

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

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PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing
(day/month/year) **15 NOV 2018**

Applicant's or agent's file reference
21188.433310

FOR FURTHER ACTION
See paragraph 2 below

International application No. PCT/US18/45238	International filing date (day/month/year) 03 August 2018 (03.08.2018)	Priority date (day/month/year) 04 August 2017 (04.08.2017)
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International Patent Classification (IPC) or both national classification and IPC
IPC - G06T 7/73 (2018.01)
CPC - G06T 7/74; H04W 4/023; G06F 3/04815

Applicant **WALMART APOLLO, 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 43bis.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 66.1bis(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 Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-8300	Date of completion of this opinion 8 November 2018 (08.11.2018)	Authorized officer Shane Thomas PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774
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WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/US18/45238

Box No. 1 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/US18/45238

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 examined, the appropriate additional examination fee must be paid.

Group I: Claims 1-7 and 15-20 are directed towards a method and a computer-readable storage medium for generating a 3D map of a storage area based on package weight and contents.

Group II: Claims 8-14 are directed towards an augmented reality device having a transparent display with an inner surface and an outer surface.

The inventions listed as Groups I and 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:

The special technical features of Group I include at least a method and a computer-readable storage medium comprising: generating a three-dimensional map of the storage area; identifying next package content, and a next package weight; determining a storage location based on: the next package content; the next package dimensions; the next package weight; the package content of each of the plurality of packages; the package weight of each of the plurality of packages; and package placement rules, which are not present in Group II.

The special technical features of Group II include at least an augmented reality device comprising: a transparent display having an inner surface and an outer surface; receiving, from a server, physical package dimensions; identifying a current location of the augmented reality device; generating augmented view data based on the current location and the current view, wherein the augmented view data enables a virtual package to illustrate how the physical package should be placed within the storage location, which are not present in Group I.

The common technical features shared by Groups I and II are a processor; storage; an augmented reality device; a storage location corresponding to a package; package dimensions of a particular package; the augmented reality device providing a view of the storage area with a virtual package in the storage location, the virtual package having corresponding package dimensions.

However, these common features are previously disclosed by US 9,595,115 B1 (CEDERLOF). Cederlof discloses a processor (a computing device includes a processor and a memory; column 4, lines 22-24); storage (a computing device includes a processor and a memory; column 4, lines 22-24); an augmented reality device (the computing device is located within an augmented reality functional node/ARFN (device); column 4, lines 20-24); a storage location corresponding to a package (the current location data of the object in the room (storage location) is provided; column 3, lines 20, 21; column 20, lines 53-55); package dimensions of a particular package (a size of the object may be stored in the object data-store; column 10, lines 61, 62); the augmented reality device providing a view of the storage area with a virtual package in the storage location, the virtual package having corresponding package dimensions (the augmented reality module of the ARFN (device) may provide prompts via a computer generated scene/room (view of the storage area) instructing a deliver person to place the table in the particular location based on a rendering/projection (virtual package) of the table made using table attributes, including dimensions, received by the data-store in the augmented reality functional node/ARFN; column 2, lines 37-41; column 3, line 1, column 4, lines 1-5; column 5, lines 1-3; column 5, lines 8-10; column 20, lines 3-6).

Since the common technical features are previously disclosed by the Cederlof reference, these common features are not special and so Groups I and II lack unity.

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. Group I: Claims 1-7, 15-20

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/US18/45238

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

1. Statement

Novelty (N)	Claims	3-5, 17-19	YES
	Claims	1, 2, 6, 7, 15, 16, 20	NO
Inventive step (IS)	Claims	NONE	YES
	Claims	1-7, 15-20	NO
Industrial applicability (IA)	Claims	1-7, 15-20	YES
	Claims	NONE	NO

2. Citations and explanations:

Claims 1, 2, 6, 7, 15, 16 and 20 lack novelty under PCT Article 33(2) as being anticipated by US 9,595,115 B1 (CEDERLOF).

