

**UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION**

KAIFI LLC,

Plaintiff,

vs.

AMAZON.COM, INC.; AMAZON.COM
SERVICES LLC; and AMAZON WEB
SERVICES, INC., unit

Defendants.

Case No. 2:24-cv-00542

**DEFENDANTS' INITIAL INVALIDITY CONTENTIONS AND ADDITIONAL
DISCLOSURES PURSUANT TO LOCAL PATENT RULES FOR U.S. PATENT NO.
7,689,001**

I. INTRODUCTION

Pursuant to the Court's Discovery Order (Dkt. No. 39), the Court's Docket Control Order (Dkt. No. 37), this District's Patent Local Rules, and Plaintiff KAIFI LLC's ("KAIFI") Initial Infringement Contentions (served November 14, 2024), Defendants Amazon.com, Inc., Amazon.com Services LLC, and Amazon Web Services, Inc. (collectively, "Defendants" or "Amazon") submit the following Initial Invalidity Contentions and additional disclosures relative to U.S. Patent No. 7,689,001, claims 1-3, 5, 7-8, and 10-11 (the claims currently alleged by KAIFI to be infringed).

KAIFI's Initial Infringement Contentions are deemed to be its final contentions pursuant to Patent Local Rule 3-6. Should KAIFI supplement its Initial Infringement Contentions with additional infringement theories with respect to the asserted claims (by Court order or otherwise), Defendants reserve the right to supplement their Initial Invalidity Contentions to assert invalidity of those additional claims and/or to assert invalidity based on the additional infringement theories. Defendants also reserve the right to supplement their Initial Invalidity Contentions in response to information learned in fact or expert discovery, including identification of additional prior art. Defendants note that KAIFI has not provided contentions that comply with the Patent Local Rules, and as such Defendants have endeavored to include invalidity contentions showing that the theories that KAIFI appears to be pursuing read directly on prior art method and systems, including (1) the Kiva system that was created between 2002 and 2005, which, inexplicably, is accused of infringement despite being prior art; and (2) the well-known ARToolKit process for determining a user's location by taking a photograph of a bar code.

These Initial Invalidity Contentions are also submitted in compliance with and in satisfaction of the notice requirements of 35 U.S.C. § 282(c). These Initial Invalidity Contentions include and incorporate Defendants' claim charts for the '001 Patent, which are being served together with these Contentions.

II. PRELIMINARY MATTERS

Defendants' Initial Invalidity Contentions are based in whole or in part on its present understanding of the asserted claims and KAIFI's Initial Infringement Contentions, including the priority dates of each of the patents-in-suit as asserted by KAIFI in its Initial Infringement Contentions. That said, Defendants dispute that the asserted claims of the patents-in-suit are entitled to the priority dates that KAIFI has asserted in its infringement contentions. Defendants further dispute that the asserted claims of the patents-in-suit are entitled to claim priority to the provisional patent applications to which they purport to claim priority.

Defendants' Initial Invalidity Contentions are responsive at least to the same level of specificity as KAIFI's Initial Infringement Contentions. Defendants' Initial Invalidity Contentions may also take into account KAIFI's apparent claim constructions, to the extent KAIFI's constructions can be gleaned from KAIFI's Initial Infringement Contentions or other allegations. Such apparent constructions may be inconsistent with the constructions that Defendants ultimately will proffer in this case. By including prior art that would anticipate or render obvious the asserted claims of the patents-in-suit based on KAIFI's disclosed and apparent claim constructions, or based on any other particular claim construction, Defendants are not adopting KAIFI's claim constructions, nor are Defendants admitting to the accuracy of any particular claim construction. Solely for the purpose of these Initial Invalidity Contentions, Defendants may, if necessary, apply alternative, and even inconsistent, claim construction positions. Defendants reserve all rights to

further amend these Initial Invalidity Contentions after the Court issues its claim construction ruling, or if the Court permits KAIFI to amend its Initial Infringement Contentions.

Defendants, however, do not concede that KAIFI's Infringement Contentions provide the requisite level of specificity, and Defendants provide these Initial Invalidity Contentions without waiving any right to receive from KAIFI full and complete specific infringement contentions. Moreover, nothing herein admits in any way that any of the accused devices or methods, or any of Defendant's other devices or methods, infringe any of the asserted claims.

B. Ongoing Investigation

Defendants' discovery and investigation in connection with this lawsuit is continuing. Thus, these Invalidity Contentions are based on information obtained to date. Among other things, discovery is still underway, witnesses remain to be deposed, and the Court has not yet construed any terms of the patents-in-suit. Accordingly, Defendants' Initial Invalidity Contentions are subject to modification, amendment, or supplementation in accordance with the Court's Docket Control Order, the Local and Patent Rules of the Eastern District of Texas, and/or the Federal Rules of Civil Procedure as this action progresses and additional information is obtained.

III. DISCLOSURES PURSUANT TO P.R. 3-3

A. Disclosures Pursuant to P.R. 3-3(a)

Pursuant to P.R. 3-3(a), Defendants identify the following prior art to the '001 Patent. Defendants contend that the prior art references and systems disclosed below all generally relate to using cameras to take pictures of tags and determine a users' location. As such, the below-disclosed pieces of prior art, collectively, are all relevant at least as background of the art to the '001 Patent, irrespective of the sub-section in which they are expressly cited. Defendants expressly reserve the right to at least use and rely on any of the prior art cited herein to establish or otherwise

support Defendants' contentions as to what was known in the state of the art during the pertinent time frame for the '001 Patent.

1. Prior Art Patents and Published Patent Applications

The following prior art patents and published patent applications are relevant to the invalidity of the asserted claims of the '001 Patent.

Reference	Number	Origin	Title	Inventor	Date of Issue or Publication
Mountz	7,402,018	US	Inventory System with Mobile Drive Unit and Inventory Holder	Michael Mountz et al.	July 22, 2008 (issued from application filed Oct. 14, 2004)
Emmanuel	7,845,560	US	Method and apparatus for determining position and rotational orientation of an object	Emmanuel et al.	December 7, 2010 (claims priority to provisional application dated December 3, 2005).
Ihara	6,650,776	US	Two-dimensional code recognition processing method, two-dimensional code recognition processing apparatus, and storage medium	Ihara et al.	November 18, 2003
Kuno	4,771,307	US	Automatic focusing system for use in camera	Kuno et al.	September 13, 1988
Devos	5,137,354	US	Computer aided three dimensional positioning sensing system and method	deVos et al.	August 11, 1992
Sheynblat	6,67,894	US	Method and apparatus for providing location-based information via a computer network	Sheynblat et al.	January 13, 2004.

