RECYCLABLE BUILIDNG BLOCK AND BUILDING SYSTEM USED FOR CONSTRUCTING BUILDING

Cross Reference To Related Application

[1] This application is a continuation-in-part of International Application No. PCT/CN2017/000151, filed February 10, 2017 designating the United States and claiming priority with respect to Chinese Patent Application No. 201610098785.X, filed February 17,2016, entitled "ENVIRONMENTALLY FRIENDLY BUILDING KIT", the disclosures of both foregoing applications being incorporated herein by reference.

Technical Field

[2] The present disclosure relates to building material, and more particularly to a recyclable building system used for constructing a building.

Background Art

[3] Generally, a solid waste involved in the present disclosure includes: industrial solid wastes, domestic wastes, construction wastes, urban sludge, and crop straw wastes. The industrial wastes include, but not limited to, a waste slag, a slag and corner wastes of industrial products. The domestic wastes include, but not limited to, waste papers, waste furniture, used plastic, packaging materials and surplus deteriorating foods, which are produced in daily life. The construction wastes include, but not limited to, cement blocks, bricks and decoration materials produced while old buildings are demolished. The urban sludge includes, but not limited to, sludge produced by sewage treatment, sludge excavated in urban underground projects, and sludge deposited in urban sewage all year round. The crop straw wastes include, but not limited to, rice straw, wheat straw, corn stalk, sorghum stalk, cotton straw, peanut straw, sesame straw, and rape straw. At present, there are many methods to deal with these various types of wastes. However, with the continuous development of the society, the various types of wastes have not been handled well and become increasingly serious social problems and continue to cause harm to the human living environment.

[4] At the same time, various methods for constructing walls are using cement mortar to block bricks into walls, or after the frame structure is built, the wall plates are fixed to

the frame structure. These methods must be implemented by professional staff using professional tools and equipment. And the built walls are all base blank walls without any decoration. After the wall is built, if it needs to be renovated and decorated, the building material used for building the wall cannot be used repeatedly for construction and demolition. As a result, a large amount of building materials is wasted, and the disassembled construction waste cannot be decomposed and become new solid wastes, causing environmental pollution.

[5] Therefore, a new recyclable building system needs to be provided.

Summary

[6] In one aspect of the present disclosure, a building system used for constructing a building comprises: a normal block used at a normal position of the building, a connection block used to fill a gap created when constructing a building; and a corner block used at a corner position of the building; wherein, each of the normal block, connection block and corner block include: an inner face, an outer face; an upper face with a base face, and a projection protruding upward from the base face, wherein the projection is extending longitudinally for the entire length of the upper face; a lower face with a complementary groove for interlocking with the projection of a cooperating interlocking block when the blocks stacked upon each other; a first end; a second end; wherein, the first end of the normal block is opposite to the second end of the normal block, and a tongue that protrudes outward formed at the first end of the normal block, and a concave portion that protrudes inward formed at the second end of the normal block; the first end of the corner block is at right angles to the second end of the corner block, and two concave portions that protrudes inward formed at the first and second ends of the corner block, respectively; the first end of the connection block is opposite to the second end of the connection block, and a planar face is formed at the first end of the connection block and the concave portion that protrudes inward formed at the second end of the connection block; wherein, the tongue of the normal block interlocks with the concave portion of the cooperating interlocking block, wherein, the cooperating interlocking block is one of the normal block, the corner block and the connection block.

[7] In the embodiment, dimensional relation between the normal block, the corner block and the connection block is defined as following: Lco=L+W; Wco=1/2L+W; Lci=L; Wci=1/2L; Lcb=1/2L; Wcb=W; Wherein, L is a length of the normal block, W is a width

of the normal block; Lco is an outer length of the corner block, Wco is an outer width of the corner block; Lci is an inner length of the corner block, Wci is an inner width of the corner block; Lcb is a length of the connection block, Wcb is a width of the connection block.

[8] In the embodiment, the building system further includes a plurality of sealing gaskets, each of the sealing gaskets disposed on the base face of the upper face and sandwiched between two interlocking blocks when the blocks stacked upon each other, wherein each of the blocks is one of the normal block, the corner block and the connection block.

[9] In the embodiment, the projection has a pair of guiding faces extending inclined from the base face of the upper face and a top face connected between the guiding faces, each guiding face connected with the base face at an angle.

[10] In the embodiment, the angle is greater than 90 degrees and smaller than 180 degrees.

