

PRECAST PLANTER

Technical Field

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The present invention relates to a precast member for construction, more specifically, to a precast planter which is particularly suitable for greening roof of high-rise buildings with a shear wall or frame shear structure.

Background

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To make the buildings more beautiful, people would generally place planters for planting flowers and grass, etc. in buildings. Conventional planters are mainly made of wooden, plastic or ceramic materials. Nevertheless, wooden planters are easily rotten, plastic planters are irresistible against sunburn, and ceramic planters are easily broken, unendurable and need to be replaced frequently. Further, conventional planters need regular artificial watering. Therefore, if the planters are directly placed on roof, taking care of them would be troublesome. Moreover, the excess water in planters is discharged outside directly, which will smear the surface of buildings or damage the water-proof layer of roof. Besides, when the water-proof layer is damaged and thus maintenance is necessary, the whole greening area has to be uprooted.

Summary of the Invention

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To overcome the defects of the current roof greening modes, the present invention provides an endurable precast planter with its own water supply and drainage system.

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The present invention provides a precast planter, which includes a planter main body of groove shape, wherein a connecting plate extends from the bottom of said

planter main body downwardly, said planter main body and connecting plate being precast concrete structural pieces, on which there are starter bars extending from the inside and integrated with the building's cast-in-situ concrete structures; said planter main body is provided with a water supply and drainage system in advance, wherein
5 the water supply port for irrigation of the water supply and drainage system is arranged at the upper part of said planter main body, and the water drainage port thereof is arranged at the bottom of the groove of said planter main body, the side wall and the bottom of the groove of said planter main body being coated with a water-proof layer.

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Said connecting plate includes a vertical plate extending downwardly from the bottom of said planter main body along its outer side.

Said connecting plate further includes a horizontal plate extending inwardly from
15 the bottom of said vertical plate.

The inner end face of said horizontal plate is provided with a tooth-like recess denting inwardly.

20 Said starter bars extends outwardly from the left and right sides of said planter main body and said connecting plate and from the bottom of the inner side of said connecting plate .

Alternatively, said starter bars extends outwardly from the outer side surfaces of
25 said planter main body and said connecting plate.

The top surface of said planter main body is a slant inclining downwardly in a direction towards the groove.

30 Said planter main body and/or said connecting plate is provided with, on the

inner side surface thereof, screw holes that can be connected with fixed corner braces for temporary installation.

Several hoisting rings are arranged on the top surface of said planter main body
5 for facilitation of hoisting.

The inner side surface of said connecting plate is coated with a water-proof layer at its lower part, and is further provided with horizontal small slots for applying water-proof paint.

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As compared with the prior arts, the precast planter of the present invention has a structure of both ends are fixed and the bottom thereof connects to the building floor. The planter is integrated with the floor parapet, or with the original structural wall body through a precast concrete framework. Hence, the precast planter of the present
15 invention has the following advantages:

(1) The production of the precast planter can be carried out outside of the construction site, thus effectively reducing the congestion of materials at the construction site;

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(2) The precast planter is convenient to be transported and assembled, and thus very suitable to be use on roof.

(3) The precast planter is convenient for quality control, and will not influence
25 maintenance of the water-proof system on roof. It can be inspected independently so that the quality of construction can be effectively ensured;

(4) Providing the precast planter on roof can generate an independent greening system on the top of the building, which can not only increase the urban greening area,
30 but also have the functions of thermal protection and heat insulation;

(5) The precast planter is endurable with a reliable quality, and can generate a long-standing greening system with one construction only;

5 (6) The precast planter can be suitably arranged according to the structure and size of the building roof, and may have a relatively larger planting area;

(7) The precast planter looks beautifully and is harmoniously integrated with the roof structure of buildings, thus beautifying the urban buildings effectively.

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Brief Description of the Drawings

Fig. 1 schematically shows the structure of the first embodiment of the precast planter of the present invention;

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Fig. 2 schematically shows the structure of the second embodiment of the precast planter of the present invention;

Fig. 3 schematically shows the structure of the water supply and drainage system of the precast planter of the present invention;

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Fig. 4 schematically shows the connection of the starter bars of the precast planter of the first embodiment;

25 Fig. 5 schematically shows the connection of the starter bars of the precast planter of the first embodiment in another way;

Fig. 6 schematically shows the connection of the starter bars of the precast planter of the second embodiment;

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Fig. 7 schematically shows hoisting the precast planter of the present invention;
and

Fig. 8 schematically shows installation and positioning of the precast planter of
5 the present invention.

