

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY
(PCT Rule 43*bis*.1)

To:

see form PCT/ISA/220

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/US2018/044290

International filing date (day/month/year)
30.07.2018

Priority date (day/month/year)
29.09.2017

International Patent Classification (IPC) or both national classification and IPC
INV. G06T15/00 G06T19/00

Applicant
APPLE INC.

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 usually 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:



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Date of completion of this opinion

see form PCT/ISA/210

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Box No. I Basis of the 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 43bis.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 13ter.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 13ter.1(a)).
 - on paper or in the form of an image file (Rule 13ter.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:

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:
see separate sheet
4. Consequently, this report has been established in respect of the following parts of the international application:
- all parts.
 - the parts relating to claims Nos.

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

1. Statement

Novelty (N)	Yes: Claims	<u>5-20</u>
	No: Claims	<u>1-4, 21-25</u>
Inventive step (IS)	Yes: Claims	<u>12-20</u>
	No: Claims	<u>1-11, 21-25</u>
Industrial applicability (IA)	Yes: Claims	<u>1-25</u>
	No: Claims	

2. Citations and explanations

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item IV

Lack of unity of invention

- 1 This Authority considers that the application does not meet the requirements of unity of invention and that there are two inventions. The reasons, for which the inventions are not so linked as to form a single general inventive concept, as required by Rule 13.1 PCT, are as follows:

The common matter linking together the independent claims 1, 5 and 12 is the following:

- a step of retrieving, by the client device, retrieving, from a map server, a set of map objects corresponding to a region of the 3D map;
- a step of receiving, by the client device, over a network, an origin position in the region of the 3D map, the origin position being specified by a host device;
- a step of receiving, by the client device, over the network, a stream of virtual positions *associated with* the host device in the 3D map; and
- a step of rendering and displaying, by the client device, a series of images of the 3D map on the client device using the stream of virtual positions *associated with* the host device.

- 2 This common matter does not comprise a single general inventive concept, based on same or corresponding special technical features within the meaning of Rule 13.2 PCT, because it is disclosed by document D1 (paragraphs [0004-0008], [0045-0048], [0051], [0068-0070], [0079] and figure 5).

- 3 Hence, the following separate inventions or groups of inventions are not so linked as to form a single general inventive concept:
- According to invention 1, the (first) stream of virtual positions is a stream of positions of a host device.
 - According to invention 2, the client device captures one or more images, determines an initial physical position based thereon, generates a stream of virtual positions of a client virtual camera and renders a second series of images on the 3D map using the stream of virtual positions of the client virtual camera. Furthermore, introduces the concept of a host virtual camera which merely corresponds to, but is necessarily identical to, the host device.

- 4 There exists no apparent technical relationship between these aforementioned non-common features of inventions 1 and 2 because invention 1 relates to a physical position and movement of a host device,

wherein invention 2 makes reference to virtual cameras separately relating to each, the host device and the client device. Thus, different technical problems are solved, so that these features cannot be considered as corresponding technical features.

- 5 Hence, the claims comprise neither the same, nor corresponding special technical features, so the technical relationship between the subject matter of the claims required by Rule 13.2 PCT is lacking and the claims are not so linked as to form a single general inventive concept as required by Rule 13.1 PCT.
- 6 Consequently the application does not meet the requirement for unity of invention.

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following documents:

- D1 US 2014/278847 A1 (GALLO FABIO [CH]) 18 September 2014
(2014-09-18)
- D2 WO 2015/010165 A1 (NAT ICT AUSTRALIA LTD [AU]) 29 January 2015
(2015-01-29)
- D3 US 2016/300389 A1 (GLENN III LLOYD FRANKLIN [US] ET AL) 13
October 2016 (2016-10-13)

1 Independent Claim 1

The lack of clarity (see section VIII.1) notwithstanding, the subject-matter of claim 1 is not new in the sense of Art. 33(2) PCT, and the criteria of Art. 33(1) PCT are therefore not met.