[11] In the embodiment, each of the normal block, the corner block and the connection block incudes a plurality of first though holes that are spaced with each other at an equal interval formed in the projection and extending from the top face of the projection to the lower face.

[12] In the embodiment, the building system further incudes a reinforcing element inserted into the first through hole and shaped to match the first through hole, wherein the diameter of the reinforcing element is smaller than that of the first through hole by 1-2mm.

[13] In the embodiment, the corner block further including an avoiding space disposed at a corner thereof; the avoiding space of the corner block is a recess formed by removing the projection at the corner for receiving the lower face of a cooperating corner block when corner blocks stacked upon each other.

[14] In another aspect of the present disclosure, a building block used for constructing a building comprises: an inner face, an outer face opposite to the inner face; an upper face having a base face and a projection protruding upward from the base face, wherein the projection extending longitudinally for the entire length of the upper face; a lower face opposite to the upper face, the lower face having a complementary groove for interlocking with the projection of a cooperating interengaging building block when the building blocks stacked upon each other; a first end; and a second end; wherein each of

the first end and the second end has one of a planar face, a tongue and a concave portion, the tongue of the building block is interlocking with the concave portion of a cooperating interengaging building block; wherein the cooperating interengaging building block is substantially similar to the building block.

[15] In the embodiment, the projection has a pair of guiding faces extending inclined from the base face of the upper face and a top face connected between the guiding faces, each guiding face connected with the base face at an angle, the angle is greater than 90 degrees and smaller than 180 degrees.

[16] In the embodiment, the building block further incudes a plurality of first though holes that are spaced with each other formed in the projection and extending from the top face of the projection to the lower face of the building block.

[17] In the embodiment, the building block further includes a plurality of second through holes extending from the base face of the upper face to the lower face of the building block and disposed at a side of the projection, a diameter of the second through hole is smaller than that of the first through hole.

[18] In the embodiment, the building block further includes a plurality of filling holes extending from the base face of the upper face to the lower face of the building block and disposed at a side of the projection, wherein each filling hole is cuboidal shaped.

[19] In the embodiment, a height of the projection in a vertical direction is smaller than a depth of the groove in the vertical direction so that a horizontal through hole is formed by means of the projection of the building block interlocking with the groove of the cooperating interengaging building block, wherein the cooperating interengaging building block is substantially similar to the building block.

[20] In the embodiment, the building block is one of a normal block, a corner block and a connection block.

[21] In the embodiment, the building block is a normal block and the first end is opposite to the second end, and the tongue protruding outward is formed at the first end and located in a center of the first end, the tongue extending longitudinally for the entire length of the first end; the complementary concave portion protruding inward is formed at the second end.

[22] In the embodiment, the building block is a corner block, and the first end is at right angles to the second end, and the first end and the second end both have the concave portions, each of the concave portions protruding inward formed at the first end or the second end.

[23] In the embodiment, the corner block further including an avoiding space disposed in a corner thereof; the avoiding space of the corner block is a recess formed by removing the projection at the corner for receiving the lower face of a cooperating corner block when corner blocks stacked upon each other.

[24] In the embodiment, the corner block further includes a protruding part disposed in a center of the avoiding space and protruding upward; and a third through hole extending from the protruding part to the lower face of the corner block.

[25] In the embodiment, the building block is the connection block and the first end of the connection block is opposite to the second end of the connection block, wherein the first end is the planar face, and the concave portion protruding inward is formed at the second end.

Brief Description of the Drawings

[26] The above and/or additional objects, features and advantages of the present disclosure, will be further elucidated by the following illustrative and non-limiting detailed description of embodiment of the present disclosure, with reference to the appended drawings, wherein:

[27] Fig. 1 illustrates an upper isometric view of a building block of a building system according to a first embodiment of the present disclosure, wherein the building block is designed as a normal block.

[28] Fig.2 illustrates a lower isometric view of the building block shown in Fig.1.

[29] Figs.3-4 illustrate isometric views of another building block of the building system according to the first embodiment of the present disclosure, wherein such building block is designed as a corner block.

[30] Figs.5-6 illustrate isometric views of the other building block of the building system according to the first embodiment of the present disclosure, wherein such building block is designed as a connection block.

[31] Figs.7a-7b illustrate isometric views of a building block of the building system according to a second embodiment of the present disclosure, wherein such building block is designed as the normal block.

[32] Figs.8a-8b illustrate isometric views of another building block of the building system according to the second embodiment of the present disclosure, wherein such building block is designed as the corner block.

