

1) Family number: 31830240 (WO05035209A3)

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Title: WOOD BAMBOO COMPOSITES

Abstract: The invention relates to novel composites constituted of wood, bamboo, micro/ macro fibre inclusions, reconstituted-bamboo laminates (4) and fillers exhibiting monolithic behaviour under sustained and diverse loading conditions using stress lamination combined with interface irregularities for providing necessary shear resistance and tensile strength. Poor performance resulting from lack of inter fiber bond, splitting, brooming etc has restricted large-scale use of bamboo and small wood as engineering materials. Integrity and monolithic behaviour of the composite is achieved with stress lamination by use of U bolts (3), rods, bands etc in conjunction with designed irregularities such as undulations, serration and indentation with fasteners e.g. clamping plates, dowels. The techniques based on the invention have the potential to utilize small dimensioned wood, bamboo and reconstituted-bamboo laminates (4) to mass produce built up members e.g. beams, girders, trusses, struts, ties, frames, cylinders etc. in engineering structures such as towers, shells, arches, tanks, culverts and bridges.

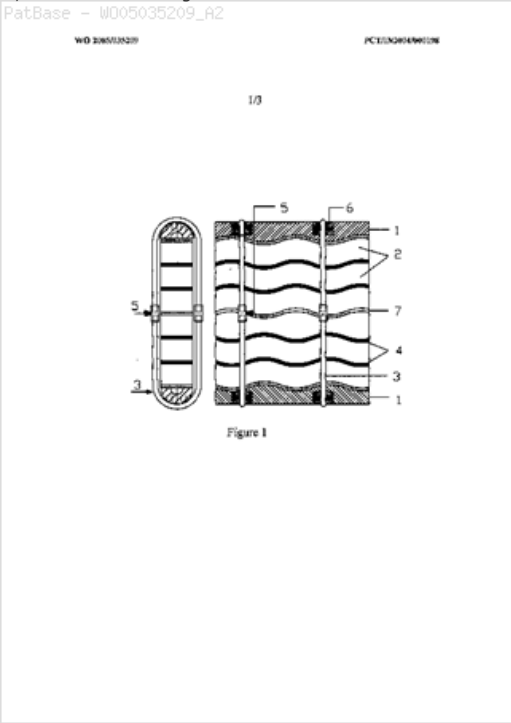
Classifications:

International (IPC 8-9): B27L7/00 B27M1/08 B27N3/04 B32B5/28 E04C2/24 E04C2/26 (Advanced/Invention); B27L7/00 B27M1/00 B27N3/04 B32B5/22 E04C2/10 E04C2/26 (Core/Invention); B27D (Subclass/Invention)

International (IPC 1-7): B27D B27L7/00 B32B5/28 E04C2/26 F16S

CPC: B27M1/08 B27N3/04 E04C2/246

European: B27M1/08 B27N3/04 E04C2/24C



Family:

Publication number	Publication date	Application number	Application date
IN00681MU2003 A	20070629	IN2003MU00681	20030703
IN218488 B	20080509	IN2003MU00681	20030703
WO05035209 A2	20050421	WO2004IN00198	20040705
WO05035209 A3	20050616	WO2004IN00198	20040705
WO05035209 B1	20050811	WO2004IN00198	20040705

Priority:

IN2003MU00681 20030703

Probable Assignee: DATYE KRISHNA RAM

Assignee(s): (std): DATYE KRISHNA RAM ; GORE VILAS NARAYAN

Assignee(s): V N GORE

Inventor(s): (std): DATYE KRISHNA RAM ; GORE VILAS NARAYAN

Inventor(s): V N GORE ; K R DATYE

Designated states: AE AG AL AM AT AU AZ BA BB BE BF BG BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GW HR HU ID IE IL IN IS IT JP KE KG KP KZ LC LK LR LS LT LU LV MA MC MD MG MK ML MN MR MW MX MZ NA NE NI NL NO NZ OM PG PH PL PT RO RU SC SD SE SG SI SK SL SN SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW

2) Family number: 1306578 (US3971177A)

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Title: Earth anchor work method and anchor device

Abstract: An earth anchor device in which a plurality of flanged load-resistant plate couplers are removably screwed at

predetermined intervals on a prestressing tendon (which usually may be cold drawn steel wire, or alloy steel wire or bar having high tensile strength, hereinafter referred to as "Tendon") forming the core portion of an earth anchor, a spring mechanism is closely annexed to the load-resistant surface of each of the flanged load-resistant plate couplers, and protective synthetic resin tubes each having an inner diameter slightly larger than the diameter of the Tendon are mounted over the peripheral portions of the Tendon which are exposed; and an earth anchor work method using such an anchor device. The anchor device is inserted into a bore drilled in the earth and embedded integrally with a charge of mortar forced into the bore, and after used, the Tendon of the anchor device is removable from the earth anchor device by being rotated about the axis thereof.

