

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 5367-02-PCT	FOR FURTHER ACTION	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/US 18/48480	International filing date (<i>day/month/year</i>) 29 August 2018 (29.08.2018)	(Earliest) Priority Date (<i>day/month/year</i>) 06 September 2017 (06.09.2017)
Applicant JOSEN PREMIUM LLC		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 5 sheets.

It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the **language**, the international search was carried out on the basis of:

the international application in the language in which it was filed.

a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

b. This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6bis(a)).

c. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. **Certain claims were found unsearchable** (see Box No. II).

3. **Unity of invention is lacking** (see Box No. III).

4. With regard to the **title**,

the text is approved as submitted by the applicant.

the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

the text is approved as submitted by the applicant.

the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

a. the figure of the **drawings** to be published with the abstract is Figure No. 1B

as suggested by the applicant.

as selected by this Authority, because the applicant failed to suggest a figure.

as selected by this Authority, because this figure better characterizes the invention.

b. none of the figures is to be published with the abstract.

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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.:
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:

3. Claims Nos.: 4-10
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 Continuation in Supplemental Box) ---

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 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.:

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.

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A. CLASSIFICATION OF SUBJECT MATTER IPC(8) - H04W 4/04, G06T 19/00 (2018.01) CPC - H04W 4/043, H04W 4/20, G01S 5/163, G06T 19/006, G01C 15/002, G06K 9/2063, G06K 9/00671, G06K 9/3208		
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) See Search History Document		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched See Search History Document		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) See Search History Document		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2014/0210856 A1 (F3 & Associates, Inc), 31 July 2014 (31.07.2014), entire document, especially Abstract; para [0017], [0023], [0027], [0059]	1-3 and 11
Y	US 2013/0303193 A1 (Dharwada et al.), 14 November 2013 (14.11.2013), entire document, especially Abstract; para [0021]-[0024], [0026]-[0027]	1-3
Y	US 2016/0019721 A1 (Huntington Ingalls Incorporated), 21 January 2016 (21.01.2016), entire document, especially Abstract; para [0028], [0036], [0039], [0057]	11
A	US 9,436,427 B2 (National Taiwan University), 06 September 2016 (06.09.2016), entire document	1-3 and 11
A	US 9,342,928 B2 (Rasane et al.), 17 May 2016 (17.05.2016), entire document	1-3 and 11
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> 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 05 December 2018		Date of mailing of the international search report 18 DEC 2018
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-8300		Authorized officer: Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

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Continuation of:

Box III. Observations where unity of invention is lacking

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be searched, the appropriate additional search fees must be paid.

Group I - Claims 1-3 are directed to a method for integrating substantially realtime telemetric data into a building information model presented as an augmented reality display.

Group II - Claim 11 is directed to a method for integrating temporal data into a building information model ("BIM") presented as an augmented reality display.

The inventions listed as Groups I-II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

Special Technical Features:

The invention of Group I included the features of obtaining one or more 3-D scans of a telemetric monitored facility; said compatible BIM having data representative of: (i) at least one telemetric monitor associated with at least one process occurring in said monitored facility, and (ii) at least two static components associated with said at least one process on said monitored facility; obtaining dynamic component data representative of said at least one telemetric monitor and representative of at least one controlled variable in said at least one process; obtaining static component data representative of said at least two static components; linking said dynamic component data and said static component data with said virtual reality BIM data, not required by group II.

The invention of Group II included the features of obtaining at least a first and a second temporal 3-D scan over corresponding first and second disparate time frames; spatially aligning a compatible BIM with said one or more 3-D scans for said monitored facility based upon at least a primary and a secondary static component in both said first temporal 3-D scan and said first compatible BIM; generating a first virtual reality BIM data which substantially spatially matches said monitored facility at said first disparate time frame based upon a best fit algorithm with said primary and secondary static components; said first compatible BIM having data representative of said primary and secondary static components and said monitored facility at said first disparate time frame; spatially aligning a second compatible BIM with said second temporal 3-D scan and generating a second virtual reality BIM data which substantially spatially matches said monitored facility at said second disparate time frame and substantially spatially matches said first compatible BIM; said second compatible BIM having data representative of at least a tertiary static component associated with said monitored facility at said second disparate time frame; generating dynamic component data based upon said primary, secondary and tertiary static component data, said dynamic component data being an estimation of a fully functional BIM for said monitored facility; linking said dynamic component data and said primary, secondary and tertiary static component data with said second virtual reality BIM data, not required by group I.