[33] Figs.9a-9b illustrate isometric views of the other building block of the building system according to the second embodiment of the present disclosure, wherein such building block is designed as the corner block.

[34] Figs.10 illustrates isometric view of a building block of the building system according to a third embodiment of the present disclosure, wherein such building block is designed as the normal block.

[35] Figs.11 illustrates isometric view of another building block of the building system according to the third embodiment of the present disclosure, wherein such building block is designed as the corner block.

[36] Figs.12 illustrates isometric view of the other building block of the building system according to the third embodiment of the present disclosure, wherein such building block is designed as the connection block.

[37] Fig.13 illustrates dimensional relationships between the normal block, the corner block and the connection block of the building system according to the first embodiment of the preset disclosure.

[38] Fig.14 shows the building blocks of the building system according to the first embodiment of the present disclosure interlocking with each other.

[39] Fig.15 further shows two building blocks of the building system according to the first embodiment of the present disclosure interlocking with each other, and a horizontal through hole thus formed therebetween.

[40] Fig.16 illustrates a perspective view of a building constructed using the building system.

[41] Fig.17 shows a plurality of reinforcing elements inserted into the building wall while a plurality of similar building blocks interlocking with each other to form such building wall.

[42] Fig.18 is a flow chart for producing the building block of the present disclosure.

Description of the Preferred Embodiments

[43] The present invention will be further illustrated below with reference to the attached drawings and the embodiments. The description in more detail aims to help to understand the present invention, instead of limiting the present invention. According to the contents disclosed by the present invention, those skilled in the art shall understand that the present invention can be implemented even without some or all of these specific details. Under other circumstances, to avoid weakening the inventiveness of the present invention, the well-known methods, structures and the like will not be described in detail.

[44] Certain terminology is used in the following description for convenience only and is not intended to be limiting. For purposes of this description, the terms "vertical" and "horizontal" are merely illustrative of relative space positions of the various components in the drawings. In actual practice, it is apparent that the components can be aligned in either orientation. Moreover, the terms "upper", "lower", "upward", "outward", "inward", "inner" and "outer" designate directions in the drawing to which reference is made. Such terminology includes the terms above specifically mentioned and words of similar import.

[45] As shown in Fig.1through Fig.7, as well as Figs.15-17, a building system 1 according to a first embodiment of the present disclosure is used for constructing a building 900. The building system 1 including a plurality of building blocks is mounted on a flat foundation 901 to construct the building 900. The building system 1 includes a normal block 11 used at a normal position 904 while constructing the building 900, a corner block 12 used at a corner position 903 while constructing the building 900, and a connection block 13 used to fill the gaps 902 created at one or more points while constructing the building 900. The normal block 11, corner block 12 and the connection block 13 may interlock with each other to construct the building 900.

[46] The normal block 11 is substantially cuboidal-shaped block structure for constructing the building 900. The normal block 11 includes an inner face 110, an outer face 111 opposite to the inner face 110, an upper face 112, a lower face 113 opposite to the upper face 112, a first end 114 and a second end 115 opposite to the first end 114. The inner face 110 and outer face 111 are substantially planar faces. The outer face 111 and inner face 110 may be a smooth face or a patterned face. At least one of the outer face 111 and

the inner face 110 may be decorated as desired. Alternatively, the building block 11 may include a decorative face attached to at least one of the inner face 110 and the outer face 111. The decorative face can be decorated with multiple colors or colored patterns by means of printing, molding, filming, engraving, pasting or hand-painting. The pattern may be flat or three-dimensional wood grain, stone grain, brick grain, skin grain. The pattern may be people, photos, geometry, logo and so on. Alternatively, the decorative face may be integrally formed with at least one of the outer face and inner face.

[47] The upper face 112 has a base face 1121 and a projection 1122 protruding upwards from the base face 1121. The projection 1122 is disposed at a center of the upper face 112 and extending longitudinally for the entire length of the upper face 112. The projection 1122 is generally trapezoidal shaped in cross sectional configuration. Specifically, the projection 1122 has a pair of guiding faces 1122a opposite to each other and a top face 1122b connected between the guiding faces 1122a. Each of the guiding faces 1122a extends inclined from the base face 1121 for preventing water from flowing into the building block, i.e. the guiding face 1122a of the projection 1122 is connected with the base face 1121 of the upper face 112 at an angle β. The angle β may be greater than 90 degrees and smaller than 180 degrees. With the configuration of the guiding face 1122a, the blocks stacked upon each other can be well positioned and guided to interlock with each other.

