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⑧ **Prefabricated panel structure for the building industry and process for the production thereof.**

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Description

The object of the present invention is a prefabricated panel for the building industry having the features of the prior art portion of claim 1, a process for the production thereof, and a method of using the panel itself.

More particularly, the panel structure according to the invention has been conceived for the complete self-contained construction of a so-called "services area", though it may find application, more generally, in the construction of all the inner partition wall of the building, especially in certain types of constructions as those intended for hotels.

By the general term "services area" is here meant the volume occupied by the bathrooms and kitchen which, according to the present invention, is concentrated around the piping system of the main installations — called also "technical block" — in a co-ordinate and functional whole.

Prefabricated panels, meant to speed up the construction of the inner partition walls of a building, or of at least part of such walls, are already widely known. DE—C—497 014 describes a panel in accordance with the prior art portion of claim 1, the nature of the slabs and fillets not being specifically indicated.

A type of panel at present in use comprises for example slabs of gypsum board, fixed onto a supporting metal structure, with the eventual interposition of an insulating core, made for example of rock wool. These panels are mounted onto a metal carrying framework, previously anchored to the concrete structure of the building. The connection points between adjacent panels are covered with gypsum smoothing.

This type of panel has however several drawbacks:

— to start with, it is fragile: its edges, or even the entire panel, may easily break during transport, or else when handling the same during assembly;

— the metal carrying framework and the corresponding connection points form as many gaps in the wall, especially for what concerns its characteristics of thermal and acoustical insulation;

— it requires, in any case, the application of a superficial protective and finishing layer, to be applied after complete mounting of the panels, and this may even involve lining with tiles, for example in the bathroom area.

A further known type of prefabricated panel, having in turn a sandwich structure, comprises two sheets of thin laminated plastic — for instance of a thickness between ten and twelve tenths of a millimeter — containing an insulating layer, consisting for example of bakelized honeycomb board. Also these panels are mounted onto a metal carrying framework. The connection points between adjacent panels are covered by metal or wooden fillet joints.

Compared to the previously mentioned type, these panels essentially have the advantage of

providing a surface which — especially if used for partitions inside offices — can be considered as substantially finished.

For what concerns the rest, they equally have the drawback of a scarce impact strength and of an insufficient thermal and acoustical insulation. They moreover have scarce fire resisting properties.

They are furthermore totally unfit for application particularly in the services area, in that they are scarcely resisting to water and to dampness in general, and on the other hand, they are also not apt to support a dampproof lining of the type with tiles.

Also other types of commercially known prefabricated panels — more particularly designed for the construction of partition walls for offices — essentially comprise the characteristics heretofore specified, of a differently composed sandwich structure mounted onto a metal carrying framework.

For what concerns more specifically the construction of service rooms, prefabrication was initially limited to the construction of the already cited "technical blocks", that is, of single-block units containing the basic sanitary installations, apt to be connected with a few operations to the risers and drain pipes, or else already incorporating some sections thereof. Blocks of this type may generally contain, in addition to all the pipes and connections required for connecting the various sanitary apparatuses, drain traps, water drain and hot water tanks, conditioning or air ventilation systems, and/or electric systems.

Such blocks have been found in practice very useful, in what they actually reduce to a considerable extent the amount of time and labor required in the building yard for arranging all the connections for the sanitary apparatuses. The block — eventually incorporating also the risers and drain pipes — is in fact placed at a pre-established point of the building and all there is left to do is to connect the sanitary apparatuses thereto.

More recently, further solutions have however been proposed, consisting in the prefabrication of complete "cabins", that is, of unitary assemblies of walls, sanitary apparatuses and respective pipes, forming a service room.

Known solutions of this type are being sold by the Italian firms MONTEDIL and ICS, as well as by the German firm H. G. MOLLER. They usually comprise a shell of plastic material — as fiberglass-reinforced plastic or methacrylate — formed in two or more moulds, wherein the actual wall of plastic material is moulded so as to obtain therein, in one piece therewith, also the sanitary apparatuses, or any other containment or carrying spaces. The inner surface of the walls forming said shell is perfectly smooth and finished. Whereas on the outer wall, the surface of which is instead rough, all the connecting pipes are applied.

Single-block cabin units thus realized are positioned in the building structure when it is still

without partition walls, they are connected to the risers and drain pipes, whereupon curtain walls or sheathing or covering walls are leant against the rough walls of the cabin.

Of course, a single-block assembly of this type — which is carried to the building yard for instance by motor transport, then lifted by crane and positioned in its final position — has the great advantage of reducing the construction times in the building yard of the corresponding service room.

Nevertheless, it is not free from drawbacks. To start with, on account of its bulk — since it is in practise a complete room, though small — and of its weight, it requires special equipment both for its transport from the factory to the building yard and for its lifting and positioning. Furthermore, it always requires external curtain or sheathing walls, which evidently reduces the advantage of such a daring prefabrication. On the other hand, in the event of damages to the plant applied on the external part, it is very difficult to operate repairs. Finally, in case of breakage or even of simple damage due to wear of the sanitary apparatuses, their replacement is very difficult and problematic due to the fact that they are formed in one piece with the wall.

A further inconvenience derives from the fact that, since these cabins are produced starting from large moulds which are generally costly, it is practically impossible to produce them in several types and different shapes, whereby the building designer has to adapt the spaces to the structure of the cabin, rather than — as it normally happens — adapting the service room to the general space requirements of the building.

Further types of single-block cabins now on the market, or equivalent solutions — such as described for example in the Canadian Patents No. 928,023 and No. 929,720 — substantially provide the same advantages, but also the same drawbacks.

A first object of the present invention is now to realize a modular panel structure, being greatly improved compared to that of the known technique and providing, in particular:

- excellent characteristics of resistance to mechanical stresses, to water and to dampness;
- a fundamental self-supporting capacity, so as to eliminate the requirement for connecting and carrying metal frameworks;
- a high dimensional precision and at least one perfectly finished surface, so as to allow a remarkably simple and quick assembly; in particular — on account of the characteristics of the laminate, which can be machined with highly precise mills — it has been possible to eliminate the need for any joint coverings;
- a minimum weight and size, with consequent easiness of transport and of handling during assembly;
- a lower and more constant factor of thermal and acoustical transmission;
- a relatively controlled cost.

These and other results are obtained with the

prefabricated panel structure according to the invention, comprising two main slabs, glued together in spaced relationship by means of fillets arranged perpendicularly to surface of the slabs, so as to form a sealed flat box-like body, the chamber formed inside said sealed box-like body containing pressed insulating material, characterized in that said slabs and fillets are made of laminated plastic, consisting of sheets of high quality cellulose imbued with a mixture of phenolic resins superposed and pressed, said slabs having a thickness of at least 5 mm, and in that said fillets are arranged along a contour which is set back from the edges of said slabs.

According to a further important characteristic, at least one of the outer faces of said main slabs has a finished surface, so that once the panels have been mounted in a partition wall construction defining a living space, there is no longer the requirement to complete or finish said wall, for instance with painting or wall-paper, as instead usually done in known technique.

To produce such a panel structure, one provides — according to the present invention — to carry out the steps of:

- delimiting on the upward turning face of a first main slab of laminated plastic, positioned flat, a contour set back in respect of its edges;
- applying along said contour, with the interposition of adhesive, the lower edge of spacing fillets arranged perpendicularly to the slab;
- filling the volume confined between said fillets with a layer of insulating material being thicker than the width of the fillets;
- overlaying a second main slab of laminated plastic, by applying it on the layer of insulating material;
- subjecting the slabs to a clamping pressure, one against the other and against the fillets, also with the interposition of adhesive, up to complete glueing thereof.

A further aspect of the present invention consists in using the aforescribed prefabricated panel structures in the building field and, in particular, for the construction of partition walls; for this purpose, one determines the perimeter of the partition walls defining different areas of a living space and, along said perimeter, one fixes to the ground a rest guide; the panels are mounted on the rest guide, providing to house the rest guide into the cavity formed between the spacing fillet and the bottom ends of the main slabs, the panels being furthermore mounted one next to the other, carrying into mutual engagement the respective vertical sides and using, time after time, flat panels, corner panels or T-connection panels up to completing the perimeter. Thanks to the fact that the spacing fillets are set back in respect of the edges of the panels, a compartment is formed along the vertical, side-by-side lateral edges, used for housing the service piping system, and/or along the horizontal edges, used for the fixing onto the rest guide fixed on the ground, or for the insertion of joints for anchorage to the ceiling.

