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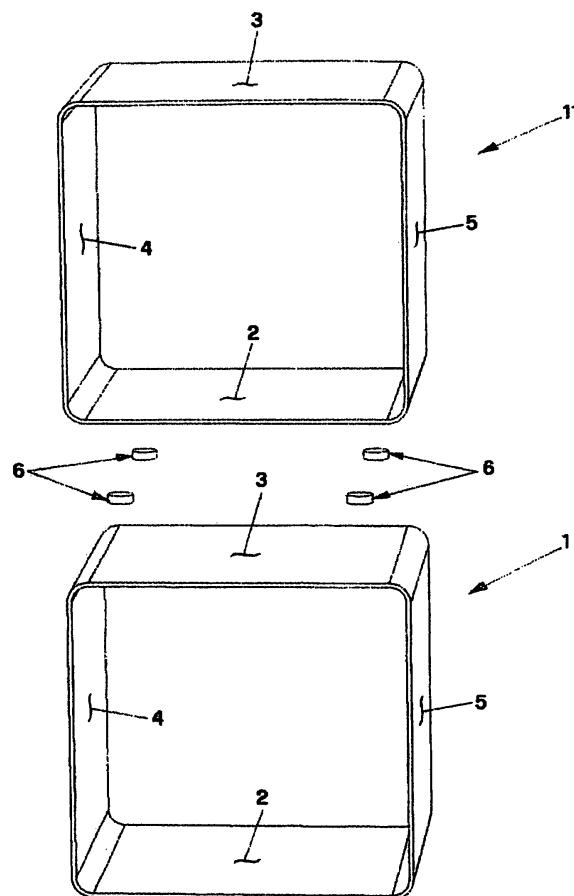
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(54) **Modular furniture structure including linking magnetic means**

(57) A furniture structure (7, 9, 10) comprising a modular element (1, 11; 71, 72; 8) and magnetic means (6) suitable to restrain the modular element to a reference surface (2, 3) adjacent to it.



**Fig. 1**

## Description

**[0001]** The invention relates to a furniture structure which is obtained by composing two or more modular elements of various kinds and sizes which are connected one each other and/or to a reference surface through magnetic means.

**[0002]** As known, the so-called fitted furniture consist of different modular elements that, usually but not exclusively, can be for example of parallelepiped or cubic shape, with one or more open surfaces.

**[0003]** These modular elements are generally aligned both horizontally and vertically, leaning and/or surmounted one against the other so as to create a wall which in itself constitutes the furniture structure. Such a furniture structure has also the function to create an organized space where books, magazines or other can be housed, all objects which can be used both in domestic circles and in the offices.

**[0004]** The known types of furniture elements of the kind described are made with modular fitted elements which can be connected one each other in a substantially fixed and obliged way. Thus, the organization flexibility of the space is substantially limited and not fully or by far free as the present invention proposes to itself. Another limit highlighted by the known technique about the furniture elements made with modular fitted furniture is that these modular elements are essentially of two types.

**[0005]** One type of such modular elements does not essentially provide a connection between modular elements one side-by-side or rising above the other and the stability of the wall consisting of such elements is entrusted only to the gravity force. This is the case, for example, of a vertically stacked modular element of parallelepiped shape, which maintains its position especially when it is loaded with objects within it. It is yet true that any unintentional collision caused by the most varied reasons could give rise to the separation of the upper modular elements and, then, their collapse with the consequences which can be imagined.

**[0006]** Another type of modular fitted elements is, instead, construed so as to a modular unit can be fixed with respect to the other, even movably for example by screws or clamps or blocks, in order to create a rigid structure which in itself could also be modified over time, but which actually would imply a considerable job, so it gives up very often to this hypothetical, rather than real, pleasure modularity. Another negative aspect of the current technique is that the furnishing elements consisted of modular fitted units connectable to each other require skilled labour, since the buyer is unable to understand with enough clarity the assembly instructions, or to have enough dexterity to carry out the composition of the modular elements so as to obtain the desired organized space.

**[0007]** The purpose of the invention is to overcome the above mentioned limits. They wish to carry out a furniture structure composed of modular elements fitted to each

other, where such modular elements can be simply put one close or above the other, or more which can be anchored to a wall, in a reversible, simple and stable way, particularly without the use of tools and without the positioning of link means in forced places and according to determined manners. According to the content of the first claim, the purpose of the invention is achieved by a furniture structure which includes one or more modular fitted elements and characterizes in that said modular elements are connectable to a reference surface adjacent to them through magnetic means.

