[0008] The room unit of the first aspect includes the floor slab and the permanent formwork serving as the formwork for at least one of the column or the wall. The permanent formwork is a concrete formwork that forms the column or wall, and thus is lighter than a body of the column or wall formed of concrete.

[0009] Therefore, the room unit is easier to transport from a factory to a construction site and to lift even at the construction site as compared with a room unit including the body of the column or wall formed of concrete.

[0010] Further, the permanent formwork is formed integrally with the floor slab, but is not formed integrally with a ceiling member. Therefore, the permanent formwork does not need to support the load of the ceiling member. Therefore, for example, the room unit is lighter than a room unit in which a ceiling member and a wall supporting the ceiling member are integrally formed. That is, the building can be constructed by using the lightweight room unit.

[0011] According to a second aspect, in the room unit of the first aspect, the floor slab is formed using first concrete and includes recesses formed at a peripheral edge and having a thickness smaller than other portions, a plurality of floor units are formed by the floor slab and the permanent formwork, and second concrete that is poured into recesses of the plurality of floor units arranged side by side and connects the plurality of floor units is provided.

[0012] In the room unit of the second aspect, the floor unit is formed by the floor slab and the permanent formwork. The number of floor units is plural, and in each of the floor units, the floor slab includes the recess formed at the peripheral edge. The floor units are arranged side by side, and the second concrete is poured into the recess to connect the floor units.

[0013] In this manner, the room unit formed by the floor slab and the permanent formwork is formed by the plurality of floor units and connected by on-site concrete. As a result, the room unit can be divided and transported from the factory to the construction site.

[0014] A building of a third aspect is a building including the room unit of the first or second aspect, the building including: a wall or a column formed by pouring concrete between permanent formworks of room units that are adjacent to each other; and a ceiling member arranged on an upper side of the room unit.

[0015] The building of the third aspect is constructed by combining a plurality of room units. The floor slab is formed in the room unit. Therefore, it is not necessary to construct the floor of the building in the site. In addition, the wall or column in the building is formed by pouring concrete between permanent formworks forming the room unit. Therefore, the number of formworks to be constructed in the site can be reduced, and a construction period can be shortened.

[0016] According to a fourth aspect, in the building according to the third aspect, the room

column 12 by forming a space surrounded by the column formwork 24A and a column formwork 24C in an adjacent room unit 20.

[0041] Similarly, the wall formwork 24B alone does not serve as a formwork for the wall 14 (see Fig. 3). As will be described later, the wall formwork 24B serves as the formwork for the wall 14 by forming a space surrounded by the wall formwork 24B or a wall formwork 24D in an adjacent room unit 20.

[0042] As shown in Fig. 2, the permanent formwork 24 is formed by layering wet materials M. A nozzle 100 of a shaping device (for example, a 3D printer) moves in the lateral direction while ejecting the paste-like wet material M to form the permanent formwork 24. As a result, a long layer of the wet material M is formed. The permanent formwork 24 is formed by forming these layers in the vertical direction.

[0043] In addition, in the permanent formwork 24, a portion forming the column formwork 24A and a portion forming the wall formwork 24B are integrally formed by continuously ejecting the wet material M to these portions. As described above, it is possible to save labor for constructing the room unit 20 by forming the permanent formwork 24 using a 3D printer or the like.

[0044] A curable material that is cured over time is used as the wet material M. Specifically, mortar (for example, normal strength mortar or fiber-reinforced mortar), gypsum, a molten resin, or the like is used as the wet material M. Examples of the molten resin include geopolymer. The geopolymer is a generic term for solidified bodies generated by a condensation polymerization reaction between alumina silica powder and an alkali solution.

[0045] (Other Components in Room Unit)

As shown in Fig. 1A, the room unit 20 includes a wall body 26 and a door/window 28 in addition to the floor slab 22 and the permanent formwork 24. The wall body 26 is a wall that partitions the inside (that is, an indoor space) and the outside (that is, an outdoor space) of the room unit 20. The door/window 28 is an openable and closable front door or glass window.

[0046] Furthermore, a partition wall, an inner door/window, a bathroom, a kitchen, a toilet, or the like (not shown) can be arranged inside the room unit 20, if necessary. Furthermore, the surfaces of the floor slab 22, the permanent formwork 24, the partition wall, and the like can be covered with a finishing material, if appropriate.

[0047] The respective components “other than” the floor slab 22 and the permanent formwork 24 in the room unit 20 may be attached at the factory, or may be attached at the construction site after the room unit 20 is carried into the construction site.

