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(54) Title: SCAFFOLD ROSETTE

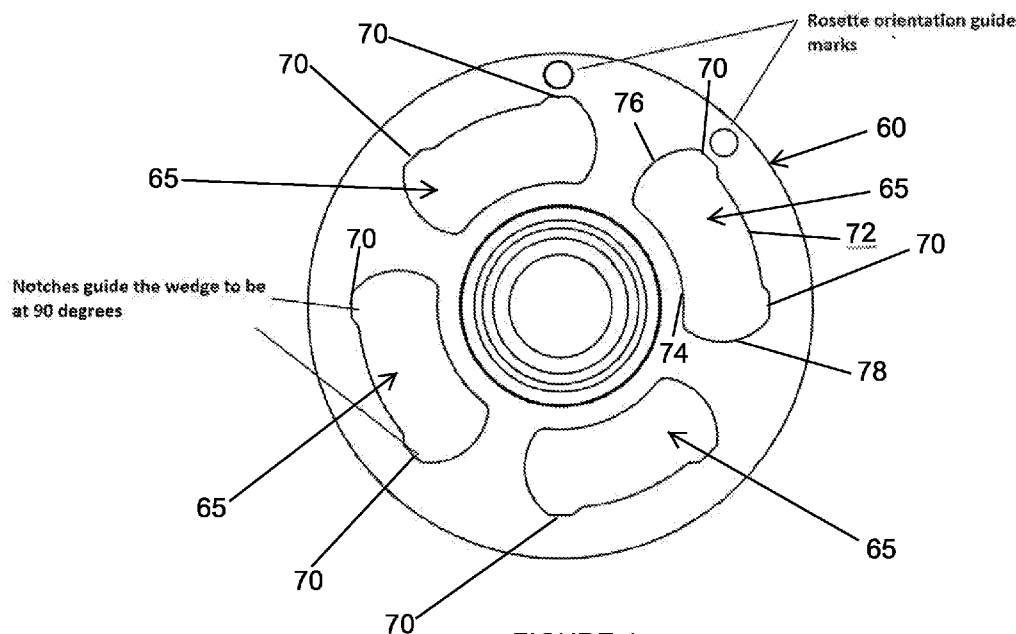


FIGURE 4

(57) Abstract: Disclosed are a scaffold rosette (60), a scaffold system and a method thereof. The scaffold rosette (60) includes a plurality of holes (65) of similar size and shape that extend axially through the scaffold rosette (60). Each of the plurality of holes (65) includes a first wedge alignment notch (70) and a second wedge alignment notch (70) spaced apart circumferentially from the first wedge alignment notch (70). The scaffold system comprises the scaffold rosette (60). The method comprises the steps of providing the scaffold rosette (60), locating a first ledger in a first hole (65) of the scaffold rosette (60) and locating a second ledger in a second hole (65) of the scaffold rosette (60).



EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV,
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,
KM, ML, MR, NE, SN, TD, TG).

Published:

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SCAFFOLD ROSETTE

CROSS REFERENCE TO RELATED APPLICATIONS

5 This application claims priority to and the benefit of Canadian Patent Application Number 3,039,447, filed 5 April 2019, the disclosure of which is now expressly incorporated herein by reference.

FIELD OF THE DISCLOSURE

10 The present application is directed to scaffolding systems and, in particular, to the use of scaffold posts that include ring lock style connections.

BACKGROUND

15 Layher GmbH launched the world's first ring lock style system in the mid-1970s. Since then, it has remained largely unchanged. Figure 1 (prior art) shows the layout of the Layher ring lock used today.

Erectors like the hole layout in the ring. The small holes allow up to 4 ledgers to be connected to the rosette at automatically orientated at 90 degrees from each other. This is achieved by the shape of the small holes which guide the wedge in the correct orientation. The large holes in the rosettes allow up to four braces or additional ledgers to be added at angles of 45 degrees from the adjacent ledgers. These larger holes also allow ledgers to be attached at angles other than 90 or 45 degrees. This can be handy when building a scaffold against the sidewalls of a round tank.

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The rosette 10 of Figure 1 is based upon the concept of the original Layher-designed rosette. It has the characteristic 4 small holes with larger holes 22 between them.

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The proliferation of the above rosette design has placed certain limits on the adaptability of all the products that use the same rosette hole layout. Figure 2 (prior art), shows the rosette used in the newly launched Monzon NO-LIMIT[®] scaffold system. It can be seen that the ledgers 30 connected to the large holes have a range of +/- 15 degrees from the 45 degree orientation. This limitation in adaptability causes erectors to have to use tube and fittings or try some other way to get the scaffold system to fit the application.

Other ring formats have also been used, though these are rare. One such system is the ALUMA SURE-LOCK[®] product. The rosette 40 is shown in Figure 3. The 8 large holes allow ledgers to be fitted at angles other than 90 and 45 degrees, but the spoke provide an annoying obstruction.

There remains a need to provide a system with increased flexibility in set up to respond to different non-linear application (for example, curved applications).

SUMMARY

A scaffolding system of the present disclosure has upright members connected to adjacent upright members by releasable ledgers that engage rosettes at spaced intervals on the upright member. The rosettes, on at least some of the upright members, each have 4 securement ports through the rosette. Each securement port of the rosette is elongate having opposed end positions orientated to locate a ledger head with these end positions being 45 degrees apart. Each securement port allows for ledger locating at a host of positions between the end positions. The securement ports are of similar size and adjacent ports are separated by one of 4 support spokes located between said ports.

A scaffolding rosette, according to the present disclosure, is of a general circular configuration with 4 elongate ledger connection ports of equal size distributed about the rosette and separated from adjacent ledger ports by support spokes

In some embodiments, the ports occupy in excess of 70 percent of a circular part of the rosette. In this way, the spokes are less than 30 percent of the circular part of the rosette.

5 According to an aspect of the present disclosure, a scaffold system comprises a scaffold rosette. The scaffold rosette extends circumferentially around a longitudinal axis and is adapted to support ledgers thereon. The scaffold rosette includes a plurality of holes of similar size and shape that extend axially through the scaffold rosette. Each of the plurality of holes extends circumferentially
10 partway about the longitudinal axis between a first circumferential edge and a second circumferential edge thereof.