**[0008]** According to a preferred embodiment of the invention, in which such modular elements are made of ferromagnetic material, the magnetic means can be interposed between two outer surfaces facing one another and belonging to contiguous modular elements. According to an executive variation of the invention, the material which constitutes the modular elements and/or the reference surfaces or the walls that are facing to each other and belonging to different modular elements, is not sensitive to the magnetic field.

**[0009]** In this second case, the modular elements are placed in contact one with each other and with the reference surfaces, while the magnetic means are arranged in pairs on opposite sides with respect to the surfaces in contact, so that such magnetic means, attracting each other, unite in a stable way even the surfaces included between them.

**[0010]** Further features and peculiarities of the invention will be better highlighted in the description of some preferred embodiments of the invention given by way of indicative but not limiting title with the aid of the attached drawing where:

- figure 1 shows two modular fitted elements of the invention between which there are the magnetic means for their connection;
- figure 2 shows an example of furnishing structure which realizes an organized space according to the teachings of the invention;
- figure 3 shows an executive variant of the invention in which pairs of magnetic means assure the stable link between two modular fitted elements composing the furniture structure;
- figure 4 shows a modular element provided with a door;
- figure 5 shows another construction of a furniture structure using the teaching of the invention.

**[0011]** Referring to figure 1, it is observed that the two modular fitted elements identified with 1 and 11, in this case equal between them, consist of two blocks with four contiguous faces 2, 3, 4 and 5, while the front and rear faces are open.

**[0012]** The magnetic means 6 are, preferably, permanent magnets which, in the example, assume a discoidal flat shape.

**[0013]** Each of them is leaned on the surface 3 of the

lower modular element 1, so that four of these magnets 6 are applied one in correspondence of each edge. In the example, the modular element 1 is made of ferromagnetic material, preferably steel, so that the magnetic means stick to it owing to the torus itself of the magnetic field, so that to cling to the surface of the modular element 1.

**[0014]** In order to avoid possible slipping between the magnetic cylindrical means 6 and the lean surface 3, in the case of the example the magnetic means are covered with paint in order to increase their coefficient of surface friction, so as to limit the slipping of the magnet on the surface 3 of the modular element 1 or anyhow to make the surface of the magnet not slippery, in other words anti-skid.

**[0015]** It is evident that, by superimposing a second modular element 11 above the first modular element 1 to which the four magnets 6 are already fastened a secure fastening between the two modular elements 1 and 11 is obtained.

**[0016]** In doing so, a configuration of the type represented in figure 2 is easily achieved, where it is possible to observe that the magnets 6, as well as being interposed on horizontal surfaces belonging to different and contiguous modular elements, are also placed on vertical surfaces belonging to modular elements one adjacent above the other in order to maintain the link between the modular elements forming the furniture structure 10 according to horizontal and vertical axes. Of course, in executive variations of the invention, here not represented, the aforesaid modular elements can be connected, always through the magnetic means 6, to a reference surface not belonging to another modular element, such as for example a ferromagnetic surface associated with a wall.

**[0017]** Advantageously, this allows both to permanently anchor the furniture element, and to support it without the need to lean it to the floor.

**[0018]** In case the modular elements are made of non-metallic material or, more generally, not sensitive to the magnetic field, the invention provides that the magnetic means 6 can also carry out their connection function among the modular elements to form a modular furniture structure.

**[0019]** This is the case, for example, of the furniture structure 7 which they observe in figure 3, where each of the modular elements is made of material not sensitive to the magnetic field, such as plastic.

**[0020]** In such a case, pairs of magnets 61 and 62 are placed with north/south coincident axes so as they attract each other, in order to keep overlapping and joined together the adjacent surface 710 and 720 belonging respectively to the modular elements 71 and 72.

**[0021]** Of course, a good stability of connection could also be got when the pairs of magnetic means will be more than one, usually four, one for each edge of the block.

**[0022]** As in the previous case, even in this embodi-

ment the modular elements can be bound to a reference surface ferromagnetic or not, using one of two connection methods cited above.

**[0023]** In the examples described so far, the magnetic means are removable from the modular elements to obtain, advantageously, the maximum flexibility of combination among them.

