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UNITED STATES DISTRICT COURT

CENTRAL DISTRICT OF CALIFORNIA

VEDERI, LLC,

Plaintiff,

v.

GOOGLE, INC.,

Defendant.

AND RELATED COUNTERCLAIMS

Case No. CV10-07747 AK (CWx)

DECLARATION OF DR. JOHN R. GRINDON IN SUPPORT OF GOOGLE'S OPENING CLAIM CONSTRUCTION BRIEF

I, Dr. John R. Grindon, declare as follows:

1. I reside in St. Louis, Missouri. I am qualified in all respects to make this declaration, have personal knowledge of the facts set forth herein, and based my opinions on my personal knowledge, except if specifically stated otherwise.

2. I have been retained by Google as an expert consultant in the above-referenced litigation. I submit this declaration in support of Google's Opening Claim Construction Brief. If asked to testify in Court under oath about the matters discussed in the declaration, I could and would so testify.

3. I understand that Plaintiff Vederi has accused Google of infringing certain claims in four patents: U.S. Patent Nos. 7,239,760 ("the '760 Patent"); 7,577,316 ("the '316 Patent"); 7,805,025 ("the '025 Patent"); and 7,813,596 ("the '596 Patent") (collectively, the "patents-in-suit").

4. I have reviewed the claims, specifications, and file histories of the patents-in-suit. I understand these patents have a common disclosure. For ease of reference, all citations to the specification are to the '760 patent, unless stated

otherwise. I have also reviewed Provisional Application No. 60/238,490 ("490 Provisional"), to which the patents-in-suit claim priority.

I. QUALIFICATIONS

5. I obtained a Bachelor of Science degree in Electrical Engineering from the University of Missouri at Rolla (now Missouri University of Science and Technology) in 1961, a Master of Science degree in Electrical Engineering from the Massachusetts Institute of Technology in 1962, and a Doctor of Science degree in Electrical Engineering from Washington University in St. Louis in 1970.

6. I have over 30 years of experience related to the technology at issue in the above-captioned litigation.

7. From 1962 to 1987 I worked at McDonnell Douglas Corporation. My work there included leading project teams in digital image processing research and development for Cruise Missile Guidance, correlation matching of sensed and stored reference images, and automatic target recognition. I also led an engineering research and development team to develop scene analysis algorithms for three-dimensional (3-D) imagery for advanced autonomous Cruise Missile Guidance employing imaging laser radars (LIDAR).

8. From 1985 to 1990 I worked at Cencit, Inc., where my work included creating and leading an engineering organization in the research and development of three-dimensional electronic imaging systems based upon digital video image processing electronics and software algorithms.

9. From 1990 to present I have worked as an independent consultant, consulting for companies on work relating to digital image processing software, calibration of imaging optics, and electronic imaging systems.

10. I am a named inventor on seven United States patents, some of which have related foreign patents and/or patent applications. U.S. Patent Nos. 4,846,577 and 6,373,963, especially, relate to digital image acquisition and processing systems that process and combine images from multiple viewpoints and

directions to generate a composite image and three-dimensional (3D) computer model of an imaged object.

11. A detailed record of my professional qualifications, including a list of publications, awards, and professional activities, is set forth in my curriculum vitae attached to this declaration at Tab A.

II. PERSON OF ORDINARY SKILL IN THE ART

12. As presently advised, I have developed an opinion as to the art pertinent to the subject matter of the patents-in-suit: the art of the field of digital image acquisition and processing, including computer software algorithm design, or related fields.

13. The original application that led to the patents-in-suit (Application No. 09/758,717) was filed on January 11, 2001. That application states that it claims priority to Provisional Application No. 60/238,490, filed on October 6, 2000.

14. I have personal knowledge that assists in understanding the level of skill in the art to which the patents-in-suit pertain in or around October 2000, which I have been informed is the date to which Vederi believes the patents claim priority. By October 2000 I had already begun work as an independent consultant and had worked in the industry for over thirty years, as described in more detail above and in the attached curriculum vitae.

