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500 7590 07/25/2013 SEED INTELLECTUAL PROPERTY LAW GROUP PLLC 701 FIFTH AVE SUITE 5400 SEATTLE, WA 98104			EXAMINER PROCTOR, JASON SCOTT	
			ART UNIT 3992	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action in Ex Parte Reexamination	Control No. 96/000,004	Patent Under Reexamination 8,078,436 B2 E
	Examiner JASON PROCTOR	Art Unit 3992

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

- a ☐ Responsive to the communication(s) filed on _____. b ☐ This action is made FINAL.
c ☒ A statement under 37 CFR 1.530 has not been received from the patent owner.

A shortened statutory period for response to this action is set to expire 2 month(s) from the mailing date of this letter. Failure to respond within the period for response will result in termination of the proceeding and issuance of an *ex parte* reexamination certificate in accordance with this action. 37 CFR 1.550(d). **EXTENSIONS OF TIME ARE GOVERNED BY 37 CFR 1.550(c).** If the period for response specified above is less than thirty (30) days, a response within the statutory minimum of thirty (30) days will be considered timely.

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

1. ☒ Notice of References Cited by Examiner, PTO-892. 3. ☐ Interview Summary, PTO-474.
2. ☐ Information Disclosure Statement, PTO/SB/08. 4. ☐ ____.

Part II SUMMARY OF ACTION

- 1a. ☒ Claims 1-56 are subject to reexamination.
1b. ☐ Claims _____ are not subject to reexamination.
2. ☐ Claims _____ have been canceled in the present reexamination proceeding.
3. ☐ Claims _____ are patentable and/or confirmed.
4. ☒ Claims 1-56 are rejected.
5. ☐ Claims _____ are objected to.
6. ☐ The drawings, filed on _____ are acceptable.
7. ☐ The proposed drawing correction, filed on _____ has been (7a) ☐ approved (7b) ☐ disapproved.
8. ☐ Acknowledgment is made of the priority claim under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some* c) ☐ None of the certified copies have
1 ☐ been received.
2 ☐ not been received.
3 ☐ been filed in Application No. _____.
4 ☐ been filed in reexamination Control No. _____.
5 ☐ been received by the International Bureau in PCT application No. _____.
* See the attached detailed Office action for a list of the certified copies not received.
9. ☐ Since the proceeding appears to be in condition for issuance of an *ex parte* reexamination certificate except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte* Quayle, 1935 C.D. 11, 453 O.G. 213.
10. ☐ Other: _____

cc: Requester (if third party requester)

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DETAILED ACTION

This Office Action addresses claims 1-56 of US Patent No. 8,078,436 B2 issued to Pershing et al. ("the '436 Patent"). A Request for Supplemental Examination was filed on 3 October 2012, but this request was defective for reasons set forth in the Notice of Noncompliant Supplemental Examination Request mailed on 28 November 2012. In response, Patent Owner filed a corrected Request for Supplemental Examination of claims 1-56 on 28 December 2012 ("the Request"). The Notice of Supplemental Examination Request Filing Date mailed on 17 January 2013 has granted the Request a filing date of 28 December 2012.

A Substantial New Question ("SNQ") of Patentability affecting at least one claim of the '436 Patent was identified in the Reasons for SNQ Determination entered on 27 March 2013 ("the Determination"). A corrected Supplemental Examination Certificate was entered on 28 March 2013.

Accompanying this Non-Final Office Action is an Order titled "Ex Parte Reexamination Ordered Pursuant to 35 U.S.C. 257." In light of this Order, this Office Action addresses claims 1-56 of the '436 Patent.

In accordance with 37 C.F.R. §1.625(d), this *ex parte* reexamination will be conducted in accordance with 37 C.F.R. §§ 1.530 through 1.570, with a few exceptions as enumerated in 37 C.F.R. §1.625(d)(1) – (d)(4).

For the reasons set forth below, claims 1-56 are rejected.

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I. REFERENCES CITED

In the Determination, the following Items of Information were determined to raise a Substantial New Question of Patentability:

Item 1	Exhibit B	European Patent No. EP 1 010 966 B 1 published October 23, 2002 and translations to English ("EP 966")
Item 3	Exhibit D	German Patent Application No. DE 198 57 667 A1 published on August 17, 2000 and translation to English ("DE 667")
Item 5	Exhibit F	www.archive.org print out of German AeroDach Web Site http://www.aerodach.de from June 13, 2004 (retrieved August 20, 2012) and translations to English, first and second versions ("Aerodach web site")
Item 6	Exhibit G	www.archive.org print out of German Aerowest Web site http://aerowest.de/ from February 6, 2006 (retrieved September 20, 2012) and translations to English ("Aerowest web site")
Item 7	Exhibit H	"AeroDach® Online Roof Evaluation Standard Delivery Format and 3D Data File" Document Version 01.00.2002 published in December 2005 ("AeroDach Roof Analysis")

In addition, the following reference is cited by the Examiner:

US Pregrant Publication No. 2003/0103651 published 5 June 2003 naming inventor Kurt Novak ("Novak")

II. RELEVANT STATUTES

35 U.S.C. § 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The following is a quotation of pre-AIA 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

III. INDEX OF CLAIM REJECTIONS

- A. Claims 36-40 and 42-56 are rejected under 35 U.S.C. § 101 because the claimed invention is drawn to non-statutory subject matter – page 11.**
- B. Claims 1-5, 7-42, and 46-56 are rejected under pre-AIA 35 U.S.C. § 103(a) as being unpatentable over EP 966 – page 14.**
- C. Claim 6 is rejected under pre-AIA 35 U.S.C. § 103(a) as being unpatentable over EP 966 in view of Aerodach Website – page 47.**
- D. Claim 43 is rejected under pre-AIA 35 U.S.C. § 103(a) as being unpatentable over EP 966 in view of Novak – page 48.**
- E. Claims 44-45 are rejected under pre-AIA 35 U.S.C. § 103(a) as being unpatentable over EP 966 in view of Novak, further in view of Official Notice – page 50.**
- F. Claims 1-5, 7-42, and 46-56 are rejected under pre-AIA 35 U.S.C. § 103(a) as being unpatentable over EP 966 in view of Applicant's Admitted Prior Art ("AAPA") – page 53.**
- G. Claim 6 is rejected under pre-AIA 35 U.S.C. § 103(a) as being unpatentable over EP 966 in view AAPA, further in view of Aerodach Website – page 64.**
- H. Claim 43 is rejected under pre-AIA 35 U.S.C. § 103(a) as being unpatentable over EP 966 in view of AAPA, further in view of Novak – page 64.**
- I. Claims 44-45 are rejected under pre-AIA 35 U.S.C. § 103(a) as being unpatentable over EP 966 in view of AAPA and Novak, further in view of Official Notice – page 65.**

IV. ADMITTED PRIOR ART

A statement by an applicant in the specification or made during prosecution identifying the work of another as "prior art" is an admission which can be relied upon for both anticipation and obviousness determinations, regardless of whether the admitted prior art would otherwise qualify as prior art under the statutory categories of 35 U.S.C. § 102. Where the specification identifies work done by another as "prior art," the subject matter so identified is treated as admitted prior art. See MPEP 2129.

The following disclosure is interpreted as an admission of prior art:

"Next, a set of reference points may be identified in each of the images. The service's 70 measurement software then uses these reference points and any acceptable algorithm to co-register the images and reconstruct the three-dimensional geometry of the object identified by the reference points. There are a variety of photo-grammetric algorithms that can be utilized to perform this reconstruction. One such algorithm used by the service 70 uses photographs taken from two or more view points to "triangulate" points of interest on the object in three-dimensional ("3D") space. This triangulation can be visualized as a process of projecting a line originating from the location of the photograph's observation point that passes through a particular reference point in the image. The intersection of these projected lines from the set of observation points to a particular reference point identifies the location of that point in 3D space. Repeating the process for all such reference points allows the software to build a 3D model of the structure.

The optimal choice of reconstruction algorithm depends on a number of factors such as the spatial relationships between the photographs, the number and locations of the reference points, and any assumptions that are made about the geometry and symmetry of the object being reconstructed. Several such algorithms are described in detail in textbooks, trade journals, and academic publications."

(436 Patent, 6:50 – 7:7, emphasis added)

"Next, the roof modeling engine 602 generates a model of the roof of the specified building. In the illustrated embodiment, the roof modeling engine 602 generates a three-dimensional model, although in other embodiments, a two-dimensional (e.g., top-down roof plan) may be generated instead or in addition. As noted above, a variety of automatic and semi-automatic techniques may be employed to generate a model of the roof of the building. In one embodiment,

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generating such a model is based at least in part on a correlation between at least two of the aerial images of the building. For example, the roof modeling engine 602 receives an indication of a corresponding feature that is shown in each of the two aerial images. In one embodiment, an operator 620, viewing two or more images of the building, inputs an indication in at least some of the images, the indications identifying which points of the images correspond to each other for model generation purposes.

The corresponding feature may be, for example, a vertex of the roof of the building, the corner of one of the roof planes of the roof, a point of a gable or hip of the roof, etc. The corresponding feature may also be a linear feature, such as a ridge or valley line between two roof planes of the roof. In one embodiment, the indication of a corresponding feature on the building includes "registration" of a first point in a first aerial image, and a second point in a second aerial image, the first and second points corresponding the substantially the same point on the roof of the building. Generally, point registration may include the identification of any feature shown in both aerial images. Thus, the feature need not be a point on the roof of the building. Instead, it may be, for example, any point that is visible on both aerial images, such as on a nearby building (e.g., a garage, neighbor's building, etc.), on a nearby structure (e.g., swimming pool, tennis court, etc.), on a nearby natural feature (e.g., a tree, boulder, etc.), etc.

In some embodiments, the roof modeling engine 602 determines the corresponding feature automatically, such as by employing on one or more image processing techniques used to identify vertexes, edges, or other features of the roof. In other embodiments, the roof modeling engine 602 determines the corresponding feature by receiving, from the human operator 620 as operator input 633, indications of the feature shown in multiple images of the building."

