



(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 153(4) EPC

(43) Date of publication:
08.03.2017 Bulletin 2017/10

(51) Int Cl.:
A47D 9/02 (2006.01)

(21) Application number: **15785584.2**

(86) International application number:
PCT/ES2015/000055

(22) Date of filing: **23.04.2015**

(87) International publication number:
WO 2015/166118 (05.11.2015 Gazette 2015/44)

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
MA

(71) Applicant: **Dominguez Fernandez, Marco Antonio**
19171 Guadalajara (ES)

(72) Inventor: **Dominguez Fernandez, Marco Antonio**
19171 Guadalajara (ES)

(74) Representative: **Del Valle Valiente, Sonia**
C/ Miguel Angel Cantero Oliva, 5,53
28660 Boadilla del Monte-Madrid (ES)

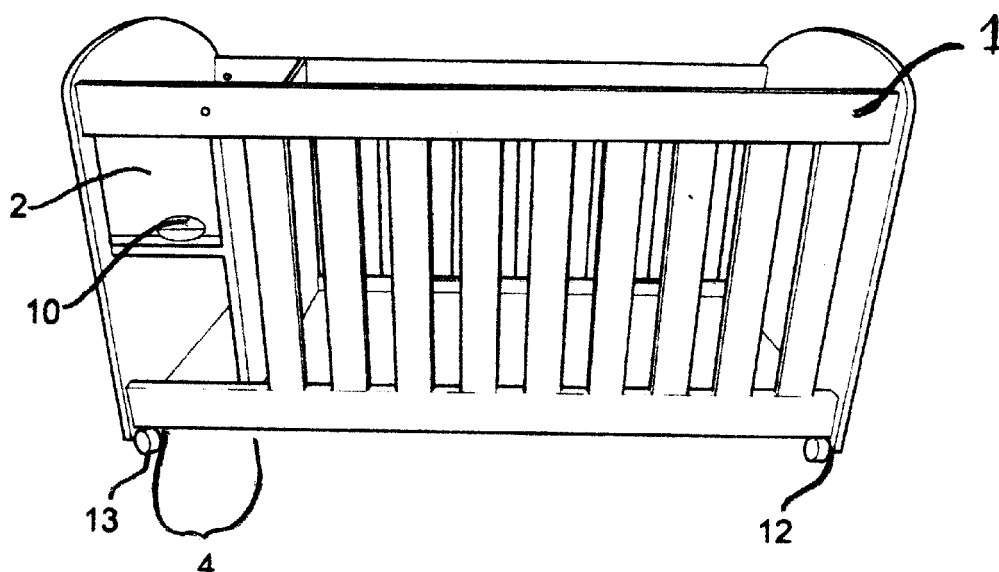
(30) Priority: **02.05.2014 ES 201430592 U**

(54) **CRADLE PROVIDED WITH AUTOMATIC ROCKING MEANS**

(57) The invention relates to a cradle, provided with automatic rocking means, that is safe, effective and easily maintained, wherein the automatic rocking means comprise a mobile mass and a motor for actuating the mass, characterized in that the rocking means are dis-

posed inside a box, said cradle being provided with a housing for the box and with detachable means for securing the box to the housing, and said box being removable from its housing.

Fig. 1



Description

[0001] The present invention relates to a cradle provided with automatic rocking means that is safe, effective and easily maintained.

Background of the invention

[0002] Cradles provided with automatic rocking means, in which said means comprise a mobile mass and a motor for actuating said mass, are known.

[0003] Several examples of these cradles have been the object of patent applications, such as those that are described in documents CN203195171, CN203137732, CN202751078 or CN2501398.

[0004] However, few or none of the ones described in said documents have been placed on the market.

[0005] There are several reasons why. First of all, many of these devices are mechanically complex and not reliable. Moreover, they are dangerous, due to the fact that they have accessible mobile parts and are not subject to authorization.

[0006] Lastly, in the case of malfunction, the repair of these devices implies disassembling the cradle or sending it to a repair service.

Description of the invention

[0007] In order to overcome the shortfalls of the state of the art, the present invention proposes a cradle provided with automatic rocking means, in which said means comprise a mobile mass and a motor for actuating the mass, characterized in that the means are disposed inside a box, the cradle being provided with a housing for said box and with detachable means for securing the box to the housing, said box being removable from said housing.

[0008] Given that the rocking means are housed in a removable box, the shortfalls of the state of the art are resolved.

[0009] Firstly, it is safe, given that the inertial rocking means can be disposed inside the box, and therefore it is not necessary to have accessible connections between the motor and the cradle in the assembly thereof.

[0010] Second, in the case of a malfunction, the only thing that needs to be done is to remove the box from the cradle and send it in for repair. The rest of the cradle continues to be operative.

[0011] According to several optional characteristics of the invention, which may be combined provided that it is technically possible:

- According to a first variant of the invention, the cradle comprises a section adjacent to one of the ends, this section provided with the aforementioned housing.
- The housing is a transverse channel which is open at both ends, such that it is possible to remove the box by pushing it.

- The channel is provided with an upper opening, and the box comprises on its upper part a push button box with controls for actuating the automatic rocking means, programming and control, said opening coinciding with the push button box when the box is in its fitted position of use.
- The channel comprises a side opening which leads to the volume of the cradle that is for receiving the baby, and in which the box comprises a speaker and a noise sensor disposed to coincide with this side opening when the box is in its fitted position of use.
- The channel comprises a side opening that allows for the viewfinder of a camera located inside the box to capture image signals from inside the cradle, and in which the viewfinder of the camera is disposed to coincide with this side opening when the box is in its fitted position of use.
- The channel comprises an upper opening that allows for the projection of images by means of a light carousel located inside the box, and in which the viewfinder of the carousel is disposed to coincide with this upper opening when the box is in its fitted position of use.
- The channel comprises an upper opening in order for the vapors of a humidifier located inside the box to be emitted, and in which the nozzle is disposed to coincide with this upper opening when the box is in its fitted position of use.
- The box comprises an opening disposed on one of its accessible faces when it is in its fitted position of use for the insertion/removal of a rechargeable battery.
- The box comprises an opening disposed on one of its inner faces where the removable tank of the humidifier system is housed and this humidifier is connected by means of a connection plug for the insertion/removal of the humidifier tank.
- The side panel has an opening and an inspection cover for when the box is fitted in its position of use, and so that the humidifier tank coincides with this cover for the insertion/removal of the refillable humidifier tank.
- The detachable means for securing the box comprise at least one screw between the outer wall of the housing and the side face of the box adjacent to said wall.
- According to another variant of the invention, the box is disposed in the cradle mattress support, and on one end thereof, such that extraction is done at an edge of the mattress support.
- The cradle comprises a control module for the automatic rocking means which may be coupled to the panel at the end of the cradle, the control module and the box provided with connections for the mutual connection thereof.
- The control module comprises connections at two different heights, such that the automatic rocking means can be disposed and powered at two different

heights of the mattress support.

- The control module has a speaker in the inner part thereof with a coinciding hole in the panel when this control module is attached to the side of the cradle.
- The control module has a video camera in the inner part thereof with a coinciding hole in the panel when this control module is attached to the side of the cradle.
- The control module has a noise sensor on the inner face thereof with a coinciding hole in the panel when this control module is attached to the side of the cradle.
- The carousel is incorporated into the control module.
- The control module has an incorporated humidifier and there is a coinciding hole in the panel when this control module is attached to the side of the cradle.
- The control module has a control panel on the upper part thereof.
- The control module has means for being secured to the side panel of the cradle.
- The control module has a removable rechargeable battery on its upper part when this control module is attached to the side of the cradle.
- The control module has an inspection cover for the tank of the removable and refillable humidifier located inside the control module when this control module is attached to the side of the cradle.
- The ratio of the mobile mass to the total mass of the cradle is a maximum of 20 gr of mobile mass per kg of cradle, the rocking speed comprised between 100 and 200 rpm.
- The mass is an eccentric mass with a vertical axis, said vertical axis actuated by the motor with the interposition of a reduction stage.
- The cradle comprises four wheels on its lower corners, with the two that are distant from the housing of the box being lockable with regard to direction as well as rotation, and the two wheels that are close to the housing being lockable with regard to direction.
- The box comprises four legs at the corners, these legs being made up of:
 - A supporting plate on the ground;
 - An attachment to the cradle;
 - An elastic element disposed between the supporting plate and the attachment;

[0012] Such that the legs allow for the movement of the cradle.