**[0024]** It is however evident that in executive variations of the invention, the magnetic means could be irremovably associated with the modular elements, for example through connection means such as screws or adhesive substances or by joint, or more be drowned in the material which constitutes the modular element, particularly in the case the latter is made of plastic.

**[0025]** As far as the shape of the modular elements is concerned, those shown in figures 1, 2 and 3 are blocks, generally open both in the front face and in the rear face.

**[0026]** It is clear that, in other executive forms of the invention, not shown, the modular elements could have a different shape from that of a block, preferably such to allow the reciprocal combination of the modular elements.

**[0027]** It is also evident that other executions could include modular elements with only one open face instead of two, or with more than two open faces, as long as the modular element presents a sufficient strength in the use to which it is meant and furthermore allows to place the magnetic means in the provided positions.

**[0028]** In figure 4 they observe again a modular element 8 provided with a door 81. This modular element 8 can also be used to compose the furniture structure of the invention.

**[0029]** Evidently, in other executive forms, not represented, one or more modular elements can internally comprise one or more sliding drawers, or separators in order to split the modular element in several compartments, or more inserts of shape suitable to steadily receive certain items such as, for example, bottles, books and so on.

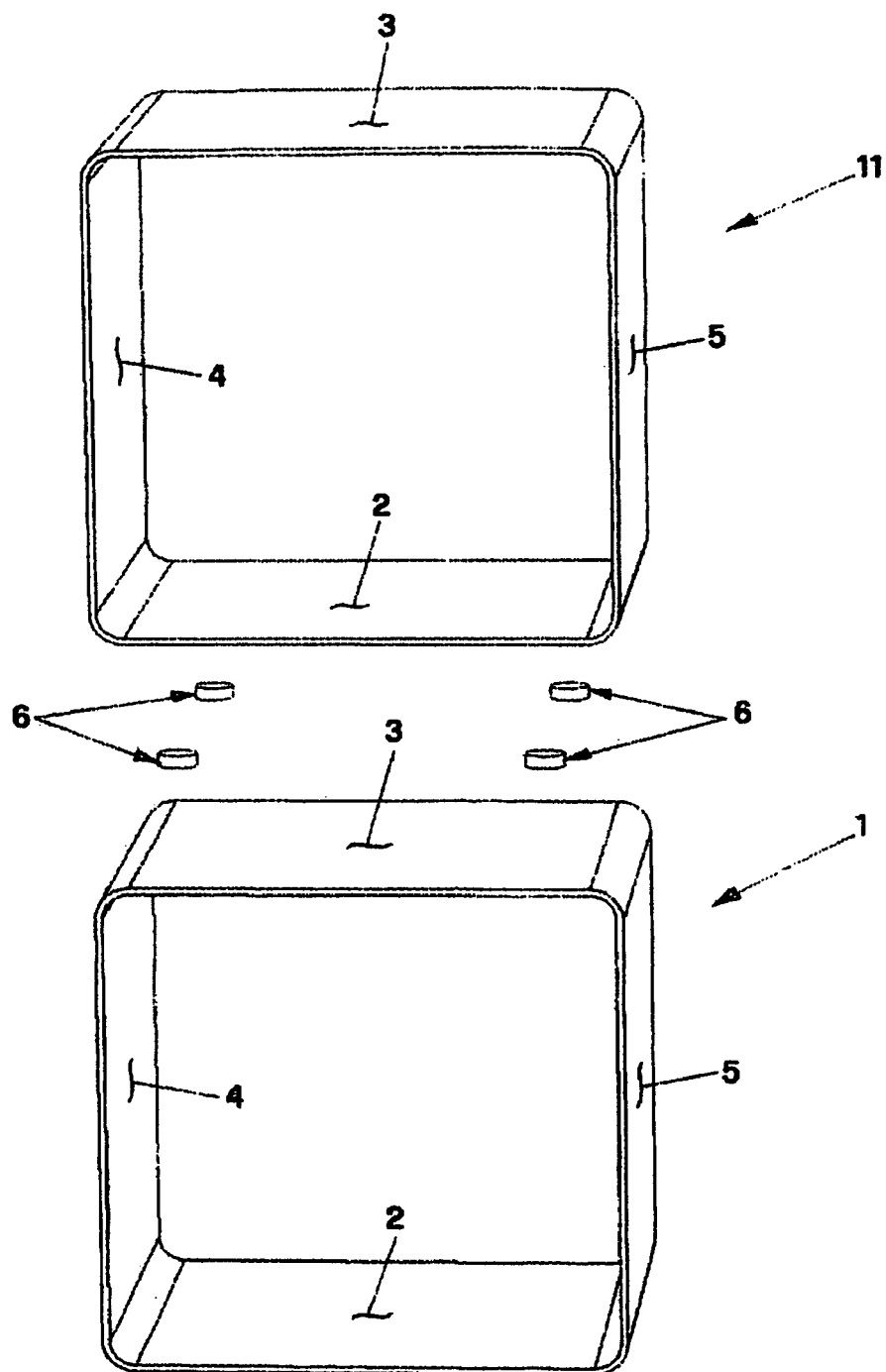
**[0030]** In figure 5 it is shown a possible organization of a furniture structure 9 of the invention made with modular elements reciprocally linked through magnetic means according to the teachings of the invention.

