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(54) **Modular structure for making storage blocks for products to be inserted into vending machines**

(57) The present finding concerns a modular structure for making storage blocks for products to be inserted into vending machines. In particular where products of even substantially different size are required to be automatically distributed by one machine. Said structure is characterised in that it foresees that the cells for containing products be defined through elements, arranged vertically and horizontally, which removably fit together

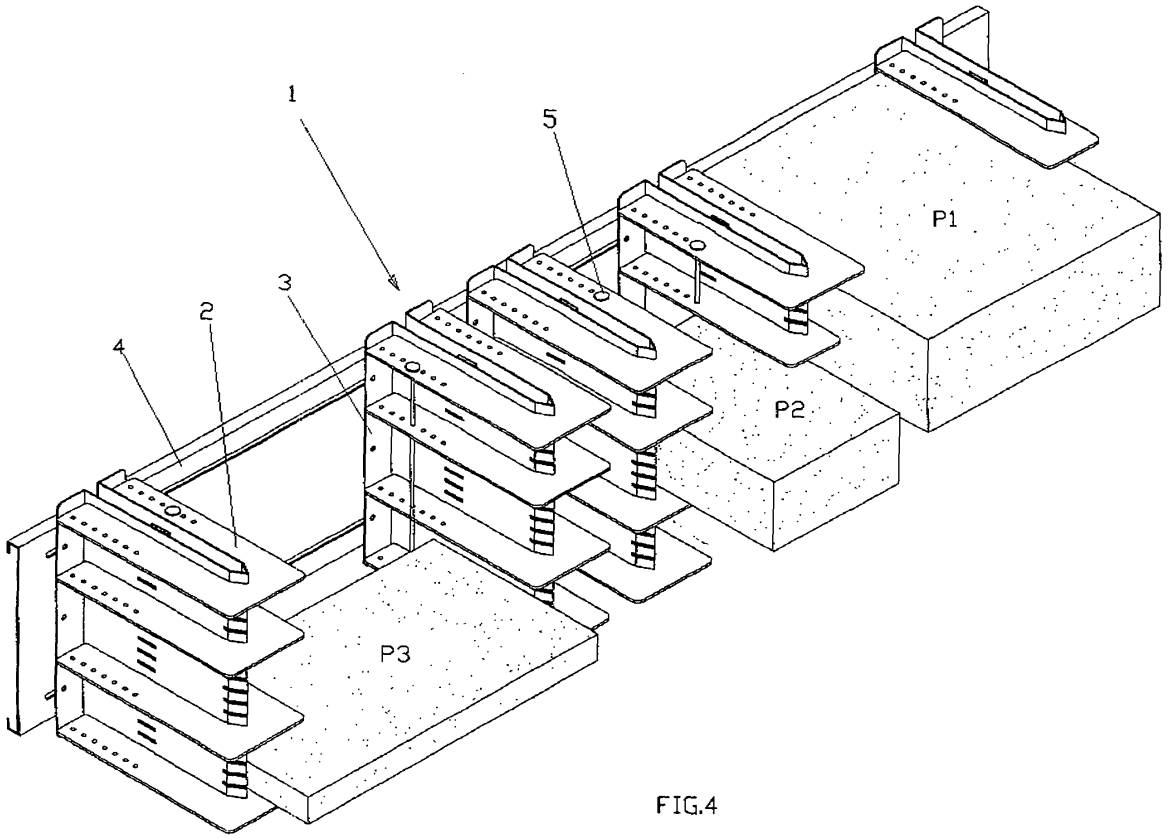

FIG.4

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Description

[0001] The present finding concerns a modular structure for making storage blocks for products to be inserted into vending machines.

[0002] So-called "vending machines", where the user can take the desired product directly from the machine, are now widespread.

[0003] In the current state of the art numerous types of vending machines are known, substantially consisting of a storage block of the products and a unitary distribution system of them.

