

PREFABRICATED, FLOORLESS, SELF-SUPPORTING MODULAR UNIT

The invention relates to a prefabricated, floorless, self-supporting modular unit, for instance a cabin or the like, in accordance with the preamble of claim 1, which modular unit comprises a supporting frame, to which at least the majority of the walls of the modular unit are fastened and which defines the primary shape of the modular unit, whereby the supporting frame includes a number of elongated support members, on top of which the walls are fastened and by means of which the modular unit is attached to its floor base.

Self-supporting modular units can be used, for instance, in a building, an off-shore structure, a ship, a train, a yacht or the like. The prefabrication degree may vary. A modular unit is provided with a supporting frame, on top of which the walls are fastened normally by screwing and which gives the modular unit its shape. A modular unit may have e.g. a bathroom module ready-fitted in it, but also some of the furnishing may be provided, if so required. While transferring the modular unit to its installation site, this furnishing may be fastened to the walls, from where it is taken down as soon as the modular unit is secured and installed into its place. Thus, the modular unit is transferred, possibly pre-furnished like this, to its site of use and fastened to its floor base conventionally by gluing, welding or nailing.

The material of the floor base is either steel or floor coating mass. The most popular and common fastening method is welding. Gluing of the cabins is generally used in case of "a floating floor" or if the floor coating mass is applied on the deck beforehand, i.e. before the cabins are transferred onboard. In the case of gluing, the modular unit is fastened to the deck, onto which coating mass has been spread, by means of L-strips, which are screwed onto the supporting frame of the modular unit and glued onto the floor base. In case of a ship cabin or the like, it is thus glued on top of the floor coating mass applied on the steel deck. Such a fastening method is

illustrated by Figure 3, which will be explained in more detail later on. The problem with this solution is the fact that coating mass needs to be added on top of the strip even afterwards and at the strip there will always be an area that is higher up than the rest of the floor base. The mounting of the strip is
5 slow to perform and due to the roughness of the floor base, the installation of vinyl parquets or similar coverings on the floor base is in practise impossible.

If the fastening of the modular unit to its floor base is performed by welding, it will also take place inside the modular unit at specific intervals at specific
10 points and it will, as well, cause roughness at the interface between the floor base and the supporting frame.

An object of the present invention is to provide an improved structure for a modular unit, the use of which makes the fastening of the modular unit to its
15 floor base easier and faster than before and which is applicable with various fastening methods so that it enables the use of different covering materials on the floor base and guarantees a proper outcome.

The objects of the invention are met mainly as explained in more detail in
20 claim 1 and in the other claims. In accordance with the invention, the support members of the supporting frame are designed so that their wall located inside the modular unit comprises a bevel or a recess for fastening means and in that support members are fastened to the floor base by the fastening means utilizing said bevel or recess.

25 The support member may preferably be a hollow, tubular element, the cross-section of which is mainly rectangular. Thus, it is very suitable for carrying the walls of the modular unit and for fastening them to the floor base. The support member may be made of steel or, for instance, of extruded
30 aluminium profile. Also other manufacturing methods and materials may be

used as long as the final outcome is sufficiently rigid to carry the walls of the modular unit and also fire safety issues, for instance, are considered.

5 Preferably, the modular unit is arranged to be attached to its floor base by means of glue by utilising said bevel or recess at the support members of the supporting frame. In this way, the use of glue does not cause any roughness on the floor base inside the modular unit and it may be covered with desired materials, as required in each particular case.

10 Alternatively, the fastening of the modular unit may be arranged to be provided by welding it to its floor base at the supporting frame, at specific intervals, by utilising said bevel or recess of the support members. Then, said bevel or recess is arranged to be filled with sealing compound between the weld points. Consequently, the sound insulation of the modular unit can be
15 improved.

In the following, the invention will be described, by way of example, with reference to the attached schematic drawings, of which

20 Figure 1 shows a perspective view of one modular unit;

Figure 2 shows a part of the modular unit according to Figure 1 seen from inside;

25 Figure 3 shows an enlarged section III-III of Figure 2 disclosing a prior art solution for fastening a modular unit to its floor base;

Figure 4 shows one solution according to the invention for fastening a modular unit to its floor base; and

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Figures 5a – 5g show various shapes of the support member in the supporting frame according to the invention in a cross-sectional plane.