In some embodiments, each of the plurality of holes includes a first wedge alignment notch and a second wedge alignment notch spaced apart
15 circumferentially from the first wedge alignment notch. The first wedge alignment notch and the second wedge alignment notch extend radially outward away from the corresponding hole.

In some embodiments, the first wedge alignment notch of a first hole included
20 in the plurality of holes is spaced apart from the second wedge alignment notch of the first hole by 45 degrees.

In some embodiments, the first hole includes an arcuate outer edge that extends between and directly interconnects the first wedge alignment notch and the
25 second wedge alignment notch.

In some embodiments, each of the plurality of holes extends between about 60 degrees and about 65 degrees circumferentially relative to the longitudinal axis between the first circumferential edge and the second circumferential edge
30 thereof.

In some embodiments, the scaffold system further includes a first rosette orientation mark located radially outward of and circumferentially aligned with the second wedge alignment notch of the first hole and a second rosette orientation mark located radially outward of and circumferentially aligned with a first wedge alignment notch of a second hole located adjacent to the first hole so that the first rosette orientation mark is spaced apart circumferentially from the second rosette orientation mark by 45 degrees.

In some embodiments, the plurality of holes includes only four holes and the four holes are spaced apart circumferentially equidistant by 90 degrees.

In some embodiments, the wedge alignment notches are each spaced apart circumferentially equidistant by 45 degrees.

In some embodiments, the scaffold system further comprises a first ledger located in a first hole included in the plurality of holes and a second ledger located in a second hole included in the plurality of holes.

In some embodiments, the first ledger is received in a first wedge alignment notch of the first hole and the second ledger is spaced apart circumferentially from a wedge alignment notch of the second hole.

According to an aspect of the disclosure, a method includes a number of steps. The method includes providing a scaffold rosette that extends circumferentially around a longitudinal axis, the scaffold rosette including a plurality of holes that extend axially through the scaffold rosette, each of the plurality of holes extends circumferentially partway about the longitudinal axis between a first circumferential edge and a second circumferential edge thereof, wherein each of the plurality of holes includes a first wedge alignment notch and a second wedge alignment notch spaced apart circumferentially from the

first wedge alignment notch, the first wedge alignment notch and the second wedge alignment notch extend radially outward away from the corresponding hole, locating a first ledger in a first hole included in the plurality of holes, and locating a second ledger in a second hole included in the plurality of holes.

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In some embodiments, the first hole and the second hole are spaced apart circumferentially by 90 degrees and locating the first ledger in the first hole includes locating the first ledger in the second wedge alignment notch of the first hole and locating the second ledger in the second hole includes locating the second ledger spaced apart circumferentially from the first wedge alignment notch and the second wedge alignment notch of the second hole so that the second ledger is spaced apart circumferentially from the first ledger by between 45 degrees and 90 degrees.

15 In some embodiments, the first hole and the second hole are spaced apart circumferentially by 90 degrees and locating the first ledger in the first hole includes locating the first ledger in the first wedge alignment notch of the first hole and locating the second ledger in the second hole includes locating the second ledger spaced apart circumferentially from the first wedge alignment notch and the second wedge alignment notch of the second hole so that the second ledger is spaced apart circumferentially from the first ledger by between 90 degrees and 135 degrees.

20 In some embodiments, the first hole and the second hole are spaced apart circumferentially by 90 degrees and locating the first ledger in the first hole includes locating the first ledger in the second wedge alignment notch of the first hole and locating the second ledger in the second hole includes locating the second ledger in the first wedge alignment notch of the second hole so that the second ledger is spaced apart circumferentially from the first ledger by 45 degrees.

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BRIEF DESCRIPTION OF THE DRAWINGS

Preferred embodiments of the disclosure are shown in the drawings, wherein:

Figure 1 shows a prior art rosette;

Figure 2 shows another embodiment of a prior art rosette;

5 Figure 3 shows another embodiment of a prior art rosette;

Figure 4 is a top view of the rosette of the present disclosure;

Figure 5 is a top view of the rosette of Figure 4 with a first connection to ledgers;

Figure 6 is a top view of the rosette of Figure 4 with a second connection to ledgers;

10 Figure 7 is a top view of the rosette of Figure 4 with a third connection to ledgers;

Figure 8 is a top view showing prior art scaffolding used around circular or curved structures;

Figure 9 is a top view showing prior art scaffolding used around circular or curved structures;

15 Figure 10 is a top view of another prior art rosette; and

Figure 11 is a top view of the rosette of the present disclosure used to receive 4 ledgers in a perpendicular configuration and 4 associated brace members.

DETAILED DESCRIPTION OF THE DISCLOSURE

20 It can be seen in Figure 4 that the proposed rosette 60 is obviously different from the majority of other ring lock style systems. The most obvious difference is that there are only 4 holes 65. The less apparent attributes of this new rosette 60 design bring the major advantages of this improved ring lock. The rosette 60 is used on scaffold posts commonly referred to as scaffold standards.

25 Each hole 65 extends circumferentially partway about a longitudinal axis 60 of the rosette 60. Each hole 65 is spaced apart from adjacent holes 65 such that the holes 65 are located at 45 degree intervals relative to the longitudinal axis 60. Each hole 65 extends circumferentially between about 60 and 65 degrees

relative to the longitudinal axis 60. In the illustrative embodiment, each hole 65 extends circumferentially about 63 degrees relative to the longitudinal axis 60.

Each hole 65 has an arcuate outer edge 72 and an arcuate inner edge 74 spaced apart radially inward from the arcuate outer edge as shown in Figure 4. The arcuate inner edge 74 has a constant radius in the illustrative embodiment. Each hole 65 further includes an arcuate first circumferential edge 66 that extends between and interconnects directly the arcuate outer edge 72 and the arcuate inner edge 74. Each hole 65 further includes an arcuate second circumferential edge 78 that extends between and interconnects directly the arcuate outer edge 72 and the arcuate inner edge 74. The second circumferential edge 78 is spaced apart circumferentially relative to the first circumferential edge 76.