Reference	Number	Origin	Title	Inventor	Date of Issue or Publication
Dempski	20040183751	US	Industrial Augmented Reality	Kelly Dempski	September 23, 2004
Kim	20070276558	US	Navigation system for position self control robot and floor materials for providing absolute coordinates used thereof	Kyoung-Koun Kim	November 29, 2007
Song	7480958	US	Robot cleaner, robot cleaning system and method of controlling same	Jeong-gon Song	January 27, 2009

2. Non-Patent Prior Art Publications

The following non-patent prior art publications are relevant to the invalidity of the asserted claims of the '001 Patent:

Reference	Title	Author	Publication Date	Publisher
Maeda	Tracking of User Position and Orientation by Stereo Measurement of Infrared Markers and Orientation Sensing	Maeda et al.	Oct. 31, 2004	IEEE/Int'l Symposium on Wearable Computing
Nakazato	Localization of Wearable Users Using Invisible Retro-reflective Markers and an IR Camera	Nakazato et al.	March 22, 2005	SPIE/ Stereoscopic Displays and Virtual Reality Systems XII
Kato	Marker Tracking and hmd calibration for video-based augmented reality conferencing system	Kato et al.	Oct. 20, 1999	IEEE/ACM Int. Workshop on Augmented Reality
Wagner	First Steps Towards Handheld Augmented Reality	Wagner et al.	Oct. 21, 2003	IEEE/Int'l Symposium on Wearable

Reference	Title	Author	Publication Date	Publisher
				Computers
Abdullah	Camera Self-Calibration for the ARToolKit	Abdullah et al.	Sept. 29, 2002	IEEE/Int'l Workshop Augmented Reality Toolkit
ARToolKit User Documentation	ARToolKit User Documentation	Human Interface Technology Laboratory	2000	Human Interface Technology Laboratory
Reitmayr	Location based Applications for Mobile Augmented Reality	Reitmayr et al.	Feb. 1, 2003	ACM / 4 th Australasian user interface conference.
Neumann 96	A Self-Tracking Augmented Reality System	Neumann et al.	July 1, 1996	ACM/Virtual Reality Software and Technology
Azuma 97	A Survey of Augmented Reality	Azuma et al.	August 1997	MIT Press
Foxlin 98	Constellation™: A Wide-Range Wireless Motion Tracking System for Augmented Reality and Virtual Set Applications	Foxlin et a.,	July 19, 1998	ACM / SIGGRAPH
Cho	A Multi-ring Color Fiducial System and An Intensity-invariant Detection Method for Scaleable Fiducial-Tracking Augmented Reality	Cho et al.	Oct. 20, 1999	IEEE/Int'l Workshop Augmented Reality
Foxlin 02	Generalized Architecture for Simultaneous Localization, Auto-Calibration, and Map-building	Eric Foxlin	Oct. 2, 2002	IEEE/RSJ Conference on Intelligent Robots and Systems
Rolland	A Survey of Tracking Technology for Virtual	Rolland et al.	Dec. 31, 2000	CRC Press

Reference	Title	Author	Publication Date	Publisher
	Environments in Fundamentals of Wearable Computers and Augmented Reality			
Rekimoto	CyberCode: Designing Augmented Reality Environments with Visual Tags	Rekimoto et al.	Apr. 1, 2000	ACM/DARE 2000 on Designing augmented reality environments
Neumann 99	Augmented Reality Tracking in Natural Environments	Neumann et al.	Mar. 9, 1999	IEEE/Int'l Symposium on Mixed Reality
Tenmoku	Nara Palace Site Navigator: Device-Independent Human Navigation)) Using a Networked Shared Database	Tenmoku et al.	2004	IOS Press
Foxlin 03	VIS-Tracker: A Wearable Vision-Inertial Self Tracker	Foxlin and Naimark	March 22, 2003	IEEE/Virtual Reality Conference
Rao	Vision-based System for Head Pose Tracking in Indoor Immersive Environments	Rao et al.	Nov. 30, 2004	IEEE/Proceedings of the 14th International Conference on Artificial Reality and Telexistence
Ababsa	Robust Camera Pose Estimation Using 2D Fiducials Tracking for Real-Time Augmented Reality Systems	Ababsa and Mallem	Aug. 8, 2004	ACM/SIGGRAPH
Signpost Web Page	Handheld Augmented Reality AR on truly Mobile Devices	Daniel Wagner	Nov. 29, 2004	Studierstube.org
Bishop	Self-Tracker: A Smart Optical Sensor on Silicon	Gary Bishop	1984	University of North Carolina
Makynen	Laser-radar-based three-dimensional sensor for teaching	Makynen et al.	September 1995	SPIE / Optical Engineering

Reference	Title	Author	Publication Date	Publisher
	robot paths			
Thomas	ARQuake: An Outdoor/Indoor Augmented Reality First Person Application	Thomas et al.	Oct. 16-17, 2000	IEEE/ Fourth International Symposium on Wearable Computers
Baczyk	Vision-Based Mobile Robot Localization with Simple Artificial Landmarks	Vaczyk et al.	September 2003	Elsevier / IFAC Proceedings
Lin	Localization of Mobile Robot based on ID Tag and WEB Camera	Lin et al.	Dec. 1, 2004	IEEE / Conference on Robotics, Automation and Mechatronics

3. Items Offered for Sale or Publicly Used or Known

A number of systems are prior art to the '001 Patent under at least 35 U.S.C. §§ 102(a), (b), (e), and/or (g), and anticipate and/or render obvious all asserted claims of '001 Patent. These systems include physical implementations of prior art patents, patent applications, and publications identified herein that were known, made, used, sold, offered for sale, or imported into this country prior to the effective filing date of the '001 Patent, including those described by the prior art patents, patent applications, and publications listed in the previous section.

Defendants further identify the following products that were sold, offered for sale, publicly used, or known that incorporate the claimed elements of the '001 Patent.

No.	System or Product	Date of First Offer or Public Disclosure	Circumstances
1	Kiva Robotic Drive Unit	2004/2005	The accused Kiva Robotic Drive units were first offered for sale no later than

No.	System or Product	Date of First Offer or Public Disclosure	Circumstances
			late 2004 or early 2005. The offers (which were accepted) were made to Staples (an office supply store) and Genco (a logistics company affiliated with Hershey) to conduct a paid beta test at their facilities. Those tests were successful and resulted in a contract to install a Kiva system that was signed in September or October 2005. Amazon anticipates that further discovery will reveal additional Kiva says or offers to sell. Additionally, Kiva's guided robotic drive units were demonstrated to a reporter from the Boston Globe, who publicly wrote about Kiva's warehouse operations on October 20, 2005.
2	Tinmith / ARQuake	2000	The ARQuake system (described in the Thomas reference) was developed in the early 2000s. It was developed at the University of South Australia and is associated with an Australian company called Tinmith. Defendants are currently investigating whether it was publicly known, used, or offered for sale in the United States.
3	SignPost	2002	The SignPost System (described in a number of references above, including Wagner and Kalkusch) was developed in 2002 in Austria. Defendants are currently investigating whether it was publicly known, used, or offered for sale in the United States.

Defendants continue to investigate the identities of the individuals or entities involved in the first sale, offer for sale, or public use of prior art products that incorporate the claimed elements of the '001 Patent, and Defendants will continue to produce additional documents relating to the invalidity of the asserted claims by those products as they become available. Defendants also note that several companies not listed here may have prior art systems, such as

Sky-Trax Inc. (i.e., the company that owns the '560 patent). Additionally, if KAIFI presents new or different infringement contentions, that could bring in additional prior art systems such as those created by iSense (the company owned by Eric Foxlin). Defendants reserve the right to provide additional invalidity contention information as additional information becomes available. Defendants also reserve the right to rely on any of the documents associated with these systems to the extent those documents qualify as printed publications.

4. Prior Inventions under 35 U.S.C. § 102(a)/ 102(g).

Defendants identify the following additional prior art systems under 35 U.S.C.

§ 102(a)/(g) (pre-AIA).

No.	System or Product	Persons involved / Circumstances
1	Kiva Robotic Drive Unit	To the extent the robotic drive units accused of infringement art found to practice one or more of the asserted claims, those claims are anticipated and/or obvious in view of the Kiva Robotic Drive Unit. This drive unit included the same type of downward-facing camera and floor fiducials that have been accused of infringement by KAIFI. Thus, if the functionality in Amazon.com Services LLC's robotic drive units infringes, the claims are invalid because those products use prior art technology to achieve the functions described in the infringement contentions. This system was created between 2002 and 2005, and the functionality that is accused of infringement was proposed in 2004 and reduced to practice no later than early 2005. Early Kiva robotic drive unit/fiducial prototypes existed no later than 2003.
2	Tinmith / ARQuake	The ARQuake system (described in the Thomas reference) was developed in the early 2000s. It was developed at the University of South Australia and is associated with an Australian company called Tinmith. Defendants are currently investigating whether it qualifies as an invention in this country.
3	SignPost	The SignPost System (described in a number of references above, including Wagner and Kalkusch) was developed in 2002 in Austria. Defendants are currently investigating whether it was publicly known, used, or offered for sale in the United States.