('436 Patent, 8:15 - 8:56, emphasis added)

"In an example embodiment, components/modules of the RES 710 are implemented using standard programming techniques. For example, the RES 710 may be implemented as a "native" executable running on the CPU 703, along with one or more static or dynamic libraries. In other embodiments, the RES 710 is implemented as instructions processed by virtual machine that executes as one of the other programs 730. In general, a range of programming languages known in the art may be employed for implementing such example embodiments, including representative implementations of various programming language paradigms, including but not limited to, object-oriented (e.g., Java, C++, C#, Visual Basic.NET, Smalltalk, and the like), functional (e.g., ML, Lisp, Scheme, and the like), procedural (e.g., C, Pascal, Ada, Modula, and the like), scripting (e.g., Perl, Ruby, Python, JavaScript, VBScript, and the like), declarative (e.g., SQL, Prolog, and the like)."

('436 Patent, 12:27-43, emphasis added)

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"In addition, programming interfaces to the data stored as part of the RES 710, such as in the RES data repository 716, can be available by standard mechanisms such as through C, C++, C#, and Java APIs; libraries for accessing files, databases, or other data repositories; through scripting languages such as XML; or through Web servers, FTP servers, or other types of servers providing access to stored data. For example, the RES data repository 716 may be implemented as one or more database systems, file systems, memory buffers, or any other technique for storing such information, or any combination of the above, including implementations using distributed computing techniques." (436 Patent, 12:61 – 13:5, emphasis added)

"Also, the example RES 710 can be implemented in a distributed environment comprising multiple, even heterogeneous, computer systems and networks. For example, in one embodiment, the image acquisition engine 711, the roof modeling engine 712, the report generation engine 713, the interface engine 714, and the data repository 716 are all located in physically different computer systems. In another embodiment, various modules of the RES 710 are hosted each on a separate server machine and are remotely located from the tables which are stored in the data repository 716. Also, one or more of the modules may themselves be distributed, pooled or otherwise grouped, such as for load balancing, reliability or security reasons. Different configurations and locations of programs and data are contemplated for use with techniques of described herein. A variety of distributed computing techniques are appropriate for implementing the components of the illustrated embodiments in a distributed manner including but not limited to TCP/IP sockets, RPC, RMI, HTTP, Web Services (XML-RPC, JAX-RPC, SOAP, and the like)." (436 Patent, 13:6-25, emphasis added)

Accordingly, claim language which is anticipated by this disclosure is regarded as admitted prior art.

V. NON-FUNCTIONAL DESCRIPTIVE MATERIAL

As set forth in MPEP 2111.05, patentable weight is generally not granted to claim language that describes nonfunctional descriptive material absent a new and unobvious functional relationship between the printed matter and the substrate. The rationale behind the printed matter cases has been extended to method claims in which an instructional limitation is added to a method known in the art. Similar to the inquiry for products with printed matter

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thereon, in such method cases the relevant inquiry is whether a new and unobvious functional relationship with the known method exists.

To be granted patentable weight, the printed matter and associated product must be in a functional relationship. A functional relationship can be found where the printed matter performs some function with respect to the product to which it is associated. For instance, indicia on a measuring cup perform the function of indicating volume within that measuring cup.

However, where a product merely serves as a support for printed matter, no functional relationship exists. These situations may arise where the claim as a whole is directed towards conveying a message or meaning to a human reader independent of the supporting product. For example, a claimed measuring tape having electrical wiring information thereon, or a generically claimed substrate having a picture of a golf ball thereupon, would lack a functional relationship as the claims as a whole are directed towards conveying wiring information (unrelated to the measuring tape) or an aesthetically pleasing image (unrelated to the substrate) to the reader. Additionally, where the printed matter and product do not depend upon each other, no functional relationship exists.

The '436 Patent discloses an invention "that allows estimates involving roofs on buildings to be created remotely" (1:15-19), in particular "the system and method ... allows a company that needs the sizes, dimensions, slopes and orientations of the roof sections on a building in order to provide a written estimate" (1:62-65). In another embodiment, "The roof estimation service then produces and sends a report to the roof company. The roof company then uses the report to prepare a final estimate that is then delivered to its potential customer" (2:49-52). In another embodiment, "The roof company reviews the information then prepares an estimate which then

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can be uploaded to the roof estimating Web site server which then forwards the estimate to the potential customer, or sent from the roof company directly via email, fax or mail to the potential customer" (3:3-8).

In light of this and other disclosure, the contents of a report or estimate are nonfunctional descriptive material. The contents of the report or estimate do not have a functional relationship with the underlying substrate because the contents merely describe the building roof for a human reader, similar to printed instructions on a piece of paper. This is expressly disclosed by at least the embodiment wherein "various techniques may be employed to generate a readable report, including automatically determining an optimal or near-optimal label font size, label position, and/or label orientation, such that the resulting report may be easily read and understood by the customer" (10:5-10). Further, the contents do not have a functional relationship with the substrate since the substrate merely provides support for the written contents. This is shown by the disclosure that the substrate can be physical or computer data, viewed on a computer display, or delivered by mail (3:3-8). Since the form of the substrate is readily interchangeable between tangible and intangible embodiments, the contents and the substrate do not depend on each other and have no particular functional relationship.

Lastly, the claims recite *to generate / generating* and *to transmit / transmitting* a roof estimate report including the claimed nonfunctional descriptive material. Although this arguably defines a nominal functional relationship between the step and the descriptive material (*e.g.*, the specific step of transmitting the specifically recited nonfunctional descriptive material), it fails to define a *new* and *unobvious* relationship between the nonfunctional descriptive material and the steps of *generating* or *transmitting*. Since the only feature of the recited steps the recitation of

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the non-functional descriptive material, these generic, abstract method steps fail to describe any new or unobvious relationship between the contents of the report and the steps of *generating* or *transmitting*.

In summary, the claim language is given the broadest reasonable interpretation in light of the specification and the guidance provided by the MPEP, including MPEP 2111.05. Patent Owner is notified that recitations of descriptive material must fully satisfy the requirements of MPEP 2111.05 in order to be granted patentable weight. Attempts to traverse the instant rejections by reference to claim language describing nonfunctional descriptive material will likely be found unpersuasive.

VI. CLAIM REJECTIONS

A. **Claims 36-40 and 42-56 are rejected under 35 U.S.C. § 101 because the claimed invention is drawn to non-statutory subject matter.**

Claim 36 recites:

36. A non-transitory computer-readable storage medium whose contents enable a computing system to generate a roof estimate report for a building having a roof, by performing a method comprising...

The specification of the '436 Patent describes at least two different interpretations for the claimed "contents". First, the '436 Patent describes a computer database storing *aerial images* that enable a computing system to generate a roof estimate report according to the claimed method:

"The software program 50 is linked to an aerial image file database 52 that contains aerial images files 54 of various buildings 92 in a region."
(‘436 Patent, 3:67 – 4:2, emphasis added)

"By simply inputting the customer's address into the software program 50, the roof estimation service 70 is able to view the customer's roof from the aerial image files 54 using a remote computer 72, determine the dimensions and slopes of the roof sections that make up the roof, and prepare a preliminary report 101 which is then used to prepare a final estimate 102 that is then delivered to the potential customer 90."
(‘436 Patent, 4:16-27)

Second, the '436 Patent describes a computer-readable medium storing *computer instructions* that enable a computer system to generate a roof estimate report according to the claimed method:

"Furthermore, in some embodiments, some or all of the components of the RES are implemented or provided in other manners, such as at least partially in firmware and/or hardware, including, but not limited to one or more application-specific integrated circuits (ASICs), standard integrated circuits, controllers (e.g., by executing appropriate instructions, and including microcontrollers and/or embedded controllers), field-programmable gate arrays (FPGAs), complex

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programmable logic devices (CPLDs), and the like Some or all of the system components and/or data structures may also be stored (e.g., as software instructions or structured data) on a computer-readable medium, such as a hard disk, a memory, a network, or a portable media article to be read by an appropriate drive or via an appropriate connection."
(‘436 Patent, 13:26-51, emphasis added)

The first covered embodiment, a computer-readable medium storing *aerial images*, is non-functional descriptive material recorded on a computer-readable medium. Accordingly, the claimed "contents" are not structurally and functionally interrelated to the medium, but are merely carried by the medium. Merely claiming non-functional descriptive material stored in a computer-readable medium does not make it statutory. Such a result would exalt form over substance. Thus, "contents" which may be *aerial images* do not become statutory by merely storing it on a "non-transitory computer-readable storage medium". See MPEP 2106.01.

A claim that covers both statutory and non-statutory embodiments (under the broadest reasonable interpretation of the claim when read in light of the specification and in view of one skilled in the art) embraces subject matter that is not eligible for patent protection and therefore is directed to non-statutory subject matter. Such claims should be rejected under 35 U.S.C. § 101. See MPEP 2106.

Further, claim 36 is directed to a product by reciting "A non-transitory computer-readable storage medium...". However, a claim that includes terms that imply that the invention is directed to a product, for instance by reciting "a machine comprising...", but fails to include tangible limitations in accordance with its broadest reasonable interpretation is not limited to a practical application, but rather wholly embraces or encompasses the concept upon which the invention is based. This is impermissible as such claim coverage would extend to every way of applying the abstract idea, law of nature or physical phenomenon. See MPEP 2106 (II)(A).

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Claim 36 merely recites that the "storage medium" holds "contents," an inherent feature of any storage medium, and not a tangible limitation of the medium. The remainder of the claim language describes a method, performed by a computing system, which is *enabled* by the contents. None of this language describes any tangible limitation of the claimed "storage medium" and fails even to directly describe the "contents". Claim 36 is directed to every way of storing any "contents" on a "medium" that *enable* a computer to perform the recited method.

Therefore, claim 36 is rejected under 35 U.S.C. § 101 because the claimed invention is drawn to non-statutory subject matter.

Dependent claims 37-40 and 42-56 recite further limitations of the *method performed by the computer*, but fail to limit the scope of the claimed "computer-readable storage medium" with "contents" to a statutory embodiment. Therefore, these claims fail to cure the deficiency noted above, and are rejected for a similar rationale.

