

BATHROOM UNIT

TECHNICAL FIELD

[0001]

The present invention relates to a bathroom unit, specifically to a bathroom unit including a waterproof pan.

BACKGROUND ART

[0002]

Conventionally, a bathroom unit including a bathroom floor that is a tiled floor formed by sticking tiles on concrete, mortar, or the like (hereinafter referred to as concrete or the like) is known. There are various types of concrete or the like, and some of the types are not relatively highly waterproof. In such a case, sometimes water may pass through the tiles or a joint portion of the upper surface of the bathroom floor and get into the concrete or the like in the lower portion of the bathroom floor due to aging of the bathroom floor. When such entry of water occurs, the concrete or the like may deteriorate, and thus the upper surface of the bathroom floor may be uneven, the durability of the bathroom unit may be lowered, and water leakage may occur.

[0003]

Therefore, various techniques for waterproofing the bathroom unit have been proposed. For example, a technique of providing a waterproof pan formed of FRP on an upper surface of a floor slab of the bathroom unit formed of PC concrete is

proposed (see Patent Document 1).

[0004]

Patent Document 1: Japanese Unexamined Patent
Application, Publication No. H06-17460

DISCLOSURE OF THE INVENTION

Problems to be Solved by the Invention

[0005]

However, according to the technique disclosed in Patent Document 1, a waterproof pan formed of FRP and provided on the floor slab formed of PC concrete has a structure in which a rib is buried in the upper surface of the floor slab formed of PC concrete, and thus a dedicated mold is required in a molding process thereof. In addition, a space to store a waterproof pan, which is a large material, needs to be secured in in a factory production line at a stage before the molding process described above.

[0006]

The present invention has been made in consideration of the situation described above, and aims to provide a bathroom unit that is highly waterproof and does not require a dedicated mold for molding in a molding process.

Means for Solving the Problems

[0007]

To achieve the object described above, the following techniques are proposed herein.

[0008]

A bathroom unit (for example, a bathroom unit 1 that will be described later) including a waterproof pan (for example, a waterproof pan 18 that will be described later) formed of FRP and provided so as to cover a waterproof region (for example, a waterproof region 17 that will be described later) of a bathroom floor (for example, a bathroom floor 10 that will be described later), and a frame member (for example, a base frame member 21 and a frame member 22 that will be described later) provided so as to surround an outer periphery of the waterproof pan is proposed.

[0009]

In what has been described above, it is preferable that a raised portion (for example, a raised portion 19 that will be described later) is formed in a peripheral edge of the waterproof pan.

[0010]

Further, in what has been described above, it is preferable that a projection part for positioning a lower portion of a wall panel (for example, a wall panel 12 that will be described later) of the bathroom unit is formed on the waterproof pan.

Effects of the Invention

[0011]

According to the present invention, a bathroom unit that is highly waterproof and does not require a dedicated mold for molding in a molding process can be provided.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012]

Fig. 1A illustrates a structure (living space side) of a bathroom unit serving as an embodiment of the present invention.

Fig. 1B illustrates a structure (outer wall side) of the bathroom unit serving as an embodiment of the present invention.

Fig. 2 illustrates a structure of a bathroom unit serving as another embodiment of the present invention.

PREFERRED MODE FOR CARRYING OUT THE INVENTION

[0013]

The present invention will be revealed by describing embodiments of the present invention in detail below with reference to drawings.

[0014]

Fig. 1A illustrates a structure of a bathroom unit serving as an embodiment of the present invention. Fig. 1A particularly illustrates a structure of a bathroom unit 1 on the side adjacent to a living space 100 with a wall panel interposed therebetween. In addition, Fig. 1B illustrates a structure of the bathroom unit serving as an embodiment of the present invention. Fig. 1B particularly illustrates the structure of the bathroom unit 1 on the side facing the outside (outer wall) of the house opposite to the side of Fig. 1A.

[0015]

In the bathroom unit 1, a framework in which pillar members such as corner posts and studs provided at predetermined parts of the four sides of a bathroom floor 10 and rectangular steel pieces 11 and 11 constituting a beam member are assembled in a rectangular shape is formed over the bathroom floor 10 having a rectangular planar shape. Plural wall panels 12 and a ceiling panel 13 are attached to respective predetermined parts of this framework, and thereby an inner space having an outer periphery closed except for an entrance (not illustrated) and a substantially rectangular parallelepiped shape is configured.

[0016]

In the bathroom floor 10, a reinforced concrete board 16 serving as a main structure of the bathroom floor 10 is disposed at the position of a bathroom unit installation surface 15 on a frame slab 14. The upper surface side of the reinforced concrete board 16 constitutes a waterproof region 17 of this bathroom floor 10. In the present embodiment, this waterproof region 17 occupies the whole area of the upper surface side of the reinforced concrete board 16. In addition, a waterproof pan 18 formed of FRP is provided so as to cover the waterproof region 17. A raised portion 19 serving as a flashing is formed in the peripheral edge of the waterproof pan 18.