**[0031]** Of course, the forms of carrying out or organization of the spaces could be the most dissimilar and the furniture structures could be assume the most complex shapes, sufficing for this using modular elements different in shapes, colours and disposition.

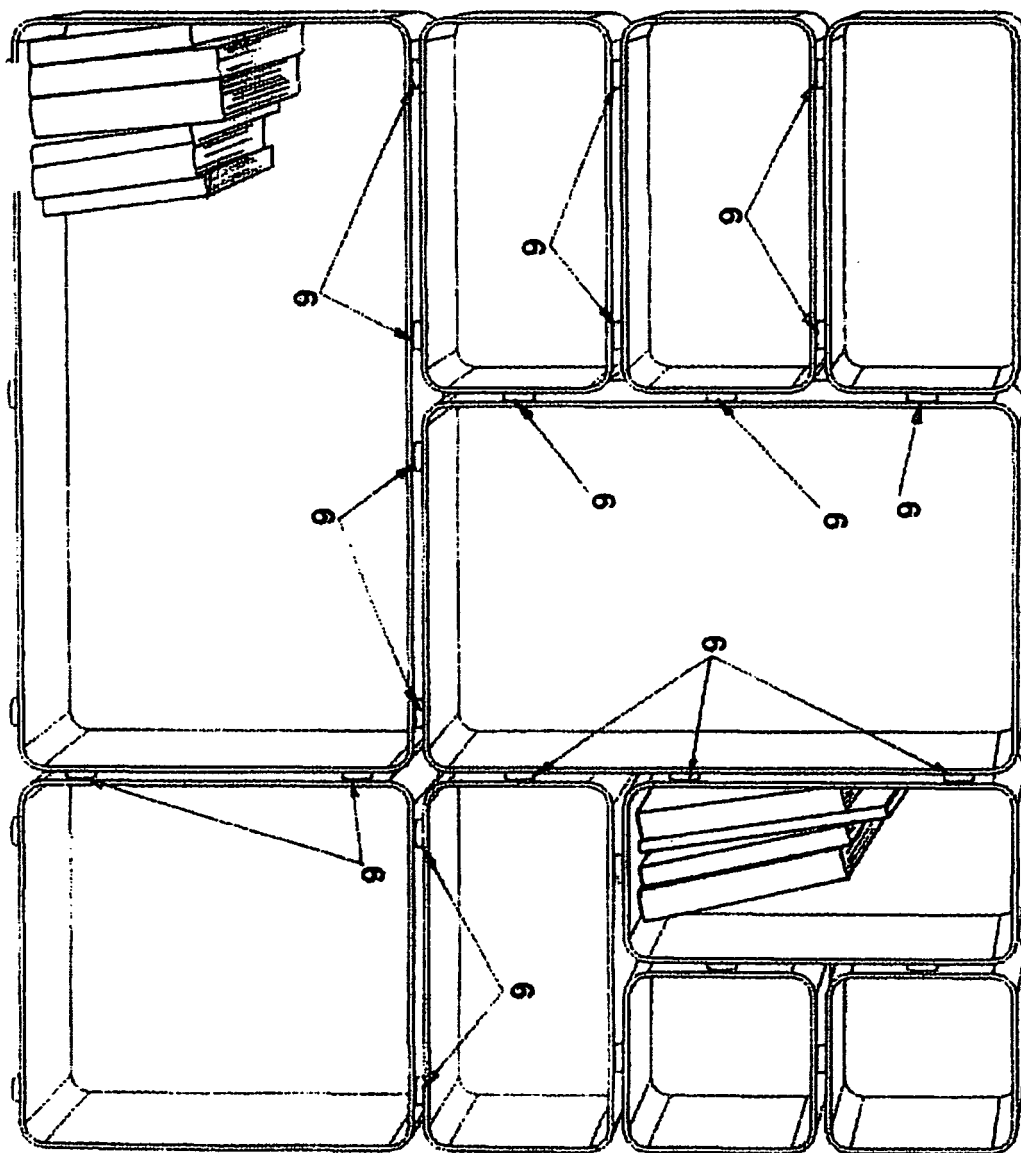
**[0032]** Anyway, it remains the fact that such modular elements are connected to each other and/or to a support surface exclusively through magnetic means and, therefore, without the need for screws, nuts or other connection means which could not be used by anyone and that, most of all, put a limit on the configurations available, which the invention succeeds in overcoming, since the shape of the furniture structure can be transformed at any time.