No.	System or Product	Persons involved / Circumstances
4	ARToolKit	The ARToolKit was an augmented reality toolkit that was developed by University of Washington researchers in 1999, and has been updated since that time. The ARToolKit provided other researchers with the ability to determine a camera's location based on a fiducial with a known location. Systems that used this ability include the SignPost and ARQuake systems as well as many others. The ARToolKit system as it existed as of the priority date of the '001 patent anticipates or renders obvious the claims of the asserted patents.

B. Disclosures Pursuant to P.R. 3-3(b)

Pursuant to P.R. 3-3(b), the prior art at issue in these contentions anticipates and/or renders obvious the asserted claims of the '001 Patent as follows:

Prior Arte	Claims Anticipated	Claims Rendered Obvious
Maeda	1-3, 5, 7-8, 10-11	1-3, 5, 7-8, 10-11
Maeda + Nakazato		1-3, 5, 7-8, 10-11
Maeda + Kato (with or without Nakazato)		1-3, 5, 7-8, 10-11
Emanuel + Ihara		1, 2, 5, 7, 8, 10
Emanuel + Ihara and Kuno		1, 3, 4, 8-10
Emanuel + Ihara and deVos		1, 6, 8, 12
Emanuel + Ihara and Shynblat		8, 11
Mountz	1-3, 5, 7-8, 10-11	1-3, 5, 7-8, 10-11
Kiva Robotic Drive Unit	1-3, 5, 7-8, 10-11	1-3, 5, 7-8, 10-11
Kiva Robotic Drive Unit + combined ARToolkit Art	1-3, 5, 7-8, 10-11	1-3, 5, 7-8, 10-11
Wagner	1-3, 5, 7-8, 10-11	1-3, 5, 7-8, 10-11
Wagner + Kalkusch	1-3, 5, 7-8, 10-11	1-3, 5, 7-8, 10-11

Prior Arte	Claims Anticipated	Claims Rendered Obvious
Wagner + Kalkusch + Abdullah		3
Wagner + Kalkusch + 2000 ARToolKit (with or without Adullah)	1-3, 5, 7-8, 10-11	1-3, 5, 7-8, 10-11
2000 ARToolkit		1-3, 8
Rekimoto		1-2, 7-8, 10-11
Tenmoku	1, 8	1,2, 5, 7-8, 10
Ababsa	1, 8	1,8
Reitmayr	1-2, 7-8, 11	1-2, 7-8, 11
Combined teachings of ARToolkit References		1-3, 5, 7-8, 10-11
Signpost	1-3, 5, 7-8, 10-11	1-3, 5, 7-8, 10-11
Combined teachings of Signpost references		1-3, 5, 7-8, 10-11
Tinmith /ARQuake	1, 8	1, 8
Thomas	1, 8	1,8
Lin	1-3, 5, 7-8, 11	1-3, 5, 7-8, 11
Kim	1-3, 5, 7-8, 10	1-3, 5, 7-8, 10

The claims of the '001 Patent are entitled to the following priority dates: November 28, 2005 or September 7, 2006, depending on how the claims are construed.

For example, to the extent one of the camera systems of the prior art is found not to disclose a particular claim element, it would have been obvious to substitute that camera system with one from another prior art reference, as that would be nothing more than a simple substitution.

To the extent the direction or distance measuring technique of the prior art is found not to satisfy a particular claim element, it would have been obvious to substitute such technique with another one from the prior art, again as that would be a simple substitution.

To the extent that the prior art software or mathematical techniques for determining camera pose from an image of a known marker (e.g., ARToolKit) is found not to satisfy a given claim limitation, it would have been obvious to substitute ARToolKit for another technique that determines camera pose from an image of a known marker, as such techniques are interchangeable and a simple substitute for one another.

As another example, it would have been obvious to combine all of the ARToolKit-using references together, such that the combined teachings of the references render the asserted claims obvious. The references all concern the same authors and subject matter and thus there is an implied suggestion to read the references together as a unified whole. Additionally, any improvement described in one of the ARToolKit papers would have been obvious to apply to another of the ARToolkit papers.

As another example, it would have been obvious to combine all of the Signpost references together, such that the combined teachings of the references render the asserted claims obvious. The references all concern the same authors and subject matter and thus there is an implied suggestion to read the references together as a unified whole. Additionally, any improvement described in one of the Signpost papers would have been obvious to apply to another of the Signpost papers.

As another example, it would have been obvious to combine the Kiva system and Mountz teachings together, as they both concern the same general subject matter (the Kiva system)

It further would have been obvious to substitute any of the markers (or “fiducials”) from any of the cited references and use such marker with any of the other references, as that would be nothing more than using the marker/fiducial for its intended purpose with a high chance of success.

Additionally, for the system grounds, to the extent they are argued to be missing or non-enabling relative to the step of determining a user or mobile terminal’s location, it would have been obvious to combine those references with references such as Kato, Maeda, or Kalkusch, which describe the process for determining location from an image of a known marker at a known location (assuming that the marker is properly formatted).

Additionally, to the extent any of the references do not adequately describe how to reconstruct the camera’s position from a photograph of a 2D bar code, it would have been obvious to used teachings such as Kato, Maeda, Lin, 2000 ARToolKit User Documentation, Foxlin 03, Kalkusch, or other references that describe the well-known process for determining location from a bar code-based location tag. That process involves (1) identifying potential square-shaped tags; (2) determining the relative orientation and distance of the tag relative to the camera based on the matrix mathematical equations described in the references listed above (this process uses the *border around* the 2D bar code); (3) determining the location of the 2D bar code in the real world based on coordinates encoded in the 2D bar code or obtained from a local or remote database of tag (or “fiducial”) locations; and (4) using the tag location information data from step (3) and the distance/orientation information from step (2) to determine exactly where the user of the camera is located. Note that the same process could be used to determine the position of a camera mounted on a robot.

In addition, to the extent that one of the anticipation or obviousness grounds listed above is found to be missing an element, it would have been obvious to further combine the prior art as follows:

For any of the references in Appendix A that does not disclose *1[pre]. A method for recognizing a location by a mobile terminal having a built-in camera, the method comprising:* (i.e., “Recognizing a Location” functionality), it would have been obvious to combine them with other references that do. For example, to the extent any of Maeda, Wagner, Kiva, Mountz, Kalkusch, Emanuel, 2000 ARToolKit User Documentation, Reitmayr, Rekimoto 00, Tenmoku, SignPost, Kiva Robotic Drive Unit, and Lin (collectively, and for purposes of this limitation only, “List A”) disclose a system that otherwise satisfies the claim elements except for this one, then it would have been obvious to combine these references with Maeda, Wagner, Kiva, Mountz, Kalkusch, Emanuel, Ihara, 2000 ARToolKit User Documentation, Ababsa, Azuma 97, Bishop, Cho, Foxlin 02, Foxlin 03, Kato, Makynen, Nakazato, Neumann 02, Rao, Reitmayr, Rekimoto 00, Rolland, Signpost Web Page, Tenmoku, Thomas, SignPost, Kiva Robotic Drive Unit, Baczyk, Dempski, Kim, Lin, and Song (collectively, and for purposes of this paragraph only, “List B”). Such a combination would be nothing more than combining prior art elements (i.e., the claimed Recognizing a Location from any of the references in List B) according to known methods (i.e., adding Recognizing a Location functionality as disclosed in the prior art) to achieve a predictable result (i.e., the claimed Recognizing a Location functionality). Such a combination would be mere use of a known technique (using the claimed Recognizing a Location functionality from List B) to improve devices from List A. In addition, it would have been obvious to do a simple substitution of any of the Recognizing a Location elements from any of the references in List B with any of the other Recognizing a Location elements in List B.

