

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD., and
SAMSUNG ELECTRONICS, AMERICA, INC.,

Petitioners

v.

HERMES IP MANAGEMENT LLC,

Patent Owner

Case IPR2025-00953

U.S. Patent No. 9,613,060

**Declaration of William R. Michalson, Ph.D. in Support of
Petition for *Inter Partes* Review of
U.S. Patent No. 9,613,060**

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I, William R. Michalson of Douglas, Massachusetts, declare that:

I. ASSIGNMENT

1. I have been retained on behalf of Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc. (together, “Samsung”), to offer technical opinions related to U.S. Patent No 9,613,060 (“the ’060 patent”) (EX1001). I understand that Samsung is requesting that the Patent Trial and Appeal Board (“PTAB” or “Board”) institute an *inter partes* review (“IPR”) proceeding of the ’060 patent.

2. I have been asked to provide my independent analysis of the ’060 patent based on the prior art publications cited in this declaration.

3. I am not and never have been, an employee of Samsung. I received no compensation for this declaration beyond my normal hourly compensation based on my time actually spent analyzing the ’060 patent, the prior art publications cited below, and issues related thereto, and I will not receive any added compensation based on the outcome of any IPR or other proceeding involving the ’060 patent.

II. QUALIFICATIONS

4. I am over the age of 18 and am competent to write this declaration. I have personal knowledge, or have developed knowledge, of these technologies based upon education, training, or experience of the matters set forth herein.

5. I earned a B.S. in Electrical Engineering from Syracuse University in 1981, and an M.S. and a Ph.D. in Electrical Engineering from the Worcester Polytechnic Institute (WPI) in 1985 and 1989, respectively.

6. I am currently a tenured Professor in Robotics Engineering in the Robotics Engineering Department of WPI. I also hold appointments as a Professor of Computer Science, a Professor of Electrical and Computer Engineering, and as a Professor of Mechanical Engineering. At WPI, I perform research and teach in the areas of navigation, communications, and computer system design. I supervised the WPI Center for Advanced Integrated Radio Navigation (CAIRN), where I was developing a Public Safety Integration Center focused on the integration of communications, navigation, and information technologies for public safety applications. Currently I direct the Robot Communication and Navigation Laboratory where my research focuses on the development, testing, and evaluation of systems for both civilian and military applications with a special emphasis on techniques focused on indoor, underground, or otherwise GPS-denied situations. My interests in communication, navigation, and computing have led me to play an active role in the development of the Robotics Program at WPI, where I teach robotics courses at the graduate and undergraduate level.

7. Prior to joining the faculty of WPI, I worked at the Raytheon Company from 1981-1991, with a leave of absence between 1985-1988 to

complete my Doctoral Degree (Ph.D.) in Electrical Engineering from the Worcester Polytechnic Institute. Prior to my leave of absence, I worked as an Engineer in the Cursive Displays Department and the VLSI Design Department of the Computer and Displays Laboratory within Raytheon's Equipment Division. After receiving my Ph.D., I returned to the Equipment Division of the Raytheon Company where I was promoted to the title of Engineer, Design and Development. I was subsequently selected to sit on the engineering staff of the newly-formed System Engineering Department of the Division's Computer and Displays Laboratory. In this capacity, I acted primarily as a consultant to other departments within the laboratory, and my responsibilities ranged from leading the hardware and software development of supercomputer-class computer systems to performing applied research into the exploitation of new technology.

8. I have more than 40 years of experience in the field of computer technology, specifically in the specialized field of signal and data processing. I have consulted and served, including being qualified by courts, as an expert for numerous patent cases, including in patent cases involving motion sensing, positioning, map navigation technologies, and wireless communications a listing of which is set forth in my current curriculum vitae which is attached to this Declaration as Appendix A.

9. I hold a commercial General Radio Operator's license (with Ship RADAR Endorsement), an Extra Class Amateur Radio operator's license, and have held a Commercial Radiotelegraph Operators license. I was first licensed as a Radio Amateur in 1974 and have been involved in the design, implementation, and repair of radio systems, including radio-controlled systems, since that time.

10. I have been involved with numerous projects involving the tracking and control of remote objects, including objects traveling in the air, on the ground, and in the water. Starting with my work at Raytheon Company I was involved with the tracking of aircraft in both military and civilian air traffic control systems. I have worked on the guidance and control systems for multiple missile systems as well as the guidance and tracking systems for fire control systems and on spaceborne systems for tracking ballistic missiles. In my work at WPI, I have been involved with numerous projects related to tracking land, sea, and air vehicles using the GPS, inertial guidance systems, including using augmentations to the GPS. As outlined in my CV, I have decades of experience using cellular and other radio technologies for passing telemetry (such as audio, video, location, and other information relevant to understanding the status of a system), performing remote control, and performing geolocation.

11. I am a named inventor on nine patents, including patents on map navigation devices, geolocation systems, and high resolution and precision location

systems. I have authored, or co-authored, over 100 journal papers and conference publications, including papers and publications regarding positioning and navigation systems and methods. I am also the co-author of a chapter entitled “An Approach for Implementing a Reconfigurable Optical Interconnection Network for Massively Parallel Computers” in Optical Interconnection – Foundations and Approaches by C. Tocci and H. J. Caulfield Eds., Artech House, 1994. At WPI I have taught courses in Sensors, Circuits, and Systems, Digital Circuit Design, Embedded Computing, Computer Architecture, Computer, and Navigation. In addition, I have advised projects involving computer systems, navigation, and communications for a large variety of applications in the air, on land, and on the sea.

12. I have received numerous awards and recognition for my work, including becoming a Senior Member of the IEEE. In addition, I was awarded the Joseph Samuel Satin Distinguished Fellowship for the 1994-1995 academic year, and the Aldo Miccioli Fellowship from the Raytheon Company’s Equipment Division. I am also a member of the Institute of Navigation, the Royal Institute of Navigation, the American Society of Engineering Educators, the Society of Automotive Engineers, the Academy of Model Aeronautics, and the National Academy of Inventors.

13. My curriculum vitae, attached as Exhibit A, includes a list of publications on which I am a named author. It contains further details regarding my experience, education, publications, and other qualifications to provide an expert opinion in connection with this proceeding.

III. SUMMARY OF CONCLUSIONS FORMED

14. This Declaration explains the conclusions that I have formed based on my analysis. To summarize these conclusions:

- Ground 1A: Based upon my knowledge and experience and my review of the prior art publications in this declaration, I believe that claims 1, 4, 7-14 of the '060 patent are made obvious by *Singh* (EX1005) in view of *Abram* (EX1006) and *Odashima* (EX1007).
- Ground 1B: Based upon my knowledge and experience and my review of the prior art publications in this declaration, I believe that claims 1, 4, 7-14 of the '060 patent are made obvious by *Singh* (EX1005) in view of *Abram* (EX1006), *Ogura* (EX1008), and *Odashima* (EX1007).
- Ground 1C: Based upon my knowledge and experience and my review of the prior art publications in this declaration, I believe that claims 1, 4, 7-14 of the '060 patent are made obvious by *Singh* (EX1005) in view of *Abram* (EX1006), *Odashima* (EX1007), and *Bullock* (EX1009).
- Ground 1D: Based upon my knowledge and experience and my review of the prior art publications in this declaration, I believe that claims 1, 4, 7-14 of the '060 patent are made obvious by *Singh* (EX1005) in view of *Abram* (EX1006), *Ogura* (E1008), *Odashima* (EX1007), and *Bullock* (EX1009).
- Ground 2A: Based upon my knowledge and experience and my review of the prior art publications in this declaration, I believe that claims 3 and 6 of the '060 patent are made obvious by *Singh* (EX1005) in view of *Abram* (EX1006), *Odashima* (EX1007), and *Suomela* (EX1010).

- Ground 2B: Based upon my knowledge and experience and my review of the prior art publications in this declaration, I believe that claims 3 and 6 of the '060 patent are made obvious by *Singh* (EX1005) in view of *Abram* (EX1006), *Ogura* (EX1008), *Odashima* (EX1007), and *Suomela* (EX1010).
- Ground 2C: Based upon my knowledge and experience and my review of the prior art publications in this declaration, I believe that claims 3 and 6 of the '060 patent are made obvious by *Singh* (EX1005) in view of *Abram* (EX1006), *Odashima* (EX1007), *Bullock* (EX1009) and *Suomela* (EX1010).
- Ground 2D: Based upon my knowledge and experience and my review of the prior art publications in this declaration, I believe that claims 3 and 6 of the '060 patent are made obvious by *Singh* (EX1005) in view of *Abram* (EX1006), *Ogura* (EX1008), *Odashima* (EX1007), *Bullock* (EX1009) and *Suomela* (EX1010).

IV. LEVEL OF ORDINARY SKILL IN THE ART

15. I have been informed by Petitioners' counsel that a person of ordinary skill in the art is a hypothetical person who is presumed to have the skill and experience of an ordinary worker in the field at the time of the priority date of the challenged patent. I have been asked to assume for the purposes of this Petition that the priority date is April 19, 2005.

16. Based on my knowledge and experience in the field and my review of the '060 patent and file history, I believe that a person of ordinary skill in the art in this matter would have had at least a Bachelor's of Science Degree (or equivalent) in an academic area emphasizing electrical engineering, computer engineering, computer science, or a related technical field, and about 1-2 years of experience designing location-based systems (e.g. familiarity with wireless communications,

geolocation systems, and human-computer interfaces). A greater amount of education in an academic area emphasizing electrical engineering, computer engineering, computer science, or a related technical field, would compensate for fewer years of work experience, and more years of work experience would compensate for less education.

17. Based on my experiences, I have at least the skills of a person having ordinary skill in the art as well as a good understanding of the capabilities of a person having ordinary skill in the art. To be clear, all of my opinions in this declaration are from the perspective of one of ordinary skill in the art as I have defined it here during the relevant timeframe.

V. LEGAL PRINCIPLES

18. I am not an attorney and offer no legal opinions, but in the course of my work, I have had experience studying and analyzing patents and patent claims from the perspective of a person skilled in the art.

19. For the purposes of this declaration, I have been informed about certain aspects of the law that are relevant to forming my opinions. My understanding of the law is as follows.

20. Petitioner's counsel has informed me that for the prior art to inherently disclose a claimed limitation, the prior art need not expressly disclose the limitation, so long as the claimed limitation necessarily flows from a disclosure

in the prior art. I also understand that it is acceptable to examine evidence outside the prior art reference (extrinsic evidence) in determining whether a feature, while not expressly discussed in the reference, is necessarily present in that reference.

21. Petitioner's counsel has informed me that a patent claim can be considered to have been obvious to a person of ordinary skill in the art at the time the application was filed. I am informed that this means that, even if all of the requirements of a claim are not found in a single prior art reference, the claim is not patentable if the differences between the subject matter in the prior art and the subject matter in the claim would have been obvious to a person of ordinary skill in the art at the time of the invention.

22. I have been informed by Petitioners' counsel that a determination of whether a claim would have been obvious should be based upon several factors, including, among others:

- the level of ordinary skill in the art at the time the application was filed;
- the scope and content of the prior art; and
- what differences, if any, existed between the claimed invention and the prior art.

23. I have been informed by Petitioners' counsel that a single reference can render a patent claim obvious if any differences between that reference and the claims would have been obvious to a person of ordinary skill in the art.

Alternatively, I understand that the teachings of two or more references may be combined in the same way as disclosed in the claims, if such a combination would have been obvious to one having ordinary skill in the art. In determining whether a combination based on either a single reference or multiple references would have been obvious, it is appropriate to consider, among other factors:

- whether the teachings of the prior art references disclose known concepts combined in familiar ways, and when combined, would yield predictable results;
- whether a person of ordinary skill in the art could implement a predictable variation, and would see the benefit of doing so;
- whether the claimed elements represent one of a limited number of known design choices, and would have a reasonable expectation of success by those skilled in the art;
- whether a person of ordinary skill would have recognized a reason to combine known elements in the manner described in the claim;
- whether there is some teaching or suggestion in the prior art to make the modification or combination of elements claimed in the patent; and
- whether the innovation applies a known technique that had been used to improve a similar device or method in a similar way.

24. I have been informed by Petitioners' counsel that one of ordinary skill in the art has ordinary creativity and is not an automaton. Petitioner's counsel has also informed me that in considering obviousness, obviousness may not be determined using the benefit of hindsight, including hindsight derived from the patent being considered.

25. I have been informed by Petitioners' counsel that for a patent claim in a later-filed application to be entitled to the priority date of an earlier-filed application, the specification of the earlier-filed application must adequately support the patent claim of the later-filed application. This means that the specification of the earlier-filed application must provide an adequate written description of the invention claimed in the later-filed application.

26. I have been informed by Petitioners' counsel that the written description requirement is met if the applicant conveys in the specification with reasonable clarity to those skilled in the art that he or she possessed the claimed invention as of the filing date of the application. An applicant shows that one is "in possession" of the invention by describing the invention, with all its claimed limitations, not merely that which makes it obvious. A description that merely renders the later-filed claim obvious is not sufficient. One may satisfy the written description requirement with words, structures, figures, diagrams, and/or formulas that fully set forth the claimed invention. Although the exact terms of the claim

need not be recited verbatim in the specification, the specification must contain an equivalent description of the claimed subject matter.

27. I am also informed that the failure to include in the written description aspects of the claimed invention that would be routinely known and understood by one of ordinary skill in the art when the application was filed will not be fatal to the validity of the claim if such aspects are inherent to what was disclosed. To be inherent, the missing descriptive matter must necessarily be present in the specification such that one skilled in the art would recognize such a disclosure.

VI. MATERIALS CONSIDERED

28. My analysis and conclusions set forth in this declaration are based on my educational background and experiences in the field (see Section II). Based on my knowledge and experience, I believe that I am considered to be an expert in the field. Also, based on my knowledge and experience, I understand and know of the capabilities of persons of ordinary skill in the field since the early 2000s, and I taught, participated in organizations, and worked closely with many such persons in the field during that time frame.

29. As part of my independent analysis for this declaration, I have considered the following: the background knowledge/technologies that were commonly known to persons of ordinary skill in this art during the time before the earliest claimed priority date for the '060 patent; my own knowledge and

experiences gained from my work experience in the field of the '060 patent and related disciplines; and my experience in working with others involved in this field and related disciplines.

30. In addition, I have analyzed the following publications and materials:

- U.S. Patent No. 9,613,060 to Choi (“the '060 Patent”) (EX1001);
- The Prosecution History of the '060 Patent (“the Prosecution History”) (EX1004);
- U.S. Patent Publication No. 2007/0195373 (“*Singh*”) (EX1005);
- U.S. Patent No. 6,462,778 (“*Abram*”) (EX1006);
- Certified Translation of Japanese Application Publication No. 2004-234562 (“*Odashima*”) (EX1007);
- U.S. Patent No. 6,995,792 (“*Ogura*”) (EX1008);
- U.S. Patent No. 6,810,323 (“*Bullock*”) (EX1009);
- U.S. Patent No. 7,480,567 (“*Suomela*”) (EX1010);
- U.S. Patent Publication No. 2004/0114042 (“*Paolini*”) (EX1011);
- U.S. Patent No. 7,751,825 (“*Gogic*”) (EX1012);
- Decision on Appeal of Application No. 11/911,879 issued March 22, 2016 (EX1013);
- U.S. Patent Publication No. 2003/0147563 (“*Liu*”) (EX1014);
- U.S. Patent Publication No. 2005/0060299 (“*Filley*”) (EX1015);

- U.S. Patent Publication No. 2004/0092250 (“*Valloppilli*”) (EX1016);
- Y. Asakura and T. Iryo, *Tracking Individual Travel Behavior Using Mobile Phone*, International Journal of Urban Sciences 8(2), 121-130 (2004) (“*Asakura*”) (EX1017);
- T. Takasaki, *et al.*, *Wild animal tracking by PHS (Personal Handy phone System)*, Human Friendly Mechatronics, ICMA 2000, 43-48 (2001) (“*Takasaki*”) (EX1018);
- U.S. Patent Publication No. 2006/0140448 (“*Fujii*”) (EX1019);

and any other materials I refer to in this declaration in support of my opinions.

31. My analysis and conclusions set forth in this declaration are based on the perspective of a person having ordinary skill in the art.

VII. OVERVIEW OF THE '060 PATENT

A. THE SPECIFICATION

32. The '060 Patent discloses a system that provides “various services using photos taken by a camera phone [] including location information at the shooting time, with the photos taken by the camera phone.” '060 Patent, 1:16-20. The patent discloses known mobile communications terminals gaining additional functions:

Recently, as electronic parts become high sensitive, smaller and lighter, a mobile communication terminal is getting more downsized, and the function of the mobile communication terminal is getting

various according to the needs of consumers. In addition to a calling function of the mobile communication terminal, a game function, an Internet retrieving function, an e-mail receiving and transmitting function, payment-settling function, etc. become generalized. In addition, the mobile communication terminal (camera phone), additionally having a camera function shooting a shape of an object with an equipped camera lens and an image transmitting function transmitting the shape of the object shot by the camera to computers or others' mobile communication terminals, becomes commercialized.

'060 Patent, 1:24-37.

33. The patent says that conventional camera phones were limited because the photos only contained image data.

However, since the shot photo has only image information, the conventional camera phone is **limited to play a role of showing a user the image information or showing others only the shot photo** by transmitting the image information to their mobile communication terminals or computers.

'060 Patent. 1:38-42.¹

34. The '060 Patent teaches “a method of inserting and storing location information at the shooting time on the photo shot by a terminal equipped with a camera.”

¹ All emphasis added unless otherwise noted.

According to the present invention, by using **a method of inserting and storing the location information at the shooting time on the photo shot by the terminal equipped with the camera**, it is possible to provide various location-based services using the shot location information as well as view the corresponding photo.

'060 Patent, 1:57-62.

35. Using this location data, the patent discloses “showing the user the shot location by map” and “guiding the user to the location when the user or others view the shot photo through the terminal.”

The present invention is provided to overcome the foregoing stated limit which the conventional camera phone contains. The object of the present invention is to provide a service of **showing the user the shot location by map or guiding the user to the location when the user or others view the shot photo through the terminal**, by including station information of the shot location or global positioning information of a GPS terminal in the image information at the time of shooting the photo with the camera phone.

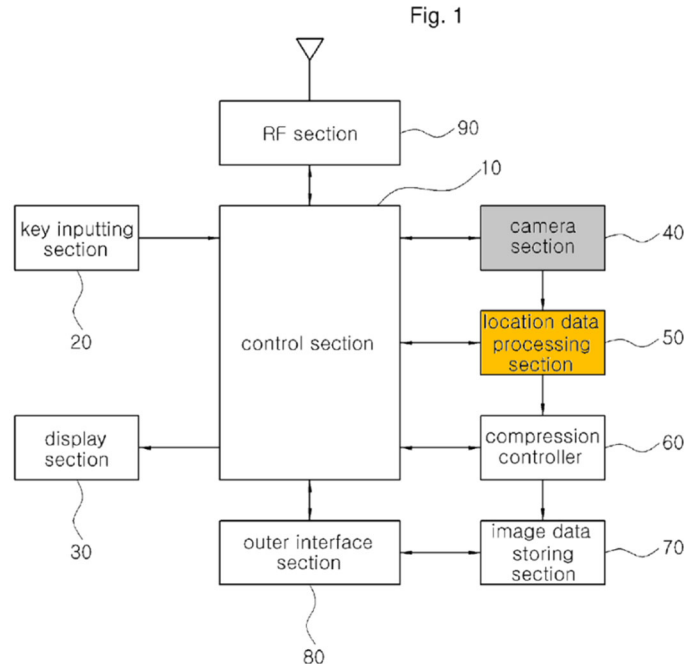
'060 Patent, 1:48-56.

The location-based service using the location information included in photo information enables the user who views the photo to obtain the geographical location information by providing map information on the shot location, and enables the user to get to the location as quickly as possible when the location in the photo catches the fancy of the

user by providing a service of guiding the user to the location in conjunction with a navigation system.

'060 Patent, 1:63-2:3.

