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(54)

AUTOMATIC DEVICE FOR POSOLOGY AND ADMINISTRATION OF DRUGS, HOMEOPATHIC PRODUCTS AND OTHER UNITS SUCH AS PILLS AND/OR CAPSULES

(57)

The invention relates to a device that allows for the automatic posology and administration of drugs, which comprises: a control unit (1) and one or more dispensing modules (2) that can be connected to each other and to the control unit (1), and in which a dispensing cartridge (3) is housed, as well as an extractor device (4) which can be manual or electromechanical, wherein the control unit comprises the necessary means for:

- programming the hour and minute for supplying the drug of each dispensing module (2);
- notifying, by means of an acoustic and/or light and/or vibratory alarm, that there is a drug to be taken;
- verifying that the drug to be taken has indeed been removed to be taken;
- checking whether the cartridge loaded in each module corresponds to the drug assigned;
- and giving instructions for supplying the quantity of units to be supplied in each dose for each module if an extractor device is included.

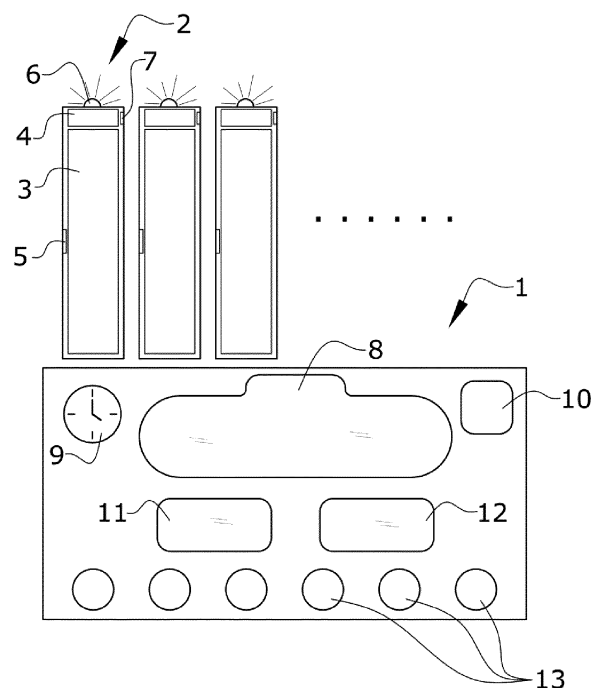


FIG.1

Description

OBJECT OF THE INVENTION

[0001] One object of the present invention, as established by the title of the invention, is a device for the posology and administration of drugs, homeopathic products and other units such as pills and/or capsules or any form that represent units that can be the object of being dispensed, as well as the system in which said device is integrated along with a smartphone or other telematic devices in which an application is installed.

[0002] Sending information to the supporting telematic device allows statistics on the ingestion of the drugs or homeopathic products to be monitored, corrected and/or compiled by professionals, advisors or by the patients themselves.

[0003] The present invention is characterised by the special constructive and functional features made up of each and every one of the elements that form part of the device, thereby making the same an efficient, safe, extendable and configurable device for the posology and administration of drugs.

[0004] Thus, the present invention falls within the field of devices and other similar tools that allow for a correct administration of drugs and units that can be dispensed and which, furthermore, are portable.

BACKGROUND OF THE INVENTION

[0005] Known in the state of the art are pill boxes in the form of containers with compartments in rows and columns, each column corresponding, for example, to one day of the week, and the different cells in which each column is compartmentalised corresponding to the different pills a user must take each day, even possibly having a label, such as "morning", "afternoon" and "evening".

[0006] However, said dispenser is nothing more than a mere place for proper storage, and furthermore, it does not allow the user to be notified at the time when they must take the pill, or for a control to be carried out.

[0007] In an attempt to automate the dispensing and notification process for users, different systems and devices have been developed, one of which uses a smartphone that is associated with a compartmentalised casing with colours, and associated with an application installed in the smartphone and which indicates the correct moment for taking the pill to the user.

[0008] Other systems have a series of compartments associated with a control unit that is able to be programmed and which notifies the user at the precise minute, hour and day in which they must take the pill, the user then proceeding to remove said pill to be taken.

[0009] In general, all of these notification systems for taking drugs in some cases require an associated smartphone, which is not always possible, and they always lack means for verifying and controlling that the pill to be taken has been removed and if the pill selected is actually

the proper pill.