[1a] a) photographing a location recognition tag storing location recognition information; (i.e., “Tag Photographing” functionality), it would have been obvious to combine them with other references that do. For example, to the extent any of Maeda, Wagner, Kiva, Mountz, Kalkusch, Emanuel, 2000 ARToolKit User Documentation, Reitmayr, Rekimoto 00, Tenmoku, SignPost, Kiva Robotic Drive Unit, and Lin (collectively, and for purposes of this limitation only, “List A”) disclose a system that otherwise satisfies the claim elements except for this one, then it would have been obvious to combine these references with Maeda, Wagner, Kiva, Mountz, Kalkusch, Emanuel, 2000 ARToolKit User Documentation, Ababsa, Azuma 97, Bishop, Cho, Foxlin 02, Foxlin 03, Kato, Makynen, Nakazato, Neumann 02, Rao, Reitmayr, Rekimoto 00, Rolland, Signpost Web Page, Tenmoku, Thomas, SignPost, Kiva Robotic Drive Unit, Baczyk, Dempski, Kim, Lin, and Song (collectively, and for purposes of this paragraph only, “List B”). Such a combination would be nothing more than combining prior art elements (i.e., the claimed Tag Photographing from any of the references in List B) according to known methods (i.e., adding Tag Photographing functionality as disclosed in the prior art) to achieve a predictable result (i.e., the claimed Tag Photographing functionality). Such a combination would be mere use of a known technique (using the claimed Tag Photographing functionality from List B) to improve devices from List A. In addition, it would have been obvious to do a simple substitution of any of the Tag Photographing elements from any of the references in List B with any of the other Tag Photographing elements in List B.

[1b] b) measuring a distance to the location recognition tag; (i.e., “Distance Measuring” functionality), it would have been obvious to combine them with other references that do. For example, to the extent any of Maeda, Wagner, Kiva, Mountz, Kalkusch, Emanuel, 2000 ARToolKit User Documentation, Reitmayr, Rekimoto 00, Tenmoku, SignPost, Kiva Robotic

Drive Unit, and Lin (collectively, and for purposes of this limitation only, “List A”) disclose a system that otherwise satisfies the claim elements except for this one, then it would have been obvious to combine these references with Maeda, Wagner, Kiva, Mountz, Kalkusch, Emanuel, 2000 ARToolKit User Documentation, Ababsa, Azuma 97, Cho, Foxlin 02, Foxlin 03, Foxlin 98, Makynen, Nakazato, Neumann 02, Rao, Reitmayr, Rekimoto 00, Rolland, Signpost Web Page, Tenmoku, Thomas, SignPost, Kiva Robotic Drive Unit, Baczyk, Dempksi, Kim, Lin, and Song (collectively, and for purposes of this paragraph only, “List B”). Such a combination would be nothing more than combining prior art elements (i.e., the claimed Distance Measuring from any of the references in List B) according to known methods (i.e., adding Distance Measuring functionality as disclosed in the prior art) to achieve a predictable result (i.e., the claimed Distance Measuring functionality). Such a combination would be mere use of a known technique (using the claimed Distance Measuring functionality from List B) to improve devices from List A. In addition, it would have been obvious to do a simple substitution of any of the Distance Measuring elements from any of the references in List B with any of the other Distance Measuring elements in List B.

[1c] c) analyzing an image of the photographed location recognition tag, and obtaining location information corresponding to the location recognition tag; (i.e., “Image Analyzing” functionality), it would have been obvious to combine them with other references that do. For example, to the extent any of Maeda, Wagner, Kiva, Mountz, Kalkusch, Emanuel, 2000 ARToolKit User Documentation, Reitmayr, Rekimoto 00, Tenmoku, SignPost, Kiva Robotic Drive Unit, and Lin (collectively, and for purposes of this limitation only, “List A”) disclose a system that otherwise satisfies the claim elements except for this one, then it would have been obvious to combine these references with Maeda, Wagner, Kiva, Mountz, Kalkusch, Emanuel,

2000 ARToolKit User Documentation, Ababsa, Cho, Foxlin 03, Nakazato, Rao, Reitmayr, Rekimoto 00, Rolland, Signpost Web Page, Tenmoku, Thomas, SignPost, Kiva Robotic Drive Unit, Baczyk, Dempski, Kim, Lin, and Song (collectively, and for purposes of this paragraph only, “List B”). Such a combination would be nothing more than combining prior art elements (i.e., the claimed Image Analyzing from any of the references in List B) according to known methods (i.e., adding Image Analyzing functionality as disclosed in the prior art) to achieve a predictable result (i.e., the claimed Image Analyzing functionality). Such a combination would be mere use of a known technique (using the claimed Image Analyzing functionality from List B) to improve devices from List A. In addition, it would have been obvious to do a simple substitution of any of the Image Analyzing elements from any of the references in List B with any of the other Image Analyzing elements in List B.

[1d] d) obtaining direction information of the photographed location recognition tag; and(i.e., “Obtaining Direction Information” functionality), it would have been obvious to combine them with other references that do. For example, to the extent any of Maeda, Wagner, Kiva, Mountz, Kalkusch, Emanuel, 2000 ARToolKit User Documentation, Reitmayr, Rekimoto 00, Tenmoku, SignPost, Kiva Robotic Drive Unit, and Lin (collectively, and for purposes of this limitation only, “List A”) disclose a system that otherwise satisfies the claim elements except for this one, then it would have been obvious to combine these references with Maeda, Wagner, Kiva, Mountz, Kalkusch, Emanuel, 2000 ARToolKit User Documentation, Ababsa, Cho, Foxlin 02, Foxlin 03, Kato, Makynen, Nakazato, Neumann 02, Rao, Reitmayr, Rekimoto 00, Rolland, Signpost Web Page, Tenmoku, Thomas, SignPost, Kiva Robotic Drive Unit, Baczyk, Dempski, Kim, Lin, and Song (collectively, and for purposes of this paragraph only, “List B”). Such a combination would be nothing more than combining prior art elements (i.e., the claimed Obtaining

Direction Information from any of the references in List B) according to known methods (i.e., adding Obtaining Direction Information functionality as disclosed in the prior art) to achieve a predictable result (i.e., the claimed Obtaining Direction Information functionality). Such a combination would be mere use of a known technique (using the claimed Obtaining Direction Information functionality from List B) to improve devices from List A. In addition, it would have been obvious to do a simple substitution of any of the Obtaining Direction Information elements from any of the references in List B with any of the other Obtaining Direction Information elements in List B.

[1e] e) calculating a mobile terminal location by using the distance information measured in b), the location information obtained in c), and the direction information obtained in d). (i.e., “Location Calculating” functionality), it would have been obvious to combine them with other references that do. For example, to the extent any of Maeda, Wagner, Kiva, Mountz, Kalkusch, Emanuel, 2000 ARToolKit User Documentation, Reitmayr, Rekimoto 00, Tenmoku, SignPost, Kiva Robotic Drive Unit, and Lin (collectively, and for purposes of this limitation only, “List A”) disclose a system that otherwise satisfies the claim elements except for this one, then it would have been obvious to combine these references with Maeda, Wagner, Kiva, Mountz, Kalkusch, Emanuel, 2000 ARToolKit User Documentation, Ababsa, Cho, Foxlin 02, Foxlin 03, Foxlin 98, Kato, Nakazato, Neumann 02, Rao, Reitmayr, Rekimoto 00, Rolland, Tenmoku, Thomas, SignPost, Kiva Robotic Drive Unit, Baczyk, Dempksi, Kim, Lin, and Song (collectively, and for purposes of this paragraph only, “List B”). Such a combination would be nothing more than combining prior art elements (i.e., the claimed Location Calculating from any of the references in List B) according to known methods (i.e., adding Location Calculating functionality as disclosed in the prior art) to achieve a predictable result (i.e., the claimed Location Calculating functionality).