15. I have not yet considered the issue of whether the asserted claims of the patents-in-suit are supported by the provisional application filed on October 2000. My definition of the level of skill in the art would not substantively change even if it is determined that the patents-in-suit are not supported by the October 2000 provisional and are only entitled to a later priority date.

16. In my opinion, a person of ordinary skill in the art of the patents-in-suit as of October 2000 was a person who has a Bachelor's degree in electrical engineering or computer science with 5 years experience in digital image acquisition

and processing, including computer software algorithm design, or an advanced degree in electrical engineering or computer science and 2-3 years experience in the field. My opinions provided in this declaration apply this standard. I further base my opinions on my review of the patents-in-suit and on my direct knowledge of the level of skill of technical people in the field in 2000.

17. I understand that a claim term has the meaning that it would have to a person of ordinary skill in the art as of the effective filing date of the patent application.

III. BACKGROUND OF THE TECHNOLOGY

18. In general terms, the purpose of Vederi's claimed inventions is to allow a user to browse a user-selected location from the user's computer by providing a certain type of image of that location on the user's computer display screen.

19. The patents-in-suit describe the "Field of the Invention" as "visual databases, specifically … the creation and utilization of visual databases of geographic locations." (1:17-19.) The patents-in-suit are "directed to a computer-implemented system and method for synthesizing images of a geographic location to generate composite images of the location" to "allow[] a user to visually navigate the area from a user terminal." (2:19-22, 47-48.)

20. The patents-in-suit acknowledge that "[t]here exist methods in the prior art for creating visual databases of geographic locations." (1:23-24.) Indeed, systems have existed since at least the late 1970s that allow users to browse through a location from a user's computer screen. I am personally acquainted with a number of such systems since the 1980s, one example being in the aerospace industry for pilot training systems wherein a visual image database is employed to display a view of terrain ahead corresponding to flight control inputs by the user.

21. Generally, these systems operate by first gathering images of a geographic area. These images are normally acquired using digital cameras or video

recorders. For example, a method using video technology to acquire the images may have used "a vehicle equipped with a video camera and a Global Positioning System (GPS) to collect image and position data by driving through the location." (1:39-42.) "The video images are later correlated to the GPS data for indexing the imagery" so that the images correspond to the physical location in the geographic area from which they originate. (1:42-43.)

22. After the images are gathered, they are typically loaded into memory storage. Such storage could be any of the typical forms, for example, a database on a hard drive or CD-ROM. An end-user application is then provided that allows the users to input a desired geographic location, typically using the street address of that location. Images associated with the geographic location are then retrieved by the user's computer and shown to the user. Many systems would provide the user the opportunity to then navigate using arrows, by clicking another location on a map, or by inputting one or more desired geographic locations.

23. Presenting a single image frame "contains a narrow field of view of a locale (e.g. a picture of a single store-front) due to the limited viewing angle of the video camera." (1:48-51.) To provide more geographical context to the user, the patents-in-suit discuss different methods that prior art systems used to generate composite images that, for example, provide a wider field of view.

24. For example, composite images could be made by pasting images onto a 3D model of a geographic location. The patents-in-suit state that the "prior art for creating visual databases of geographic locations" includes methods wherein "individual photographs" and images derived from video recordings are "electronically past[ed] … on a polygonal mesh that provide[s] the framework for a three-dimensional (3D) rendering of the location." (1:23-30.) Such methods, according to the patents-in-suit, are "time consuming and inefficient for creating large, comprehensive databases covering a substantial geographic area such as an entire city, state, or country." (1:31-33.)

25. Additionally, as the patents-in-suit explain, the prior art includes projecting images on an imaginary sphere to provide a 360 degree view, stating that the prior art "teaches the dense sampling of images … in two dimensions either within a plane, or on the surface of an imaginary sphere surrounding the object/scene." (1:63-67.) The patents-in-suit state that such a method "is computationally intensive and hence cumbersome and inefficient in terms of time and cost." (2:1-2.)