Classifications:

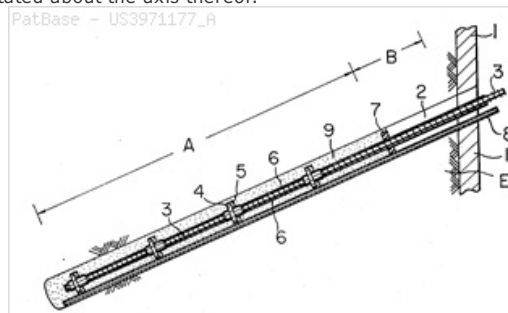
International (IPC 8-9): E02D5/76 E02D5/80 (Advanced/Invention);
E02D5/74 E02D5/80 (Core/Invention)

International (IPC 1-7): E02D5/54 E02D5/74 E02D5/76 E02D5/80

CPC: E02D5/76

European: E02D5/76

US: 405/259.5 52/166 52/698



Family:

Publication number	Publication date	Application number	Application date
DE2534341 A1	19760715	DE19752534341	19750801
DE2534341 B2	19780330	DE19752534341	19750801
DE2534341 C3	19790517	DE19752534341	19750801
FR2297288 A1	19760806	FR19750021190	19750704
FR2297288 B1	19800411	FR19750021190	19750704
GB1465030 A	19770216	GB19750030700	19750722
JP51079920 A2	19760712	JP19750004655	19750109
JP53004326 B4	19780216	JP19750004655	19750109
JP928238 C3	19781013	JP19750004655	19750109
US3971177 A	19760727	US19750588656	19750620

Priority:

JP19750004655 19750109

Probable Assignee: MITSUI CONSTR

Assignee(s): (std): KIMURA S ; KIMURA SHOICHI ; MITSUI CONSTR ; MITSUI CONSTRUCTION CO

Assignee(s): MITSUI CONSTRUCTION CO LTD ; MITSUI CONSTRUCTION CO LTD TOKIO ; MITSUI KENSETSU KK ; MITSUI CONSTR CO LTD

Inventor(s): (std): ENDO YUZO ; ENDO JUZO

Inventor(s): ENDO YUZO URAWA SAITAMA JAPAN

3) Family number: 50924134 (CN102400699A)

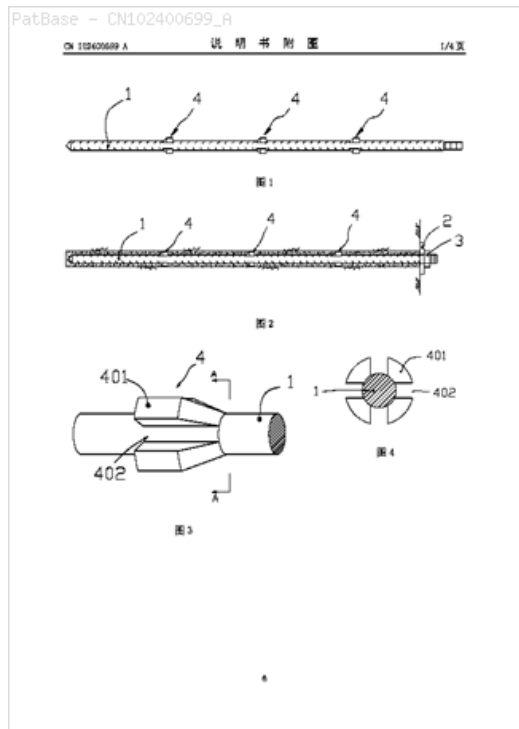
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Title: BAMBOO-JOINT TYPE HIGH-STRENGTH ANCHOR ROD