Thus conceived, the structure according to the present invention, as well as its method of use, provide—compared to known technique—a great number of advantages:

— to start with, the single panels can be industrially produced complete of their respective means of mutual connection and anchorage and with fully finished surfaces; on the other hand, for the finishing of such surfaces, one may adopt any building or industrial techniques allowing to obtain the best characteristics according to the use foreseen for the panels: for residential houses, for hotels or for other large building complexes, and so on;

— moreover, said panels form in practice wall elements of modular dimensions, which may be differently composed according to the structural and dimensional requirements of the project, so as to allow the most varied arrangements of service rooms;

— such panels, having essentially flat and smooth surfaces, may be easily piled up and packed with a minimum bulk; this forms a further advantage both for the storage in a very small space, and for their transport and/or lifting in the building yard;

— the setting up in the building yard is extremely fast, not only on account of the modest weight of the panels, but especially due to the fact that, on one hand thanks to their high dimensional precision and, on the other hand, due to the complete absence of supplementary connecting and carrying frameworks, it is possible to carry out the assembly very easily — almost as if it were a constructions game — without having to provide for any adjustments or arrangements in the building yard, including the connection of pipelines, especially electric lines, into the vertical or horizontal spaces formed, as said, by the spacing fillets which are set back in respect of the edges of the panels;

— thanks to the means of mutual connection and support, the set of panels thus assembled results perfectly rigid and stable, substantially like a group of stone walls. To set working the service room enclosed therein, it is sufficient to link the various sanitary apparatuses in correspondence of connection points and connect them with corresponding pipelines, provided in the "technical block", through passages suitably arranged into one of the panels leaning against the "technical block".

Further characteristics and advantages of the structure according to the present invention will anyhow result evident from the following description of some preferred embodiment thereof, given however by mere way of non-limiting example and illustrated in the accompanying drawings, in which:

Fig. 1 is a partial schematic horizontal section view of two juxtaposed panels;

Fig. 2 is a partially sectioned plane view of a panel;

Fig. 3 is a partial section view of the three elements of laminated plastic which form the panel;

Fig. 4 is a partially sectioned elevation view of a pair of assembled juxtaposed panels;

Fig. 5 is a partial head view of a panel, in correspondence of the point of anchorage to the floor;

Fig. 6 is a horizontal schematic section view of a panel forming a corner;

Fig. 7 is a horizontal schematic section view of a panel having the form of a T or a double T connection;

Fig. 8 is a schematic plan view of a possible arrangement of a service area realized with the panels according to the invention;

Fig. 9 is a horizontal section view, on an enlarged scale, of the association of some of the panels used in the arrangement of fig. 3;

Fig. 10 is a schematic plan view of a different arrangement of a service area, inserted in a wider complex designed for hotel use;

Fig. 11 is a schematic elevation view of a partition wall used in the complex of fig. 10; and

Fig. 12 is a partial schematic vertical section view, on an enlarged scale, of the same wall of fig. 11 and of the respective anchoring system.

As shown, the panel according to the present invention is formed by a pair of thick main slabs 1 and 2 of laminated plastic.

By the term "laminated plastic" is meant at present a sheet product made up starting from sheets of high-quality cellulose, with high mechanical strength, imbued with a mixture of phenolic resins, superposed and pressed. Preferably, use is also made of a sheet of cellulose — or else of fabric, or even of veneering of wood, cork or the like — imbued with melaminic resin and on which an ornamental design may eventually be reproduced, forming a superficial layer, applied on one or on both faces of the "laminated" and having a decorative function. Such plastic laminates have been up to date produced in thicknesses usually not wider than ten to twelve millimeter tenths, and they have exclusively been used as sheets for covering and protecting a carrying structure, for example of wood.

Whereas, the "thick laminated plastic" is a laminate produced substantially with the same technique as described above, but sufficiently thick — for instance, 5 to 12 mm — to become, to a more or less large extent, self-supporting. A thick laminate of this type, though of very particular conformation, has been proposed in the Italian Patent application No. 24066 A/80 filed on 8th August 1980 in the name of the same Applicant.

The panel according to the present invention uses the two laminated plastic slabs 1 and 2, with the interposition of a layer 3 of insulating material, consisting for example of pressed cork. According to the invention, this insulating layer is delimited along its entire contour, by fillets 4, also made of thick laminated plastic.

Figures 1 and 2, but more particularly figure 3, show how to assemble the aforementioned elements 1, 2, 3 and 4. The faces of the slabs 1 and 2 turning towards the inside of the panel are provided — to delimit the contour enclosing the

insulating layer 3 — with grooves 1' and 2', into which engage the fillets 4 with their opposed edges (if the grooves 1' and 2' are wide enough) or, preferably, with ribs 4' formed on their edges.

The grooves 1', 2' and the ribs 4' are formed by milling, and this — taking into account the highly compact and hard structure of the laminate — allows an execution of high dimensional precision, to the full advantage of the subsequent assembly and gluing operations.

In practice, to construct the panel one proceeds as follows:

— the slab 1 is positioned flat, with its inner face turning upwards, and adhesive is spread thereon, for instance cold adhesive of the "536 spray" type produced by the firm AREC. The fillets 4 are then applied, and their respective ribs 4' are engaged into the grooves 1'. The space delimited by the fillets 4 is filled with insulating material — preferably formed by cork sheets or the like — up to a thickness slightly exceeding the width of the fillets 4. Finally, the slab 2 is positioned thereon, being in turn previously spread with adhesive on its inner face, causing the ribs 4' of the fillets to get engaged into the grooves 2'. The panel thus formed is then subjected to pressure — so as to press in particular the insulating material — and during this step the adhesive firmly sets.

In practice, it has been found that the engagement of the ribs 4' into the grooves 1' and 2' is not strictly indispensable, but the fillets may simply abut against the inner faces of the slabs 1 and 2 and be directly glued hereto. In this case it will evidently be necessary to provide means for temporarily keeping the fillets in a correct position, during pressing of the panels.

The result is anyhow a panel which — mainly on account of the box-like structure formed by the slabs 1 and 2 and by the fillets 4, but also owing to the compactness of the interposed insulating material — is perfectly rigid and self-supporting. On the other hand, due to the very absence of any metal carrying frameworks, such a panel is also extremely light and handy.

An important characteristic of the panels according to the invention lies moreover in the fact that the fillets 4 are set back in respect of the edges of the slabs 1 and 2, so that when two panels are juxtaposed, a chamber S — clearly shown in figure 1 — is formed therebetween, said chamber being apt to house service pipelines, and particularly electric lines.

For connecting several panels in succession — in order to form an entire wall — their vertical edges may be subjected to a further finishing operation, which consists in forming cog rib profiles 4"; each pair of profiles is apt to engage, by simple cogging, with a pair of mating profiles formed on the opposite side of each adjacent panel (as shown particularly in figure 1). This cogging allows to obtain a perfect airtight of joint coverings.

Figure 4 and 5 show how the panels are fixed one to the other into a wall structure. For this

purpose, a guide 5 is placed on the floor — firmly fixed by any known system, for example by riveting — comprising a metal rectangular section (as shown in figure 5) or an omega section, or the like.

To start with, each panel is positioned onto this guide 5, so that its bottom fillet 4 may substantially rest on the top of such guide, while the edges of the slabs 1 and 2, which extend beyond said fillet 4, embrace the guide 5 itself, as clearly shown in figure 5.

Once a first panel P has been thus positioned, it will be simply anchored to the guide 5 with a bracket 6. This latter is fixed on one side, by means of a screw 7 or rivet or the like, to the top of the guide 5, and on the other side it is fixed to the vertical fillet 4 of the panel P by means of screws screwed into holes 6'.

The adjacent panel P' is positioned onto the guide 5 in the same way, being brought close to the panel P up to mutual connection of the cog rib profiles 4", so as to guarantee the correct anchoring of the panel P' to the side panel P. At its opposite side (not shown in figure 4) the panel P' is then fixed with a bracket 6, in an identical way as described hereabove.

Thus, as seen, each panel is fixed to the floor with a single bracket, its correct anchorage being furthermore guaranteed by the cogging of the vertical edges of the single juxtaposed panels.

For what concerns the anchoring at the top of panel, this can be obtained on a similar way than done for the base, through a guide symmetrical to the guide 5, especially when having to compose walls for a relatively compact service area, such as described hereinafter with reference to figure 8. Whereas, in the event of having to assemble a relatively long rectilinear wall without any transversal supports, a top anchoring system of the type described hereinafter with reference to figures 11 and 12 will be adopted.

Figure 6 shows a panel forming a corner. As can be seen, the fundamental structure is essentially the same as seen with reference to figure 1, that is, with slabs 1 and 2 of laminated plastic enclosing a thick layer 3 of pressed cork or other insulating material.