[48] The lower face 113 is substantially complementary to the upper face 112. Specifically, the lower face 113 has a complementary groove 1131 for receiving the projection 1122 of a cooperating block when the blocks stacked upon each other to form an interlocking bond, wherein the cooperating block is similar to the normal block 11. In the present disclosure, a depth d of the groove 1131 is greater than a height h of the projection 1122 in a vertical direction Z so that a horizontal through hole 14 is formed by the projection 1122 of one normal block 11 mating with the groove 1131 of the cooperating block when the blocks stacked upon each other, wherein the cooperating block is identical or similar to the normal block 11. The horizontal through hole 14 may be used for receiving electrical wires, pipes or other utility.

[49] The normal block 11 further includes a plurality of first through holes 101 disposed in the projection 1122 and extending from the top face 1122b of the projection 1122 to the lower face 113 of the building block 11. The plurality of first through holes 101 are arranged spaced-apart with each other at an equal interval. The first through hole 101

may be cuboidal shaped, cylindrical-shaped, and the like. The design of a plurality of first through holes 101 facilitates in the formation of a first vertical channel, when a plurality of blocks, similar to normal block 11, are stacked upon each other.

[50] The normal block 11 further includes a plurality of second through holes 102 disposed in the projection 1122 and extending from the top face 1122b of the projection 1122 to the lower face 113 of the building block 11 for receiving electrical wires, pipes or other utility. The plurality of second through holes 102 are arranged spaced-apart with each other at an equal interval. Each second through hole 102 is located between two adjacent first through holes 101. The second through hole 102 may be cuboidal shaped, cylindrical-shaped, and the like. A diameter of the second through hole 102 is smaller than that of the first through hole 101.

[51] The first end 114 has a tongue 1141 formed at a center thereof. The tongue 1141 protrudes outward at the first end 114 of the normal block 11, i.e. protrudes in a direction away from the second end 115. The tongue 1141 extends longitudinally for the entire length of the first end 114. The entire length of the first end 114 is a length of the normal block 11 in a vertical direction Z. The second end 115 has a concave portion 1151 formed at a center thereof. The concave portion 1151 protrudes inward at the second end 115, i.e. protrudes in a direction toward the first end 114. The concave portion 1151 extends longitudinally for the entire length of the second end 115. The entire length of the first end 115 is the length of the normal block 11 in the vertical direction Z. The configuration of the tongue 1141 and the concave portion 1151 is produced such that the tongue of one normal block can interlock with the concave portion of a cooperating block, wherein the cooperating block is identical or similar to the normal block 11.

[52] The corner block 12 has a generally L-shaped outline when viewed from above in Fig.4. The corner block 12 includes an inner face 120, an outer face 121 opposite to the inner face 120, an upper face 122, a lower face 123 opposite to the upper face 122, a first end 124 and a second end 125. The first end 124 is at right angles to the second end 125. The structure of the corner block 12 is substantially similar to that of the normal block 11. The upper face 122 also has the base face 1121 and the projection 1122 extending for the entire length of the upper face 122 of the corner block 12. The lower face 123 also has the groove 1131. The corner block 12 also has the first through holes 101 and the second through holes 102 formed in the projection 1122 and extending from the top face 1122b of the projection 1122 to the lower face 123 of the corner block 12.

[53] The first end 124 and the second end 125 both have the concave portions 1151, i.e. the concave portions 1151 protrudes inward at the first and second ends 124, 125, respectively. When a normal block 11 and a corner block 12 are mated adjacent to each other, the interlocking bond is formed. Precisely, when the tongue 1141 of the normal block 11 is mated with the concave portion 1151 of the corner block 12, the interlocking bond is formed due to the complementary nature of the structure between the tongue and the concave portion 1151.

[54] The corner block 12 further includes an avoiding space 129 formed at the corner thereof. The avoiding space 119 is a recess formed by means of removing the projection 1122 at the corner. The corner block 12 further includes a protruding portion 128 disposed in a center of the avoiding space 129 and protruding upwards from the base face 1121 of the upper face 112 of the corner block 12. The avoiding space 129 is configured for receiving the lower face 123 of cooperating corner block 12 when the corner blocks 12 stacked upon each other, wherein the cooperation corner block 12 is identical to the corner block 12. A third through hole 1281 is formed in the protruding portion 128 and extending from the protruding portion 128 to the lower face 123 of the corner block 12.