[0004] In a first type of vending machine, the storage block of the products and the unitary distribution system constitute a single mechanism; this type is represented by vending machines that foresee the use of a plurality of rotary platforms, divided into compartments and vending machines that foresee the use of rotary spirals, where the platforms or the spirals, rotating about their own axis, position the product at an opening that allows the user to take the selected product.

[0005] On the other hand, in another type of vending machine, the storage block of the products and the distribution system constitute two distinct and separate units; indeed, the storage block substantially consists of a compartment divided into cells on which the products are arranged whereas the distribution system consists of a grabbing arm which, through anthropomorphic movements, picks up the individual product from the shelf and positions it at an opening that allows it to be taken by the user.

[0006] Such a second type of vending machine, as well as numerous functional advantages, does however also have the drawback that the storage block often actually takes up substantially more space than the volume occupied by the products deposited in it, since the products are also substantially smaller than the volume of the cell of the compartment in which they are inserted.

[0007] In the current state of the art this drawback cannot be eliminated since, in vending machines normally used, the elements making up the shelf, in particular the shelf bases and the dividing walls that define the cells for containing the products, form a rigid structure, for which reason, whenever it is necessary to vary the position of one or more walls and/or of one or more shelf bases, to create cells of suitable dimensions for the size of the products that they have to contain, it is necessary to carry out complex disassembly and reassembly operations of the aforementioned elements, with substantial loss of time and the need for qualified personnel to be present.

[0008] Just as an example, we describe a vending machine used for the distribution of spare parts in a domestic appliance repair workshop, where the pieces used, by their very nature, are of substantially differing sizes, from the smallest piece, such as a screw or a spring, right up to very large parts, such as a motor.

[0009] Usually, the individual pieces are contained in parallelepiped-shaped boxes, which often take up less space, in height, width and depth, than the height, width and depth of the corresponding containment cell, with the consequence of substantial waste of space, which is unused (for example, boxes of different heights deposited on the same shelf, or else boxes of different widths and different heights deposited in identical cells.

[0010] The purpose of the present finding is to make a storage block, of the type in compartmented cells that does not have the drawbacks encountered by similar known products.

[0011] Specifically, the purpose of the present finding is to make a storage block of the compartmented type where it is possible to make cells of variable dimensions, so that each cell is of a size equal to or only slightly larger than the size of the object contained in it, so as to reduce the space used in the storage block to the minimum possible.

[0012] This purpose is obtained by foreseeing that the cells for containing the products are defined through elements, arranged vertically and horizontally, that removably fit together.

[0013] In greater detail, the novelty of the finding is represented by the special configuration of the aforementioned elements, which allow a storage block to be made with a so-called "modular" structure.

[0014] Constructively, the finding foresees that the vertical elements consist of a profile, preferably made from stamped sheet metal, shaped in a "T", with the head that is fixed, through mobile connections, such as screws, fasteners and the like, to the vertical support wall, whereas the shaft, which constitutes the upright of the compartment, is equipped with side grooves, which allow the horizontal elements to be slotted in.

[0015] The horizontal elements, which act as shelf bases, consist of sheeted plates, made from sheet steel or plastic, which are equipped with a notch that allow them to be inserted into the shaft of the vertical element and are held in this position through the fastening that occurs between two microprojections, present on the aforementioned notch that fit into the corresponding side groove, present on the aforementioned vertical element.

[0016] The finding shall be defined more clearly through the description of a possible embodiment thereof, given only as a non-limiting example, with the help of the attached tables of drawings, where:

- fig. 1 (table I) represents a perspective and exploded view of a modular structure according to the finding;
- figs. 2, 3 (table II) represent, respectively, a perspective view and an elevated front view of the elements constituting the modular structure according to fig. 1;
- fig. 4 (table III) represents the modular structure according to fig. 1, when in use;
- figs. 5, 6 (table IV) represent, respectively, front and

plan views of the structure according to fig. 4.

[0017] As can be seen in fig. 1, the modular structure according to the finding, wholly indicated with reference numeral 1, comprises vertical elements 2 and horizontal elements 3, which must be fitted together so as to form a shelf, equipped with a plurality of cells "C", which is applied onto a wall 4, through known connections, which are not represented.

