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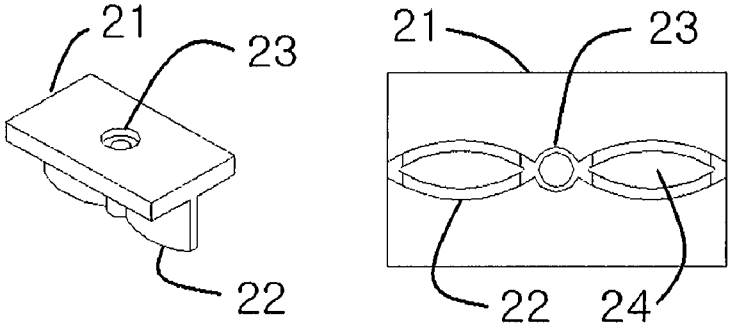
(54) **Title**: DECK FASTENER AND STRUCTURE FOR CONNECTING DECK BOARD

Fig. 2



(57) **Abstract**: A connection member made of wood, synthetic wood or the like, that is, a deck fastener, and a connection structure for connecting the deck boards using the same, which makes up for a conventional method for directly or indirectly fastening deck boards by simply using a nail or a screw, are disclosed. The deck fastener has a structure for preventing torsion and damage from occurring due to deformation of the deck boards under temperature and humidity conditions varying according to climate. Further, there is an advantage that a nail or a screw is not exposed from the surfaces of the boards by fixing the boards with the fastener instead of a connection structure using a screw.

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DECK FASTENER AND STRUCTURE FOR CONNECTING DECK BOARD

Technical Field

The present invention relates to a member connected to a lower structure of deck boards, that is, a deck fastener, for construction of the deck boards made of wood, synthetic wood or the like and a connection structure for connecting the deck boards using the same, and more particularly to a deck fastener appropriate for contraction and expansion of the deck boards without exposing a head portion of a screw.

Background Art

Conventional deck clip and fastener have a simple shape for simply connecting a board to a lower structure. Accordingly, when the board contracts and expands according to variation in temperature and humidity due to climate or external factors, torsion, damage or the like may occur.

A deck board supporting structure is disclosed in Japanese Patent Laid-open Publication No. 2006-77446. However, an H-shaped flange is used as a fastener and there is no hollow structure in the flange. Accordingly, it is different from the present invention having a hollow structure in a T-shaped fastener.

A deck structure is disclosed in Japanese Patent Laid-open Publication No. 1999-280144. However, a flat plate is used as a fastening means of the deck and there is no disclosure regarding prevention of torsion or damage of the deck.

A deck system having a deck clip is disclosed in US Patent No. 6314699. However, there is no disclosure regarding a hollow structure of a clip and prevention of torsion or damage of the deck.

Disclosure

Technical Problem

Therefore, the present invention has been made in view of the above

problems, and it is an object of the present invention to provide a deck connection member and a structure for connecting deck boards using the same capable of preventing torsion and damage of the boards by offering mobility to a lower coupling portion corresponding to contraction and expansion of the deck boards.

Technical Solution

In accordance with an aspect of the present invention, the above and other objects can be accomplished by the provision of a deck connection member comprising: a horizontal member connected to opposite side surfaces of adjacent deck boards and a vertical member having a hollow structure.

The vertical member may include a piece hole formed at a center thereof and hollow portions formed symmetrically with respect to the piece hole.

The hollow portions may have a cross-sectional shape such as an elliptic shape, a circular shape or a polygonal shape.

The hollow portions may expand and contract corresponding to contraction and expansion of deck boards.

In accordance with another aspect of the present invention, there is provided an assembly structure of deck boards comprising: deck boards having grooves formed on their side surfaces; and a deck connection member which includes a horizontal member and a vertical member having a piece hole and hollow portions, wherein the horizontal member of the deck connection member is inserted into the grooves formed on opposite side surfaces of adjacent deck boards.