At the ends of each of the four (4) holes are wedge alignment notches 70. This allows ledgers or braces to be easily connected to the rosette at 90 degree or 45 degree orientation relative to each other. Each wedge alignment notch 70 extends radially outward away from the respective hole 65 relative to the longitudinal axis 62. Each wedge alignment notch 70 is directly connected to one of the first circumferential edge and the second circumferential edge of the respective hole 65. A first wedge alignment notch 70 of a given hole 65 is spaced apart circumferentially from a second wedge alignment notch 70 of the given hole 65.

The larger holes 65 allow for variable intermediate ledger angles to be achieved much more easily than the holes of the prior art style rosettes. In the illustrative embodiment, the rosette 60 includes only four holes 65 and each hole 65 includes two wedge alignment notches 70.

In order for infinite orientation angles of the ledgers to be achieved, the standards can be rotated (about the longitudinal axis 62 of the rosette 60 and

corresponding post) in increments of 45 degrees, while maintaining the alignment notches at the 90 degree positions. The 45 degree rotation changes to position of the spokes while maintaining 90 degree connection. This type of rotation is not possible with the prior art style rosette or does not provide the same advantages. Figures 5 and 6 show the difference between two orientations of the new rosette 60.

The rosette 60 further includes rosette orientation marks 100 and 102 as shown in Figure 5. The rosette orientation mark 100 is located radially outward and circumferentially aligned with a wedge alignment notch 70 of a first hole 65. The rosette orientation mark 102 is located radially outward and circumferentially aligned with a second wedge alignment notch 70 of a second hole 65 that is adjacent the first hole 65 so that the rosette orientation marks 100 and 102 are spaced apart circumferentially from each other by at or about 45 degrees. The rosette orientation marks 100 and 102 are circular in the illustrative embodiment. The rosette orientation marks 100, 102 are surface markings in some embodiments. In some embodiments, rosette orientation marks 100, 102 are holes that extend through the rosette 60.

With the rosette orientation marks 100 and 102 sitting at about the 12 and 2 o'clock positions, as shown in Figure 5, ledger C can be located at an infinite number of angles ranging between 45 degrees and 90 degrees relative to Ledger B. Note that ledgers A and B are both located in alignment notches 70 and are therefore at 90 degrees relative to each other. The ledgers A, B, C may be located at an infinite number of locations circumferentially between the alignment notches 70 of a given hole 65 in some embodiments. As shown in Figure 5, ledger A is located at 180 (180) degrees, ledger B is located at 90 degrees, and ledger C is located at 45 degrees. As such, ledger C is 45 degrees apart from ledger B.

When the standard is rotated so that the rosette orientation marks 100 and 102 are sitting at about the 2 and 3 o'clock positions, as shown in Figure 6, ledger C can be located at angles ranging from 90 degrees to 135 degrees relative to Ledger B. That is, ledger C may be located at an infinite number of angles between 90 degrees and 135 degrees relative to Ledger B. Note that ledgers A and B are still both located in alignment notches 70 and are therefore at 90 degrees relative to each other.

With the rosette orientation marks sitting once again at the 12 and 2 o'clock positions, as shown in Figure 7, ledger C can be located at angles ranging between 135 degrees and 180 degrees relative to Ledger B. Note that ledgers A and B are both located in alignment notches 70 and are therefore at 90 degrees relative to each other. Ledger C is located in an alignment notch 70 at 135 degrees and 180 degrees and is not located in an alignment notch 70 if between angles of 135 degrees and 180 degrees.

In the industrial construction and maintenance markets, there are refineries that have a large number of circular structures such as tanks, cat-crackers etc. The standard ways of building scaffolds is to use a combination of rectangular and trapezoidal bays (Type A Scaffolds is shown in Figure 8), or all trapezoidal bays (Type B scaffolds shown in Figure 9).

Building circular scaffolds using these two scaffold configurations is made much simpler if using the system having the new rosette 60. Any combination of angles and ledger lengths can be used to achieve the correct radius of the scaffold.

If the standards of the prior art systems (see Figure 10) are rotated by 45 degrees in a similar way to the new rosette 60 described previously, the erectors can no longer easily achieve 90 connections. In addition the other ledgers or braces

can only be fitted at 45 degrees or 90 degrees +/- 15 degrees. This is severely restricted compared to the rosette 60 of the present disclosure.

5 The rosette 60, as shown in Figure 11, can also engage ledgers in a standard 8 way connection.

10 The new rosette 60 and the use thereof on scaffold posts, standards and frames represents a major design improvement. The increased versatility that comes with the new design simplifies installation for non-linear application while remaining compatible with existing systems. This flexibility together with its compatibility with existing ring lock type systems is particularly advantageous.

15 Although various preferred embodiments of the present disclosure have been described herein in detail, it will be appreciated by those skilled in the art that variations may be made thereto without departing from the scope of the appended claims.

What is claimed is:

1. In a scaffold system with upright members connected to adjacent upright members by releasable ledgers that engage rosettes at spaced intervals on the upright member,

characterized in that the rosettes on at least some of the upright members, each having 4 securing ports through the rosette;

each port of the rosette is elongate and has opposed end positions orientated to locate a ledger head with these end positions being 45 degrees apart; and

wherein the port allows for ledger locating at a host of positions between the positions; and

wherein said ports are of similar size and adjacent ports are separated by one of 4 support spokes located between said ports.

2. A scaffold rosette of a general circular configuration with 4 elongate ledger connection ports of equal size distributed about the rosette and separated from adjacent ledger ports by support spokes.

3. A scaffold system comprising:

a scaffold rosette (60) that extends circumferentially around a longitudinal axis (62) and adapted to support ledgers thereon, the scaffold rosette (60) including a plurality of holes (65) of similar size and shape that extend axially through the scaffold rosette (60), each of the plurality of holes (65) extends circumferentially partway about the longitudinal axis (62) between a first circumferential edge (76) and a second circumferential edge (78) thereof,

wherein each of the plurality of holes (65) includes a first wedge alignment notch (70) and a second wedge alignment notch (70) spaced apart circumferentially from the first wedge alignment notch (70), the first wedge

alignment notch (70) and the second wedge alignment notch (70) extend radially outward away from the corresponding hole (65).