[0010] Thus, one object of the present invention is to develop an automatic dispenser for the posology and administration of drugs, homeopathic products and other units such as pills and/or capsules that, on the one hand, allows for a control of whether the user has actually removed the units and when they have removed them, and thus if they have taken the correct pill or drug that corresponds to that moment, and, on the other hand, allows for a prior and posterior control of whether the pill or drug located in the assigned compartment is the correct one.

DESCRIPTION OF THE INVENTION

[0011] One object of the present invention is an automatic device for the posology and administration of drugs, homeopathic products and other units such as pills and/or capsules, which comprises one or more modules that can be connected in a linked fashion to other modules, all of which able to be connected to a control unit or CPU, wherein housed inside each module is a cartridge provided with drugs to be supplied, in addition to an extraction device.

[0012] Each module is a physical space electronically linked to a programmable unit where the units to be dispensed are loaded and has a mechanical sub-compartment provided with a sensor where the pill, capsule and/or unit to be taken by the user is dispensed.

[0013] The control unit (CPU) is a programmable unit that allows a series of functions to be carried out through the button panel or touch screen, such as the ones described below:

- Assigning or programming in each module the hour and minute for supplying each drug.
- Giving instructions for supplying the quantity of units to be supplied in each dose for each module.
- Notifying, by means of an acoustic and/or light and/or vibratory alarm, that there is a drug to be taken.
- Verifying that the drug to be taken has indeed been removed to be taken.
- Checking whether the cartridge loaded in each module corresponds to the drug assigned.
- Reading the posology and features of the loaded unit in the module by means of a barcode or system for such purpose.

[0014] Thanks to the fact that they are able to be connected to one another, the modules allow a configurable device for posology and administration to be configured to the proper size, and one that all the while is still portable and which is not limited to a specific number of drugs, with there being no limitation whatsoever by the CPU of the number of modules that can be connected to each other.

[0015] Each and every one of the modules is in communication with the control unit by means of contact, either through the first one of the modules and subsequent

contacts between them, such that they are in contact in series, or by means of a direct contact of each module with the control unit.

[0016] The dispensing modules have an inner housing in which they can house at least one cartridge containing the drug to be dispensed, an identification code reader for the cartridge such that the control unit can verify whether the cartridge loaded in the module corresponds to the drug that must be dispensed through said module.

[0017] In addition to the drug-containing cartridge, the modules have a dispensing device that extracts from the cartridge the corresponding number of units to be dispensed, which also has a dispensing control reader that allows the control unit to verify and check whether the drugs supplied have been removed by the user to be taken.

[0018] Furthermore, a series of acoustic and/or visual means are arranged on the dispensing modules allowing the user to identify the module from which they must take a specific drug.

[0019] Thanks to the features described, an automatic device for the posology and administration of drugs is achieved that allows statistics on the ingestion of drugs or homeopathic products to be monitored, corrected and/or compiled by professionals, advisors or by the very patients themselves by sending information to the supporting telematic device or smartphone.

[0020] Except when indicated otherwise, all of the technical and scientific elements used in this specification have the meaning commonly understood by one with average skill in the art to which this invention belongs. When this invention is put into practice, methods and materials may be used that are similar or equivalent to the ones described in this specification.

[0021] Throughout the description and the claims, the term "comprises" and its variants do not aim to exclude other technical features, additions, components or steps. For those skilled in the art, other objects, advantages and features of the invention may be deduced from both the description and the practical use of the invention.

EXPLANATION OF THE FIGURES

[0022] As a complement to the present description, and for the purpose of helping to make the features of the invention more readily understandable, in accordance with a preferred practical exemplary embodiment thereof, said description is accompanied by a set of drawings constituting an integral part of the same, which by way of illustration and not limitation represent the following.

Figure 1 shows a general representation in a possible embodiment of an automatic dispenser such as the one which is the object of the present invention.

Figure 2 shows a dispensing system in which a device such as the previously described one is inte-

grated in a system with a smartphone or telematic device.

Figure 3 shows an embodiment of the dispenser in which the dispensing modules are placed against the flat surface of the control unit.

PREFERRED EMBODIMENT OF THE INVENTION

[0023] With reference to the figures, a preferred embodiment of the invention proposed is described below.