Such a combination would be mere use of a known technique (using the claimed Location Calculating functionality from List B) to improve devices from List A. In addition, it would have been obvious to do a simple substitution of any of the Location Calculating elements from any of the references in List B with any of the other Location Calculating elements in List B.

2. The method of claim 1, wherein the direction information obtained in d) is offset information of an offset state of the location recognition tag based on the mobile terminal, and the offset information is obtained by analyzing a photographing angle of the photographed location recognition tag. (i.e., “Offset Information” functionality), it would have been obvious to combine them with other references that do. For example, to the extent any of Maeda, Wagner, Kiva, Mountz, Kalkusch, Emanuel, 2000 ARToolKit User Documentation, Reitmayr, Rekimoto 00, SignPost, Kiva Robotic Drive Unit, and Lin (collectively, and for purposes of this limitation only, “List A”) disclose a system that otherwise satisfies the claim elements except for this one, then it would have been obvious to combine these references with Maeda, Wagner, Kiva, Mountz, Kalkusch, Emanuel, 2000 ARToolKit User Documentation, Ababsa, Foxlin 02, Foxlin 98, Kato, Nakazato, Neumann 02, Neumann 96, Rao, Reitmayr, Rekimoto 00, Rolland, SignPost, Kiva Robotic Drive Unit, Dempski, Kim, Lin, and Song (collectively, and for purposes of this paragraph only, “List B”). Such a combination would be nothing more than combining prior art elements (i.e., the claimed Offset Information from any of the references in List B) according to known methods (i.e., adding Offset Information functionality as disclosed in the prior art) to achieve a predictable result (i.e., the claimed Offset Information functionality). Such a combination would be mere use of a known technique (using the claimed Offset Information functionality from List B) to improve devices from List A. In addition, it would have been obvious to do a simple

substitution of any of the Offset Information elements from any of the references in List B with any of the other Offset Information elements in List B.

3. The method of claim 1, wherein the distance information in b) is measured by the camera when an auto focusing operation of the camera is performed. (i.e., “Auto Focusing” functionality), it would have been obvious to combine them with other references that do. For example, to the extent any of Maeda, Kiva, Mountz, Emanuel, 2000 ARToolKit User Documentation, SignPost, Kiva Robotic Drive Unit, and Lin (collectively, and for purposes of this limitation only, “List A”) disclose a system that otherwise satisfies the claim elements except for this one, then it would have been obvious to combine these references with Maeda, Kiva, Mountz, Abdullah, Emanuel, Kuno, 2000 ARToolKit User Documentation, Ababsa, Cho, Neumann 96, SignPost, Kiva Robotic Drive Unit, Kim, Lin (collectively, and for purposes of this paragraph only, “List B”). Such a combination would be nothing more than combining prior art elements (i.e., the claimed Auto Focusing from any of the references in List B) according to known methods (i.e., adding Auto Focusing functionality as disclosed in the prior art) to achieve a predictable result (i.e., the claimed Auto Focusing functionality). Such a combination would be mere use of a known technique (using the claimed Auto Focusing functionality from List B) to improve devices from List A. In addition, it would have been obvious to do a simple substitution of any of the Auto Focusing elements from any of the references in List B with any of the other Auto Focusing elements in List B.

5. The method of claim 1, wherein the location recognition tags are arranged so that a desired precision for using the location recognition tags at a predetermined physical area may be achieved, and the location recognition tags are formed as one-dimensional or two-dimensional barcode types. (i.e., “Desired Precision” functionality), it would have been obvious to combine them with other references that do. For example, to the extent any of Maeda, Wagner, Kiva,

Mountz, Kalkusch, Emanuel, Reitmayr, Tenmoku, SignPost, Kiva Robotic Drive Unit, and Lin (collectively, and for purposes of this limitation only, “List A”) disclose a system that otherwise satisfies the claim elements except for this one, then it would have been obvious to combine these references with Maeda, Nakazato, Wagner, Kiva, Mountz, Kalkusch, Emanuel, Azuma 97, Cho, Foxlin 03, Reitmayr, Signpost Web Page, Tenmoku, SignPost, Kiva Robotic Drive Unit, Kim, Lin, and Song (collectively, and for purposes of this paragraph only, “List B”). Such a combination would be nothing more than combining prior art elements (i.e., the claimed Desired Precision from any of the references in List B) according to known methods (i.e., adding Desired Precision functionality as disclosed in the prior art) to achieve a predictable result (i.e., the claimed Desired Precision functionality). Such a combination would be mere use of a known technique (using the claimed Desired Precision functionality from List B) to improve devices from List A. In addition, it would have been obvious to do a simple substitution of any of the Desired Precision elements from any of the references in List B with any of the other Desired Precision elements in List B.

7. The method of any one of claim 1 to claim 6, wherein the location recognition tag stores location information of one among an absolute location coordinate and a logic location coordinate. (i.e., “Coordinate Information” functionality), it would have been obvious to combine them with other references that do. For example, to the extent any of Maeda, Wagner, Kiva, Mountz, Kalkusch, Emanuel, Reitmayr, Rekimoto 00, Tenmoku, SignPost, Kiva Robotic Drive Unit, and Lin (collectively, and for purposes of this limitation only, “List A”) disclose a system that otherwise satisfies the claim elements except for this one, then it would have been obvious to combine these references with Maeda, Wagner, Kiva, Mountz, Kalkusch, Emanuel, Ababsa, Foxlin 03, Nakazato, Rao, Reitmayr, Rekimoto 00, Tenmoku, SignPost, Kiva Robotic Drive Unit, Baczyk, Dempksi, Kim, Lin, and Song (collectively, and for purposes of this paragraph only, “List

B”). Such a combination would be nothing more than combining prior art elements (i.e., the claimed Coordinate Information from any of the references in List B) according to known methods (i.e., adding Coordinate Information functionality as disclosed in the prior art) to achieve a predictable result (i.e., the claimed Coordinate Information functionality). Such a combination would be mere use of a known technique (using the claimed Coordinate Information functionality from List B) to improve devices from List A. In addition, it would have been obvious to do a simple substitution of any of the Coordinate Information elements from any of the references in List B with any of the other Coordinate Information elements in List B.

8[pre]. A location recognition device for recognizing a location by using a built-in camera, the location recognition device comprising: (i.e., “Location Recognition Device” functionality), it would have been obvious to combine them with other references that do. For example, to the extent any of Maeda, Wagner, Kiva, Mountz, Kalkusch, Emanuel, 2000 ARToolKit User Documentation, Reitmayr, Rekimoto 00, Tenmoku, SignPost, Kiva Robotic Drive Unit, and Lin (collectively, and for purposes of this limitation only, “List A”) disclose a system that otherwise satisfies the claim elements except for this one, then it would have been obvious to combine these references with Maeda, Wagner, Kiva, Mountz, Kalkusch, Emanuel, Ihara, 2000 ARToolKit User Documentation, Ababsa, Azuma 97, Cho, Foxlin 02, Foxlin 03, Makynen, Nakazato, Neumann 02, Rao, Reitmayr, Rekimoto 00, Rolland, Tenmoku, Thomas, SignPost, Kiva Robotic Drive Unit, Baczyk, Dempksi, Kim, Lin, and Song (collectively, and for purposes of this paragraph only, “List B”). Such a combination would be nothing more than combining prior art elements (i.e., the claimed Location Recognition Device from any of the references in List B) according to known methods (i.e., adding Location Recognition Device functionality as disclosed in the prior art) to achieve a predictable result (i.e., the claimed Location Recognition Device functionality). Such a combination would be

mere use of a known technique (using the claimed Location Recognition Device functionality from List B) to improve devices from List A. In addition, it would have been obvious to do a simple substitution of any of the Location Recognition Device elements from any of the references in List B with any of the other Location Recognition Device elements in List B.