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B. Claims 1-5, 7-42, and 46-56 are rejected under pre-AIA 35 U.S.C. § 103(a) as being unpatentable over EP 966.

In this Office Action, all citations of EP 966 refer to the page numbers of Appendix B provided with the Request, and all quotations of EP 966 are taken from the "First English Translation" in the same Appendix B.

Regarding claims 1 [and 18], EP 966 discloses:

1. A computing system [computer-implemented method] for generating a roof estimate report, the computing system [method] comprising:

"A graphic and/or alphanumeric representation of the object description can be displayed on the client computer. Advantageously, the preparation of the measurement data in the host computer is such that further processing is not required by the client. For example, the customer can receive extensive measurements with respect to a house roof, which involve material and cost calculations for the renovation of a roof by a roofer."
(EP 966, ¶ 00019)

"The inventive method provides the broad user community for the first time with the opportunity to use aerial imagery for the spatial measurement and description of specific objects. This is done on the basis of first performing a two-dimensional processing of the raw data initially generated by the measurement. The resulting limited amount of data, after structuring by integrating external factual data, is ideally suited for optimum handling in a network-type decentralized data processing system, in particular with low capacity transmission lines such as the Internet."
(EP 966, ¶ 0020, emphasis added)

a memory;

"In the following processing step, the aforementioned orthophoto-hybrid data sets are stored on a host computer, i.e. a server."
(EP 966, ¶ 0012)

"In the next processing step and on request, the orthophoto-hybrid data sets are transferred to any client computer connected to the network."
(EP 966, ¶ 0013)

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a roof estimation module that is stored on the memory and that is configured, when executed, to:

receive [receiving] a first and a second aerial image of a building having a roof, each of the aerial images providing a different view of the roof of the building;

"The present invention relates to a method for generating a three-dimensional object description of a localized spatial object – especially a building – from aerial stereoscopic pairs..."

(EP 966, ¶ 0001)

"Following the client computer request by entering the object-specific factual data, the host computer first identifies the three-dimensional raw data that underlies the object-specific ortho-hybrid data set selected at the client computer. These are the aerial image data and the parameter data, for example of a building or a house roof."

(EP 966, ¶ 0016, emphasis added)

correlate [correlating] the first aerial image with the second aerial image;

In this way, stereoscopic aerial pairs of the objects, i.e. two aerial photographs are taken in stereoscopic coverage, to give sets of two-dimensional, geometric image data and parameter data that contain highly detailed information on the camera angle of the image pairs, absolute image coordinates and other image recording parameters. These data provide the raw data to calculate real oriented representations of the earth's surface."

(EP 966, ¶ 0002, emphasis added)

generate [generating], based at least in part on the correlation between the first and second aerial images, a three-dimensional model of the roof that includes a plurality of planar roof sections that each have a corresponding slope, area, and edges; and

"The subject matter of this measuring method is the three-dimensional description of spatial objects located on the earth's surface, especially spatially limited land and buildings, such as roads, residential and industrial buildings and other buildings, by means of aerial images. In this way, stereoscopic aerial pairs of the objects, i.e. two aerial photographs are taken in stereoscopic coverage, to give sets of two-dimensional, geometric image data and parameter data that contain highly detailed information on the camera angle of the image pairs, absolute image coordinates and other image recording parameters. These data

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provide the raw data to calculate real oriented representations of the earth's surface."

(EP 966, ¶ 0002)

"Following the client computer request by entering the object-specific factual data, the host computer first identifies the three-dimensional raw data that underlies the object-specific ortho-hybrid data set selected at the client computer. These are the aerial image data and the parameter data, for example of a building or a house roof. From the three-dimensional raw data, the host computer now performs a three-dimensional model calculation for the selected object. A three-dimensional object data set is generated as a result that, together with the object-specific factual data, forms a complete three-dimensional object description from the aerial perspective. Specifically, such a three-dimensional object description could contain, for example, information on the type and area of a house roof, including data on the roof pitch, placement and size of windows and chimneys, and similar."

(EP 966, ¶ 0016, emphasis added)

"In this case, the determination of the roof shape and/or the roof surface is performed on the host computer by a partially or fully automated image analysis procedure. This eliminates time-consuming manual processing."

(EPP 966, ¶ 0022)

"Based on the available three-dimensional raw data, a stereoscopic model description of the roof is calculated. Using image analysis techniques, it is therefore possible to determine with reasonable accuracy the information necessary for the renovation through the description of the roof surface, roof form, ridge lines, roof line, chimneys, windows, roof structures."

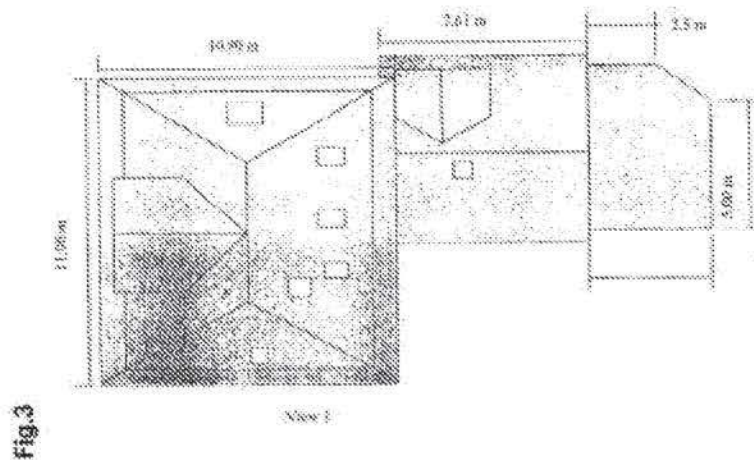
(EP 966, ¶ 0031, emphasis added)

generate and transmit [transmitting] a roof estimate report that includes one or more top plan views of the three-dimensional model annotated with numerical values [indications]

"The resulting calculated three-dimensional object description may be output either as flat two-dimensional graphics as shown in Fig. 3, and/or as a perspective three-dimensional representation as shown in Fig. 4, and then transmitted to the client computer. At the same time, the factual data is processed and added alphanumerically to the transmitted image data."

(EP 966, ¶ 0033)

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(EP 966, FIG. 3)

that indicate the corresponding slope, area, and length of edges of at least some of the plurality of planar roof sections

[of at least one of the slope, area, and lengths of the edges of the plurality of planar roof sections]

"For example, for cleaning a house roof, all relevant information, such as roof shape, roof surface, roof pitch, including any particularities can be determined with sufficient precision so that the modification of a measure on the basis of this information is possible."

(EP 966, ¶ 0003, emphasis added)

"A graphic and/or alphanumeric representation of the object description can be displayed on the client computer. Advantageously, the preparation of the measurement data in the host computer is such that further processing is not required by the client. For example, the customer can receive extensive measurements with respect to a house roof, which involve material and cost calculations for the renovation of a roof by a roofer."

(EP 966, ¶ 0019)

"Using image analysis techniques, it is therefore possible to determine with reasonable accuracy the information necessary for the renovation through the description of the roof surface, roof form, ridge lines, roof line, chimneys, windows, roof structures."

(EP 966, ¶ 0031, emphasis added)

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"The orthophoto-hybrid data set can be further processed into technical graphics with an indication of dimensions, as shown in Fig. 3."
(EP 966, ¶ 0032)

"At the same time, the factual data is processed and added alphanumerically to the transmitted image data. For example, the roof can be provided in m² to give a first impression of the scope of the necessary roof renovation."
(EP 966, ¶ 0033, emphasis added)

using [wherein the roof estimate report includes] at least two different indicia for different types of roof properties.

A first indicia for a first type of roof property – color to outline surfaces:

"This display is particularly user friendly when both the factual data of the orthophoto-hybrid data sets displayed graphically, i.e., inserted in the orthophoto data. In the previously proposed application, it is conceivable, for example, to mark graphically in color the outline of roof surfaces that form the object in order to highlight it."
(EP 966, ¶ 0023)

A second indicia for a second type of roof property – numbers to indicate area:

"At the same time, the factual data is processed and added alphanumerically to the transmitted image data. For example, the roof can be provided in m² to give a first impression of the scope of a necessary roof renovation."
(EP 966, ¶ 0033)

Alternatively, a third indicia for a third type of roof property – alphanumeric characters to indicate street data with respect to the building:

"In this case, the roof of the building forms the object for which a spatial object description is produced through the inventive method. Advantageously, the factual data in this case includes street data with respect to this building, i.e. street name plus house number. Of course, it can also include cadastral data or coordinates."
(EP 966, ¶ 0021)

Although EP 966 teaches how to determine "all relevant information, such as roof shape, roof surface, roof pitch" (¶ 0003), and EP 966 teaches how "to determine with reasonable

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accuracy the information necessary for renovation" including "roof form, ridge lines, roof line" and "roof structures" (§ 0031), and EP 966 teaches that such "factual data is processed and added alphanumerically to the transmitted image data" (§ 0033), EP 966 does not expressly disclose the claimed feature of a roof estimate report that includes "numerical values that indicate the corresponding *slope* of at least some of the plurality of planar roof sections".

However, in light of the teachings to determine "all relevant information, such as" "roof pitch," and the teaching that "the information necessary for renovation" [of a roof] includes "roof form, ridge lines, roof line" and "roof structures," it would have been obvious to a person of ordinary skill in the art modify the teachings of EP 966 to arrive at a roof estimate report that includes "numerical values that indicate the corresponding *slope* of at least some of the plurality of planar roof sections". This modification merely follows the instructions expressly taught by EP 966 to arrive at an embodiment which is naturally suggested by the instructions, but is not explicitly disclosed in the reference. This modification would provide an enhanced roof estimate report that provides the customer with additional factual data such as roof pitch of the roof form, ridge lines, roof line, or roof structures.