[0017]

It is to be noted, in the present embodiment, a

waterproof layer 20 formed of FRP is disposed on the lower surface side of the reinforced concrete board 16 so as to oppose the bathroom unit installation surface 15 of the frame slab 14. In addition, floor tiles 24 are stuck on the waterproof pan 18 of the bathroom floor 10 formed of FRP by glue 23 so as to be packed in longitudinal and lateral directions. Similarly, wall tiles 24a are stuck on the wall panels 12 so as to be packed in longitudinal and lateral directions.

[0018]

A frame member formed of a rigid body is provided so as to surround the outer periphery of the waterproof pan 18. In this case, the frame member is constituted by connecting a base frame member 21 which is formed of relatively large rectangular steel pieces surrounding the outer periphery of the reinforced concrete board 16 and a frame member 22 which is formed of relatively small rectangular steel pieces disposed on the base frame member 21 so that the outer peripheral surface of the base frame member 21 and the outer surface of the frame member 22 are flush with each other.

[0019]

Base angles 25 serving as fixing members formed of steel plate pieces are fastened to the inner side surface of the frame member 22 with screws 26. The base angles 25 each include a fixation raised portion 25a drooping down along the surface of the frame member 22 from a screwing position, a horizontal plate part 25b extending along the upper surface of

the floor tiles 24, and a positioning part 25c standing from a side of the horizontal plate part 25b opposite to the fixation raised portion 25a.

[0020]

The positioning part 25c of the base angle 25 is elastically in contact with a back hanger 27, which is a plate-shaped metal piece screwed to the back surface of a lower portion of a wall panel 12, and causes a positioning effect at a lower portion of the wall panel 12 whose higher portion is screwed.

[0021]

As illustrated in Fig. 1A, a part of the bathroom floor 10 of the bathroom unit 1 on the side adjacent to the living space 100 with a partition wall 29, on which cloth 28 is applied, interposed therebetween is flat overall. Meanwhile, as illustrated in Fig. 1B, a shower area 31 is provided in a part of the bathroom unit 1 on the side opposite to the side of Fig. 1A. A recess inclined from a flat part of the bathroom floor 10 toward a water discharging drain 10d provided at a corner portion is formed in the shower area 31. This recess is constituted by a part in which the reinforced concrete board 16 becomes thinner approaching the water discharging drain 10d. However, this part is of course included in the waterproof region 17 and covered by the waterproof pan 18 formed of FRP, and the floor tiles 24 are stuck thereon with the glue 23.

[0022]

As described above, in the structure of the bathroom unit 1 described in detail with reference to Fig. 1A and Fig. 1B, the waterproof pan 18 formed of FRP is provided so as to cover the waterproof region 17 of the bathroom floor 10, and the base frame member 21 and the frame member 22 are provided so as to surround the outer periphery of the waterproof pan 18. According to this, the base frame member 21 and the frame member 22 serving as a frame member can be used as a mold when forming the waterproof pan 18 formed of FRP so as to cover the waterproof region 17, and thus the waterproof pan 18 can be formed.

[0023]

Schematically describing the molding process, for example, the frame member (21 and 22) is used as a mold, and a reinforced plastic material obtained by impregnating a glass mat formed of glass fibers with resin such as polyester resin is layered on a base plate that is the reinforced concrete board 16 having been solidified. Subsequently, a gel coating is applied and is cured by heat, and is thus the waterproof pan 18 formed of FRP is formed. At this time, the raised portion 19 of the waterproof pan 18 serving as a flashing is formed along the frame member (21 and 22) by causing the outer periphery of the reinforced plastic material to stand up along the inner wall of the frame member (21 and 22), applying the gel coating also to this raised portion, and curing the gel coating in this state.

[0024]

Therefore, a mold such as the mold of the conventional technique described above is not required to be additionally provided. Moreover, the frame member that also functions as a mold for production in the process of construction constitutes the structure of the bathroom unit 1, and this leads to less waste. In addition, since no mold is needed, the bathroom unit can be produced at low cost and in a short time in accordance with a construction plan.

[0025]

In addition, according to the embodiment of Fig. 1A and Fig. 1B, the waterproof pan 18 formed of FRP covers the whole area of the bathroom floor 10. Thus, even if water soaks through the floor tiles 24 due to aging or the like, the water reaching the reinforced concrete board 16 will be effectively prevented by the waterproof pan 18. Therefore, the reinforced concrete board 16 is not encroached. Moreover, since the raised portion 19 serving as a flashing is formed in the waterproof pan 18, water temporarily retained on the bathroom floor 10 of the bathroom unit 1 is blocked by the raised portion 19 and water leakage to the outside is suppressed even in the case where the water leaks to the outside from a lower portion of the wall panels 12. Even if a small amount of water accumulates inside the raised portion 19, the water will evaporate spontaneously. Therefore, no additional draining means or the like is required.

[0026]

Further, the waterproof pan 18 has a structure that is

not related to positioning of the wall panels 12 unlike a waterproof pan 18a that will be described later. Therefore, changing the positions of the wall panels 12 in the region in which the waterproof pan 18 is laid does not affect the waterproof effect, and thus freedom in the layout is ensured.