36. The '060 Patent discloses terminals with various components including a camera section 40 (light grey), and a location data processing section 50 (orange).² '060 Patent, 3:8-14, 3:39-43, 3:44-67 (describing cell positioning system (CPS) and Global Positioning System (GPS)), FIG. 1.



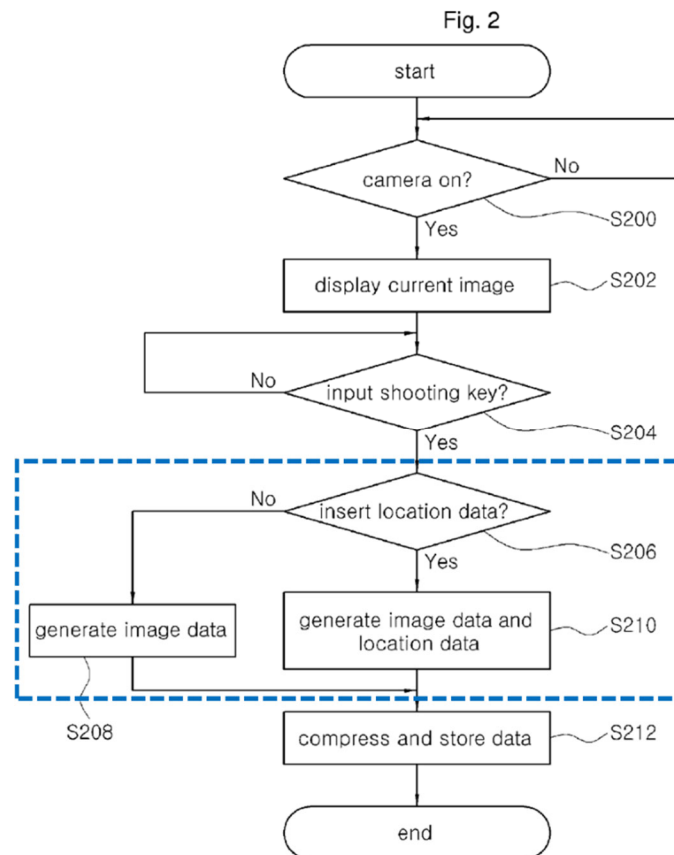
'060 Patent, FIG. 1 (annotated)

37. The patent discloses that after the user shoots a picture and acquires first image data, “a menu inquiring about whether to insert the location data is

² The patent mislabels reference 50 as “location information processing section” twice. '060 Patent, 3:35-43.

displayed,” allowing the user to choose to insert the location data into the first image data. ’060 Patent, 4:20-26 (S206). If the user chooses to insert the location data, the **location data processing section** inserts the location data into the first image data and generates second image data (S210). ’060 Patent, 4:26-29, FIG. 2 (annotated in dotted blue). The terminal then transmits the second image data.

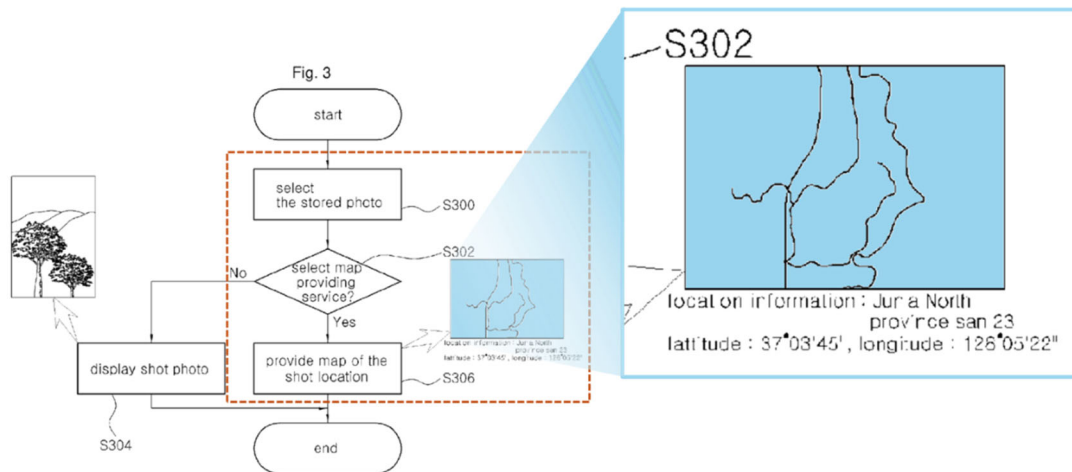
’060 Patent, 4:29-39, FIG. 2.



’060 Patent, FIG. 2 (annotated)

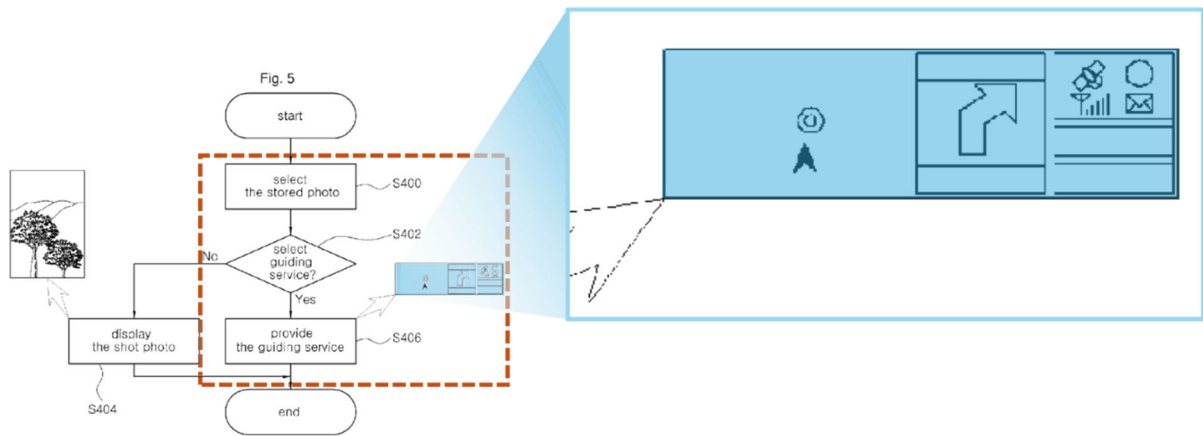
38. The ’060 Patent also discloses “providing a map of the shot location to the user” as one example of a **location-based service**. ’060 Patent, 2:42-46. At

the receiving terminal, a user selects the photo, which includes the first image data and the location data, and retrieves a map providing service so that “the map of the shot location is provided.” ’060 Patent, 4:44-60 (describing S306 FIG. 3). The patent discloses the **map (light blue)** can include traffic information and geographic information of the shot location. ’060 Patent, 4:57-60.



’060 Patent, FIG. 3 (excerpted and annotated)

39. The patent also discloses providing a **guiding service (light blue)**. ’060 Patent, 2:52-56. The user at the receiving terminal selects a photo and selects a **guiding service**. ’060 Patent, 5:20-34 (describing FIG. 5). The **guiding service** provides navigation data guiding the user to the location included in the photo. ’060 Patent, 5:27-34.



'060 Patent, FIG. 5 (excerpted and annotated)

B. THE CLAIMS

40. The table below includes identifiers for the '404 patent claims and limitations, which are referenced throughout.

Claim 1	
[1pre]	A location-based service method using image data provided by a terminal equipped with a camera, and using location data that includes location information of the terminal, comprising:
[1a]	generating first image data with the terminal at a predetermined location;
[1b]	receiving location data of the predetermined location;
[1c]	prompting a user to choose whether or not to insert the received location data into the first image data to generate a second image data and, when the user chooses to do so, inserting the received location data into the first image data to generate a second image data;
[1d]	transmitting the second image data, the second image data including the first image data and the location data, to another terminal;

Claim 1	
[1e]	receiving, at the another terminal, a selection input for an image corresponding to the second image data, from the user;
[1f]	displaying, at the another terminal, an image corresponding to the first image data, and a menu inquiring about whether to select a location-based service;
[1g]	receiving, at the another terminal, via the displayed menu, a selection input for the location-based service, from the user;
[1h]	receiving, at the another terminal, location-based service data corresponding to the location data of the selected second image data; and
[1i]	providing the location-based service to the another terminal by using the received location-based service data.

Claim 3	
[3]	The location-based service method according to claim 1, wherein the map includes at least one of geographical information, traffic information, administrative district information, and information including the latitude and the longitude of the location data.

Claim 4	
[4pre]	The location-based service method according to claim 1
[4a]	wherein the location-based service is a guiding service,
[4b]	wherein the receiving the selection input comprises transmitting a service request signal and the location data to a navigation system;
[4c]	wherein the navigation system provides a navigation data corresponding to the location data, as the location-based service data, and

Claim 4	
[4d]	wherein the providing the location-based service comprises providing the guiding service by means of a navigator of the another terminal, which is displayed on a display section of the another terminal.

Claim 6	
[6]	The location-based service method according to claim 4, wherein the navigation data comprises at least one of the information including the shortest route corresponding to the location data, traffic information and turnaround time.

Claim 7	
[7]	The location-based service method according to claim 1, wherein the location data are provided by a location data providing system.

Claim 8	
[8]	The location-based service method according to claim 7, wherein the location data providing system is configured to provide the location data of the terminal using a Cell Positioning System (CPS).

Claim 9	
[9]	The location-based service method according to claim 7, wherein the location data providing system is configured to provide the location data of the terminal using a Global Positioning System (GPS).

Claim 10

[10]	The location-based service method according to claim 1, wherein the location data includes information on latitude and longitude of the terminal or base station.
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Claim 11

[11]	The location-based service method according to claim 1, wherein the terminal equipped with the camera includes a camera phone or a digital camera.
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Claim 12

[12]	The location-based service method according to claim 11, wherein the digital camera includes a module for receiving the location data.
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Claim 13

[13pre]	A location-based service method using image data provided by a terminal equipped with a camera, and using location data that includes location information of the terminal, comprising:
[13a]	generating first image data with the terminal at a predetermined location;
[13b]	receiving location data of the predetermined location;
[13c]	prompting a user to choose whether or not to insert the received location data into the first image data to generate a second image data and, when the user chooses to do so, inserting the received location data into the first image data to generate a second image data;

Claim 13	
[13d]	transmitting the second image data, the second image data including the first image data and the location data, to another terminal;
[13e]	receiving, at the another terminal, a selection input for an image corresponding to the second image data, from the user;
[13f]	displaying, at the another terminal, an image corresponding to the first image data, and a menu inquiring about whether to select a location-based service;
[13g]	receiving, at the another terminal, via the displayed menu, a selection input for the location-based service, from the user;
[13h]	receiving, at the another terminal, location-based service data corresponding to the location data of the selected second image data; and
[13i]	providing the location-based service to the another terminal by using the received location-based service data.

Claim 14	
[14pre]	The location-based service method according to claim 13,
[14a]	wherein the location-based service is a guiding service, and
[14b]	wherein the receiving the selection input comprises transmitting a service request signal and the location data to a navigation system,
[14c]	wherein the navigation system provides a navigation data corresponding to the location data, as the location-based service data, and
[14d]	wherein the providing the location-based service comprises providing the guiding service by means of a navigator of the another terminal, which is displayed on a display section of the another terminal.

C. THE PROSECUTION HISTORY

41. The original application that issued as the '060*Pat* was filed on April 19, 2006. '060 Patent, Cover (code 22). The application claims foreign priority to Korean Application No. 10-2005-0032452 filed April 19, 2005. '060 Patent, (code 30).

42. I understand that for purposes of this proceeding, I am to assume the priority date is April 19, 2005.

(21)	Appl. No.:	11/911,879
(22)	PCT Filed:	Apr. 19, 2006
(86)	PCT No.:	PCT/KR2006/001444
	§ 371 (c)(1), (2), (4) Date:	Mar. 27, 2008
(87)	PCT Pub. No.:	WO2006/112656
	PCT Pub. Date:	Oct. 26, 2006
(65)	Prior Publication Data	
	US 2008/0171558 A1	Jul. 17, 2008
(30)	Foreign Application Priority Data	
	Apr. 19, 2005 (KR)	10-2005-0032452

'060 Patent, Cover (excerpted).

43. The original application contained 23 claims. *EX1004*, 19-21. On October 13, 2010, the Examiner issued an Office Action rejecting 20 of the claims as anticipated by the prior art, and the remaining claims as obvious over the prior art. *EX1004*, 113-123. The Examiner's primary reference had been previously

identified in the July 25, 2006 International Search Report. *EX1004*, 27 (citing U.S. Application Publication No. 2002/0101619 (Tsubaki)).

44. The January 13, 2011 amendment narrowed the independent claims to require “a step of transmitting the second image data to the remote user and providing a location-based service to the remote user using the location data of the second image data.” *EX1004*, 162. The Examiner issued a Final Office Action identifying written description issues and maintaining the prior rejections. *EX1004*, 166-178. The amendment filed June 24, 2011 further narrowed the independent claims to require that “the second image data including the first image data and the location data” was transmitted to “another terminal.” *EX1004*, 184-191. Subsequently, the September 14, 2012 Office Action issued rejecting all claims over new prior art.

45. The December 14, 2012 amendment narrowed the independent claims by requiring “prompting a user to choose whether [] to insert the received location data into the first image data to generate a second image data.” *EX1004*, 231-238. The Examiner issued a Final Office Action on February 19, 2013, rejecting all claims again after identifying an additional prior art reference. The applicant filed a Notice of Appeal, and the Board reversed the Examiner on March 22, 2016. *EX1013*. While doing so, the Board also issued new grounds for rejection of claims 1 and 15. *EX1013*, 7-12. The May 20, 2021 amendment canceled claims 1 and 15

and amended certain dependent claims. *EX1004*, 338-345. An Office Action issued June 13, 2016 rejected these claims as well. After an August 24, 2016 interview, an amendment was filed September 12, 2016 that narrowed the independent claims by requiring receiving a selection input for the second image data, displaying an image corresponding to the first image and a menu inquiring about whether to select a location-based service, receiving a selection input via the menu for a location-based service, and receiving location-based service data corresponding to the second image data's location data. *EX1004*, 386-398.

46. The December 16, 2016 Notice of Allowance included an Examiner's statement that restated the September 12, 2016 claim amendments. *EX1004*, 402-409. The '060 Patent issued April 4, 2017.

VIII. OVERVIEW OF THE PRIOR ART

47. *Singh* is titled "[m]ethod for providing recommendations using image, location data, and annotations" and relates generally to "providing information with digital images" including "a geographic position of the subject and other information associated with generating a path to the subject."

A method for providing information with digital images includes receiving a digital image of a subject, the digital image including as metadata a geographic position of the subject and other information associated with generating a path to the subject. A path to the subject from the source location can then be generated based on a geographic position of the source location and the metadata included with the

digital image. The metadata can be stored on a mobile device and an alert provided when the mobile device is near the geographic position of the subject or if a trajectory of the mobile device does not match the generated path. Relationships with other digital images having associated metadata may also be included. In this manner, users have the ability to use their image capture devices to intelligently share digital images of subjects and knowledge of the subjects, delivering greater value from these devices.

Singh, [0005].

48. *Singh* explains that existing digital image capture devices that receive images with location coordinates are “not able to actively interface with the user based on this appended information.”

Typically, the digital images are uploaded and any information the user wishes to share, such as location coordinates, text descriptions, and/or voice comments are then appended as annotations to the images. However, this appended information is limited, both in its scope and in its use. The digital image capture device that receives these images is not able to actively interface with the user based on this appended information in a meaningful fashion.

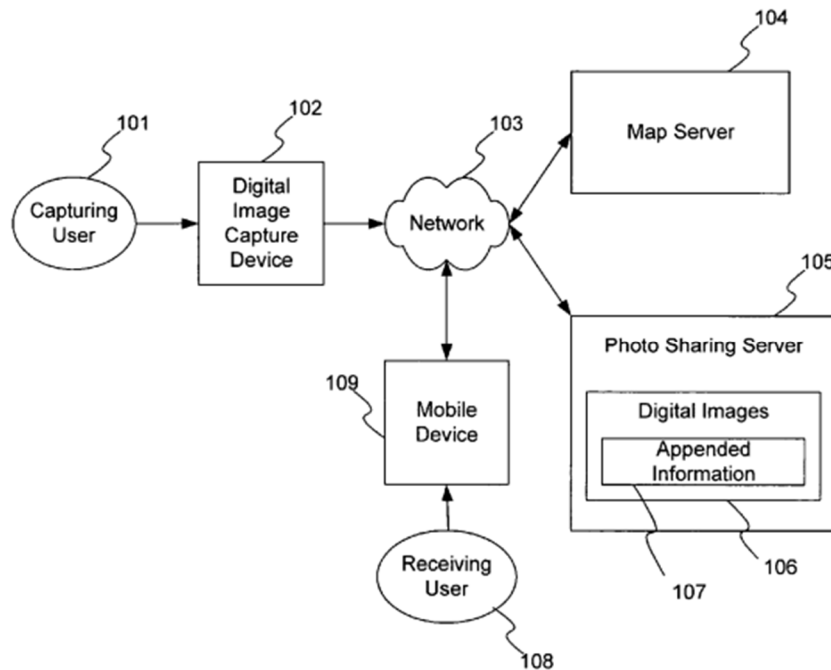
Singh, [0003].

49. With increasing use of digital images, *Singh* explains there exists a need to “append information to digital images that allow a digital image capture device to more actively and meaningfully interface with a recipient of the images.”

Accordingly, there exists a need for an improved method for providing recommendations with digital images in the sharing of the digital images. The method should append information to digital images that allow a digital image capture device to more actively and meaningfully interact with a recipient of the images. Possible appended information should include a recommended direction of approach to a location of the image subject and relationships between images. The method should also allow alerts if the recommendations are being violated, alerts if the user is near the location of a selected image subject, and allow the user to request a path to the location. The present invention addresses such a need.

Singh, [0004].

50. *Singh* discloses “a method for providing information with digital images in the sharing of digital images.” *Singh*, [0014]. In Figure 1, *Singh* depicts digital image capture device 102 and mobile device 109, both of which may be “a digital camera, a camera phone, a personal digital assistant including an image capture subsystem, etc.” *Singh*, [0015], [0016].



Singh, FIG. 1

51. The capturing user 101 “captures images of various subjects.”

FIG. 1 illustrates a preferred embodiment of a system for providing information with digital images in the sharing of the digital images in accordance with the present invention. The system includes **an image capture device 102, such as a digital camera, a camera phone, a personal digital assistant including an image capture subsystem, etc.** The device 102 is used by **a capturing user 101 to capture images of various subjects.** The device 102 can upload any captured digital images 106 onto the photo sharing server 105, via a network 103, such as the Internet. The digital images 106 include information 107 appended to them as metadata. The information 107 includes location data and user specified annotations. The location data can include the geographical coordinates and/or altitude of the subject that

can be provided by global positioning system (GPS) unit (not shown) included in the device 102.

Singh, [0015]

FIG. 2 is a flowchart illustrating a preferred embodiment of a method for providing information with digital images in the context of generating paths. First, **a digital image of a subject is received, via step 201**, with the digital image including as metadata a geographic position of the subject and other information associated with generating a path to the subject. For example, the **user 101 can capture a digital image 106 of the subject**. The geographic position of the subject and the other information associated with generating a path to the subject is then appended to the digital image 106 as part of the appended information 107. The digital image 106 and its appended information 107 are then uploaded to a photo sharing server 105. They can be uploaded and displayed as part of a web site. Other users 108 can then access this web site, and their respective mobile devices 109 can receive the digital image 106 and its information 107. However, the digital image 106 and information 107 can also be shared directly between users without departing from the spirit and scope of the present invention. Once the digital image is received, the path to the subject from a source location may be generated based on a geographic location of the source location and the metadata included with the digital image, via step 202.

Singh, [0017].