[0018] As can be seen in figs. 2 and 3, the vertical element consists of a T-shaped profile 2.1, with the head 2.2 resting upon the vertical wall 4, whereas on the shaft 2.3, which ends with a cusp 2.4, there are side slits 2.5 and front slits 2.6 on the two side walls, said slits being aligned with each other on the aforementioned cusp.

[0019] The horizontal element 3 consists of a sheeted plate 3.1, equipped with a longitudinal notch 3.2, from which two opposite tongues 3.3 project.

[0020] With this embodiment, as can be seen in figs. 1-3, the assembly of the modular structure 1 according to the finding is thus reduced to the insertion of the plate 3 into the profile 2, until the tongues 3.3 lock into corresponding side slots 2.5, so as to achieve fastening and a portion of said plate slots into the front slot 2.6, to make the necessary support.

[0021] Moreover, the plate 3, which substantially constitutes the base of the shelf, can be either double (3.1), i.e. project from both sides of the vertical element 2 (which substantially constitutes the upright of the shelf) or single (3.1.1), i.e. projecting from just one side of the aforementioned upright.

[0022] Finally, as can be seen in fig. 5, so that the grabbers of the grabbing hands can hold them correctly, all of the products P of the storage block have to be arranged perfectly aligned at the front.

[0023] In order to achieve this, when the products are not deep enough to abut against the back wall 4 (see product P1) and therefore use up the entire depth of the cell, the finding foresees limiting the depth of the cells through the pins 5 which, when slotted into the corresponding holes 6, formed on the plates 3, constitute the new back walls according to the different depths of the products slotted into the cells (see products P2, P3).

[0024] From what has been outlined above the operating advantages achieved with the use of the modular structure according to the finding are clear, since, from the combination of the horizontal displacement of the profiles 2 with both the vertical positioning of the plates 3 and with the insertion of the pins 5, it is possible to define cells "C" of any size (width, height and depth), so as to define spaces only slightly larger than the size of the objects deposited in them.

[0025] Obviously, embodiments even substantially different from the one described are possible, according to the different types of products, storage blocks and vending machines, without for this reason departing from the scope of the following claims.

Claims

1. MODULAR STRUCTURE FOR MAKING STORAGE BLOCKS FOR PRODUCTS TO BE INSERTED INTO VENDING MACHINES, in particular where products of even substantially different size are required to be automatically distributed by one machine,
said structure being **characterised in that** it foresees that the cells for containing products be defined through elements, arranged vertically and horizontally, which removably fit together, where the vertical elements consist of a profile, preferably made from stamped sheet metal, shaped in a "T", with the head that is fixed, through mobile connections, such as screws, fasteners and the like, to the vertical support wall, whereas the shaft, which constitutes the upright of the compartment, is equipped with side grooves, which allow the horizontal elements to be slotted in and where said horizontal elements, which act as shelf bases, consist of sheeted plates, made from sheet steel or plastic, which are equipped with a notch that allows them to be inserted into the shaft of the vertical element and they are held in this position through the fastening that occurs between two microprojections, present on the aforementioned notch that fit into the corresponding side grooves, present on the aforementioned vertical element.

2. MODULAR STRUCTURE FOR MAKING STORAGE BLOCKS FOR PRODUCTS TO BE INSERTED INTO VENDING MACHINES, according to claim 1, where vertical elements (2) and horizontal elements (3) are foreseen, which are fitted together so as to form a compartment, equipped with a plurality of cells "C", said structure being **characterised in that** the vertical element consists of a T-shaped profile (2.1), with the head (2.2) resting upon the vertical wall (4), whereas on the shaft (2.3), which ends with a cusp (2.4), there are side slits (2.5) on the two side walls and front slits (2.6) on the aforementioned cusp, aligned with each other.