Regarding claim 19, EP 966 discloses:

19. The method of claim 18 wherein identifying the building includes receiving a street address of the building.

"The user at the client computer, i.e. the customer, can select, for example, a particular building by inputting the address."
(EPP 966, ¶ 0014)

Regarding claims 2 [and 20], EP 966 discloses:

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2. The computing system of claim 1 wherein the roof estimation module is further configured to correlate the first and second aerial images by receiving an indication of one or more corresponding points on the building shown in each of the first and second aerial images.

[20. The method of claim 18 wherein correlating the first and second aerial images includes receiving an indication of one or more corresponding points shown in each of the first and second aerial images.]

"In the subsequent processing steps, the orthophoto data is structured by the use of external factual data. The result of this is that object-specific orthophoto-hybrid data sets are formed. Factual data, for example, could be cadastral data, road data and/or other building data. In this way, for example, unique pairing of address data containing a street name and house number can be effected with a particular building. The two-dimensional orthophoto data is stored together with these external factual data in a respective orthophoto-hybrid data set referenced to the specific object."
(EP 966, ¶ 0011, emphasis added)

Under an alternative interpretation:

In a preferred embodiment, the graphical representation of the orthophoto-hybrid data sets does not only display the ortho-hybrid data and factual data together graphically on the client computer, but it also forms a graphical user interface, whereby each of the specific orthophoto-hybrid data sets is graphically and interactively selectable. This makes possible a user guide, as it is known among modern graphical user interfaces. Concretely, a marker, such as a mouse cursor, is moved interactively by means of a corresponding input device over the on-screen graphics and, for example the desired roof surface is marked by clicking. A request for the production of an object description is made in this way."
(EP 966, ¶ 0024, emphasis added)

Regarding claim 21, EPP 966 discloses:

21. The method of claim 20 wherein receiving the indication of the corresponding point includes receiving the indication from a user.

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"This makes possible a user guide, as it is known among modern graphical user interfaces. Concretely, a marker, such as a mouse cursor, is moved interactively by means of a corresponding input device over the on-screen graphics and, for example the desired roof surface is marked by clicking. A request for the production of an object description is made in this way."
(EP 966, ¶ 0024, emphasis added)

Regarding claims 3 [and 22], EP 966 discloses:

3. The computing system of claim 1 wherein the roof estimation module is further configured to generate the three-dimensional model by receiving an indication of at least one of a ridgeline of the roof, a valley of the roof, an edge of the roof, a hip of the roof, and a gable of the roof.

[22. The method of claim 18 wherein generating the three-dimensional model includes receiving an indication of at least one of a ridgeline of the roof, a valley of the roof, an edge of the roof, a hip of the roof, and a gable of the roof.]

"In a preferred embodiment, the graphical representation of the orthophoto-hybrid data sets does not only display the ortho-hybrid data and factual data together graphically on the client computer, but it also forms a graphical user interface, whereby each of the specific orthophoto-hybrid data sets is graphically and interactively selectable. This makes possible a user guide, as it is known among modern graphical user interfaces. Concretely, a marker, such as a mouse cursor, is moved interactively by means of a corresponding input device over the on-screen graphics and, for example the desired roof surface is marked by clicking. A request for the production of an object description is made in this way."
(EP 966, ¶ 0024, emphasis added)

Regarding claim 4, EP 966 discloses:

4. The computing system of claim 1 wherein the roof estimation module is further configured to receive the first and second aerial image from an image source computing system.

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"The present invention relates to a method for generating a three-dimensional object description of a localized spatial object – especially a building – from aerial stereoscopic pairs, whereby – two-dimensional image data from the aerial pairs and the stereoscopic parameter data are digitized and stored in a data processing system as three-dimensional raw data;"
(EP 966, ¶ 0001)

"In the following processing step, the aforementioned orthophoto-hybrid data sets are stored on a host computer, i.e. a server. This is incorporated in a network-type data processing system via data transmission lines. This may be either a local network of a company or a large decentralized network, such as the global scope of the Internet. A plurality of client computers are connected to the data transmission lines, giving them access to the data bases or the host computer via the data transmission lines."
(EP 966, ¶ 0012)

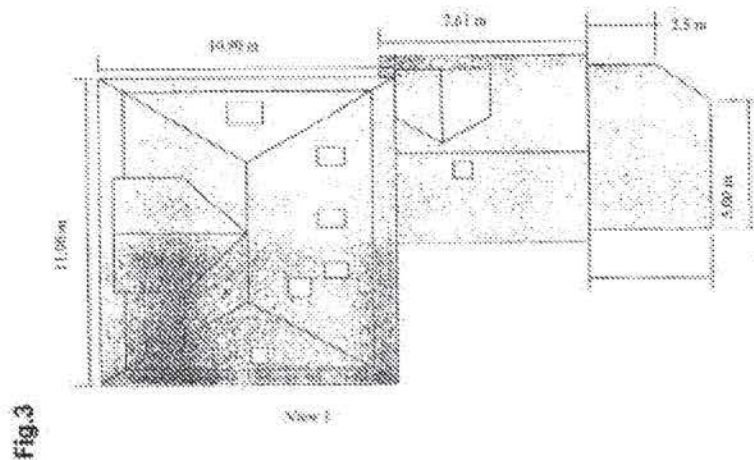
Regarding claims 5 [and 23], EPP 966 discloses:

5. The computing system of claim 1 wherein the roof estimation module is further configured to generate the roof estimate report by generating an electronic file that includes an image of the building along with line drawings of the one or more top plan views of the three-dimensional model.

[23. The method of claim 18, further comprising generating the roof estimate report, the roof estimate report being a data file that includes an image of the building along with line drawings of the one or more top plan views of the three-dimensional model.]

"The resulting calculated three-dimensional object description may be output either as flat two-dimensional graphics as shown in Fig. 3, and/or as a perspective three-dimensional representation as shown in Fig. 4, and then transmitted to the client computer. At the same time, the factual data is processed and added alphanumerically to the transmitted image data."
(EP 966, ¶ 0033)

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(EP 966, Fig. 3)

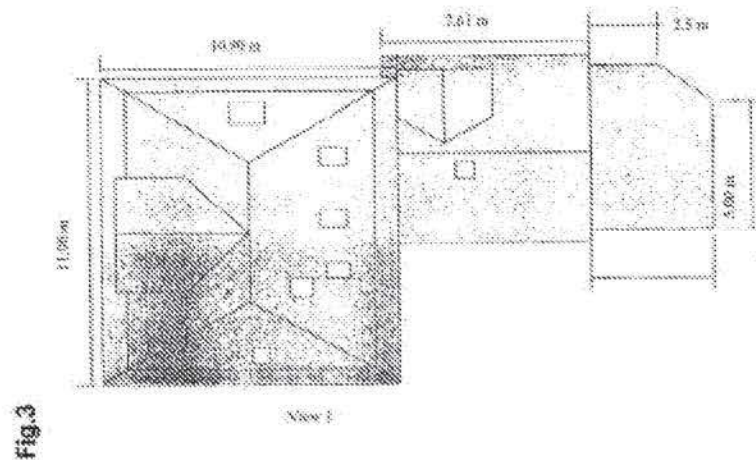
Regarding claim 24, EPP 966 discloses:

24. The method of claim 18 wherein transmitting the roof estimate report includes transmitting a data file that includes the one or more top plan views of the three-dimensional model.

"The resulting calculated three-dimensional object description may be output either as flat two-dimensional graphics as shown in Fig. 3, and/or as a perspective three-dimensional representation as shown in Fig. 4, and then transmitted to the client computer. At the same time, the factual data is processed and added alphanumerically to the transmitted image data."

(EP 966, ¶ 0033)

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(EP 966, Fig. 3)

Regarding claims 7 [and 25], EPP 966 discloses:

7. The computing system of claim 1 [method of claim 18] wherein the different types of roof properties include different roof measurements, and the at least two different indicia include at least one of: length, slope, and area.

A first indicia for a first type of roof property – color to outline surfaces:

"This display is particularly user friendly when both the factual data of the orthophoto-hybrid data sets displayed graphically, i.e., inserted in the orthophoto data. In the previously proposed application, it is conceivable, for example, to mark graphically in color the outline of roof surfaces that form the object in order to highlight it."

(EP 966, ¶ 0023)

A second indicia for a second type of roof property – numbers to indicate area:

"At the same time, the factual data is processed and added alphanumerically to the transmitted image data. For example, the roof can be provided in m² to give a first impression of the scope of a necessary roof renovation."

(EP 966, ¶ 0033)

Alternatively, a third indicia for a third type of roof property – alphanumeric characters to indicate street data with respect to the building:

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"In this case, the roof of the building forms the object for which a spatial object description is produced through the inventive method. Advantageously, the factual data in this case includes street data with respect to this building, i.e. street name plus house number. Of course, it can also include cadastral data or coordinates."

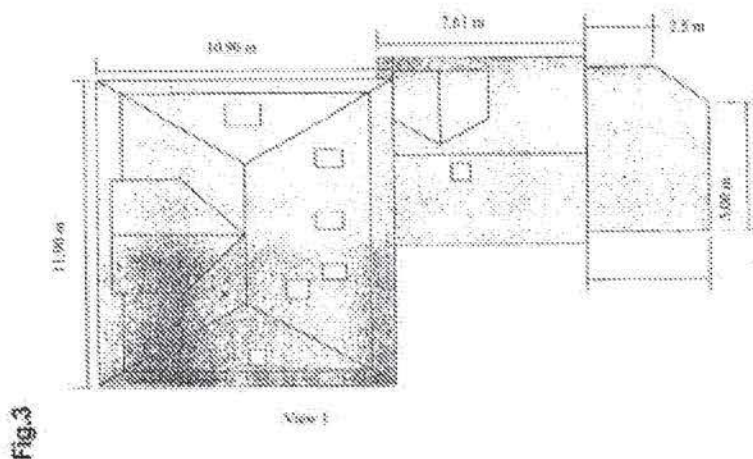
(EP 966, ¶ 0021)

Regarding claims 8 [and 26 | and 47], EPP discloses:

8. The computing system of claim 7 [method of claim 25 | non-transitory computer-readable storage medium of claim 46] wherein the length is located adjacent to a line representing a segment, the slope is located next to an arrow indicating direction of the slope and the area is located within a section having the area.