26. When creating a spherical projection, multiple images taken from different, overlapping views are typically recorded using specialized camera systems. Such camera systems typically have multiple cameras facing in different directions and mounted in close proximity in order to approximate an expanded or full range of views from a single position. These images are then combined to create a panoramic view. Because the multiple images are taken at or near the same time, motion or lack of motion of the platform holding the camera is not a factor. Further, because images are taken in different directions from the same position, the camera is not required to move in order to generate the images that are used to form the panorama. Additionally, position information is not required in order to properly combine the images when forming a panorama.

27. This spherical projection approach to creating a panoramic image has the advantage that three-dimensional scenes, that is, scenes with multiple, unaligned objects or features which may be at different distances from the camera, can be properly "stitched" to create a panoramic image. Further, the panoramic image can encompass as much of the surrounding "sphere" as desired, up to and including a full sphere of 360° azimuth, and 180° elevation.

28. Vederi's claimed invention sacrifices image quality in order to reduce computational complexity. Indeed, the provisional patent application states that "[t]he present method is a compromise between quality of the synthetic image and algorithmic complexity." (Declaration of Sasha G. Rao In Support Of Google's

Opening Claim Construction Brief, Exhibit H at 8; exhibits to the "Rao Declaration" are hereinafter cited as "Rao Ex. __".) Vederi acknowledged that "[m]uch more sophisticated and computationally intensive techniques for 3 dimensional reconstruction of the scene are available in the prior art." *Id.* But for Vederi's "proposed application, the quality of the panoramic images is sufficient even in presence of some distortion." *Id.*

29. The patents-in-suit purport to invent and claim something different that can be performed in a "more time and cost efficient manner," and that "should not require the reconstruction of 3D scene geometry nor the dense sampling of the locale in multiple dimensions." (2:5-7.)

IV. THE ACCUSED STREET VIEW SERVICE

30. I understand that Vederi has alleged that Google's Street View Service infringes the patents-in-suit. I have personally used Street View on a number of occasions over at least the past several years. End-users access Street View through Google Maps to view locations of their choice. Google has had to gather a massive amount of image data in order to provide Street View to users.

31. I understand that Google creates composite images using a curved or spherical projection method.[1] A website provided by Google to assist programmers with interacting with the system (e.g. by creating custom panoramas) shows an example panorama projected onto a sphere:

[1] See, for example, http://code.google.com/apis/maps/documentation/javascript/services.html#CustomStreetView.

The same website also provides an example "full wrap-around panorama":

32. By creating images using this method, Google is able to provide a very high quality service to its users. The patents-in-suit call the spherical projection

method computationally intensive, cumbersome, and inefficient. Indeed, creating composite images in this manner involves complex algorithms and the collection and processing of an enormous amount of data. Other processing methods might be less cumbersome, but would lead to lower quality composite images.

33. Specifically, using a spherical projection method creates a high quality service because the composite images suffer from less distortion and wider viewing ranges than composite images created using the method taught by the patents-in-suit (discussed further below).

V. THE DISCLOSED SYSTEMS AND METHODS OF THE PATENTS-IN-SUIT

34. The patents-in-suit teach a process for allowing users to browse through a geographic area similar to processes available in the prior art. For example, the patents-in-suit disclose that "an image recording device moves along a path recording images of objects along the path" in order to initially collect the data. (2:26-28.) The image recording devices "preferably tak[e] the form of digital video cameras." (3:56-57.) For example, the data acquisition cameras may consist of "four cameras 10 mounted on top of a moving motor vehicle." (4:64-65; Figure 1.) The patents-in-suit refer to these single image frames acquired by the image recording device as *acquired* images.

35. As was taught in the prior art, in the disclosed system location data is saved as images are being acquired, the location data provided by a "GPS receiver and/or inertial navigation system." (2:28-30; *see also* 3:66-4:8.) In order to retain the correspondence between the images and their original geographic location, "[t]he image and position information is provided to a computer to associate each image with the position information." (2:31-32.) Specifically, the video cameras "provide a frame number and time information" and the GPS receiver and/or inertial navigation system provide position information, and then, in certain embodiments,

this information is stored and used "by a post-processing system 38 to create the composite images." (4:14-29.)