4. The scaffold system of claim 3, wherein the first wedge alignment notch (70) of a first hole (65) included in the plurality of holes (65) is spaced apart from the second wedge alignment notch (70) of the first hole (65) by 45 degrees.

5. The scaffold system of claim 4, wherein the first hole (65) includes an arcuate outer edge (72) that extends between and directly interconnects the first wedge alignment notch (70) and the second wedge alignment notch (70).

6. The scaffold system of any of claims 3 through 5, wherein each of the plurality of holes (65) extends between about 60 degrees and about 65 degrees circumferentially relative to the longitudinal axis between the first circumferential edge and the second circumferential edge thereof.

7. The scaffold system of any of claims 3 through 6, further comprising a first rosette orientation mark (100) located radially outward of and circumferentially aligned with the second wedge alignment notch (70) of the first hole (65) and a second rosette orientation mark (102) located radially outward of and circumferentially aligned with a first wedge alignment notch (70) of a second hole (65) located adjacent to the first hole (65) so that the first rosette orientation mark (100) is spaced apart circumferentially from the second rosette orientation mark (102) by 45 degrees.

8. The scaffold system of any of claims 3 through 7, wherein the plurality of holes (65) includes only four holes (65) and the four holes are spaced apart circumferentially equidistant by 90 degrees.

9. The scaffold system of any of claims 3 through 8, wherein the wedge alignment notches (70) are each spaced apart circumferentially equidistant by 45 degrees.

10. The scaffold system of any of claims 3 through 9, further comprising a first ledger located in a first hole (65) included in the plurality of holes (65) and a second ledger located in a second hole (65) included in the plurality of holes (65).

11. The scaffold system of claim 10, wherein the first ledger is received in a first wedge alignment notch (70) of the first hole (65) and the second ledger is spaced apart circumferentially from a wedge alignment notch (70) of the second hole (65).

12. A method comprising:

providing a scaffold rosette (60) that extends circumferentially around a longitudinal axis (62), the scaffold rosette (60) including a plurality of holes (65) that extend axially through the scaffold rosette (60), each of the plurality of holes (65) extends circumferentially partway about the longitudinal axis (62) between a first circumferential edge (76) and a second circumferential edge (78) thereof, wherein each of the plurality of holes (65) includes a first wedge alignment notch (70) and a second wedge alignment notch (70) spaced apart circumferentially from the first wedge alignment notch (70), the first wedge alignment notch (70) and the second wedge alignment notch (70) extend radially outward away from the corresponding hole (65),

locating a first ledger in a first hole (65) included in the plurality of holes (65),
and

locating a second ledger in a second hole (65) included in the plurality of holes (65).

13. The method of claim 12, wherein the first hole (65) and the second hole (65) are spaced apart circumferentially by 90 degrees and locating the first ledger in the first hole (65) includes locating the first ledger in the second wedge alignment notch (70) of the first hole (65) and locating the second ledger in the second hole (65) includes locating the second ledger spaced apart circumferentially from the first wedge alignment notch (70) and the second wedge alignment notch (70) of the second hole (65) so that the second ledger is spaced apart circumferentially from the first ledger by between 45 degrees and 90 degrees.

14. The method of claim 12, wherein the first hole (65) and the second hole (65) are spaced apart circumferentially by 90 degrees and locating the first ledger in the first hole (65) includes locating the first ledger in the first wedge alignment notch (70) of the first hole (65) and locating the second ledger in the second hole (65) includes locating the second ledger spaced apart circumferentially from the first wedge alignment notch (70) and the second wedge alignment notch (70) of the second hole (65) so that the second ledger is spaced apart circumferentially from the first ledger by between 90 degrees and 135 degrees.

15. The method of claim 12, wherein the first hole (65) and the second hole (65) are spaced apart circumferentially by 90 degrees and locating the first ledger in the first hole (65) includes locating the first ledger in the second wedge alignment notch (70) of the first hole (65) and locating the second ledger in the second hole (65) includes locating the second ledger in the first wedge alignment notch (70) of the second hole (65) so that the second ledger is spaced apart circumferentially from the first ledger by 45 degrees.