Abstract: The invention discloses a bamboo-joint type high-strength anchor rod, comprising a full-length anchoring type anchor rod body, a pallet and a nut, wherein the anchor rod body is provided with a plurality of antiskid anchor joints. The antiskid anchor joints can adopt multiple modes, for example, all the antiskid anchor joints are similar to conical bodies; the conical body is formed by 3-6 conical body subblocks which are evenly distributed on the circumference of the anchor rod body, and a gap is left between a pair of adjacent conical body subblocks; and all the conical body subblocks are welded or bonded on the anchor rod body. The bamboo-joint type high-strength anchor rod optimizes the stressed state thereof when being applied on site. The preliminary experiment proves that the use of the antiskid anchor joints not only increases the friction between the anchor rod and mortar, but also increases the friction between an anchoring agent and a rock body, so that the anchoring force of the anchor rod is greatly increased. In the bamboo-joint type high-strength anchor rod, the use is simple, and the reliability and the supporting effect can be obviously improved under the condition that the construction efficiency is not influenced and the cost is not increased a lot.

Classifications:

International (IPC 8-9): E02D5/74 E21D21/00 (Advanced/Invention)



Family:

Publication number	Publication date	Application number	Application date
CN102400699 A	20120404	CN201110367009	20111118
CN202338349 U	20120718	CN201120459029U	20111118

Priority:

CN201110367009 20111118 CN201120459029U 20111118

Probable Assignee: UNIV SHANDONG SCIENCE AND TECH

Assignee(s): (std): SHANDONG UNIV OF SCIENCE AND TECHNOLOGY ; UNIV SHANDONG SCIENCE AND TECH

Assignee(s): SHAN DONG UNIVERSITY OF SCIENCE AND TECHNOLOGY ; SHANDONG UNIVERSITY OF SCIENCE AND TECHNOLOGY

Inventor(s): (std): GANG WANG ; CHUNGUANG WANG ; XUEZHEN WU ; YUJING JIANG ; LIANJUN CHEN ; ZHIJIE WEN

Inventor(s): WANG GANG ; WANG CHUNGUANG ; CHEN LIANJUN ; WU XUEZHEN ; JIANG YUJING ; WEN ZHIJIE

4) Family number: 70603358 (ES2676910A)

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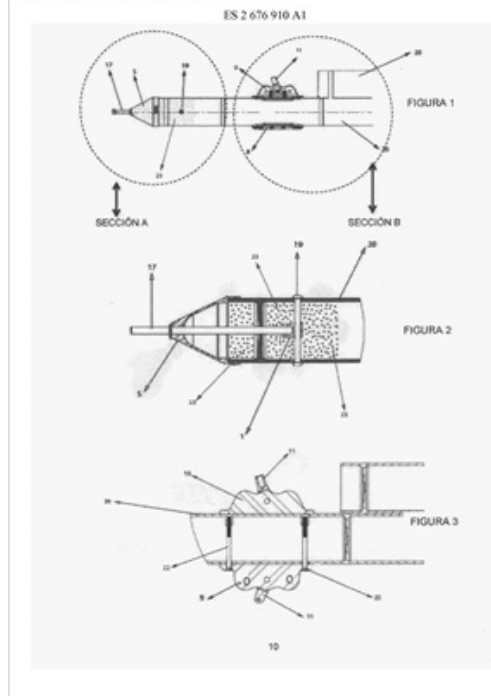
Title: SISTEMA DE UNION ATORNILLADO DE CANAS DE BAMBU Bamboo SCREWING CONNECTION SYSTEM (Machine translation)

Abstract: Source: ES2676910A [ES] Piezas de union de canas de bambu y procedimiento de montaje consistente en la union de diferentes piezas metalicas atornilladas sobre secciones macizadas de la cana y formando multiples combinaciones entre si, dotando a la invencion de una gran versatilidad para resolver cualquier geometria. Es un sistema novedoso que aporta las caracteristicas de resistencia, durabilidad y ligereza que no aportaban los sistemas tradicionales de union que se han practicado hasta el momento. **Machine translation:** Connecting pieces of bamboo and assembling method consisting of the union of different metal parts macizadas sections of the rod and screwed on forming multiple combinations with each other, giving the invention of great versatility to solve any geometry. It is a novel system which provides the characteristics of strength, durability and lightness not accounted for traditional systems that have been practiced so far.