3. MODULAR STRUCTURE FOR MAKING STORAGE BLOCKS FOR PRODUCTS TO BE INSERTED INTO VENDING MACHINES, according to claim 2, **characterised in that** the horizontal element (3) consists of a sheeted plate (3.1), equipped with a longitudinal notch (3.2), from which two opposite tongues (3.3) project.

4. MODULAR STRUCTURE FOR MAKING STORAGE BLOCKS FOR PRODUCTS TO BE INSERTED INTO VENDING MACHINES, according to claims 2 and 3, **characterised in that** the plate (3) is inserted into the profile (2), until the tongues (3.3) lock into corresponding side slots (2.5), so as to achieve fastening and a portion of said plate slots into the front

slot (2.6), to make the necessary support.

5. MODULAR STRUCTURE FOR MAKING STORAGE BLOCKS FOR PRODUCTS TO BE INSERTED INTO VENDING MACHINES, according to claims 3 and 4, **characterised in that** the plate (3.1), which substantially constitutes the shelf base, is configured so as to project from both sides of the vertical element (2).

6. MODULAR STRUCTURE FOR MAKING STORAGE BLOCKS FOR PRODUCTS TO BE INSERTED INTO VENDING MACHINES, according to claims 3 and 4, **characterised in that** the plate (3.1.1), which substantially constitutes the shelf base, is configured so as to project from just one side of the vertical element (2).

7. MODULAR STRUCTURE FOR MAKING STORAGE BLOCKS FOR PRODUCTS TO BE INSERTED INTO VENDING MACHINES, according to one or more of the previous claims, **characterised in that** it is able to vary the depth of the cells through pins (5) which, when slotted into the corresponding holes (6), formed on the plates (3), constitute the new back walls, according to the different depths of the products slotted into the cells.

