

# PATENT COOPERATION TREATY

# PCT

From the INTERNATIONAL SEARCHING AUTHORITY

To:  
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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 <i>(day/month/year)</i>
	29 November 2018 (29-11-2018)
Applicant's or agent's file reference KSH86851P.WOP	<b>PAYMENT DUE</b> within <b>ONE MONTH</b> from the above date of mailing
International application No. PCT/GB2018/052383	International filing date <i>(day/month/year)</i>
	22 August 2018 (22-08-2018)
Applicant ZAPPAR LIMITED	

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 VIEGAS DA CRUZ, Isabel Tel: +31 (0)70 340-1923
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This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-21, 23-25

Optically readable marker with identifier consisting of plurality of dots arranged in various patterns

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2. claim: 22

Method of dot detection using a ring neighborhood (FAST inspired point detection)

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The subject matter of claim 1 is considered to be a matter of common knowledge as it merely defines dotted fiducial markers indicating the position of data to be read.

It is disclosed for instance in D1 as follows:

An optically readable marker (9 in Figs. 1, 2, 3) comprising:

data to be extracted (27 in Figs. 2 and 3); and

an identifier arranged to identify a location of the data to be extracted, wherein the identifier comprises a plurality of dots arranged in a set pattern, and wherein the dots are small compared to the size of the data to be extracted (fiducial points 22 in Figs. 2 and 3).

Corresponding method claim 17 is provided in D1 as well (page 12, lines 27 to 29).

The application claims two contributions with respect to this common knowledge:

I. a specific configuration of fiducial points: claims 4 and 6 to 11, pages 14 to 18 in description, Figures 3 to 5;

II. a method of dot detection, the modified "FAST" algorithm, claim 22, pages 19 to 22, Figures 6 and 7.

The two subjects do not share a common inventive concept, the only link being provided through the subject matter of claim 1, which is as noted above a matter of common knowledge (fiducial marker points).

Thus the current application is non-unitary in the sense of Rule 13 PCT.

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	WO 03/087991 A2 (ESCHER GROUP LTD [US]) 23 October 2003 (2003-10-23)  page 8, line 24 - page 9, line 7; figures 2,3,6 page 15, line 14 - line 30  -----	1,2,6-8, 13, 17-19,23
X	US 2002/186884 A1 (SHAKED DORON [IL] ET AL) 12 December 2002 (2002-12-12) paragraph [0006] - paragraph [0018]; figures 3-6 paragraph [0033] - paragraph [0037]  -----	1-21, 23-25
X	HAN PENGFEI ET AL: "L-split marker for augmented reality in aircraft assembly", OPTICAL ENGINEERING, SOC. OF PHOTO-OPTICAL INSTRUMENTATION ENGINEERS, BELLINGHAM, vol. 55, no. 4, 1 April 2016 (2016-04-01), page 43110, XP060072969, ISSN: 0091-3286, DOI: 10.1117/1.OE.55.4.043110 [retrieved on 2016-04-29] Sections 2.1, 3; figures 1,2,15,18  -----	1-21, 23-25
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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

**Annex to Form PCT/ISA/206  
COMMUNICATION RELATING TO THE RESULTS  
OF THE PARTIAL INTERNATIONAL SEARCH**

International Application No  
PCT/GB2018/052383

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>FILIPPO BERGAMASCO ET AL: "Image-Space Marker Detection and Recognition Using Projective Invariants", 3D IMAGING, MODELING, PROCESSING, VISUALIZATION AND TRANSMISSION (3DIMPVT), 2011 INTERNATIONAL CONFERENCE ON, IEEE, 16 May 2011 (2011-05-16), pages 381-388, XP031896509, DOI: 10.1109/3DIMPVT.2011.55 ISBN: 978-1-61284-429-9 Section II</p> <p align="center">-----</p>	1-21,24,25

# Patent Family Annex

Information on patent family members

International Application No <b>PCT/GB2018/052383</b>
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 03087991	A2	23-10-2003	
		AU 2003234699 A1	27-10-2003
		US 2003219145 A1	27-11-2003
		WO 03087991 A2	23-10-2003
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US 2002186884	A1	12-12-2002	
		EP 1399873 A1	24-03-2004
		JP 2004530227 A	30-09-2004
		US 2002186884 A1	12-12-2002
		WO 02101632 A1	19-12-2002
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Application no:  
Demande n°: PCT/GB2018/052383  
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**.