Classifications:

International (IPC 8-9): E04B1/58 E04C2/16 E04C3/12
F16B7/04 (Advanced/Invention)

CPC: F16B7/044 E04B1/26 E04B1/2604 E04B1/2608 E04B1/58
E04B2001/266 E04B2001/2668 E04B2001/2692 E04C2/16 E04C2/18
E04C3/12 E04C3/125 E04C3/127

**Family:**

Publication number	Publication date	Application number	Application date
ES2676910 AA	20180726	ES20170000086	20170125

Priority:

ES20170000086 20170125

Probable Assignee:

GRAU SARABIA MARIA DOLORES

Assignee(s): (std):

GRAU SARABIA MARIA DOLORES

Assignee(s):

MARIA DOLORES GRAU SARABIA

Inventor(s): (std):

GRAU SARABIA MARIA DOLORES

Inventor(s):

MARIA DOLORES GRAU SARABIA

5) Family number: 32108974 (JP2005163441A)

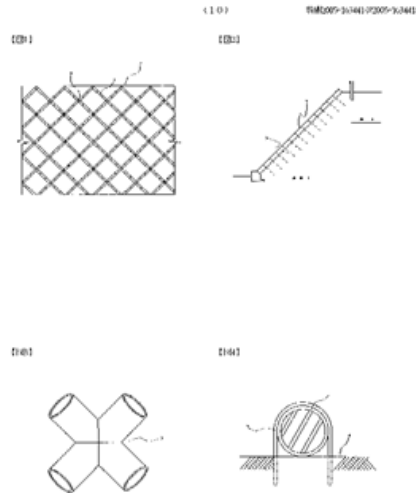
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Title: BAMBOO FOUNDATION MATERIAL, BAMBOO GRATING CRIB DEVICE, AND BAMBOO FENCE CONDUIT DEVICE

Abstract: PROBLEM TO BE SOLVED: To provide a bamboo foundation material which enables the use of a large amount of inexpensive bamboo material and which can sufficiently stand long-term use, and a grating crib device or a fence conduit device, which uses the bamboo foundation material. SOLUTION: Characteristically, the almost linear bamboo material with a large diameter is selected for a body part of the bamboo foundation material. The bamboo material is cut to a predetermined length, and formed like an almost cylindrical pipe by hollowing out a bamboo joint; high-fluidity mortar is infilled into a through hollow part and solidified; and the bamboo foundation material is formed as a foundation material for constructing a double-structure state wherein an outside is made of the bamboo material and wherein an inside is made of a rod-shaped concrete member.

Classifications:

International (IPC 8-9): E01F15/04 E01F7/02 E02B13/00 E02B5/02 E02D17/20 (Advanced/Invention);
E01F15/00 E01F7/02 (Advanced/Non-invention);
E01F15/02 E01F7/00 E02B13/00 E02B5/00 E02D17/20 (Core/Invention);
E01F15/00 E01F7/00 (Core/Non-invention)
International (IPC 1-7): E01F15/00 E01F7/02 E02B13/00 E02B5/02 E02D17/20

**Family:**

Publication number	Publication date	Application number	Application date
JP2005163441 A2	20050623	JP20030405680	20031204
JP4179979 B2	20081112	JP20030405680	20031204

Priority:

JP20030405680 20031204

Probable Assignee: IVIC KK**Assignee(s):** (std): IVIC KK**Inventor(s):** (std): IWAI KENKICHI ; KANAZAWA YUTAKA**6) Family number: 8413178** (US5473849A)

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Title: BUILDING WALL AND METHOD OF CONSTRUCTING SAME

Abstract: A simple, environmentally benign building for on-site erection and fabrication is made of monolithic, architectural, structural walls, beams, girders, joists and panels of relatively high physical strength which exhibit great durability and resistance to fire, wind and seismic damage and which have highly desirable acoustic and thermal transfer characteristics. The wall is constructed by casting a core of flowable fibrous, foam-cement mix between two, thin panels of manufactured, exterior-grade fiberglass reinforced cement board. Particles and proteins from the core mix penetrate, migrate into and fill interstitial spaces in the cement board, forming a strong, continuous and homogenous bond between the fill material and the board itself. This imparts additional strength to the cement board by filling the interstitial voids, creating a solid, homogeneous wall. The wall, girder, etc. structure is fabricated at the building site to form seamless, monolithic wall units according to the lost-form system of casting by erecting, assembling and appropriately connecting the fiber cement boards. An outer cement board is used as a permanent form creating one side of the building wall. The fiber-foam-cement core supplies structural strength, insulating properties and monolithic bonding of all components. An inner, cement board creates the interior side of the wall.

