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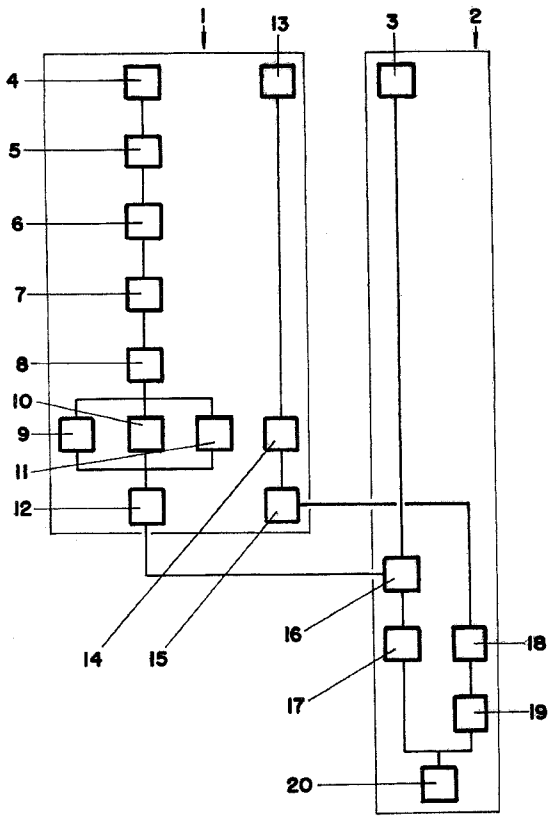
(54) Title: PROCESS FOR PRODUCING AND ASSEMBLING ROOM MODULES AND CONSTRUCTION COVERAGES FOR BUILDING HOUSES AND OTHERS

FIGURE 1



(57) Abstract: The present invention relates to a process for producing and assembling room modules and construction coverages for building houses and others, in order to drastically reduce the costs and time required to build such houses.

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"PROCESS FOR PRODUCING AND ASSEMBLING ROOM MODULES AND CONSTRUCTION COVERAGES FOR BUILDING HOUSES AND OTHERS".

FIELD OF THE INVENTION

The present invention relates to a process for producing and assembling room modules and construction coverages for building houses and others, in order to drastically reduce the costs and time required to build such houses.

PRIOR ART DESCRIPTION

Especially in poor countries, many people risk their lives building houses in places with high chances of falling down.

On the other hand, many governments build huge residential sets with equal houses constructed to the hundreds for attending the complaints of poor condition population, which can only pay a lowermost value for the installments.

In an attempt to reduce building costs, many solutions have been studied and tested, most of them having disastrous results, due to the use of unsuitable working hours. Other successful solutions did not result in cost reducing or high yields.

The production of bricks in the place of construction using a clay press or clay-cement press has been unsuccessfully tested as a solution for the above-mentioned problems of the art.

The most common process for building the walls of such constructions is still the use of bricks made of clay or cement joined by cement mortar. However, the labor used in such constructions is not specialized and, sometimes, with poor technical support. Ideally, the constructions should

be constantly supervised by a civil engineer. However, this is not always possible. Consequently, there may arise some problems like unsuitable amount of cement in the mortar resulting in low resistant walls or, in case of using an excessive amount of cement, the waste of material.

The Brazilian document BR9901980 describes a constructive process for obtaining modular buildings, which consist in the production of totally ready and finished modules. Such modules are pre-mounted in the plant and then are separated and carried to the place of the construction, where they are mounted again in the definitive form, over foundations which are previously prepared in the place of the construction.

The Brazilian document BR9901947 discloses a process for the construction of prefabricated houses using light panels. For the assembly of such panels, pillars composed by metallic profiles are used. After the assembly of the panels, ceramic or wall tiles are applied in the walls of the kitchen and bathroom. Next, the remaining parts are mounted, like the metallic structure for receiving the roof coverage, door and window frames, etc.

Document BR7905647 describes industrialized modulated houses and a process for construction the same developed from constructive elements of small dimensions made of armed concrete and susceptible of production in industrial scale.

Document BR7802248 refers to prefabricated modulated units for the formation of enclosed spaces in general. Such units comprise a structural floor frame, a structural ceiling or coverage frame, four vertical structural members or columns for intercalating among the structural frames,

panels for vertical closure or smooth walls with suitable openings and metallic pipes with a threading end and another flanged end for attaching the structural members.

The process of the present invention, in comparison with the prefabricated modules of the above-mentioned prior art enables a quicker and cost-saving production of ready-to-use modules which are carried to the place of construction totally mounted and containing all sanitary and electrical installations.

The prior art do not comprise any process able to carry the modules totally ready and finished. For example, document BR9901980 refers to modules which are pre-mounted in the plant and then are separated and carried to the place of the construction, where they are mounted again in the definitive form. Such system requires the use of much more time and labor if compared with the process of the present invention.

As document BR9901980, documents BR9901947, BR7905647 and BR7802248 do not disclose modules which are carried to the place of the construction totally ready and finished. All of them are carried in parts which are mounted in the place of construction, leading to a higher amount of time and labor for obtaining the final construction.