[8a] an image photographing unit for photographing a plurality of location recognition tags that are arranged in a predetermined physical area and respectively store location recognition information, and for performing a digital image process; (i.e., “Image Photographing Unit” functionality), it would have been obvious to combine them with other references that do. For example, to the extent any of Maeda, Wagner, Kiva, Mountz, Kalkusch, Emanuel, 2000 ARToolKit User Documentation, Reitmayr, Rekimoto 00, Tenmoku, SignPost, Kiva Robotic Drive Unit, and Lin (collectively, and for purposes of this limitation only, “List A”) disclose a system that otherwise satisfies the claim elements except for this one, then it would have been obvious to combine these references with Maeda, Wagner, Kiva, Mountz, Kalkusch, Emanuel, Ihara, 2000 ARToolKit User Documentation, Ababsa, Azuma 97, Cho, Foxlin 02, Foxlin 03, Makynen, Nakazato, Neumann 02, Rao, Reitmayr, Rekimoto 00, Rolland, Tenmoku, Thomas, SignPost, Kiva Robotic Drive Unit, Baczyk, Dempksi, Kim, Lin, and Song (collectively, and for purposes of this paragraph only, “List B”). Such a combination would be nothing more than combining prior art elements (i.e., the claimed Image Photographing Unit from any of the references in List B) according to known methods (i.e., adding Image Photographing Unit functionality as disclosed in the prior art) to achieve a predictable result (i.e., the claimed Image Photographing Unit functionality). Such a combination would be mere use of a known technique (using the claimed Image Photographing Unit functionality from List B) to improve devices from List A. In addition, it would have been obvious to do a simple substitution of any of the Image

Photographing Unit elements from any of the references in List B with any of the other Image Photographing Unit elements in List B.

[8b] a distance measuring unit for measuring a distance to the location recognition tag; (i.e., “Distance Measuring Unit” functionality), it would have been obvious to combine them with other references that do. For example, to the extent any of Maeda, Wagner, Kiva, Mountz, Kalkusch, Emanuel, 2000 ARToolKit User Documentation, Reitmayr, Rekimoto 00, Tenmoku, SignPost, Kiva Robotic Drive Unit, and Lin (collectively, and for purposes of this limitation only, “List A”) disclose a system that otherwise satisfies the claim elements except for this one, then it would have been obvious to combine these references with Maeda, Wagner, Kiva, Mountz, Kalkusch, Emanuel, 2000 ARToolKit User Documentation, Ababsa, Azuma 97, Cho, Foxlin 02, Foxlin 03, Foxlin 98, Makynen, Nakazato, Neumann 02, Rao, Reitmayr, Rekimoto 00, Rolland, Tenmoku, Thomas, SignPost, Kiva Robotic Drive Unit, Baczyk, Dempksi, Kim, Lin, and Song (collectively, and for purposes of this paragraph only, “List B”). Such a combination would be nothing more than combining prior art elements (i.e., the claimed Distance Measuring Unit from any of the references in List B) according to known methods (i.e., adding Distance Measuring Unit functionality as disclosed in the prior art) to achieve a predictable result (i.e., the claimed Distance Measuring Unit functionality). Such a combination would be mere use of a known technique (using the claimed Distance Measuring Unit functionality from List B) to improve devices from List A. In addition, it would have been obvious to do a simple substitution of any of the Distance Measuring Unit elements from any of the references in List B with any of the other Distance Measuring Unit elements in List B.

[8c] an image analyzing unit for analyzing an image of the location recognition tag processed by the image photographing unit, and obtaining corresponding location information

and direction information of the location recognition tag; and(i.e., “Image Analyzing Unit” functionality), it would have been obvious to combine them with other references that do. For example, to the extent any of Maeda, Wagner, Kiva, Mountz, Kalkusch, Emanuel, 2000 ARToolKit User Documentation, Reitmayr, Rekimoto 00, Tenmoku, SignPost, Kiva Robotic Drive Unit, and Lin (collectively, and for purposes of this limitation only, “List A”) disclose a system that otherwise satisfies the claim elements except for this one, then it would have been obvious to combine these references with Maeda, Nakazato, Kato, Wagner, Kiva, Mountz, Kalkusch, Emanuel, 2000 ARToolKit User Documentation, Ababsa, Cho, Kato, Makynen, Nakazato, Neumann 02, Rao, Reitmayr, Rekimoto 00, Rolland, Tenmoku, Thomas, SignPost, Kiva Robotic Drive Unit, Baczyk, Dempski, Kim, Lin, and Song (collectively, and for purposes of this paragraph only, “List B”). Such a combination would be nothing more than combining prior art elements (i.e., the claimed Image Analyzing Unit from any of the references in List B) according to known methods (i.e., adding Image Analyzing Unit functionality as disclosed in the prior art) to achieve a predictable result (i.e., the claimed Image Analyzing Unit functionality). Such a combination would be mere use of a known technique (using the claimed Image Analyzing Unit functionality from List B) to improve devices from List A. In addition, it would have been obvious to do a simple substitution of any of the Image Analyzing Unit elements from any of the references in List B with any of the other Image Analyzing Unit elements in List B.

[8d] a location recognizing unit for recognizing a user location by using distance information measured by the distance measuring unit, and the location information and the direction information obtained by the image analyzing unit. (i.e., “Location Recognizing Unit” functionality), it would have been obvious to combine them with other references that do. For example, to the extent any of Maeda, Wagner, Kiva, Mountz, Kalkusch, Emanuel, 2000

ARToolKit User Documentation, Reitmayr, Tenmoku, SignPost, Kiva Robotic Drive Unit, and Lin, and Song (collectively, and for purposes of this limitation only, “List A”) disclose a system that otherwise satisfies the claim elements except for this one, then it would have been obvious to combine these references with Maeda, Nakazato, Kato, Wagner, Kiva, Mountz, Kalkusch, Emanuel, 2000 ARToolKit User Documentation, Ababsa, Cho, Foxlin 02, Foxlin 03, Kato, Nakazato, Neumann 02, Rao, Reitmayr, Rolland, Tenmoku, Thomas, SignPost, Kiva Robotic Drive Unit, Baczyk, Dempski, Kim, Lin, and Song (collectively, and for purposes of this paragraph only, “List B”). Such a combination would be nothing more than combining prior art elements (i.e., the claimed Location Recognizing Unit from any of the references in List B) according to known methods (i.e., adding Location Recognizing Unit functionality as disclosed in the prior art) to achieve a predictable result (i.e., the claimed Location Recognizing Unit functionality). Such a combination would be mere use of a known technique (using the claimed Location Recognizing Unit functionality from List B) to improve devices from List A. In addition, it would have been obvious to do a simple substitution of any of the Location Recognizing Unit elements from any of the references in List B with any of the other Location Recognizing Unit elements in List B.