Each corner panel is however formed by two rectilinear panel parts, in each of which the contour of the insulating layer is defined by the heretofore described fillets 4 only on three sides of the panel, while in correspondence of the vertical corner side, the said layer is delimited by a wooden upright 8. This upright 8 has a double function:

— on one hand, it is in fact apt to reinforce the panel just in correspondence of its corner position, which is the most stressed part of structure;

— on the other hand, it is also apt to facilitate the mutual gluing of the two rectilinear panel parts, which gluing is carried out along the dashed line X-X.

Figure 7 shows a panel in the form of a T or a double T connection. This panel is used, as better illustrated hereinafter, for the construction of a

rectilinear wall, to which are perpendicularly connected other walls. In the structure of figure 7, the main rectilinear panel P incorporates — in correspondence of the positions of connection to the walls perpendicular thereto — a wooden upright 9, in replacement of the cork layer 3. A lath 10, also of wood, is furthermore applied — by gluing or even by screws or other known suitable means — on the outer face of the panel, in correspondence of the upright 9.

The lath 10 is used as guiding element for a panel section 11, forming the beginning of a perpendicular wall, and it acts just like the guide 5 used to anchor the panel to the floor. In fact, the section 11 is brought into engagement with the lath 10, so that the fillet 4 comes in contact with the lath and the ends of the slabs 1 and 2, extending beyond the fillet 4, can embrace the sides of the lath 10. The panel section 11 thus results perfectly positioned.

For anchoring the section 11 to the main panel 1, opposed holes 12 and 13 are provided, at regular distances, on the fillets 4 of the section 11 itself. A first smaller hole 12 is used for the passage of a screw 14 or the like, which anchors the section onto the lath 10 and onto the upright 9, while a second larger hole 13 is used for letting through a tool to drive in the screw 14.

It should be noted that the corner panel, as well as the T or double T panel, is assembled at the factory, and not in the building yard, whereby assembly can be done with the highest possible precision.

Figures 8 and 9 show a way of using the panels described so far. Figure 8 shows a possible arrangement of a services area, surrounding a volume V containing the delivery and drain pipes. On one side of the volume V is formed a bathroom B, while on the other side there is a kitchen C with sink 15 and cooker 16, and on the third side there is room for a cupboard A. All the hatched contour represents the partition walls formed with the panels according to the invention.

Figure 9 shows more in detail how the various types of panels are associated to realize a wall arrangement as that shown in figure 8. One can actually see rectilinear panels P, corner panels P1 and double T panel P2, which latter is used to anchor the walls delimiting the technical volume V.

Figure 10 shows a different structural arrangement, of the twin type, designed for hotel use. It will be noted that with the panels according to the present invention it is possible to realize, not only bathroom areas B, placed by twos and each having a technical volume V of their own, or eventually some cupboard elements A, but also the entire partition walls D between one room and the next.

However, for these partition walls D, two additional problems have to be faced:

— in fact, on one hand, since this rectilinear wall is relatively long and has no transversal bracing connections, it is indispensable to provide for anchoring means not only at floor level but also at the ceiling;

— on the other hand, since these partition walls are actually designed to separate hotel rooms, higher soundproofing conditions may be required than those foreseen between service areas and rooms of the same living space.

The first of these problems is solved in the way shown in figure 11, and more in detail in figure 12, taking also into account the fact that, while the construction of the panels at the factory may be carried out with high dimensional precision, vice-versa the concrete structures or the building structures in general have rather wide tolerances.

In view of this fact, it is foreseen to construct the panels with a height about 5 cm below the room height planned in the building project. The panels are then fixed at the base by being placed astride of a metal guide, in the manner heretofore described. At the top, the panels are fixed by means of extending brackets 18 which are anchored directly to the ceiling at regular intervals. These brackets 18 may be simple L-shaped metal brackets. Alternatively, one may use brackets made of rubber or similar resilient material, adapting more easily — by mere elastic deformation — to the distance differences between the ceiling and the top of the panels.

For what concerns instead the second problem, namely a more efficient soundproofing, this is solved — according to the present invention — by using a couple of shortly spaced panels, as illustrated in the constructive variant of figure 12. In this case, a bottom guide is used, formed by a pair of parallel ribs 5A and 5B, connected by a flat intermediate portion 5C. On this flat portion 5C are set the means of anchorage to the floor, for example expansion screws 20, while the panels are placed astride of the ribs 5A, 5B.

At the top ends, after having fixed the panels by means of the bracket 18, the space lying between the top of the panels and the surface of the ceiling is filled with insulating material L, for example rock wool. Both sides of the double wall thus formed are then closed by masking frames 19. The frames 19 may have any configuration and be fixed by any suitable means of known type, whereby it seems unnecessary to give a detailed description of such means.

The intermediate space between the panels forms a practically sealed air chamber.

The practical tests carried out on the panels produced according to the present invention have given fully satisfactory results.

In actual fact, even if using for the main slabs 1 and 2, laminates of a relatively limited thickness — that is, of about 5—6 mm, instead of the 9—10 mm specified for example in the aforesaid patent application No. 24066 A/80 — the panel offers surprising features of stiffness and mechanical strength. On the other hand, it is light and handy.

On account of its method of construction, the panel according to the invention provides furthermore very precise and uniform dimensional and qualitative characteristics, and this considerably facilitates the assembly operations in the building yard. It has been found in practice that, for

constructing for example a bathroom, the construction time is reduced up to 70% compared to the traditional systems.

Moreover, the afocited dimensional and qualitative characteristics are permanent in time, whereby there is no fear at all of any yieldings or deformations. The panel is in fact resisting to impact, abrasion and chemical etching; it is liquid-proof and thereby perfectly resisting to dampness which is normally present in sevice areas; it is furthermore quite fire-resisting.

The panels according to the invention have a good soundproofing or deadening power. With a panel of the type illustrated in figure 1, about 40—50 mm thick, an absorption of about 32—35 db has been observed, while a wall with two panels, as the one illustrated in figure 12, has been found to provide an absorption up to 48 db.

The high dimensiona! precision and the excellent finishing in the production of these panels allows them to be assembled simply juxtaposed, as shown in figures 1 and 4, without the need — as already said — for any joint coverings between one panel and the next. Moreover, the free space being formed between two juxtaposed panels — indicated with S in figure 1 — allows the passage of cables, pipes or the like, thereby eliminating the problems and additional costs involved in the prearrangement of canalizations or the like.

It should finally be noted that the particularly simple structure of these panels allows them to be produced both of standard modular dimensions, and of special dimensions on request of the designers, this allowing to satisfy high requirements of flexibility of use.

Claims

1. Prefabricated panel for the building industry, comprising two main slabs (1, 2) glued together in spaced relationship by means of fillets (4) arranged perpendicularly to the surface of the slabs, so as to form a sealed flat box-like body, the chamber formed inside said sealed box-like body containing pressed insulating material (3), characterized in that, said slabs (1, 2) and fillets (4) are made of laminated plastic consisting of sheets of high quality cellulose imbued with a mixture of phenolic resins superposed and pressed, said slabs having a thickness of at least 5 mm, and in that, said fillets (4) are arranged along a contour which is set back from the edges of said slabs (1, 2).

2. Prefabricated panel as in claim 1, wherein the laminated plastic forming the slabs (1, 2) and the spacing fillets (4) is of a thickness of 5 to 10 mm.

3. Prefabricated panel as in claim 1, wherein the outer face of at least one of the slabs (1, 2) of laminated plastic forming the panel has a finished surface.

4. Prefabricated panel as in claim 1, wherein the insulating material (3) contained in the sealed chamber consists of cork.

5. Prefabricated panel as in claims 1 or 4, wherein said insulating material (3) is formed of

several superposed and juxtaposed sheets or sheet parts, pressed up to occupying the entire volume of said chamber formed by the sealed box-like body.

6. Prefabricated panel as in claim 1, wherein at least the opposite vertical edges (4") of each panel are shaped so as to obtain a simple groove-and-tongue engagement with the edges of the adjacent panels.

7. Prefabricated panel as in claim 1, wherein the cavity (S) formed between each spacing fillet and the ends of the main slabs extending beyond the fillet forms a space for housing service pipelines.

8. Prefabricated panel as in any one of the preceding claims, presenting itself in the form of a flat panel.

9. Prefabricated panel as in any one of the claims 1 to 7, presenting itself in the form of a corner panel.

10. Prefabricated panel as in claim 9, wherein the insulating material, in correspondence of the corner position, comprises at least one stiff wooden upright (8).

11. Prefabricated panel as in any one of the claims 1 to 11, presenting itself in the form of a panel for T connections.

12. Prefabricated panel structure as in claim 11, wherein, in correspondence of the T connection position, the insulating material of the main panel incorporates a wooden upright (9).