Specific Embodiments of the Invention

In the following embodiments of the present invention are further illustrated in
10 combination with the drawings.

As shown in Fig. 1 and Fig. 2, the precast planter of the present invention mainly
comprises a planter main body 1 and a connecting plate 2, both of them being precast
concrete structural pieces with reinforcing bars therein. Said planter main body 1 has
15 a roughly U-shaped cross section, thus forming a groove 12 with an upward opening
for planting flowers and grass. Said connecting plate 2 extends downwardly from the
bottom of the planter main body 1.

As shown in Fig. 4, the planter main body 1 and connecting plate 2 are provided
20 with starter bars 3 extending from inside, which are integrated with the cast-in-situ
concrete structure 20 of buildings. As shown in Fig. 3, said planter main body 1 is
further provided with a water supply and drainage system 5, the water supply pipe 51
of which extends upwardly to a position above the top of the planter main body 1. In
this way, a plurality of water supply ports for irrigation are located at appropriate
25 positions above the top of the planter main body 1, and are preferably uniformly
located along the length direction of the planter main body 1. Further, time control
switches can be arranged on the water supply pipe 51 for automatically watering
different plants at a certain time intervals that are most suitable for respective plants.
The water drainage ports 52 of said water supply and drainage system 5 are uniformly
30 positioned at the bottom of the groove of said planter main body 1 along the length

direction of the planter main body 1. In addition, as shown in Fig. 1 or Fig. 2, the planting areas of said planter main body 1 is undergone with a permanent water-proof treatment, i.e., a water-proof layer 11 is coated on the side wall and bottom of the groove 12.

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Said connecting plate 2 can be designed in various manners. For example, in the first embodiment as shown in Fig. 1, the cross section of the connecting plate 2 is roughly L-shaped, including a vertical plate 21 extending downwardly from the bottom of said planter main body 1 along its outer side and a horizontal plate 22 extending inwardly from the bottom of said vertical plate 21. Such a structure is suitable for building roof without parapet. In this case, the outer side surface of the planter main body 1 and the outer side surface of the vertical plate 21 can function as the parapet of the roof. As shown in Figs. 4 and 5, the starter bars 3 exposed are designed such that they extend out of the left and right sides of the planter main body 1 and the connecting plate 2 and the inner side surface of the horizontal plate 22, and integrated with the cast-in-situ parapet structure 20 at the left and right sides of the planter and the cast-in-situ concrete structure 10 of the roof respectively. Said horizontal plate 22 is supported on the outer edge of the roof, and the inner end portion of said horizontal plate 22 is integrated with the cast-in-situ concrete structure 10 of the roof. To enhance the integration effect, the inner end face of the horizontal plate 10 is provided with a tooth-like recess 25 indenting inwardly.

In the second embodiment as shown in Fig. 2, said connecting plate 2 only comprises a vertical plate 21 extends downwardly from the bottom of the planter main body 1 along its outer side but without the horizontal plate 22. This structure is suitable for building roofs having parapet already. In this case, as shown in Fig. 6, the outer side wall of the planter main body 1 is comparatively thin, and the exposed starter bars 3 thereof are designed such that they extend out of the outer side surface of the planter main body 1 and the connecting plate 2, and then connect with the cast-in-situ parapet structure 20 of the roof.

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When the planter is relatively long, it can be formed by jointing several separated planters together. In this case, the starter bars 3 can be preset outwardly from the left and right sides of the planter main body 1 and the connecting plate 2, and the
5 connecting gap between the adjacent planters are filled with concrete.

As shown in Figs. 1 and 2, the top surface of said planter main body 1 is designed as a slant inclining downwardly along a direction towards the groove 12, thus enabling an effective collection of rainwater. The inner side surface of the
10 connecting plate 2 is coated with a water-proof layer 23 for preventing water penetration. At the same time, the inner side surface of the connecting plate 2 is further provided with a horizontal small slot 24 for applying water-proof paint.

