A frame structure for a plastic window frame structure includes four plastic casings, four steel bushings, and four angled insertion members. The plastic casings are integrally connected with each other by welding to form a rectangular frame. Each of the steel bushings is axially mounted in a respective one of the plastic casings. Each of the insertion members is mounted in the plastic casings and mounted on any two adjacent steel bushings to connect the steel bushings. Thus, the steel bushings are connected by the insertion members, so that the steel bushings are combined integrally, thereby greatly enhancing the structural strength of the frame structure.
FIG. 8
PRIOR ART

FIG. 7
PRIOR ART
FRAME STRUCTURE FOR PLASTIC WINDOW

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention relates to a frame structure for a plastic window, and more particularly to a frame structure having an enhanced structural strength with a reduced size.

[0003] 2. Description of the Related Art

[0004] A conventional frame structure for a plastic window in accordance with the prior art shown in FIGS. 6-8 comprises four plastic casings 1 connected with each other to form a rectangular frame, and four steel bushings 2 each axially mounted in a respective one of the plastic casings 1.

[0005] However, the steel bushings 2 are separated from each other without connection therebetween, thereby greatly decreasing the structural strength of the conventional frame structure. In addition, when the conventional frame structure is subjected to a stress, such as the wind pressure or the like, the load applied on the frame structure is concentrated on one of the steel bushings 2, so that the frame structure is easily deformed due to a stress concentration. Further, the conventional frame structure has a smaller structural strength so that the sizes of the plastic casing 1 and the steel bushing 2 have to be increased for the frame structure to withstand a larger load, thereby increasing costs of fabrication.

SUMMARY OF THE INVENTION

[0006] The present invention is to mitigate and/or obviate the disadvantage of the conventional frame structure.

[0007] The primary objective of the present invention is to provide a frame structure wherein the steel bushings are connected by the insertion members, so that the steel bushings are combined integrally, thereby enhancing the structural strength of the frame structure.

[0008] Another objective of the present invention is to provide a frame structure wherein the frame structure is subjected to a stress, such as the wind pressure or the like, the load applied on the frame structure is evenly distributed on and shared by the steel bushings, thereby preventing the frame structure from being worn out or broken due to a stress concentration so as to enhance the lifetime of the frame structure.

[0009] A further objective of the present invention is to provide a frame structure wherein the frame structure has an enhanced structural strength with a reduced size to withstand a larger load, so that the size of the plastic casing and the steel bushing can be reduced largely, thereby decreasing costs of fabrication.

[0010] In accordance with the present invention, there is provided a frame structure, comprising four plastic casings, four steel bushings, and four angled insertion members, wherein:

[0011] the plastic casings are integrally connected with each other by welding to form a rectangular frame;

[0012] each of the steel bushings is axially mounted in a respective one of the plastic casings; and

[0013] each of the insertion members is mounted in the plastic casings and mounted on any two adjacent steel bushings to connect the steel bushings, so that the steel bushings are combined integrally by the insertion members.

[0014] Further benefits and advantages of the present invention will become apparent after a careful reading of the detailed description with appropriate reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] FIG. 1 is a front view of a frame structure in accordance with the preferred embodiment of the present invention;

[0016] FIG. 2 is a partially cut-away perspective cross-sectional view of the frame structure in accordance with the preferred embodiment of the present invention;

[0017] FIG. 3 is an exploded perspective view of the frame structure as shown in FIG. 2;

[0018] FIG. 4 is a side view of the cross-sectional view of the frame structure as shown in FIG. 2;

[0019] FIG. 5 is a plan view of the frame structure taken along line 5-5 as shown in FIG. 4;

[0020] FIG. 6 is a plan view of a conventional frame structure in accordance with the prior art;

[0021] FIG. 7 is a partially cut-away side view of the conventional frame structure as shown in FIG. 6; and

[0022] FIG. 8 is a plan view of the conventional frame structure taken along line 8-8 as shown in FIG. 6.

DETAILED DESCRIPTION OF THE INVENTION

[0023] Referring to the drawings and initially to FIGS. 1-3, a frame structure for a plastic window in accordance with the preferred embodiment of the present invention comprises four plastic casings 10, four steel bushings 20, and four angled insertion members 30.