Document D1 discloses (the references in parentheses applying to this document) a method of providing a three-dimensional map on a display of a client device (figure 5 and paragraph [0069]:"data may be transmitted to the

client devices and rendered locally, taking advantage of capabilities of the client device"; paragraph [0004]: "to devices of spectators"), the method comprising, performing, by the client device:
retrieving, from a map server, a set of map objects corresponding to a region of the 3D map (paragraphs [0045], [0047-0048] [0051], [0070], [0079]*);
receiving, over a network, an origin position in the region of the 3D map, the origin position being specified by a host device (paragraphs [0005], [0007-0009], [00045] and [00053-0054]);
receiving, over the network, a stream of virtual positions of the host device in the 3D map corresponding to physical movements of the host device (paragraphs [0046], [0053-0054] and [0094]); and
rendering and displaying a series of images of the 3D map on the client device using the stream of virtual positions of the host device (paragraphs [0005], [0007-0008], [0046-0051], [0068]: "data may be transmitted to the client devices and rendered locally").

(*) In paragraphs [0047-0048], [0051] and [0070], the map objects [*sic*] are disclosed in the form of (data indicative of) static objects forming part of the environment to be depicted in the 3D map. In paragraph [0045], the map objects are disclosed in the form of non-static objects (e.g. race cars) containing host devices. In paragraph [0079] the map objects are disclosed in the form of objects (advertising graphics) to be rendered at defined virtual positions within the 3D map.

2 **Dependent Claims 2-4**

2.1 The additional features of claims 2 and 3 are disclosed in paragraphs [0051], [0070] and [0079] of document D1. Therefore, the subject-matter of claims 2 and 3 is not new (Art. 33(2) PCT).

2.2 The additional feature of claim 4 is disclosed in figures 6E and 6F (visible trace of a motion path depicted). Therefore, the subject-matter of claim 4 is not new (Art. 33(2) PCT).

2.3 **Independent Claim 5**

The lack of clarity (see section VIII.2) notwithstanding, the subject-matter of claim 5 lacks an inventive step in the sense of Art. 33(3) PCT, and the criteria of Art. 33(1) PCT are therefore not met.

- 2.3.1 Document D1 discloses (the references in parentheses applying to this document) a method of providing a three-dimensional map on a display of a client device (figure 5 and paragraph [0069]), the method comprising, performing, by a host device ~~having a physical camera:~~
~~retrieving, from a map server, a set of map objects corresponding to a region of the 3D map;~~
specifying an origin position in the region of the 3D map (paragraphs [0005], [0007-0009], [00045] and [00053-0054]);
generating a stream of virtual positions of the host device in the 3D map corresponding to physical movements of the host device (paragraphs [0046], [0053-0054] and [0094]); and
transmitting the origin position and the stream of virtual positions to the client device (paragraphs [0005], [0007-0009], [0045-0046], [0053-0054] and [0094]), wherein the client device renders and displays a series of images of the 3D map on the client device using the stream of virtual positions of the host device (paragraphs [0005], [0007-0008], [0046-0051], [0068]).
- 2.3.2 The subject-matter of claim 5 differs from the method disclosed in document D1 in that the host device (i) has a physical camera and (ii) retrieves a set of map objects from a map server.
- 2.3.3 The features underlying both of these differences have no clearly recognizable relevance to the claimed method and therefore no technical effect. Therefore, no technical problem to be solved by the person skilled in the art when starting from the disclosure of document D1 can be recognized. Thus, the above-mentioned difference do not contribute to an inventive step (Art. 33(3) PCT), and the requirements of Art. 33(1) PCT are not met.

3 Dependent Claims 6-11

- 3.1 The additional features of claims 6 and 7 do not contribute to an inventive step (Art. 33(3) PCT) for the following reason. Starting from the disclosure of document D1 and faced with the technical problem of providing visual feedback to the race car driver regarding the rendered images provided to the spectators, the person skilled in the art would not require an inventive step to integrate a client device (as used by a spectator) with the host device built into the race car (see paragraph [0045] of D1). The additional features of claims 6 and 7 are then immediately implied.