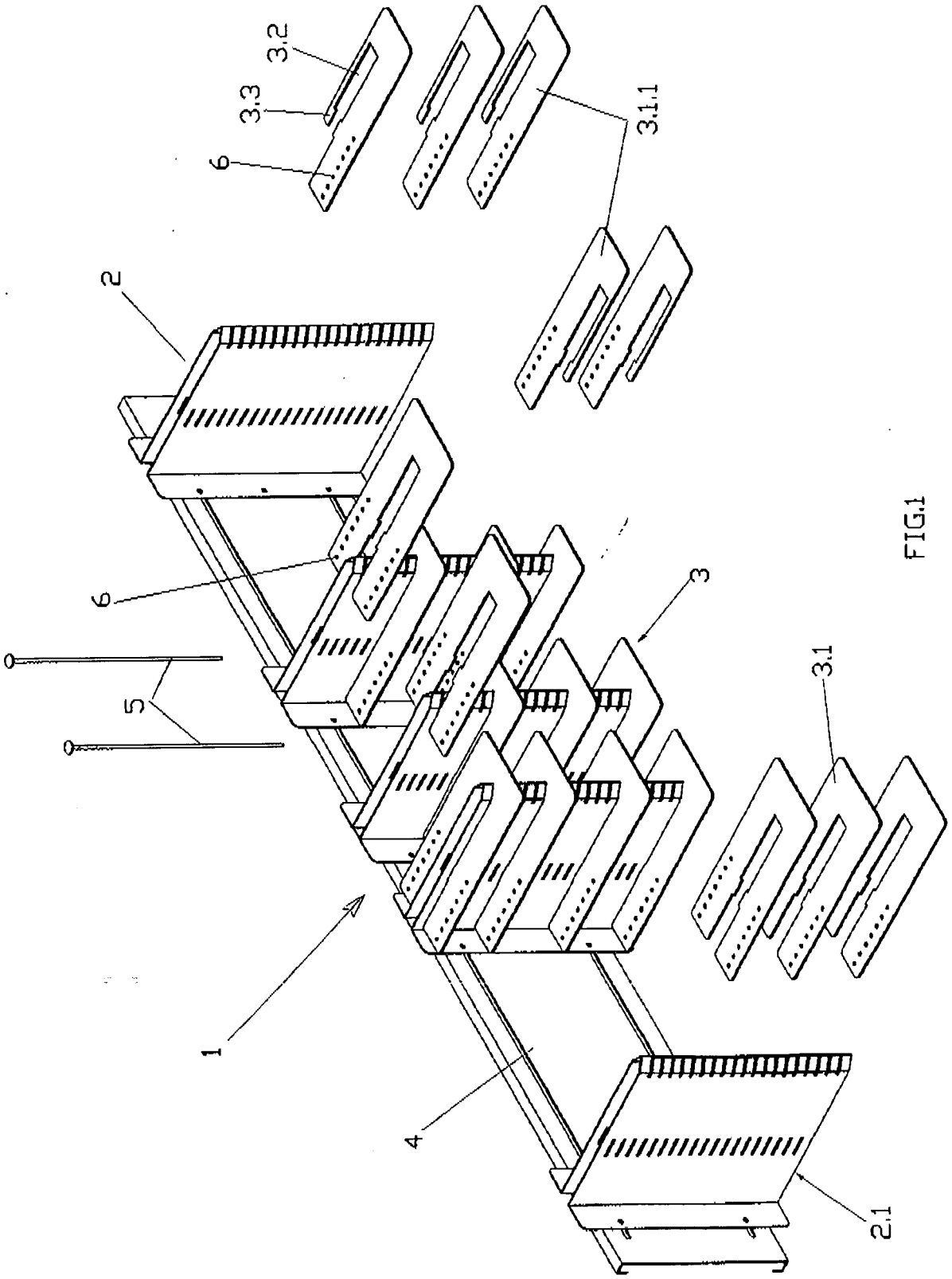

FIG.1

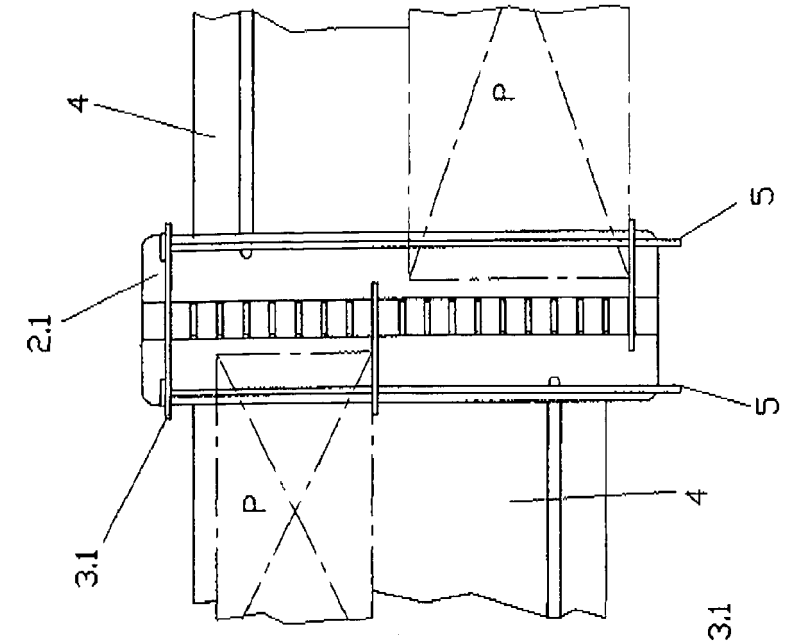