As shown in Fig. 7, at the top of said planter main body 1 several hoisting rings 8
15 are provided to facilitate hoisting in site. As shown in Fig. 8, screw holes 7 are preset on the inner side surface of said planter main body 1 and said connecting plate 2, for connecting with fixed corner braces 61 for the purpose of temporary installation. Screw holes are also provided in the cast-in-situ concrete structure 10 of the roof. In construction-in-situ, firstly the whole planter is hoisted to the desired position, and
20 then the fixed corner braces 61 and 62 are mounted at the screw holes preset on the inner side surfaces of the planter main body 1 and the connecting plate 2 and the roof. Subsequently, the fixed corner braces 61 and 62 are connected with each other through a corresponding connecting rod 9, thus securing the position of the planter. With respect to the planter of the first embodiment, it is further required to mount an
25 adjustable corner brace 63 on the lower part of the connecting plate 2 so as to adjust the horizontal position of the planter and also function as a load-bearing during cast. Finally, the starter bars 3 at each connecting region between the planter and the roof, including the connecting regions between adjacent planters, are adjusted, and concrete is cast in-situ at all connecting regions. After casting, it is only necessary to remove
30 the fixed corner braces 61 and 62, the adjustable corner brace 63 and the

corresponding connecting rod 9 and refill the corresponding screw holes, with which the in-site installation of the precast planters of the present invention is completed.

The foregoing are only preferred embodiments of the present invention and shall
5 not be construed as restricting the present invention. Any amendments, equivalents or improvements made under the spirit and principle of the present invention shall be included in the protection scope of the present invention.

Claims

1. A precast planter, including a planter main body (1) of groove shape, characterized in that:

5 a connecting plate (2) extends from the bottom of said planter main body (1) downwardly, said planter main body (1) and connecting plate (2) being precast concrete structural pieces, on which there are starter bars (3) extending from the inside and integrated with the building's cast-in-situ concrete structures;

 said planter main body (1) is provided with a water supply and drainage system
10 (5) in advance, wherein the water supply port for irrigation of the water supply and drainage system is arranged at the upper part of said planter main body (1), and the water drainage port (52) thereof is arranged at the bottom of the groove of said planter main body (1), the side wall and the bottom of the groove of said planter main body (1) being coated with a water-proof layer (11).

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2. The precast planter according to claim 1, characterized in that: said connecting plate (2) includes a vertical plate (21) extending downwardly from the bottom of said planter main body (1) along its outer side.

20 3. The precast planter according to claim 2, characterized in that: said connecting plate (2) further includes a horizontal plate (22) extending inwardly from the bottom of said vertical plate (21).

 4. The precast planter according to claim 3, characterized in that: the inner end
25 face of said horizontal plate (22) is provided with a tooth-like recess (25) denting inwardly.

 5. The precast planter according to any one of claims 1 to 4, characterized in that:
 said starter bars (3) extends outwardly from the left and right sides of said planter
30 main body (1) and said connecting plate (2) and from the bottom of the inner side of

said connecting plate (2).

6. The precast planter according to any one of claims 1 to 4, characterized in that:
said starter bars (3) extends outwardly from the outer side surfaces of said planter
5 main body (1) and said connecting plate (2).

7. The precast planter according to any one of claims 1 to 4, characterized in that:
the top surface of said planter main body (1) is a slant inclining downwardly in a
direction towards the groove.

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8. The precast planter of according to any one of claims 1 to 4, characterized in
that: said planter main body (1) and/or said connecting plate (2) is provided with, on
the inner side surface thereof, screw holes (7) that can be connected with fixed corner
braces (61) for temporary installation.

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9. The precast planter of according to any one of claims 1 to 4, characterized in
that: several hoisting rings are arranged on the top surface of said planter main body
(1) for facilitation of hoisting.

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10. The precast planter of according to any one of claims 1 to 4, characterized in
that: the inner side surface of said connecting plate (2) is coated with a water-proof
layer (23) at its lower part, and is further provided with horizontal small slots (24) for
applying water-proof paint.