[0048] <Building>

Fig. 3 shows a part of the building 10 formed by assembling the room units 20. The

[0092] The permanent formwork 84 is fixed to each of the floor units 80A, 80B, 80C, and 80D. The permanent formwork 84 is fixed to the poured portion 82B. A portion to which the permanent formwork 84 is fixed in the poured portion 82B is a portion to be an outer peripheral portion of the room unit 80 shown in Fig. 8A.

[0093] In the room unit 80, the concrete 86 is poured into the recess 82V as shown in Fig. 8A in a state where the floor units 80A, 80B, 80C, and 80D shown in Fig. 9A are arranged. The concrete 86 is a connecting member that connects a plurality of floor units (the floor units 80A, 80B, 80C, and 80D). The concrete 86 is an example of second concrete in the disclosure.

[0094] Further, the joint formwork 88 is bridged between the permanent formworks 84 in the floor units 80A, 80B, 80C, and 80D arranged adjacent to each other. The joint formwork 88 is temporarily fixed to the permanent formwork 84.

[0095] Although not shown in Fig. 8A, similarly to the floor slab 22, the floor slab 82 can be formed in such a way that portions forming the common hallway 32 and the balcony 34 as indicated by the broken line hatching in Fig. 3 are formed integrally with a portion forming a dwelling. Further, both or one of the common hallway 32 and the balcony 34 may be formed separately from the floor slab 82 and may be retrofitted to the room unit 80 at the construction site.

[0096] (Other Components in Room Unit)

As shown in Fig. 8A, the room unit 80 includes a wall body 26 and a door/window 28 similarly to the room unit 20. Furthermore, a partition wall, an inner door/window, a bathroom, a kitchen, a toilet, or the like (not shown) can be arranged inside the room unit 80, if necessary. Furthermore, the surfaces of the floor slab 82, the permanent formwork 84, the partition wall, and the like can be covered with a finishing material, if appropriate.

[0097] <Room Unit Construction Method>

(Construction of Floor Slab)

First, the precast concrete plates 82A are laid as shown in Figs. 10A and 10B in order to construct the room unit 80. At this time, the plates 82A forming the floor units 80A, 80B, 80C, and 80D may be arranged while being spaced apart from each other as shown in Fig. 9A.

[0098] Next, the reinforcing bars 22A as slab reinforcements are arranged as shown in Figs. 11A and 11B, and concrete is then poured on the plate 82A to form the poured portion 82B. The poured portion 82B is poured to portions other than a portion serving as a joint between the respective floor units 80A, 80B, 80C, and 80D (that is, portions on boundary lines E1, E2, and E3).

[0099] As a result, the recess 82V having a smaller thickness than the other portions is formed in each of the floor units 80A, 80B, 80C, and 80D. Further, a plurality of floor slabs 82 forming

CLAIMS

1. A room unit that is assembled at a site to form a building including a plurality of the room units, the room unit comprising:

a floor slab; and

a permanent formwork provided integrally with the floor slab and serving as a formwork for at least one of a column or a wall.

2. The room unit according to claim 1, wherein:

the floor slab is formed using first concrete and includes recesses formed at a peripheral edge and having a thickness smaller than other portions,

a plurality of floor units are formed by the floor slab and the permanent formwork, and

second concrete that is poured into recesses of the plurality of floor units arranged side by side and connects the plurality of floor units is provided.

3. A building including the room unit according to claim 1 or 2, the building comprising:

a wall or a column formed by pouring concrete between permanent formworks of room units that are adjacent to each other; and

a ceiling member arranged on an upper side of the room unit.

4. The building according to claim 3, wherein:

the room units are layered in a vertical direction, and

a ceiling member in a room unit of a lower floor is formed with a floor slab of a layered room unit of an upper floor.

5. The building according to claim 3 or 4, wherein the permanent formwork is formed by layering a wet material.

6. A building construction method comprising:

laterally arranging room units each including a floor slab and a permanent formwork that is provided integrally with the floor slab and serves as a formwork for at least one of a column or a wall,

pouring concrete between permanent formworks in room units that are adjacent to each other to construct a lower floor; and

arranging a room unit forming an upper floor above the lower floor to form a ceiling member of a room unit of the lower floor with a floor slab in the room unit of the upper floor.

7. The building construction method according to claim 6, further comprising:

forming a plurality of floor slabs each including a recess formed at a peripheral edge by pouring concrete on a part of an upper side of a precast concrete plate;

forming a plurality of floor units by fixing the permanent formwork to each of the floor slabs;

arranging the plurality of floor units side by side; and

forming the room unit by pouring concrete into each recess and connecting the plurality of floor units.