**Claims**

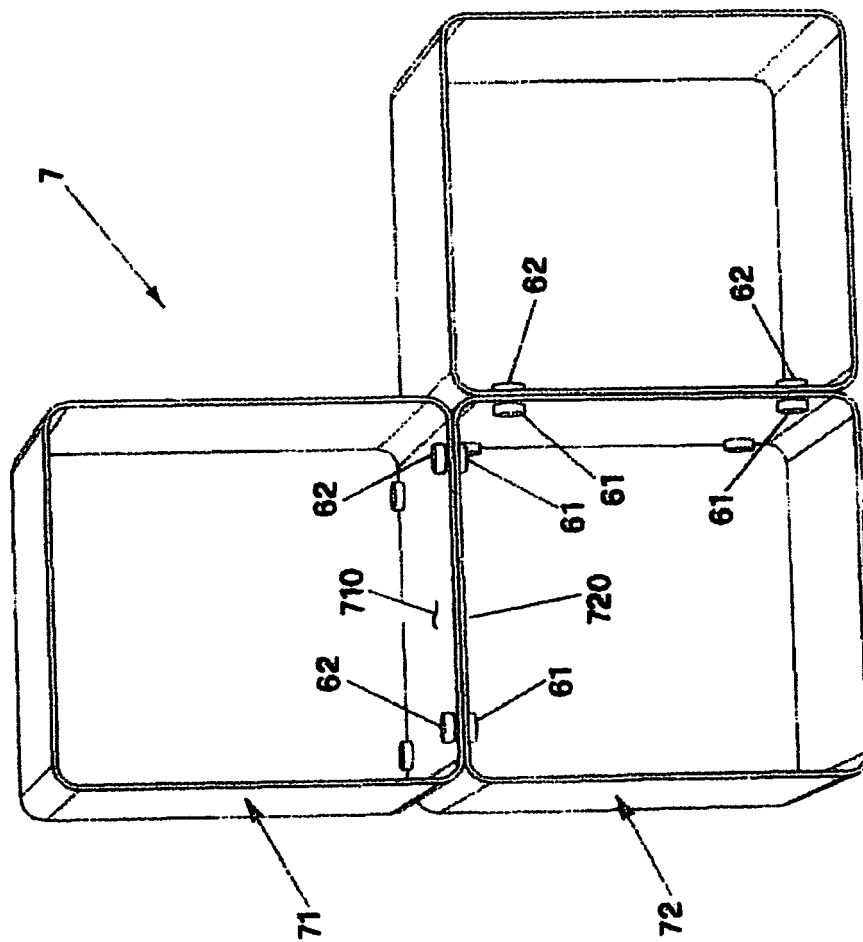
1. Furniture structure (7, 9, 10) comprising at least one modular element (1, 11; 71, 72; 8) **characterized in that** it includes magnetic means (6) suitable to restrain said at least one modular element to at least one reference surface (2, 3) adjacent to it.
2. Furniture structure as claim 1) **characterized in that** at least one of said reference surface is a ferromagnetic surface.
3. Furniture structure as claim 2) **characterized in that** said ferromagnetic surface is associated with a wall.
4. Furniture structure as any of the previous claims **characterized in that** it comprises two or more modular elements (1, 11; 71, 72) one adjacent to the other, each defining one of said reference surfaces (2, 3) to which the other modular element is restrained through said magnetic means (6).
5. Furniture structure as any of the previous claims **characterized in that** said reference surface (2, 3) are ferromagnetic and said magnetic means (6) are interposed between each of said modular elements (1, 11) and a corresponding reference surface (2, 3).
6. Furniture structure (7) as any of previous claims **characterized in that** at least one of said modular elements (71, 72) has at least a first reference surface (710, 720) facing and in contact with a second reference surface (710, 720), being present at least a pair of magnetic means (6) with north-south coincident axis, opposed each other on two sides of said reference surfaces (710, 720) mutually in contact.
7. Furniture structure as claim 6) **characterized in that** at least said reference surfaces (710, 720) facing and mutually in contact are made of materials not sensitive to the magnetic field.
8. Furniture structure as any of the previous claims **characterized in that** said magnetic means (6) present a cylindrical and essentially flat shape.
9. Furniture structure as any of the previous claims **characterized in that** said magnetic means are provided with surfaces painted with anti-skid paint.
10. Furniture structure as any of the previous claims **characterized in that** said modular elements present a block shape with at least one face open.
11. Furniture structure as claim 10) **characterized in that** at least one of said modular elements (8) includes a door (81) placed in correspondence of at least one of its open face.
12. Furniture structure as any of the previous claims **characterized in that** said magnetic means (6) are permanent magnets.
13. Furniture structure as any of the previous claims **characterized in that** said magnetic means (6) are removable from said modular elements.
14. Furniture structure as any of the claims from 1) to 12) **characterized in that** said magnetic means (6) are irremovably associated with said modular elements.