FIG. 3 is a flowchart illustrating in more detail the method of FIG. 2 for providing information with digital images in the context of appending information to the digital images used in generating paths. First, the **capturing user 101 captures a digital image of a subject, via step 301**. The digital image capture device 102 then appends the location of the subject 302 to the image, via step 302. In this embodiment, the location information is geographical coordinates of the subject, provided, for example, by the GPS unit described above. Optionally, the user 101 may append text and/or voice annotations to the image, via step 303. The user 101 also appends a recommended direction of approach to the location, via step 304. For example, the device 102 can capture the user's 101 direction of approach in visiting the location. Then, perhaps with the help of a map server 104 coupled to the device 102 as shown in FIG. 1 or a GPS unit included in the capture device, the device 102 specifies a compass direction for the approach or a street name and appends this information to the image.

Singh, [0018].

52. The digital images 106 include metadata appended to them including “the geographical coordinates and/or altitude of the subject” provided by a GPS unit in the device 102.” *Singh*, [0015], [0017]. A photo sharing server 105 receives these digital images 106 with geographical coordinates. *Singh*, [0015], [0017]. The capturing user 101 may also share images 106 “directly between users.” *Singh*, [0017], [0020]. Upon receiving the digital images 106 (steps 401, 501), the

receiving user may select one or more of the digital images and “request paths to their locations” (step 402, 502). *Singh*, [0024]-[0027].

FIG. 5 is a flowchart illustrating an example of the path request option provided by the method in accordance with the present invention. First, the receiving user 108 receives digital images onto his device 109, either from the photo sharing server 105 or directly from the capturing user 101, via step 501. The receiving user 108 can then select a digital image, via step 502. For the selected digital image, the receiving user 108 selects any direction or relationship needed to satisfy an informational message, prompt, or alert by the mobile device 109, via step 503. For example, if the digital image has appended to it several recommended streets for approaching the location, the receiving user 108 can select one of the recommended directions. If the digital image has appended to it a “visit after” relationship with more than one digital image, the receiving user 108 can select which location to visit afterwards. Alternatively, rather than a receiving user 108 having to explicit select images 106 in step 501, any received image in the mobile device 109 can automatically generate the informational messages, prompts, or alerts for the receiving user 108 as the mobile device 109 nears the location of the image subject.

Singh, [0025], FIG. 5.

When the map server 104 is used to generate the path, the mobile device 109 can send the receiving user's 108 current location to the map server 104 as a source location in the generated path, for

example, using the device's 109 GPS unit described above. The mobile device can also send the geographic position of the subject of the digital image 106 that is included as metadata to the image to map server 104. Using this positional information, the map server 104 can generate a path from the source location to the subject using the above-described path search algorithms. The generated path can then be downloaded to the mobile device 109 from the map server 104 to provide informational messages, prompts, or alerts to the receiving user 108.

Singh, [0027].

53. *Abram* is similar to *Singh* and discloses a method for “labeling digital image data” acquired by a digital imaging device.

Methods, systems, and articles for manufacture consistent with the present invention overcome the shortcomings of existing systems by providing methods and means for labeling digital image data.

According to one aspect of the invention, a digital image is acquired using a digital imaging device.

Abram, 1:56-61.

54. As background, *Abram* describes various shortcomings in how conventional digital cameras store image data files. *Abram*, 1:9-53. One such shortcoming is that conventional devices may automatically name files with non-descriptive or non-meaningful information such as a consecutive alphanumeric filename.

Digital imaging devices, such as digital cameras and scanners, create digital representations of images and store the digital representations to data files for future use and manipulation. Data file names are created either automatically or entered in manually by the user.

Conventional digital imaging devices that create filenames automatically typically use consecutive alphanumeric filenames, such as “xxx0001.jpg” and “xxx0002.jpg”, to label the data files. While the files are labeled automatically, the file name created by the device has no relevance to the contents or description of the image.

Nondescriptive filenames make organizing, indexing, sorting and retrieval of these files difficult and time consuming.

Abram, 1:9-21; see also Abram, 1:31-44.

55. Another shortcoming is that conventional devices require the user to manually enter the file name.

Some conventional imaging devices allow the use of descriptive file names, but these file names must be entered by the user. In conventional scanning devices, for example, pages to be scanned are loaded into a document feeder. The user specifies scan settings, including a file name for the stored image. The user must enter a descriptive name, such as “capecod1.” When the user indicates that the desired settings are chosen by, for example, pressing a button, the scanned image is then saved as the indicated file name.

Abram, 1:22-30.

56. Abram therefore teaches giving the user a choice about the descriptive information to associate with image files via a menu. *Abram*, 1:49-63, 1:67-2:5. Abram teaches that “[t]he geographic coordinates, place name, or other descriptive term may be used.” *Abram*, 2:60-63, 6:20-56.

57. *Odashima* is also similar to *Singh* and relates to “an information distribution system that integrates image data” and “location data pertaining to the image data” so that the location of the image data can be reflected on a map. *Odashima*, [0001].

The present invention has been made in light of such problems, and an object thereof is to provide an information distribution system capable of unambiguously ascertaining the location of image data and reflecting such on a map even when the location information is in various formats.

Odashima, [0008]

58. *Odashima* discloses a system with transmission terminals, a server, and receiving terminals.

As illustrated in FIG. 1 and FIG. 2, the information distribution system according to the embodiment is provided with: **a plurality of transmission terminals T (T1, T2, T3)** that can transmit identification data, captured image data, and location data pertaining to the imaging location of the image data; **a server device S** that receives each data transmitted from **a transmission terminal T (T4)** other than the image data transmission terminals T (T1, T2, T3) and

the image data transmission terminals (T1, T2, T3), and delivers the integrated data; and a plurality of receiving terminals R that can receive the data delivered from the server device S.

Odashima, [0020].

59. The transmission terminals, some of which may be mobile phones, capture and transmit image data and location data to the server. *Odashima*, [0020]-[0021]. The transmission terminals capture image data with a digital camera and acquire location data using GPS or other techniques involving cell ID, triangulation systems, or hybrid systems.

Specifically, as **an image data transmission terminal T, for example, a mobile phone (T1, T2) that is provided with a digital camera for capturing an image**, is capable of acquiring image data captured by this digital camera and location data of the captured self, and is capable of associating this image data with location data and transmitting. The function for acquiring the location data may be any function such as **a function for acquiring by radio positioning using a GPS satellite**, a function for acquiring a location from a relationship with a PHS base station, or a function for identifying and acquiring by inputting an address location of an imaging location. **In addition to the GPS system, there are, for example, cell ID systems that utilize the fact that the service area of the mobile communication is composed of many cells covering each small area, triangulation systems by base stations, and hybrid systems that use these in a composite manner.** Furthermore, as the image data transmission

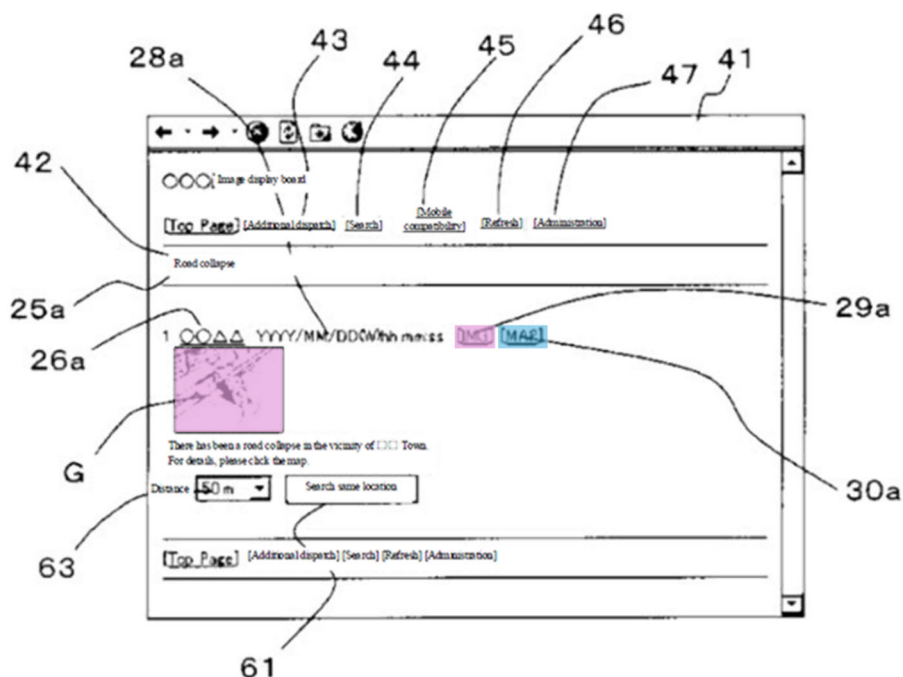
terminal T, for example, a personal computer (T3) that can take in image data from a digital camera and can acquire location data of this image data using the same functions as described above is used. In other words, any transmission terminal T capable of transmitting image data and location data pertaining to an imaging location of image data may be used.

Odashima, [0021]

60. The server integrates the image data and location data and delivers it to the receiving terminals. *Odashima*, [0020]. In particular, *Odashima*'s server generates list screen 21 which includes image data G and map button 30a.

Odashima, [0027]-[0028], FIG. 4. *Odashima*'s server also generates detailed display screen 41 which also includes image data G and map button 30a.

Odashima, [0030]-[0031], FIG. 5.



Odashima, FIG. 5 (annotated)

IX. INTERPRETATION OF THE '060 PATENT CLAIMS

61. I have given all the claim terms their plain and ordinary meaning, as would have been understood by a person having ordinary skill in the art having taken into consideration the language of the claims, the specification, and the prosecution history of record.

X. DETAILED EXPLANATION OF THE GROUND

A. GROUND 1A: *SINGH-ABRAM-ODASHIMA* RENDERS CLAIMS 1, 4, 7-14 OBVIOUS

1. Claims 1, 13³

- a. [1pre] , [13pre] **A location-based service method using image data provided by a terminal equipped with a camera, and using location data that includes location information of the terminal, comprising:**

62. In my opinion, to the extent the preamble is limiting, *Singh* teaches this feature.⁴

63. *Singh* discloses a system in Figure 1 and various methods carried out with or by that system with reference to Figures 2-8. My analysis below focuses on the overall method collectively disclosed in *Singh*'s description related to Figures 3, 5, and 6. *Singh* discloses with reference to Figure 3 a method where a

³ Claims 1 and 13 are identical, so I have grouped them together in my analysis.

⁴ I use the term "teaches" to refer to both express teachings or those that, in my opinion, are fairly suggested to a person having ordinary skill in the art.

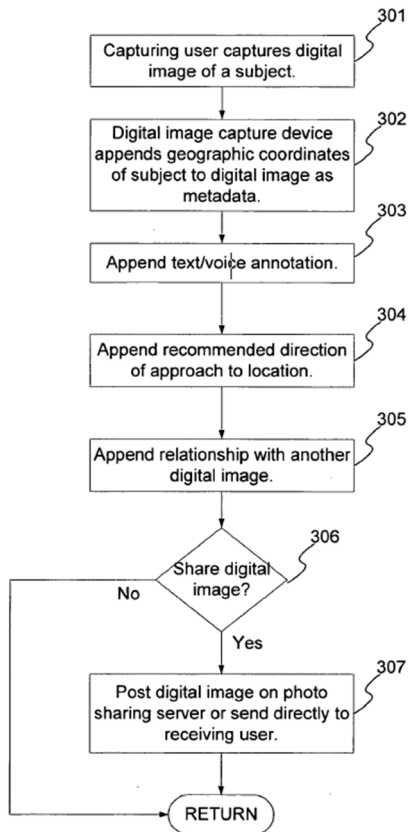
capturing user with an image capture device “captures a digital image of a subject” (step 301), appends metadata to the image including “the location of the subject” (step 302), and sends the image, either to a photo sharing server or to the mobile device of a receiving user (step 307).

FIG. 3 is a flowchart illustrating in more detail the method of FIG. 2 for providing information with digital images in the context of appending information to the digital images used in generating paths. First, the **capturing user 101 captures a digital image of a subject, via step 301**. The digital image capture device 102 then **appends the location of the subject 302 to the image, via step 302**. In this embodiment, the location information is geographical coordinates of the subject, provided, for example, by the GPS unit described above.

Singh, [0018]

If the user 101 wishes to share the captured digital image, via step 306, then the image is posted on the photo sharing server 105, or alternatively, it can be sent directly to a receiving user's 108 mobile device 109, via step 307. The receiving user 108 then receives the digital image and can view/play the text/voice annotations, view the recommended direction of approach, and/or view the relationships the digital image has with any other digital images.

Singh, [0020]



Singh, FIG. 3

64. With reference to Figure 5, *Singh* discloses a method by which a receiving user can, with its mobile device, receives the digital image either from the photo sharing server or directly from the capturing user (step 501), selects a digital image (step 502), requests the map server generate paths using a path search algorithm (step 505), and displays the generated paths to the receiver user's mobile device (step 506). *Singh*, [0010].

FIG. 5 is a flowchart illustrating an example of the path request option provided by the method in accordance with the present invention.

First, the receiving user 108 receives digital images onto his device 109, either from the photo sharing server 105 or directly from the

capturing user 101, via step 501. The receiving user 108 can then select a digital image, via step 502. For the selected digital image, the receiving user 108 selects any direction or relationship needed to satisfy an informational message, prompt, or alert by the mobile device 109, via step 503. For example, if the digital image has appended to it several recommended streets for approaching the location, the receiving user 108 can select one of the recommended directions. If the digital image has appended to it a “visit after” relationship with more than one digital image, the receiving user 108 can select which location to visit afterwards. Alternatively, rather than a receiving user 108 having to explicit select images 106 in step 501, any received image in the mobile device 109 can automatically generate the informational messages, prompts, or alerts for the receiving user 108 as the mobile device 109 nears the location of the image subject.

Singh, [0025].

Next, **the receiving user 108 requests that the device 109 or the map server 104 generate paths to the location using a path search algorithm, via step 505.** This device 109 can be configured to automatically determine whether the map server 104 or device 109 is to generate the paths, or the choice can be determined by the device 109 based on it's inherent capabilities. Path search algorithms are known in the art and will not be described here. **The device 109 or map server 104 can generate the paths, and the generated paths can be displayed to the receiving user 108 using the mobile device 109, via step 506.** When generated by the mobile device 109, the

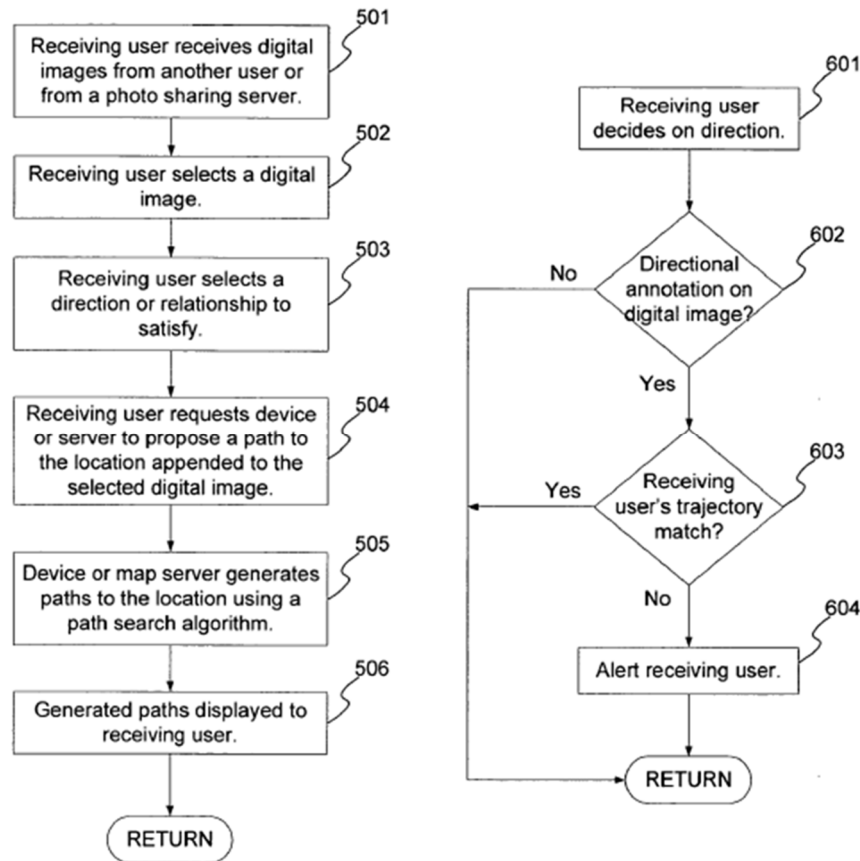
device 109 can use the other information included as metadata, such as a recommended direction of approach, to generating recommended path to the subject.

Singh, [0026].

65. And with reference to Figure 6, *Singh* discloses a method including a step for comparing the user's trajectory along the path to a directional annotation in the image (step 603), and alerting the receiving user if it does not match (step 604).

The method in accordance with the present invention further provides the option for the receiving user 108 to receive alerts from the device 109 when the receiving user 108 violates the recommended direction of approach or path. FIG. 6 is flowchart illustrating an example of the violation alert option provided by the method in accordance with the present invention. First, the receiving user 108 decides on a direction to a location in a digital image, via step 601. The device 109 then determines if the digital image has a directional annotation, via step 602. The directional annotation includes a recommended direction of approach or a path, as described above. If there is a directional annotation, the device 109 determines if the receiving user's 108 trajectory matches, via step 603. For example, the device 109 can receive the receiving user's 108 current location using the GPS unit describe above, and can use a plurality of this information to calculate the receiving user's 108 trajectory. If the receiving user's 108 trajectory does not match the directional annotation, then the device 109 sends an alert to the receiving user 108, via step 604.

Singh, [0029].



Singh, FIGs. 5, 6

66. A person having ordinary skill in the art would have understood *Singh* to disclose that the methods in Figures 3, 5, and 6 are related to each other and could be carried out contiguously, such that, collectively, *Singh* discloses a method involving various steps related to capturing, transmitting, and receiving images followed by requesting and receiving a path, and then receiving alerts related to that path. The method includes steps for generating a path to a position included as metadata to an image, downloading the path to a mobile device, and providing

related informational messages, prompts, or alerts. *Singh*, [0017], [0018], [0024], [0027], FIGs. 3-6 (steps 504-506 and 604). A person having ordinary skill in the art would have understood that these steps constitute a “location-based service” because they provide a service to the user based on location information (e.g., the location of the subject of the image or the location of the receiving terminal).

67. *Singh* teaches that, as part of the overall method, device 102, “such as a digital camera, camera phone, or a personal digital assistant with an image capture subsystem,” captures the “digital image of a subject.”

FIG. 1 illustrates a preferred embodiment of a system for providing information with digital images in the sharing of the digital images in accordance with the present invention. The system includes an image capture device 102, **such as a digital camera, a camera phone, a personal digital assistant including an image capture subsystem, etc. The device 102 is used by a capturing user 101 to capture images of various subjects.** The device 102 can upload any captured digital images 106 onto the photo sharing server 105, via a network 103, such as the Internet. The digital images 106 include information 107 appended to them as metadata. The information 107 includes location data and user specified annotations. The location data can include the geographical coordinates and/or altitude of the subject that can be provided by global positioning system (GPS) unit (not shown) included in the device 102.

Singh, [0015].

FIG. 3 is a flowchart illustrating in more detail the method of FIG. 2 for providing information with digital images in the context of appending information to the digital images used in generating paths. **First, the capturing user 101 captures a digital image of a subject, via step 301.** The digital image capture device 102 then appends the location of the subject 302 to the image, via step 302. In this embodiment, the location information is geographical coordinates of the subject, provided, for example, by the GPS unit described above.