[0013] Lastly, the elastic element is a spiral spring or an elastomer block.

Brief description of the drawings

[0014] For the purpose of helping to make the foregoing description more readily understandable, it is accompanied by a set of drawings that, schematically and by way of illustration and not limitation, represent two prac-

tical embodiments.

Figures 1 to 6 show a first embodiment of the invention, in that the automatic rocking means are disposed in a box at an end section of the cradle, the box incorporating all of the other functions of the cradle.

Figures 7 to 11 schematically show a second embodiment of the invention, in which the automatic rocking means are disposed in a box integrated in the mattress support, but in which all of the other functions, including the control functions, are arranged in a control module coupled to a vertical end panel of the cradle.

Figures 12 and 14 show a box related to the first preferred embodiment.

Figure 13 shows a leg which is especially designed for the cradle of the invention.

Description of a preferred embodiment

[0015] As can be observed in the figures, the invention relates in general to a cradle 1 provided with automatic rocking means, in which said means comprise a mobile mass and a motor for actuating the mass, characterized in that the means are disposed inside a box 2, the cradle being provided with a housing 3 for said box 2 and with detachable means for securing the box 2 to the housing 3, said box 2 being removable from said housing 3.

First preferred embodiment

[0016] As can be seen in figures 1 to 5, the cradle comprises a section 4 adjacent to one of the ends, this section being provided with the aforementioned housing 3, which is a transverse channel open at both ends, such that it is possible to remove the box 2 by pushing it.

[0017] This channel is provided with an upper opening 5, and the box 2 comprises on its upper part a push button box 6 with controls for actuating the automatic rocking means, programming and control, said opening 5 coinciding with the push button box 6 when the box 2 is in its fitted position of use. The channel 3 can optionally be provided with a detachable safety cover 33 adapted to cover the upper opening 5, thereby hiding the push button box 6.

[0018] The channel comprises:

- A side opening 8 that leads to the volume of the cradle that is for receiving the baby, and the box 2 comprises a speaker 9 and a noise sensor 14 disposed to coincide with this side opening 8 when the box 2 is in its fitted position of use.
- A side opening 28 that allows for the viewfinder of a camera 24 located inside the box 2 to capture image signals from inside the cradle and in which the viewfinder of the camera 24 is disposed to coincide with this side opening 28 when the box 2 is in its fitted

position of use.

- An upper opening 29 that allows for the projection of images by means of a light carousel 21 located inside the box 2 and in which the viewfinder of the carousel is disposed to coincide with this upper opening 29 when the box 2 is in its fitted position of use.
- An upper opening 30 so that the vapors of a humidifier 23 located inside the box 2 can be emitted, and in which the nozzle is disposed to coincide with this upper opening 30 when the box 2 is in its fitted position of use.

[0019] The box comprises an opening 10 disposed on one of its accessible faces when it is in its fitted position of use for the insertion/removal of a rechargeable battery.

[0020] The box 2 comprises an opening disposed on one of its inner faces where the removable tank 22 of the humidifier system is housed, and this humidifier is connected by means of a connection plug for the insertion/removal of the humidifier tank 22.

[0021] The side panel 31 has an opening and an inspection cover 32 for when the box 2 is fitted in its position of use and in order for the humidifier tank 22 to coincide with this inspection cover 32 for the insertion/removal of the refillable humidifier tank.

[0022] As can be seen in figure 6, the detachable means for securing the box comprise at least a screw 11 between the outer wall of the housing 3 and the side face of the box 2 adjacent to said wall.

Second preferred embodiment

[0023] In this second embodiment, the box 2 is disposed in the cradle mattress support 15, and on one end thereof, such that removal is done at an edge of the mattress support. The box is secured to the mattress support by means of T-screws, such that when they are loosened, the box is detached from the mattress support by becoming unfastened. Therefore, the box will remain inaccessible from the bottom of the mattress support, and only the two holes for the fastening screws will be seen from above.

[0024] Also provided is a control module 16 for the automatic rocking means which may be coupled to the panel P at the end of the cradle, the control module 16 and the box 2 provided with connections 17 for the mutual connection thereof.

[0025] This control module 16 comprises:

- Connections 17 at two different heights, as can be seen in figure 10, such that the automatic rocking means can be disposed and powered at two different heights of the mattress support 15. Figure 10 shows, through the corresponding holes in the panel P, the elements 9, 14 and 24 that belong to the module 16, represented in figure 11.
- A speaker 9 in the inner part thereof with a coinciding

hole in the panel P when this control module is attached to the side of the cradle.

- A video camera 24 in the inner part thereof with a coinciding hole in the panel P when this control module is attached to the side of the cradle.
- A noise sensor 14 on its inner face with a coinciding hole in the panel P when this control module is attached to the side of the cradle.
- An incorporated carousel 21.
- An incorporated humidifier 23 with an upper hole in the panel P when this control module is attached to the side of the cradle.
- A control panel 26 on the upper part thereof.
- Means for being secured 25 to the side panel P of the cradle.
- A removable rechargeable battery 27 on the upper part thereof when this control module is attached to the side of the cradle.
- An inspection cover for the tank 34 of the removable and refillable humidifier located inside the control module 16 when this control module is attached to the side of the cradle.

[0026] In all of the embodiments, the ratio of the mobile mass to the total mass of the cradle is a maximum of 20 gr of mobile mass per kg of cradle, the rocking speed comprised between 100 and 200 rpm.

[0027] This mass is an eccentric mass with a vertical axis, said vertical axis actuated by the motor with the interposition of a reduction stage.

[0028] As can be seen in figure 1, the cradle comprises four wheels 12, 13 on its lower corners, with the two that are distant 12 from the housing of the box being lockable with regard to direction as well as rotation, and the two wheels that are close 13 to the housing being lockable with regard to direction.

[0029] As can be seen in figure 13, the box comprises four legs on the corners, these legs made up of:

- A supporting plate on the ground 18;
- An attachment to the cradle 19;
- A spiral spring or an elastomer block 20 disposed between the supporting plate 18 and the attachment 19;

[0030] Such that the legs allow for the movement of the cradle.

[0031] Despite the fact that reference has been made to a specific embodiment of the invention, it is evident for a person skilled in the art that numerous variations and changes may be made to the cradle described, and that all the aforementioned details may be substituted by other technically equivalent ones, without detracting from the scope of protection defined by the attached claims.