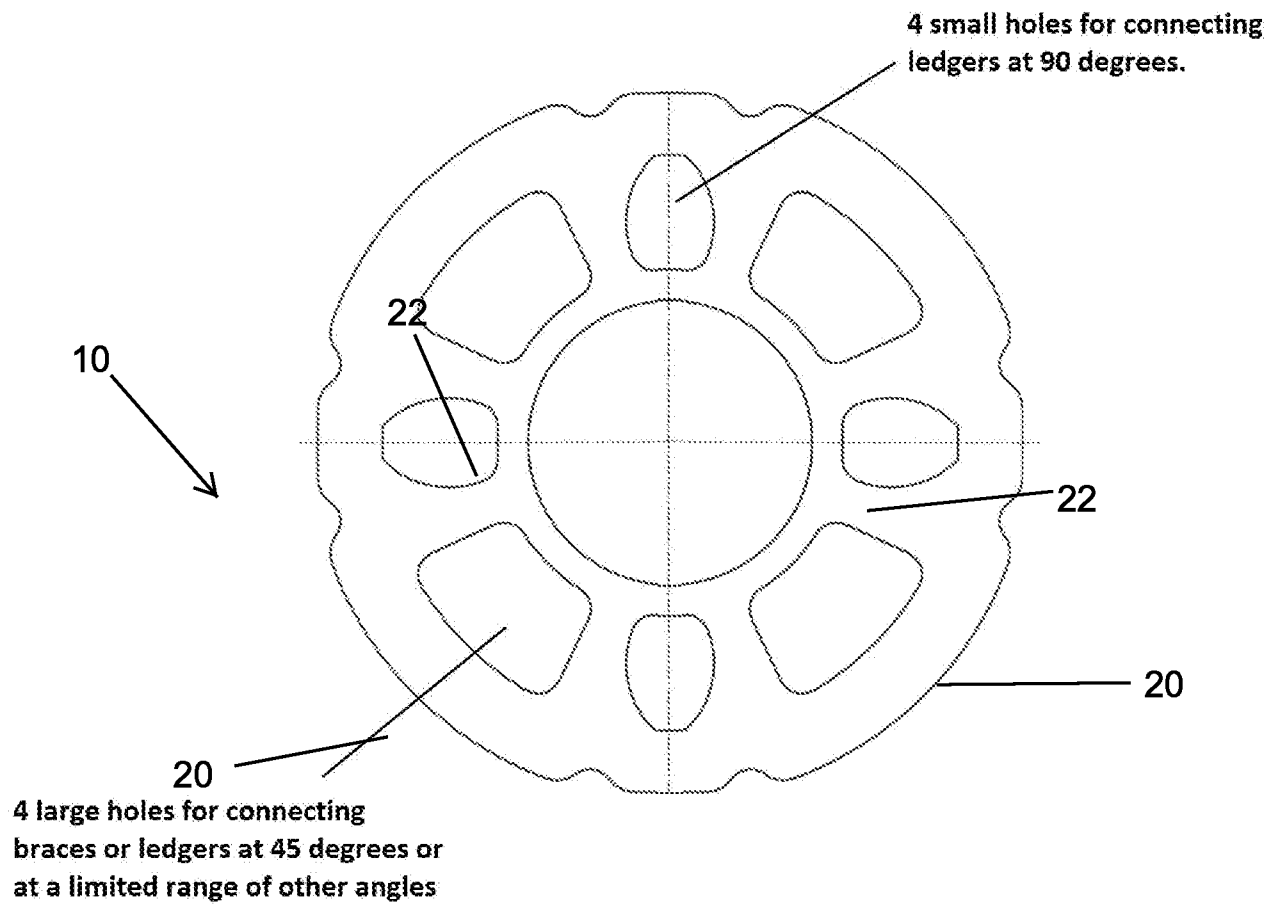


FIGURE 1 (PRIOR ART)

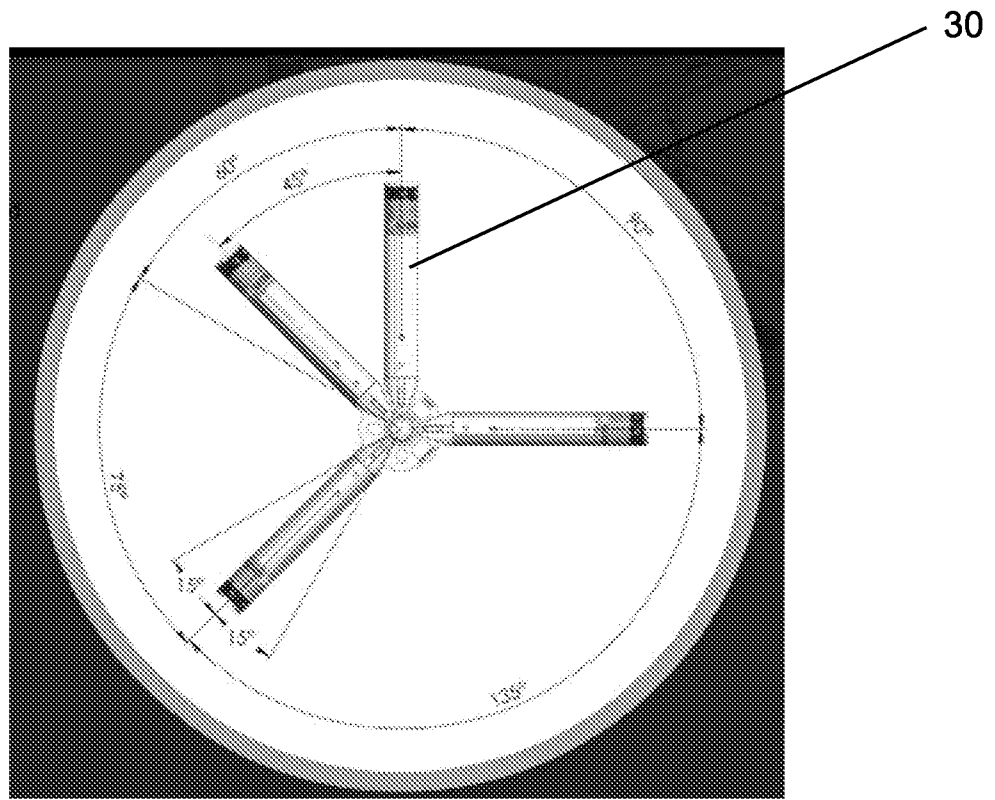


FIGURE 2 (PRIOR ART)

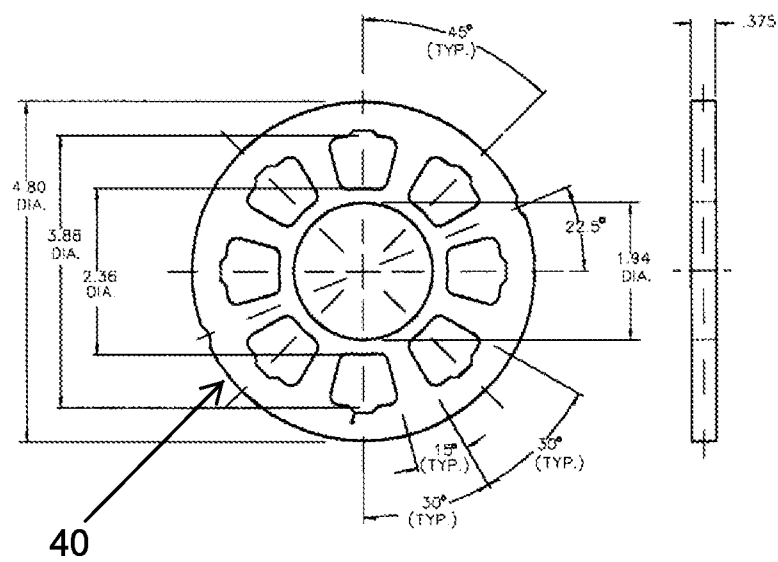


FIGURE 3 (PRIOR ART)