Classifications:**International (IPC 8-9):** B32B13/02 C04B28/02 E04B1/04

E04B2/86 (Advanced/Invention);

B32B13/00 C04B28/00 E04B2/86 (Core/Invention)

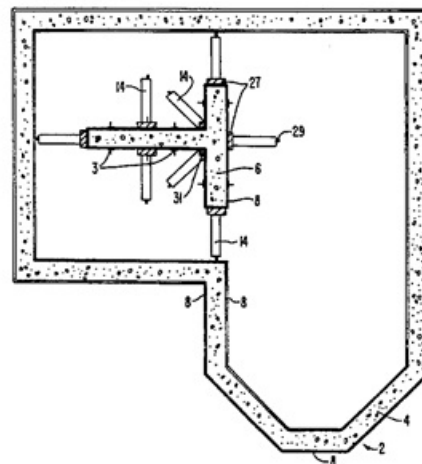
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E04H1/00

CPC: Y02W30/92 C04B28/02 C04B2111/00612 E04B2002/8688 B32B5/18

B32B13/045 B32B2266/08 B32B2307/304 B32B2307/558 B32B2413/00

B32B2607/00 B32B13/02 E04B2/8647

European: B32B13/02 C04B28/02 E04B2/86H M04B111/00T6 P04B2/86S**US:** 249/42 249/46 264/42 52/424 52/699 52/741.4

Family:

Publication number	Publication date	Application number	Application date
 AU199343941 A1	19931230	AU19930043941	19930527
 BRPI9302099 A	19931207	BR1993PI02099	19930528
 CA2136448 AA	19941122	CA19932136448	19930527
 CN1090362 A	19940803	CN19931008234	19930528
 EP0654108 A1	19950524	EP19930914189	19930527
 EP0654108 A4	19961023	EP19930914189	19930527
 IN182702 A	19990626	IN1993MA00369	19931103
 US5473849 A	19951212	US19930066675	19930524
 WO9324711 A1	19931209	WO1993US05032	19930527

Priority:

US19920890755 19920528 US19930066675 19930524 WO1993US05032 19930527

Probable Assignee: MATERIALS TECHNOLOGY LTD

Assignee(s): (std): FOUR CORNERS GROUP INC ; JONES ROGER H JR ; LICATA RICKY D ; MATERIALS TECHNOLOGY LTD

Assignee(s): MATERIALS TECHNOLOGY LIMITED

Inventor(s): (std): JONES ROGER H JR ; LICATA RICKY D ; JONES ROGER HAROLD ; JONES JR ROGER H

Inventor(s): ROGER H JONES JR ; RICKY D LICATA ; JR ROGER H JONES ; JONES ROGER H

Agent(s): FETHERSTONHAUGH AND CO

Designated states: AT AU BB BE BF BG BJ BR CA CF CG CH CI CM CZ DE DK ES FI FR GA GB GN GR HU IE IT JP KP KR LI LK LU MC MG ML MN MR MW NE NL NO NZ PL PT RO RU SD SE SK SN TD TG UA US VN

7) Family number: 32817708 (CN2761727Y)

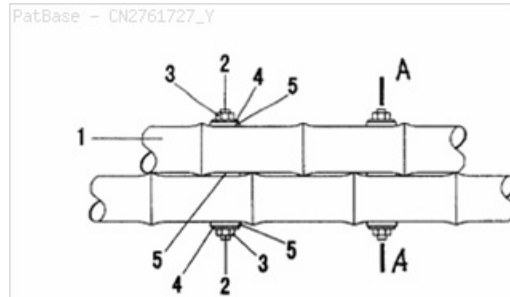
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Title: ORIGINAL BAMBOO STRUCTURE NODE USED FOR TAI FAMILY BAMBOO BUILDING

