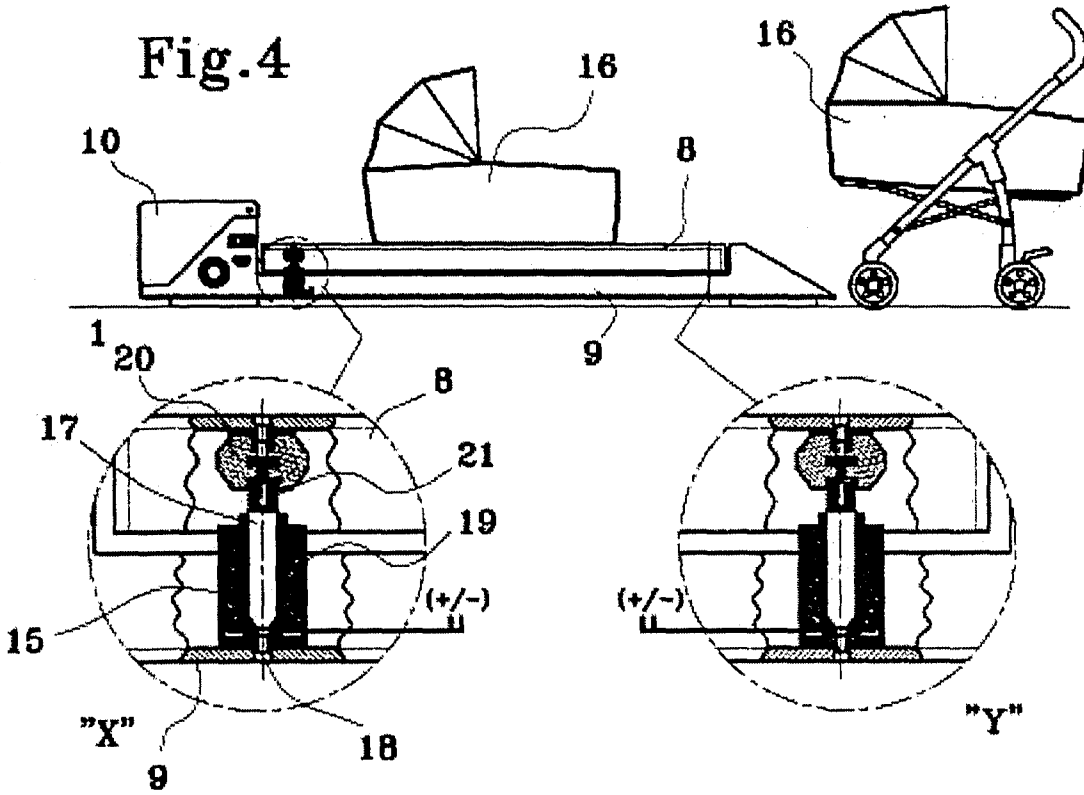
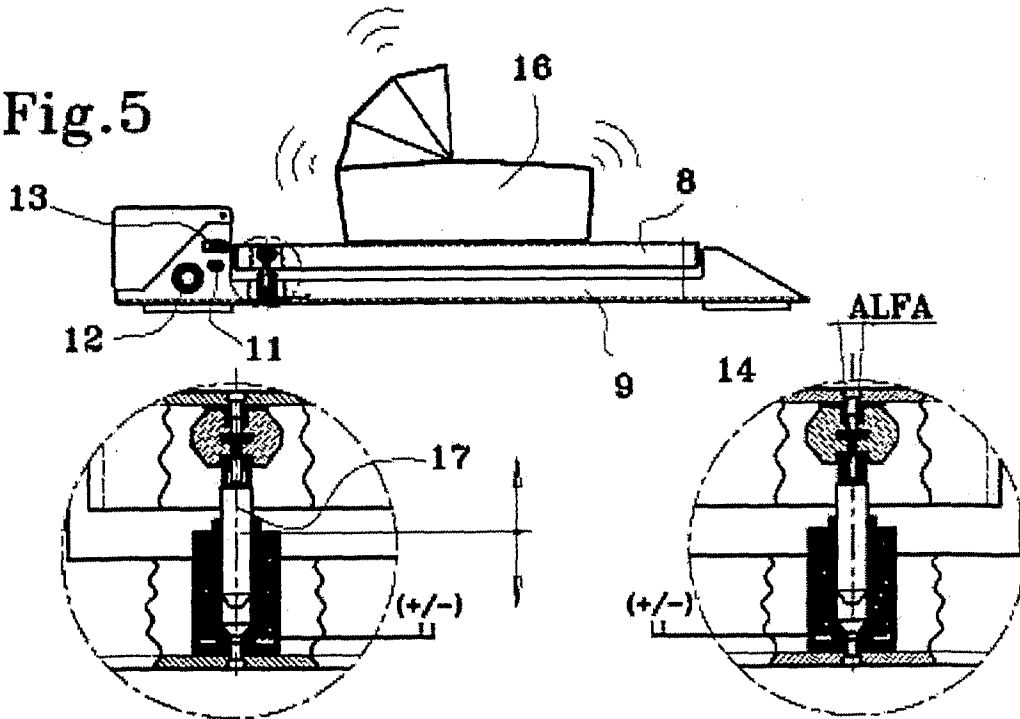