Reference number 1 in the drawings refers to a modular unit, which may, in practise, be typically for instance a cabin. It has a supporting frame and walls 2 attached thereto. The modular unit 1 is in this case also provided with a bathroom module 1a, which is a part of the modular unit itself. Normally, the walls 2 are composed of various panel elements, known as such, and they are supported onto the supporting frame, usually by means of screw-mounting. The supporting frame is made of metal, usually steel, and it comprises a number of hollow support members 3 attached to one another. The modular unit 1 is fastened by means of the supporting frame to its floor base 5 at specific points, denoted by reference number 4 in Figure 2, and in practise, the supporting frame also defines the shape of the modular unit. Normally, the modular unit is also provided with a roof section, but it has no separate floor, as the floor base forms its floor, which may be covered in various ways, for instance with a wall-to-wall carpet or parquet. The floor base 5 comprises in this case, i.e. in a ship application, a steel deck 5a, which is coated with coating mass 5b, to which the modular unit is eventually fastened either by gluing, welding or nailing.

Figure 3 shows a typical previously known structure, related specifically to a cabin on a ship or the like, and a fastening method for a modular unit, where the walls 2 are fastened by screws to the support members 3 forming the supporting frame. The modular unit is fastened to the floor base by gluing and by utilising an L-strip 6, a number of which are mounted at specific intervals inside the modular unit. The floor base comprises here a steel deck 5a and deck coating mass 5b on top of it. The L-strip is attached to the support member 3 and/or to the wall 2 by screws and/or by gluing, and the fastening to the floor base is performed by gluing. The thickness of the glue layer is about 2 – 3 mm and is denoted by reference number 7. The stability

of the strip can be ensured, if required, by screws before the glue 7 has dried. As shown in Figure 3, the fastening point 4 remains on a raised level with respect to the level of the floor base, whereby mounting of parquet, for instance, becomes impossible.

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Figure 4 shows one fastening method according to the invention. In this case, the wall of the support member 3 located inside the modular unit is provided with a bevel or a recess 3a, which can be preferably used for spreading the glue 7. Preferably, the glue 7 is spread over the entire length of the supporting frame, but since it does not extend from the wall of the support member 3 to the interior of the modular unit 1, it does not limit the choice of flooring material. The fastening is performed quickly and easily by spreading the glue 7 into said bevel or recess 3a.

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15 The solution according to the invention may also be applied to fastening by welding, whereby a weld joint is provided at specific intervals on the bevel or recess 3a of the support member. If a need to improve the sound insulation of the modular unit exists, the bevel or recess 3a of the support member is filled with sealing compound between the weld points.

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The supporting frame may be made of steel, but it may also be of aluminium, and manufactured by extrusion or some other way. Figures 5a – 5g illustrate various shapes of relevant cross-sections of the support member 3.

25 The invention is not limited to the described embodiments, but several modifications are conceivable within the scope of the appended claims.

CLAIMS

1. A prefabricated, floorless, self-supporting modular unit (1), for instance a cabin or the like, comprising a supporting frame, to which at least the majority of the walls (2) of the modular unit are fastened and which defines the primary shape of the modular unit (1), whereby the supporting frame includes a number of elongated support members (3), on top of which the walls (2) are fastened and by means of which the modular unit (1) is attached to its floor base (5a, 5b), **characterised** in that said support members (3) are designed so that their wall located inside the modular unit (1) comprises a bevel or a recess (3a) for fastening means and in that support members (3) are fastened to the floor base (5a,5b) by the fastening means utilizing said bevel or recess (3a).
2. A modular unit according to claim 1, **characterised** in that the support member (3) is a hollow, tubular element, the cross-section of which is mainly rectangular.
3. A modular unit according to claim 1 or 2, **characterised** in that the support member (3) is made of steel.
4. A modular unit according to claim 1 or 2, **characterised** in that the support member (3) is made of extruded aluminium profile.
5. A modular unit according to any of the preceding claims, **characterised** in that the modular unit (1) is arranged to be attached to its floor base (5a, 5b) by means of glue (7) by utilising said bevel or recess (3a) at the support members (3) of the supporting frame.
6. A modular unit according to any of claims 1 - 4, **characterised** in that the fastening of the modular unit (1) is arranged to be provided by welding it to its

floor base (5a, 5b) at the supporting frame, at specific intervals, by utilising said bevel or recess (3a) of the support members (3).

- 5 7. A modular unit according to claim 6, **characterised** in that said bevel or recess (3a) is arranged to be filled with sealing compound between the weld points.