"The resulting calculated three-dimensional object description may be output either as flat two-dimensional graphics as shown in Fig. 3, and/or as a perspective three-dimensional representation as shown in Fig. 4, and then transmitted to the client computer. At the same time, the factual data is processed and added alphanumerically to the transmitted image data."

(EP 966, ¶ 0033)



(EP 966, Fig. 3)

Although EP 966 does not expressly disclose "the slope is located next to an arrow indicating direction of the slope," this difference would have been obvious to a person of

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ordinary skill at the time the invention was made. The claim language describes a conventional written notation to indicate slope. Accordingly, in view the express instruction in EP 966 to determine "all relevant information, such as roof shape, roof surface, roof pitch" (§ 0003) and that "factual data is processed and added alphanumerically to the transmitted image data" (§ 0033), it would have been obvious to add slope data to the image data using a conventional written notation to indicate slope.

Although EP 966 does not expressly disclose "the area is located within a section having the area," this difference would have been obvious to a person of ordinary skill at the time the invention was made. The claim language describes a conventional written notation to indicate area. Accordingly, in view of the express instruction in EP 966 that "the roof can be provided in m² to give a first impression of the scope of a necessary roof renovation" (§ 0033), and "to determine with reasonable accuracy the information necessary for the renovation through the description of the roof surface, roof form, ridge lines, roof line, chimneys, windows, roof structures" (§ 0031), it would have been obvious to indicate the area on the report using a conventional written notation to indicate area.

Further, the differences between the claimed invention and the embodiment expressly disclosed by EP 966, Fig. 3, are merely differences in nonfunctional descriptive material. Accordingly, these differences do not patentably distinguish the claimed invention over the prior art. See MPEP 2111.05.

Regarding claims 9 [and 27 | and 48], EPP 966 discloses:

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9. The computing system of claim 1 [method of claim 18 | non-transitory computer-readable storage medium of claim 36] wherein the different types of roof properties include different roof features, and the at least two different indicia include different graphical representations of the different roof features.

A first indicia for a first type of roof property – color to outline surfaces:

"This display is particularly user friendly when both the factual data of the orthophoto-hybrid data sets displayed graphically, i.e., inserted in the orthophoto data. In the previously proposed application, it is conceivable, for example, to mark graphically in color the outline of roof surfaces that form the object in order to highlight it."

(EP 966, ¶ 0023)

A second indicia for a second type of roof property – numbers to indicate area:

"At the same time, the factual data is processed and added alphanumerically to the transmitted image data. For example, the roof can be provided in m² to give a first impression of the scope of a necessary roof renovation."

(EP 966, ¶ 0033)

Alternatively, a third indicia for a third type of roof property – alphanumeric characters to indicate street data with respect to the building:

"In this case, the roof of the building forms the object for which a spatial object description is produced through the inventive method. Advantageously, the factual data in this case includes street data with respect to this building, i.e. street name plus house number. Of course, it can also include cadastral data or coordinates."

(EP 966, ¶ 0021)

Regarding claims 10 [and 28 | and 49], EPP 966 discloses:

10. The computing system of claim 1 [method of claim 18 | non-transitory computer-readable storage medium of claim 36] wherein the different types of roof properties include a ridge line and a valley line and the at least two different indicia include

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one color of a line associated with a ridge and a different color of a line associated with a valley.

EP 966 expressly discloses a top plan view of the three-dimensional model including a ridge line and a valley line using at least one color of line (EP 966, Fig. 3). EP 966 does not expressly disclose using one color of a line with a ridge, and a different color of line for a valley.

However, EP 966 teaches to use at least two different colors to represent the roof by teaching "to mark graphically in color the outline of roof surfaces that form the object in order to highlight it. This display is extremely user friendly" (EP 966, ¶ 0023).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use "at least two different indicia includ[ing] one color of a line associated with a ridge and a different color of a line associated with a valley" as claimed. EP 966 expressly teaches to color the outline of the roof to provide an extremely user friendly display. The difference between the claimed invention and the prior art merely involves modifying EP 966's express disclosure to graphically mark *the outline of the roof* using a different color to graphically mark *the ridge and valley lines of the roof* using different colors. Since EP 966 expressly teaches that the use of color provides an "extremely user friendly" graphical display, a person of ordinary skill in the art would have found the difference between the prior art and the claimed invention obvious.

Further, matters relating to ornamentation only which have no function cannot be relied upon to patentably distinguish the claimed invention from the prior art. See MPEP 2144.04 (I).

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Further, the differences between the claimed invention and the prior art are merely differences in nonfunctional descriptive material. Accordingly, these differences do not patentably distinguish the claimed invention over the prior art. See MPEP 2111.05.

Regarding claims 11 [and 29 | and 50], EPP 966 discloses:

11. The computing system of claim 1 [method of claim 18 | non-transitory computer-readable storage medium of claim 36] wherein the different types of roof properties include at least one of: a roof section, a roof segment, a roof valley, a ridge, a roof size, a roof geometry, a roof measurement, a roof dimension, slope, length and area.

A first indicia for a first type of roof property – color to outline surfaces:

"This display is particularly user friendly when both the factual data of the orthophoto-hybrid data sets displayed graphically, i.e., inserted in the orthophoto data. In the previously proposed application, it is conceivable, for example, to mark graphically in color the outline of roof surfaces that form the object in order to highlight it."

(EP 966, ¶ 0023)

A second indicia for a second type of roof property – numbers to indicate area:

"At the same time, the factual data is processed and added alphanumerically to the transmitted image data. For example, the roof can be provided in m2 to give a first impression of the scope of a necessary roof renovation."

(EP 966, ¶ 0033)

Alternatively, a third indicia for a third type of roof property – alphanumeric characters to indicate street data with respect to the building:

"In this case, the roof of the building forms the object for which a spatial object description is produced through the inventive method. Advantageously, the factual data in this case includes street data with respect to this building, i.e. street name plus house number. Of course, it can also include cadastral data or coordinates."

(EP 966, ¶ 0021)

Regarding claims 12 [and 30 | and 51], EPP 966 discloses:

12. The computing system of claim 1 [method of claim 18 | non-transitory computer-readable storage medium of claim 36] wherein the at least two different indicia include at least one of: different line color, different line weight, different visual characteristics of a line, different characters, different color of characters, different visual characteristics of characters, different measurements, different visual characteristics of measurements, different placement of measurements with respect to lines, different symbols, different visual characteristics of symbols and different placement of measurements with respect to symbols.

A first indicia for a first type of roof property – color to outline surfaces:

"This display is particularly user friendly when both the factual data of the orthophoto-hybrid data sets displayed graphically, i.e., inserted in the orthophoto data. In the previously proposed application, it is conceivable, for example, to mark graphically in color the outline of roof surfaces that form the object in order to highlight it."
(EP 966, ¶ 0023)

A second indicia for a second type of roof property – numbers to indicate area:

"At the same time, the factual data is processed and added alphanumerically to the transmitted image data. For example, the roof can be provided in m² to give a first impression of the scope of a necessary roof renovation."
(EP 966, ¶ 0033)

Alternatively, a third indicia for a third type of roof property – alphanumeric characters to indicate street data with respect to the building:

"In this case, the roof of the building forms the object for which a spatial object description is produced through the inventive method. Advantageously, the factual data in this case includes street data with respect to this building, i.e.

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street name plus house number. Of course, it can also include cadastral data or coordinates."

(EP 966, ¶ 0021)

Regarding claims 13 [and 31 | and 52], EPP 966 discloses:

13. The computing system of claim 1 [method of claim 18 | non-transitory computer-readable storage medium of claim 36] wherein the different types of roof properties include a ridge length and a valley length and the at least two different indicia include one color of a line associated with a ridge and a different color of a line associated with a valley.

EP 966 expressly discloses a top plan view of the three-dimensional model including a ridge line and a valley line using at least one color of line (EP 966, Fig. 3). The claimed properties – a ridge length and a valley length – are inherent properties of a ridge line and a valley line, and are inherently disclosed by, *e.g.*, EP 966, Fig. 3. EP 966 does not expressly disclose using one color of a line with a ridge, and a different color of line for a valley.

However, EP 966 teaches to use at least two different colors to represent the roof by teaching "to mark graphically in color the outline of roof surfaces that form the object in order to highlight it. This display is extremely user friendly" (EP 966, ¶ 0023).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use "at least two different indicia includ[ing] one color of a line associated with a ridge and a different color of a line associated with a valley" as claimed. EP 966 expressly teaches to color the outline of the roof to provide an extremely user friendly display. The difference between the claimed invention and the prior art merely involves modifying EP 966's express disclosure to graphically mark *the outline of the roof* using a

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different color to graphically mark *the ridge and valley lines of the roof* using different colors. Since EP 966 expressly teaches that the use of color provides an "extremely user friendly" graphical display, a person of ordinary skill in the art would have found the difference between the prior art and the claimed invention obvious.

Further, matters relating to ornamentation only which have no function cannot be relied upon to patentably distinguish the claimed invention from the prior art. See MPEP 2144.04 (I).

Further, the differences between the claimed invention and the prior art are merely differences in nonfunctional descriptive material. Accordingly, these differences do not patentably distinguish the claimed invention over the prior art. See MPEP 2111.05.

Regarding claims 14 [and 32 | and 53], EPP 966 discloses:

14. The computing system of claim 13 [method of claim 31 | non-transitory computer-readable storage medium of claim 52] wherein the one color of the line associated with the ridge is red and the different color of the line associated with the valley is blue.

EP 966 does not expressly disclose using a red color associated with a ridge line and a blue color associated with a valley line.

However, EP 966 teaches to use at least two different colors to represent the roof by teaching "to mark graphically in color the outline of roof surfaces that form the object in order to highlight it. This display is extremely user friendly" (EP 966, ¶ 0023).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use "the one color of the line associated with the ridge is red and the

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different color of the line associated with the valley is blue" as claimed. EP 966 expressly teaches to color the outline of the roof to provide an extremely user friendly display. The difference between the claimed invention and the prior art merely involves modifying EP 966's express disclosure to graphically mark *the outline of the roof* using a different color to graphically mark *the ridge and valley lines of the roof* using arbitrarily chosen red and blue colors. Since EP 966 expressly teaches that the use of color provides an "extremely user friendly" graphical display, a person of ordinary skill in the art would have found the difference between the prior art and the claimed invention obvious.