The deck connection member may be fixed to a joist by a direct connection type piece or a nail through a piece hole, and the deck connection member, the direct connection type piece or the nail may be concealed from surfaces of the deck boards.

The engagement projections may be formed at lower ends of the grooves formed on the side surfaces of the deck boards, and engagement grooves may be formed at a lower portion of the horizontal member of the deck connection member.

Description of Drawings

The above and other objects, features and other advantages of the present invention will be more clearly understood from the following detailed description taken in conjunction with the accompanying drawings, in which:

Fig. 1 illustrates a cross-sectional view showing a connection structure of deck boards according to the present invention;

Fig. 2 illustrates a perspective view and a bottom view of a deck connection member according to a first embodiment of the present invention;

Fig. 3 illustrates a perspective view and a bottom view of a deck connection member according to a second embodiment of the present invention;

Fig. 4 illustrates a perspective view and a bottom view of a deck connection member according to a third embodiment of the present invention; and

Fig. 5 illustrates a perspective view and a bottom view of a deck connection member according to a fourth embodiment of the present invention.

Best Mode

Hereinafter, the present invention will be described in detail with reference to the accompanying drawings.

Fig. 1 illustrates a cross-sectional view showing a connection structure of deck boards according to the present invention, which includes deck boards 10 and a fastener 20.

The deck boards 10 are manufactured of wood, synthetic wood or the like. The deck boards 10 include grooves 11 formed on their side surfaces to receive the fastener 20.

Engagement projections 12 are formed at lower ends of the grooves formed on the side surfaces and are engaged with engagement grooves 25 formed at a lower portion of the fastener 20, thereby increasing a coupling force between the deck boards 10 and the fastener 20.

The fastener 20 is manufactured of metal having elasticity, synthetic resin such as thermoplastic resin and thermosetting resin or the like. The fastener 20 is inserted into the grooves 11 formed on the side surfaces between the adjacent deck boards 10, thereby connecting the deck boards 10.

After the deck boards 10 are assembled with the fastener 20, the fastener 20 is fixed to a joist (not shown) installed under the deck boards 10 using a fixing

means such as a direct connection type piece 30 or a nail through a piece hole 23 of the fastener 20.

That is, in a construction method, as shown in Fig. 1, one side of the fastener 20 is inserted into one of the deck boards 10 and is fixed to the joist (not shown) installed at a lower portion in advance using the direct connection type piece 30. Then, the other one of deck boards 10 is inserted into the other side of the fastener 20. The construction is made by repeating these processes.

Since the fastener 20 is installed on the side surfaces of the deck boards 10, the fastener 20 is covered with the deck boards 10 without being exposed to the outside. Also, the direct connection type piece 30 fixed through the fastener 20 is not exposed. Accordingly, there is no problem of ruining an external appearance due to exposure of a piece head as in the conventional technology.

In the construction using the fastener 20 according to the present invention, even though a general direct connection type piece is used as in the conventional technology, since the piece 30 is fastened to the fastener 20, it is possible to maintain a uniform distance between the deck boards 10 while the fastener 20 is not exposed from the surfaces of the deck boards 10. Further, since the piece hole 23 is formed in the fastener 20, fastening of the piece 30 becomes considerably easy.

A gap generated between the deck boards 10 may be filled with an additional member after the piece 30 is fixed.

Fig. 2 illustrates a perspective view and a bottom view of a deck connection member according to the first embodiment of the present invention. The fastener 20 includes a horizontal member 21 and a vertical member 22 to have T-shaped side surfaces.

The horizontal member 21 has a longer length in an insertion direction into the deck boards 10 to have an approximately rectangular shape. The piece hole 23 is formed at the center of the horizontal member 21 to receive the piece 30.

The vertical member 22 includes the piece hole 23 through which the piece 30 passes and may be manufactured as a single body with the horizontal member 21.

The vertical member 22 includes a pair of hollow portions 24 formed symmetrically with respect to the piece hole 23 formed at the center thereof.