Claims

1. A cradle (1) provided with automatic rocking means, in which said means comprise a mobile mass and a motor for actuating said mass, **characterized in that** said means are disposed inside a box (2), the cradle (1) being provided with a housing (3) for said box (2) and with detachable means for securing the box (2) to the housing (3), said box (2) being removable from said housing (3). 5
2. The cradle according to claim 1, which comprises a section (4) adjacent to one of the ends, this section being provided with the aforementioned housing (3). 10
3. The cradle according to claim 2, in which the housing (3) is a transverse channel open at both ends, such that it is possible to remove the box (2) by pushing it. 15
4. The cradle according to claim 3, in which the channel (3) is provided with an upper opening (5), and the box (2) comprises on its upper part a push button box (6) with controls for actuating (7) the automatic rocking means, programming and control, the opening (5) coinciding with the push button box (6) when the box (2) is in its fitted position of use. 20 25
5. The cradle according to either of claims 3 or 4, in which the channel comprises a side opening (8) that leads to the volume of the cradle that is for receiving the baby, and in which the box (2) comprises a speaker (9) and a noise sensor (14) disposed to coincide with this side opening (8) when the box (2) is in its fitted position of use. 30 35
6. The cradle according to any of claims 3 to 5, in which the channel comprises a side opening (28) that allows for the viewfinder of a camera (24) located inside the box (2) to capture image signals from inside the cradle and in which the viewfinder of the camera (24) is disposed to coincide with this side opening (28) when the box (2) is in its fitted position of use. 40
7. The cradle according to any of claims 3 to 6, in which the channel comprises an upper opening (29) that allows for projection of images by means of a light carousel (21) located inside the box (2) and in which the viewfinder of the carousel (21) is disposed to coincide with this upper opening (29) when the box (2) is in its fitted position of use. 45 50
8. The cradle according to any of claims 3 to 7, in which the channel comprises an upper opening (30) so that the vapors of a humidifier (23) located inside the box (2) can be emitted, and in which the nozzle of the humidifier is disposed to coincide with this upper opening (30) when the box (2) is in its fitted position of use. 55
9. The cradle according to any of claims 3 to 8, in which the box comprises an opening (10) disposed on one of its accessible faces when it is in its fitted position of use for the insertion/removal of a rechargeable battery. 5
10. The cradle according to claim 8, in which the box (2) comprises an opening disposed in one of its inner faces where the extractable tank (22) of the humidifier system is housed and this humidifier is connected by means of a connection plug for the insertion/removal of the humidifier tank (22). 10
11. The cradle according to any of claims 3 to 5, in which the side panel (31) has an opening and an inspection cover (32) for when the box (2) is fitted in its position of use, and so that the humidifier tank (22) coincides with this inspection cover (32) for the insertion/removal of the refillable humidifier tank. 15
12. The cradle according to claims 2 to 11, in which the detachable means for securing the box comprise at least a screw (11) between the outer wall of the housing (3) and the side face of the box (2) adjacent to said wall. 20 25
13. The cradle according to claim 1, in which the box (2) is disposed in the mattress support (15), and on one end thereof, such that removal is done at one edge of the mattress support. 30
14. The cradle according to claim 13, which comprises a control module (16) for the automatic rocking means which may be coupled to the panel (P) at the end of the cradle, the control module (16) and the box (2) provided with connections (17) for the mutual connection thereof. 35 40
15. The cradle according to claim 9, in which the control module comprises connections (17) at two different heights, such that the automatic rocking means can be disposed and powered at two different heights of the mattress support (15). 45
16. The cradle according to claim 14, in which the control module (16) has a speaker (9) in the inner part thereof with a coinciding hole in the panel (P) when this control module is attached to the side of the cradle. 50
17. The cradle according to claim 14, in which the control module (16) has a video camera (24) in the inner part thereof, with a coinciding hole in the panel (P) when this control module is attached to the side of the cradle. 55
18. The cradle according to claim 14, in which the control module (16) has noise sensor (14) on its inner face with a coinciding hole in the panel (P) when this con-

trol module (16) is attached to the side of the cradle (P).

19. The cradle according to claim 14, in which the control module (16) has an incorporated carousel (21). 5
20. The cradle according to claim 14, in which the control module (16) has an incorporated humidifier (23), with an upper hole in the panel (P) when this control module is attached to the side of the cradle. 10
21. The cradle according to claim 14, in which the control module (16) has a control panel (26) on its upper part.
22. The cradle according to claim 14, in which the control module (16) has attachments (25) to the side panel (P) of the cradle. 15
23. The cradle according to claim 14, in which the control module (16) has a removable rechargeable battery (27) on its upper part when this control module is attached to the side of the cradle. 20
24. The cradle according to claim 14, in which the control module (16) has an inspection cover (34) for the tank of the removable and refillable humidifier located inside the control module (16) when this control module is attached to the side of the cradle. 25
25. The cradle according to any of claims 2 to 24, in which the ratio of the mobile mass to the total mass of the cradle is a maximum of 20 gr of mobile mass per kg of cradle, the rocking speed comprised between 100 and 200 rpm. 30
26. The cradle according to any of the previous claims, in which said mass is an eccentric mass with a vertical axis, said vertical axis actuated by the motor with the interposition of a reduction stage. 35
27. The cradle according to claims 2 to 26, which comprises four wheels (12, 13) on its lower corners, with the two that are distant (12) from the housing for the box being lockable both with regard to direction as well as rotation, and the two wheels that are close (13) to the housing being lockable with regard to direction. 40
28. The cradle according to any of claims 1 to 27, in which the box comprises four legs on the corners, these legs being made up of: 50
 - A supporting plate on the ground (18);
 - An attachment to the cradle (19);
 - An elastic element (20) disposed between the supporting plate (18) and the attachment (19) such that the legs allow the cradle to move. 55