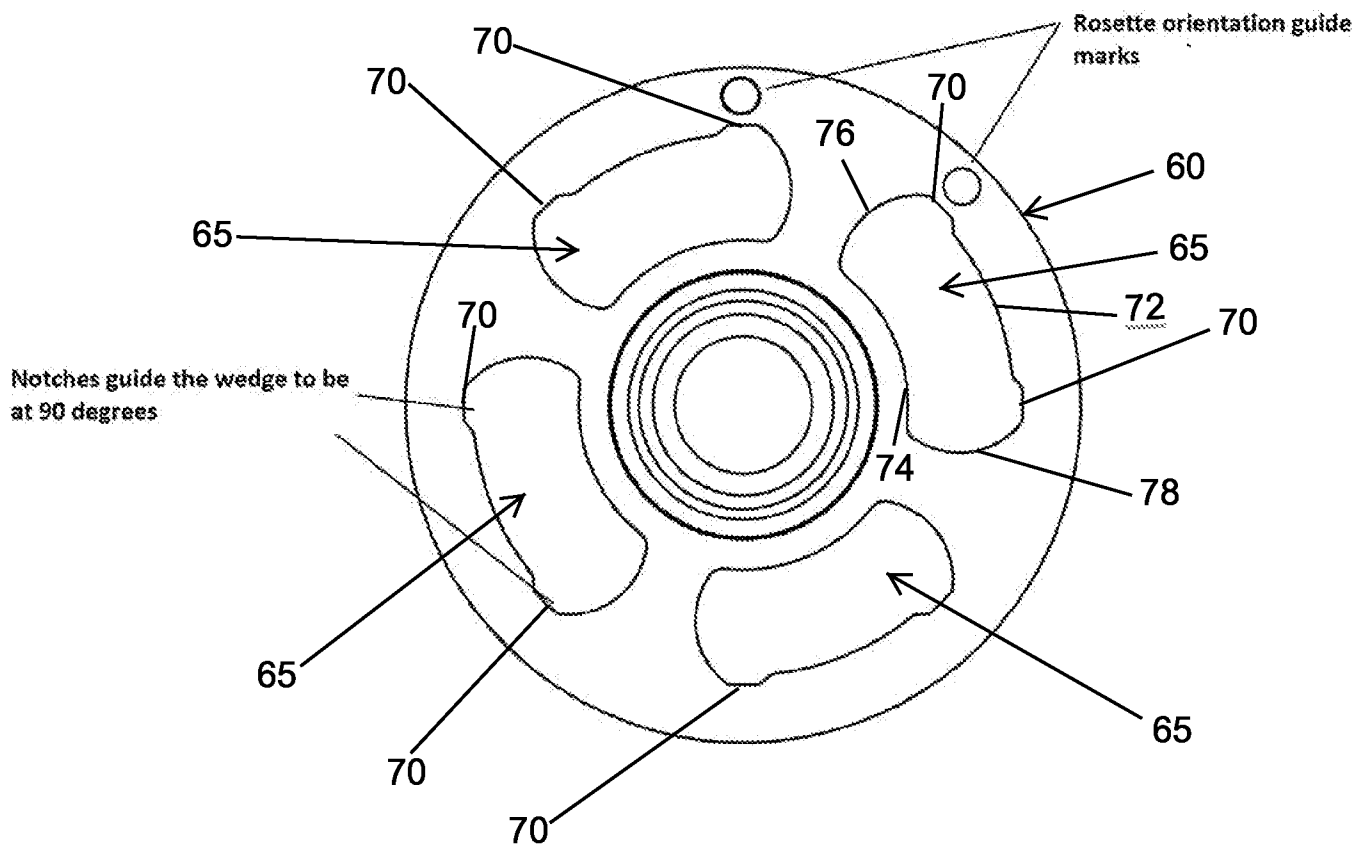


FIGURE 4

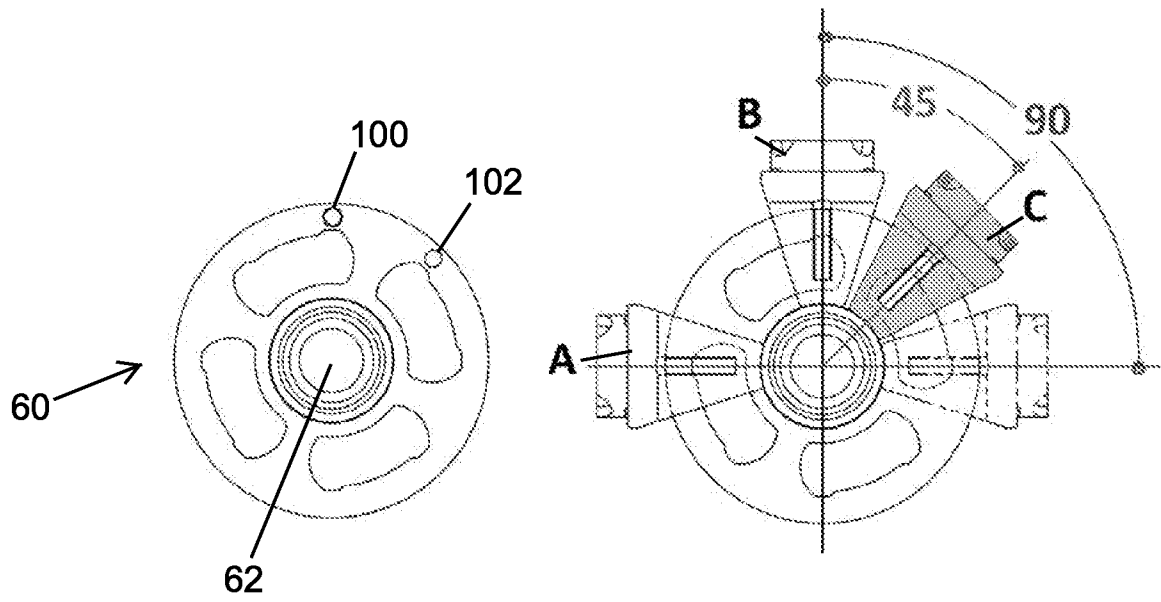


FIGURE 5

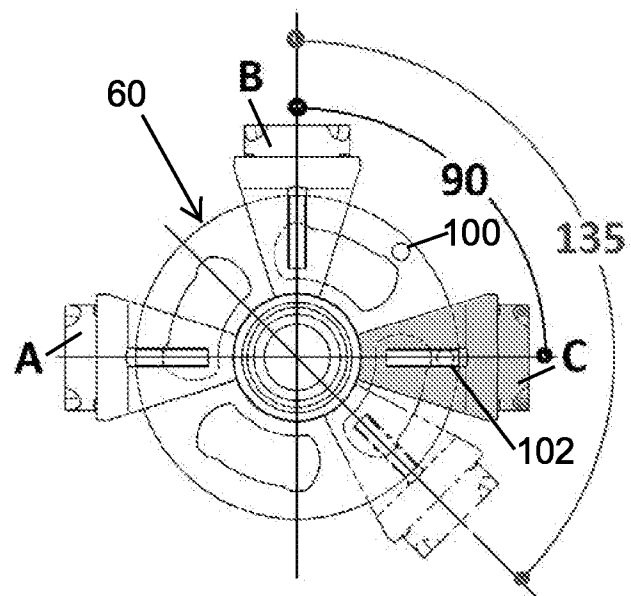


FIGURE 6