FIG.3

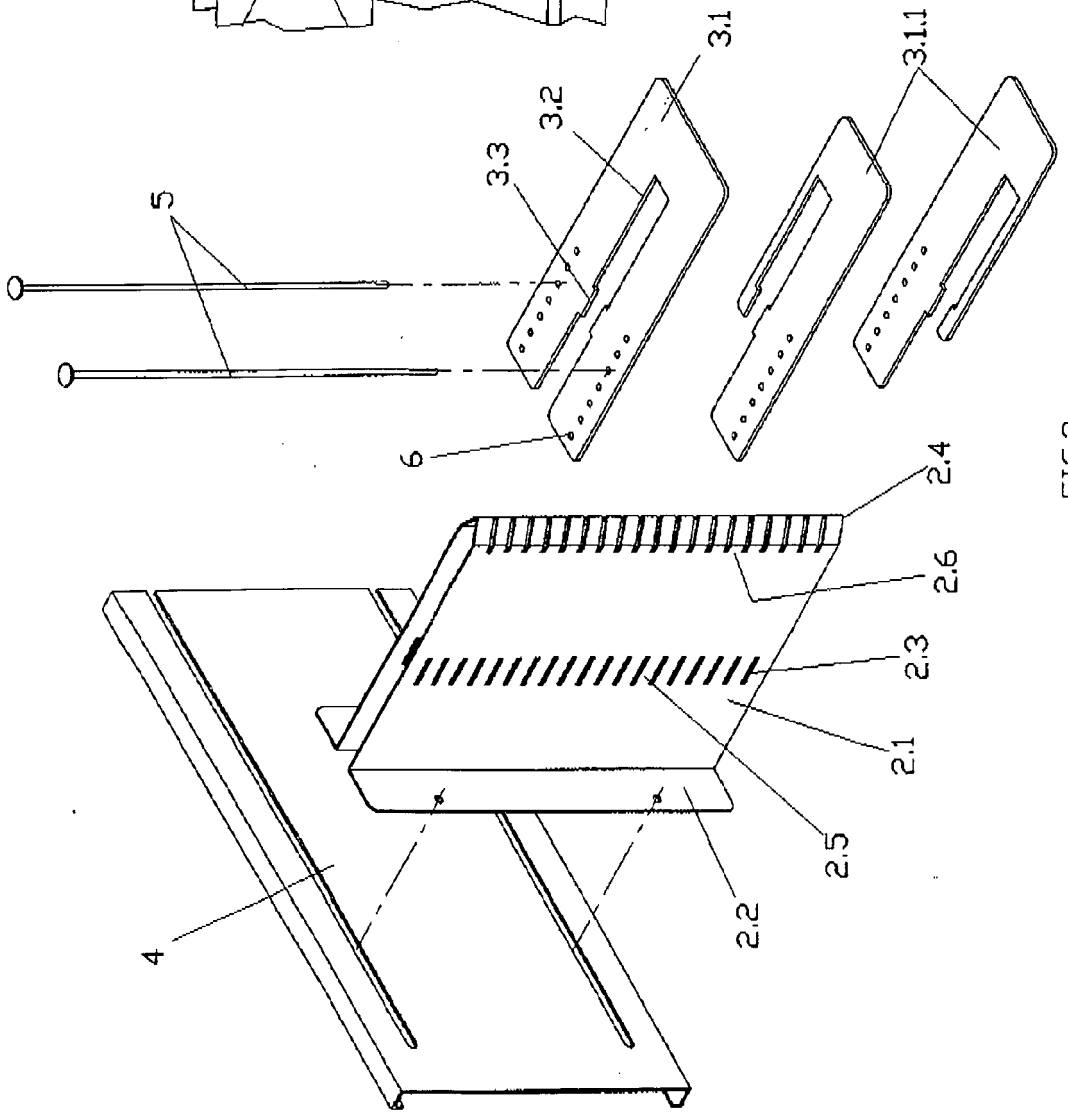

FIG.2