10. The location recognition device of claim 8, further comprising a tag location information storage unit for storing location coordinate information of a location of the location recognition tag, and logic location coordinate information corresponding to the location coordinate information. (i.e., “Information Storage Unit” functionality), it would have been obvious to combine them with other references that do. For example, to the extent any of Maeda, Wagner, Kiva, Mountz, Kalkusch, Emanuel, Reitmayr, Rekimoto 00, Tenmoku, SignPost, and Kiva Robotic Drive Unit (collectively, and for purposes of this limitation only, “List A”) disclose a system that otherwise satisfies the claim elements except for this one, then it would have been

obvious to combine these references with Maeda, Wagner, Kiva, Mountz, Kalkusch, Emanuel, Reitmayr, Rekimoto 00, Tenmoku, SignPost, Kiva Robotic Drive Unit, Kim (collectively, and for purposes of this paragraph only, “List B”). Such a combination would be nothing more than combining prior art elements (i.e., the claimed Information Storage Unit from any of the references in List B) according to known methods (i.e., adding Information Storage Unit functionality as disclosed in the prior art) to achieve a predictable result (i.e., the claimed Information Storage Unit functionality). Such a combination would be mere use of a known technique (using the claimed Information Storage Unit functionality from List B) to improve devices from List A. In addition, it would have been obvious to do a simple substitution of any of the Information Storage Unit elements from any of the references in List B with any of the other Information Storage Unit elements in List B.

11. The location recognition device of claim 8 or claim 10, wherein the location recognizing unit transmits the information obtained by the image analyzing unit to an external location managing server, receives location information calculated by the external location managing server, and recognizes a user location. (i.e., “Location Managing Server” functionality), it would have been obvious to combine them with other references that do. For example, to the extent any of Wagner, Kiva, Mountz, Kalkusch, Emanuel, Rekimoto 00, SignPost, Kiva Robotic Drive Unit, and Lin (collectively, and for purposes of this limitation only, “List A”) disclose a system that otherwise satisfies the claim elements except for this one, then it would have been obvious to combine these references with Wagner, Kiva, Mountz, Kalkusch, Emanuel, Sheynblat, Rekimoto 00, Signpost Web Page, SignPost, Kiva Robotic Drive Unit, Dempksi, Lin (collectively, and for purposes of this paragraph only, “List B”). Such a combination would be nothing more than combining prior art elements (i.e., the claimed Location Managing Server from any of the

references in List B) according to known methods (i.e., adding Location Managing Server functionality as disclosed in the prior art) to achieve a predictable result (i.e., the claimed Location Managing Server functionality). Such a combination would be mere use of a known technique (using the claimed Location Managing Server functionality from List B) to improve devices from List A. In addition, it would have been obvious to do a simple substitution of any of the Location Managing Server elements from any of the references in List B with any of the other Location Managing Server elements in List B.

C. Disclosures Pursuant to P.R. 3-3(c)

The claim charts in the Appendices identify where in each of the charted prior art references the limitations of the asserted claims of the '001 Patent are found. As discussed below and certain of the accompanying claim charts, the following claim terms are or may be governed by 35 U.S.C.

§ 112 ¶ 6:

- (Claim 8) a distance measuring unit for measuring a distance to the location recognition tag;
- (Claim 8) an image analyzing unit for analyzing an image of the location recognition tag processed by the image photographing unit, and obtaining corresponding location information and direction information of the location recognition tag;
- (Claim 8) a location recognizing unit for recognizing a user location by using distance information measured by the distance measuring unit, and the location information and the direction information obtained by the image analyzing unit;

- (Claim 10) a tag location information storage unit for storing location coordinate information of a location of the location recognition tag, and logic location coordinate information corresponding to the location coordinate information; and
- (Claim 11) wherein the location recognizing unit transmits the information obtained by the image analyzing unit to an external location managing server, receives location information calculated by the external location managing server, and recognizes a user location.

The claim charts identify the structure(s), act(s), or material(s) in each item of prior art that performs the claimed function.

Defendants have endeavored to cite to the most relevant portions of the identified prior art. However, other portions of the identified prior art may additionally disclose, either expressly or inherently, one or more elements or limitations of the asserted claims. In an effort to focus the issues, Defendants identify only exemplary portions of the identified prior art. To the extent it is found a charted reference does not expressly disclose certain claim limitations, such limitations are inherent. Defendants reserve the right to rely on uncited portions of the identified prior art to establish the invalidity of the asserted claims. Moreover, Defendants reserve the right to rely on uncited portions of the identified prior art, rely on other references (irrespective of whether such references themselves qualify as prior art) to show the state of the art, and/or to rely on expert or fact testimony to provide context to, or aid in, understanding the cited portions of the identified prior art. Where Defendants cite to a particular drawing or figure in the attached claim charts, the citation encompasses the description of the drawing or figure, as well as any text associated with the drawing or figure. Similarly, where Defendants cite to particular text concerning a drawing or figure, the citation encompasses that drawing or figure as well.

Relatedly, it is often the case that certain portions of patent disclosures build upon other disclosures – even if they are referred to as a separate or alternative embodiment. Thus, Defendants’ citations to structures or functions incorporate by reference all disclosures to related structures or functions, including any additional detail provided as to the operation or design of those structures or functions. Further, citations in each dependent claim include citations to each claim from which it directly or indirectly depends. And citations as to any recited limitation, step, or component in the claims apply wherever each such limitation, step, or component is repeatedly recited elsewhere in the claim.

D. Disclosures Pursuant to P.R. 3-3(d)

Pursuant to Patent Local Rule 3-3(d), Defendants hereby identify grounds of invalidity based on (1) lack of written description and enablement under 35 U.S.C. § 112, ¶ 1; and (2) indefiniteness under 35 U.S.C. § 112, ¶ 2. These Initial Invalidity Contentions shall not be construed as an admission that any claim construction advanced by Defendants in this case or in related proceedings is in any way inconsistent, flawed, or erroneous. Nor should these contentions prevent Defendants from advancing claim construction and/or noninfringement positions in lieu of, or in addition to, invalidity positions. Further, these Initial Invalidity Contentions shall not be construed as an admission of or acquiescence to KAIFI’s purported construction of the claim language or of other positions advanced by KAIFI during the course of this litigation. Indeed, Defendants’ Invalidity Contentions under 35 U.S.C. § 112 may depend on the Court’s claim construction, as well as KAIFI’s asserted claim scope.

Below, Defendants identify the issues under 35 U.S.C. § 112 of which they are presently aware. Pursuant to the applicable provisions of the Docket Control Order and Local Rules, Defendants reserve the right to supplement or amend their contentions after the Court’s *Markman* ruling or if KAIFI amends or alters its infringement contentions in any way.

1. Written Description and Enablement

To satisfy the written description requirement of pre-AIA 35 U.S.C. § 112, ¶ 1, the specification of a patent must “clearly allow persons of ordinary skill in the art to recognize that the inventor invented what is claimed” and “had possession of the claimed subject matter as of the filing date.” *Ariad Pharm., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (en banc). In particular, an adequate written description must “demonstrate that the patentee possessed the full scope of the invention recited in [the] claim.” *LizardTech*, 424 F.3d at 1345. To satisfy the enablement requirement, “the specification of a patent must teach those skilled in the art how to make and use the full scope of the claimed invention without undue experimentation.” *Genentech, Inc. v. Novo Nordisk A/S*, 108 F.3d 1361, 1365 (Fed. Cir. 1997) (quotations omitted); *see also Amgen v. Sanofi*, 143 S.Ct. 1243 (2023) (“If a patent claims an entire class of processes, machines, manufactures, or compositions of matter, the patent’s specification must enable a person skilled in the art to make and use the entire class. In other words, the specification must enable the full scope of the invention as defined by its claims. The more one claims, the more one must enable.”).