Singh, [0018]

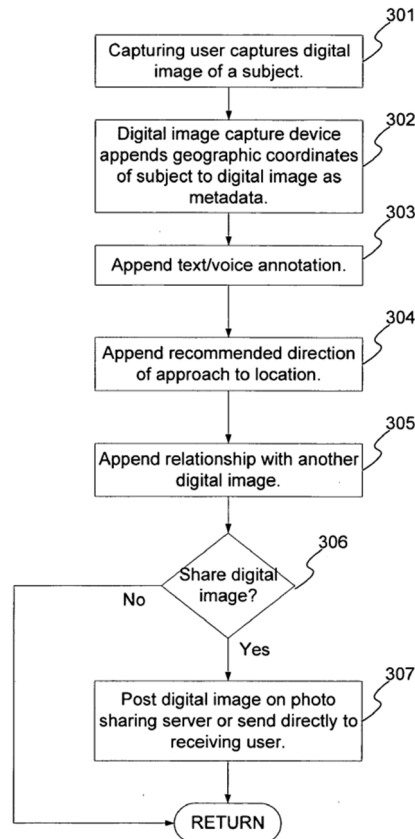


FIG. 3

Singh, FIG. 3

68. A person having ordinary skill in the art would have understood a “digital image” to comprise “image data” because a digital image comprises digital data representing the image. A person having ordinary skill in the art would have understood “a digital camera, camera phone, or a personal digital assistant with an image capture subsystem” to encompass a “terminal equipped with a camera.” ’060 Patent, 2:15-16 (“the terminal comprises a camera phone or a digital camera.”).

69. *Singh* teaches that the position of the subject or place where the image was captured is included in the image as metadata, and that the position (e.g., geographical coordinates) is provided by a GPS unit in the device. *Singh*, [0015] (“The digital images 106 include information 107 appended to them as metadata. The information 107 includes location data and user specified annotations. The location data can include the geographical coordinates and/or altitude of the subject that can be provided by global positioning system (GPS) unit (not shown) included in the device 102.”).

For example, assume that the user 101 takes a trip on a scenic route.

As the user 101 passes an interesting place, he notices a particularly exciting scene. He takes an image of this scene with the digital image capture device 102, via step 301. The device 102 automatically records the geographical coordinates of the place using, for example, the GPS unit described above. The device 102 can then append the geographical coordinates to the image as

metadata, via step 302. The user 101 can also specify that a recommended direction of approach to the subject be appended to the image 106 as metadata, via step 304, such as “approach from the East”. The user 101 places this image with the appended geographical coordinates and recommended direction of approach on a travel web site, via steps 306-307. Another user 108, who has an interest in the same geographical region, can retrieve the images and its appended information.

Singh, [0021]; see also Singh, FIG. 2 (step 202).

70. And the path is generated to that position.

Once the receiving user 108 receives the digital images captured by the capturing user 101, the method in accordance with the present invention can provide the option for the receiving user 108 to select one or more of the digital images prior to visiting the location in the images and to request paths to the locations. FIG. 4 is a flowchart illustrating a preferred embodiment of the path request option provided by the method in accordance with the present invention. A digital image of a subject including as metadata a geographic position of the subject and other information associated with generating a path to the subject is first received, via step 401. For example, the digital image can be received by the mobile device 109. Next, a request for the path to the subject is received, via step 402. For example, the user 108 can select the digital image on the mobile device 109 can request the path to the subject of the digital image. A geographic position of a source location is then determined, via step 403. The source location is the starting point of the path and can be the position of the mobile

device 109 or the receiving user 108 requesting the path. Then, the path to the subject from the source location is generated based on the geographic position of the source location and the metadata included with the digital image, via step 404.

Singh [0024].

71. A person having ordinary skill in the art would have understood that the position of the subject or place where the image was taken is “location data that includes location information of the terminal” because a person having ordinary skill in the art would have understood, when the image is captured, the device 102 (e.g., camera phone) is in the same location as the subject of the image or place where the image is taken, and the GPS unit from which the coordinates are derived is included in the device 102. Stated differently, a person having ordinary skill in the art would have understood that, in the context of *Singh*’s disclosure, the position of the subject or place where the image was taken is the same as the position of the camera phone that captured the image.

72. Accordingly, a person having ordinary skill in the art would have understood that *Singh* teaches a method including steps for generating a path to the subject or place of the image and providing alerts related to the path (“a location-based service method”) wherein the image is captured by a capturing device such as a camera phone (“using image data provided by a terminal equipped with a camera”) and the position included in the image is the position of the subject or

place where the image was captured provided by a GPS unit included in the capturing device (“using location data that includes location information of the terminal”).

b. [1a], [13a] generating first image data with the terminal at a predetermined location;

73. In my opinion, *Singh* teaches this feature.

74. *Singh* discloses that, using capture device 102 (e.g., a camera phone), the “capturing user 101 captures a digital image of a subject.” *Singh*, [0018], FIG. 3 (step 301). For example, “[a]s the user 101 passes an interesting place, he notices a particularly exciting scene. He takes an image of this scene with the digital image capture device 102.” *Singh*, [0021].

75. Based on my background and experience, a person having ordinary skill in the art would have understood that capturing a digital image of a subject generates “image data,” such as digitized image sensor data and/or an image file. This is corroborated, for example, by *Ogura*, which describes a digital camera with an “image pickup section 2” that “converts the image of a subject into digital data, obtains signal components (hereinafter referred to as ‘image data’), such as a digital luminance signal and color difference multiplex signal (Y, Cb, Cr data), from the digital data and transfers the image data to the DRAM 5.” *Ogura*, 7:52-

57.⁵ As another example, *Fujii* describes the operation of an “image capturing apparatus 1” and equates the term “image data” with the “captured image”:

Referring now to FIG. 4, the internal configuration of the image capturing apparatus 1 will be described. FIG. 4 is a block diagram showing the internal functions of the image capturing apparatus 1.

An image capturing part 308 has a CCD (image capturing device) and photoelectrically converts a subject image based on light from a subject incident from the taking lens 2, thereby obtaining an electric image signal (captured image) of the subject. The image signal is properly subjected to an analog signal process by an image processor 307 and converted to a digital image signal. The digital image signal is input to a computing processor (CPU) 304. In the CPU 304, processes such as black level correction, white balance correction, and γ correction are performed on a digital image signal.

The CPU 304 reads a control program, and parameters necessary for various controls, various settings, and the like stored in a program part 309, and executes the control program, thereby realizing the control on the whole image capturing apparatus 1, various functions, and the like. A program line and the like used for exposure control are stored in the program part 309.

The CPU 304 temporarily stores the image data subjected to the various image processes into an image memory 306. *At the time of*

⁵ I rely on *Ogura* as evidence of the knowledge of a POSITA for this limitation, and not part of the unpatentability ground.

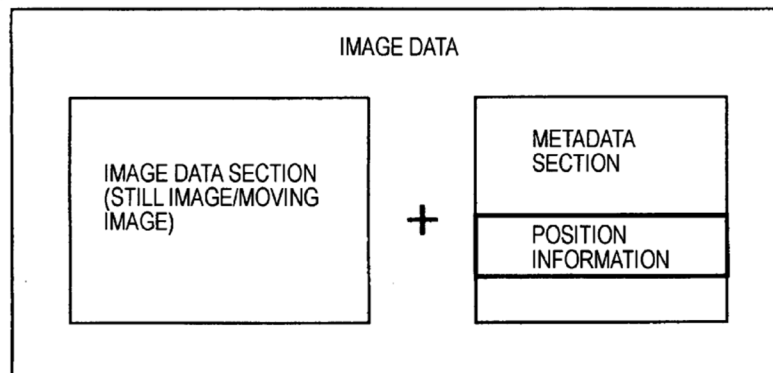
image capturing, the image data (captured image) temporarily stored in the image memory 306 is sent to a memory card slot in which the memory card 90 is inserted at a predetermined timing, thereby storing the image data onto the memory card 90.

Fujii, [0052]-[0055]; *see also id.*, [0043].⁶ A person having ordinary skill in the art also would have understood that “image data” could refer to an image data file. This is corroborated, for example, by *Ueno*, which equates the term “image data” with “image file.” *Ueno*, [0006] (“With the use of a device having a global positioning system (GPS) function in combination of an image capturing apparatus such as a video camera or a digital still camera, position information associated with the capture time can be added as additional information to files of *image data (image files)* based on moving images or still images recorded by the image capturing apparatus.”); *see also id.*, [0029].⁷

⁶ I rely on *Fujii* as evidence of the knowledge of a POSITA for this limitation, and not part of the unpatentability ground.

⁷ I rely on *Ueno* as evidence of the knowledge of a POSITA for this limitation, and not part of the unpatentability ground.

FIG. 2

*Ueno*, FIG. 2

76. This is also consistent with how the '060 Patent describes “generating first image data.” 060 Patent at 4:17-26 (“If the camera shooting mode is set to ‘on’, the current image of the location which the user wants to shoot is displayed on the display section (S202). Subsequently, if the user input a photo shooting key (S204), the current image is shot, and a menu inquiring about whether to insert the location data is displayed (S206). In addition, selectively, the step (S206) can be performed after the first image data are generated and stored. If the user does not want to insert the location data into the shot image data, the shot first image data are generated and transmitted to the compression controller, and the compression controller compresses and stores the first image data on the image data storing section (S208).”)

77. A person having ordinary skill in the art would have also understood *Singh* to teach capturing the image at a “predetermined location” because *Singh*

discloses that a user may “notice[] a particularly exciting scene” and then “take[] an image of this scene.”

For example, assume that the user 101 takes a trip on a scenic route. **As the user 101 passes an interesting place, he notices a particularly exciting scene. He takes an image of this scene with the digital image capture device 102, via step 301. The device 102 automatically records the geographical coordinates of the place using, for example, the GPS unit described above.** The device 102 can then append the geographical coordinates to the image as metadata, via step 302. The user 101 can also specify that a recommended direction of approach to the subject be appended to the image 106 as metadata, via step 304, such as “approach from the East”. The user 101 places this image with the appended geographical coordinates and recommended direction of approach on a travel web site, via steps 306-307. Another user 108, who has an interest in the same geographical region, can retrieve the images and its appended information.

Singh, [0021].

78. That is, a person having ordinary skill in the art would have understood that the user captures the image at a location the user determined, or noticed, before capturing the image, i.e., a “predetermined location.” The claims and the specification do not place any limitations on how the location must be “predetermined.” I note that this interpretation is also consistent with how the Patent Office interpreted this during prosecution. *EX1013*, 7 (“As for the ‘at a

predetermined location' limitation, the image is taken at a location and, thus, generated 'at a predetermined location,' as broadly as recited.") After this, the applicant did not dispute this interpretation. *E.g.*, *EX1004*, 344-345 (applicant arguing limitations other than the predetermined location limitation after Board decision), 395-396 (applicant arguing limitations other than the predetermined location before Notice of Allowance).

79. Accordingly, *Singh* teaches capturing a digital image with the capturing device (e.g., camera phone) ("generating first image data with the terminal") at a location that the capturing user noticed before capturing the image ("at a predetermined location").

c. [1b], [13b] receiving location data of the predetermined location;

80. In my opinion, *Singh* in combination with *Abram* teaches this feature.

81. *Singh* discloses capturing an image and then appending geographic position (e.g., geographic coordinates provided by the GPS unit) of the subject or place to the image. *Singh*, [0017]-[0018], [0021] ("The device 102 automatically records the geographical coordinates of the place using, for example, the GPS unit described above. The device 102 can then append the geographical coordinates to the image."); FIG. 3 (step 302).

82. A person having ordinary skill in the art would have understood that to append the geographic coordinates to the image as *Singh* discloses, the capturing

device 102 previously received the geographical coordinates from the GPS unit because the GPS unit would need to provide the coordinates before the device can append them to the image. Receiving geographic coordinates is consistent with how the '060 Patent describes “receiving location data.”

The location information processing section (50) includes the location data **received from a location information providing means** (not illustrated) in the first image data generated in the camera section (40). The location information providing means can be a **GPS means** using a satellite or CPS means using a base station information.

'060 Patent, 3:38-43.

83. *Singh* does not expressly disclose that the capturing device receives the geographic coordinates after the user captures the image, i.e., after “generating first image data with the terminal at a predetermined location.” Nevertheless, in my opinion, a person having ordinary skill in the art would have considered this feature obvious in view of *Singh* in combination with *Abram*.

84. *Abram* is similar to *Singh* and discloses a “process of associating descriptive data obtained from [a] location determination device with a digital image file.” *Abram*, 4:4-6. *Abram* discloses a digital camera 100 has a location determination unit 375 (e.g., a GPS receiver).

FIG. 3 is a block diagram of a digital camera 100 with a location determination unit 375. Location determination unit 375 may be external to camera 100 as shown in FIG. 3 or located inside camera

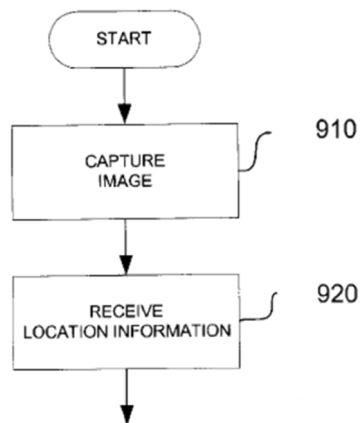
100. Location determination unit 375 tracks the camcorder's location via signals collected by an antenna. **Location determination unit 375 may be, for example, a conventional global positioning satellite (GPS) receiver.**

Abram, 3:39-46.

85. *Abram* expressly discloses that the digital camera 100 “acquires an image (stage 910)” before it “receives location information from a location determination device, such as a GPS (stage 920).”

Consistent with the present invention, a digital imaging device acquires an image (stage 910). The digital imaging device also receives location information from a location determination device, such as a GPS (stage 920). **The location information received may be, for example, longitudinal and latitudinal coordinates of the location of the camera when the image was acquired.** The coordinates may be associated with the file as is (stage 924), in which case the coordinates are simply linked to the image data (stage 926).

Abram, 6:20-28; *Abram*, FIG. 9 (stages 920), 6:23-26 (“The location information received may be, for example, longitudinal and latitudinal coordinates of the location of the camera when the image was acquired.”).



Abram, FIG. 9 (excerpted)

86. Based on my background and experience, a person having ordinary skill in the art would have understood that, in implementing *Singh*'s teachings, there were a finite number of options for when to receive the GPS coordinates from *Singh*'s GPS unit relative to capturing the image: before or after capturing the image. This is corroborated by, for example, *Ogura*, which describes positioning immediately before or immediately after photographing. *See Ogura*, 1:13-2:56.

According to this invention, as positioning is performed **immediately before or immediately after photographing**, the adverse influence on the GPS positioning apparatus or power consumption of the battery is minimized. As positioning is performed to acquire a positioning result before or after a photographing instruction is given, the photographing timing and the positioning timing do not overlap each other. This prevents the battery life from being significantly shortened.

Ogura, 4:4-12.⁸

87. A person having ordinary skill in the art would have understood that *Singh* and *Abram* are very similar and that *Abram* simply discusses the relative timing of receiving the GPS coordinates in more detail than *Singh*. A person having ordinary skill in the art also would have recognized that other, very similar prior art references also disclose receiving GPS coordinates from a GPS unit after capturing an image. Paolini is one example where the device 100 acquires the image (step 302), converts the image into a graphics file (step 304), and acquires GPS signals (step 306).

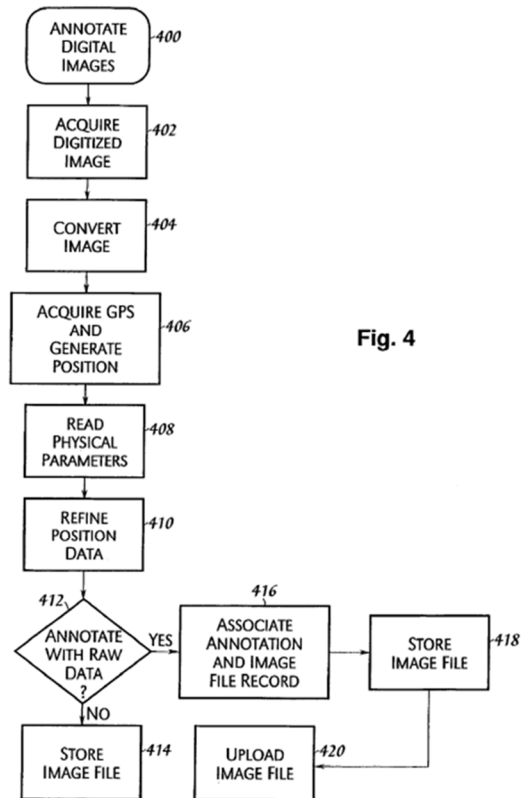
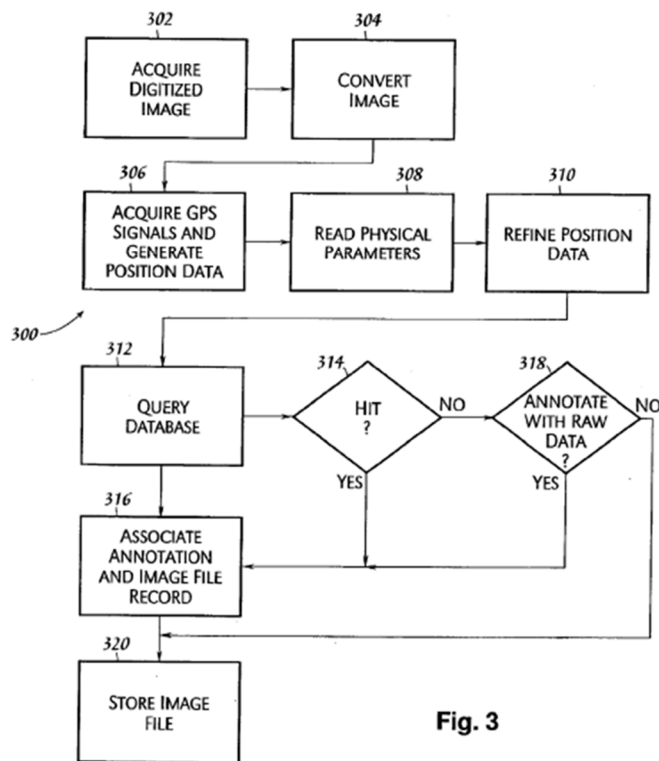
In step 302, **the digitized image is acquired**. Step 302 may be performed by the imaging system, electro optical converter and digitizer as may be typically employed in digital photographic or videographic equipment. In step 304, **the raw image is converted to a graphics file, for example a JPEG or MPEG file**. **GPS signals are acquired in step 306, and the position corresponding to the photographic equipment and commonly located GPS receiver are generated**. Note that step 306 may be performed by a conventional GPS receiving device, which as previously noted, may be a free standing GPS receiver, or alternatively, an embedded GPS receiver implementation may be used. Single-chip GPS solutions that may be used in conjunction with the present invention include the MG-4000

⁸ I rely on *Ogura* as evidence of the knowledge of a POSITA for this limitation, and not part of the unpatentability ground.

and MG-4100 GPS chips by Motorola, Inc., Schaumburg, Ill. In step 308, physical parameters associated with the recording device, for example, a compass heading, tilt angle and optical settings of the device are determined and, in step 310, the position data are refined in accordance with standard trigonometric relationships. In this way, for example, a point position associated with the GPS may be augmented to provide, for example, a coordinate of an object in the field of view or, define a range of coordinates bounding the subject matter being imaged. Concomitantly, the viewer recognizable annotation may be suitably refined.

Paolini, [0026]; *see also Paolini*, [0029] (disclosing methodology 400 in FIG. 4 where “steps 402-410 may be performed analogously to corresponding steps 302-310 in methodology 300” in FIG. 3).⁹

⁹ I rely on *Paolini* as evidence of the knowledge of a POSITA for this limitation, and not part of the unpatentability ground.



Paolini, FIGs. 3, 4.

88. Thus, a person having ordinary skill in the art would therefore have considered applying *Abram*'s teaching to *Singh* to be obvious to try, as it amounts to choosing from a finite number of identified, predictable solutions (i.e., receiving the position information before, during, or after capturing the image). *Ogura*, 3:47-53; see also *Ogura*, 4:4-7 (same).¹⁰ A person having ordinary skill in the art also would have considered applying *Abram*'s teaching to *Singh* to amount to the use of a known technique (receiving GPS coordinates after capturing an image) to

¹⁰ I rely on *Ogura* as evidence of the knowledge of a POSITA for this limitation, and not part of the unpatentability ground.

improve a similar device (the *Singh* device) in the same way (to receive the GPS coordinates after capturing an image).

