PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: ROBERT C. KAIN, JR.
KAIN SPIELMAN, P.A.
900 SOUTHEAST THIRD AVENUE, SUITE 205
FORT LAUDERDALE, FL 33316

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	18 DEC 2018
Applicant's or agent's file reference 5367-02-PCT	**FOR FURTHER ACTION** See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US 18/48480	29 August 2018 (29.08.2018)	06 September 2017 (06.09.2017)

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

Applicant JOSEN PREMIUM LLC

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☒ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☒ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/US	Date of completion of this opinion	Authorized officer
Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-8300	05 December 2018	Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 18/48480

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established 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)).

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a)).

3. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing:

   a. ☐ forming part of the international application as filed:

      ☐ in the form of an Annex C/ST.25 text file.

      ☐ on paper or in the form of an image file.

   b. ☐ furnished together with the international application under PCT Rule 13*ter*.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.

   c. ☐ furnished subsequent to the international filing date for the purposes of international search only:

      ☐ in the form of an Annex C/ST.25 text file (Rule 13*ter*.1(a)).

      ☐ on paper or in the form of an image file (Rule 13*ter*.1(b) and Administrative Instructions, Section 713).

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 18/48480

Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application.

☒ claims Nos. 4-10

because:

☐ the said international application, or the said claims Nos. _____ relate to the following subject matter which does not require an international search *(specify)*:

☒ the description, claims or drawings *(indicate particular elements below)* or said claims Nos. 4-10 are so unclear that no meaningful opinion could be formed *(specify)*:

Claims 4-10 are held unsearchable, since they are not drafted in accordance with the second and third sentences of Rule 6.4(a).

☐ the claims, or said claims Nos. _____ are so inadequately supported by the description that no meaningful opinion could be formed *(specify)*:

☒ no international search report has been established for said claims Nos. 4-10

☐ a meaningful opinion could not be formed without the sequence listing; the applicant did not, within the prescribed time limit:

- ☐ furnish a sequence listing in the form of an Annex C/ST.25 text file, and such listing was not available to the International Searching Authority in the form and manner acceptable to it; or the sequence listing furnished did not comply with the standard provided for in Annex C of the Administrative Instructions.
- ☐ furnish a sequence listing on paper or in the form of an image file complying with the standard provided for in Annex C of the Administrative Instructions, and such listing was not available to the International Searching Authority in the form and manner acceptable to it; or the sequence listing furnished did not comply with the standard provided for in Annex C of the Administrative Instructions.
- ☐ pay the required late furnishing fee for the furnishing of a sequence listing in response to an invitation under Rule 13*ter*.1(a) or (b).

☐ See Supplemental Box for further details.

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 18/48480

Box No. IV Lack of unity of invention

1. ☒ In response to the invitation (Form PCT/ISA/206) to pay additional fees the applicant has, within the applicable time limit:
   - ☒ paid additional fees.
   - ☐ paid additional fees under protest and, where applicable, the protest fee.
   - ☐ paid additional fees under protest but the applicable protest fee was not paid.
   - ☐ not paid additional fees.
2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is
   - ☐ complied with.
   - ☒ not complied with for the following reasons:

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 telemeteric 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) ----

4. Consequently, this opinion has been established in respect of the following parts of the international application:
   - ☒ all parts.
   - ☐ the parts relating to claims Nos. _____

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 18/48480

Box No. V **Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	1-3 and 11	YES
	Claims	None	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-3 and 11	NO
Industrial applicability (IA)	Claims	1-3 and 11	YES
	Claims	None	NO

2. Citations and explanations:

Claims 1-3 lack an inventive step under PCT Article 33(3) as being obvious over US 2014/0210856 A1 (F3 & Associates, Inc) in view of US 2013/0303193 A1 to Dharwada et al. (hereinafter 'Dharwada').