Further, matters relating to ornamentation only which have no function cannot be relied upon to patentably distinguish the claimed invention from the prior art. See MPEP 2144.04 (I).

Further, the differences between the claimed invention and the prior art are merely differences in nonfunctional descriptive material. Accordingly, these differences do not patentably distinguish the claimed invention over the prior art. See MPEP 2111.05.

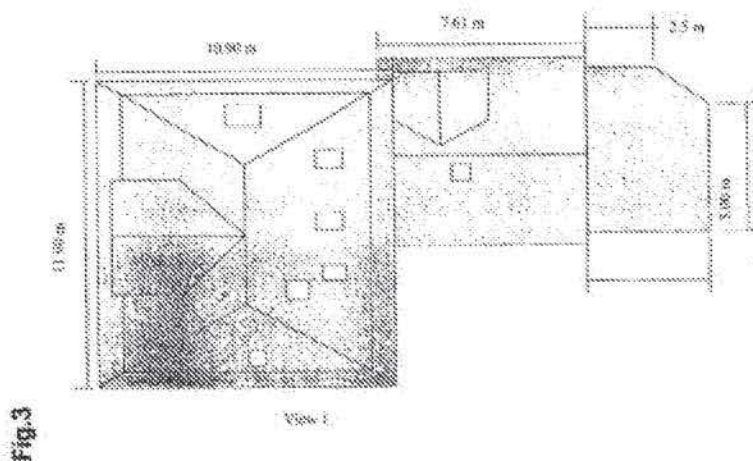
Regarding claims 15 [and 33 | and 54], EPP 966 discloses:

15. The computing system of claim 1 [method of claim 18 | non-transitory computer-readable storage medium of claim 36] wherein the different types of roof properties include a ridge and the at least two different indicia include a ridge length indicia, wherein the ridge length indicia is a ridge line with a numerical value adjacent thereto.

EP 966 does not expressly disclose a ridge length indicia that is a ridge line with a numerical value adjacent thereto.

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However, EP 966 teaches a two-dimensional top plan view, including ridge lines, and teaches displaying a numerical value adjacent to a line. EP 966 teaches to provide additional numerical values on the top plan view, "For example, the roof can be provided in m²" (EP 966, ¶ 0033).



(EP 966, Fig. 3)

Further, EP 966 teaches "to determine with reasonable accuracy the information necessary for the renovation through the description of the roof surface, roof form, ridge lines, roof line, chimneys, windows, roof structures" (EP 966, ¶ 0031). Further, EP 966 teaches that "For example, for cleaning a house roof, all relevant information, such as roof shape, roof surface, roof pitch, including any particularities can be determined with sufficient precision so that the modification of a measure on the basis of this information is possible" (EP 966, ¶ 0003).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide "a ridge length indicia that is a ridge line with a numerical value adjacent thereto" as claimed. EP 966 expressly teaches to determine "the information necessary for the renovation," including "roof form, ridge lines, roof line" and other roof dimensions. EP 966 expressly teaches to provide numerical values adjacent to the related

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features (such as edge length in Fig. 3), and expressly suggests adding other numerical values to the display, such as roof area in m² (EP 966, ¶ 0033). Since EP 966 describes a ridge line and a ridge length as relevant or necessary information for roof work, and since EP 966 teaches to provide numerical values adjacent to the related roof features, a person of ordinary skill in the art would have found the difference between the claimed invention and the prior art obvious.

Further, matters relating to ornamentation only which have no function cannot be relied upon to patentably distinguish the claimed invention from the prior art. See MPEP 2144.04 (I).

Further, the differences between the claimed invention and the prior art are merely differences in nonfunctional descriptive material. Accordingly, these differences do not patentably distinguish the claimed invention over the prior art. See MPEP 2111.05.

Regarding claims 16 [and 34 | and 55], EPP 966 discloses:

16. The computing system of claim 1 [method of claim 18 | non-transitory computer-readable storage medium of claim 36] wherein the different types of roof properties include a valley and the at least two different indicia include a valley length indicia, wherein the valley length indicia is a valley line with a numerical value adjacent thereto.

This claim is obvious over EP 966 for rationale substantially similar to that shown above regarding claim 15. The only difference is that claim 15 recites a "ridge" where claim 16 recites "valley". This is a nominal difference and does not alter the obviousness analysis.

Further, matters relating to ornamentation only which have no function cannot be relied upon to patentably distinguish the claimed invention from the prior art. See MPEP 2144.04 (I).

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Further, the differences between the claimed invention and the prior art are merely differences in nonfunctional descriptive material. Accordingly, these differences do not patentably distinguish the claimed invention over the prior art. See MPEP 2111.05.

Regarding claims 17 [and 35 | and 56], EPP 966 discloses:

17. The computing system of claim 1 [method of claim 18 | non-transitory computer-readable storage medium of claim 36] wherein the different types of roof properties include a slope and the at least two different indicia include a slope indicia, wherein the slope indicia is an arrow in a direction of the slope with a numerical value adjacent thereto.

This claim is obvious over EP 966 for rationale substantially similar to that shown above regarding claim 15. The only difference is that claim 15 recites a "ridge" and a "ridge line" where claim 17 recites a "slope" and "an arrow". This is a nominal difference and does not alter the obviousness analysis.

Further, matters relating to ornamentation only which have no function cannot be relied upon to patentably distinguish the claimed invention from the prior art. See MPEP 2144.04 (I).

Further, the differences between the claimed invention and the prior art are merely differences in nonfunctional descriptive material. Accordingly, these differences do not patentably distinguish the claimed invention over the prior art. See MPEP 2111.05.

Regarding 36, EP 966 discloses:

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36. A non-transitory computer-readable storage medium whose contents enable a computing system to generate a roof estimate report for a building having a roof, by performing a method comprising:

"A graphic and/or alphanumeric representation of the object description can be displayed on the client computer. Advantageously, the preparation of the measurement data in the host computer is such that further processing is not required by the client. For example, the customer can receive extensive measurements with respect to a house roof, which involve material and cost calculations for the renovation of a roof by a roofer."
(EP 966, ¶ 00019)

"The inventive method provides the broad user community for the first time with the opportunity to use aerial imagery for the spatial measurement and description of specific objects. This is done on the basis of first performing a two-dimensional processing of the raw data initially generated by the measurement. The resulting limited amount of data, after structuring by integrating external factual data, is ideally suited for optimum handling in a network-type decentralized data processing system, in particular with low capacity transmission lines such as the Internet."
(EP 966, ¶ 0020, emphasis added)

receiving one or more images of the building;

"The present invention relates to a method for generating a three-dimensional object description of a localized spatial object – especially a building – from aerial stereoscopic pairs..."
(EP 966, ¶ 0001)

"Following the client computer request by entering the object-specific factual data, the host computer first identifies the three-dimensional raw data that underlies the object-specific ortho-hybrid data set selected at the client computer. These are the aerial image data and the parameter data, for example of a building or a house roof."
(EP 966, ¶ 0016, emphasis added)

**generating, based on the one or more images of the building, a model of the roof that includes a plurality of planar roof sections that each have a corresponding area and edges;
and**

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"The subject matter of this measuring method is the three-dimensional description of spatial objects located on the earth's surface, especially spatially limited land and buildings, such as roads, residential and industrial buildings and other buildings, by means of aerial images. In this way, stereoscopic aerial pairs of the objects, i.e. two aerial photographs are taken in stereoscopic coverage, to give sets of two-dimensional, geometric image data and parameter data that contain highly detailed information on the camera angle of the image pairs, absolute image coordinates and other image recording parameters. These data provide the raw data to calculate real oriented representations of the earth's surface."

(EP 966, ¶ 0002)

"Following the client computer request by entering the object-specific factual data, the host computer first identifies the three-dimensional raw data that underlies the object-specific ortho-hybrid data set selected at the client computer. These are the aerial image data and the parameter data, for example of a building or a house roof. From the three-dimensional raw data, the host computer now performs a three-dimensional model calculation for the selected object. A three-dimensional object data set is generated as a result that, together with the object-specific factual data, forms a complete three-dimensional object description from the aerial perspective. Specifically, such a three-dimensional object description could contain, for example, information on the type and area of a house roof, including data on the roof pitch, placement and size of windows and chimneys, and similar."

(EP 966, ¶ 0016, emphasis added)

"In this case, the determination of the roof shape and/or the roof surface is performed on the host computer by a partially or fully automated image analysis procedure. This eliminates time-consuming manual processing."

(EPP 966, ¶ 0022)

"Based on the available three-dimensional raw data, a stereoscopic model description of the roof is calculated. Using image analysis techniques, it is therefore possible to determine with reasonable accuracy the information necessary for the renovation through the description of the roof surface, roof form, ridge lines, roof line, chimneys, windows, roof structures."

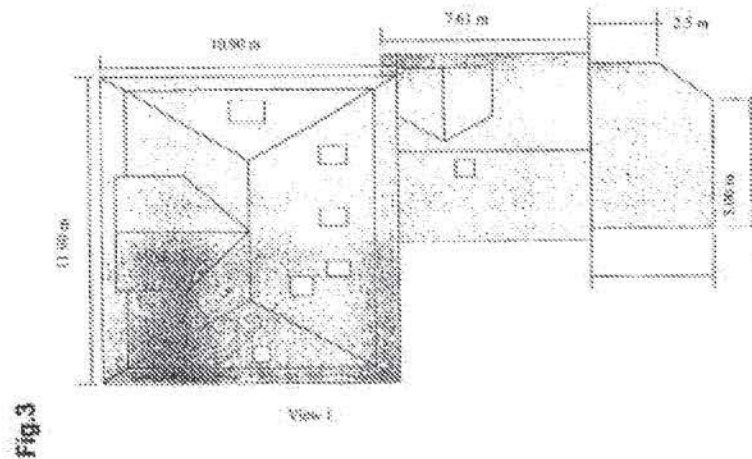
(EP 966, ¶ 0031, emphasis added)

transmitting a roof estimate report that includes one or more views of the model, the report being annotated with numerical indications

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"The resulting calculated three-dimensional object description may be output either as flat two-dimensional graphics as shown in Fig. 3, and/or as a perspective three-dimensional representation as shown in Fig. 4, and then transmitted to the client computer. At the same time, the factual data is processed and added alphanumerically to the transmitted image data."