[0024] Figure 1 shows that the automatic device for the posology and administration of drugs comprises:

- a control unit (1)
- a series of dispensing modules (2) that can be connected to each other and to a control unit (1),

wherein the control unit has the means necessary to be able to program the hour and minute for supplying the drug of each dispensing module (2), in one possible embodiment having:

- a display (8) that shows the current hour and minute and the hour and minute that is programmed for the dispensing module (2).
- a button (9) for adjusting the actual time.
- a button (10) for programming the dispensing in each module.
- a button (11) for adjusting the hours.
- a button (12) for adjusting the minutes.
- a series of buttons (13) that are numbered or identified, or tactile devices that correspond to each one of the dispensing modules (2). These buttons can be physical buttons or buttons integrated into a single touch screen.

[0025] Each one of the dispensing modules (2) has an inner space in which a cartridge (3) containing the drug to be dispensed is located, and an identification code reader (5) for each cartridge (3), and furthermore, each dispensing module (2) has an extractor device (4) for the number of units to be taken in each dose, said extractor device being associated with a control reader (7) that allows for a control of the units of the drug extracted from the cartridge that have been collected for the dose.

[0026] The extractor device (4) mounted on each dispensing module (2) can either be manual, in which case it will be activated by the user the moment the user is notified, or it can be electromechanical, such that at the moment at which it receives an order from the control unit (1), the extraction of the cartridge (3) of the number of programmed units of the corresponding drug is carried out.

[0027] A series of notification means can be arranged on each one of the dispensing modules (2), which in one possible embodiment can be LEDs or lights (6) that notify and identify that a drug has to be taken and the module

from which it must be collected.

[0028] The notification means can be complemented by acoustic means, either integrated in each module or in the control unit (1).

[0029] Figure 2 shows a system made up of the previously claimed device and which is integrated in the functioning thereof with a smartphone (14), which can be a telematic device, both being connected by means of wireless communication (15) by means of Wi-Fi, Bluetooth or other telematic communication systems.

[0030] The automatic dispensing system can also have geolocation means that allow an advisor to know where the device is and also possibly where the user is.

[0031] The smartphone (14) will have an application installed which will be used to program the posology and administration of the drugs of each dispensing module (2), in addition to making the notifications and controls, specifically whether the container cartridge (3) has been loaded in the corresponding dispensing module (2) or whether the drug that must be taken has been removed by the user to be taken.

[0032] Figure 3 shows an alternative arrangement to that which is shown in Figures 1 and 2, in which the dispensing modules (2) are placed against the flat surface defined by the control unit (1), thereby facilitating the arrangement of additional dispensing modules in cases where a high number of cartridges (3) is necessary, in addition to considerably reducing the final volume of the device.

[0033] Having thus adequately described the nature of the present invention, as well as how to put it into practice, it must be noted that, within its essential nature, the invention may be carried out according to other embodiments differing in detail from that set out by way of example, which the protection sought would equally cover, provided that the fundamental principle thereof is not altered, changed or modified.

Claims

1. An automatic device for the posology and administration of drugs, homeopathic products and other units such as pills and/or capsules or any other form that represents ingestible units, **characterised in that** it comprises:

- a control unit (1);
- one or more dispensing modules (2) that can be connected to other dispensing modules (2) and to the control unit (1), and a container cartridge (3) and an extractor device (4) being housed in at least one dispensing module (2);

wherein the control unit has the necessary means for:

- programming the hour and minute for supplying

the drug of each dispensing module (2);

- notifying, by means of an acoustic and/or light and/or vibratory alarm, that there is a drug to be taken;

- verifying whether the drug to be taken has indeed been removed to be taken;

- checking if the cartridge loaded in each module corresponds to the drug assigned.

2. The automatic device for the posology and administration of drugs, homeopathic products and other units such as pills and/or capsules or any other form that represents ingestible units according to claim 1, **characterised in that** each one of the dispensing modules (2) has an inner space in which a cartridge (3) containing the drug to be dispensed is housed, and an identification code reader (5) for each cartridge (3), and furthermore, each dispensing module (2) has an extractor device (4) for the number of units to be taken in each dose, said extractor device being associated with a control reader (7) that allows for a control of the units of the drug extracted from the cartridge that have been collected for the dose.

3. The automatic device for the posology and administration of drugs, homeopathic products and other units such as pills and/or capsules or any other form that represents ingestible units according to claim 1 or 2, **characterised in that** acoustic and/or visual means (6) are arranged on each one of the dispensing modules (2).

4. The automatic device for the posology and administration of drugs, homeopathic products and other units such as pills and/or capsules or any other form that represents ingestible units according to claim 2, **characterised in that** the extractor device (4) can be manually activated.