36. In those embodiments where the disclosed system creates composite images that will be shown to the user on the user terminal, "[t]he computer synthesizes image data from the acquired images to create a composite image depicting a view of the objects …." (2:33-35.) One advantage of these images is that "[p]referably, the composite image provides a field of view of the location that is wider than the field of view provided by any single image acquired by the image recording device." (2:35-38.) In other words, "the composite images help provide a panoramic view of the location." (5:53-54.)

37. The post-processing system preferably includes a computer with a video acquisition card and a processor "programmed with instructions to take the image and position data and create one or more composite images for storing into an image database 32." (4:36-38.) "The image database 32 is preferably a relational database that resides in a mass storage device." (4:38-40.)

38. However, the patents-in-suit disclose an alternative embodiment for the formation of composite images. In this embodiment, "the images are transferred directly to the data acquisition computer 34 as the images are being recorded," eliminating the post-processing system 38 which includes the image database storage 32. (4:44-46; Figure 1.) In this embodiment, the data acquisition computer 34 is "preferably equipped with the video acquisition card and includes sufficient storage space for storing the acquired images." (4:46-48.) Because "the data acquisition computer 34 preferably contains program instructions to create the composite images from the acquired images" it can form the composite images itself without the need for the post-processing system 38. (4:48-51.) Images may be stored and then processed to form composite images, but one of ordinary skill in the art would recognize that images may be processed "on-the-fly" as they are being received and originally stored into permanent memory as composite images.

39. The patents-in-suit, in seeking to improve upon the so-called "computationally intensive" and "cumbersome" methods of forming composite images in the prior art, teach a single way to form composite images that seeks to minimize this computational burden. This process is illustrated by Figure 2 (see below, ¶ 58).

40. Essentially, a computer identifies optical rays that would originate from an assumed synthetic viewpoint, referred to as a "fictitious camera", and also identifies the corresponding optical rays from the actual camera, and extracts portions of acquired image frames to piece together and form a composite image. (5:55-6:4.) The computer pieces a sequence of composite images together "on a column-by-column basis by extracting the corresponding optical column from each image frame." (6:6-9; *see also* 9:19-10:35 and Figures 10-12.) The final step of Figure 10, which describes the formation of composite images, is to "[s]tack all columns side by side to generate one single image bitmap" (i.e., a composite image). The composite images "depict[] a view of the objects from a particular location outside of the path" (2:34-35) because a person must move off of the path on which the images were taken in order to achieve a wider panoramic view like the one shown in the composite image. The composite images are stored in the image database and an association is created in order to maintain the correspondence between the composite pictures and the original geographic location. (6:19-23.)

41. The way of generating composite images taught by the patents-in-suit suffers from a distortion problem because it requires moving the camera along a path, i.e. along a trajectory, taking pictures along the way, each picture taken at a different position of the camera. These individual pictures are then combined to form a composite image. This method, in general, suffers from attempting to combine images from different positions, which produce different perspective views. This is not possible to do for three-dimensional scenes containing multiple, unaligned objects at different distances, without substantial distortions. Thus, the

method of generating composite images by combining images taken from different positions, such as taught in the patents, has limited use in practice, primarily for flat or nearly flat surfaces, such as for document scanning. For example, a moving imaging sensor is used in digital copy machines, and in flatbed scanners such as were popular in the days of film photography. Generation of composite images using a moving camera has also seen use in aerial and satellite photography, wherein the carrying platform moves along a trajectory as images are acquired in a swath below. Unlike the spherical projection approach distinguished in the patent specification, in order for the approach described in the patent to work, the carrying platform must be in motion, and it must move along a known or determined path. Thus, the claims of the patents-in-suit have the limitation of "image frames acquired by an image recording device moving along a trajectory" (*see*, *e.g.*,'760 patent, claim 1) because forming composite images using the method of the patents-in-suit requires the combination of a series of images taken from a sequence of positions along a known path of travel. As discussed further above, the method of forming spherical projections is accomplished by combining images taken in multiple directions from a single location and, accordingly, does not require a moving camera. Furthermore, the composite images formed by the spherical projection method depict a view from the location where the original acquired images were taken. The patents-in-suit explicitly require that the claimed composite images, instead, "depict[] a view of the objects from a particular location *outside* the path" from which the acquired images were taken.