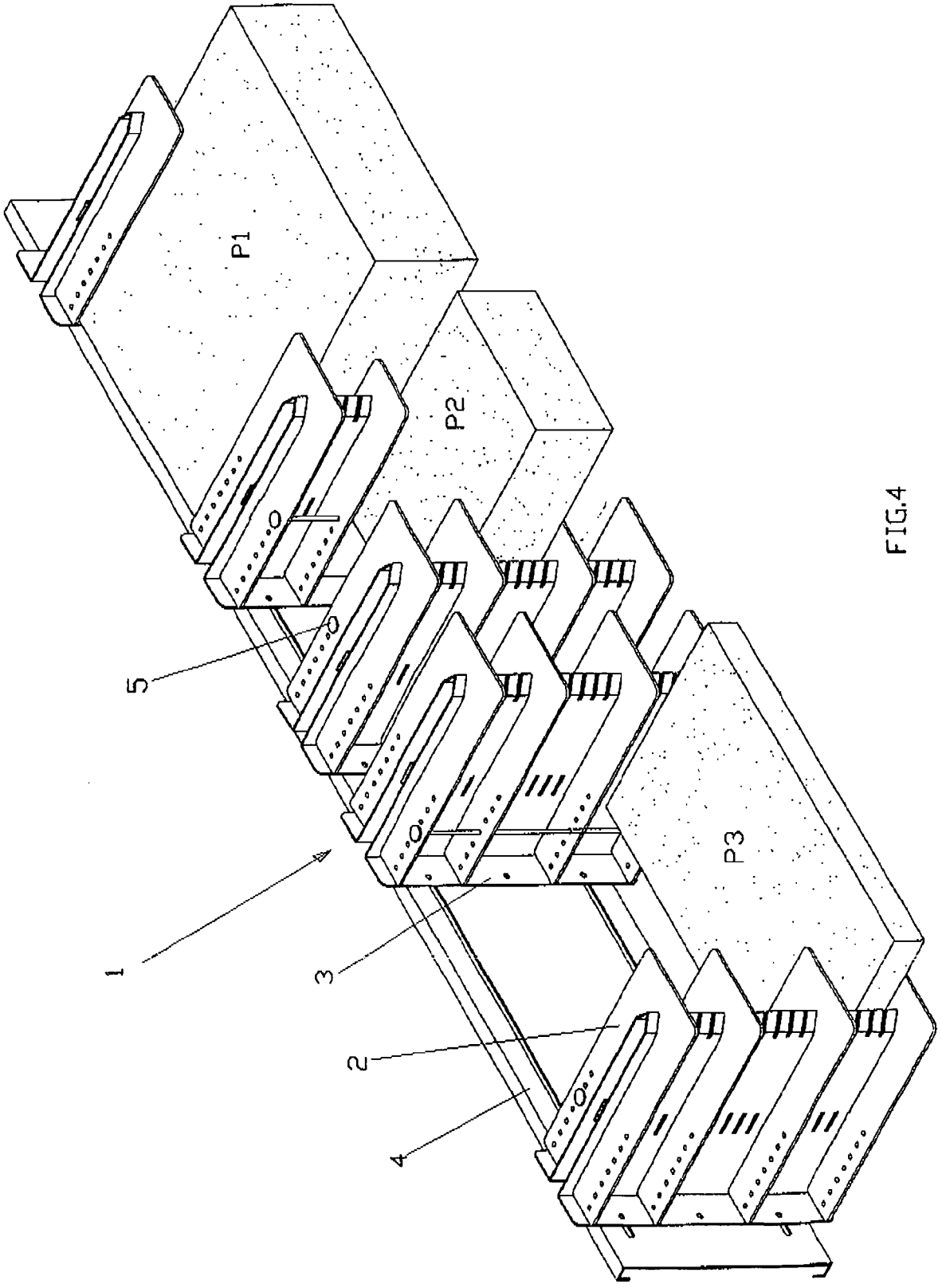

FIG.4

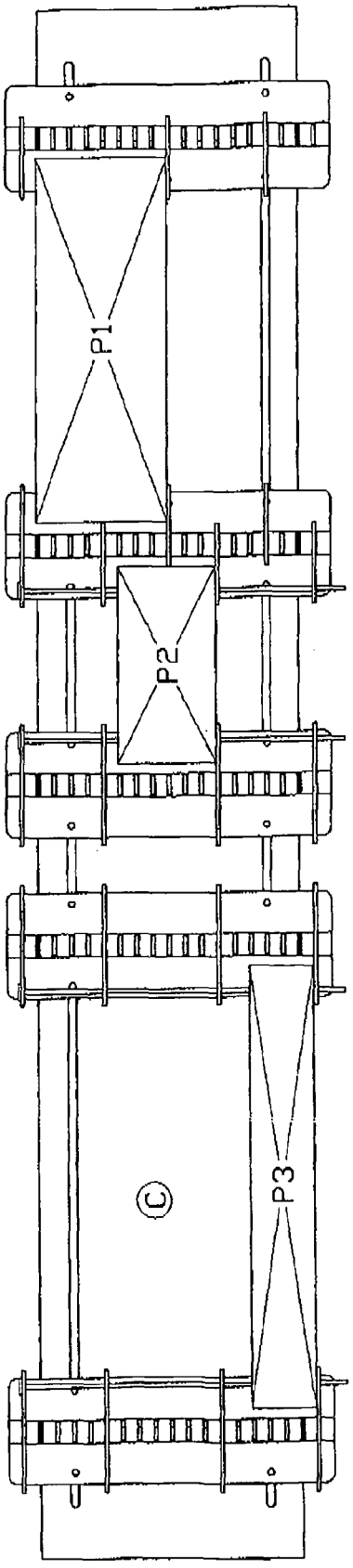