13. Process for the production of a self-supporting panel as in any one of the preceding claims, comprising the steps of:

— delimiting on the upward face of a first main slab (1) of laminated plastic, positioned flat, a contour set back in respect of its edges;

— applying along said contour, with the interposition of adhesive, the lower edge of spacing fillets (4) arranged perpendicularly to the slab;

— filling the volume confined between said fillets with a layer of insulating material (3) being thicker than the width of the fillets;

— overlaying a second main slab of laminated plastic (2), by applying it on the layer of insulating material;

— subjecting the slabs (1, 2) to a clamping pressure, one against the other and against the fillets (4), also with the interposition of adhesive, up to complete glueing thereof.

14. Process as in claim 13, wherein cog rib profiles (4") are formed by milling at least on the opposite vertical edges of the main slabs of each assembled panel, said profiles forming a mutual cogging engagement with the adjacent panels.

15. Use of a panel structure as in any one of the claims 1 to 12 in the building field, particularly for the construction of partition walls.

16. Use as in claim 15, wherein one determines the perimeter of the partition walls defining different areas of a living space and, along said perimeter, one fixes to the ground a rest guide (5); the panels are mounted on the rest guide (5), providing to house the rest guide (5) into the cavity formed between the spacing fillet (4) and the bottom ends of the main slabs (1, 2), the

panels being furthermore mounted one next to the other, carrying into mutual engagement the respective vertical sides and using, time after time, flat panels, corner panels of T-connection panels, up to completing the perimeter.

17. Use as in claim 16, wherein one determines the perimeter of the partition walls fixing to the ground a double rest guide (5A, 5B, 5C), on the two guides being mounted two sets of parallel panels, and a sealed air chamber being formed between the parallel adjacent panels fixed onto said two guides.

18. Use as in claims 16 or 17, in which one fixes by means of anchoring brackets (18), the free space between the top of the panels and the ceiling being filled with sealed compensation joints.

19. Use as in claim 16 or 17, wherein the free space (5) being formed at least along the vertical edges of the juxtaposed sides of the panels, is used for housing service pipelines.

Patentansprüche

1. Vorgefertigte Bauplatte für die Bauindustrie, aufweisend zwei Hauptbretter (1, 2), die in beabstandeter Beziehung mit Hilfe von Leisten (4) zusammen verleimt sind, angeordnet rechtwinklig zu der Oberfläche der Bretter, um so einen abgedichteten, flachen boxenartigen Körper zu bilden, wobei die Kammer, die innen in Bezug auf auf den abgedichteten boxenartigen Körper ausgebildet ist, gepreßtes Isolationsmaterial (3) enthält, dadurch gekennzeichnet, daß die Bretter (1, 2) und Leisten (4) aus laminierten Kunststoff hergestellt sind, bestehend aus Blätternhochqualitativer Zellulose getränkt mit einer Mischung aus Phenolharzen, übereinandergeschichtet und gepreßt, daß diese Bretter eine Dicke von zumindest 5 Millimetern haben und daß die Leisten (4) entlang dem Umfang angeordnet sind, der in Bezug auf die Ecken der Brettern (1, 2) zurückversetzt ist.

2. Vorfabrizierte Bauplatte nach Anspruch 1, wobei der laminierte Kunststoff, der die Bretter (1, 2) bildet und die beabstandeten Leisten (4) eine Dicke von 5 bis 10 Millimetern aufweisen.

3. Vorgefertigte Bauplatte nach Anspruch 1, wobei die äußere Fläche zumindest eines der Bretter (1, 2) aus laminiertem Kunststoff, die die Bauplatten bilden, eine endbearbeitete Oberfläche besitzt.

4. Vorgefertigte Bauplatte nach Anspruch 1, wobei das Isolationsmaterial (3), das sich in der abgedichteten Kammer befindet, aus Kork besteht.

5. Vorgefertigte Bauplatte nach den Ansprüchen 1 oder 4, wobei daß Isolationsmaterial (3) aus verschiedenen übereinanderangeordneten und nebeneinander befindlichen Blättern oder Blatteilen besteht, die gepreßt sind, um das gesamte Volumen der Kammer auszufüllen, die durch den abgedichteten boxenartigen Körper gebildet ist.

6. Vorgefertigte Bauplatte nach Anspruch 1, wobei zumindest die gegenüberliegenden verti-

kalen Ecken (4'') jeder Bauplatte so geformt sind, daß sie eine einfache Ausnehmung- und -Zungenzusammenwirkung mit den Ecken der angrenzenden Bauplatten ergeben.

5 7. Vorgefertigte Bauplatte nach Anspruch 1, wobei die Höhlung (S), die zwischen jeder beabstandeten Leiste und den Enden Hauptbretter ausgebildet ist und sich Über die Leisten hinweg erstreckt, einen Raum zur Aufnahme von Versorgungsleitungen bildet.

10 8. Vorfabrizierte Bauplatte nach einem der vorstehenden Ansprüche, in Form einer flachen Bauplatte.

15 9. Vorgefertigte Bauplatte nach einem der Ansprüche 1 bis 7, in Form einer Eckenbauplatte.

10. Vorgefertigte Bauplatte nach Anspruch 9, wobei das Isolationsmaterial, in Übereinstimmung mit der Eckenposition, zumindest einen steifen Holzträger (8) aufweist.

20 11. Vorgefertigte Bauplatte nach einem der Ansprüche 1 bis 10, in Gestalt einer Bauplatte für T-Verbindungen.

12. Vorgefertigte Bauplattenstruktur nach Anspruch 11, wobei, in Übereinstimmung mit der T-Verbindungsposition, das Isolationsmaterial der Hauptbauplatte einen hölzernen Träger (9) aufweist.

13. Verfahren zur Herstellung einer elbsttragenden Bauplatte gemäß einem der vorstehenden Ansprüche, aufweisend die Schritte:

30 Abgrenzung auf einer nach oben weisenden Fläche eines ersten Hauptbrettes (1) aus laminiertem Kunststoff, bei flacher Positionierung, einer zurückversetzten Kontur in Bezug auf deren Ecken;

35 Aufbringung entlang der Kontur, mit einer Zwischenschaltung eines Klebstoffs — die untere Ecke von Abstandsleisten (4), angeordnet rechtwinklig in Bezug auf das Brett;

40 Ausfüllung des Volumens, das zwischen den Leisten gebildet ist, mit einer Schicht aus Isolationsmaterial (3) die Dicker ist als die Breite der Leisten;

45 Darüberlegen eines zweiten Hauptbrettes aus laminiertem Kunststoff (2), in dem es auf die Schicht aus Isolationsmaterial gelegt wird;

50 Unterwerfen der Bretter (2) einem Klemmdruck, wobei eines gegen das andere und gegen die Leisten (2) gepreßt ist, desgleichen mit der Zwischenschaltung eines Klebstoffes, bis zur vollständigen Verleimung.

14. Verfahren nach Anspruch 13, wobei Verzahnungsrippenprofile (4'') durch Fräsen ausgebildet sind, zumindest an gegenüberliegenden vertikalen Ecken der Hauptbretter jeder zusammengeführten Bauplatte, wobei diese Profile eine gegenseitig verzahnte Zusammenwirkung mit angrenzenden Bauplatten ergeben.

15. Verwendung einer Bauplattenstruktur nach einem der Ansprüche 1 bis 12 auf dem Gebiet des Bauens, insbesondere für die Errichtung von Trennwänden.

16. Verwendung nach Anspruch 15, wobei man den Umfang der Trennwände, die verschiedene Gebiete eines Wohnbereiches abgrenzen, be-

stimmt, und, entlang den Umfang, auf dem Boden eine Rastschiene (5) befestigt; wobei die Bauplatten an der Rastschiene (5) angebracht werden, wobei weiter vorgesehen ist, daß die Rastschiene (5) in dem Hohlraum, der zwischen den Abstandsleisten (4) und den Bodenenden der Hauptbretter (1, 2) ausgebildet ist, aufgenommen werden und die Bauplatten weiterhin eine an der anderen befestigt werden, indem sie in gegenseitiger Zusammenwirkung die jeweiligen vertikalen Seiten führen und wobei, von Zeit zu Zeit, flache Bauplatten, Eckenbauplatten der T-Verbindungsbauplatten verwendet werden, bis zu einer Vervollständigung des Umfangs.

17. Verwendung nach Anspruch 16, wobei man den Umfang der Trennwände bestimmt, an den Boden eine doppelte Rastführung (5A, 5B, 5C) befestigt, wobei an zwei Führungen zwei parallele Bauplatten befestigt sind, und eine abgedichtete Luftkammer zwischen den angrenzenden parallelen Bauplatten ausgebildet ist, befestigt auf den zwei Führungen.