29. The cradle according to claim 28, in which the elastic element is a spiral spring or an elastomer block.

Fig. 1

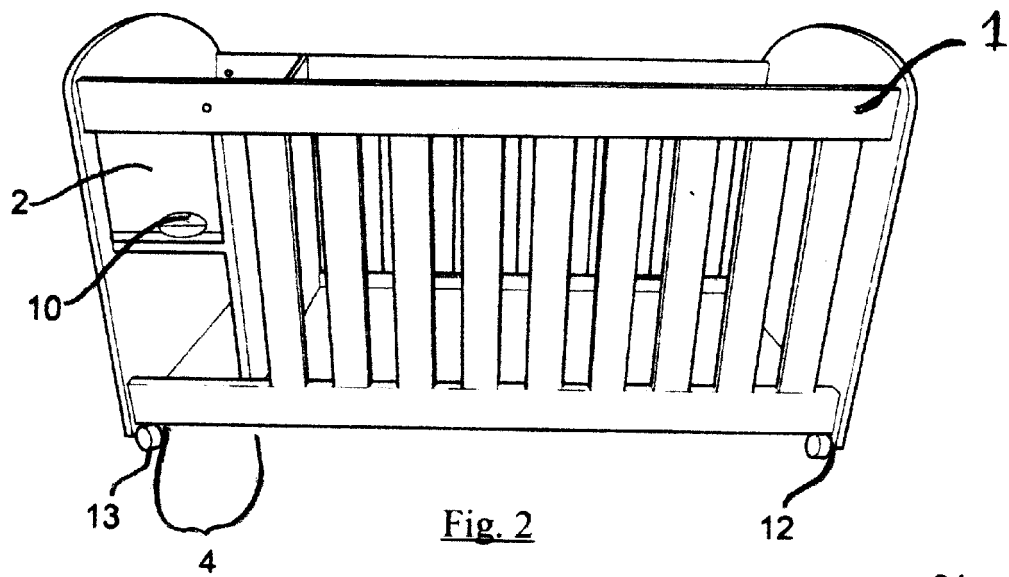


Fig. 2

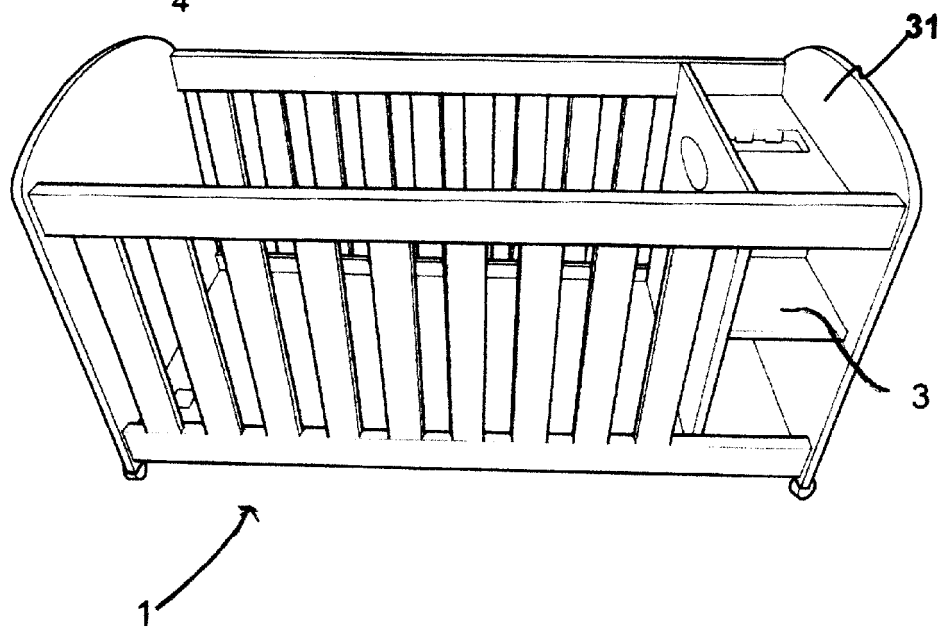