5. The automatic device for the posology and administration of drugs, homeopathic products and other units such as pills and/or capsules or any other form that represents ingestible units according to claim 2, **characterised in that** the extractor device (4) can be automatically activated from the control unit, having electromechanical means for said purposes.

6. The automatic device for the posology and administration of drugs, homeopathic products and other units such as pills and/or capsules or any other form that represents ingestible units according to any of the preceding claims, **characterised in that** the control unit comprises:

- a display (8) that shows the current hour and minute and hour and minute that is programmed for the dispensing module (2).
- a button (9) for adjusting the actual time.

- a button (10) for programming the dispensing of each module.
- a button (11) for adjusting the hours.
- a button (12) for adjusting the minutes.
- a series of buttons (13) or tactile devices that are numbered or identified and which correspond to each one of the dispensing modules (2).

7. An automatic drug dispensing system that uses the device according to any of claims 1 to 6, which further comprises a telematic device or smartphone (15) in wireless communication with the automatic device, said smartphone (15) having an application installed from which the posology and administration of the drugs of each dispensing module (2) is programmed, in addition to making notifications and controls, specifically whether the container cartridge (3) has been loaded in the corresponding dispensing module (2) or whether the drug that must be taken has been removed by the user to be taken.

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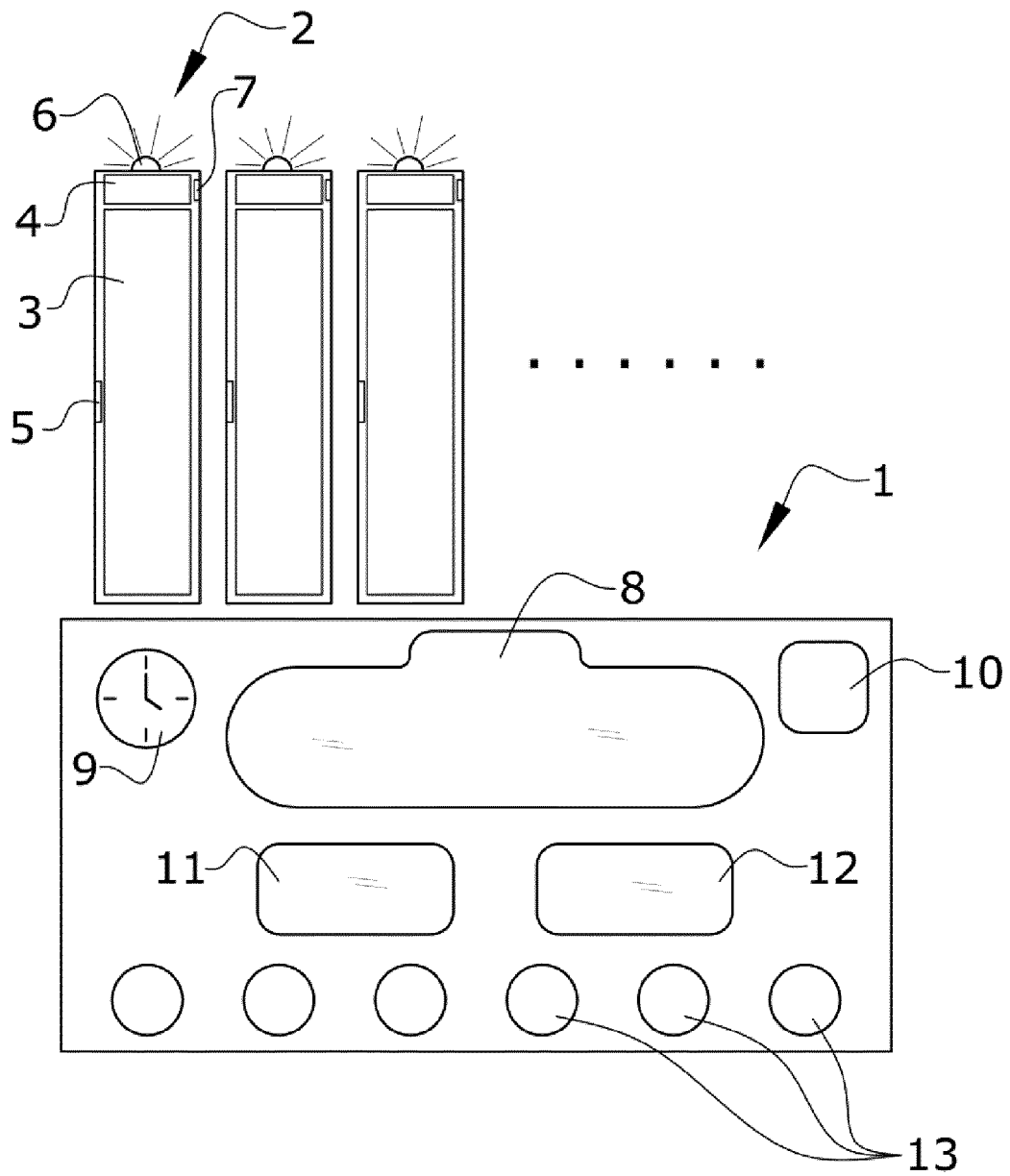