- 3.2 The additional features of claims 8 and 9 are disclosed in paragraphs [0051], [0070] and [0079] of document D1. Therefore, the subject-matter of claims 8 and 9 lacks an inventive step (Art. 33(3) PCT). It is noted that the reasoning of section 3.1 also applies to these claims.
- 3.3 The additional features of claim 10 are disclosed in figure 2B: 220 and in paragraph [0053] of document D1. The subject-matter of claim 10 therefore lacks an inventive step (Art. 33(3) PCT).
- 3.4 The additional features of claim 11 are disclosed in figure 2B: 240 (first network) and in figure 2B: 220 (second network). The subject-matter of claim 11 therefore lacks an inventive step (Art. 33(3) PCT).

4 Independent Claim 12

The subject-matter of claim 12 is neither disclosed nor rendered obvious by the available prior art. Therefore, the requirements of Art. 33(1) PCT are considered to be met.

5 Dependent Claims 13-20

Claims 13-20 are dependent on claim 12 and as such also meets the requirements of Art. 33(1) PCT .

5.1 Independent Claims 21-25

The subject-matter of independent claims 21-25 corresponds, in terms of a computer product and in terms of a system, to that of claims 1 and 5. The above objections raised in respect of these latter claims therefore also apply, mutatis mutandis, to independent claims 21-25 which thus do not meet the requirements of Art. 33(1) PCT for lack of novelty of their respective subject matter (Art. 33(2) PCT) in so far as they refer to the method of claim 1, and for lack of inventive step (Art. 33(3) PCT) in so far as they refer to the method of claim 5.

Re Item VIII

Certain observations on the international application

1 Independent Claim 1

The application does not meet the requirements of Art. 6 PCT, because claim 1 is not clear.

- 1.1 Claim 1 comprises a step of "retrieving, from a map server, a set of map objects". Contrary to Art. 6 PCT, this wording is unclear as it would appear that data pertaining to the map objects, rather than a set of objects per se, is retrieved. However, even under this assumption, it is unclear of what type this data is. Possible interpretations include data indicating object identifiers, object coordinates, object geometry, object textures, etc.
- 1.2 Moreover, the meaning of the expression "origin position" is unclear. Possible interpretations include an origin of a coordinate system or an origin of a path of motion.
- 1.3 Moreover, the meaning of the expression "virtual positions" used in claim 1 is unclear in the absence of an unambiguous definition of this term in the claim.
- 1.4 Claim 1 further specifies a method step of "receiving, over the network, a stream of virtual positions of the host device [...] corresponding to physical movements of the host device". This wording fails to convey the nature of the "correspond[ence]" and whether the host device transmits a stream of virtual positions or a stream of data indicative of the physical movements which requires transformation into the stream of virtual positions before the latter is received by the client device. If the virtual positions are indeed emitted by the host device, it is unclear how said host device can have all the information necessary to translate its physical position into coordinates of a virtual position relative to a 3D map generated in a remote client device. In this case claim 1 lacks essential technical features indicating how the host device obtains the virtual position data.

2 Independent Claim 5

The application does not meet the requirements of Art. 6 PCT, because claim 5 is not clear.

- 2.1 The objections raised in respect of claim 1 also apply, mutatis mutandis, to claim 5.

2.2 Moreover, claim 5 specifies that the host device "ha[s] a physical camera". Contrary to Art. 6 PCT, this feature is not suitable for specifying a method. Moreover, the relevance of the physical camera is entirely unclear, as neither claim 5 nor any of its dependent claims specifies any method step in which image data generated by the physical camera is used.

2.3 Furthermore, claim 5 specifies that the host device "retriev[es], from a map server, a set of map objects" but does not comprise any method step in which the map objects are used by the host device. Therefore, the relevance of the step of "retrieving" is unclear.

3 Independent Claim 12

The application does not meet the requirements of Article 6 PCT, because claim 12 is not clear.

Claim 12 comprises a method step of "specifying a set of physical positions of a set of 3D objects of the 3D map relative to the initial position [...]". This wording is not clear because it does not allow the reader to infer in an unambiguous way technical features limiting the claimed subject-matter. It is unclear what operations are performed in the step of "specifying". In particular, it is unclear whether an operation of determining or converting coordinates of a physical position is performed, or whether the term "specifying" is intended to merely relate to selecting certain positions of a set of map objects.