[55] As shown in Fig.6-7, the connection block 13 has one first through hole 101, however, the normal block 11 has two first through holes 101. The connection block 13 also has an inner face 130, an outer face 131 opposite to the inner face 130, an upper face 132, a lower face 133 opposite to the upper face 132, a first end 134 and a second end 135 opposite to the first end 134. The upper face 132 also has the base face 1121 and the projection 1122. The lower face 123 also has the groove 1131. The connection block 13 also has the first through holes 101 and the second through holes 102 formed in the projection 1122 and extending from the top face 1122b to the lower face 133 of the connection block 13.

[56] The first end 134 is a planar face 1341, and the second end 135 is the concave portion 1151, i.e. the concave portion 1151 protrudes inward at the second end 135. When a normal block 11 and a connection block 13 are mated adjacent to each other, the interlocking bond is formed. Precisely, when the tongue 1141 of the normal block 11 is mated with the concave portion 1151 of the connection block 13, the interlocking bond is formed due to the complementary nature of the structure between the tongue and the concave portion. The one or more connection blocks 13 are used to fill small uneven gaps created at the one or more points of termination while constructing the building 900.

[57] The building system 1 further includes a reinforcing element 15 inserted into the first vertical channel formed by the first through holes 101 aligned with each other while a plurality of similar blocks stacked upon each other so that a more secure interlocking interconnection is exhibited. The reinforcing element 15 may be tubular-shaped, and made by hollow metal, plastic or composite material. With such configuration, the reinforcing element 15 may be used as a water supply pipe, a gas supply pipe, a power cable pipe, a communication cable pipe, and so on. The reinforcing element 15 may be shaped to match the first through hole 101, such as a reinforcing rod, which has a diameter smaller than that of the first through hole 101 by 1-2mm. The reinforcing element 15 is detachable inserted into the vertical channel and can be removed when demolishing the building 900. Thus, the blocks can also be removed with no damage from the building and can be historically reused repeatedly as a new product. As shown in Fig.17, a plurality of reinforcing elements is used for constructing the building wall. When the building wall is too high, at least two reinforcing elements 15 need to be connected together to be filled into the vertical channel. A connector 151 is used for connecting between at least two reinforcing elements 15, furtherly, the connector 151 is detachably connected between the reinforcing elements 15 so that the reinforcing elements 15 can be detachable while demolishing such building. The connector 151 in different vertical channel are not aligned with each other and are staggered with each other to make the building more firmly.

[58] Preferably, a waterproof glue, a fastening glue, a structural glue, a cement or other adhesive may be applied between each of the interlocking blocks 11,12,13 to enhance the strength of the wall of the building.

[59] The building system 1 further includes a plurality of sealing gaskets 16, each of the sealing gaskets 16 is sandwiched between two interlocking blocks, each of the two blocks may be at least one of the corner block 12, normal block 11 and the connection block 13. When the block is stacked upon the cooperating block for constructing the building wall, the sealing gasket 16 is sandwiched between the blocks. The sealing gasket 16 is disposed on the base face 1121 of the upper face 112, 122, or 132 of the block and pressed by the lower face 113, 123 or 133 of the block. With such configuration, the building wall may be waterproof, soundproof, and insulative.

[60] Alternatively, referring to Figs.8a-10b, according to a second embodiment of present disclosure, the differences between the first embodiment and the second embodiment are

that the second through holes are omitted and a plurality of filling holes are formed in the normal block 21, corner block 22 and connection block 23. Specifically, the normal block 21 further includes at least one filling hole 210 disposed at the side of the projection 1122 and extending from the base face 1121 of the upper face 112 to the lower face 213 of the normal block 21 for accommodating insulating material 211. The filling hole 210 may be cuboidal shaped. The normal block 21 may include a plurality of filling holes 210 spaced apart each other at an equal interval and located at both sides of the projection 1122. When the first through hole 101 is cuboidal shaped, the length of the filling hole 210 in the horizontal direction is greater than that of the first through hole 101.

[61] Similarly, the corner block 22 also has the filling holes 210 disposed at the side of the projection 1122 and extending from the base face 1121 of the upper face 222 to the lower face 223 of the corner block 22 for accommodating insulating material 211. The corner block 22 may include a plurality of filling holes 210 spaced apart each other at an equal interval and located at both sides of the projection 1122. When the first through hole 101 is cuboidal shaped, the length of the filling hole 210 in the horizontal direction is greater than that of the first through hole 101.