FIG.1

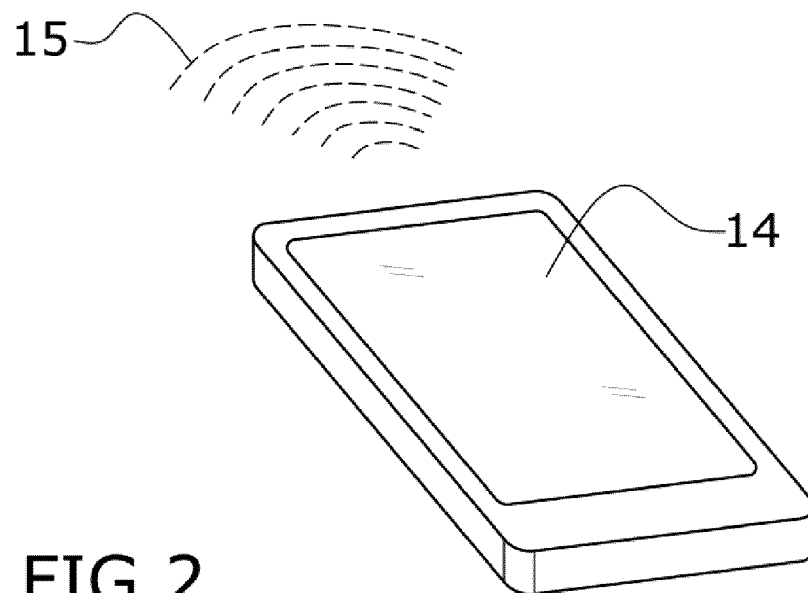
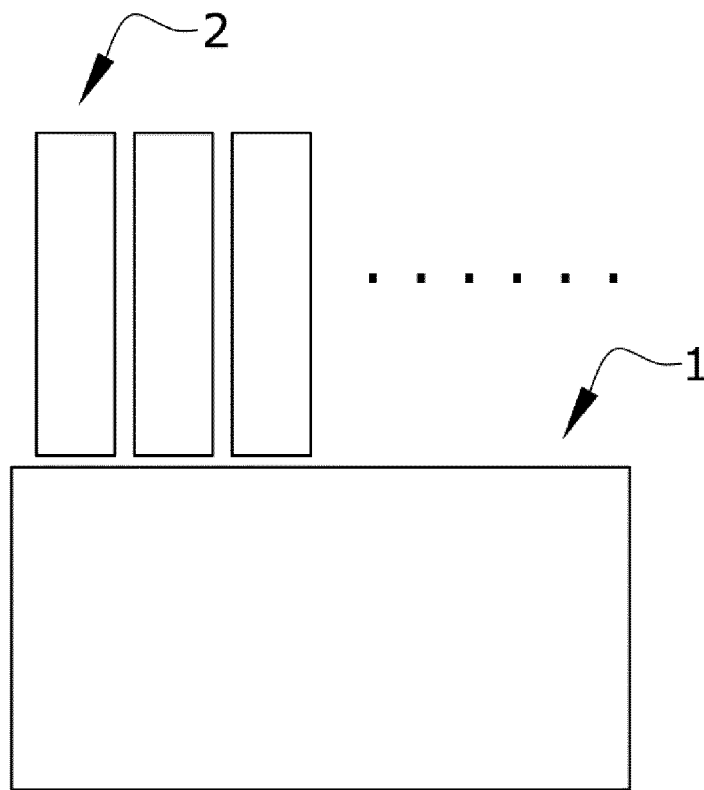