**Reference** is made to the following **documents**:

- D1 WO 03/087991 A2 (ESCHER GROUP LTD [US]) 23 October 2003
- D2 US 2002/186884 A1 (SHAKED DORON [IL] ET AL) 12 December 2002
- D3 HAN PENGFEI ET AL: "L-split marker for augmented reality in aircraft assembly", OPTICAL ENGINEERING, SOC. OF PHOTO-OPTICAL INSTRUMENTATION ENGINEERS, BELLINGHAM, vol. 55, no. 4, April 2016
- D4 FILIPPO BERGAMASCO ET AL: "Image-Space Marker Detection and Recognition Using Projective Invariants", 3D IMAGING, MODELING, PROCESSING, VISUALIZATION AND TRANSMISSION (3DIMPVT), 2011 INTERNATIONAL CONFERENCE ON, IEEE, 16 May 2011, pages 381-388

**Re Item IV**

**Lack of unity of invention**

- 1 The subject matter of **claim 1 is considered to be a matter of common knowledge** as it merely defines dotted fiducial markers indicating the position of data to be read. It is disclosed for instance in **D1** as follows:

*An optically readable marker (9 in Figs. 1, 2, 3) comprising:*

*data to be extracted (27 in Figs. 2 and 3); and*

*an identifier arranged to identify a location of the data to be extracted, wherein the identifier comprises a plurality of dots arranged in a set pattern, and wherein the dots are small compared to the size of the data to be extracted (fiducial points 22 in Figs. 2 and 3).*

- 2 Corresponding **method claim 17 is provided in D1** as well (page 12, lines 27 to 29).

- 3 The application claims **two contributions** with respect to this common knowledge:

**I. a specific configuration of fiducial points: claims 4 and 6 to 11**, pages 14 to 18 in description, Figures 3 to 5;

**II. a method of dot detection**, the modified "FAST" algorithm, **claim 22**, pages 19 to 22, Figures 6, 7.

- 4 The two subjects do not share a common inventive concept, the only link being provided through the subject matter of claim 1, which is a matter of common knowledge (fiducial marker points). The current application is **non-unitary in the sense of Rule 13 PCT**.

- 5 For the purpose of the search all claims but claim 22 are grouped with the first invention.

## Re Item V

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

#### Re. D1

- 6 As noted above, **D1 teaches the subject matter of independent claims 1 and 17.** The subject matter of **independent claim 23 and dependent claims 2, 6 to 8, 13 and 17 to 19** are disclosed in the same passages (see Fig. 3 in particular).  
**The subject matter of these claims is therefore not new (Art. 33(1) and (2) PCT) with respect to D1.**

#### Re. D2

- 7 D2 discloses a marker (comprising text) and an identifier for a marker made out of dots completely surrounding the marker (see Fig. 4). A method of detecting the dots and the identifier is also provided (Fig. 5). Any of the sides of the rectangle can be considered as the subset of at least three collinear dots optionally claimed in claims 9 and 10.  
It is therefore noted that **the subject matter of claims 1 to 13, 17 to 21 and 23 lacks novelty (Art. 33(1) and (2) PCT) with respect to D2.**
- 8 **Claims 14 to 16** define obvious analogous uses for markers; **the subject matter of these claims lacks therefore an inventive step (Art. 33(1) and (3) PCT).**

#### Re. D3 and D4

- 9 Both D3 and D4 disclose markers (n.b. the terminology is different, the markers of D3 and D4 correspond to the identifier of the claims) for augmented reality (see abstracts) made out of patterns comprising collinear dots (the L-shaped corners of D3 comprise at least three collinear dots - see Fig. 2, as do the sides of the square in D4 - Fig. 1(e)).
- 10 D3 also teaches that those markers comprise data inside (including text, Fig. 18); this is otherwise obvious for Augmented Reality markers (see e.g. <https://en.wikipedia.org/w/index.php?title=ARToolkit&oldid=787438905>, see also 2.1 in D3).
- 11 It is therefore concluded that **with respect to D3 the subject matter of claims 1 to 15, 17 to 21, 23 and 25 lacks novelty (Art. 33(1) and (2) PCT)**, and that **the subject matter of claims 14 to 16, 24 and 25 lacks inventive step ((Art. 33(1) and (3) PCT - see argument in 8 above).**
- 12 Furthermore **the subject matter of claims 1 to 21 and 23 to 25 is deemed to lack an inventive step (Art. 33(1) and (3) PCT) with respect to D4** (see 8 and 10 above).