The hollow portions 24 expand and contract corresponding to the contraction and expansion of the deck boards 10 to prevent deformation and damage of the deck boards 10.

That is, the deck fastener 20 of the present invention is formed in a hollow structure to have mobility at a lower portion. Accordingly, the fastener 20 contracts when the deck boards 10 expand, thereby preventing damage, and the fastener 20 expands again when the deck boards 10 contract again, thereby maintaining a distance between the deck boards 10.

Figs. 3 to 5 illustrate perspective views and bottom views of deck connection members according to other embodiments of the present invention. In a case of Fig. 3, the hollow portions 24 have a heptagonal shape. In a case of Fig. 4, the hollow portions 24 have a diamond shape. In a case of Fig. 5, the hollow portions 24 have an elliptic shape as in Fig. 2, but have a slightly different shape in the piece hole 23. Of course, the hollow portions 24 of the fastener 20 may have various shapes in addition to the shapes shown in Figs. 2 to 5.

Although the preferred embodiments of the present invention have been disclosed for illustrative purposes, those skilled in the art will appreciate that various modifications, additions and substitutions are possible, without departing from the scope and spirit of the invention as disclosed in the accompanying claims.

Industrial Applicability

As described above, according to the connection member of the present invention, it is possible to prevent torsion and damage according to contraction and expansion of the deck boards. Also, connection and disconnection are easy and it is possible to overcome a drawback caused by direct fastening of a nail, a screw or the like.

CLAIMS

1. A deck connection member comprising:

a horizontal member connected to opposite side surfaces of adjacent deck boards and a vertical member having a hollow structure.

2. The deck connection member according to claim 1, wherein the vertical member includes a piece hole formed at a center thereof and hollow portions formed symmetrically with respect to the piece hole.

3. The deck connection member according to claim 2, wherein the hollow portions have a cross-sectional shape of an elliptic shape, a circular shape or a polygonal shape.

4. The deck connection member according to claim 2, wherein the hollow portions expand and contract corresponding to contraction and expansion of deck boards.

5. An assembly structure of deck boards comprising:

deck boards having grooves formed on their side surfaces; and

a deck connection member which includes a horizontal member and a vertical member having a piece hole and hollow portions,

wherein the horizontal member of the deck connection member is inserted into the grooves formed on opposite side surfaces of adjacent deck boards.

6. The assembly structure of deck boards according to claim 5, wherein the deck connection member is fixed to a joist by a direct connection type piece or a nail through the piece hole, and the deck connection member, the direct connection type piece or the nail is concealed from surfaces of the deck boards.

7. The assembly structure of deck boards according to claim 5, wherein engagement projections are formed at lower ends of the grooves formed on the side surfaces of the deck boards, and engagement grooves are formed at a lower

portion of the horizontal member of the deck connection member.