Fig. 3

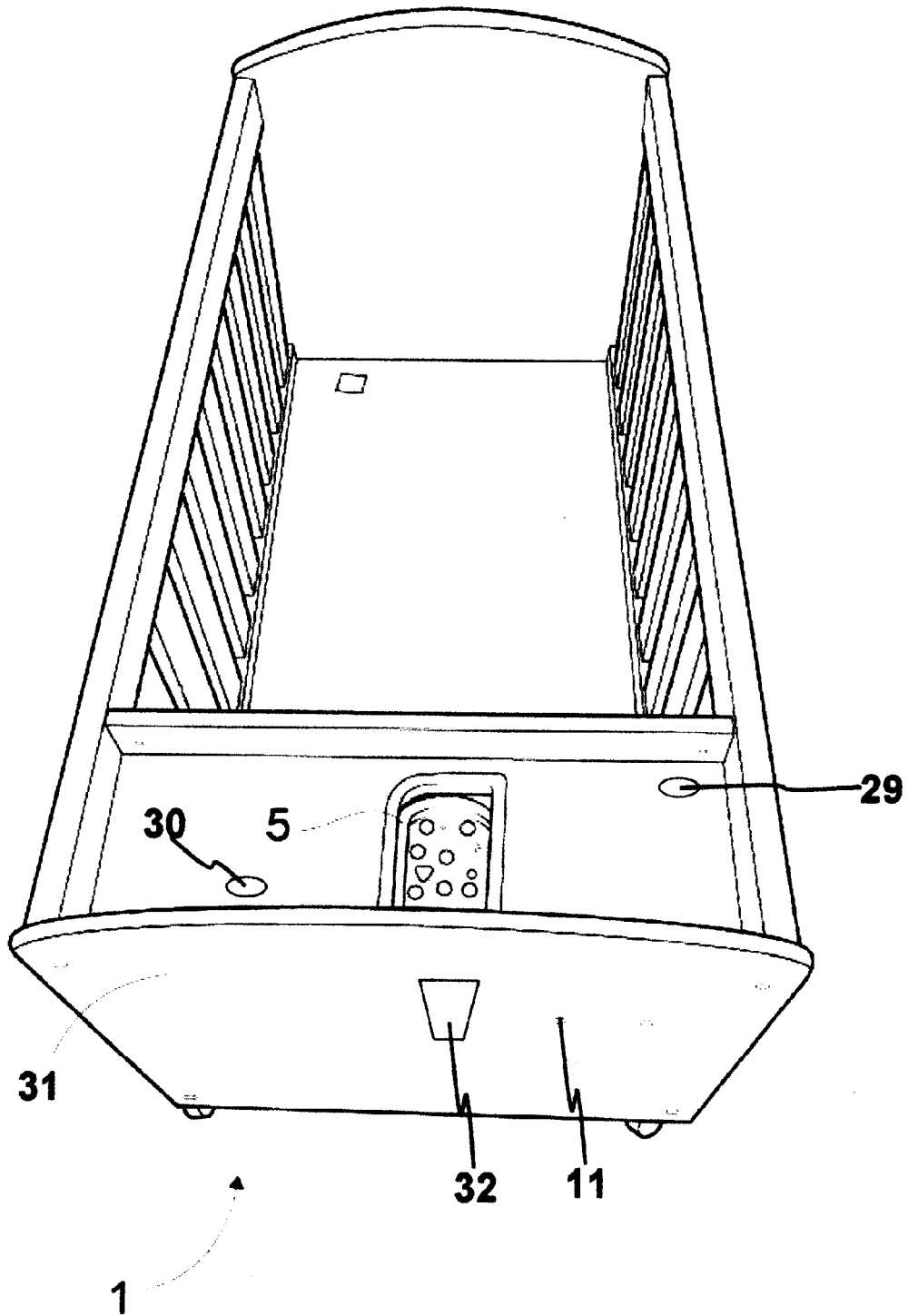


Fig. 5

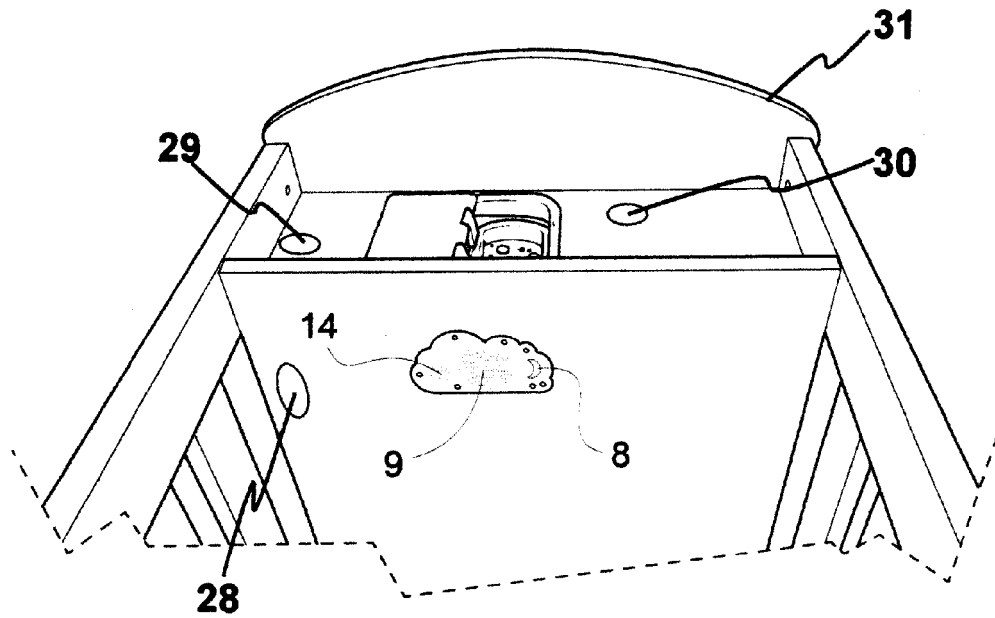


Fig. 4

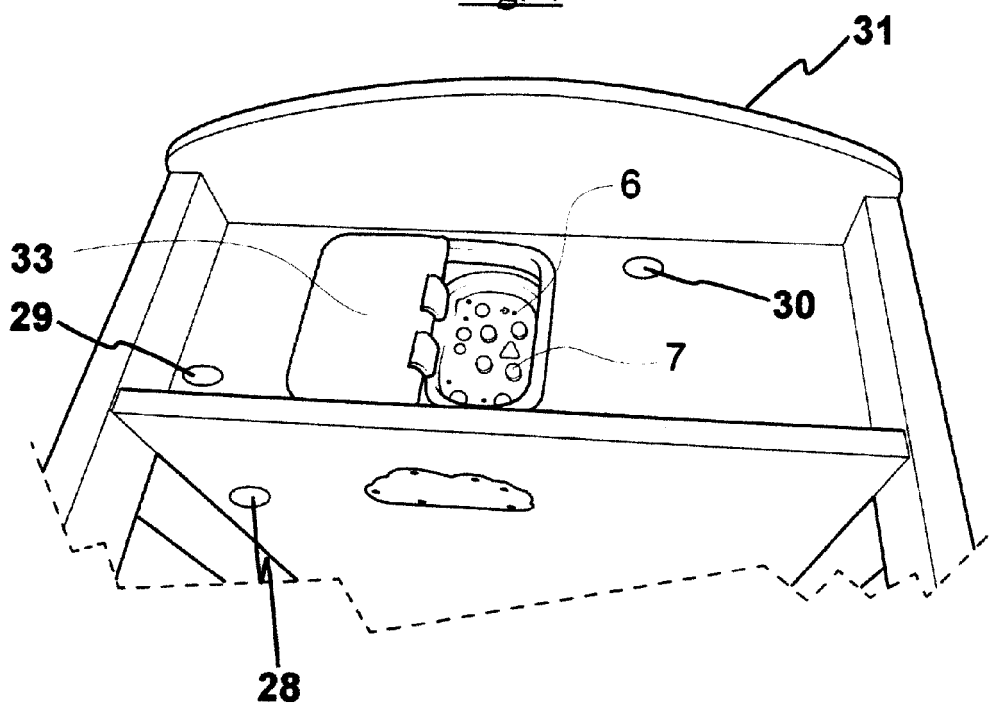


Fig. 6

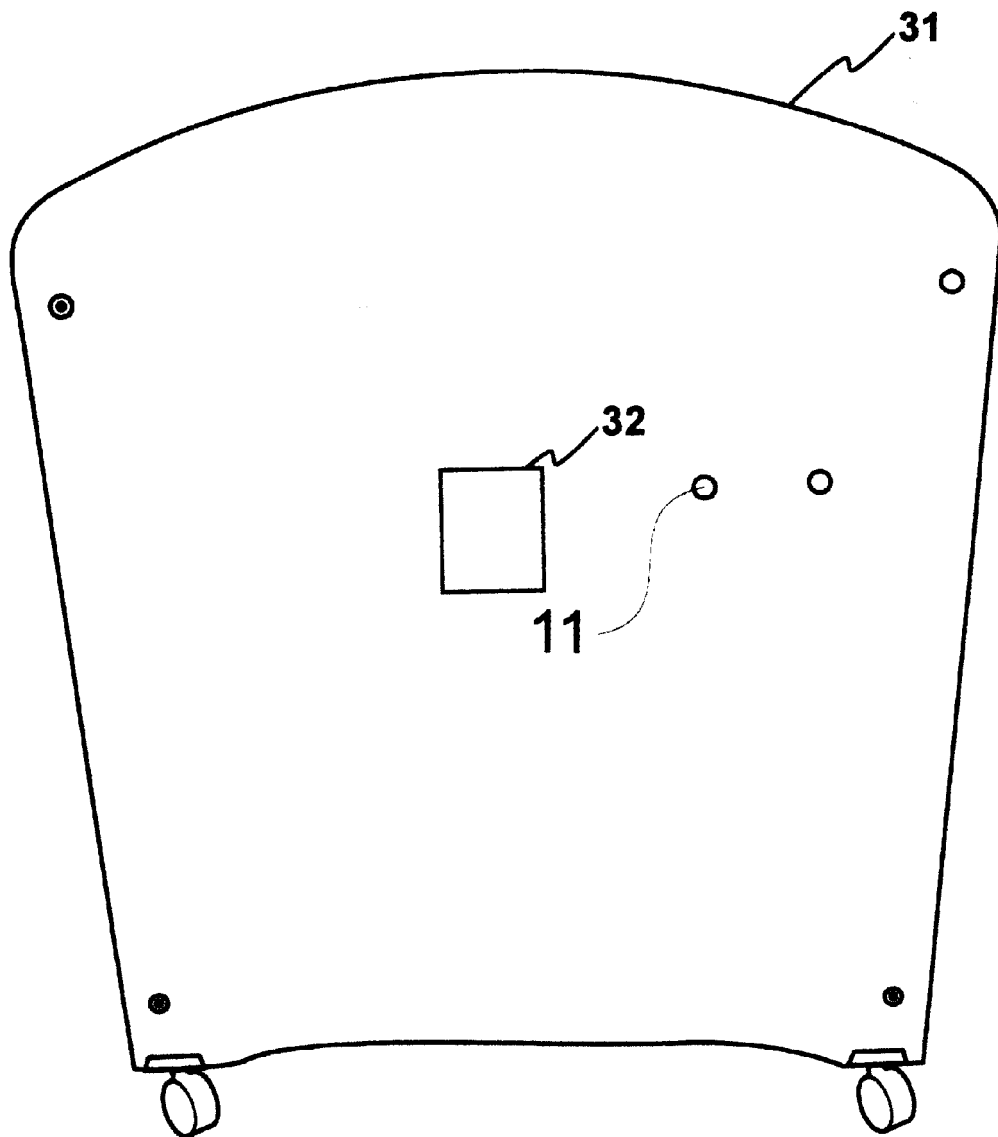