18. Verwendung nach Anspruch 16 oder 17, wobei man mit Hilfe von Verankerungen (18) Befestigungen vornimmt und der Raum zwischen dem oberen Bereich der Bauplatten und der Decke mit abgedichteten Kompensationsverbindungen ausgefüllt ist.

19. Verwendung nach Anspruch 16 oder 17, wobei der freie Raum (5), der zumindest entlang den vertikalen Ecken der nebeneinanderangeordneten Seiten der Bauplatten ausgebildet ist, zur Aufnahme von Versorgungsleitungen verwendet wird.

Revendications

1. Panneau préfabriqué pour l'industrie du bâtiment, comportant deux dalles principales (1, 2) collées ensemble à distance l'une de l'autre au moyen de tasseaux (4) disposés perpendiculairement à la surface des dalles, de façon à former un corps en caisson plate étanche, la chambre formée à l'intérieur dudit corps en caisson étanche contenant un matériau d'isolation (3) comprimé, caractérisé en ce que lesdites dalles (1, 2) et lesdits tasseaux (4) sont fabriqués en plastique stratifié constitué de feuilles de cellulose de haute qualité imprégnées d'un mélange de résines phénoliques, superposées et comprimées, lesdites dalles ayant une épaisseur d'au moins 5 mm; et en ce que lesdits tasseaux (4) sont disposés le long d'un contour qui est en retrait par rapport aux bords desdites dalles (1, 2).

2. Panneau préfabriqué selon la revendication 1, où le plastique stratifié formant les dalles (1, 2) et les tasseaux d'espacement (4) a une épaisseur de 5 à 10 mm.

3. Panneau préfabriqué selon la revendication 1, où la face extérieure d'au moins l'une des dalles (1, 2) de plastique stratifié constituant le panneau a une surface de qualité finition.

4. Panneau préfabriqué selon la revendication 1, où le matériau isolant (3) contenu dans la chambre étanche consiste en du liège.

5. Panneau préfabriqué selon la revendication 1, où la revendication 4, où ledit matériau isolant (3) est formé de plusieurs feuilles ou portions de feuilles superposées et juxtaposées, comprimées jusqu'à occuper la totalité du volume de ladite chambre formée par le corps en caisson étanche.

6. Panneau préfabriqué selon la revendication 1, où au moins les bords verticaux opposés (4'') de chaque panneau sont conformés de façon à obtenir un assemblage simple par languette de rainure avec les bords des panneaux adjacents.

7. Panneau préfabriqué selon la revendication 1, où la cavité (S) formée entre chaque tasseau d'espacement et les extrémités des dalles principales s'étendant au-delà du tasseau forme un espace pour loger es conduites de service.

8. Panneau préfabriqué selon l'une quelconque des revendications précédentes, se présentant lui-même sous la forme d'un panneau plat.

9. Panneau préfabriqué selon l'une quelconque des revendications 1 à 7, se présentant lui-même sous la forme d'un panneau d'angle

10. Panneau préfabriqué selon la revendication 9, où le matériau isoant, en correspondance avec la position d'angle, comporte au moins un montant rigide en bois (8).

11. Panneau préfabriqué selon l'une quelconque des revendications 1 à 11, se présentant lui-même sous la forme d'un panneau pour raccords en T.

12. Structure de panneau préfabriqué selon la revendication 11, où en correspondance avec la position du raccordement en T, le matériau isolant du panneau principal reçoit un montant en bois (9).

13. Procédé de fabrication d'un panneau auto-porter selon l'une quelconques des revendications précédentes, comportant les étapes consistant à:

— délimiter, sur la face tournée vers le haut d'une première dalle principale (1) de plastique stratifié, placée à plat, un contour en retrait par rapport à ses bords;

— appliquer le long dudit contour, avec interposition de colle, le bord inférieur de tasseaux (15) disposés perpendiculairement à la dalle;

— remplir le volume enclos entre lesdits tasseaux d'une couche de matériau isolant (3) plus épaisse que la largeur des tasseaux;

— superposer une seconde dalle principale de plastique stratifié (2) en l'appliquant sur la couche de matériau isolant;

— soumettre les dalles (1, 2) à une pression d'enserrage, l'une contre l'autre et contre les tasseaux (4), également avec interposition de colle, jusqu'à leur collage complet.

14. Procédé selon la revendication 13, où on forme, par fraisage, des profils d'assemblage à tenon (4''), au moins sur les bords verticaux opposés des dalles principales de chaque panneau assemblé, lesdits profils formant un assemblage mutuel à tenon avec les panneaux adjacents.

15. Emploi d'une structure de panneau selon l'une quelconque des revendications 1 à 12, dans

le domaine du bâtiment, en particulier pour la construction de parois de séparation.

16. Emploi comme dans la revendication 15, où on détermine le périmètre des parois de séparation définissant différentes zones d'un espace à vivre et, le long dudit périmètre, on fixe au sol un guide de soutien (5); où on monte les panneaux sur le guide de soutien (5), en faisant en sorte de loger le guide de soutien (5) dans la cavité formée entre le tasseau d'espacement (4) et les extrémités inférieures des dalles principales (1, 2) les panneaux étant de plus montés l'un près de l'autre, les côtes verticaux respectifs étant amenés en engagement mutuel, et en utilisant, selon les cas, des panneaux plats, des panneaux d'angle ou des panneaux de raccordement en T, jusqu'à terminer le périmètre.

17. Emploi selon la revendication 16, où on détermine le périmètre des parois de séparation en fixant au sol un double guide de soutien (5A, 5B, 5C), deux jeux de panneaux parallèles étant montés sur les deux guides et une chambre à air étanche étant formée entre les panneaux adjacents parallèles fixés sur lesdits deux guides.

18. Emploi selon la revendication 16 ou la revendication 17, dans lequel on fixe au moyen de goussets d'ancrage (18), l'espace libre entre le haut des panneaux et le plafond étant rempli de joints de compensation étanches.

19. Emploi selon la revendication 16 ou la revendication 17, où on utilise pour loger les conduites de service l'espace libre (S) qui est formé au moins le long des bords verticaux des côtés juxtaposés des panneaux.

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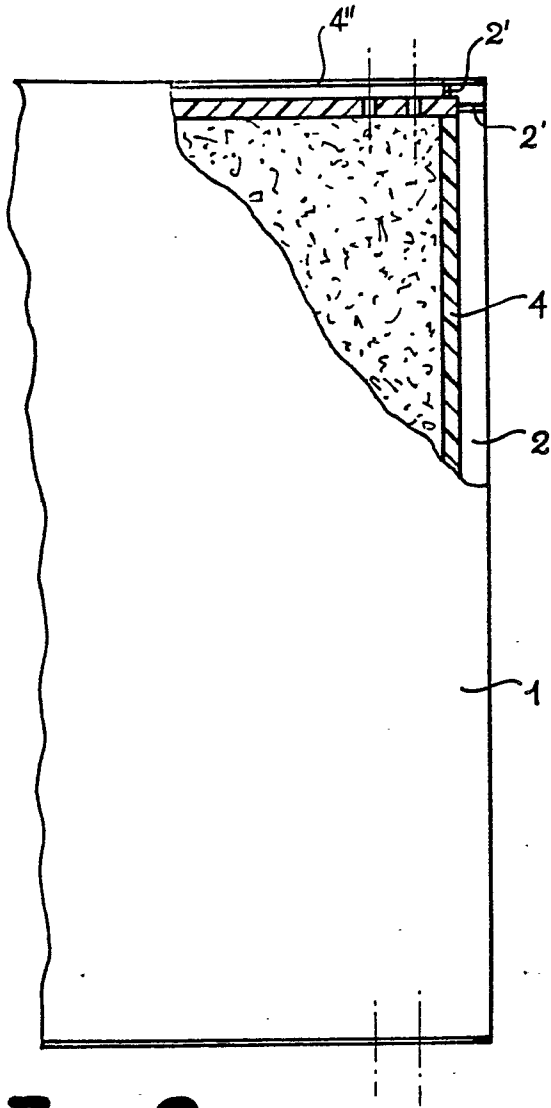