FIG.5

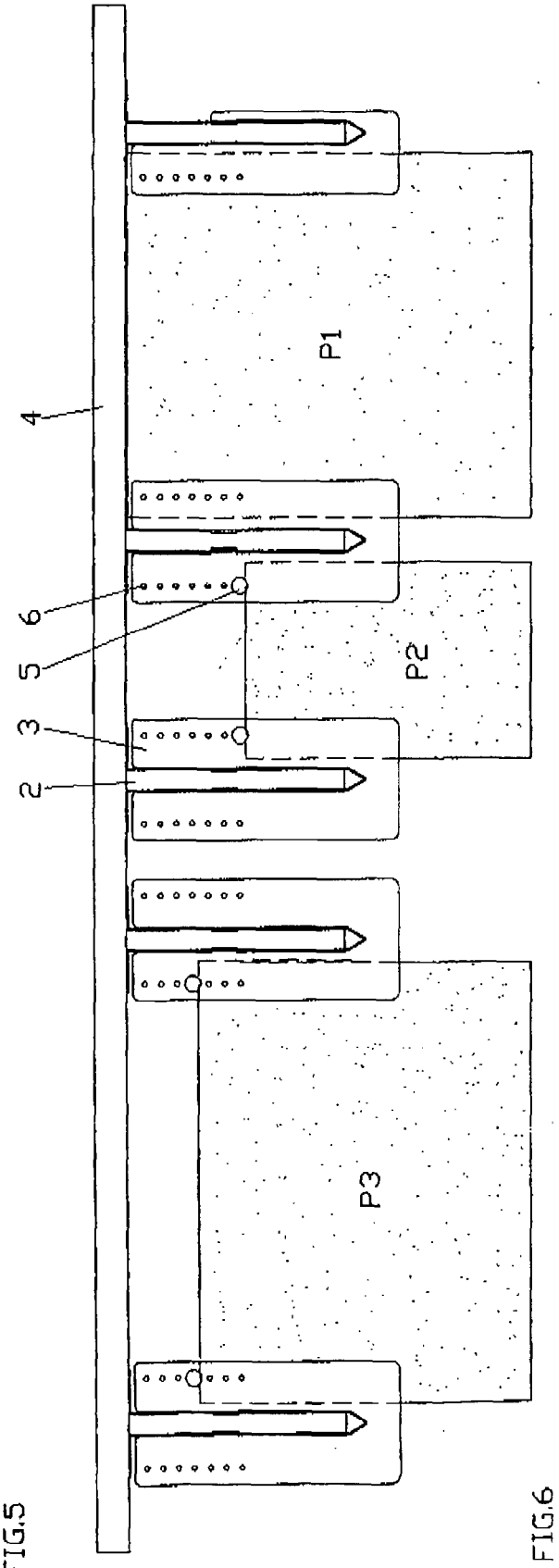

FIG.6