Regarding claim 1, F3 & Associates, Inc teaches a method for integrating supplemental data into a building information model ("BIM") presented as an augmented reality display or a virtual reality display to one or more users comprising (Abstract - 3D digital model of the internal elements can be retrieved by the mobile device and overlaid in relation to the marker position, orientation, and size so that it is seen at a calculated distance in depth behind the external element as they would exist hidden behind the external element in the real environment): 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); spatially 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 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), displaying on said augmented reality display or said virtual reality display said virtual reality BIM data and said supplemental data, said supplemental 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). F3 & Associates, Inc does not teach integrating substantially realtime telemetric data into a building information model ("BIM") presented as an augmented reality display; telemetric monitored facility; 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. However, Dharwada teaches integrating substantially realtime telemetric data into a building information model presented as an augmented reality display (Abstract - BIM-aware location based application on a mobile device; providing real-time status information for the number of BIM equipment representations on the mobile device; BIM-aware location based application on a mobile device can include updating the floor plan with the implanted number of BIM equipment representations and real-time status information based on a determined location of the mobile device); telemetric monitored facility (para [0009], [0025]-[0026] - one or more embodiments can include displaying a floor plan of a building (e.g., single building, campus with multiple buildings, campus with multiple structures, etc.); real-time status information can include information collected through a number of existing systems (e.g., lighting systems, HVAC systems, security systems, fire systems, etc.); number of sensors that are connected to an antenna that enables the VAV boxes 108-1, 108-2, 108-3, 104-1, 104-2, 104-3 to transmit real-time temperature information to the BIM-aware location based application);

--- (See Continuation in Supplemental Box) ---

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 18/48480

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of:
Box IV. Lack of unity of invention

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.

Box V.2. Citations and Explanations.

(Continuation of claim 1) 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 (para [0021]-[0024], [0026] a variable air volume (VAV) box 108-3 can correspond to room 113. The number of BIM equipment can correspond to the floor plan in a number of ways; a VAV box 108-3 can be within the walls and/or above the ceiling of room 113. In another example, a diffuser can be within the interior portion of a room; number of VAV boxes 108-1, 108-2, 108-3, 104-1, 104-2, 104-3 can be implemented in a floor plan to display a location of the VAV boxes 108-1, 108-2, 108-3, 104-1, 104-2, 104-3 within the floor plan; sensors that are connected to an antenna that enables the VAV boxes 108-1, 108-2, 108-3, 104-1, 104-2, 104-3 to transmit real-time temperature information); 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 (para [0026].0027] transmit real-time temperature information to the BIM-aware location based application; BIM-aware location based application can receive the number of characteristics and display the number of characteristics at a location of the corresponding number of VAV boxes 108-1, 108-2, 108-3, 104-1, 104-2, 104-3); obtaining static component data representative of said at least two static components and linking said dynamic component data and said static component data with said vi1iual reality BIM data (para [0022]-[0024]- number of VAV boxes 108-1, 108-2, 108-3, 104-1, 104-2, 104-3 can be at a corresponding position within the floor plan. The number of VAV boxes 108-1, 108-2, 108-3, 104-1, 104-2, 104-3 can be implemented in a floor plan to display a location of the VAV boxes 108-1, 108-2, 108-3, 104-1, 104-2, 104-3 within the floor plan; BIM-aware location based application can receive the number of characteristics and display the number of characteristics at a location of the corresponding number of VAV boxes 108-1, 108-2, 108-3, 104-1, 104-2, 104-3). It would have been obvious to one of ordinary skill in the art to combine the building information model presentation taught by F3 & Associates, Inc with the real time telemetric data integration taught by Dharwada since doing so would provide an interactive and user friendly interface for presentation of real time information of monitored facility.

--- (See Continuation in Supplemental Box) ---

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 18/48480

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of:
Box V.2. Citations and Explanations.

Regarding claim 2, Dharwada teaches the method of integrating substantially realtime telemetric data into a BIM as claimed in claim 1 including at least one of: (a) generating said compatible BIM from a library of BIM data objects and said at least two static components are included in said library of BINI data objects; (b) generating said compatible BIM from a library of BIM data objects and said at least two static components are included in said library of BIM data objects wherein said dynamic component data represents a dynamic data object for one or both of said two static components included in said library of BIM data objects; (c) wherein said compatible BIM includes data objects from a piping and instrumentation diagram ("P&ID") for said monitored facility, said P&ID representing said static component data, said static component data including instrumentation component data and control component data, said P&ID further representing said dynamic component data, said dynamic component data including process flow data in said monitored facility, instrumentation status data in said monitored facility and control status data in said monitored facility, said control component data at least effecting said process flow data; (d) wherein said compatible BIM includes data objects from as-built plans of said monitored facility; and (e) wherein a first static component of said at least two static components is a pipe used in said at least one process, said first static component being pipe static component data; said one or more 3-D scans of said monitored facility having scan data representative of an insulation over said pipe; said one or more 3-D scans of said monitored facility having further scan data representative of a flange on said pipe; obtaining thickness data of said flange based upon said further scan data; obtaining one or both of an estimated outside diameter and an estimated inside diameter of said pipe based upon the flange thickness data; in said virtual reality BIM data, using a pipe BIM object data to represent said pipe; updating said pipe static component data with said one or both of said estimated outside diameter and said estimated inside diameter of said pipe; linking said dynamic component data with said pipe static component data for said at least one process occurring in said monitored facility (para [0036]-[0041], [0066]-[0069]- compatible BIM includes data objects from as-built plans of said monitored facility).