(EP 966, ¶ 0033)



(EP 966, FIG. 3)

of the area and lengths of the edges of at least some of the plurality of planar roof sections,

"For example, for cleaning a house roof, all relevant information, such as roof shape, roof surface, roof pitch, including any particularities can be determined with sufficient precision so that the modification of a measure on the basis of this information is possible."

(EP 966, ¶ 0003, emphasis added)

"A graphic and/or alphanumeric representation of the object description can be displayed on the client computer. Advantageously, the preparation of the measurement data in the host computer is such that further processing is not required by the client. For example, the customer can receive extensive measurements with respect to a house roof, which involve material and cost calculations for the renovation of a roof by a roofer."

(EP 966, ¶ 0019)

"Using image analysis techniques, it is therefore possible to determine with reasonable accuracy the information necessary for the renovation through the

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description of the roof surface, roof form, ridge lines, roof line, chimneys, windows, roof structures."

(EP 966, ¶ 0031, emphasis added)

"The orthophoto-hybrid data set can be further processed into technical graphics with an indication of dimensions, as shown in Fig. 3."

(EP 966, ¶ 0032)

"At the same time, the factual data is processed and added alphanumerically to the transmitted image data. For example, the roof can be provided in m2 to give a first impression of the scope of the necessary roof renovation."

(EP 966, ¶ 0033, emphasis added)

wherein the roof estimate report includes at least two different indicia for different types of roof properties.

A first indicia for a first type of roof property – color to outline surfaces:

"This display is particularly user friendly when both the factual data of the orthophoto-hybrid data sets displayed graphically, i.e., inserted in the orthophoto data. In the previously proposed application, it is conceivable, for example, to mark graphically in color the outline of roof surfaces that form the object in order to highlight it."

(EP 966, ¶ 0023)

A second indicia for a second type of roof property – numbers to indicate area:

"At the same time, the factual data is processed and added alphanumerically to the transmitted image data. For example, the roof can be provided in m2 to give a first impression of the scope of a necessary roof renovation."

(EP 966, ¶ 0033)

Alternatively, a third indicia for a third type of roof property – alphanumeric characters to indicate street data with respect to the building:

"In this case, the roof of the building forms the object for which a spatial object description is produced through the inventive method. Advantageously, the factual data in this case includes street data with respect to this building, i.e. street name plus house number. Of course, it can also include cadastral data or coordinates."

(EP 966, ¶ 0021)

Although EP 966 teaches how to determine "all relevant information, such as roof shape, roof surface, roof pitch" (§ 0003), and EP 966 teaches how "to determine with reasonable accuracy the information necessary for renovation" including "roof form, ridge lines, roof line" and "roof structures" (§ 0031), and EP 966 teaches that such "factual data is processed and added alphanumerically to the transmitted image data" (§ 0033), EP 966 does not expressly disclose the claimed feature of a roof estimate report that includes "numerical values that indicate the corresponding *slope* of at least some of the plurality of planar roof sections".

However, in light of the teachings to determine "all relevant information, such as" "roof pitch," and the teaching that "the information necessary for renovation" [of a roof] includes "roof form, ridge lines, roof line" and "roof structures," it would have been obvious to a person of ordinary skill in the art modify the teachings of EP 966 to arrive at a roof estimate report that includes "numerical values that indicate the corresponding *slope* of at least some of the plurality of planar roof sections". This modification merely follows the instructions expressly taught by EP 966 to arrive at an embodiment which is naturally suggested by the instructions, but is not explicitly disclosed in the reference. This modification would provide an enhanced roof estimate report that provides the customer with additional factual data such as roof pitch of the roof form, ridge lines, roof line, or roof structures.

Regarding claim 37, EP 966 discloses:

37. The non-transitory computer-readable storage medium of claim 36 wherein generating the model includes generating a three-dimensional model based on a correlation between two of the one or more images.

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"The subject matter of this measuring method is the three-dimensional description of spatial objects located on the earth's surface, especially spatially limited land and buildings, such as roads, residential and industrial buildings and other buildings, by means of aerial images. In this way, stereoscopic aerial pairs of the objects, i.e. two aerial photographs are taken in stereoscopic coverage, to give sets of two-dimensional, geometric image data and parameter data that contain highly detailed information on the camera angle of the image pairs, absolute image coordinates and other image recording parameters. These data provide the raw data to calculate real oriented representations of the earth's surface."

(EP 966, ¶ 0002, emphasis added)

"Based on the available three-dimensional raw data, a stereoscopic model description of the roof is calculated. Using image analysis techniques, it is therefore possible to determine with reasonable accuracy the information necessary for the renovation through the description of the roof surface, roof form, ridge lines, roof line, chimneys, windows, roof structures."

(EP 966, ¶ 0031, emphasis added)

Regarding claim 38, EP 966 discloses:

38. The non-transitory computer-readable storage medium of claim 36 wherein the method further comprises generating the roof estimate report, the roof estimate report including annotated line drawings of each of the one or more views of the model.

"For example, for cleaning a house roof, all relevant information, such as roof shape, roof surface, roof pitch, including any particularities can be determined with sufficient precision so that the modification of a measure on the basis of this information is possible."

(EP 966, ¶ 0003, emphasis added)

"A graphic and/or alphanumeric representation of the object description can be displayed on the client computer. Advantageously, the preparation of the measurement data in the host computer is such that further processing is not required by the client. For example, the customer can receive extensive measurements with respect to a house roof, which involve material and cost calculations for the renovation of a roof by a roofer."

(EP 966, ¶ 0019)

"Using image analysis techniques, it is therefore possible to determine with reasonable accuracy the information necessary for the renovation through the

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description of the roof surface, roof form, ridge lines, roof line, chimneys, windows, roof structures."

(EP 966, ¶ 0031, emphasis added)

"The orthophoto-hybrid data set can be further processed into technical graphics with an indication of dimensions, as shown in Fig. 3."

(EP 966, ¶ 0032)

"At the same time, the factual data is processed and added alphanumerically to the transmitted image data. For example, the roof can be provided in m² to give a first impression of the scope of the necessary roof renovation."

(EP 966, ¶ 0033, emphasis added)

Regarding claim 39, EP 966 discloses:

39. The non-transitory computer-readable storage medium of claim 36 wherein the one or more images of the building are images obtained from at least one of an aircraft, satellite, and ground-based platform, and wherein the one or more views of the model are top-down line drawing views of the model.

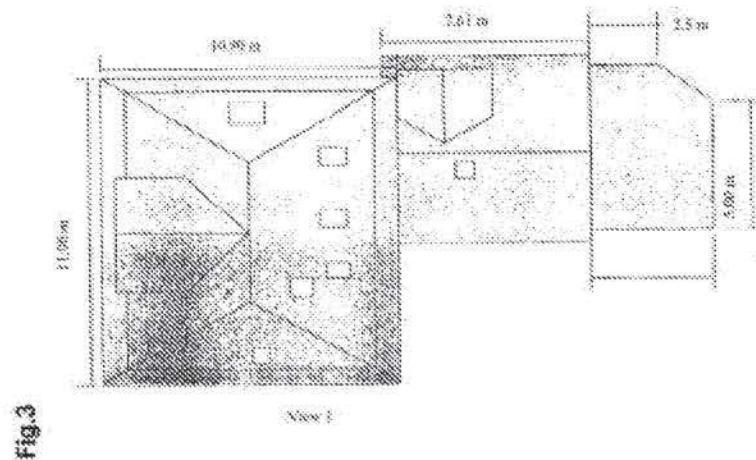
"The subject matter of this measuring method is the three-dimensional description of spatial objects located on the earth's surface, especially spatially limited land and buildings, such as roads, residential and industrial buildings and other buildings, by means of aerial images. In this way, stereoscopic aerial pairs of the objects, i.e. two aerial photographs are taken in stereoscopic coverage, to give sets of two-dimensional, geometric image data and parameter data that contain highly detailed information on the camera angle of the image pairs, absolute image coordinates and other image recording parameters. These data provide the raw data to calculate real oriented representations of the earth's surface."

(EP 966, ¶ 0002, emphasis added)

"The orthophoto-hybrid data set can be further processed into technical graphics with an indication of dimensions, as shown in Fig. 3."

(EP 966, ¶ 0032)

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(EP 966, FIG. 3)

Regarding claim 40, EP 966 discloses:

40. The non-transitory computer-readable storage medium of claim 36 wherein generating the model of the roof includes automatically identifying at least some features of the roof for inclusion in the model.

"Based on the available three-dimensional raw data, a stereoscopic model description of the roof is calculated. Using image analysis techniques, it is therefore possible to determine with reasonable accuracy the information necessary for the renovation through the description of the roof surface, roof form, ridge lines, roof line, chimneys, windows, roof structures."

(EP 966, ¶ 0031, emphasis added)

Regarding claim 41, EP 966 discloses:

41. The non-transitory computer-readable storage medium of claim 36 wherein the contents are instructions that when executed cause the computing system to perform the method.

"A graphic and/or alphanumeric representation of the object description can be displayed on the client computer. Advantageously, the preparation of the measurement data in the host computer is such that further processing is not required by the client. For example, the customer can receive extensive

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measurements with respect to a house roof, which involve material and cost calculations for the renovation of a roof by a roofer."
(EP 966, ¶ 00019)

"The inventive method provides the broad user community for the first time with the opportunity to use aerial imagery for the spatial measurement and description of specific objects. This is done on the basis of first performing a two-dimensional processing of the raw data initially generated by the measurement. The resulting limited amount of data, after structuring by integrating external factual data, is ideally suited for optimum handling in a network-type decentralized data processing system, in particular with low capacity transmission lines such as the Internet."
(EP 966, ¶ 0020, emphasis added)

Regarding claim 42, EP 966 discloses:

42. The non-transitory computer-readable storage medium of claim 36 wherein the method further comprises transmitting to a remote computing system a computer-readable data file that includes a representation of the model.