Fig. 2

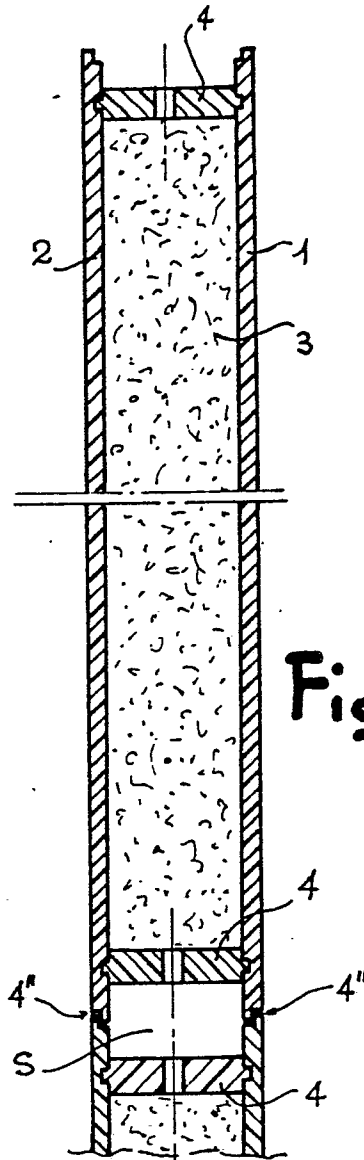


Fig. 1

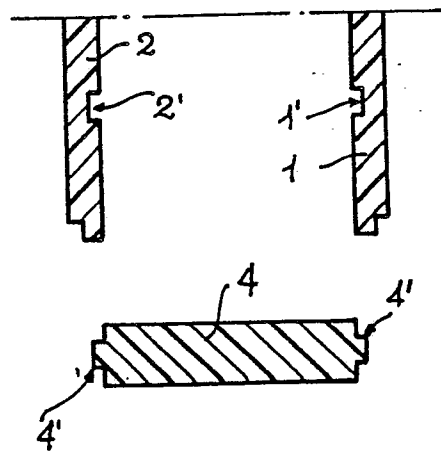


Fig. 3

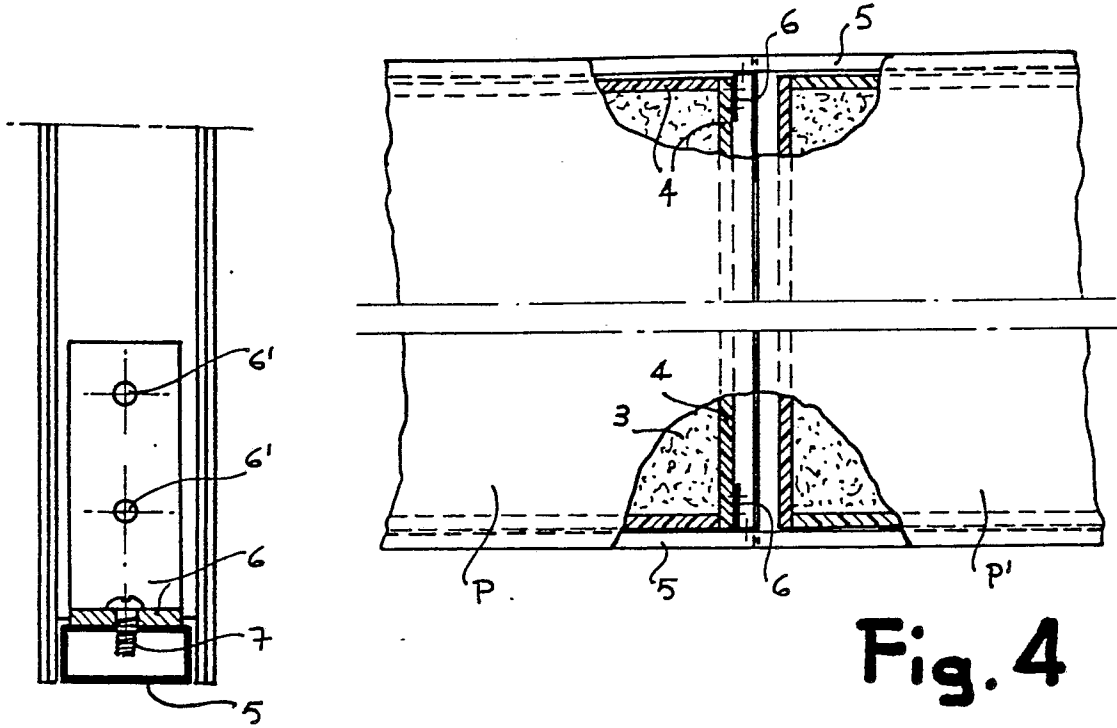


Fig. 4

Fig. 5