[0024] The plastic casings 10 are integrally connected with each other by welding to form a rectangular frame. Any two adjacent plastic casings 10 are combined and arranged at a right angle as shown in FIG. 1. Each of the plastic casings 10 has a substantially rectangular cross-section and has a hollow inside formed with a chamber 12.

[0025] Each of the steel bushings 20 is axially mounted in a respective one of the plastic casings 10 and has a substantially rectangular cross-section. Preferably, each of the steel bushings 20 is mounted in the chamber 12 of a respective one of the plastic casings 10.

[0026] Each of the insertion members 30 made of a steel material is mounted in the plastic casings 10 to connect any two adjacent steel bushings 20, so that the steel bushings 20 are combined integrally by the insertion members 30. Each of the insertion members 30 is substantially L-shaped and is
The insertion sections 32 of each of the insertion members 30 are arranged at a right angle as shown in FIG. 4. Preferably, each of the insertion sections 32 of each of the insertion members 30 has a substantially inverted U-shaped cross-section.

[0027] As shown in FIGS. 4 and 5, the plastic casings 10, the steel bushings and the insertion members 30 are combined with each other by a plurality of fastening members 40. Preferably, each of the fastening members 40 is a screw, a bolt or a rivet. Alternatively, the plastic casings 10, the steel bushings 20 and the insertion members 30 are combined with each other by an adhesive.

[0028] Accordingly, the steel bushings 20 are connected by the insertion members 30, so that the steel bushings 20 are combined integrally, thereby enhancing the structural strength of the frame structure. In addition, when the frame structure is subjected to a stress, such as the wind pressure or the like, the load applied on the frame structure is evenly distributed on and shared by the steel bushings 20, thereby preventing the frame structure from being deformed, distorted, worn out or broken due to a stress concentration so as to enhance the lifetime of the frame structure. Further, the frame structure has an enhanced structural strength with a reduced size to withstand a larger load, so that the size of the plastic casing 10 and the steel bushing 20 can be reduced largely, thereby decreasing costs of fabrication.

[0029] Although the invention has been explained in relation to its preferred embodiment(s) as mentioned above, it is to be understood that many other possible modifications and variations can be made without departing from the scope of the present invention. It is, therefore, contemplated that the appended claim or claims will cover such modifications and variations that fall within the true scope of the invention.

What is claimed is:

1. A frame structure, comprising four plastic casings, four steel bushings, and four angled insertion members, wherein:
   - the plastic casings are integrally connected with each other by welding to form a rectangular frame;
   - each of the steel bushings is axially mounted in a respective one of the plastic casings; and
   - each of the insertion members is mounted in the plastic casings and mounted on any two adjacent steel bushings to connect the steel bushings, so that the steel bushings are combined integrally by the insertion members.

2. The frame structure in accordance with claim 1, wherein each of the insertion members is made of a steel material.

3. The frame structure in accordance with claim 1, wherein each of the insertion members is substantially L-shaped.

4. The frame structure in accordance with claim 1, wherein each of the insertion members is integrally formed with two insertion sections each axially inserted into a respective one of the steel bushings.

5. The frame structure in accordance with claim 4, wherein the insertion sections of each of the insertion members are arranged at a right angle.

6. The frame structure in accordance with claim 4, wherein each of the insertion sections of each of the insertion members has a substantially inverted U-shaped cross-section.

7. The frame structure in accordance with claim 1, wherein the plastic casings, the steel bushings and the insertion members are combined with each other by a plurality of fastening members.

8. The frame structure in accordance with claim 7, wherein each of the fastening members is a screw.

9. The frame structure in accordance with claim 7, wherein each of the fastening members is a bolt.

10. The frame structure in accordance with claim 7, wherein each of the fastening members is a rivet.

11. The frame structure in accordance with claim 1, wherein the plastic casings, the steel bushings and the insertion members are combined with each other by an adhesive.

12. The frame structure in accordance with claim 1, wherein each of the plastic casings has a hollow inside formed with a chamber, and each of the steel bushings is mounted in the chamber of a respective one of the plastic casings.

13. The frame structure in accordance with claim 1, wherein each of the steel bushings has a substantially rectangular cross-section.

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