89. A person having ordinary skill in the art would have had a reasonable expectation of success in applying *Abram*'s teaching in this regard to *Singh*. *Singh* and *Abram* both disclose devices that capture images and include GPS units and processors. *See Singh*, [0015] (disclosing the GPS unit), [0036] (disclosing its techniques being implemented on a "processor containing system"); *Abram*, 3:39-54 (disclosing GPS receiver), 6:64-67 (disclosing "the described implementation includes software"). *Singh* discloses its devices are "a digital camera, a camera phone, and a personal digital assistant including an image capture subsystem," and *Abram* discloses a digital camera. *Singh*, [0015]; *Abram*; 3:39-54. Modifying *Singh*'s method to include *Abram*'s software teachings in *Singh*'s devices would have straightforward and well within a person having ordinary skill in the art's ordinary skill, as *Abram* confirms by implementing this functionality in a device like *Singh*'s.

90. Accordingly, a person having ordinary skill in the art would have understood the *Singh-Abram* combination teaches receiving geographic coordinates ("receiving location data") of the device at the location where the user predetermined to capture the image ("of the predetermined location").

- d. **[1c], [13c] prompting a user to choose whether or not to insert the received location data into the first image**

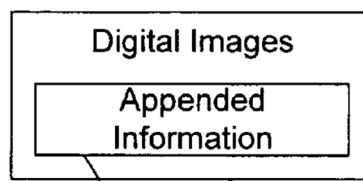
data to generate a second image data and, when the user chooses to do so, inserting the received location data into the first image data to generate a second image data;

91. In my opinion, *Singh-Abram* teaches this feature.

92. *Singh* discloses “append[ing] the location of the subject 302 to the image” such that the image “includ[es] as metadata a geographic position of the subject.” *Singh*, [0017], [0015] (“digital images 106 include information 107 appended to them as metadata”) *see also id.*, Abstract.

93. Based on my background and experience, a person having ordinary skill in the art would have understood that appending the coordinates as metadata to the image such that the image includes the coordinates as metadata to constitute “inserting” the “location data into the first image data” because a person having ordinary skill would have understood that for the image to “include” the coordinates as metadata, the coordinates are inserted into the image.

94. This is corroborated by *Singh* itself, which schematically illustrates the appended metadata inserted inside the box representing the digital images.

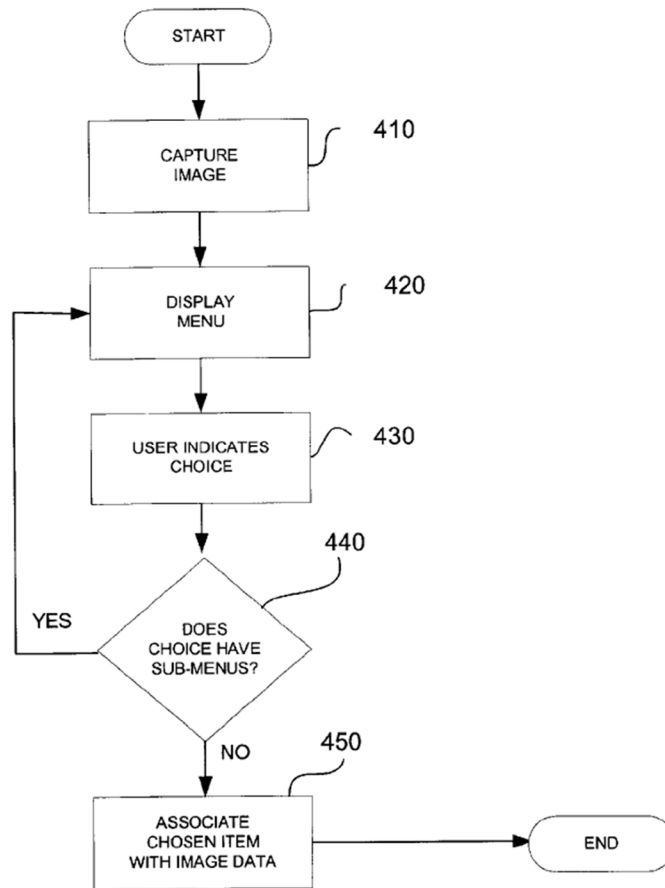


Singh, FIG. 1 (excerpted)

95. A person having ordinary skill in the art would have also understood that including the coordinates in the image constitutes generating “a second image data” because after appending the coordinates to the image (i.e., “first image data”) the image has been modified to include new or additional metadata.

96. *Singh* does not expressly disclose “prompting a user to choose whether or not to” append the geographic coordinates to the image as metadata. In my opinion, this feature nevertheless would have been obvious in view of *Singh* in combination with *Abram*.

97. *Abram* discloses, with reference to Figure 4, a “process of associating descriptive data with a digital image file.” *Abram*, 4:4-6.



Abram, FIG. 4

98. After an image is acquired (stage 410), “a menu is displayed to the user (stage 420).” *Abram*, 4:4-8, FIG. 4. The menu is activated manually or automatically by the act of acquiring an image.

FIG. 4 is a flow chart illustrating a process of associating descriptive data with a digital image file consistent with the present invention. At some point in the process an image is acquired (stage 410). After the image is acquired, **a menu is displayed to the user (stage 420)**. To display the menu, **a user may activate the menu manually** by, for example, pushing a button on the camera, or by speaking a command.

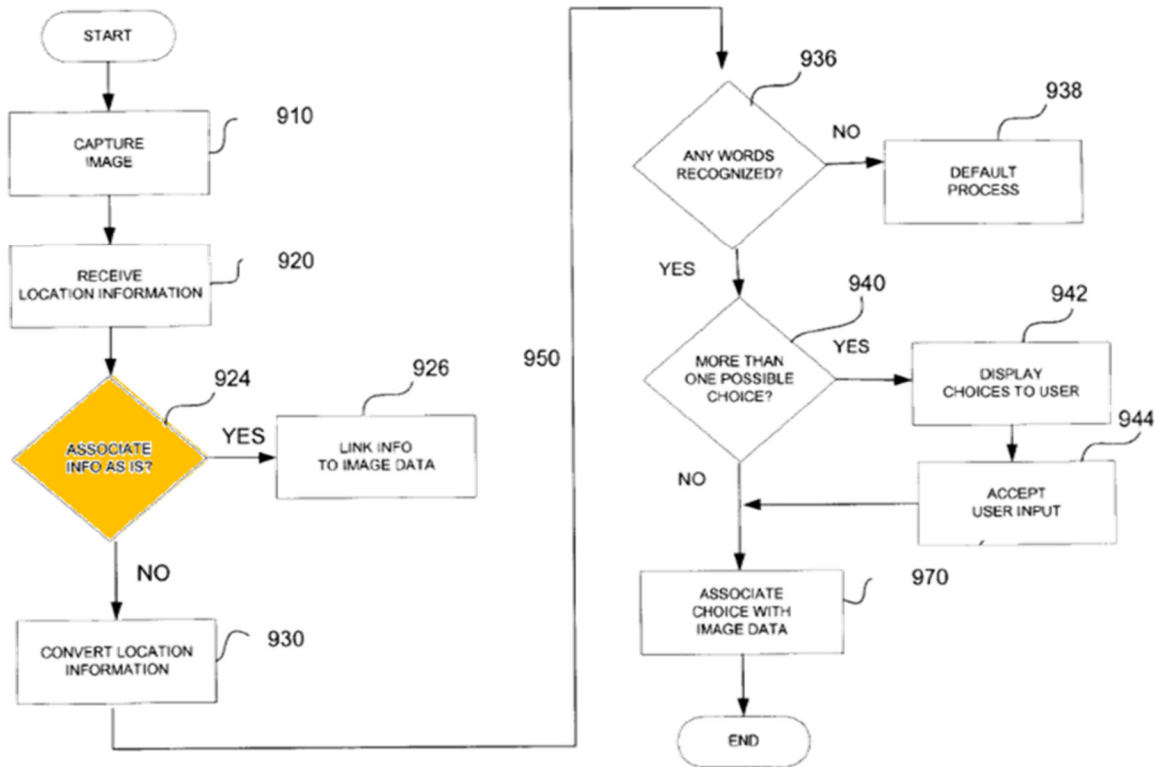
In another embodiment, **the menu is automatically activated by the act of acquiring an image.**

Abram, 4:4-12, FIG. 4.

99. The menu allows the user to make a choice about the metadata to be associated with the image file. *Abram*, 1:61-63 (“A menu of descriptive terms is displayed to a user and the user selects at least one of the descriptive terms for association with the digital image file.”); *see also Abram*, 4:32-35 (“While the menu is displayed to the user, the user indicates one or more of the displayed items by, for example, manipulating a scroll wheel, pushing a button, or speaking a command.”).

100. *Abram* further teaches that the “[m]enu items may be, for example, descriptive terms, categories of content, relationships, or stored information created by the user.” *Abram*, 4:17-19. In addition, *Abram* teaches that its disclosed system and method may be used to “associat[e] descriptive data obtained from [a] location determination device with a digital image file.” *Abram*, 2:55-63. With reference to Figure 9, *Abram* discloses that after receiving the location information (e.g., coordinates), a decision is made about whether the coordinates are to be associated with the file as is or not. *Abram*, 6:26-28, FIG. 9 (**stage 924 “Associate info as is?”**). If yes, “the coordinates are simply linked to the image data.” *Abram*, 6:26-28 (stage 926). If no, the coordinates are not associated with the image as-is,

and the coordinates may be converted into city or location names, if available, and the user can select from among the possible names. *Abram*, 5:51-54, 6:29-56.



Abram, FIG. 9 (annotated)

101. In view of the above, in my opinion, a person having ordinary skill in the art would have understood *Abram* to teach (1) after the image is captured, displaying a menu to the user so as to give the user choices about the metadata to associate with an image file, (2) that the choices of metadata may be “descriptive data obtained from an location determination device,” and (3) that the user should be given a choice about whether to associate location data (e.g., coordinates) “as-is” or not. Although the embodiment in *Abram*’s Figure 9 does not explicitly

disclose displaying a menu for the purpose of receiving a user selection of yes or no in step 924, in my opinion a person having ordinary skill in the art would have understood that *Abram*'s menu teachings are not limited to selecting, e.g., city names, and that *Abram* broadly teaches using a menu for associating any metadata with an image file, including location coordinates. Moreover, a person having ordinary skill in the art would have understood *Abram* to suggest using a displayed menu to receive a yes/no selection from the user in step 924 of Figure 9 because *Abram* is concerned with giving the user the choice of location information to associate with the image file, and *Abram* does not otherwise disclose that any other entity (i.e., besides the user) would have control over the metadata to be associated with the image file.

102. In my opinion, a person having ordinary skill in the art would have understood that it was advantageous to give the user of *Singh*'s capturing device control over whether to append the location coordinates as metadata to *Singh*'s image. *Abram* disparages prior art techniques that automatically associated information with a captured image in favor of displaying a menu to the user. *Abram*, 1:12-20 (“While the files are labeled automatically, the file name created by the device has no relevance to the contents or description of the image”). In my opinion, it was also known to person of ordinary skill in the art that interference with GPS positioning systems could occur “so that positioning may not be

performed properly.” See *Ogura*, 4:4-10.¹¹ Because *Singh* discloses that the location data is used to calculate a path for the receiving user, a person having ordinary skill in the art would have understood the importance and desirability of ensuring that the device appends correct location information to the first image data. A person having ordinary skill in the art would have understood that one way to ensure the correctness of information involves the user providing confirmation before appending the information. During prosecution, the applicant did not dispute the Patent Office’s determination that this feature was obvious. *EX1013*, 8-9. This feature was also taught by other prior art references, such as *Paolini*, confirming this was a known technique.

The position data may be correlated with descriptive information and associated with the corresponding image (steps 312-316). In step 312, the database of geographic coordinates and viewer recognizable features and the corresponding viewer recognizable descriptive information is accessed. Such a database may be embodied in an apparatus in accordance with the present inventive principles as discussed hereinabove in conjunction with FIG. 1 illustrating database 116. If there is a hit in the database, step 314, then in step 316, the viewer recognizable descriptive information is associated, as an annotation with the image file record of the photographed or videographed subject matter. **If, however, there is no hit in the**

¹¹ I rely on *Ogura* as evidence of the knowledge of a POSITA for this limitation, and not part of the unpatentability ground.

database associated with the particular geographic location, then in step 318, a determination is made if the image is annotated with the raw position data, and physical parameters. **The determination may be made in response to a user selection.** If the image is to be annotated with the raw data, methodology 300 returns to step 316 and annotates the image file record accordingly. Otherwise, step 316 is bypassed.

Paolini, [0027].¹²

103. Thus, in my opinion, a person having ordinary skill in the art would have considered the combination to amount to the application of a known technique (*Abram*'s teachings related to displaying a menu after an image is captured allowing the user to choose whether or not the coordinates are "associated with the file as is") to a known method (*Singh-Abram*'s method with devices capturing images and appending location information) ready for improvement (*Singh*'s method and device is capable of displaying information to the user and receiving input/selections from the user) to yield predictable results (*Singh*'s method including a step for displaying a menu to the user with the choice of whether to append the location coordinates to the image not).

104. In my opinion, a person having ordinary skill in the art also would have considered the combination to amount to the use of a known technique

¹² I rely on *Paolini* as evidence of the knowledge of a POSITA for this limitation, and not part of the unpatentability ground.

(*Abram*'s teachings related to displaying a menu after an image is captured allowing the user to choose whether or not the coordinates are "associated with the file as is") to improve similar devices (*Singh* and *Abram* are similar devices concerned with associating location information with a captured image) in the same way (to provide the user with more control over whether location coordinates should be associated with the captured image).

105. A person having ordinary skill in the art would have had a reasonable expectation of success in making the combination, as *Abram* provides this teaching, and modifying *Singh*'s method to include *Abram*'s software teachings in *Singh*'s devices would have straightforward and well within a person having ordinary skill in the art's ordinary skill. *Singh* and *Abram* both disclose devices that capture images and include GPS units and processors. *See Singh*, [0015] (disclosing the GPS unit). [0036] (disclosing its techniques being implemented on a "processor containing system"); *Abram*, 3:39-54 (disclosing GPS receiver), 6:64-67 (disclosing "the described implementation includes software").

106. Accordingly, a person having ordinary skill in the art would have understood the *Singh-Abram* combination to teach that, after the image is captured, displaying a menu through which the user chooses whether to append the coordinates as metadata to the image as is ("prompting a user to choose whether or not to insert the received location data into the first image data to generate a second

image data”) and if the user chooses to do so, appending the coordinates as metadata to the image such that they are included in the image (“inserting the received location data into the first image data to generate a second image data”).

- e. **[1d], [13d] transmitting the second image data, the second image data including the first image data and the location data, to another terminal;**

107. In my opinion, *Singh-Abram* teaches this feature.

108. *Singh* discloses that, after the location coordinates are appended to the captured image, “[i]f the user 101 wishes to share the captured digital image, via step 306 ... then the image is posted on the photo sharing server 105, or alternatively, it can be sent directly to a receiving user’s 108 mobile device 109.” *Singh*, [0020], [0015] (“The device 102 can upload any captured digital images 106 onto the photo sharing server 105, via a network 103, such as the Internet.”), [0017] (“The digital image 106 and its appended information 107 are then uploaded to a photo sharing server 105.”), [0018], FIG. 3. If uploaded to the server, then “[t]he mobile device 109 can receive the digital images 106 and appended information 107 by accessing the photo sharing server 105 via the network 103.” *Singh*, [0016]; *see also Singh*, [0025] (“First, the receiving user 108 receives digital images onto his device 109, either from the photo sharing server 105 or directly from the capturing user 101, via step 501.”).

109. A person having ordinary skill in the art would have understood that sending the image directly to the receiving user's mobile device 109 constitutes "transmitting" the image to mobile device 109. A person having ordinary skill in the art would have understood that for the receiving user's mobile device 109 to receive the digital images from the photo sharing server 105, the photo sharing server transmits the digital images to the mobile device 109. A person having ordinary skill in the art would have also understood that the receiving user's 108 mobile device 109 is "another terminal."

110. Thus, in my opinion, a person having ordinary skill in the art would have understood *Singh* to teach that the capturing device 102 transmits the image with the included coordinates ("second image data") to mobile device 109 (to "another terminal"). A person having ordinary skill in the art would have also understood that if the device 109 receives the images with included coordinates from the photo sharing server 105, the server 105 transmits the image including the appended coordinates ("second image data") to the mobile device 109 ("to another terminal"). A person having ordinary skill in the art would have understood *Singh's* separate and independent disclosures each to teach transmitting the "second image data" to mobile device 109.

111. Accordingly, a person having ordinary skill in the art would have understood the *Singh-Abram* combination teaches that the capturing device or a

server sends the captured digital image with the included coordinates (“transmitting the second image data”) to a receiving user’s mobile device (“to another terminal”), where the captured digital image includes appended coordinates (“the second image data including the first image data and the location data”).

- f. [1f], [13f] displaying, at the another terminal, an image corresponding to the first image data, and a menu inquiring about whether to select a location-based service;¹³**

112. In my opinion, *Singh-Abram* in combination with *Odashima* teaches this feature.

113. With reference to Figure 5, *Singh* teaches a method for requesting a path. “First, the receiving user 108 receives digital images onto his device 109, either from the photo sharing server 105 or directly from the capturing user 101, via step 501.” *Singh*, [0025]. Then, the receiving user 108 can select a digital image (step 502). *Singh*, [0025]. Once selected, receiving user 108 “selects any direction or relationship needed to satisfy an informational message, prompt, or alert by the mobile device 109.” *Singh*, [0025]. Then the “the receiving user 108 requests that the device 109 or the map server 104 generate paths to the location using a path search algorithm.” *Singh*, [0025].

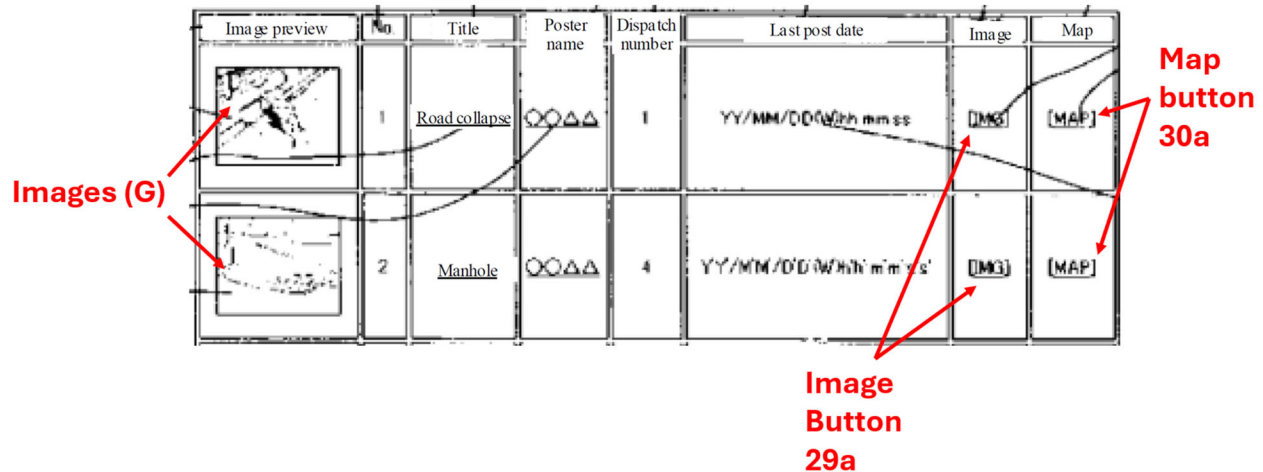
¹³ In my opinion, there is no logic or grammar in the claims that would require element [1f] - [13f] to occur after element [1e], [13e].