[0027]

Fig. 2 illustrates a structure of a bathroom unit according to another embodiment of the present invention. In Fig. 2, parts corresponding to Fig. 1A that have already been described will be illustrated with the same reference numbers, and the description of each component will be omitted as appropriate. It is to be noted that although a bathroom unit 1a serving as the embodiment of Fig. 2 includes changes in the parts corresponding to Fig. 1A, there is no change in parts corresponding to Fig. 1B.

[0028]

The structure of the embodiment of Fig. 2 is different from Fig. 1A mainly in the shape of the waterproof pan around the base angles 25. That is, the waterproof pan 18a of Fig. 2 is formed so as to cover the upper surface side of the base angles 25. That is, the raised portion 19 of the waterproof pan 18a is formed along the outer surface of the fixation raised portions 25a of the base angles 25. In addition, a projection part 32 is formed by being bent so as to cover the tip end and both surfaces of the positioning part 25c of the base angle 25. The raised portion 19 and the projection part 32 are interconnected by a recess part 33 extending along the

upper surface of the horizontal plate part 25b of the base angle 25. It is to be noted that the regions of the waterproof pan 18a other than the regions described above are not different from the waterproof pan 18 described with reference to Fig. 1A and Fig. 1B.

[0029]

The embodiment of Fig. 2 is different from Fig. 1A also in that the floor tiles 24 disappear at positions immediately before the positions at which the wall panels 12 stand up and the lower ends of the wall panels 12 reach the waterproof pan 18a. A waterproof seal is applied between the lower ends of the wall panels 12 and the waterproof pan 18a. In addition, the back hangers 27 disposed at lower portions of the wall panels 12 elastically come into contact with the projection part 32 of the waterproof pan 18a described above, and the lower portions of the wall panels 12 are positioned.

[0030]

The molding process of the waterproof pan 18a is overall no different to the molding process of the waterproof pan 18. The waterproof pan 18a is formed of FRP along the outer surface of the base angles 25 attached in advance to the frame member 22, and the raised portion 19 and the projection part 32 are formed in the course of the formation. Accordingly, the projection part 32, which is a positioning member of the lower portions of the wall panels 12, is itself formed as a part covered by a waterproof coating of an FRP layer. Therefore, the projection part 32 effectively functions for suppression

of water leakage as well as functioning as a positioning member.

[0031]

In the embodiment of Fig. 2 described above, the waterproof pan 18a formed of FRP also covers the whole area of the bathroom floor 10. Thus, even if water soaks through the floor tiles 24 due to aging or the like, the water will be effectively prevented from reaching the reinforced concrete board 16 by the waterproof pan 18a. Therefore, the reinforced concrete board 16 is not encroached. Moreover, since the raised portion 19 serving as a flashing is formed by the waterproof pan 18a, water temporarily retained on the bathroom floor 10 of the bathroom unit 1 is blocked by the raised portion 19 and water leakage to the outside is suppressed even in the case where the water leaks to the outside from a lower portion of the wall panels 12. Even if a small amount of water accumulates inside the raised portion 19, the water will evaporate spontaneously. Therefore, no additional draining means or the like is required. Particularly, in the case of Fig. 2, even if water leaks to the outside from a lower portion of the wall panels 12, the projection part 32 covered by a waterproof coating of a FRP layer prevents the water leakage from expanding from the position of the leak. Moreover, since the raised portion 19 also prevents water leakage to the outside, a great effect of suppressing water leakage is achieved.

[0032]

The embodiments of the present invention have been described above in detail with reference to drawings. However, the present invention is not limited to these, and can be implemented by modifying or changing the embodiments in various ways. For example, although the reinforced concrete board 16 is used as a foundation in formation of the waterproof pan (18 or 18a) in the embodiments described above, a composite panel appropriately positioned and disposed within the frame member (21 and 22) may be the foundation and the waterproof pan may be formed thereon in a similar manner to the manner described above. In this case, the composite panel does not necessarily include a recess like the shower area 31 of the reinforced concrete board 16 described above. Alternatively, a flat composite panel may be positioned and disposed within the frame member (21 or 22) in an attitude having an appropriate inclination toward the water discharging drain.

EXPLANATION OF REFERENCE NUMERALS

[0033]

- 1 bathroom unit
- 10 bathroom floor
- 11 rectangular steel piece
- 12 wall panel
- 13 ceiling panel
- 16 reinforced concrete board
- 17 waterproof region

- 18 waterproof pan
- 18a waterproof pan
- 19 raised portion
- 20 waterproof layer
- 21 base frame member
- 22 frame member
- 25 base angle
- 27 back hanger
- 31 shower area
- 32 projection part

CLAIMS

1. A bathroom unit comprising:
a waterproof pan formed of FRP and provided so as to cover a waterproof region of a bathroom floor; and
a frame member provided so as to surround an outer periphery of the waterproof pan.
2. The bathroom unit according to claim 1,
wherein a raised portion is formed in a peripheral edge of the waterproof pan.
3. The bathroom unit according to claim 1 or 2,
wherein a projection part for positioning a lower portion of a wall panel of the bathroom unit is formed on the waterproof pan.