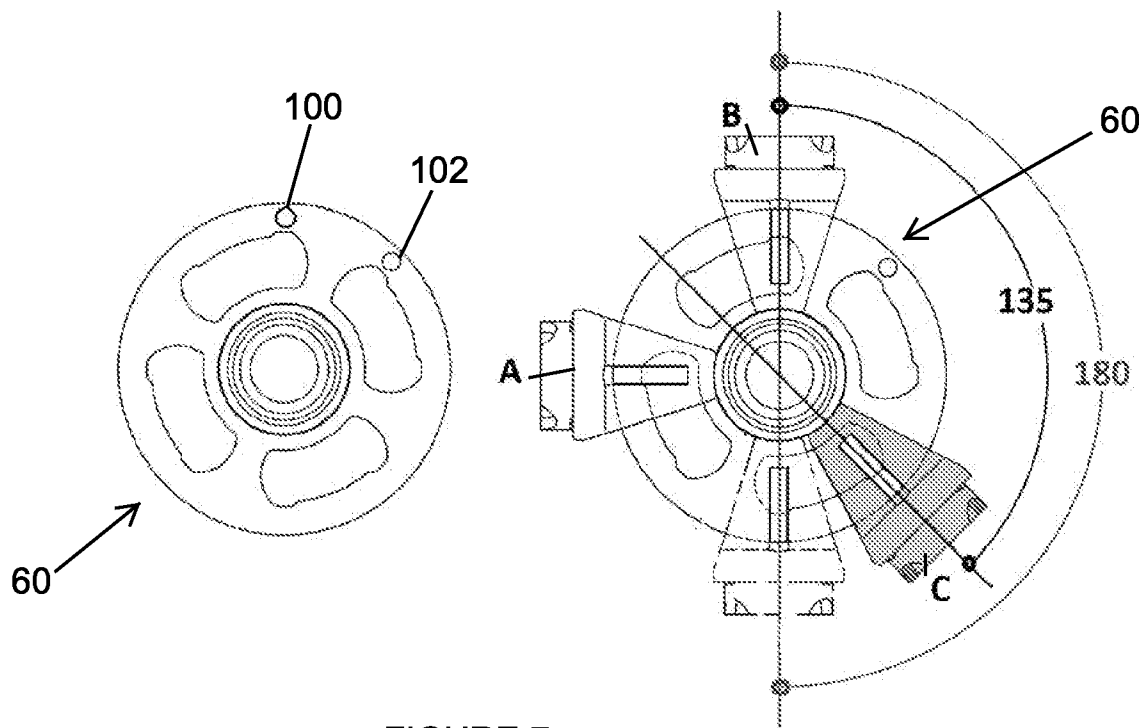


FIGURE 7

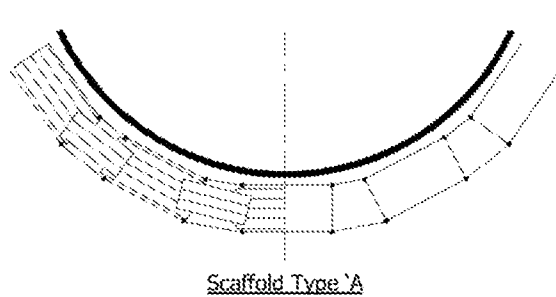


FIGURE 8 (PRIOR ART)

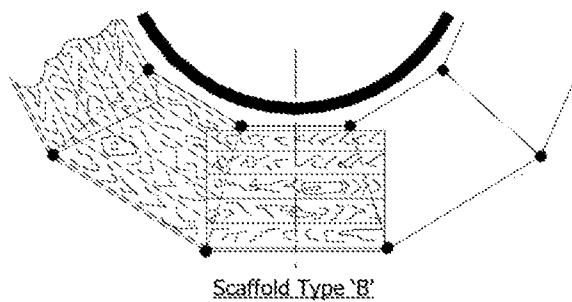


FIGURE 9 (PRIOR ART)