The specification of the ’001 Patent fails to meet the written description and enablement requirements of 35 U.S.C. § 112 ¶ 1 because it fails to disclose, enable or teach—or fails to disclose, enable or teach the full scope of—the asserted claims for the following reason:

- The claims are invalid overall because they appear to cover two separate scenarios, but only describe the first. The ’001 patent describes the scenario of a user taking a manual picture of a location tag, and then the system determining the user’s location based on the photograph. However, the specification does not describe how the claimed functionality might be used with an augmented reality system, which uses location tags to continuously track a user’s location. As described in the above references, at the time of the claimed

invention, using video images of locations tags was a common way to precisely and continuously track a user's location for use in an augmented reality system. The '001 patent does not describe or enable such continuous video tracking, even though its claims are broad enough to cover them (if its claims have the breadth which KAIFI attributes to them).

- The claims also lack written description because they do not describe or enable the full scope of location measurement techniques using photographs of location tags (alone or in combination with other distance measurement techniques). While one particular technique is described—using a photograph of a location tag along with an autofocus or other range sensor—that does not a fair representation of the scope of potential techniques that were known at the time for measuring location, distance, and direction, including, without limitation, stereoscopic measurement, Extended Kalman Filters, the multitude of techniques for SLAM (“simultaneous location and mapping”), 3-point or 4-point position determinations, or any of the other techniques that a POSITA would understand to be in play for determining location from a photograph of a location tag.
- Claims 1 and 8 and their dependents lack written description and enablement because the '001 patent attempts to cover the use of all distance measurement techniques including the use of ultrasonic waves to measure distance (claim 4) even though that method is not mentioned or described in the '001 patent itself.
- Claims 1 and 8 and their dependents lack written description and enablement to the extent they are interpreted to cover anything other than a human user of a terminal. The '001 patent expressly distinguishes its teachings from prior art systems that use cameras mounted on robots to determine position. '001 patent at 1:54-64. The remainder of the

'001 patent is expressly focused on human users, as shown, e.g., in Figure 1 (showing how humans determine position; Figure 2 (showing a human with a mobile device); Figure 5 (showing human with mobile device); throughout the patent (showing repeated references to “user location,” such as in the “Field of the Invention” section at 1:18-23); Figure 7-8 and associated text at 7:10-22 and 8:8-13 (describing how a user selects the location to photograph using a menu on the terminal). There is no indication that the named inventors had even thought of or had possession of, let alone enabled, a version of their system that would use a robot/camera combination.

- Claim 5 lacks enablement of its full scope because the term “desired precision” has no upper limit. The '001 patent does not describe any specific precision that is enabled, such as 5-meter, 1-meter, 5cm, 1cm, 1mm, etc. Although a gross precision such as 5-meter was likely enabled, higher precisions such as 1-meter or 5cm likely were not. A POSITA would have recognized that different triangulation algorithms were known to have varying levels uncertainty. Additional sources of uncertainty would be introduced by the camera, by imprecision or error in tag placement. The '001 patent does not address these details, and thus does not enable the full scope of the precision claimed by claim 5.
- Claims 1-12 are invalid due to lack enablement and written description because they all purport to cover the concepts claimed in dependent claims 6 and 12. Specifically, the terms “triangulation measuring algorithm” in claim 6 and “triangular measuring algorithm” in claim 12 lack enablement and written description, and as a result their parent claims fail to enable or describe the full scope of what they claim. First, it is unclear what a “triangular measuring algorithm” in claim 6 actually is; the '001 patent briefly mentions a “triangulation measuring algorithm” but not a “triangular measuring algorithm,” and

“triangular measuring algorithm” is not a term of art. Second, even if this term refers to a triangulation measuring algorithm, the named inventors did not describe or enable the full scope of that term. There are many sophisticated algorithms for determining position in space using angles and other information. See, e.g., Rekimoto, J. and Ayatsuka, Y., *CyberCode: Designing Augmented Reality Environments with Visual Tags*, ACM Proc. of DARE 2000 at 8 (April 2000); Foxlin, Motion Tracking Requirements and Technologies at 37, available at <https://web.archive.org/web/20040206105733/http://www.isense.com/company/papers/Motion%20Tracking%20Survey%20Chapter.pdf> (explaining that there are many types of determining location and orientation including “trilateration,” “triangulation,” and the “perspective-n-point-problem,” also called the “exterior orientation problem” or “space resection problem.” Foxlin identifies the field of determining position from camera images as “very complex, and the state of the art is still advancing.” *Id.* at 38. The ’001 patent’s attempt to cover all such methods violates the full scope enablement and written description requirements as to not just claims 6 and 12 but all the claims in the ’001 patent, which under the doctrine of claim differentiation and under 35 U.S.C. § 112 would include the subject matter of claims 6 and 12 within the scope of the “calculating a mobile terminal location” step of claim 1 or the “location recognizing unit” of claim 12.

2. Indefiniteness

“A patent is invalid for indefiniteness if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention.” *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2124 (2014). The patent itself must “describe the exact scope of an invention.”

Markman v. Westview Instruments, Inc., 517 U.S. 370, 373 (1996). “The definiteness requirement must take into account the inherent limitations of language,” but at the same time, “a patent must be precise enough to afford clear notice of what is claimed.” *Nautilus, Inc.*, 134 S.Ct. at 2128-29.

The following claim terms are indefinite because they fail to inform a person of ordinary skill the scope of the invention with reasonable certainty:

- Claims 1 and 8 are indefinite to the extent they are read as permitting the analysis step (c) to be performed on an image other than that obtained during photographing step;
- “Measuring a distance” in claims 1 and 8 is indefinite to the extent this term is understood to cover a system that takes pictures of a location tag from a fixed, known distance and direction, as there is no way that a POSITA would have fair warning that such a system would potentially read on such claim language;
- “Obtaining direction information” in claim 1 and “obtaining . . . direction information” in claim 8 are indefinite to the extent the terms are understood to cover a system that takes pictures of a location tag from a fixed, known distance and direction over the tag, as in such a system it is impossible to tell what the starting and ending point of the analysis should be. For example, the starting point for the “obtaining [...] direction information” could be (1) the center of the image sensor; (2) the center of the lens (which is an element of any terminal with a build-in camera); (3) the closest point of the camera unit to the closest point of the location recognition tag; (4) the center of mass of the mobile terminal; (5) the center of mass of a user holding the mobile terminal; (6) the spot directly underneath the center of mass of the mobile terminal; (7) the closest point of the camera unit to a center

point of the location recognition tag; and so forth. A POSITA would not be able to tell what the claimed “direction” was allegedly (particularly, since the camera is always pointed in the same direction).

- The term “auto focusing operation” in claim 3 is indefinite to the extent it is read to cover a system that relies on a fixed-focus camera, as a POSITA would not be able to determine what is and is not an “auto focusing operation” in such a system.
- The term “a desired precision” in claim 5 is indefinite because it does not permit a POSITA to understand what is, and what is not, covered by the claim language. There is no objective standard on which a POSITA would know, ex ante, what level of precision is covered by this claim. Indeed, the claim itself seems to rely on the subjective thoughts of the person or team implementing a tag-based position measuring system. The amount of precision that is “desired” will be application dependent. Some applications may only require a gross understanding of where the user is located, such as a system for locating a worker within a warehouse (as roughly illustrated in Figure 2. Other potential applications, such as tag-based augmented reality systems for surgery, might require higher precision, and all tracking systems would, broadly speaking, benefit from additional precision. However, the ’001 patent does not permit a POSITA to objectively ascertain what is the “desired” precision.

I. DISCLOSURES PURSUANT TO P.R. 3-4

Defendants’ Patent Local Rule 3-4(a)-(b) document production is being produced together with this submission.

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Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the above and foregoing document has been served on all counsel of record via email on January 16, 2025.

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