As per claims 1 and 15, Cederlof discloses a method and a computer-readable storage medium having instructions, the method and the computer-readable storage medium comprising: the stored instructions which, when executed by a computing device, cause the computing device to perform operations (computer-executable instructions stored on computer-readable storage media are executed by processors to perform operations; column 15, lines 40-44); identifying, via a processor accessing a database and for each package in a plurality of packages which are stored in a storage area (a computing device includes an object data-store storing attributes of objects located in a room (area); abstract): a package content (packages containing a plurality of items (content) are provided; column 6, lines 13, 14); a package weight (a scale in the augmented reality environment may provide an indication of the object's mass (weight); column 10, lines 66, 67); package dimensions (a size (dimensions) of the object may be stored in the object data-store; column 10, lines 61, 62); and a package location (the location attributes comprise location data of the object; column 3, lines 20, 21); generating, via the processor, a three-dimensional map of the storage area based on the package dimensions and the package location of each package in the plurality of packages (a user gestures to move a three dimensional projection of a table to a particular location in the room (storage area), where the augmented reality module provides prompts via a computer generated scene (map) instructing a deliver person to place the table in the particular location based on a rendering/projection of the table made using table attributes, including dimensions, received by the data-store in the augmented reality functional node/ARFN; column 2, lines 37-41; column 3, line 1, column 4, lines 1-5; column 5, lines 1-3; column 5, lines 8-10; column 10, lines 61-64; column 20, lines 3-6); identifying a next package to be stored in the storage area (the user may access the object data-store to present a renderings of objects within a list of objects (next package), and readily move each rendering about the room with a series of gestures to find a desired location for the actual object, and when brought into the room, the augmented reality system directs placement of the actual object to the desired location; column 2, lines 16-22; column 9, lines 27-37), the next package having a next package content (an object may be a container holding other objects (the next package content); column 6, lines 18-22), next package dimensions (due to the size (next package dimensions) limitations of the closet, large pieces of furniture such as sofas, tables, chairs (each of the plurality of packages), and so forth may be excluded; column 18, lines 1-4), and a next package weight (rather than moving a heavy (weight) physical object, the user may conveniently and easily move the rendering to experiment with various placements of the physical; column 22, lines 22-24); as the next package is being delivered to the storage area, determining, via the processor, a storage location within the storage area for the next package (the user may access the object data-store to present a rendering of a table, and readily move that rendering about the room with a series of gestures to find a desired location for the actual table, and when brought into the room, the augmented reality system directs placement of the actual table to the desired location; column 2, lines 16-22), wherein the storage location is based on: the next package content (an object may be a container holding other objects (the next package content), such as a filled tote with the significance being the contents of the tote and not necessarily the container itself, where different attributes affecting location may be stored for different categories of objects; column 6, lines 18-22; column 14, lines 42-44); the next package dimensions (some objects may be packages containing a plurality of items which may or may not be identical, such as a twelve-can case of cola or set of different sized (next package dimensions) wrenches; column 6, lines 13-16); the next package weight (some objects may be packages containing a plurality of items which may or may not be identical, such as a twelve-can case of cola or set of different sized wrenches (next package), where the mass/weight (next package weight) of an object is provided; column 6, lines 13-16; column 9, lines 29-32; column 10, lines 65-67; column 11, lines 1-3); the package content of each of the plurality of packages (some objects may be packages containing a plurality of items (package content) which may or may not be identical, such as a twelve-can case of cola or set of different sized wrenches; column 6, lines 13-16); the package weight of each of the plurality of packages (rather than moving a heavy (weight) physical object, the user may conveniently and easily move the rendering to experiment with various placements of the physical objects (each of the plurality of packages); column 22, lines 22-24); the package dimensions of each of the plurality of packages (due to the size (package dimensions) limitations of the closet, large pieces of furniture such as sofas, tables, chairs (each of the plurality of packages), and so forth may be excluded; column 18, lines 1-4); the package location of each of the plurality of packages (a quantity threshold (package placement rule) is used to indicate what pre-determined quantity has been set to be maintained at that location, where a pre-determined minimum of two rolls of paper towels or other items (each of the packages) may be set for the pantry (package location); column 14, lines 45-50); and package placement rules (a default location for stowing an object may be pre-loaded information (package placement rule) defined by a manufacturer, and a quantity threshold (package placement rule) is used to indicate what pre-determined quantity has been set to be maintained at that location; column 14, lines 26-30; column 14, lines 45-50);

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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US18/45238

Supplemental Box

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Continuation of:

-Continued from Box V: Citations and Explanations-

transmitting, to an augmented reality device, the storage location and the next package dimensions, such that the augmented reality device generates an augmented reality view of the storage area with a virtual package in the storage location, the virtual package having the next package dimensions (a user gestures (transmitting) to move a projection of a table/object to a particular location (storage location) in the room (storage area), where the augmented reality module may provide prompts via a computer generated scene (augmented reality view of the storage area) instructing a deliver person to place the table in the particular location based on a rendering/projection (virtual package) of the table/object made using table attributes, including dimensions, received by the data-store in the augmented reality functional node/ARFN; column 2, lines 37-41; column 3, line 1, column 4, lines 1-5; column 5, lines 1-3; column 5, lines 8-10; column 20, lines 3-6).

