

PATENT COOPERATION TREATY

PCT

From the INTERNATIONAL SEARCHING AUTHORITY

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INVITATION TO PAY ADDITIONAL FEES
 AND, WHERE APPLICABLE, PROTEST FEE
 (PCT Article 17(3)(a) and Rule 40.1 and 40.2(e))

	Date of mailing (day/month/year) 12 November 2018 (12-11-2018)
Applicant's or agent's file reference P36245WO1	PAYMENT DUE within ONE MONTH from the above date of mailing
International application No. PCT/US2018/044290	International filing date (day/month/year) 30 July 2018 (30-07-2018)
Applicant APPLE INC.	

1. This International Searching Authority

(i) considers that there are 2 (number of) inventions claimed in the international application covered by the claims indicated on an extra sheet:

(ii) therefore considers that **the international application does not comply with the requirements of unity of invention** (Rules 13.1, 13.2 and 13.3) for the reasons indicated on an extra sheet:

(iii) has carried out a partial international search (see Annex) will establish the international search report on those parts of the international application which relate to the invention first mentioned in claims Nos.:
see extra sheet

(iv) will establish the international search report on the other parts of the international application only if, and to the extent to which, additional fees are paid.

2. Consequently, the applicant is hereby **invited to pay**, within the time limit indicated above, the amount indicated below:

<u>EUR 1.775,00</u>	x	<u>1</u>	=	<u>EUR 1.775,00</u>
Fee per additional invention		number of additional inventions		currency/total amount of additional fees

3. The applicant is informed that, according to Rule 40.2(c), **the payment of any additional fee may be made under protest**, i.e., a reasoned statement to the effect that the international application complies with the requirement of unity of invention or that the amount of the required additional fee is excessive, where applicable, subject to the payment of a protest fee.
 Where the applicant pays additional fees under protest, the applicant is hereby invited, within the time limit indicated above, to pay a protest fee (Rule 40.2(e)) in the amount of EUR 875,00 (currency/amount)

Where the applicant has not, within the time limit indicated above, paid the required protest fee, the protest will be considered not to have been made and the International Searching Authority will so declare.

4. Claim(s) Nos. _____ have been found to be unsearchable under Article 17(2)(b) because of defects under Article 17(2)(a) and therefore have not been included with any invention.

Name and mailing address of the International Searching Authority European Patent Office, P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk Tel. (+31-70) 340-2040 Fax: (+31-70) 340-3016	Authorized officer ERIKSSON, Ingeborg Tel: +49 (0)89 2399-2432
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This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-11, 21-25

Method of providing a 3D map on a display of a client device, the method comprising retrieving, by the client device, (data of) map objects, receiving, by the client device, (data of) an original position and a sequence of virtual positions of a host device, transmitted by said host device, and rendering, by the client device, a series of images of the 3D map based on the retrieved data and the virtual positions of the host device;

2. claims: 12-20

Method of providing a 3D map on a display of a client device, the method comprising retrieving, by a client device, map objects, receiving, by the client device, an origin position and a stream of virtual positions of a host virtual camera, rendering, by the client device, a first series of images of the 3D map based thereon, capturing, by the client device, one or more images of its physical environment, determining, by the client device, its initial physical position based on the one or more images, generating, by the client device, a stream of virtual positions of a client virtual camera corresponding to the client device as measured using one or more second images captured by the client device, and rendering, by the client device, a second series of images of the 3D map using the stream of virtual positions of the client virtual camera;

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.

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).

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, but is necessarily identical to, the host device.

There exists no 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.

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.

Consequently the application does not meet the requirement for unity of invention.

1. The present communication is an Annex to the invitation to pay additional fees (Form PCT/ISA/206). It shows the results of the international search established on the parts of the international application which relate to the invention first mentioned in claims Nos.:
- see 'Invitation to pay additional fees'
2. This communication is not the international search report which will be established according to Article 18 and Rule 43.
3. If the applicant does not pay any additional search fees, the information appearing in this communication will be considered as the result of the international search and will be included as such in the international search report.
4. If the applicant pays additional fees, the international search report will contain both the information appearing in this communication and the results of the international search on other parts of the international application for which such fees will have been paid.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2014/278847 A1 (GALLO FABIO [CH]) 18 September 2014 (2014-09-18) paragraph [0001] - paragraph [0101] figures 1-6F	1-11, 21-25
X	----- WO 2015/010165 A1 (NAT ICT AUSTRALIA LTD [AU]) 29 January 2015 (2015-01-29) page 1, line 1 - page 27, line 15 figures 1-13	1-11, 21-25
A	----- US 2016/300389 A1 (GLENN III LLOYD FRANKLIN [US] ET AL) 13 October 2016 (2016-10-13) paragraph [0002] - paragraph [0097]; figures 1-10	1-11, 21-25

Further documents are listed in the continuation of box C.

Patent family members are listed in 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 document 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

Patent Family Annex

Information on patent family members

International Application No PCT/US2018/044290
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2014278847 A1	18-09-2014	EP 3114629 A2	11-01-2017
		US 2014278847 A1	18-09-2014
		WO 2014140915 A2	18-09-2014

WO 2015010165 A1	29-01-2015	AU 2014295814 A1	28-01-2016
		US 2016148418 A1	26-05-2016
		WO 2015010165 A1	29-01-2015

US 2016300389 A1	13-10-2016	NONE	

Application no:
Demande n°: PCT/US2018/044290
Anmelde-Nr:

DISCLAIMER

The attached provisional opinion on the patentability of the first invention searched serves only as information.
A reply addressing the points raised in the opinion is **not** required and will **not** be taken into account when issuing the final search report and opinion on patentability.

AVERTISSEMENT

L'avis provisoire ci-joint sur la brevetabilité de la première invention recherchée ne sert qu'à titre d'information.
Une réponse abordant les points soulevés dans l'avis n'est **pas** nécessaire et ne sera **pas** prise en compte lors de l'établissement du rapport final de la recherche et de l'avis sur la brevetabilité.

DISCLAIMER

Die beigefügte vorläufige Stellungnahme zur Patentierbarkeit der ersten geprüften Erfindung dient lediglich zur Information.
Eine Antwort auf die erhobenen Punkte in der Stellungnahme ist **nicht** erforderlich und bleibt bei der Erstellung des endgültigen Recherchenberichts und der Stellungnahme zur Patentierbarkeit **unberücksichtigt**.

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).

3.5 **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.