Abstract: The utility model relates to an original bamboo structure node used for Tai family bamboo buildings, which belongs to the technical field of building structures. An anchor rod is arranged in a raw bamboo cavity at a node site, and cement mortar is perfused to form nodes of butt joint, overlapping and the connection of the raw bamboo, a concrete column, or stones, the raw bamboos and a steel component. When shaft lines of each row bamboo at the sites of the butt joint are in the same plane, an anchor bolt and a screw cap are matched and fastened, a metal washer, a rubber gasket and a plastic sleeve pipe are matched and fastened and the row bamboos of the butt joint sites can be provided with a metal hoop. When the shaft lines of each row bamboo at the sites of the butt joint are not in the same plane, the anchor bolt, the screw cap and the washer are matched and fastened, and a pulling strip is arranged between two nodes. Connection nodes between the raw bamboos and the concrete column, and the stones or the steel component have the connection structures that one end of the anchor bolt is fixed on the concrete column, and the other end is directly inserted in the cavity of the row bamboos through a metal cup mouth which is used for supporting one end of the raw bamboos and is perfused by the cement mortar. The utility model has the advantages that water-resistant and insect prevention abilities are strong, cleavage crack resistant ability of the raw bamboos is raised, node materials can be cyclically used and the use of the metal cup mouth enables the reliability and durability of a column base to be raised.

Classifications:

International (IPC 8-9): E04B1/26 E04B1/58 (Advanced/Invention);
E04B1/26 E04B1/58 (Core/Invention)

**Family:**

Publication number	Publication date	Application number	Application date
 CN2761727 Y	20060301	CN200420104503U	20041012

Priority:

CN200420104503U 20041012

Probable Assignee: UNIV KUNMING TECHNOLOGY

Assignee(s): (std): KUNMING UNIV OF SCIENCE AND TECHNOLOGY ; KUNMING UNIV OF TECHNOLOGY ; UNIV KUNMING TECHNOLOGY

Inventor(s): (std): BAI WENFENG ; TANG LETIAN ; YANG YUMING ; YIN ZHONGWEN ; ZENG ZHIHAI

Inventor(s): ZHIHAI ZENG ; ZHONGWEN YIN ; YUMING YANG ; WENFENG BAI ; LETIAN TANG

8) Family number: 50508219 (CN202117176U)

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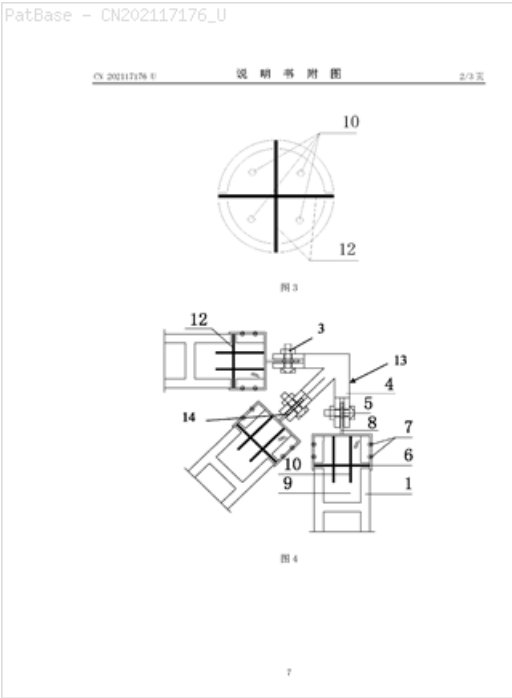
Title: Bamboo structured connecting joint

Abstract: The utility model discloses a bamboo structured connecting joint, which comprises a plurality of bamboo poles, a plurality of bamboo pole connectors, a plurality of bamboo pole connecting joints, a plurality of bolts and a plurality of nuts. Two

bamboo pole connectors are mounted at two ends of each bamboo pole respectively, and the bamboo poles with the bamboo pole connectors are mutually connected through the bamboo pole connecting joints, the bolts and the nuts. Each bamboo pole connector comprises a steel hoop, stirrups, a bamboo pole connecting end, a concrete filled core, a plurality of embedded steel bars, an end plate and a crossed reinforcing rib. The end of each bamboo pole is structurally reinforced by means of concrete and steel, material performances of bamboos, concrete and steel are fully used, and the bamboo structured connecting joint is convenient in construction, reliable in connection and high in safety.