Fig. 1

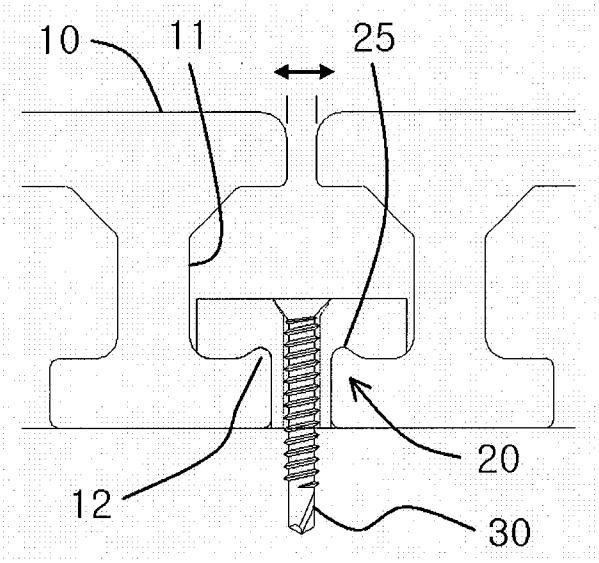


Fig. 2

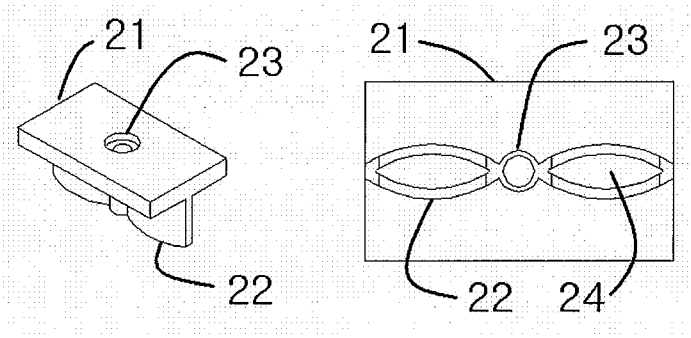


Fig. 3

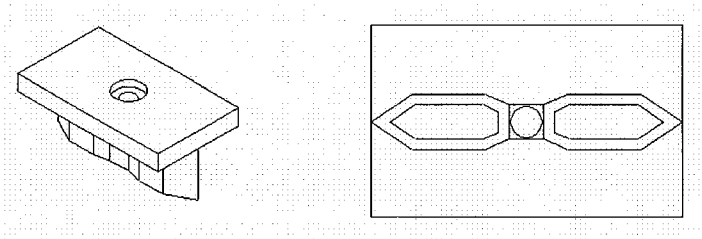


Fig. 4

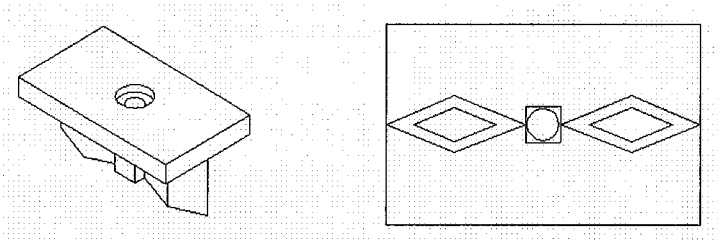
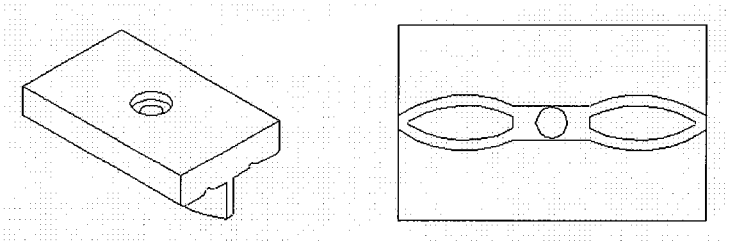


Fig. 5



INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2008/002948

A. CLASSIFICATION OF SUBJECT MATTER

E04B 5/00(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC E04B 5/00, E04F 15/00, E04F 15/024

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean Utility Models and applications for Utility Models since1975
Japanese Utility Models and applications for Utility Models since1975

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKIPASS(KIPO internal) & Keyword : "deck", "connection", and "cavity"

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6,314,699 B1 (RONALD R. WEST) 13 November 2001 See columns 2-4 and figures 1-4.	1
A	JP 2006-077446 A (NIPPON LIGHT METAL CO., LTD.) 23 March 2006 See figure 3.	1-7
A	JP 11-280144 A (NATIONAL HOUSE INDUSTRIAL CO., LTD.) 12 October 1999 See figures 2-4.	1-7
A	JP 09-203190 A (MASUSETSUTO CO., LTD.) 05 August 1997 See figures 1-4.	1-7
A	JP 2005-42542 A (YKK AP CO., LTD.) 17 February 2005 See figures 22-23.	1-7

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
14 JANUARY 2009 (14.01.2009)	**14 JANUARY 2009 (14.01.2009)**

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6314699 B1	13.11.2001	CA 2277586 A1 US 2003-0101673 A1	15.07.2000 05.06.2003
JP 2006-077446 A	23.03.2006	None	
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