Fig.5



INTERNATIONAL SEARCH REPORT

International application No
PCT/IT2006/000215

A. CLASSIFICATION OF SUBJECT MATTER
 INV. B62B9/22 A47D9/02 A47D9/04

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)
 B62B A47D A47C

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 practical, 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	DE 299 01 730 U1 (SCHMITZ SANDRA [DE]) 15 April 1999 (1999-04-15) the whole document	1,2,6, 16,21
X	WO 95/23722 A (MCCUAIG RONALD [GB]; KEMP PETER [GB]) 8 September 1995 (1995-09-08) the whole document	1,2,6, 11-14, 16-18,21
X	FR 2 669 201 A1 (DJABALI ABDELMALIK) 22 May 1992 (1992-05-22) page 2, line 26 - page 6, line 17; figures 1,3-9	1-3,6, 11,14, 16-18

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 document 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.
- *B* document member of the same patent family

Date of the actual completion of the international search 7 December 2006	Date of mailing of the international search report 11/07/2007
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer Kus, Slawomir

INTERNATIONAL SEARCH REPORT

International application No
PCT/IT2006/000215

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 2006/010972 A (JETTA COMPANY LTD [CN]; WONG SUI-KAY [CN]) 2 February 2006 (2006-02-02) page 4, line 20 - page 10, line 9; figures 1-5 -----	1,2,11, 13-18, 21,22
X	GB 2 307 025 A (GEORGE RODNEY ERNEST [GB]) 14 May 1997 (1997-05-14) the whole document -----	1,2,6, 13,16-18
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X	WO 98/17150 A2 (INFANT ADVANTAGE INC [US]) 30 April 1998 (1998-04-30) page 5 - page 24; figures 1-25 -----	1-3,6, 10,11, 13,14, 16-18, 21,22
X	WO 2005/084497 A (MITCHELL CHRISTOPHER ROBERT MU [AU]) 15 September 2005 (2005-09-15) page 10, line 12 - page 12, line 23; figures 1-10 -----	1,2,5-7, 13, 16-18, 21,22
X	JP 11 089681 A (COMBI CO) 6 April 1999 (1999-04-06) figures 1-14 -----	1-3,5,6, 11,13, 14, 16-18, 22,23
X	DE 20 2005 017014 U1 (IDEEMATEC DEUTSCHLAND GMBH [DE]) 12 January 2006 (2006-01-12) the whole document -----	1,2
X	GB 2 334 670 A (ROWE CHRISTOPHER [GB]; CRABTREE JOHN RAWLYN CHARLES [GB]) 1 September 1999 (1999-09-01) the whole document -----	1,2

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IT2006/000215

Box 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.:
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:

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 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:

see additional sheet

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 fee, this Authority did not invite payment of any additional fee.

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.:

1-23

Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
- No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-23

System and/or device for sending and/or helping an infant to sleep

2. claim: 24

System for registering the movement of a plane or car

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/IT2006/000215

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