42. One of the several distortion problems that applies to the method taught in the patents-in-suit, but not to the spherical approach, is that of distortions in those portions of the composite image that do not lie along a horizontal line from the camera. This and other distortion problems are not well-discussed in the specification of the issued patents, but are described in the provisional patent application upon which the issued patents are based. Thus, it is helpful to review the

'490 Provisional. Particularly, pages 6 through 8 of the '490 Provisional (*see* Rao Ex. H) describe these distortions.

43. For example, size distortion is created. (*See, e.g.*, Rao Ex. H at Fig. 6 and associated text.) Additionally, because the patents' method of creating composite images "relies on an assumption that the vehicle path is along a straight line," a "wavy effect on the synthetic panorama" will be created if the vehicle deviates from a straight line. (*See, e.g.*, Rao Ex. H at Figs. 8-9 and associated text.)

44. The distortions that occur in the method taught in the patents for composite views at angles above or below the horizontal from the camera become increasingly serious at increasingly greater angles above or below the horizontal. Accordingly, the method of the patent can only tolerate a small amount of deviation from the horizontal to the extent that distortion is tolerable. This type of distortion is not a problem of the prior art spherical projection method, e.g. using a cluster of cameras located at the same position to take a plurality of images in different directions to generate a composite panoramic image. Note that Fig. 2 of the patent specification depicts a relatively narrow range of elevations, nothing like the curved spherical view provided by the prior art spherical projection method.

45. Using the vertical, flat method of creating composite images described in the Vederi patents creates substantial distortions for three-dimensional scenes containing objects at different distances. The patents-in-suit recognize the distortion created by the disclosed method of forming composite images, and suggests some possible ways to attempt to reduce this distortion (i.e., through the computing and using of optical flow, or using additional cameras). (15:27-39.) For Vederi's "proposed application, the quality of the panoramic images is sufficient even in presence of some distortion." (Rao Ex. H at pg. 8.)

46. In the disclosed system, "[t]he composite images and association information are then stored in an image database." (2:42-44.)

47. Optionally, a "map of the location may also be displayed to the user" that contains information about static objects / landmarks in the geographic area. (2:53-54.) For example, "[i]f the objects are business establishments, the information displayed … may include the name, address, and phone number [] of the establishment." (12:61-64.)

48. The end-goal of the system is to show these composite images to the user on a user's computer to allow a user to virtually browse through a geographic location. The user chooses the location, for example, "the user may enter an address of the location, enter the geographic coordinates of the location, select the location on a map of the geographic area, or specify a displacement from the current location" using a "remote terminal that communicates with a host computer." (11:56-61.) The host computer then retrieves a composite image and sends it to the user's computer for the user's computer to display to the user. (11:61-12:2.) A typical user terminal would be a personal computer. (12:3-5.) Figure 16 is an illustration of a graphical user interface that is displayed on a user terminal and allows the user to input requests and receive information. (12:29-41.)

49. The patents-in-suit do not disclose that a request is placed by anyone or anything other than a user, and also do not disclose anything that includes a display for the user other than the user terminal.

VI. CLAIM CONSTRUCTION DISPUTES

50. I understand that the full text of the asserted claims is attached as Joint Ex. A to the Declaration of Sasha G. Rao In Support Of Google's Opening Claim Construction Brief, a list of disputed terms along with the parties' proposed constructions is attached thereto as Joint Ex. B, and that a list of terms for which the parties have agreed upon constructions is attached thereto as Joint Ex. C.

51. I agree with Google's proposed constructions of the disputed terms. Below, I provide my detailed opinions on two of the terms in dispute --

"depicting views … the views being substantially elevations" and "image source" from the viewpoint of a person of ordinary skill in the art.