Fig. 7

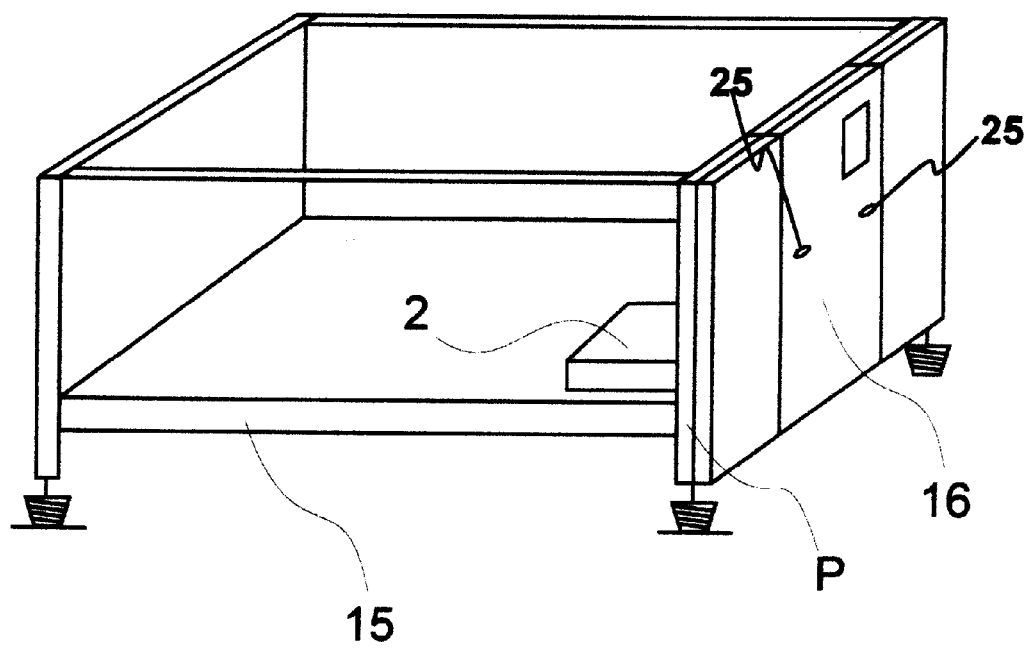


Fig. 8

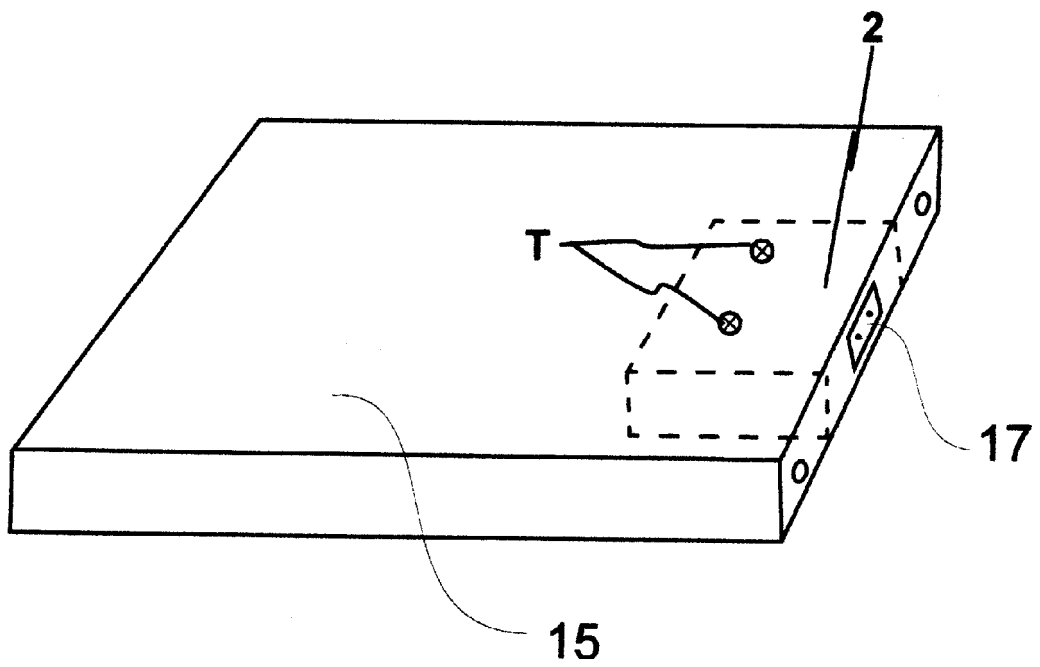


Fig. 9

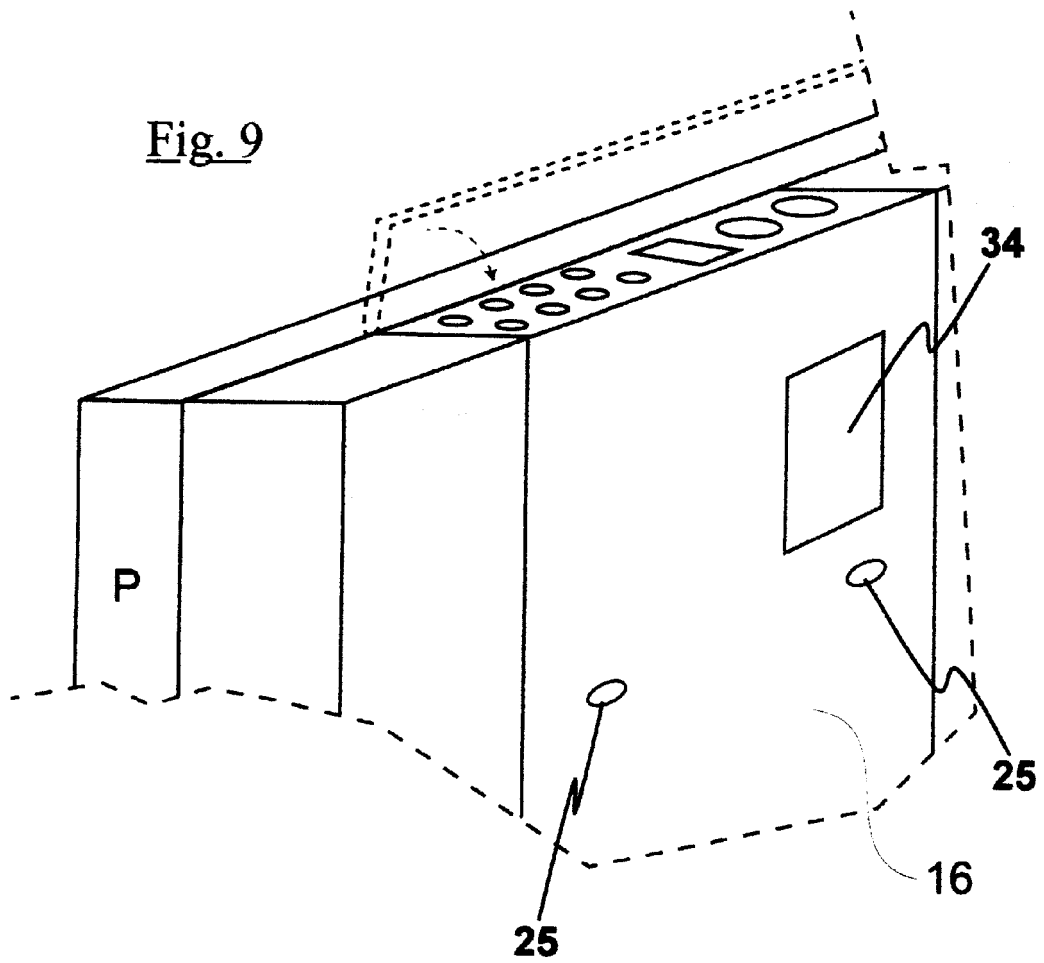


Fig. 10

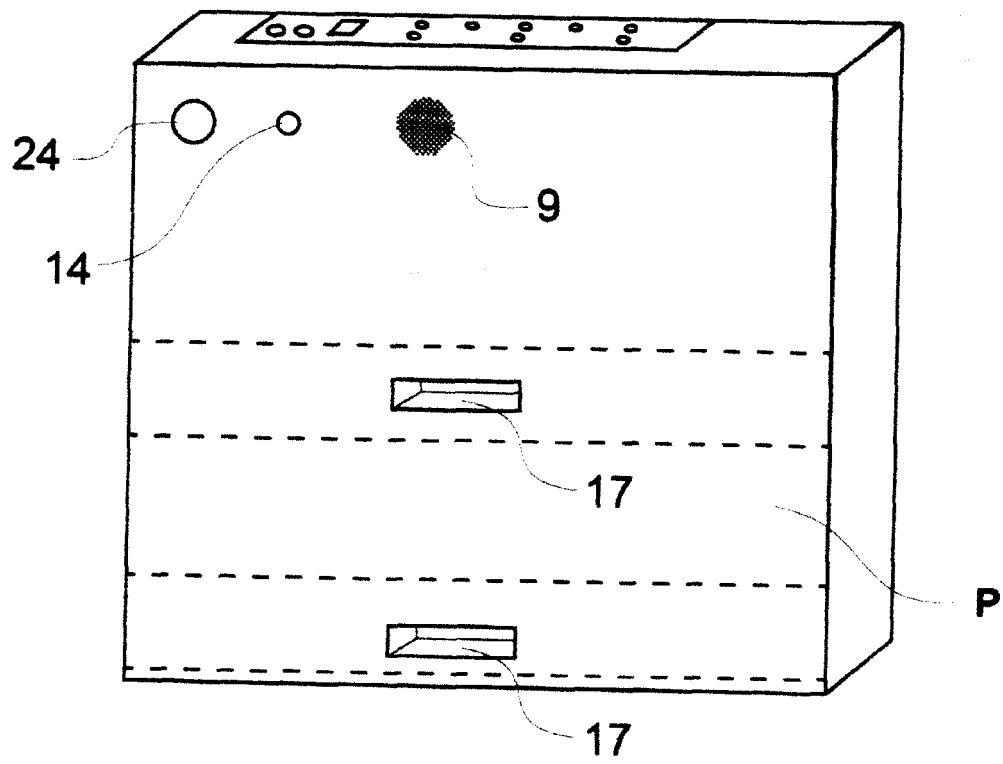