As per claims 2 and 16, Cederlof discloses the method of claim 1 and the computer-readable storage medium of claim 15, respectively. Additionally, Cederlof discloses, wherein the next package was unknown when at least one package in the plurality of packages was placed in the storage area (a preliminary identification (package was unknown) of an object is made by comparing attributes of the detected (placed in the storage area) object with previously stored attributes for a previously (when at least one package in the plurality of packages was placed in the storage area) detected object of multiple objects (plurality of packages) within the environment; column 2, lines 88-67; column 3, lines 1-4; column 16, lines 2-5).

As per claims 6 and 20, Cederlof discloses the method of claim 5 and the computer-readable storage medium of claim 19, respectively. Additionally, Cederlof discloses, wherein the human user is assigned to load a plurality of storage areas (associated locations are places/rooms (plurality of storage areas) where an object is likely to reside or be placed (to load) within a user's (user is assigned to load) augmented reality environment, where a user interaction datastore maintains information about interactions (to load) between the user and one or more objects; column 5, lines 26-28; column 14, lines 37-41; column 14, lines 54-57; column 19, lines 50-54).

As per claim 7, Cederlof discloses the method of claim 1. Additionally, Cederlof discloses, further comprising: receiving, from the augmented reality device, a confirmation that the next package is placed in the storage location (using sensors accessible to the computing device (augmented reality device) that maintains the augmented reality environment, attributes of the detected objects are determined and provided to the object datastore that is updated (confirmation) to reflect the changes in location (storage location) attributes of an object; column 2, lines 48-52; column 19, lines 1-4; column 21, lines 35-37); and updating the three-dimensional map based on the confirmation (the object datastore is updated (confirmation) to reflect the changes in location attributes of an object, where the augmented reality system presents a three-dimensional rendering (updating the three-dimensional map), such as a projection, of a physical object which has updated attributes stored in the object datastore; column 11, lines 4-6; column 19, lines 1-4; column 21, lines 35-37).

Claims 3 and 17 lack an inventive step under PCT Article 33(3) as being obvious over Cederlof in view of US 6,563,520 B1 to PARKER et al. (hereinafter "Parker").

As per claims 3 and 17, Cederlof discloses the method of claim 1 and the computer-readable storage medium of claim 15, respectively. Cederlof does not disclose, wherein the storage area is a freight truck. However, Parker discloses, wherein the storage area is a freight truck (a package is stacked in a particular location in a truck; abstract; column 8, lines 50-54). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method and the storage medium of Cederlof to provide the storage area being a freight truck, as taught by Parker, in order to provide additional capabilities for efficiently selecting storage locations and placing packages within the selected locations.

Claims 4 and 18 lack an inventive step under PCT Article 33(3) as being obvious over Cederlof in view of US 2003/0232708A1 (RABIEA).

As per claims 4 and 18, Cederlof discloses the method of claim 1 and the computer-readable storage medium of claim 15, respectively. Cederlof does not disclose, wherein the storage area is a grocery bag. However, Rabiea discloses, wherein the storage area is a grocery bag (a bag enables containment of produce, grocery or other items placed therein via an opening; abstract). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method and the storage medium of Cederlof to provide the storage area being a grocery bag, as taught by Rabiea, in order to provide additional capabilities for efficiently selecting storage locations and placing packages within the selected locations.

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WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/US18/45238

Supplemental Box

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Claims 5 and 19 lack an inventive step under PCT Article 33(3) as being obvious over Cederlof in view of US 9,665,960 B1 to AMAZON TECHNOLOGIES, INC. (hereinafter "Amazon").

As per claims 5 and 19, Cederlof discloses the method of claim 1 and the computer-readable storage medium of claim 15, respectively. Cederlof does not disclose, wherein the augmented reality device is being worn as one of glasses and a visor by a human user. However, Amazon discloses, wherein the augmented reality device is being worn as one of glasses and a visor by a human user (a user computing device such as a smart eyewear (glasses) can identify the location of items within an image and create an alternative/augmented reality visual representation of the items to facilitate locating the items in the physical world; column 3, lines 14-16; column 11, lines 52-58; column 12, lines 65-67; column 13, line 1). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method and the storage medium of Cederlof to provide the augmented reality device being worn as one of glasses and a visor by a human user, as taught by Amazon, in order to provide additional capabilities using an augmented environment for efficiently selecting storage locations and placing packages within the selected locations.

Claims 1-7 and 15-20 have industrial applicability as defined by PCT Article 33(4) because the subject matter can be made or used in industry.