A. "depicting views … the views being substantially elevations"

52. "Substantially elevations" does not appear to make grammatical sense in the claims of the Vederi patents and does not have an accepted meaning to a person of ordinary skill in the art of the patents-in-suit.

53. Elevation, however, is a term of art in architecture, meaning: "[a] drawing showing the vertical elements of a building, either exterior or interior, as a direct projection onto a vertical plane." American Architecture (1998) (attached at Tab B). *See also* A Dictionary of Architecture (1999) ("Accurate geometrical projection, drawn to scale, of a building's façade or any other visible external or internal part on a plane vertical (at a right angle) to the horizon.") (attached at Tab C); Penguin Dictionary of Architecture and Landscape Architecture (1999) ("The external faces of a building; also a drawing made in projection on a vertical plane to show any one face (or elevation) of a building") (attached at Tab D). Elevation is also used to refer to the height of a point above a reference level in the mapping and architecture arts. *See* American Architecture (1998) ("The vertical distance above or below some established reference level.") (Tab B).

54. Consistent with its meaning in architecture, the plain English meaning of "elevation" is a front, back, or side view on a vertical plane. *See, e.g.*, American Heritage (2000) ("[a] scale drawing of the side, front, or rear of a structure") (attached at Tab E); Webster's II New College Dictionary (1995) ("A scale drawing of the side, front, or rear of a particular structure") (attached at Tab F).

55. Based on my review of the file history, Vederi added "substantially elevations" to the claims in a January 23, 2007 amendment to overcome the prior art Levine patent (U.S. Patent No. 6,140,943). The Examiner stated that Levine disclosed "images providing a non-aerial view of objects." (Rao Ex. K at 3.) One of ordinary skill in the art would understand that, to overcome that

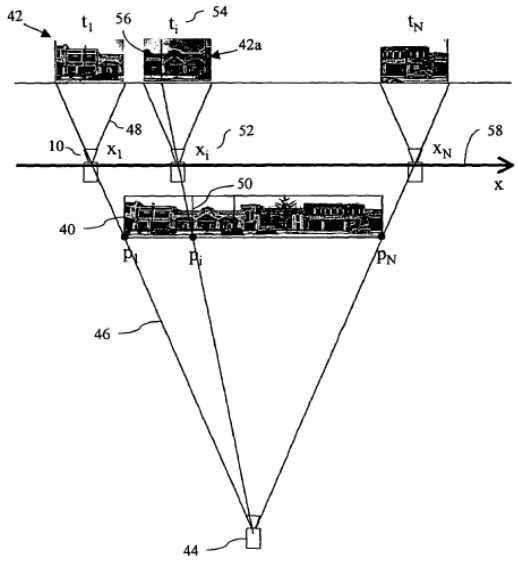
rejection, Vederi replaced "non-aerial views" with the phrase "the views being substantially elevations" to limit the type of view of the object covered by the claims to front, back, or side views.

56. I understand that Google's proposed construction of the claim phrase "depicting views … the views being substantially elevations" is "vertical flat (as opposed to curved or spherical) depictions of front, back, or side views." To the extent this term can be understood and a construction can be assigned, I agree with Google's proposed construction because it properly takes into account Vederi's description of its invention in the patent specification and the file history.

57. One of ordinary skill in the art reading Vederi's patents would understand them to exclude spherical and curved depictions of views generated by sampling on the "surface of an imaginary sphere surrounding the object/scene" (1:66-67.) The patent characterizes the use of such views as problematic because it says that they are "computationally intensive and hence cumbersome and inefficient in terms of time and cost" (2:1-2) compared to the flat views of the claimed invention.

58. One of ordinary skill in the art reading the Vederi patents would understand that all disclosed embodiments of the claimed invention are flat two-dimensional depictions of an object along its vertical plane. For example, Fig. 2 shows a flat depiction of an object along a vertical plane.