Fig. 11

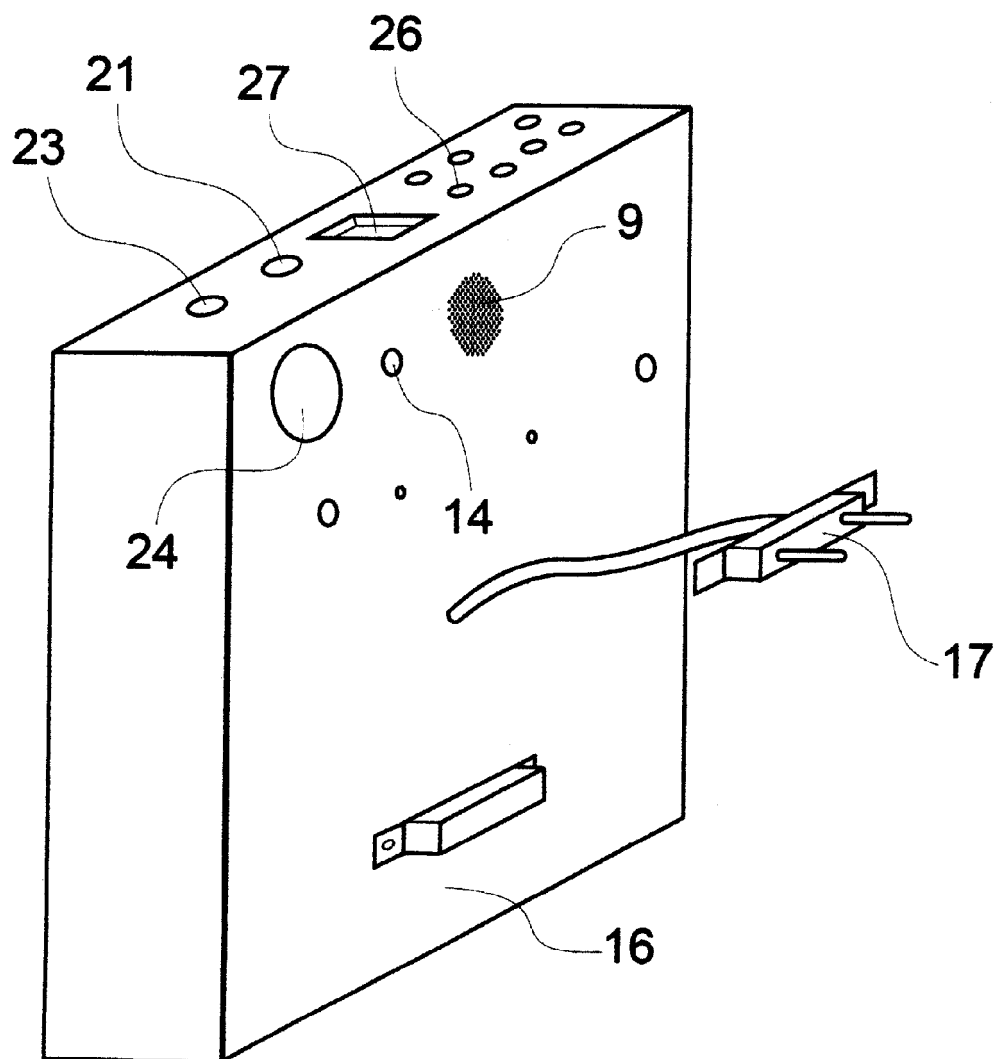


Fig. 12

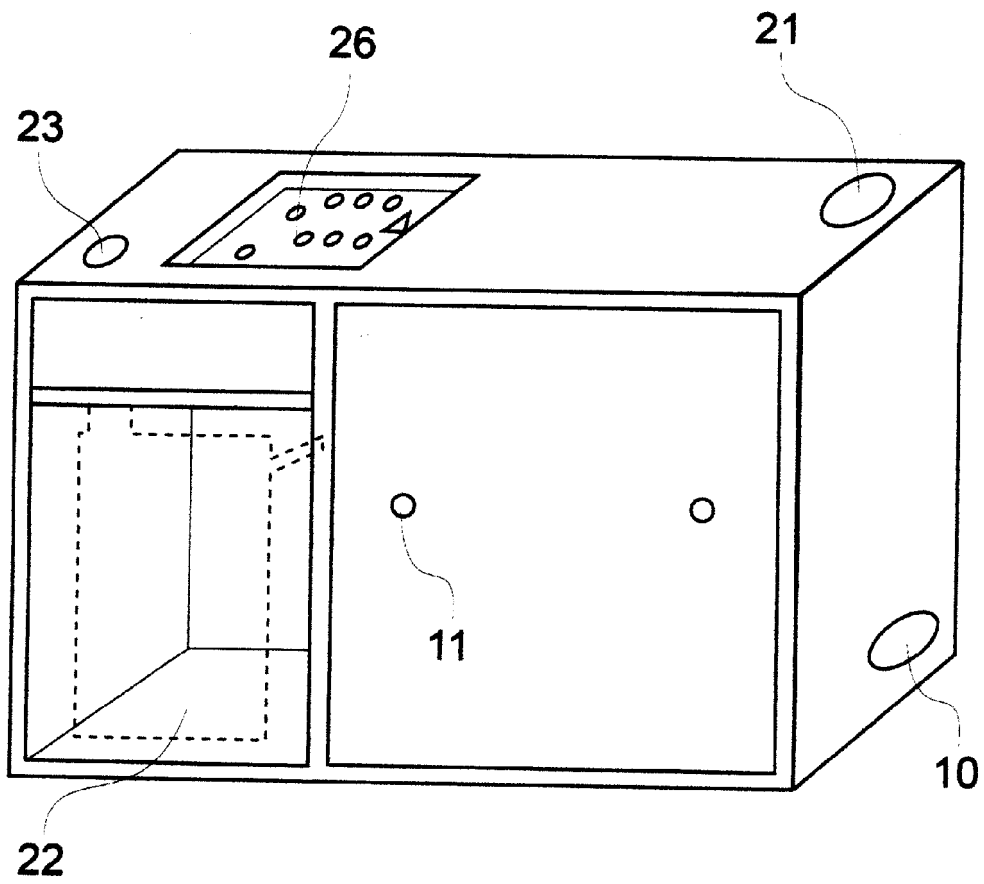


Fig. 13

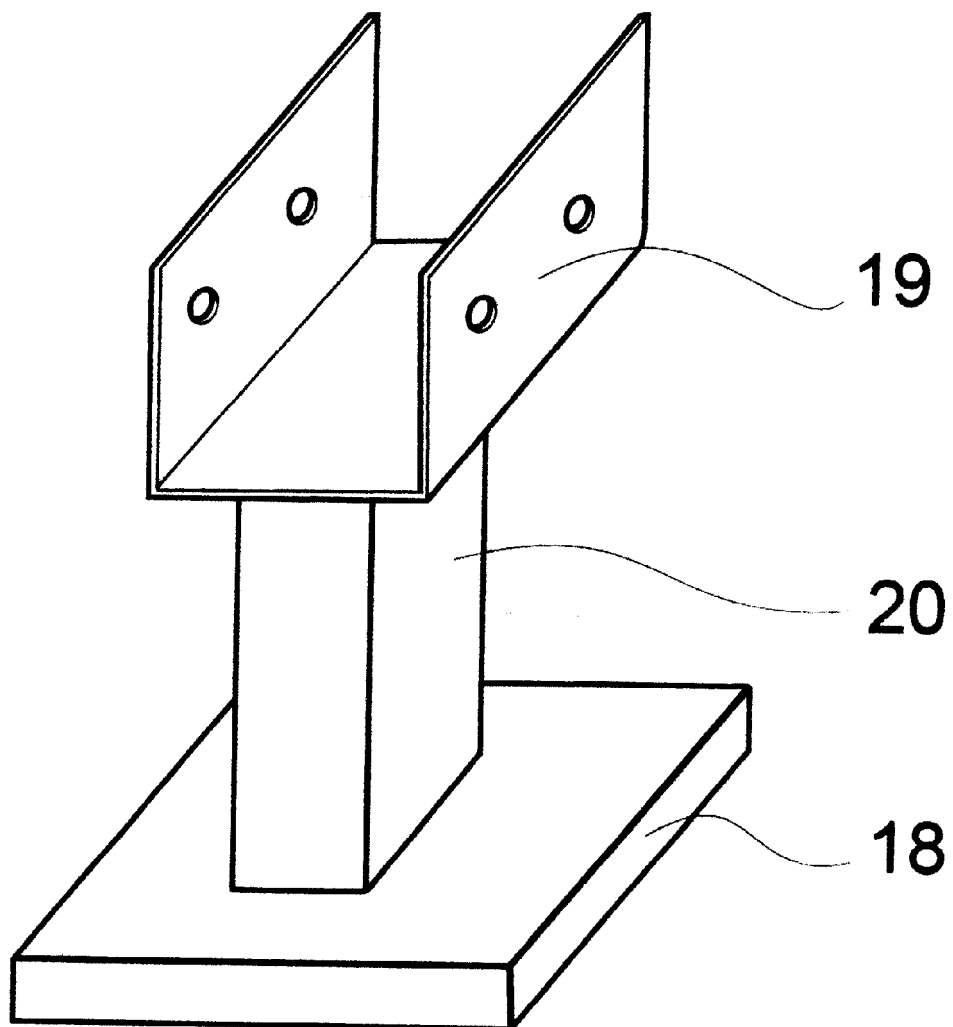
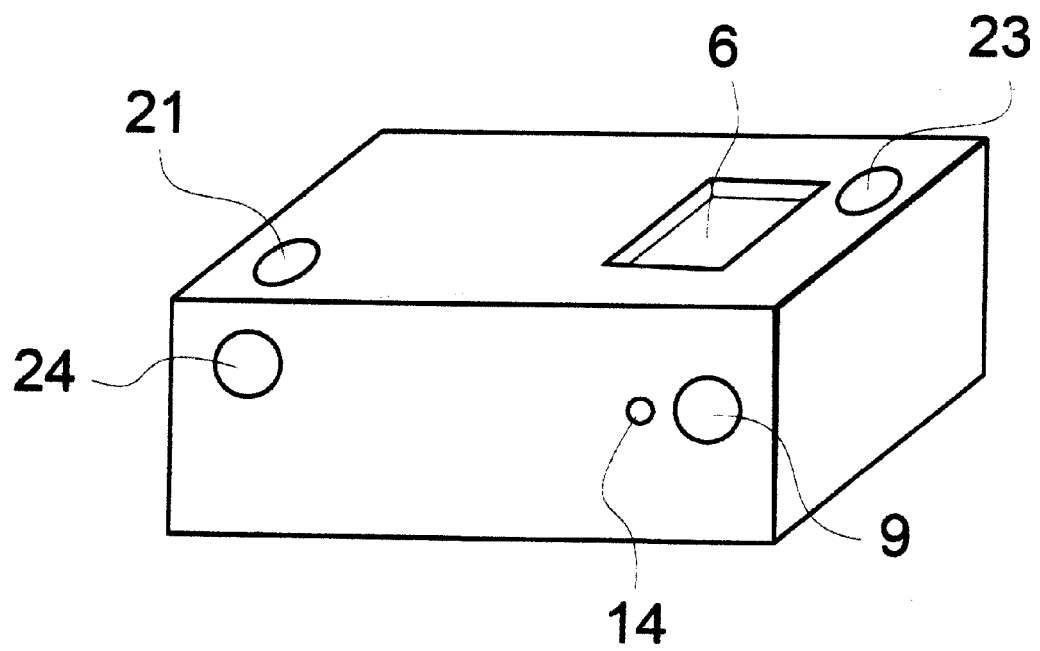