FIG.2

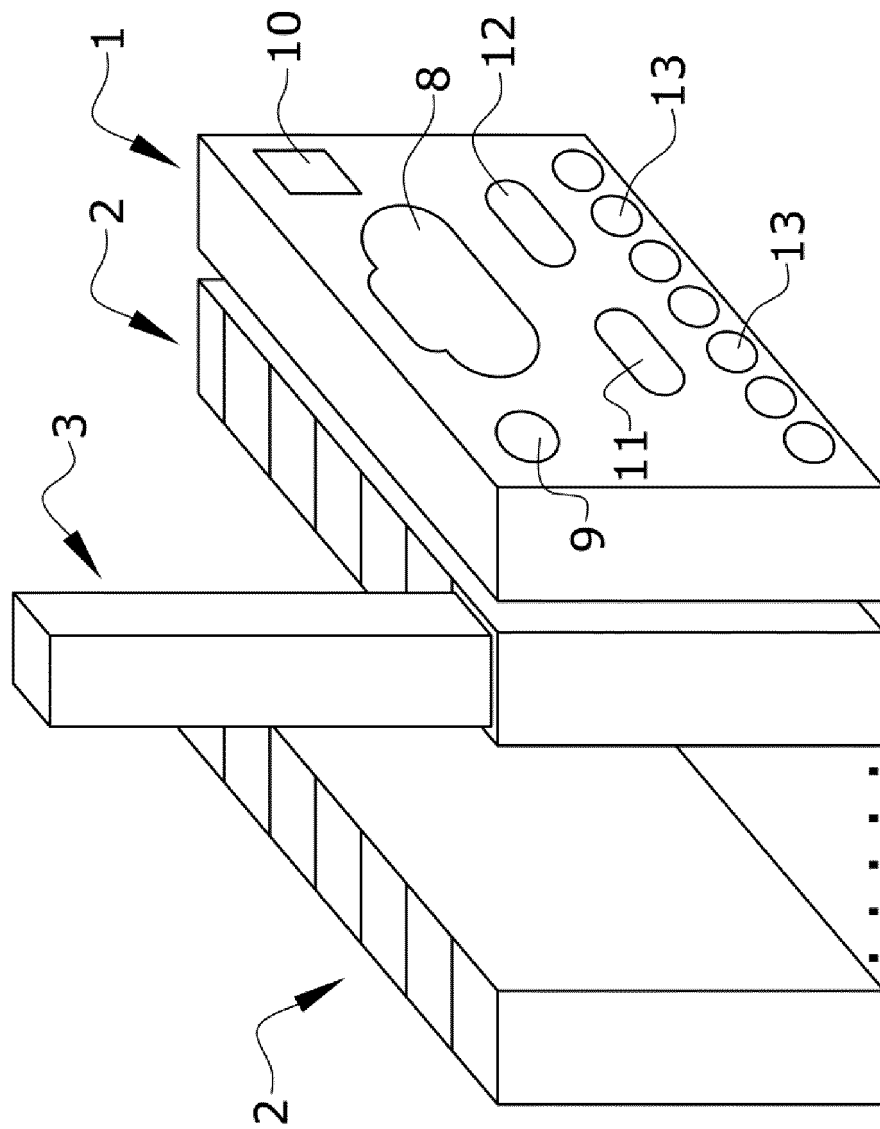


FIG. 3

INTERNATIONAL SEARCH REPORT

International application No.

PCT/ES2016/070606

A. CLASSIFICATION OF SUBJECT MATTER

A61J7/04 (2006.01)

B65D83/04 (2006.01)

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)

A61J, B65D

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 practicable, search terms used)

EPODOC, INVENES

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2015290083 A1 (GOETZ FRANK M ET AL.) 15/10/2015, [0007]-[0009], [0023]-[0062], fig 1 & 2	1-7
A	US 2016015602 A1 (PANZINI PHILIPPE ET AL.) 21/01/2016, [0025] – [0039], [0044], [0052], figs 7 - 9 & 12	1-3, 6
A	US 2014277702 A1 (SHAW THOMAS J) 18/09/2014, fig.1	7
A	US 5752621 A (PASSAMANTE ANTHONY P) 19/05/1998, pag. 3, lín. 9	1-7
A	GB 2205306 A (BARHAM SUSAN ELLEN) 07/12/1988, the whole document	1-7

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:

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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

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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

"&"

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Date of the actual completion of the international search

27/04/2017

Date of mailing of the international search report

04/05/2017

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/ES2016/070606

Information on patent family members

Patent document cited in the search report	Publication date	Patent family member(s)	Publication date
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