Classifications:

International (IPC 8-9): E04B1/58 (Advanced/Invention)



Family:

Publication number	Publication date	Application number	Application date
 CN202117176 U	20120118	CN201120186335U	20110603

Priority:

CN201120186335U 20110603

Probable Assignee: UNIV CIVIL AVIAT CHINA

Assignee(s): (std): CIVIL AVIAT UNIVERSITY OF CHINA ; CIVIL AVIATION UNIV OF CHINA ; UNIV CIVIL AVIAT CHINA

Assignee(s): CIVIL AVIATION UNIVERSITY OF CHINA

Inventor(s): (std): BINQIANG LI ; GUOGUANG LIU ; YUAN LIU ; ZHIWEI WU

Inventor(s): LI BINQIANG ; LIU GUOGUANG ; LIU YUAN ; WU ZHIWEI

9) Family number: 44148030 (US2009313926A)

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Title: CONNECTION FOR SANDWICH PANEL AND FOUNDATION

Abstract: A joint connecting a sandwich panel to a foundation comprising, a sandwich panel having a core and two outer layers separated from one another by the core, an anchor in the foundation, a U-shape member having two side walls and a bottom wall extending between the sidewalls, the bottom wall defining an opening that is aligned with the anchor in the foundation and a securing member insertable through the opening in the bottom wall of the U-shape member and engaged to the anchor to secure the U-shape member to the anchor, wherein the U-shape member is connected to the outer layers of the sandwich panel by bonding material between the outer layers of the sandwich panel and the side walls of the U-shape member.

Classifications:

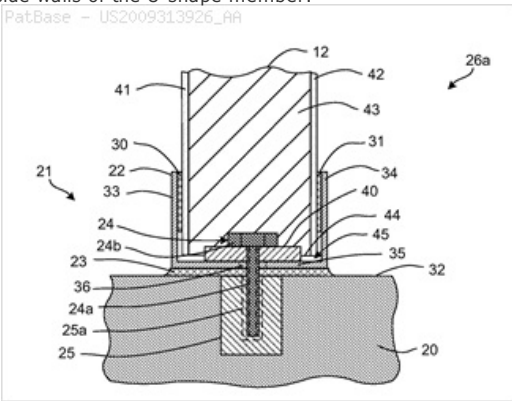
International (IPC 8-9): E04B1/00 E04B2/00 (Advanced/Invention);

E04B1/00 E04B2/00 (Core/Invention)

CPC: E04B1/0007 E04B1/14

European: E04B1/14 P04B1/00B

US: 52/274 52/745.09



Family:

Publication number	Publication date	Application number	Application date
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Priority:

US20080142865 20080620

Probable Assignee: INNOVIDA FACTORIES LTD
Assignee(s): (std): INNOVIDA FACTORIES LTD
Assignee(s): MILLPORT ASSOCIATES SA
Inventor(s): (std): SCHWARTAU ULRICH
Agent(s): RENNER OTTO BOISSELLE AND SKLAR LLP

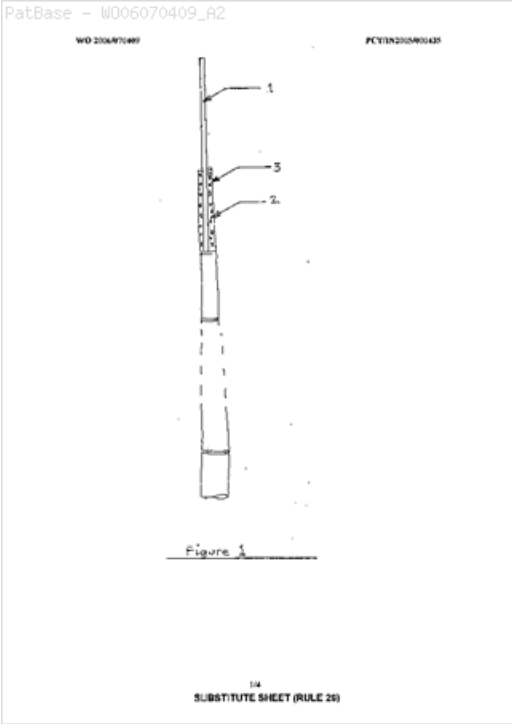
10) Family number: 33099833 (WO06070409A2) © PatBase

Title: AN IMPROVED POLYHOUSE

Abstract: The invention relates to a method and process for using bamboos in polyhouse construction. It relates to the use bamboos in building a polyhouse. The bamboo is being filled with volume-retaining material for support and strength. The invention thus makes the Polyhouse durable, easy to construct and cost effective.

