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[Continued on next page]

(54) Title: COMPOSITE OPEN/SPACED MATRIX COMPOSITE SUPPORT STRUCTURES AND METHODS OF MAKING AND USING THEREOF

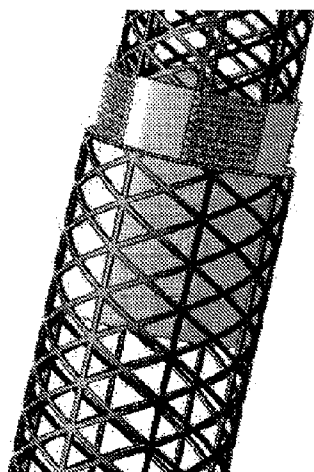


Fig 43: quick locking connector for high load applications connecting tower sections.

(57) Abstract: A lattice support structure or tower comprising one or more open matrix composite strut members connecting a series of interlocking connectors to create a ridged support platform for telecommunications, surveillance, renewable energy, lighting and energy transmission applications. Embodiments of the invention are telescoping for ease of transport and erection. The erection and deployment can be achieved through means of automatic deployment or manual.



MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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Published:

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— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))

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Previous Correction:

see Notice of 27 June 2013

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2012/038614

A. CLASSIFICATION OF SUBJECT MATTER

INV.	E04H12/02	E04H12/16	E04H12/18	E04H12/22	E04H12/34
	E04C3/00	E04C3/36	F03D11/04	F16B7/10	F16B7/18
	F16B7/20	H01Q1/12	B29C70/00	B29C70/56	H01L31/042

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)

E04H E04C F03D F16B H01Q B29C

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

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

EP0-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 02/10535 A2 (UNIV BRIGHAM YOUNG [US]; JENSEN DAVID W [US]; FRANCOM LARRY R [US]) 7 February 2002 (2002-02-07)	1-8, 11-13, 20-25, 28-30, 37,38,42
Y	page 3, lines 5-15 page 4, lines 7-20 page 12, lines 1-10 page 17, line 25 - page 18, line 22 page 34, line 20 - page 35, line 4 page 39, line 20 - page 41, line 13 figures 1,2,5,6,7,27,28a,38a, 47-50,55, 62-64, 77-79 ----- -/--	9,10, 14-19, 26,27, 31-36

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

☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

8 April 2013

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International application No

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 98/09042 A1 (SACAC SCHLEUDERBETONWERK AG [CH]; TERRASI GIOVANNI PIETRO [CH]; FELDER) 5 March 1998 (1998-03-05) page 1, paragraph 1 page 2, paragraph 2 page 3, paragraphs 3,4 page 4, paragraph 4 page 8, paragraphs 1,2 page 10, paragraph 1 page 12, paragraph 4; figures 4-7 -----	1-3,5-7, 11,20,23
X	US 2009/211173 A1 (WILLEY LAWRENCE DONALD [US] ET AL) 27 August 2009 (2009-08-27) -----	1-7, 11-13, 20-25, 28-30, 37,38, 41,42
Y	paragraphs [0007], [0008], [0009], [0032], [0033], [0037], [0038], [0041], [0042], [0043] figures 1,4,11,12,13 -----	8-10, 14-19, 26,27
Y	EP 0 009 451 A1 (PLASTIREMO [FR]) 2 April 1980 (1980-04-02) abstract; figures 1-13 -----	8-10,14, 15,18, 19,26, 27,31, 32,35,36
Y	DE 26 28 029 A1 (PIETZSCH LUDWIG) 29 December 1977 (1977-12-29) the whole document -----	8-10,14, 16,17, 26,27, 33,34

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2012/038614

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☒ Claims Nos.: 75, 76
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
see FURTHER INFORMATION sheet PCT/ISA/210
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

see additional sheet(s)

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-38, 41, 42

A lattice composite matrix support structure comprising a plurality of struts formed by a plurality of fiber/polymer members which are interweaved and set in a stabilized position and methods of manufacturing thereof.

2. claims: 39, 40

An expandable tool for producing a lattice composite matrix support structure.

3. claims: 43-74

A two-dimensional support structure.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.2

Claims Nos.: 75, 76

Claims 75 and 76 do have as subject-matter "lattice structures and methods of claims 1-74", which renders their subject-matter completely unclear, not only with regard to the lack of unity of invention objection, but also with regard to the objections given as a whole in section VIII of the present written opinion.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guidelines C-IV, 7.2), should the problems which led to the Article 17(2) declaration be overcome.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2012/038614

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 0210535	A2	07-02-2002	AT 546347 T AU 8300501 A BR 0112814 A CA 2416833 A1 CN 1464934 A EP 1358392 A2 IL 154130 A JP 2004520539 A MX PA03000732 A US 2005115186 A1 WO 0210535 A2	15-03-2012 13-02-2002 21-02-2006 07-02-2002 31-12-2003 05-11-2003 24-12-2009 08-07-2004 14-07-2003 02-06-2005 07-02-2002
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