114. A person having ordinary skill in the art would have understood that for the receiving user of mobile device 109 to “select the digital image” and to make a request to generate a path to the location, *Singh*’s mobile device 109 displays the image(s) and an option for requesting a path to the images. At a minimum, *Singh*’s disclosure suggests that the mobile device 109 displays the image(s) and an option for requesting a path to the images because a person having ordinary skill in the art would have understood that the device would need to display the images and options for the user to select them.

115. *Odashima* discloses a system and method similar to *Singh* and teaches a technique for displaying images and providing options for location-based services to a receiving terminal. In particular, *Odashima* discloses a system with transmission terminals, a server, and receiving terminals. *Odashima*, [0020]. The transmission terminals capture and transmit image data and location data to the server. *Odashima*, [0020]-[0021]. The server integrates the image data and location data and delivers it to the receiving terminals. *Odashima*, [0020]. *Odashima*’s server generates list screen 21 which includes image data G and map button 30a. *Odashima*, [0027]-[0028], FIG. 4.

116. I have reproduced below a portion of Figure 4 showing the list screen 21. *Odashima*’s list screen 21 shows multiple images in the “Image Preview” section, and provides an image button 29a for viewing an enlarged image G.

Odashima, [0028] (disclosing the “IMG” button for enlarging the image on the list screen). Michalson ¶116.



Odashima, FIG. 4 (annotated and excerpted)

117. List screen 21 also includes a map button 30a. *Odashima*, [0028] (disclosing the “MAP” button for displaying a corresponding map). After the user selects the map button 30a, *Odashima* teaches displaying a map with an X placed at a location based on the image data. *Odashima*, [0028], [0033], FIG. 6.

118. In view of the above disclosures, in my opinion, a person having ordinary skill in the art would have understood *Odashima* to teach that a receiving terminal that displays a preview of each received image and at least two buttons for each preview image — one button provides an option to view an enlarged image, and one button provides an option to display a map of the location of the image. A person having ordinary skill in the art would have understood that *Odashima*’s

map button 30a provides a location-based service because the '060 Patent discloses “providing map information” as a location-based service.

The present invention is provided to overcome the foregoing stated limit which the conventional camera phone contains. The object of the present invention is to **provide a service of showing the user the shot location by map** or guiding the user to the location when the user or others view the shot photo through the terminal, by including station information of the shot location or global positioning information of a GPS terminal in the image information at the time of shooting the photo with the camera phone.

'060 Patent, 1:48-56

The location-based service using the location information included in photo information enables the user who views the photo to obtain the geographical location information by **providing map information on the shot location**, and enables the user to get to the location as quickly as possible when the location in the photo catches the fancy of the user by providing a service of guiding the user to the location in conjunction with a navigation system.

'060 Patent, 1:63-2:3.

119. A person having ordinary skill in the art would have understood that displaying multiple options for multiple images to constitute a “menu” because menus comprise multiple options. A person having ordinary skill in the art

therefore would have understood *Odashima*'s list screen 21 to comprise "a menu inquiring about whether to select a location-based service."

120. A person having ordinary skill in the art would have considered *Odashima*'s teachings to be a suitable technique for implementing the functionality of *Singh*'s receiving user's mobile device 109. Thus, a person having ordinary skill in the art would have considered it obvious to apply *Odashima*'s teachings to the *Singh-Abram* combination because it amounts to the application of a known technique (*Odashima*'s teachings related to displaying the image previews and buttons for requesting a location-based service) to a known method (the *Singh-Abram* combination) ready for improvement (*Singh*'s mobile device 109 includes a display and the ability to receive user input) to yield predictable results (providing the *Singh-Abram* combination's receiving users the ability to view the received images and to select desired location-based services).

121. In addition, in my opinion, a person having ordinary skill in the art would have found this combination obvious because it amounts to applying a known technique (*Odashima*'s teachings related to displaying the image previews and buttons for requesting a location-based service) to improve similar devices (the *Singh-Abram* combination) in the same way (providing location-based information).

122. A person having ordinary skill in the art would have had a reasonable expectation of success because implementing the combination would have required nothing more than routine skill for a person having ordinary skill because of the similarities between the *Singh-Abram* combination and *Odashima*'s system. For example, *Valloppillil* depicts in FIG. 12 a "home page 121 of a restaurant" that includes an image with several hyperlinks on a mobile device. *Valloppillil*, [0090], FIG. 12.¹⁴ Applying *Odashima*'s teaching to the *Singh-Abram* combination would have therefore been straightforward to a person having ordinary skill in the art and well within the skill of a person having ordinary skill in the art at the time.

123. A person having ordinary skill in the art would have understood that the *Singh-Abram-Odashima* combination teaches displaying on the receiving user's mobile device previews of the received images, and that this constitutes displaying "an image corresponding to the first image data" because each image preview is a smaller version of the captured image (the "first image data"). The specification and claims do not place any limitations on required correspondence between the displayed "image" and the "first image data."

124. A person having ordinary skill in the art would have also understood that the *Singh-Abram-Odashima* combination teaches displaying buttons for

¹⁴ I rely on *Valloppillil* as evidence of the knowledge of a POSITA and not part of the unpatentability ground.

requesting a path to the subject of the received images and that this constitutes displaying “a menu inquiring about whether to select a location-based service” because a “menu” is comprised of multiple options.

125. Accordingly, a person having ordinary skill in the art would have understood the *Singh-Abram-Odashima* combination to teach displaying on the receiving user’s device (“displaying, at the another terminal”) a preview of the received images (“an image corresponding to the first image data”) and a button for requesting a path to the location of the image(s) (“and a menu inquiring about whether to select a location-based service”).

g. [1e], [13e] receiving, at the another terminal, a selection input for an image corresponding to the second image data, from the user;

126. In my opinion, *Singh-Abram-Odashima* teaches this feature.

127. With reference to Figure 5, *Singh* teaches a method for requesting a path. “First, the receiving user 108 receives digital images onto his device 109, either from the photo sharing server 105 or directly from the capturing user 101, via step 501.” *Singh*, [0025]. Then, the receiving user 108 can select a digital image (step 502). *Singh*. A person having ordinary skill in the art would have understood that selecting a digital image constitutes “receiving ... at the another terminal, a selection input for an image” because *Singh* discloses that the receiving user receives digital images “onto his device” (i.e., the “another terminal”) and the

receiving device receives a “selection input for an image” when the user “selects a digital image.”

128. As I explained above in §X.A.1.f, *Singh-Abram-Odashima* teaches displaying on the receiving user’s device a preview of the received images and buttons for requesting a path to the location of the images. A person having ordinary skill in the art would have understood that the *Singh-Abram-Odashima* combination renders obvious the user selecting the image preview. A person having ordinary skill in the art would have understood that the image preview is an image “corresponding to the second image data” because each image preview is a smaller version of the captured image that is part of the image that includes location data appended to it (the “second image data”). The specification and the claims do not place any limitations on required correspondence between the displayed “image” and the “second image data.”

129. The *Singh-Abram-Odashima* combination does not expressly disclose that the “capturing user” and the “receiving user” are the same user, and thus, the *Singh-Abram* combination does not expressly disclose “prompting *a user*” (i.e., a user at *Singh*’s capturing terminal) and then “receiving, at the another terminal, a selection input ..., from *the user*.” It is my opinion that the *Singh-Abram* combination renders this feature obvious in view of the knowledge of a person having ordinary skill in the art. *Singh*’s disclosure is not limited to having different

people as the capturing user and receiving user. And a person having ordinary skill in the art would have understood that it was common and advantageous for individuals to have multiple devices from which to access their captured images. This is corroborated, for example, by *Bullock*, which teaches that “[m]aking the waypoints in remote apparatus 200 accessible from means other than just mobile apparatus 100 offers significant convenience and flexibility to a user.” 2:49-55.¹⁵ As another example, *Filley* discloses that “[t]he digital photographs may be obtained from digital cameras 120 that are operated by the users 110. The **digital cameras 120 may be standalone units or may be incorporated into other devices, such as portable phones or PDAs.** Digital photographs may also be obtained from **scanners** that form image data files 114 from physical photographs (which may have been taken with either film cameras or digital cameras). The scanners may be connected to other suitable equipment, if necessary, such as **personal computers.**”¹⁶ Thus, a person having ordinary skill in the art would have understood that by the earliest alleged priority date, in practice, the capturing user and the receiving user of *Singh*’s system would be the same person.

¹⁵ I rely on *Bullock* as evidence of the knowledge of a POSITA and not part of the unpatentability ground.

¹⁶ I rely on *Filley* as evidence of the knowledge of a POSITA and not part of the unpatentability ground.

130. Accordingly, a person having ordinary skill in the art would have understood the *Singh-Abram-Odashima* combination teaches that the receiving user's mobile device receives the user's selection of a digital image preview ("receiving, at the another terminal, a selection input for an image corresponding to the second image data from the user").

h. [1g], [13g] receiving, at the another terminal, via the displayed menu, a selection input for the location-based service, from the user;

131. In my opinion, *Singh-Abram-Odashima* teaches this feature.

132. As I explained in §X.A.1.f, *Singh* teaches that the receiving user requests a path to the location of the image. As I explained in §X.A.1.f, the *Singh-Abram-Odashima* combination teaches displaying a menu including a button for requesting the path. And as I explained in §X.A.1.h, a person having ordinary skill in the art would have understood that the receiving user would at least sometimes be the same as the capturing user.

133. Accordingly, a person having ordinary skill in the art would have understood the *Singh-Abram-Odashima* combination teaches the user selecting a button displayed as part of the menu on the receiving device to request a path to the location of the image ("receiving, at the another terminal, via the displayed menu, a selection input for the location-based service from the user").

- i. **[1h], [13h] receiving, at the another terminal, location-based service data corresponding to the location data of the selected second image data; and**

134. In my opinion, *Singh-Abram-Odashima* teaches this feature.

135. *Singh* discloses the generated path is downloaded to the mobile device 109 (step 404). *Singh*, [0024], [0027] (“The generated path can then be downloaded to the mobile device 109 from the map server 104 to provide informational messages, prompts, or alerts to the receiving user 108”).

136. *Singh* discloses the map server 104 receives the receiving user’s 108 current location “as a source location in the generated path” using the device’s 109 GPS unit. *Singh*, [0027]. “The mobile device can also send the geographic position of the subject of the digital image 106 that is included as metadata to the image to map server 104.” *Singh*, [0027]. “Using this positional information, the map server 104 can generate a path from the source location to the subject.” *Id.* Because the *Singh* generated path is from the source location to the subject of the image, a person having ordinary skill in the art would have understood the downloaded path to constitute “location-based service data corresponding to the location data of the selected second image data.”

137. Accordingly, a person having ordinary skill in the art would have understood the *Singh-Abram-Odashima* combination teaches downloading to the receiving user’s device a generated path (“receiving, at the another terminal,

location-based service data”) wherein the generated path includes the location data of the subject of the digital image (“corresponding to the location data of the selected second image data”).

j. [1i], [13i] providing the location-based service to the another terminal by using the received location-based service data.

138. In my opinion, *Singh-Abram-Odashima* teaches this feature.

139. *Singh* discloses “the generated paths can be displayed to the receiving user 108 using the mobile device 109, via step 506.” *Singh*, [0026], [0027] (“The generated path can then be downloaded to the mobile device 109 from the map server 104 to provide informational messages, prompts, or alerts to the receiving user 108”). A person having ordinary skill in the art would have understood *Singh*’s displaying the generated path (that was downloaded from the map server), and providing “information messages, prompts, or alerts” teaches providing the location-based service to another terminal.

140. Accordingly, a person having ordinary skill in the art would have understood the *Singh-Abram-Odashima* combination teaches displaying a generated path at the receiving user’s device and providing informational messages, prompts, or alerts to the receiving user device (“providing the location-based service to the another terminal”) where the generated path is downloaded to

the mobile device from map server (“by using the received location-based service data”).

2. Claims [4], [14]

141. In my opinion, *Singh-Abram-Odashima* teaches claims 4 and 14.

142. *Singh* discloses that its method provides a generated path displayed to the receiving user 108. *Singh*, [0026] (step 506) (“The device 109 or map server 104 can generate the paths, and the generated paths can be displayed to the receiving user 108 using the mobile device 109, via step 506.”), [0005] (“A path to the subject from the source location can then be generated based on a geographic position of the source location and the metadata included with the digital image.”).

143. *Singh* discloses that “the receiving user 108 requests that the ... the map server 104 generate paths.” *Singh*, [0026]. The receiving mobile device 109 sends “the receiving user’s 108 current location to the map server 104 as a source location in the generated path, for example, using the device’s 109 GPS unit” and sends “the geographic position of the subject of the digital image 106” to map server 104, and the map server 104 can generate “a path from the source location to the subject.” *Singh*, [0027]. “The generated path can then be downloaded to the mobile device 109 from the map server 104 to provide informational messages, prompts, or alerts to the receiving user 108.” *Singh*, [0027].

- a. **[4pre], [14pre] The location-based service method according to claim 1 / The location-based service method according to claim 13,**
- [4a], [14a] wherein the location-based service is a guiding service, / wherein the location-based service is a guiding service, and**

144. In my opinion, *Singh-Abram-Odashima* teaches these features.

145. A person having ordinary skill in the art would have understood that the path that is downloaded to the mobile device 109 and the associated messages, prompts, or alerts function to guide the receiving user from the receiving user's current location to the geographic position of the subject of the digital image, and that this is consistent with how the '060 Patent describes a "guiding service." '060 Patent, 5:27-34 ("If the user selects the guiding service, the navigation data corresponding to the location data of the shot location are transmitted to the terminal by the navigation system, and the guiding service by means of a navigator of the terminal, including the shortest route to the shot location, the traffic condition, etc., is displayed on the display section (S406)").

146. Accordingly, a person having ordinary skill in the art would have understood that the *Singh-Abram-Odashima* combination teaches providing the receiving user a generated path with associated messages, prompts, or alerts from the receiving user's current location to the geographical position of the subject of

the digital image's metadata ("wherein the location-based service is a guiding service").

b. [4b], [4b] wherein the receiving the selection input comprises transmitting a service request signal and the location data to a navigation system,

147. In my opinion, *Singh-Abram-Odashima* teaches these features.

148. A person having ordinary skill in the art would have understood that *Singh*'s map server 104, which generates the path, is consistent with how the '060 Patent describes a "navigation system." '060 Patent, 5:27-34 (explaining that the "navigation system" "generates navigation data" which includes "the shortest route to the shot location").

149. A person having ordinary skill in the art would have understood that the map server is connected to the user's mobile device 109 via a network, and that communications between the mobile device and the map server would therefore be accomplished by transmitting signals between them over the network. *Singh*, FIG. 1. Thus, a person having ordinary skill in the art would have understood that when the user requests a path, including by sending the source location and the geographic position of the subject of the digital image to the map server, this constitutes "transmitting a service request signal and the location data" to the map server.

150. Accordingly, a person having ordinary skill in the art would have understood the *Singh-Abram-Odashima* combination teaches receiving the selection input transmits a signal (“transmitting a service request signal”) and the geographic position of the subject of the digital image (“and the location data”) to the *Singh* map server (“to a navigation system”).

c. [4c], [14c] wherein the navigation system provides a navigation data corresponding to the location data, as the location-based service data, and

151. In my opinion, *Singh-Abram-Odashima* teaches these features.

152. *Singh* discloses that the generated path is “downloaded to the mobile device 109 from the map server 104 to provide informational messages, prompts, or alerts to the receiving user 108.” *Singh*, [0028]. *Singh* also discloses displaying the path and the recommended direction of approach. *Singh*, [0026]. In my opinion, this is consistent with how the ’060 Patent describes “navigation data” as including, for example, a route. ’060 Patent, 5:27-34, claim 6 (“wherein the navigation data comprises at least one of the information including the shortest route corresponding to the location data”). Thus, a person having ordinary skill in the art would have understood the mobile device downloading the generated path from the map server to constitute “the navigation system provid[ing] a navigation data ... as the location-based service data.” A person having ordinary skill in the art would have also understood that *Singh*’s generated paths “correspond[] to the

location data” because the generated paths guide, or navigate, the receiving user 108 to the geographic position of the digital image 106. *Singh*, [0027].

153. Accordingly, a person having ordinary skill in the art would have understood the *Singh-Abram-Odashima* combination teaches the map server 104 (“navigation system”) downloads the generated paths to the mobile device 109 and displays the generated paths (“provides a navigation data ... as the location-based service data”), where the generated path includes the digital image’s geographic position as the destination (“corresponding to the location data”).

- d. [4d], [14d] wherein the providing the location-based service comprises providing the guiding service by means of a navigator of the another terminal, which is displayed on a display section of the another terminal.**

154. In my opinion, *Singh-Abram-Odashima* teaches this feature.

155. As I explained above in §X.A.2.a, a person having ordinary skill in the art would have understood that the *Singh-Abram-Odashima* combination teaches providing the receiving user a generated path with associated messages, prompts, or alerts from the receiving user’s current location to the geographical position of the subject of the digital image’s metadata (“wherein the location-based service is a guiding service”).

156. *Singh* discloses “the generated paths can be displayed to the receiving user 108 using the mobile device 109, via step 506.” *Singh*, [0026]. This is consistent with how the ’060 patent describes the claimed “navigator of the another

terminal.” ’060 patent, 5:52-54 (“The navigator (not illustrated) of the terminal (60) receives and displays the navigation information on the display section.”).

157. *Singh* discloses implementing the mobile device 109 as, e.g., a digital camera or PDA. *Singh*, [0016]. Based on my background and experience, in my opinion, a person having ordinary skill in the art would have understood that such devices have display screens. This is corroborated, for example, by *Ogura*, *Bullock*, and *Suomela*. See *Ogura*, 7:35-40 (digital camera with “a display section”), *Bullock*, 6:16-21 (disclosing vehicle interface 420 with “a display 426 for visually conveying information to the user”), *Suomela*, 5:1-3 (disclosing mobile device 210 with display 228), FIGs. 1, 2 (depicting a phone with display 228).¹⁷ A person having ordinary skill in the art would have understood that for the mobile device 109 to display the generated paths to the receiving user, the mobile device 109 has a display screen. A person having ordinary skill in the art would have understood this is consistent with how the ’060 patent describes a “display section” that displays various items. Thus, a person having ordinary skill in the art would have understood *Singh* to disclose device 109 includes a display screen for at least displaying the generated paths (i.e., that the “navigator” is “displayed on a display section of the another terminal.”).

¹⁷ I rely on *Ogura*, *Bullock*, and *Suomela* as evidence of the knowledge of a POSITA for this limitation, and not part of the unpatentability ground.

158. Accordingly, a person having ordinary skill in the art would have understood the *Singh-Abram-Odashima* combination teaches downloading the generated paths to the receiving user's mobile device to provide "informational messages, prompts, or alerts ("providing the guiding service by means of a navigator of the another terminal") and displaying the generated paths on a screen of the mobile device ("which is displayed on a display section of the another terminal.").

3. [7] The location-based service method according to claim 1, wherein the location data are provided by a location data providing system.

159. In my opinion, *Singh-Abram-Odashima* teaches this feature.

160. *Singh* teaches that "[t]he location data can include the geographical coordinates and/or altitude of the subject that can be provided by global positioning system (GPS) unit (not shown) included in the device 102." *Singh*, [0015]. The GPS unit is consistent with how the '060 Patent describes this feature. '060 Patent, 3:63-67 ("The terminal using the GPS (Global Positioning System) means which utilize a satellite receives the location data of the current altitude, direction, etc. through a GPS antenna contained in the terminal from the satellite floating over the earth."), 3:38-43.

161. Accordingly, a person having ordinary skill in the art would have understood the *Singh-Abram-Odashima* combination teaches the location data

being provided by a GPS unit (“the location data are provided by a location data providing system”).

4. [8] The location-based service method according to claim 7, wherein the location data providing system is configured to provide the location data of the terminal using a Cell Positioning System (CPS).

162. In my opinion, *Singh-Abram-Odashima* teaches this feature.

163. As I explained in §X.A.3, *Singh* discloses obtaining the geographical coordinates (“location data”) with a GPS unit. *Singh*, [0021]. *Singh* does not expressly disclose a “location data providing system” that is “configured to provide the location data of the terminal using a Cell Positioning System (CPS).” In my opinion, this feature would have nevertheless been obvious in view of *Odashima*’s teachings.