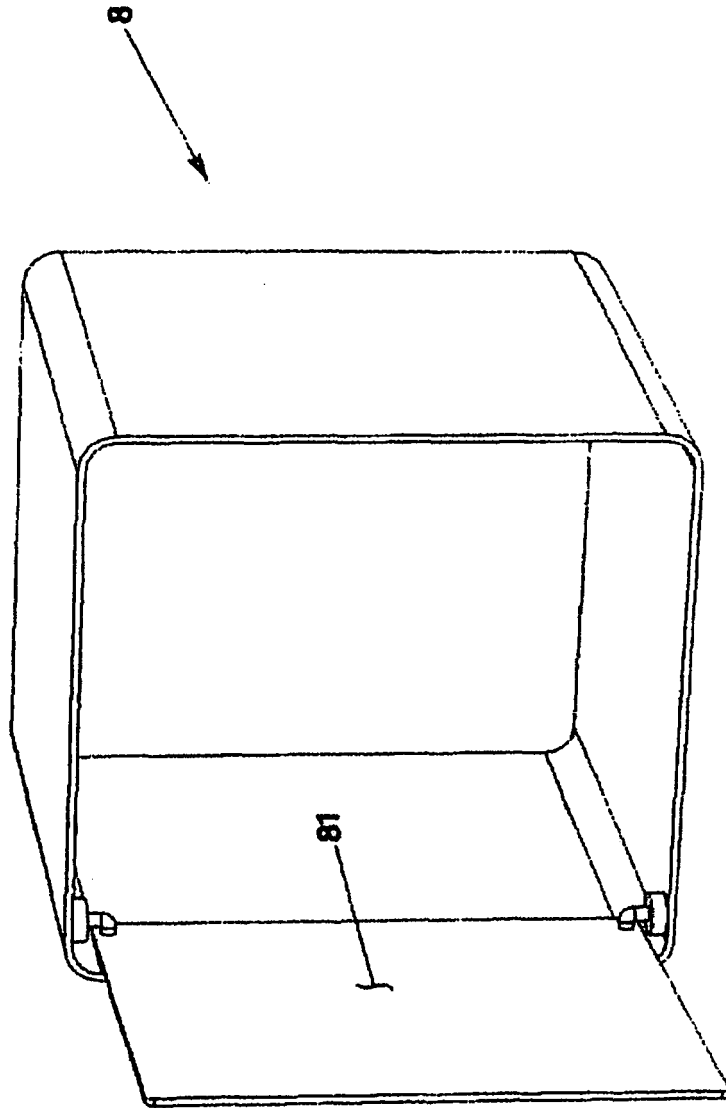
**Fig. 1**



***Fig. 2***



**Fig. 3**



***Fig. 4***



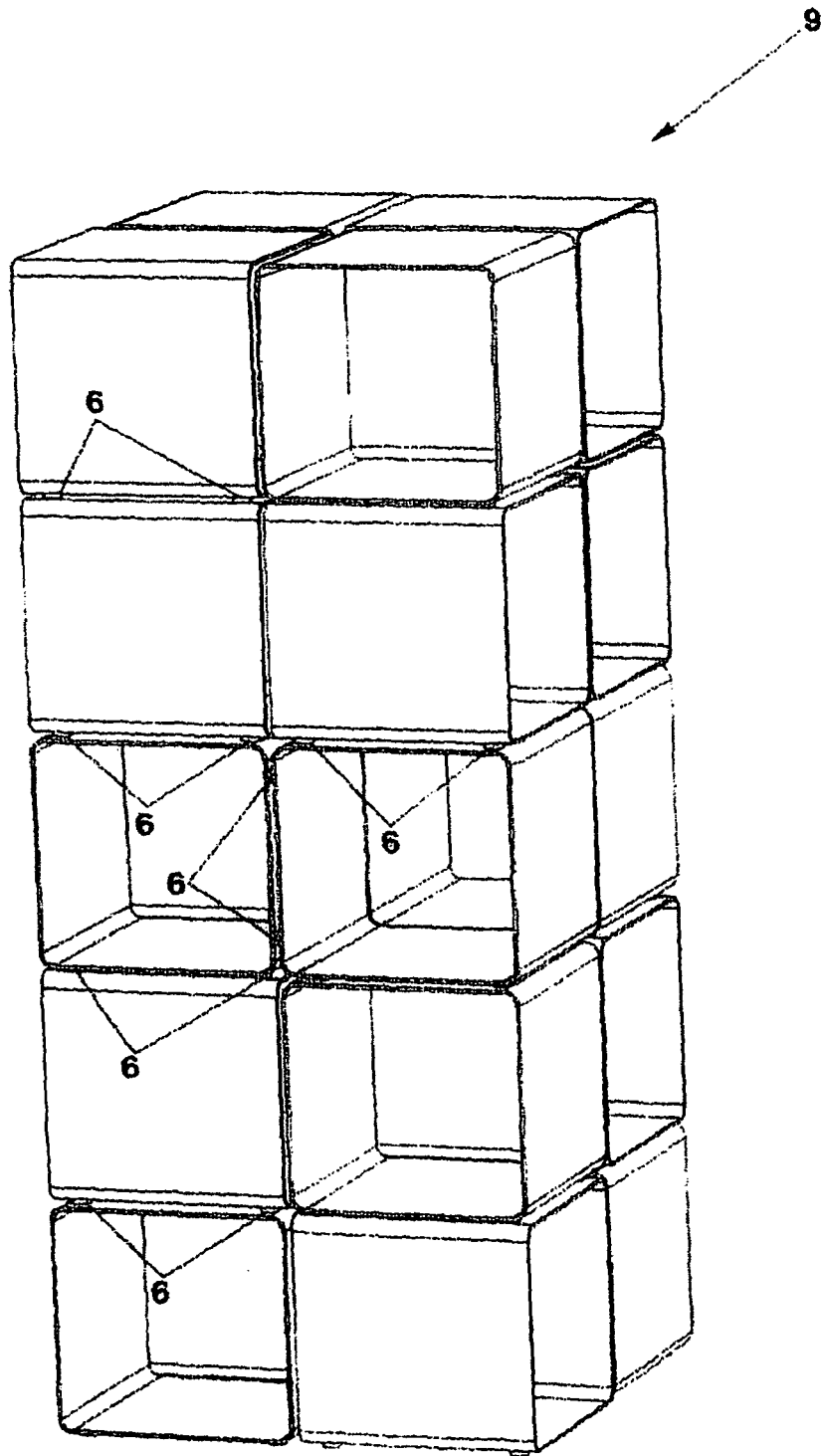


Fig. 5



European Patent  
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# EUROPEAN SEARCH REPORT

Application Number  
EP 08 42 5238

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 2004/039212 A (AIRLEED AG [CH]; BALZ STEIGER [CH]) 13 May 2004 (2004-05-13) * the whole document *	1-7, 10-14	INV. A47B87/02
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			TECHNICAL FIELDS SEARCHED (IPC)
			A47B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 31 July 2008	Examiner van Hoogstraten, S
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT  
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EP 08 42 5238

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
The members are as contained in the European Patent Office EDP file on  
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31-07-2008

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