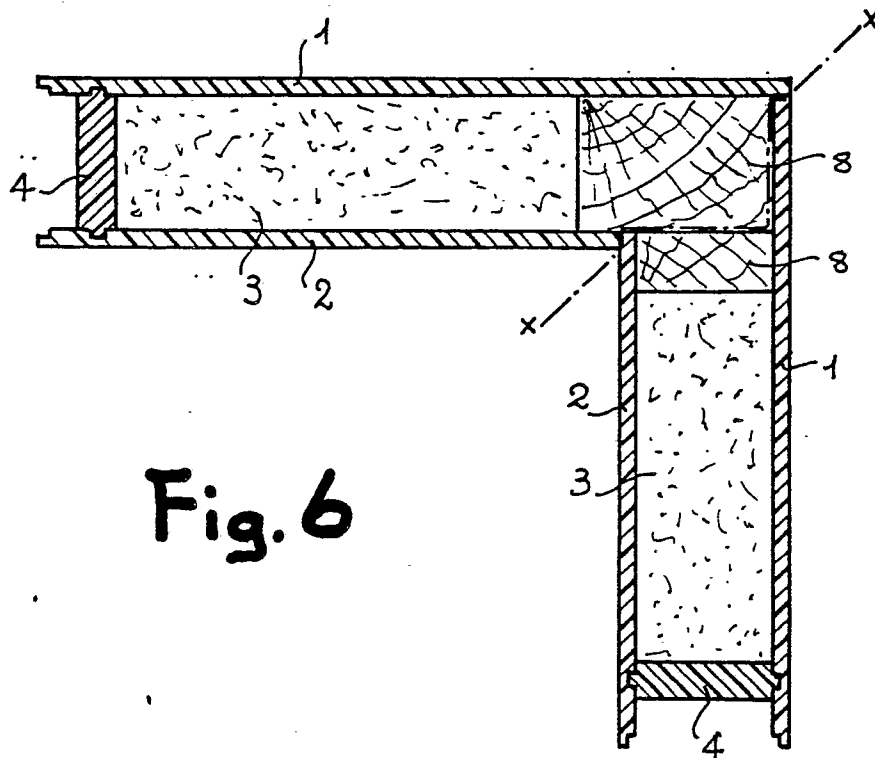


Fig. 6

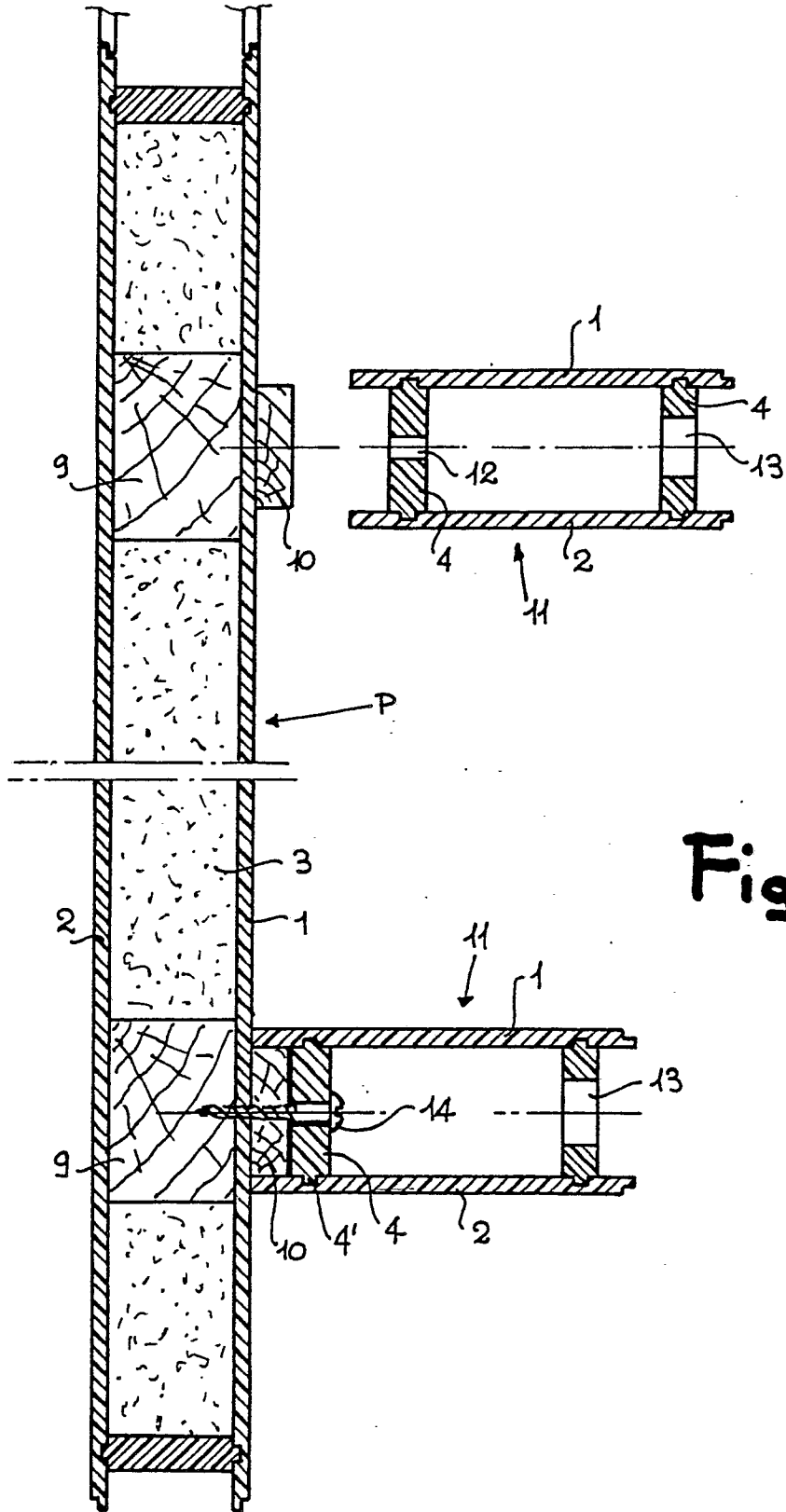


Fig. 7

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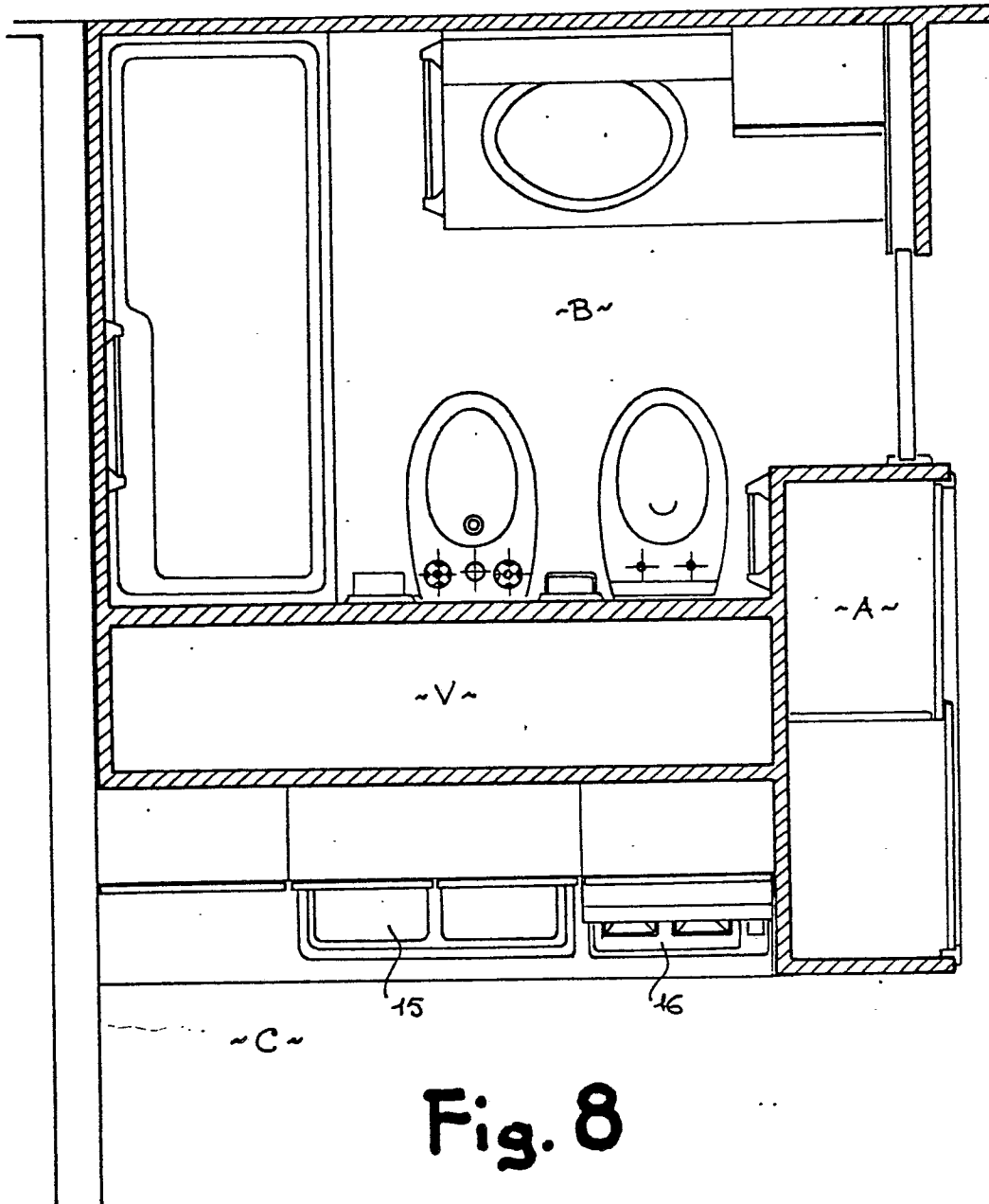