164. *Odashima* teaches mobile phones T1, T2 include “[t]he function for acquiring the location data” which includes a GPS system for using GPS satellites or “a function for acquiring a location from a relationship with a PHS base station.” *Odashima*, [0021]; *see also Odashima*, [0021] (“[i]n addition to the GPS system, there are, for example, cell ID systems that utilize the fact that the service area of the mobile communication is composed of many cells covering each small area, triangulation systems by base stations, and hybrid systems that use these in a composite manner.”)

165. A person having ordinary skill in the art would have recognized that *Odashima* suggests the interchangeability of GPS systems and “hybrid systems.” When discussing the server’s latitude and longitude means 10, *Odashima* discloses how GPS location data is generally latitude and longitude and “thus the data is used as is.” *Odashima*, [0025]. *Odashima* also discloses the server’s latitude and longitude means 10 “calculate[s] the latitude and longitude of the location ... in the case of data acquired from a relationship with a PHS base station.” *Odashima*, [0021]; *see also Odashima*, [0011] (disclosing “even when the location data from the transmission terminal is various location data ... it is calculated as latitude and longitude data unambiguously”). A person having ordinary skill in the art would have therefore understood that *Odashima* teaches latitude and longitude coordinates may be calculated using “a relationship with a PHS base station,” as used in *Odashima*’s hybrid system. By 2005, a person having ordinary skill in the art would have been well-aware of the ability to perform position determination using the Personal Handy-phone system (PHS). It was well-known that systems with a micro-cellular architecture like PHS could be used for determining location and, indeed, the PHS system was used to perform positioning. For example, *Asakura* discloses multiple location position techniques including using signal strength and distance, using location data of multiple base stations, and when the location data of base stations is not available, using reference vectors. *Asakura*,

122-124.¹⁸ These techniques were sufficiently established that PHS location devices were attached to animals for tracking purposes. *See generally, Takasaki.*¹⁹

166. Thus, a person having ordinary skill in the art would find this modification of the *Singh-Abram-Odashima* combination obvious because it is a simple substitution of one known element (*Odashima*'s hybrid systems that use cell ID systems using the service areas of the mobile communications network and triangulation systems using the base stations in a "composite manner") for another (the *Singh-Abram-Odashima* combination with devices using a GPS unit taught by *Singh*) to obtain predictable results (providing location data using cell ID and triangulation systems in a "composite manner").

167. A person having ordinary skill in the art would have had a reasonable expectation of success because *Odashima* teaches "hybrid systems" as another example, "[i]n addition to the GPS systems," for acquiring location data in mobile phones T1, T2. *See Odashima*, [0021]. Applying *Odashima*'s "hybrid system" teachings to the *Singh-Abram-Odashima* combination using *Singh*'s devices 102, 109 would have been straightforward and well within the skill of a person having ordinary skill in the art.

¹⁸ I rely on *Asakura* as evidence of the knowledge of a POSITA for this limitation, and not part of the unpatentability ground.

¹⁹ I rely on *Takasaki* as evidence of the knowledge of a POSITA for this limitation, and not part of the unpatentability ground.

168. Accordingly, a person having ordinary skill in the art would have understood the *Singh-Abram-Odashima* combination teaches using a “hybrid system” (“the location data providing system”) including cell ID systems and triangulation systems to provide location data (“is configured to provide the location data of the terminal using a Cell Positioning System (CPS)”).

5. [9] The location-based service method according to claim 7, wherein the location data providing system is configured to provide the location data of the terminal using a Global Positioning System (GPS).

169. In my opinion, *Singh-Abram-Odashima* teaches this feature.

170. As I discussed in §X.A.3 for claim 7, *Singh* teaches using the GPS unit. A person having ordinary skill in the art would have understood the GPS unit relies on the GPS satellites and therefore teaches using a Global Positioning System (GPS).

171. Accordingly, a person having ordinary skill in the art would have understood the *Singh-Abram-Odashima* combination teaches using a GPS unit (“the location data providing system is configured to provide the location data of the terminal”) that uses the Global Positioning System’s satellites (“using a Global Positioning System (GPS)”).

6. [10] The location-based service method according to claim 1, wherein the location data includes information on latitude and longitude of the terminal or base station.

172. In my opinion, *Singh-Abram-Odashima* teaches this feature.

173. *Singh* teaches the “location data can include the geographical coordinates and/or altitude of the subject” provided by the GPS unit of the device

102. *Singh*, [0015]. A person having ordinary skill in the art would have understood the geographic coordinates are latitude and longitude. *See Odashima*, [0025] (disclosing that GPS data “is generally latitude and longitude data”).

174. Accordingly, a person having ordinary skill in the art would have understood the *Singh-Abram-Odashima* combination teaches the location data from the GPS unit (“the location data”) includes geographic coordinates (“includes information on latitude and longitude of the terminal”).

7. [11] The location-based service method according to claim 1, wherein the terminal equipped with the camera includes a camera phone or a digital camera.

175. In my opinion, *Singh-Abram-Odashima* teaches this feature.

176. *Singh* teaches that the device 102 is “a digital camera, a camera phone, a personal digital assistant including an image capture subsystem, etc.” *Singh*, [0015]. A person having ordinary skill in the art would have understood that *Singh*’s mobile device that is “a digital camera, a camera phone” encompasses the requirement that “the terminal equipped with the camera includes a camera phone or a digital camera.”

177. Accordingly, a person having ordinary skill in the art would have understood the *Singh-Abram-Odashima* combination teaches the terminal is a

digital camera or a camera phone (“the terminal equipped with the camera includes a camera phone or a digital camera”).

8. [12] The location-based service method according to claim 11, wherein the digital camera includes a module for receiving the location data.

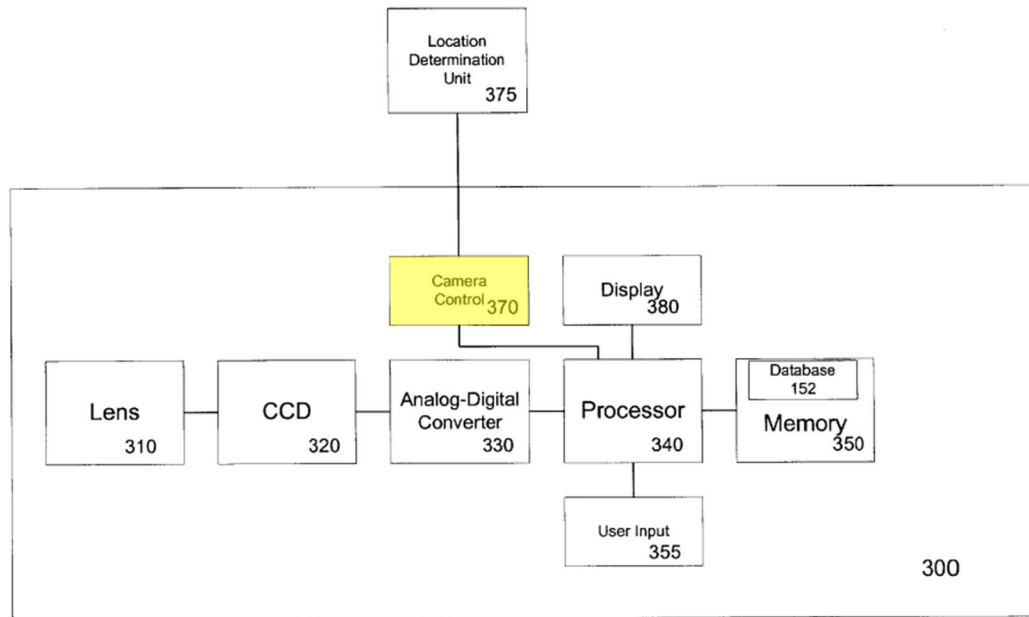
178. In my opinion, *Singh-Abram-Odashima* teaches this feature.

179. *Singh* discloses device 102, the digital camera, includes location data “that can be provided by global positioning system (GPS) unit (not shown) included in the device 102.” *Singh*, [0015]. As I discussed in §X.A.1.b, *Singh* discloses the capturing device 102 receiving geographical coordinates from the GPS unit. *Singh* further discloses that the methods implemented by device 102 are implemented by “instructions of a computer program” embodied in a computer readable medium for use by or in connection with an instruction execution system, apparatus, or device, such as a computer based system, processor containing system, or other system that can fetch the instructions from the instruction execution system, apparatus, or device and execute the instructions.” *Singh*, [0036].

180. In view of these disclosures, in my opinion, a person having ordinary skill in the art would have understood *Singh* to teach implementing device 102 as a processor-based device that executes instructions of a computer program. A person having ordinary skill in the art would have also understood that for such device to

receive geographic coordinates from the GPS unit, the device includes a module (e.g., instructions of a computer program) that receives the coordinates.

181. At a minimum, in my opinion, a person having ordinary skill in the art would have considered it obvious to implement the *Singh-Abram-Odashima* device with such a module in view of *Abram*'s teachings. *Abram* is similar to *Singh* and discloses a digital camera 100 including a "a location determination unit 375" that "passes the location information (such as the coordinates or place name) to camera control 370." *Abram*, 3:55-59, FIG. 3. *Abram* further discloses a "computer-readable medium containing instructions for controlling a computer system to perform a method ... the method comprising: ... receiving numeric geographic coordinates from a location determination device." *Abram*, 8:32-38 (claim 6). Thus, a person having ordinary skill in the art would have understood *Abram* to teach computer program instructions (i.e., a "module") for receiving geographic coordinates from a location determination unit.



Singh, FIG. 3 (annotated)

182. A person having ordinary skill in the art would have considered it obvious to apply *Abram*'s teachings related to the camera control 370 to *Singh*'s device because the combination amounts to applying a known technique (*Abram*'s camera control 370 implemented with computer readable instructions) to a known device (*Singh*'s device 102) ready for improvement (*Singh*'s device 102 may be a processor-based device that executes program instructions and receives coordinates from a GPS unit) to yield predictable results (*Singh*'s device 102 including a computer program instructions to receive the coordinates from the GPS unit).

183. Accordingly, a person having ordinary skill in the art would have understood the *Singh-Abram-Odashima* combination teaches the mobile device is a digital camera ("the digital camera") that includes a processor executing program

instructions to receive coordinates from the GPS unit (“includes a module for receiving the location data”).

B. GROUND 1B: *SINGH-ABRAM-OGURA-ODASHIMA* RENDERS CLAIMS 1, 4, 7-14 OBVIOUS

1. Claims 1, 13

- a. [1pre], [13pre] A location-based service method using image data provided by a terminal equipped with a camera, and using location data that includes location information of the terminal, comprising:**

184. In my opinion, to the extent the preamble is limiting, *Singh* teaches this feature for the same reasons as I discussed at §X.A.1.a.

- b. [1a], [13a] generating first image data with the terminal at a predetermined location;**
[1b], [13b] receiving location data of the predetermined location

185. In my opinion, *Singh* in combination with *Abram* and *Ogura* teaches these features.

186. As I discussed in §X.A.1.a, a person having ordinary skill in the art would have understood *Singh* to teach that the capturing device 102 receives geographical coordinates from the GPS unit. As I discussed in §X.A.1.c, a person having ordinary skill in the art would have understood the *Singh-Abram* combination to teach receiving geographic coordinates (“receiving location data”) of the device at the location where the user predetermined to capture the image (“of the predetermined location”). To the extent the Patent Owner argues or the

Board finds that the claimed “predetermined location” is a location predetermined by the terminal (as opposed to predetermined by the user), the claims nevertheless would have been obvious in further view of *Ogura*.

187. *Singh* is silent about when the GPS unit of mobile device 102 determines the GPS coordinates corresponding to the subject of the image. *Ogura* discloses a digital camera 100 with GPS positioning capability. *Ogura*, 7:33-35. *Ogura*’s camera includes a GPS antenna, a GPS processing section, a control section, temporary memory (DRAM) 5, and saving memory (flash memory) 6.

FIG. 1 is a block diagram illustrating the structure of one embodiment of a camera with a GPS positioning capability according to this invention. A digital camera 100 has a GPS antenna 1 a, a GPS processing section 1, an image pickup section 2, a control section 3, an operation section 4, a temporary memory (DRAM) 5, a saving memory (flash memory) 6, a display section 7 and an unillustrated power supply circuit. A warning display lamp 8 may be provided.

Ogura, 7:33-40.

188. *Ogura*’s GPS processing section uses the radio waves from a GPS signal to compute the location position of the digital camera.

The GPS processing section (GPS positioning apparatus) 1 includes an RF circuit, an A/D converter, a data register, a counter, a decoder and a control section (microcomputer). The GPS processing section 1 amplifies and demodulate radio waves from a GPS satellite received at the GPS antenna 1 a, decodes the acquired satellite data and

performs position determination (positioning), such as computation of the local position of the digital camera 100, based on the decoded data. The positioning result from the GPS processing section 1 is sent to the control section 3 that performs the general control of the digital camera 100.

Ogura, 7:41-51.

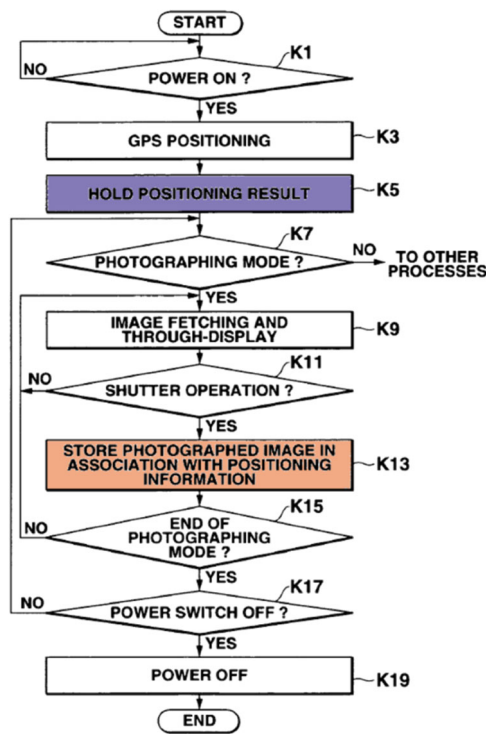
189. *Ogura* discloses that “DRAM 5 is used as a work memory” and that this is distinct from flash memory 6 which “stores each photographed image.”

Ogura, 8:27-28.

190. *Ogura* teaches acquiring the positioning result “immediately before or immediately after photographing.” *Ogura*, 4:4-7. One of the embodiments, depicted in FIG. 14, performs positioning when the camera is powered on. *Ogura*, 15:56-58. *Ogura* teaches that in the FIG. 14 embodiment, the GPS processing section receives the GPS radio waves, computes the local position of the device, and “hold[s] [the] positioning result” in the “positioning result memory area” in RAM 3b or DRAM 5. *Ogura*, 15:63-16:15, FIG. 14 (**step K5** labeled “Hold Positioning Result” **(annotated in dark purple)**).

191. *Ogura*’s “positioning result memory area” holds the positioning result (FIG. 14, **step K5**), and the positioning result is not yet associated with an image. Only when the image is stored in flash memory 6 is the positioning result retrieved from positioning result memory area and associated with image data. *See Ogura*,

16:40-43 (disclosing after the image is acquired, storing the compressed image data 6 and “[a]t this time, the positioning result ... stored in the RAM 3b in **step K5** is stored in association with the photographed image.”) (**step K13 (annotated in orange)**). Because generally the photographic position is not changed after powering on the camera, *Ogura* teaches that the stored positioning result will “match[] with the actual photographic location in most cases.” *Ogura*, 17:7-11.



Ogura, FIG. 14 (annotated)

192. A person having ordinary skill in the art would have considered it obvious to modify the *Singh-Abram* combination with *Ogura*’s teachings. A person having ordinary skill in the art would have also been motivated to obtain positioning “immediately before or immediately after photographing” to reduce

interference with, and the power consumption of, the GPS positioning apparatus because “the photographing timing and the positioning timing do not overlap each other.” *See Ogura*, 4:4-12. And because the positioning is performed when the camera is powered on, before acquiring an image, “the user can perform the shutter manipulation without being conscious about positioning (because the user needs not wait for positioning to be completed.)” *Ogura*, 16:65-17:11.

193. A person having ordinary skill in the art would have considered modifying *Singh* with *Ogura*’s teachings in this regard obvious because it amounts to applying a known technique (*Ogura*’s teachings of acquiring and holding a positioning result in working memory before capturing an image) to a known method (the *Singh* method) ready for improvement (*Ogura* teaches linking the acquiring of a positioning result to each time an image is captured, like *Singh*’s method’s devices, increases the possibility of interference with the GPS positioning apparatus and increases power consumption) to yield predictable results (reduced interference and power consumption in the devices used in the *Singh method*). And a person having ordinary skill in the art would have had a reasonable expectation of success because of the similarities between the *Singh* method’s devices and *Ogura*’s digital camera with a GPS processing section.

194. In the *Singh-Abram-Ogura* combination, the GPS unit would acquire location data when the device is powered on, as *Ogura* teaches. Once the

combination's GPS unit determines the geographic coordinates using the GPS signals, *Ogura* teaches storing the result in working memory. See *Ogura*, 15:63-16:15, FIG. 14 (step K5 labeled "Hold Positioning Result"). The location at which the *Singh-Abram-Ogura* combination's device's GPS unit acquires location data is the required "predetermined location" because it is the location at which the GPS unit obtains the location data, beforehand.

195. In the *Singh-Abram-Ogura* combination, the distinction between working memory of the location determination device holding location data and the memory storing the image in association with the location data taught by *Ogura* would also exist. By storing the location data as *Ogura* teaches, a person having ordinary skill in the art would understand that this does not associate the location data with any image data. Then, when executing *Singh's* teachings of capturing images ("generating first image data at a predetermined location"), the captured image will be of the "predetermined location" because the GPS unit obtained the location data at that location beforehand, as *Ogura* teaches. A person having ordinary skill in the art would have therefore understood that the *Singh-Abram-Ogura* combination teaches that the required "predetermined location" is a location at which the GPS unit acquired location data beforehand.

196. Accordingly, in my opinion, a person having ordinary skill in the art would have understood the *Singh-Abram-Ogura* combination teaches that when the

device captures the image (“generating first image data”), the device has already acquired the positioning result for a location and holds the positioning result in memory for the location (“with the terminal at a predetermined location”) and then *Singh*’s mobile device receives the coordinates (“receiving location data”) corresponding to the location of the terminal immediately before the image was captured (“of the predetermined location”).

c. [1c], [13c] – 1[i], 13[i]

197. In my opinion, *Singh-Abram-Ogura* in combination with *Odashima* teaches these features for the same reasons as I discussed at §§X.A.1.d - X.A.1.j.

2. Claims 4, 7-14

198. In my opinion, the *Singh-Abram-Ogura-Odashima* combination teaches the features of claims 4, 7-14 for the same reasons as I discussed at §§X.A.2 - X.A.8.

C. GROUND 1C: *SINGH-ABRAM-ODASHIMA-BULLOCK* RENDERS CLAIMS 1, 4, 7-14 OBVIOUS

1. Claims 1, 13

a. [1pre], [13pre] – 1[f], 13[f]

199. In my opinion, to the extent the preamble is limiting, *Singh* in combination with *Abram* and *Odashima* teaches this feature for the same reasons as I discussed at §X.A.1.a - X.A.1.f.

- b. [1e], [13e] receiving, at the another terminal, a selection input for an image corresponding to the second image data, from the user;**

200. In my opinion, *Singh-Abram-Odashima* in combination with *Bullock* teaches this feature.

201. As I explained in §X.A.1.g, the *Singh-Abram-Odashima* teaches the receiving user's mobile device receives the user's selection of a digital image preview ("receiving, at the another terminal, a selection input for an image corresponding to the second image data from the user") because a person having ordinary skill in the art would have understood that it was common and advantageous for individuals to have multiple devices from which to access their captured images.