Fig. 14



INTERNATIONAL SEARCH REPORT

International application No.
PCT/ES2015/000055

5	A. CLASSIFICATION OF SUBJECT MATTER	
	A47D9/02 (2006.01)	
	According to International Patent Classification (IPC) or to both national classification and IPC	
	B. FIELDS SEARCHED	
10	Minimum documentation searched (classification system followed by classification symbols) A47D, A63G	
	Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched	
15	Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) EPODOC, INVENES, WPI	
	C. DOCUMENTS CONSIDERED TO BE RELEVANT	
20	Category*	Citation of document, with indication, where appropriate, of the relevant passages
		Relevant to claim No.
	Y	EP 1900311 A1 (MAKERIDEA S R L) 19/03/2008, the whole document.
25	Y	DE 20209872U U1 (SCHUETZ THOMAS) 10/10/2002, the whole document.
	Y	GB 2429400 A (TECHNIK2 LTD TECHNIK2 LTD ET AL.) 28/02/2007, the whole document.
30	Y	WO 2008094329 A1 (GRACO CHILDRENS PROD INC ET AL.) 07/08/2008, the whole document.
	A	US 2883867 A (SPEAR CHARLES E) 28/04/1959, the whole document.
35	A	GB 2464333 A (INTELLICOT LTD) 21/04/2010, The whole the document.
40	☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.	
45	* 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 documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family
50	Date of the actual completion of the international search 05/06/2015	Date of mailing of the international search report (08/06/2015)
55	Name and mailing address of the ISA/ OFICINA ESPAÑOLA DE PATENTES Y MARCAS Paseo de la Castellana, 75 - 28071 Madrid (España) Facsimile No.: 91 349 53 04	Authorized officer P. Alonso Gaston Telephone No. 91 3495323

Form PCT/ISA/210 (second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/ES2015/000055

C (continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of documents, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 2292124 A1 (NIDO EDUCA S L) 09/03/2011, the whole document.	1-29
A	DE 29817858U U1 (MAKERIDEA S R L) 17/12/1998, the whole document.	1-29
A	US 7551100 B1 (SALLEY G MACKAY ET AL.) 23/06/2009, the whole document.	1-29
A	US 4785797 A (CUERVO ARMANDO A) 22/11/1988, the whole document.	1-29
A	US 4656680 A (WILSON ROGER F) 14/04/1987, The whole the document.	1-29
A	WO 2005016216 A2 (NON INVASIVE MONITORING SYST ET AL.) 24/02/2005, the whole document.	1-29
A	US 5088138 A (MUNSTER CANDICE W) 18/02/1992, the whole document.	1-29
A	US 2555776 A (ALSCHULER ROSE H ET AL.) 05/06/1951, the whole document.	1-29

Form PCT/ISA/210 (continuation of second sheet) (July 2009)

EP 3 138 447 A1

INTERNATIONAL SEARCH REPORT

International application No.

PCT/ES2015/000055

Information on patent family members

Patent document cited in the search report	Publication date	Patent family member(s)	Publication date
EP1900311 A1	19.03.2008	ITTO20060133U U1 US2008060129 A1	13.03.2008 13.03.2008
----- DE20209872U U1	----- 10.10.2002	----- NONE	----- -----
----- GB2429400 A	----- 28.02.2007	----- NONE	----- -----
----- WO2008094329 A1	----- 07.08.2008	CN102113794 A CN102113793 A CN101626711 A CN101528088 A CN101528088B B CN101528087 A CN101528087B B DE112007002469T T5 GB2455024 A GB2455024 B WO2008055252 A2 WO2008055252 A3 WO2008055231 A2 WO2008055231 A3 US2008136236 A1 US2008165016 A1 US7884710 B2 US2008146361 A1 US2008146360 A1 US7874927 B2 US2008146359 A1 US2008139327 A1 US7918742 B2 US2008143155 A1 US7727078 B2 US2008136229 A1 US7938731 B2	06.07.2011 06.07.2011 13.01.2010 09.09.2009 17.08.2011 09.09.2009 18.07.2012 17.09.2009 03.06.2009 21.09.2011 08.05.2008 17.07.2008 08.05.2008 17.07.2008 12.06.2008 10.07.2008 08.02.2011 19.06.2008 19.06.2008 25.01.2011 19.06.2008 12.06.2008 05.04.2011 19.06.2008 01.06.2010 12.06.2008 10.05.2011
----- US2883867 A	----- 28.04.1959	----- NONE	----- -----
----- GB2464333 A	----- 21.04.2010	----- NONE	----- -----
----- EP2292124 A1	----- 09.03.2011	----- WO2009144338 A1 ES2330711 A1 ES2330711 B1	03.12.2009 14.12.2009 04.08.2010
----- DE29817858U U1	----- 17.12.1998	----- RU10522U U1 SE9803357L L ITTO970209U U1 IT236336Y Y1 GB2330769 A FR2769480 A3 FR2769480 B3 ES1041098U U ES1041098Y Y DK9800383U U3 CN2346324Y Y	16.08.1999 16.04.1999 15.04.1999 08.08.2000 05.05.1999 16.04.1999 10.09.1999 16.06.1999 16.10.1999 24.03.2000 03.11.1999

Form PCT/ISA/210 (patent family annex) (July 2009)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/ES2015/000055

Information on patent family members

Patent document cited in the search report	Publication date	Patent family member(s)	Publication date
US7551100 B1	23.06.2009	NONE	
US4785797 A	22.11.1988	ZA8805055 A	26.04.1989
		US4681096 A	21.07.1987
		WO8900412 A1	26.01.1989
		PT87984 A	30.06.1989
		PT87984 B	31.01.1994
		JPH01503687 A	14.12.1989
		EP0329731 A1	30.08.1989
		EP0329731 A4	27.06.1990
		DK119789 A	10.05.1989
		CA1306396 C	18.08.1992
		AU2122988 A	13.02.1989
US4656680 A	14.04.1987	NONE	
WO2005016216 A2	24.02.2005	US2006185083 A1	24.08.2006
		US7404221 B2	29.07.2008
		CA2534302 A1	24.02.2005
		CA2534302 C	20.10.2009
		BRPI0413304 A	10.10.2006
US5088138 A	18.02.1992	WO9215233 A1	17.09.1992
		MX9200974 A	01.09.1992
		AU1533192 A	06.10.1992
US2555776 A	05.06.1951	NONE	

Form PCT/ISA/210 (patent family annex) (July 2009)

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- CN 203195171 [0003]
- CN 203137732 [0003]
- CN 202751078 [0003]
- CN 2501398 [0003]