DETAILED DESCRIPTION OF THE INVENTION

The present invention refers to a process for producing and assembling room modules and construction coverages for building houses and others, comprising the manufacture of standardized and finished modules corresponding to at least one room of the construction, using the same techniques used by the mass production

industry for the quick construction of residential structures.

The modules used in the present invention comprise the walls and the roof, both made of light concrete and containing the hydro-sanitary piping (in the case of bathrooms) and electrical installations duly located and attached in their definitive places. Such modules also have the studs, coatings and painting duly applied.

The process of the present invention allows the standardization of the modules, since the production is made in a plant with all required resources for the better working performance. Furthermore, the availability of suitable resources, materials and techniques, and also the constant presence of a civil engineer allows for each module being manufactured with high efficiency and quickness.

All the metallic structure of the construction coverage is also manufactured in the plant.

The foundation which will receive the modules is concreted in the definitive place of the construction with all inlets and outlets of the hydro-sanitary piping and electrical installations suitably positioned due to the use of moulds together with guide-pins for correctly casing the concrete modules of each room.

The process of the present invention is used preferably for the construction of one-floored residences, but can also be used for two-floored residences.

DETAILED DESCRIPTION OF THE FIGURE

Figure 1 shows a schematic flowchart of the process of the present invention. Such flowchart represents the production of modules and roof structural parts, and the

preparation of the foundation in the place of construction for receiving and fixing the referred modules.

The process of the present invention comprises two stages (1) and (2) which are executed preferably simultaneously.

The foundation is executed in stage (2), where the inlets and outlets of the hydro-sanitary piping and electrical installations are suitably positioned in the floor, together with the guide-pins for correctly casing the modules of the rooms (4).

In stage (1), which occurs in the plant, the referred modules of the rooms (4) are manufactured in standardized moulds, assembling the metallic structures in metallic moulds (5) and placing, positioning and fixing in the referred metallic structures all the hydro-sanitary piping and electrical installations, as well as the draw-in boxes (6), as defined in the project. Then, the moulds are concreted with light concrete (7) and are demoulded after a period of quick cure (8). Next, the coatings and sanitary ware (9) are fixed where required, the studs are directly fixed to the monolithic concrete (10) and the painting is applied to the walls and ceiling (11). Then, the modules are lifted by steel cables using hooks concreted in the referred modules in certain locations foreseen in the project. The modules are placed in trucks to be carried (12) to the place of the construction, where the foundation was executed (3).

Furthermore, the metallic modules (13) which are used for manufacturing the structure (14) for covering the modules (4) are simultaneously produced in the plant (1).

Such metallic modules (13) are also carried to the place of the construction, where the foundation was executed (3).

In the place of the construction, the modules (4) are lifted, suitably positioned (16) and then are encased in the guide-pins of the foundation (3). The association among the several modules is completed by using special cramps followed by the connection (17) of hydro-sanitary piping and electrical installations among the modules (4) and the foundation (3) and the connection thereof with the public hydro-sanitary and electrical networks.

Following such stages, it occurs the placement and fixing stage (18) of the coverage supporting structure (14), which receives the tiles (19). Finally, it is executed the final revision for providing the necessary finishing (20).

CLAIM

1. Process for producing and assembling room modules and construction coverages **characterized in that** it is comprised by the following stages:

Stage (1), which occurs in the plant, where: (a) the modules of the rooms (4) are manufactured in standardized moulds, assembling the metallic structures in metallic moulds (5) and placing, positioning and fixing in the referred metallic structures all the hydro-sanitary piping and electrical installations, as well as the draw-in boxes (6); (b) the moulds are concreted with light concrete (7) and are demoulded after a period of quick cure (8); (c) the coatings and sanitary ware (9) are fixed where required, the studs are directly fixed to the monolithic concrete (10) and the painting is applied to the walls and ceiling (11); (d) the modules are lifted by steel cables using hooks concreted in the referred modules; (d) the modules are placed in trucks to be carried (12) to the place of the construction, where the foundation was executed (3); (e) the metallic modules (13) used for manufacturing the structure (14) for covering the modules (4) are simultaneously produced in the plant (1); (f) the metallic modules (13) are also carried to the place of the construction; (g) the modules (4) are lifted, suitably positioned (16) and then are encased in the guide-pins of the foundation (3); (h) the association among the several modules is completed by using special cramps followed by the

connection (17) of hydro-sanitary piping and electrical installations among the modules (4) and the foundation (3) and the connection thereof with the public hydro-sanitary and electrical networks; (i) the coverage supporting structure (14) is positioned and fixed (18), which receives the tiles (19); and (j) the final revision for providing the necessary finishing (20) is executed; and

Stage (2), which occurs in the place of the construction, where the inlets and outlets of the hydro-sanitary piping and electrical installations are suitably positioned in the floor, together with the guide-pins for correctly casing the modules of the rooms (4).

FIGURE 1