202. To the extent the Patent Owner argues, or the Board finds, that *Singh-Abram-Odashima* does not teach that the user who received the prompting (element [1c]) is the same user from whom the receiving device receives "a selection input for an image corresponding to the second image data" required by this feature, *Bullock* provides such a teaching.

203. *Bullock* discloses "an arrangement 10 that include a mobile apparatus 100 and a remote apparatus 200" that is "operably coupled to, and remotely located from, mobile apparatus 100." *Bullock*, 2:23-24, 2:38-44. The "[r]emote apparatus 200 allows the user to retrieve and manipulate the waypoint from both mobile

apparatus 100 and an alternative access means 300 that is operably coupled to remote apparatus 200 and remotely located from mobile apparatus 100. Making the waypoints in remote apparatus 200 accessible from means other than just mobile apparatus 100 offers significant convenience and flexibility to a user.”

Remote apparatus 200 allows the user to retrieve and manipulate the waypoint from both mobile apparatus 100 and an alternative access means 300 that is operably coupled to remote apparatus 200 and remotely located from mobile apparatus 100. Making the waypoints in remote apparatus 200 accessible from means other than just mobile apparatus 100 offers significant convenience and flexibility to a user.

Bullock, 2:49-55.

204. *Bullock* discloses that when a real estate agent driving through a neighborhood “encounters a house for sale,” the agent marks the location using a device in the car, causing the capture of a digital picture of the house and attaching “other information (i.e., the geographic position and the time).” *Bullock*, 13:21-30. The user shares this information to the service center and later accesses the information from another device at the office. *Bullock*, 13:45-59. A person having ordinary skill in the art would have understood that *Bullock*’s real estate agent would use a device in the office that is different from the device used in the agent’s vehicle. A person having ordinary skill in the art would have therefore understood that *Bullock*’s disclosure of a user (i.e., “real estate agent”) interacting with two

separate devices (i.e., the vehicle interface and the office) teaches the same user interacting with two different devices.

205. A person having ordinary skill in the art would have considered the combination to amount to the use of a known technique (*Bullock's* disclosure of mobile apparatus 100 and remote apparatus 200 being used by the same user) to improve a similar technique (*Singh-Abram-Odashima's* method) in the same way (offering significant convenience and flexibility to a user as *Bullock* teaches).

Similarly, a person having ordinary skill in the art would have considered the combination to amount to applying a known technique (*Bullock's* disclosure of mobile apparatus 100 and remote apparatus 200 being used by the same user) to a known method (*Singh-Abram-Odashima's* method) ready for improvement (the same user using two devices, which *Singh-Abram-Odashima's* method does not expressly disclose) to yield predictable results (offering significant convenience and flexibility to a user as *Bullock* teaches).

206. A person having ordinary skill in the art would have had a reasonable expectation in success in making the combination. *Singh* does not restrict the same user from using both the capturing device 102 and the receiving device 109. As such, any modifications necessary to apply *Bullock's* same user teachings to *Singh-Abram-Odashima's* method would have been straightforward and well within a person having ordinary skill in the art's ordinary skill.

207. Accordingly, a person having ordinary skill in the art would have understood that the *Singh-Abram-Odashima* combination teaches that the receiving user receives digital images "onto his device" and receives the user's selection of a digital image ("receiving, at the another terminal, a selection input for an image") that was transmitted from the capturing user's device appended with location coordinates as metadata ("corresponding to the second image data"), and that *Bullock* teaches the same user uses the capturing and receiving device ("from the user").

c. [1g], [13g] receiving, at the another terminal, via the displayed menu, a selection input for the location-based service, from the user;

208. In my opinion, *Singh-Abram-Odashima-Bullock* teaches this feature.

209. As I explained in §X.A.1.f, *Singh* teaches that the receiving user requests a path to the location of the image. As I explained in §X.A.1.f, the *Singh-Abram-Odashima* combination teaches displaying a menu including a button for requesting the path. And as I explained in §X.C.1.b, a person having ordinary skill in the art would have understood that *Bullock* teaches that the same user would use the capturing and receiving devices of the *Singh-Abram-Odashima* combination's method.

210. Accordingly, a person having ordinary skill in the art would have understood the *Singh-Abram-Odashima-Bullock* combination teaches the receiving

user selecting a button displayed as part of the menu on the receiving device to request a path to the location of the image (“receiving, at the another terminal, via the displayed menu, a selection input for the location-based service”) from the same user using the capturing and receiving devices (“from the user”).

- d. **[1h], [13h] receiving, at the another terminal, location-based service data corresponding to the location data of the selected second image data; and**

211. In my opinion, *Singh-Abram-Odashima-Bullock* teaches this feature for the same reasons as I discussed at §X.A.1.i.

- e. **[1i], [13i] providing the location-based service to the another terminal by using the received location-based service data.**

212. In my opinion, *Singh-Abram-Odashima-Bullock* teaches this feature for the same reasons as I discussed at §X.A.1.j.

2. Claims 4, 7-14

213. In my opinion, *Singh-Abram-Odashima-Bullock* teach these features for the same reasons as I discussed at §§X.A.2 - X.A.8.

D. GROUND 1D: *SINGH-ABRAM-OGURA-ODASHIMA-BULLOCK* RENDERS CLAIMS 1, 4, 7-14 OBVIOUS

1. Claims 1, 13

- a. **[1pre], [13pre] A location-based service method using image data provided by a terminal equipped with a camera, and using location data that includes location information of the terminal, comprising:**

214. In my opinion, to the extent the preamble is limiting, *Singh* teaches this feature for the same reasons as I discussed at §X.A.1.a.

b. [1a], [13a] - [1b], [13b]

215. In my opinion, *Singh* in combination with *Abram* and *Ogura* teaches these features for the same reasons as I discussed at §X.B.1.b.

c. [1c], [13c] - [1f], [13f]

216. In my opinion, *Singh-Abram-Ogura* in combination with *Odashima* teaches these features for the same reasons as I discussed at §§X.A.1.d-X.A.1.f.

d. [1e], [13e], [1g], [13g]

217. In my opinion, *Singh-Abram-Ogura-Odashima-Bullock* teaches this feature for the same reasons as I discussed at §§X.C.1.b - X.C.1.c.

e. [1h], [13h], [1i], [13i]

218. In my opinion, *Singh-Abram-Ogura-Odashima-Bullock* teach these features for the same reasons as I discussed at §§X.A.1.i - X.A.1.j.

2. Claims 4, 7-14

219. In my opinion, the *Singh-Abram-Ogura-Odashima-Bullock* combination teaches these features for the same reasons as I discussed at §§X.A.2-X.A.8.

E. GROUND 2A: *SINGH-ABRAM-ODASHIMA-SUOMELA* RENDERS CLAIMS 3, 6 OBVIOUS

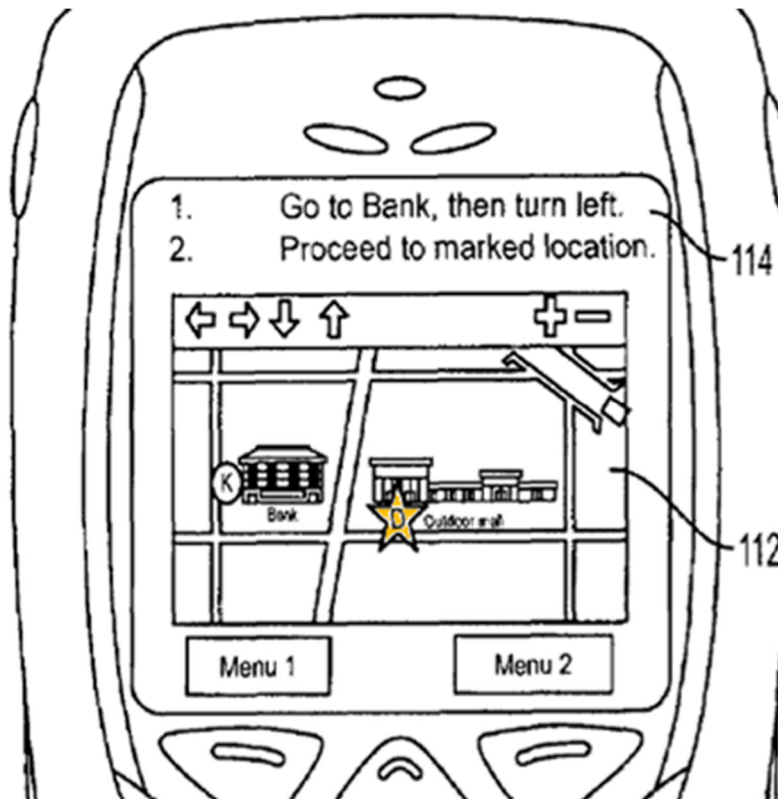
1. [3] The location-based service method according to claim 1, wherein the map includes at least one of geographical

information, traffic information, administrative district information, and information including the latitude and the longitude of the location data.

220. In my opinion, *Singh-Abram-Odashima* in combination with *Suomela* teaches this feature.

221. The *Singh-Abram-Odashima* combination teaches displaying a generated path, but does not expressly disclose providing a map. *See Singh*, [0026] (“The device 109 or map server 104 can generate the paths, and the generated paths can be displayed to the receiving user 108 using the mobile device 109, via step 506.”).

222. *Suomela* teaches the mobile device 110 is a phone that displays a digital map 112. *Suomela*, 3:43-47, FIG. 1. *Suomela*’s “[m]obile device 110 may comprise a network-enabled wireless device, such as a digital camera, a cellular phone.” *Suomela*, 4:25-29. *Suomela*’s mobile device 110 includes a GPS receiver 236. *Suomela*, 5:3-5, FIG. 2. *Suomela*’s digital map 112 provides “a user with directions to a desired destination” identified by the D symbol. *Suomela*, 3:47-50, FIG. 1; *see also Suomela*, 10:42-46 (identifying “an **Outdoor Mall 804** (annotated in yellow) designated by a “**D**” symbol” as the destination). *Suomela*’s FIG. 7 teaches a method for determining navigation instructions including an interactive map 112 displayed on the mobile device 110. *Suomela*, 9:23-46.



Suomela, FIG. 1 (excerpted)

223. *Suomela* discloses the starting point “may include a user’s current location.” *Suomela*, 3:64-66. Once the route is calculated, using Dijkstra’s shortest path algorithm, for example, *Suomela* discloses providing a “navigation map ... generated by selecting a portion of the graphical map.”

A **navigation map** may also be generated by selecting a portion of a graphical map stored in the map database that includes the nodes and links of the second recommended route plus a perimeter area.

Graphical navigation instructions may also be provided, such as highlighting the recommended route on the navigation map. The graphical navigation instructions may also be provided for a route from a starting point to the destination via the closest known location.

Suomela, 10:25-32.

The map software may match the starting point and the destination with location nodes stored in the map database and, **using an algorithm such as Dijkstra's shortest path algorithm, calculate a shortest path from the starting point node via intermediate nodes to the destination node**. Other known wayfinding methods may be used, such as methods that evaluate the fastest route, the shortest route using highways, and the shortest route using local roads between the starting point and the destination.

Suomela, 9:38-46 (disclosing the usage of Dijkstra's shortest path algorithm), 10:16-19 (same).

224. And *Suomela* teaches that “highlighting the recommended route on the navigation map” is one way of providing graphical navigation instructions guiding the user from the starting point to the destination. *Suomela*, 10:29-32.

225. A person having ordinary skill in the art would have recognized *Suomela*'s digital map 112 includes roads and the location of the **destination D**. See *Suomela*, FIG. 1. A person having ordinary skill in the art would have therefore understood *Suomela*'s map 112 includes at least geographical information and information about the latitude and longitude of the location data because of the display of roads (“geographical information”) and the location of the destination (“the latitude and longitude of the location data”).

226. A person having ordinary skill in the art would have been motivated to modify the *Singh-Abram-Odashima* combination with *Suomela*'s teachings because doing so would provide graphical navigation instructions in the form of a route on a map with geographical information, and information including the location data, for example. A person having ordinary skill in the art would have sought to provide such information in a graphical manner, and *Suomela* provides such a teaching and confirms its applicability on a mobile device such as a phone.

227. A person having ordinary skill in the art would have found it obvious to modify the *Singh-Abram-Odashima* combination to include the map display teachings from *Suomela* because it is the application of a known technique (*Suomela*'s display of a map providing graphical navigation instructions to a destination) to a known method (the *Singh-Abram-Odashima* method for generating paths) ready for improvement (*Singh-Abram-Odashima* discloses "the generated paths can be displayed to the receiving user 108 using the mobile device 109, via step 506" but lacks any express disclosure of providing a route on the map using the generated paths). A person having ordinary skill in the art would have also found this obvious because it would use a known technique (*Suomela*'s graphical map displayed on a phone with graphical routing information) to improve similar a method (*Singh-Abram-Odashima* generated paths location-based

service method) in the same way (providing a graphical map with geographical information).

228. In my opinion, a person having ordinary skill in the art would have had a reasonable expectation of success. Like the *Singh-Abram-Odashima* combination, *Suomela* discloses a phone 110, and like *Singh*, *Suomela* teaches using a server 324 providing data “to display map 112.” *Suomela*, 5:47-51. And *Suomela* evidences how graphical maps that provided graphical navigation instructions on a phone existed. *E.g.*, *Suomela*, FIG. 1. A person having ordinary skill in the art would have therefore had a reasonable expectation of success in modifying the *Singh-Abram-Odashima* combination with *Suomela*’s teachings.

229. Accordingly, a person having ordinary skill in the art would have understood *Suomela* to teach displaying a map with highlighted roads providing the route (“the map includes at least one of geographical information, traffic information, administrative district information”) and the location of the destination (“and information including the latitude and the longitude of the location data”).

2. **[6] The location-based service method according to claim 4, wherein the navigation data comprises at least one of the information including the shortest route corresponding to the location data, traffic information and turnaround time.**

230. In my opinion, *Singh-Abram-Odashima-Suomela* teaches this feature.

231. As discussed for claim 4, the *Singh* map server 104 provides the generated path, and a person having ordinary skill in the art would have understood *Singh*'s generated path teaches the navigation data. *Singh* discloses a path search algorithm is used to generate paths, via step 505. *Singh*, [0026], [0027]. *Singh* lacks, however, details as to these path search algorithms.

232. *Suomela* discloses that the map software uses “an algorithm such as Dijkstra’s shortest path algorithm” to calculate the shortest path between the starting point to the destination. *Suomela*, 9:38-43. “Other known wayfinding methods may be used, such as methods that evaluate the fastest route, the shortest route using highways, and the shortest route using local roads between the starting point and the destination.” *Suomela*, 9:43-46. A person having ordinary skill in the art would have therefore understood *Suomela* to teach how to obtain the shortest route corresponding to the location data, at a minimum.

233. A person having ordinary skill in the art would have been motivated to modify the *Singh-Abram-Odashima* combination because of *Singh*'s mention that “[p]ath search algorithms are known in the art.” *Singh*, [0026]. *Suomela* provides one example of known path search algorithms, the Dijkstra shortest path algorithm, and discloses that “[o]ther known wayfinding methods may be used, such as methods that evaluate the fastest route, the shortest route using highways, and the shortest route using local roads between the starting point and the

destination.” *Suomela*, 9:43-46. A person having ordinary skill in the art would have therefore been motivated to apply *Suomela*’s specific algorithmic teachings to the *Singh-Abram-Odashima* combination.

234. A person having ordinary skill in the art would have found such a combination obvious because it amounts to applying a known technique (*Suomela*’s teachings of using the Dijkstra shortest path algorithm and other known wayfinding methods to find the shortest route between the starting point and the destination) to improve a similar method (the *Singh-Abram-Odashima* combination using known path search algorithms) in the same way (providing the shortest route between the starting point and destination). Similarly, a person having ordinary skill in the art would have found such a combination obvious because it amounts to applying a known technique (*Suomela*’s technique of using the Dijkstra shortest path algorithm and other known wayfinding methods to find the shortest route between the starting point and the destination) to improve a known method (the *Singh-Abram-Odashima* combination) ready for improvement (the *Singh-Abram-Odashima* combination uses path search algorithms “known in the art” but offers no details) to yield predictable results (providing the shortest route between the starting point and the destination).

235. A person having ordinary skill in the art would have had a reasonable expectation of success because *Singh* contemplates using a path search algorithm,

and *Suomela* provides the specific teachings for the Dijkstra shortest path algorithm. Applying *Suomela*'s teachings to the *Singh-Abram-Odashima* combination would have been straightforward and well within the ordinary skill of a person having ordinary skill in the art.

236. Accordingly, a person having ordinary skill in the art would have understood *Singh-Abram-Odashima-Suomela* to teach finding the shortest route between the starting point to the destination using the Dijkstra shortest path algorithm ("the navigation data comprises at least one of the information including the shortest route corresponding to the location data").

F. GROUND 2B: *SINGH-ABRAM-OGURA-ODASHIMA-SUOMELA* RENDERS CLAIMS 3, 6 OBVIOUS

237. *Singh-Abram-Ogura-Odashima* in combination with *Suomela* teaches the features of claims 3 and 6 for the same reasons as I discussed at §X.E for *Singh-Abram-Odashima-Suomela*. A person having ordinary skill in the art would have been motivated and found it obvious to modify *Singh-Abram-Ogura-Odashima* with *Suomela* for the same reasons as discussed for Ground 2A for modifying *Singh-Abram-Odashima* with *Suomela*. See §X.E.

G. GROUND 2C: *SINGH-ABRAM-ODASHIMA-BULLOCK-SUOMELA* RENDERS CLAIMS 3, 6 OBVIOUS

238. *Singh-Abram-Odashima-Bullock* in combination with *Suomela* teaches the features of claims 3 and 6 for the same reasons as discussed I discussed

at §X.E for *Singh-Abram-Odashima-Suomela*. A person having ordinary skill in the art would have been motivated and found it obvious to modify *Singh-Abram-Odashima-Bullock* with *Suomela* for the same reasons as discussed for Ground 2A for modifying *Singh-Abram-Odashima* with *Suomela*. See §X.E.

H. GROUND 2D: *SINGH-ABRAM-OGURA-ODASHIMA-BULLOCK-SUOMELA* RENDERS CLAIMS 3, 6 OBVIOUS

239. *Singh-Abram-Ogura-Odashima-Bullock* in combination with *Suomela* teaches the features of claims 3 and 6 for the same reasons as I discussed at §X.E for *Singh-Abram-Ogura-Odashima-Suomela*. A person having ordinary skill in the art would have been motivated and found it obvious to modify *Singh-Abram-Ogura-Odashima-Bullock* with *Suomela* for the same reasons as discussed for Ground 2A for modifying *Singh-Abram-Odashima* with *Suomela*. See §X.E.

XI. Secondary Considerations

240. I am not aware of any evidence in the '060 Patent's prosecution history or elsewhere supporting any secondary considerations arguments, or evidence of any nexus of such alleged evidence to the challenged claims. See generally, *EX1004*. To the extent the Patent Owner asserts that such evidence exists in its responses, I reserve the right to address any such evidence.

XII. CONCLUSION

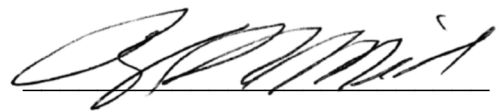
241. The findings and opinions set forth in this declaration are based on my work and examinations to date.

242. I may continue my examinations. I may also receive additional documentation and other factual evidence over the course of this IPR that will allow me to supplement and/or refine my opinions. I reserve the right to add to, alter, or delete my opinions and my declaration upon discovery of any additional information. I reserve the right to make such changes as may be deemed necessary.

243. In signing this declaration, I recognize that the declaration will be filed as evidence in an IPR before the PTAB. I also recognize that I may be subject to cross-examination in the case and that cross-examination will take place within the United States. If cross-examination is required of me, I will appear for cross-examination within the United States during the time allotted for cross-examination.

244. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Date: 30 April 2025

A handwritten signature in black ink, appearing to read 'W. Michalson', written over a horizontal line.

William R. Michalson, Ph.D.