[62] Similarly, the connection block 23 also has the filling holes 210 disposed at the side of the projection 1122 and extending from the base face 1121 of the upper face 232 to the lower face 233 of the connection block 23 for accommodating insulating material 211. The connection block 23 may include a plurality of filling holes 210 spaced apart each other at an equal interval and located at both sides of the projection 1122. When the first through hole 101 is cuboidal shaped, the length of the filling hole 210 in the horizontal direction is greater than that of the first through hole 101.

[63] Alternatively, as shown in Figs.11-13, according to a third embodiment of the present disclosure, the difference between the first embodiment and the third embodiment is that the second through hole may be disposed at a different position. The plurality of second through holes 102 may be disposed at the side of the projection 1122 and extending from the base face 1121 of the upper face 312 to the lower face 313 of the normal block 31. The plurality of second through holes 102 can be divided into two groups disposed at both sides of the projection 1122, respectively. Each group has at least three adjacent second through holes 102.

[64] Similarly, the corner block 32 also has the plurality of second through holes 102

disposed at the side of the projection 1122 and extending from the base face 1121 of the upper face 322 to the lower face of the corner block 32. The plurality of second through holes 102 can be divided into two groups disposed at both sides of the projection 1122, respectively. Each group has at least three adjacent second through holes 102.

[65] Similarly, the connection block 33 also has the plurality of second through holes 102 disposed at the side of the projection 1122 and extending from the base face 1121 of the upper face 332 to the lower face 113 of the connection block 33. The plurality of second through holes 102 can be divided into two groups disposed at both sides of the projection 1122, respectively. Each group has at least three adjacent second through holes 102.

[66] According to various embodiments of the present invention, when a first block and a second block similar to the normal block 11 are mated adjacent to each other, the interlocking bond is formed. Precisely, when the tongue of the normal block is mated with the concave portion of the second block, the interlocking bond is formed due to the complementary nature of the structure between the tongue and the concave portion. When the first block is stacked upon a second block, each of the first block and second block is at least one of the normal block, corner block and connection block, an interlocking bond is formed by means of the projection 1122 interlocking with the groove 1131. Interlocking the plurality of blocks forms a network of horizontal and vertical channels with the first through holes 101 of the blocks aligned with each other in the vertical direction Z, and the horizontal through holes 14 of the blocks aligned with each other in the horizontal direction X,Y.

[67] Fig.14 shows the dimensional relation between the normal block 11, the corner block 12, and the connection block 13. A width of the normal block 11 is denoted by W, and a length of the normal block 11 is denoted by L. An outer length of the corner block 12 is denoted by Lco, the dimension Lco is obtained by adding the length L of the normal block 11 to the width W of the normal block 11, i.e. Lco=L+W. An inner length of the corner block 12 is denoted by Lci, the dimension Lci is equal to the length L of the normal block 11, i.e. Lci=L. An outer width of the corner block 12 is denoted by Wco, the dimension Wco is obtained by half of the length L of the normal block 11 adding to the width W of the normal block, i.e. Wco=1/2 L+W; An inner width of the corner block 12 is denoted by Wci, the dimension Wci is equal to half of the length L of the normal block 11, i.e. Wci=1/2L. A thickness of the corner block 12 is denoted by Tc, the dimension Tc is equal to the width W of the normal block 11, i.e. Tc=W. A length of the

connection block 13 is denoted by Lcb, the dimension Lcb is equal to half of the length L of the normal block 11, i.e. Lcb=1/2 L; A width of the connection block 13 is denoted by Wcb, the dimension Wcb is equal to the width W of the normal block, i.e. Wcb=W. It should be understood that the dimension L and W of the normal block 11 can be varied depending on the actual requirement of users. For instance, the dimension L may be 500 mm, and the dimension W may be 150mm, thus, the dimension Lcb is 250mm, and the dimension Wcb is 150mm; the dimension Lco is 650mm, the dimension Wco is 400mm, the dimension Lci is 500 mm, and the dimension Wci is 250mm. According to actual verification, this dimensional relation between the normal block, the corner block and the connection block can guarantee that each building block can be perfectly construct a building without any need to cut them. It should be understood that a dimension allowance is existed while assembling the blocks for constructing the building, the value of the dimension allowance may be ranged from -30mm to +30mm, which is varied depending on the size of the gap between two adjacent blocks.