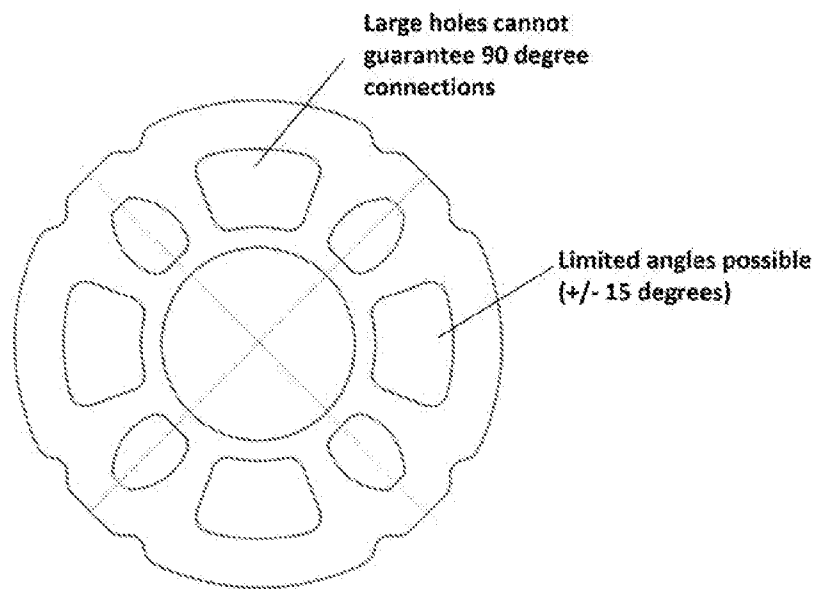


FIGURE 10 (PRIOR ART)

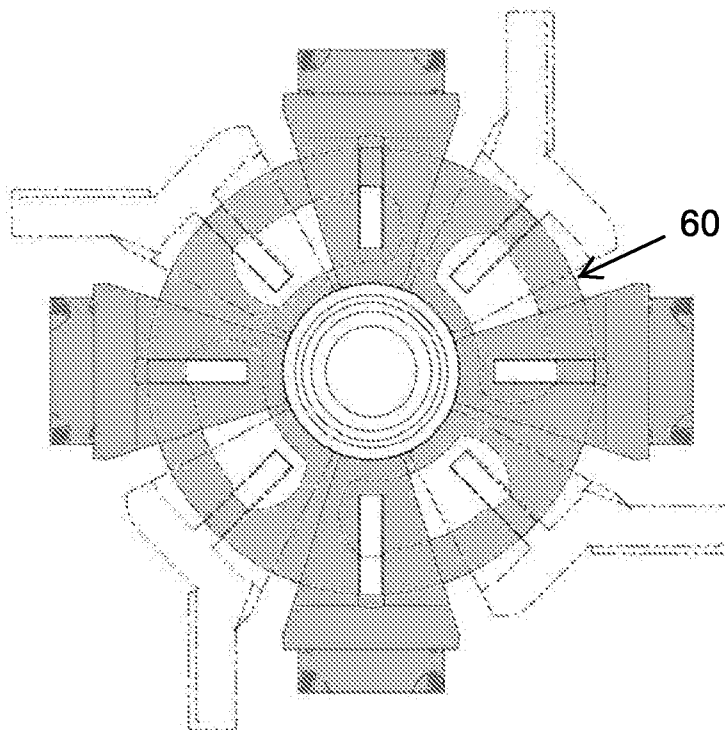


FIGURE 11

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2020/083434

A. CLASSIFICATION OF SUBJECT MATTER

E04G 7/32(2006.01)i; E04G 7/30(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)

E04G

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)

CNABS, CNTXT, CNKI, VEN: scaffold?, rosette?, hole?, ledger?, degree, axis+, notch+, mark+, orient+, locat+, arc+

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2011262215 A1 (THACKER STEVE HOWARD et.al) 27 October 2011 (2011-10-27) description, paragraphs [0028]-[0042], figures 1-14	1, 2
A	CN 204876507 U (JIANGSU SHUNFENG MUNICIPAL CONSTRUCTION ENGINEERING CO LTD) 16 December 2015 (2015-12-16) the whole document	1-15
A	CN 205025081 U (JIANGSU YEQIANG SCAFFOLD SCIENCE & TECHNOLOGY DEV CO LTD) 10 February 2016 (2016-02-10) the whole document	1-15
A	US 2017260759 A1 (UI PROPERTY LTD et.al) 14 September 2017 (2017-09-14) the whole document	1-15
A	US 2015023726 A1 (SAFERITE PLATFORMS INC et.al) 22 January 2015 (2015-01-22) the whole document	1-15
A	US 2013142564 A1 (NEXT GENERATION SCAFFOLD SERVICES INC et al.) 06 June 2013 (2013-06-06) the whole document	1-15
A	CA 2205154 C (ALUMA ENTPR INC) 02 July 2002 (2002-07-02) the whole document	1-15



Further documents are listed in the continuation of Box C.



See patent family annex.

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Date of the actual completion of the international search

23 June 2020

Date of mailing of the international search report

08 July 2020

Name and mailing address of the ISA/CN

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Authorized officer

REN,Qihua

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2020/083434

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
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				US	8303207	B2	06 November 2012
				CA	2737715	A1	23 October 2011
				AU	2011201827	A1	10 November 2011
CN	204876507	U	16 December 2015	None			
CN	205025081	U	10 February 2016	None			
US	2017260759	A1	14 September 2017	EP	3183077	A1	28 June 2017
				WO	2016026873	A1	25 February 2016
				CA	2958589	A1	25 February 2016
				US	2020002956	A1	02 January 2020
US	2015023726	A1	22 January 2015	US	9157245	B2	13 October 2015
US	2013142564	A1	06 June 2013	CA	2825848	A1	04 August 2011
				CA	2825848	C	20 March 2018
				US	2011180350	A1	28 July 2011
				EP	2529064	B1	27 March 2019
				US	8393439	B2	12 March 2013
				AU	2011209619	A1	20 September 2012
				EP	2529064	A4	23 September 2015
				WO	2011094351	A3	06 October 2011
				WO	2011094351	A2	04 August 2011
				EP	2529064	A2	05 December 2012
				AU	2011209619	B2	03 December 2015
CA	2205154	C	02 July 2002	CA	2205154	A1	16 November 1998
				GB	2326208	A	16 December 1998
				GB	2326208	B	16 May 2001
				GB	9810385	D0	15 July 1998