Common Technical Features

Groups I-II share the features of obtaining one or more 3-D scans of a monitored facility from the group of monitored facilities including an industrial plant facility, an industrial processing platform, a commercial site, a floating production storage and offloading vessel, and a maritime vessel; aligning a compatible BIM with said one or more 3-D scans for said monitored facility and generating virtual reality BIM data which substantially spatially matches said 10 monitored facility, displaying on said augmented reality display or said first and second virtual reality display said virtual reality BIM data, said dynamic component data and said static component data, one or both of said dynamic component data and said static component data concurrently displayed with said virtual reality BIM data upon a user's command.

--- (see continuation in next supplemental sheet) ---

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However, the shared technical features do not represent a contribution over prior art as being anticipated by US 2014/0210856 A1 (F3 & Associates, Inc), 31 July 2014 (31.07.2014).

F3 & Associates, Inc teaches obtaining one or more 3-D scans of a monitored facility from the group of monitored facilities including an industrial plant facility, an industrial processing platform, a commercial site, a floating production storage and offloading vessel, and a maritime vessel (para [0015], [0017], [0020], [0050]-[0051] - industrial facilities such as hospitals or laboratories, there are many types of internal elements behind the walls and the ceilings; generated from point cloud data obtained from surveying and laser scanning the internal elements; data acquisition device 110 which is used to survey and laser scan the internal elements 101 (prior to being covered by the external element 102) to generate point cloud data with scan points at known coordinates); external element can also be laser scanned to generate point clouds associated with the external element if it has interesting features or an uneven surface); aligning a compatible BIM with said one or more 3-D scans for said monitored facility (para [0017], [0023], [0027], [0059] - augmented reality visualization is placed at a specific set of coordinates on the finished wall determined by surveying equipment; targets are positioned at control points on or around the internal elements 101. Through surveying, the coordinates of the target control points in relation to a real world coordinate system can be determined; position the point clouds accurately in an environment's coordinate system and align the point clouds, targets can be used to tie the clouds together; the data file may further include supplemental content associated with a 3D digital model. Examples of supplemental content may include additional building information model ("BIM") about the internal elements; storing a data file that includes the selected portion of the 3D digital model of the internal elements and the relation data between the digital model and the selected marker in data storage); generating virtual reality BIM data which substantially spatially matches said 10 monitored facility, displaying on said augmented reality display or said first and second virtual reality display said virtual reality BIM data, said dynamic component data and said static component data, one or both of said dynamic component data and said static component data concurrently displayed with said virtual reality BIM data upon a user's command (para [0017], [0023], [0059]- augmented reality application of the mobile device will then overlay the 3D model of the internal elements on the live view, aligned to the orientation and scale of the scene, even if the user moves around; targets are positioned at control points on or around the internal elements 101. Through surveying, the coordinates of the target control points in relation to a real world coordinate system can be determined; the data file may further include supplemental content associated with a 3D digital model. Examples of supplemental content may include additional building information model ("BIM") about the internal elements; supplemental content may further include a recommended viewing angle or distance to view an augmented reality image using the mobile device 140 on the project site. The supplemental content may be animated, auditory, visual, or a combination thereof, and different information layers of supplemental content can be selected by the user on a touch screen display of the mobile device for visualization).

As the common features were known in the art at the time of the invention, this cannot be considered a common technical feature that would otherwise unify the groups. Therefore, Groups I-II lack unity under PCT Rule 13.