Regarding claim 3, Dharwada teaches said dynamic component data is one of a plurality of said dynamic component data tables, at least one dynamic component data table including key performance indicator data for said monitored facility (para [0027]-[0029], [0054]-[0055], [0072]).

Claim 11 lacks an inventive step under PCT Article 33(3) as being obvious over F3 & Associates, Inc in view of US 2016/0019721 A1 (Huntington Ingalls Incorporated).

Regarding claim 11, F3 & Associates, Inc a method for integrating supplemental data into a building information model presented as an augmented reality display or a virtual reality display to one or more users comprising (Abstract - 3D digital model of the internal elements can be retrieved by the mobile device and overlaid in relation to the marker position, orientation, and size so that it is seen at a calculated distance in depth behind the external element as they would exist hidden behind the external element in the real environment): obtaining at least a first 3-D scan 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, a maritime vessel, and a heritage site (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); spatially aligning a first compatible BIN with said first temporal 3-D scan for said monitored facility based upon at least a supplemental data component in said first temporal 3-D scan and said first compatible BIM (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 a first virtual reality BIM data which substantially spatially matches said monitored facility at said first time based upon a best fit algorithm with said data (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); displaying on said augmented reality display or said virtual reality display said virtual reality BIM data, said supplemental data, one or both of said 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).

--- (See Continuation in Supplemental Box) ---

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 18/48480

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:
Box V.2. Citations and Explanations.

(Continuation of claim 11) F3 & Associates, Inc does not teach integrating temporal data into a building information model presented as an augmented reality display or a virtual reality display to one or more users comprising: obtaining at least a first and a second temporal 3-D scan over corresponding first and second disparate time frames of a temporally monitored facility; 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 BINI 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. However, Huntington Ingalls Incorporated teaches integrating temporal data into a building information model presented as an augmented reality display or a virtual reality display to one or more users comprising (Abstract; para [0042] - providing information associated with a lift process to a mobile device user; lift environment information is used to assemble AR lift information for transmission to and display on the mobile interface device. The AR lift information is configured for viewing in conjunction with a real-time view of the lift process target area captured by the mobile interface device; all of the actions of the method M100 may be repeated to periodically): obtaining at least a first and a second temporal scan over corresponding first and second disparate time frames of a temporally monitored facility (para [0009], [0042]- capturing information about a lift process target area within the structural environment; periodically or continuously provide real-time environment information to the mobile interface device 101); a first BIM having data representative of said primary and secondary static components and said monitored facility at said first disparate time frame and a second BIM having data representative of at least a tertiary static component associated with said monitored facility at said second disparate time frame (para [0018]-[0021], [0050]-[0053] - land vehicles, buildings and any other static or dynamically variable structure; real-time communication is critical to the processes associated with heavy lift operations in both static and dynamic environments; digital image of a portion 20 of an environment in which a lift operation with a load 30 is to take place or is taking place (referred to herein as the target environment or target area). In the exemplary lift operation illustrated in FIG. 5, the load 30 is a highly irregular shaped load that is being lifted using multiple rigging lines 32 attached to the load 30 such as by the lift ring 34; space inside a vessel or building or an exterior area such as deck, building roof, or the ground adjacent a structure); 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 and linking said dynamic component data and said primary, secondary and tertiary static component data with said second virtual reality BIM data (para [0028], [0036], [0039], [0057] - AR operating system 104 is configured to assemble AR information for transmission to and display by the mobile device 101. The AR information is constructed using the processed environment data from the environment data systems 103 and the pose of the mobile device 101 using any of various techniques; data from sensors located in areas near the mobile interface device 101 or on or associated with the target object. The information may also be or include information on the status of a system with which the mobile device user may be required to interact; the AR information could include an AR image that visually shows the deviation in conjunction with a real-time view of the target object; rendering a visual display that can be superimposed over the view of the target area 20 captured by the mobile interface device 201. This rendering could include, for example, textual/numerical information or graphical information positioned so as to be readily associable with a component or node appearing in the captured view of the target area). It would have been obvious to one of ordinary skill in the art to combine the building information model presentation taught by F3 & Associates, Inc with the temporal data integration taught by Huntington Ingalls Incorporated since doing so would provide an interactive and user-friendly interface for presentation of real time facility information.

Claims 1-3 and 11 have industrial applicability as defined by PCT Article 33(4) because the subject matter can be made or used in industry.