[68] Fig.17 illustrates the building wall constructed using the normal block 11, the connection block 13 and a plurality of reinforcing elements 15. When the building wall is constructed, at the first layer, a plurality of normal blocks 11 are arranged horizontally side by side, and interlocking bonds are formed with the tongue interlocking with the concave portion of the normal blocks 11. At the second layer, the normal blocks 11 may be offset by half of the length L of the normal block 11 relative to them at the first layer, and connection blocks 13 are filled to the termination ends. The connection blocks 13 and normal blocks 11 are mated adjacent to each other, interlocking bonds are formed with the tongue mating with the concave portion. Interlocking bonds formed between the blocks 11,13 at the first layer and the second layer are formed with the projections 1122 of the blocks 11 at first layer mating with the grooves 1131 of the blocks 11,13 at the second layer. Thus, the third layer can be constructed the same as that at the first layer, and the fourth layer can be constructed the same as that at the second layer. With such configuration, the building blocks can be interengaged securely, which can resist an impact of strong objects and have good anti-seismic effect. The first through holes 101 at the first layer, the second layer and the third layer are aligned with each other to form a plurality of vertical channels for receiving the reinforcing elements 15.

[69] Referring to Fig.18, a method for producing the building block according to present disclosure is disclosed. The method is described as following: a solid waste J including,

but not limited to, industrial solid wastes, domestic wastes, construction wastes, urban sludge, and crop straw wastes, are recovered. Then, putting the recovered solid wastes J into a crushing center A to be pulverized into particles of about 5 mm. A high-water waste K (such as domestic garbage, municipal sludge, etc) is sent to a high-temperature dehydration and elimination center B for high-temperature dehydration, sterilization, and deodorization. A large amount of high-temperature steam I thus obtained would be transported to the high-temperature steam kiln C. Then, the pulverized solid waste L and the dehydrated waste are fed into a stirring center D together with a curing agent, a water repellent, a modifier, a flame retardant, and a binder in a certain ratio, and are thoroughly stirred and mixed. The mixed and stirred materials are sent to the product forming center E to make a building block billet. The billet is fed into the high temperature steam kiln C for high-temperature steaming, and the distilled water H thus produced is sent to the stirring center D for mixing and stirring. After high-temperature steaming, the billet is sent to a facing machining center F to be decorated according to the user's actual requirement and thus, a desired building block is produced. If necessary, the billet will be sealed with composite materials to ensure the physical and chemical properties of the billet stable for a long time. Finally, the building block is sent to the user after being sent to the palletizing packaging center G. However, in the palletizing packaging center G, the product with defect is sent to the product forming center E for repair, and the scrap is sent to the crushing center A for crushing and reused. There is no waste water, waste gas, and waste residue produced throughout the entire manufacturing process.

[70] In the foregoing specification, specific embodiments of the invention have been described. However, one of ordinary skill in the art appreciates that various modifications and changes can be made without departing from the scope of the invention as set forth in the claims below. Accordingly, the specification and figures are to be regarded in an illustrative rather than a restrictive sense, and all such modifications are intended to be included within the scope of the invention. The invention is defined solely by the appended claims including any amendments made during the pendency of this application and all equivalents of those claims as issued.

What is claimed is:

1. A building system for constructing a building, comprising:

a normal block used at a normal position of the building,

a connection block used to fill a gap created when constructing a building; and

a corner block used at a corner position of the building; wherein,

each of the normal block, connection block and corner block include:

an inner face,

an outer face;

an upper face, having a base face, and a projection protruding upward from the base face, wherein the projection is extending longitudinally for the entire length of the upper face;

a lower face, having a complementary groove for interlocking with the projection of a cooperating interlocking block when the blocks stacked upon each other;

a first end;

a second end; wherein,

the first end of the normal block opposite to the second end of the normal block, and a tongue protruding outward at the first end of the normal block, and a concave portion protruding inward at the second end of the normal block;

the first end of the corner block is at right angles to the second end of the corner block, and two concave portions protruding inward at the first and second ends of the corner block, respectively;

the first end of the connection block is opposite to the second end of the connection block, and a planar face formed at the first end of the connection block and the concave portion protruding inward at the second end of the connection block; wherein,

the tongue of the normal block interlocks with the concave portion of the cooperating interlocking block, wherein,

the cooperating interlocking block is one of the normal block, the corner block and the connection block.