Fig. 2



59. The specification repeatedly describes creating composite images "on a column-by-column basis" whereby the flat, vertical columns are "extracted and combined" to form a composite image. (6:2-19; *see also* 9:19-10:35 and FIGS. 10-12; Rao Ex. H at FIG. 5 and related text.)

60. One of ordinary skill in the art would understand that the technique disclosed by the inventors for generating views (*see*, *e.g.*, Fig. 2) simply would not work for a so-called "computationally intensive" spherical or curved projection. Whereas Vederi teaches adjoining vertical columns from individual image frames together to form a panorama, one of ordinary skill in the art would understand that spherical and curved projections would involve processes that stitch together images by pasting them onto a virtual object. Additionally, as discussed above, vertical, flat composite images require combining a series of images acquired from a recording device moving along a path whereas spherical composite images are formed from images taken in different directions from a single location. Furthermore, as discussed above, vertical, flat composite images depict a view of the objects from outside the path whereas spherical composite images depict a view of the object from the location where the acquired images were taken.

B. "image source"

61. "Image source" does not have an accepted, specialized meaning to a person of ordinary skill in the art. Nor is "image source" defined in the patent specifications. Based on my review of the file history, I understand that Vederi added "image source" by amendment to replace the term "image database" to overcome an anticipation rejection over the prior art Levine patent. (Rao Ex. J at 3.)

62. One of ordinary skill in the art would understand that Vederi's proposed construction ("a computer accessible storage of images linked to geographic locations") is the same as the meaning of "image database." I disagree with Vederi's proposed construction of "image source."

63. To the extent this term can be understood and a construction can be assigned, Google's proposal that "image source" means "source of the recorded images" is consistent with my understanding regarding a person of ordinary skill in the art because it properly excludes "image source[s]" that only contain processed images, as opposed to images as originally "recorded."

64. Based on my review of the file history, the Examiner stated that the prior art Levine patent disclosed, in detail, an image database: "Levine discloses a system (Figures 1, 3, 13-14) including an image database (memory 21 in Figure 3 and a mass storage 107 in Figure 13 can provide database)…." (Rao Ex. K at 3.) One of ordinary skill in the art would understand that Levine's storage includes "video map images" that are necessarily processed to link them to geographic locations because they would be shown to travelers while driving. (Rao Ex. L at Abstract.)

65. "Image database" is used by the specifications to describe where composite images formed by post-processing of individual acquired image frames are stored. (*See*, *e.g.*, Abstract, 2:30-45; 6:19-23; 6:49-54; 10:18-25; and 11:61-65.)

66. The patent specifications repeatedly describe the recording of images from a video camera or other image recording device.[2] For example, the patents discuss an embodiment where "the images are transferred directly to the data acquisition computer 34 as the images are being recorded." (4:44-46.) In this embodiment, the computer 34 would have a video acquisition card, sufficient storage space, and "program instructions to create the composite images from the acquired images." (4:46-51.) One of ordinary skill in the art would understand that these images, taken from the image recording device, could be either (1) originally recorded into memory as individual images or (2) processed upon receipt and originally recorded as composite images. (5:16-19; *see supra* ¶ 38.)

67. One of ordinary skill in the art would understand that Vederi distinguished Levine because the database of Levine stored processed map images rather than actual pictures of the geographic area. (Rao Ex. J at 11-12.) In making this change, one of ordinary skill in the art would understand that Vederi intended to claim the alternative disclosed embodiment described above in which images taken from an image recording device can be either (1) originally recorded into memory as individual images or (2) processed upon receipt and originally recorded as composite images. Accordingly, one of ordinary skill in the art would understand that Vederi changed "image database" to "image source" to exclude databases that merely included processed images (as Levine did), rather than images as originally recorded.

[2] *See, e.g.*, 2:26-27 ("an image recording device moves along a path recording images"); Abstract ("A video camera moves along a street recording images of objects along the street.").

I declare, under the penalty of perjury, under the laws of the United States, that the foregoing is true and correct.

Dated: St. Louis, Missouri

October 4, 2011

John Grindon

John R. Grindon, D.Sc.