Fig. 8

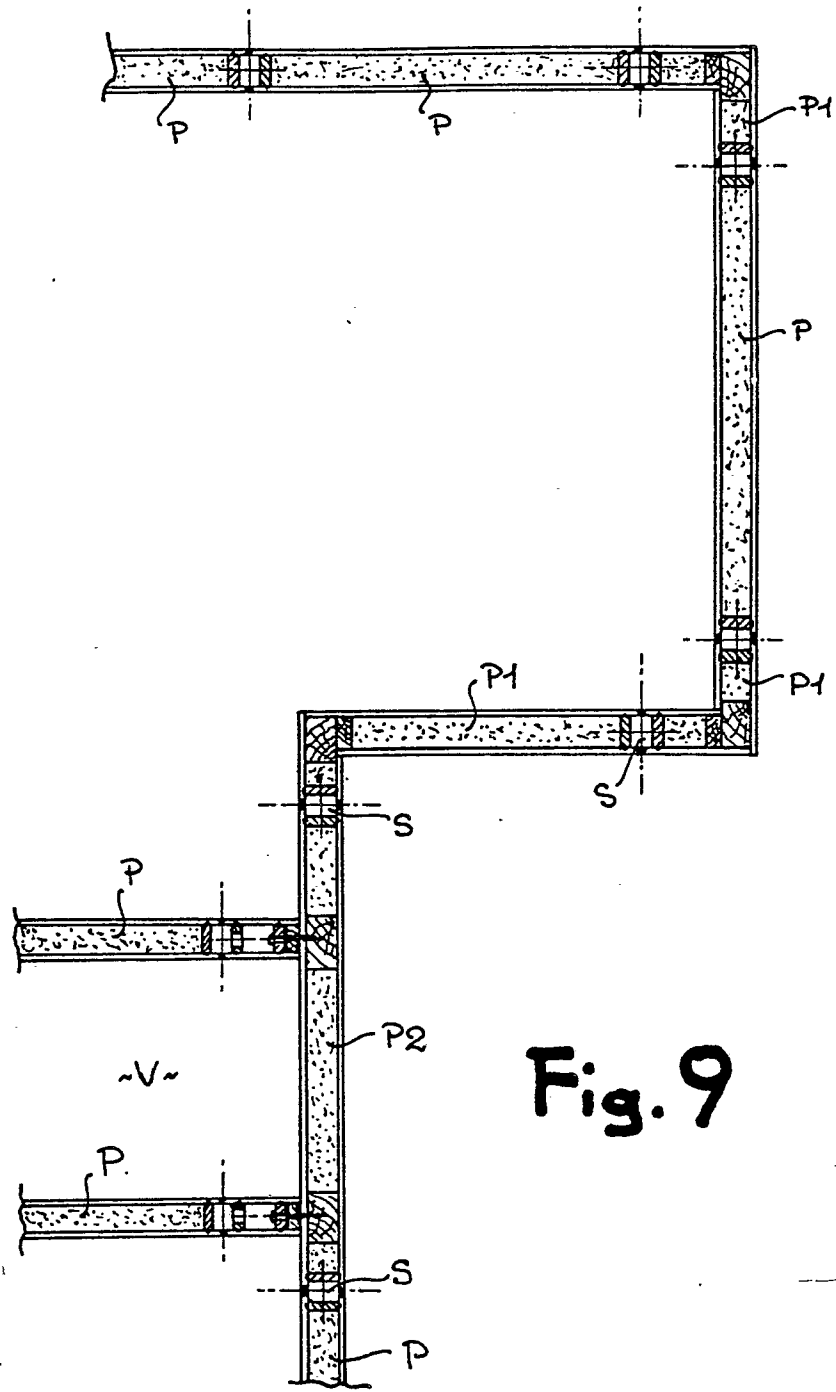


Fig. 9

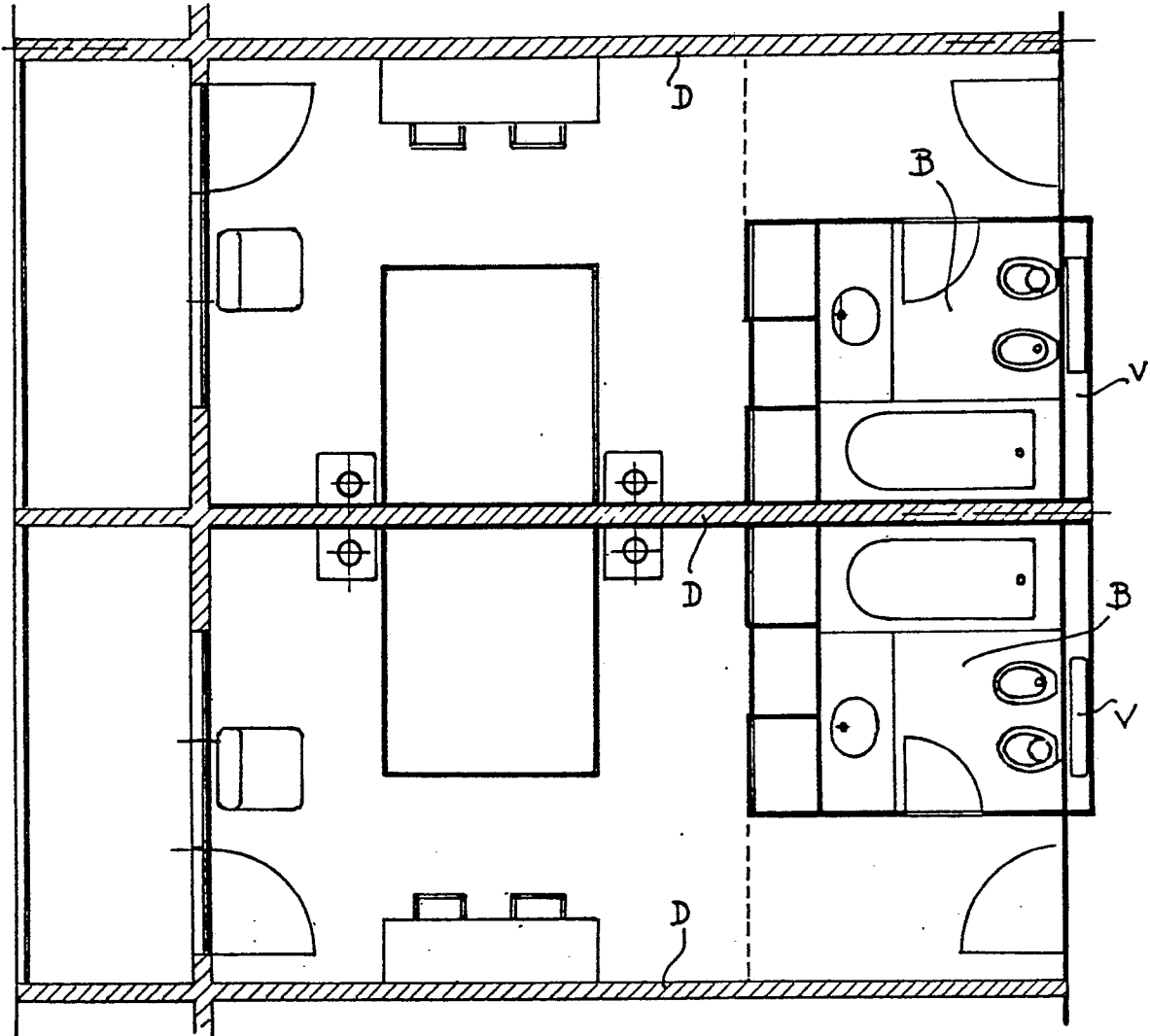


Fig. 10

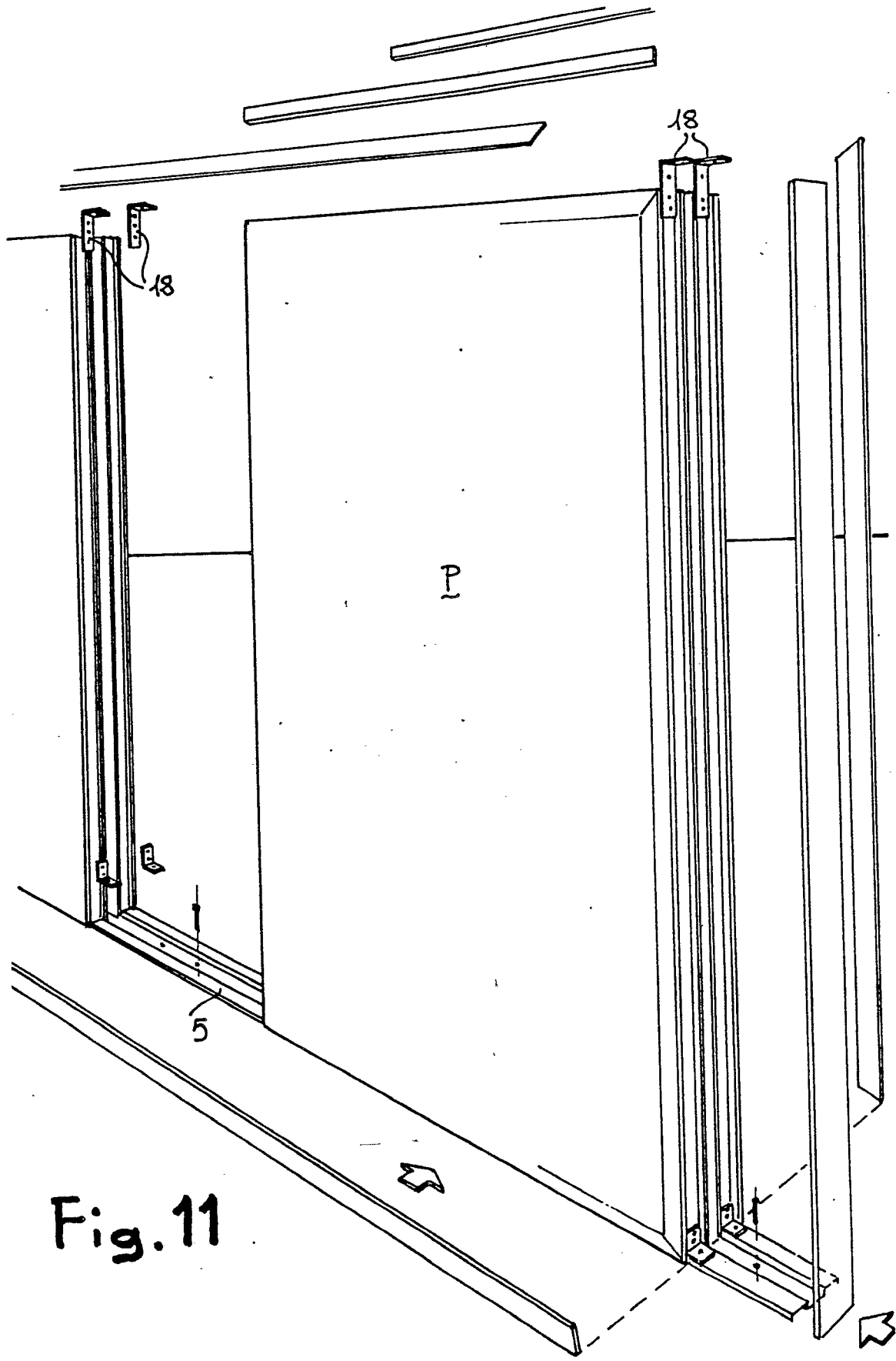


Fig. 11