2. The building system according to claim 1, wherein, dimensional relations between the normal

block, the corner block and the connection block are defined as following:

$$Lco=L+W;$$

$$Wco=1/2L+W;$$

$$Lci=L;$$

$$Wci=1/2L;$$

$$Lcb=1/2L;$$

$$Wcb=W;$$

Wherein, L is a length of the normal block;

W is a width of the normal block;

Lco is an outer length of the corner block;

Wco is an outer width of the corner block;

Lci is an inner length of the corner block;

Wci is an inner width of the corner block;

Lcb is a length of the connection block;

Wcb is a width of the connection block.

3. The building system according to claim 1, further comprising a plurality of sealing gaskets, each of the sealing gaskets disposed on the base face of the upper face and sandwiched between two interlocking blocks which are stacked upon each other, wherein each of the interlocking blocks is one of the normal block, the corner block and the connection block.

4. The building system according to claim 1, wherein, the projection has a pair of guiding faces extending inclined from the base face of the upper face and a top face connected between the guiding faces, each guiding face connected with the base face at an angle.

5. The building system according to claim 4, wherein, the angle is greater than 90 degrees and smaller than 180 degrees.

6. The building system according to claim 1, wherein, each of the normal block, the corner block and the connection block includes a plurality of first though holes spaced with each other formed in the projection and extending from the top face of the projection to the lower face.

7. The building system according to claim 6, further comprising a reinforcing element inserted into the first through hole and shaped to match the first through hole, wherein the diameter of the reinforcing element is smaller than that of the first through hole by 1-2mm.

8. The building system according to claim 1, wherein, the corner block further including an avoiding space disposed in a corner thereof;

the avoiding space of the corner block is a recess formed by removing the projection at the corner for receiving the lower face of a cooperating corner block when corner blocks stacked upon each other.

9. A building block used for constructing a building, comprising:

an inner face,

an outer face opposite to the inner face;

an upper face having a base face and a projection protruding upward from the base face, wherein the projection extending longitudinally for the entire length of the upper face;

a lower face opposite to the upper face, the lower face having a complementary groove for interlocking with the projection of a cooperating inter engaging building block when the building blocks stacked upon each other;

a first end;

a second end;

wherein each of the first end and the second end has one of a planar face, a tongue and a concave portion; the tongue of the building block is interlocking with the concave portion of a cooperating inter engaging building block;

wherein the cooperating inter engaging building block is substantially similar to the building block.

10.The building block according to claim 9, wherein, the projection has a pair of guiding faces extending inclined from the base face of the upper face and a top face connected between the guiding faces, each guiding face connected with the base face at an angle, wherein the angle is greater than 90 degrees and smaller than 180 degrees.

11. The building block according to claim 9, further comprising a plurality of first though

holes that are spaced with each other formed in the projection and extending from the top face of the projection to the lower face of the building block.

12.The building block according to claim 11, further comprising a plurality of second through holes extending from the base face of the upper face to the lower face of the building block and disposed at both sides of the projection, a diameter of the second through hole smaller than that of the first through hole.

13. The building block according to claim 11, further comprising a plurality of filling holes extending from the base face of the upper face to the lower face of the building block and disposed at both sides of the projection, wherein each filling hole is cuboidal shaped.

14.The building block according to claim 9, wherein a height of the projection in a vertical direction is smaller than a depth of the groove in the vertical direction so that a horizontal through hole is formed by means of the projection of the building block interlocking with the groove of the cooperating inter engaging building block.

15. The building block according to claim 14, wherein the building block is one of a normal block, a corner block and a connection block.

16. The building block according to claim 15, wherein, the building block is a normal block, and

the first end is opposite to the second end, and

the tongue protruding outward is formed at the first end, the tongue extending longitudinally for the entire length of the first end; and

the complementary concave portion protruding inward is formed at the second end.

17. The building block according to claim 15, wherein, the building block is a corner block, and

the first end is at right angles to the second end, and

the first end and the second end both have the concave portions, each of the concave portions protruding inward formed at the first end or the second end.

18. The building block according to claim 17, wherein, the corner block further comprises an avoiding space disposed in a corner thereof; wherein,

the avoiding space of the corner block is a recess formed by removing the projection at the corner for receiving the lower face of a cooperating corner block when corner blocks stacked

upon each other.

19. The building block according to claim 18, wherein, the corner block further comprises a protruding portion disposed in a center of the avoiding space and protruding upward; and

a third through hole extending from the protruding portion to the lower face of the corner block.

20. The building block according to claim 15, wherein, the building block is a connection block and the first end of the connection block is opposite to the second end of the connection block, wherein the first end is the planar face, and the concave portion protruding inward is formed at the second end.