Classifications:

International (ipc 8-9): E04C3/36 (Advanced/Invention);
E04C3/30 (Core/Invention)
International (ipc 1-7): B04B1/10 E04C3/12
CPC: E04C3/36
European: E04C3/36



Family:

Publication number	Publication date	Application number	Application date
CN101087922 A	20071212	CN200580044899	20051226
CN101087922 B	20110126	CN200580044899	20051226
IN01415MU2004 A	20060721	IN2004MU01415	20041227
IN220222 B	20080815	IN2004MU01415	20041227
WO06070409 A2	20060706	WO2005IN00435	20051226
WO06070409 A3	20060908	WO2005IN00435	20051226

Priority:

IN2004MU01415 20041227 WO2005IN00435 20051226

Probable Assignee: RAJESH EDKE

Assignee(s): (std): EDKE RAJESH ; RAJESH EDKE
Assignee(s): EDKE RAJESH RAM
Inventor(s): (std): EDKE RAJESH ; RAJESH EDKE
Inventor(s): EDKE RAJESH RAM

Designated states: AE AG AL AM AT AU AZ BA BB BE BF BG BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GW HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LC LK LR LS LT LU LV LY MA MC MD MG MK ML MN MR MW MX MZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RU SC SD SE SG SI SK SL SM SN SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW

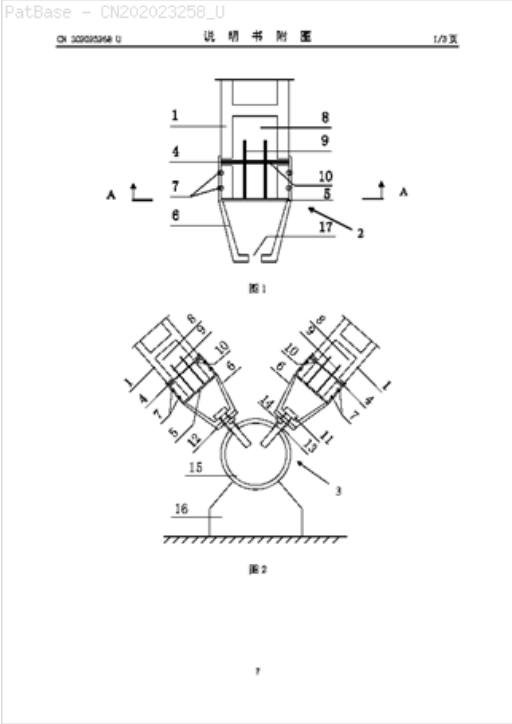
11) Family number: 49910378 (CN202023258U) © PatBase

Title: Bolt-sphere connecting node of bamboo structure

Abstract: The utility model relates to a bolt-sphere connecting node of a bamboo structure, which comprises a plurality of bamboo poles, a plurality of bamboo pole connecting pieces and a bolt-sphere node, wherein the two ends of the bamboo poles are respectively provided with the bamboo pole connecting pieces, and the bamboo pole connecting pieces are used for connecting the bamboo poles or the bamboo poles and a foundation through the bolt-sphere node. The bolt-sphere connecting node of the bamboo structure has the following advantages that: 1) the bending moment and shearing force of the connecting node of the bamboo structure can be released by a hinged method, and the conventional finite element software can be utilized to accurately establish a computational model for analysis; 2) the bamboo poles are used as main force-bearing components, and concrete and steel materials are utilized to strengthen the end parts of the bamboo poles, so that bamboo components fail in advance because the end parts are damaged, and thus the utilization rate of the materials is improved; 3) the construction is convenient, and the application range is wide; 4) the end parts of the bamboo components are filled with the concrete, and steel hoops and stirrups are arranged outside the bamboo components, so the reliability of the end parts of the components is enhanced; and 5) the environment is protected, and the economy is high.

Classifications:

International (IPC 8-9): E04B1/58 (Advanced/Invention)



Family:

Publication number	Publication date	Application number	Application date
 CN202023258 U	20111102	CN201120090040U	20110330

Priority:

CN201120090040U 20110330

Probable Assignee: UNIV CIVIL AVIAT CHINA

Assignee(s): (std): CIVIL AVIAT UNIVERSITY OF CHINA ; CIVIL AVIATION UNIV OF CHINA ; UNIV CIVIL AVIAT CHINA

Assignee(s): CIVIL AVIATION UNIVERSITY OF CHINA

Inventor(s): (std): BINQIANG LI ; GUOGUANG LIU ; ZHIKAI WU ; ZHIWEI WU

Inventor(s): LI BINQIANG ; LIU GUOGUANG ; WU ZHIKAI ; WU ZHIWEI