"Finally, the object data processed in this way, including the associated factual data is transmitted to the client as a three-dimensional object description via the data transmission lines."
(EP 966, ¶ 0017)

Regarding claim 46, EP 966 discloses:

46. The non-transitory computer-readable storage medium of claim 36 wherein the different types of roof properties include different roof measurements, and the at least two different indicia include at least one of: length, slope, and area.

A first indicia for a first type of roof property – color to outline surfaces:

"This display is particularly user friendly when both the factual data of the orthophoto-hybrid data sets displayed graphically, i.e., inserted in the orthophoto data. In the previously proposed application, it is conceivable, for example, to mark graphically in color the outline of roof surfaces that form the object in order to highlight it."

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(EP 966, ¶ 0023)

A second indicia for a second type of roof property – numbers to indicate area:

"At the same time, the factual data is processed and added alphanumerically to the transmitted image data. For example, the roof can be provided in m2 to give a first impression of the scope of a necessary roof renovation."

(EP 966, ¶ 0033)

Alternatively, a third indicia for a third type of roof property – alphanumeric characters to indicate street data with respect to the building:

"In this case, the roof of the building forms the object for which a spatial object description is produced through the inventive method. Advantageously, the factual data in this case includes street data with respect to this building, i.e. street name plus house number. Of course, it can also include cadastral data or coordinates."

(EP 966, ¶ 0021)

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C. Claim 6 is rejected under pre-AIA 35 U.S.C. § 103(a) as being unpatentable over EP 966 in view of Aerodach Website.

In this Office Action, all citations of Aerodach Website refer to the page numbers of Appendix F provided with the Request, and all quotations of Aerodach Website are taken from the "First English Translation" in the same Appendix F.

Regarding claim 6, EP 966 in view of Aerodach Website teaches:

6. The method of claim 1 wherein transmitting the roof estimate report includes initiating printing of the one or more top plan views of the three-dimensional model.

EP 966 discloses a method to produce an electronic roof estimate report (*e.g.*, EP 966, ¶ 0008). EP 966 does not expressly disclose *printing* the top plan views.

However, Aerodach Website expressly teaches **printing of the one or more top plan views of the three-dimensional model.**

"Optional: Layout drawing as large-format plot €28.00
When the footprint exceeds 80 cm x 120 cm on a scale of 1:200
Included in orders of roof measurements, delivery via mail
Optional: Order processing without Internet connection €25.00
For phone processing, printout on DIN A4 instead of e-mail. Included in orders of roof measurements, delivery via mail."
(Aerodach Website, page 9 of 62)

EP 966 and Aerodach Website are analogous art because both are directed to producing a roof report by analyzing images of a roof.

A person would have been motivated to combine the teachings of EP 966 and Aerodach Website in order to provide the optional *printing* functionality because some customers may prefer a "large-format plot" and dislike electronic computer data files. A person would have been further motivated to provide the optional *printing* functionality in order to process customer

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orders "without Internet connection," thereby reaching a larger pool of potential customers. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine the teachings of EP 966 and Aerodach Website in order to arrive at the claimed invention.

D. Claim 43 is rejected under pre-AIA 35 U.S.C. § 103(a) as being unpatentable over EP 966 in view of Novak.

Regarding claim 43, EP 966 in view of Novak teaches:

43. The non-transitory computer-readable storage medium of claim 36 wherein generating the model of the roof includes generating a two-dimensional model of the roof based on a single image that provides a substantially top-down view of the roof.

EP 966 discloses **generating a two-dimensional model of the roof** using images that **provide a substantially top-down view of the roof** (*e.g.*, EP 966, FIGS. 1 and 3). However, EP 966 discloses a method that uses stereoscopic *pairs* of images (*e.g.*, EP 966, ¶ 0001).

Novak teaches a method of **generating a model of an object including generating a two-dimensional model of the object based on a single image.**

"A photogrammetric apparatus for capturing a single image of an object, capturing a plurality of data about the image, analyzing the data, and computing relationships between substantially coplanar points in the image. The apparatus includes an image capturing device that captures images and stores the images in a storage device with database. The database simultaneously receives and stores data from a bearing finding device, a range finding device, and an azimuth finding device. The apparatus may include a global positioning system (GPS) device to collect and store to the database a geophysical location of the image capturing device when the image was captured. The apparatus includes an image processor to analyze the images and data stored in the database. The image processor includes routines for calibrating the apparatus, measuring distances between

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substantially coplanar points in the image, and calculating a plurality of relationships among various coplanar points in the image."

(Novak, abstract, emphasis added)

"For example, an architect may need to obtain the exterior dimensions of a building from the planar images of each side thereof. In a further example, engineers need to collect utility pole data such as pole height, pole diameter, the height of attachments such as electrical and communications cables, transformers, and similar information."

(Novak, ¶ 0007, emphasis added)

"The calibrated photogrammetric apparatus also includes a measurement routine that accepts inputs from a user viewing the captured and processed image of at least two points in the image that are substantially coplanar on the real world target of interest. As described above, the term "coplanar" as used herein has a specialized meaning in the context of the instant invention. The measurement routine is configured to retrieve data from the storage device database and to determine a distance between the points using the calibration data set and a series of trigonometric calculations. The measurement routine may be used to measure the distance between points on substantially coplanar objects or other, different points in the image. For example, the distance between various points on a substantially coplanar utility pole may be calculated. More specifically, the point can correspond to cables or equipment on the pole. In similar fashion, the amount of sag in a conductor between such poles can also be calculated.

(Novak, ¶ 0017, emphasis added)

"In the fourth step 440 the user selects a point at the right edge of the pole and a point at the left edge of the pole at the location that the pole diameter is desired. The image processor 190 automatically determines the distance in pixel units of measure between the selected points. The diameter of the pole at reference point "A" is then calculated 450 by multiplying the image scale at point "A" with the pixel separation distance. Lastly, once the diameter is known the circumference of the pole at point "A" is calculated 460 using principles of geometry. With the diameter known and the image processor's 190 ability to determine the distance between any two substantially coplanar points on the pole, a myriad of other calculations may be performed including, for instance, the surface area calculation and the volume calculation. Further, one with skill in the art can appreciate that in addition to cylindrical objects, the area and perimeter of all planar geometric shapes may be easily calculated by simply identifying the critical distances on the shape."

(Novak, ¶ 0065, emphasis added)

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EP 966 and Novak are analogous art because both are directed to determining information about an object by analyzing images of the object.

A person would have been motivated to combine the teachings of EP 966 and Novak in order to provide a system that requires only a *single* image of a building to prepare a roof estimate report, using an "accurate, low-cost analysis" of "points in a single image of a field location" (Novak, ¶ 0010). Accordingly, the combination of EP 966 and Novak could reduce or eliminate the need for costly, complicated aerial stereoscopic image pairs, relying instead on the low-cost technique described by Novak. In forming the combination, it would have been obvious that the "planar geometric shapes" (Novak, ¶ 0065) of interest would be planar sections of a building roof (*e.g.*, EP 966, ¶ 0003), so that the system can provide "all relevant information, such as roof shape, roof surface, roof pitch" for, *e.g.*, cleaning a house roof (EP 966, ¶ 0003). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine the teachings of EP 966 and Novak in order to arrive at the claimed invention.

E. Claims 44-45 are rejected under pre-AIA 35 U.S.C. § 103(a) as being unpatentable over EP 966 in view of Novak, further in view of Official Notice.

Regarding claims 44 and 45, EP 966 in view of Novak, further in view of Official Notice teaches:

44. The non-transitory computer-readable storage medium of claim 43 further comprising:

presenting the model to a customer; and

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modifying the model of the roof based on input received from the customer, the input indicating a slope corresponding to one of the plurality of planar roof sections, wherein transmitting the roof estimate report includes generating a roof estimate report based on the modified model.

45. The non-transitory computer-readable storage medium of claim 43 further comprising:

modifying the model of the roof based on input received from a customer, the input identifying a ridge or valley of the roof, wherein transmitting the roof estimate report includes generating a roof estimate report based on the modified model.

EP 966 discloses **presenting the model to a customer** (*e.g.*, EP 966, ¶ 0033).

Neither EP 966 nor Novak expressly describe a step of **modifying the model of the roof based on input received from a customer, the input indicating a slope corresponding to one of the plurality of planar roof sections [identifying a ridge or valley of the roof], wherein transmitting the roof estimate report includes generating a roof estimate report based on the modified model.**

Official Notice is taken that it is old and well known to modify a product offering when a customer indicates that the product is inappropriate or inferior.

It is well known that a clothes customer is unlikely to buy clothes that are the wrong size because the customer will expect that the clothes do not fit. It is well known that a car parts customer is unlikely to purchase car parts for a wrong car because those the customer would expect that the car parts would be unusable. Similarly, a roof report customer is unlikely to purchase a roof report (*i.e.*, a product consisting of *factual information* about a roof) when the

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customer knows that the underlying factual information is incorrect. An incorrect roof report is an inappropriate or inferior product.

However, it is old and well known to modify a product offering when a customer indicates that the product offering is inappropriate or inferior. It is well known to offer a clothing customer "large" sized clothes after the customer indicates that he only wears "large" size clothing. It is well known to offer car parts that match a customer car's make, model, and year after the customer has indicated that information. Finally, when a customer sees a roof estimate report and indicates that the underlying factual information is incorrect, it is obvious to modify the underlying factual information based on the customer's input in order to produce an appropriate, superior product.

Therefore, it would have been obvious to modify the model of the roof to include factual roof pitch information provided by the customer, and to offer the modified roof report. Similarly, it would have been obvious to modify the model of the roof to include factual ridge or valley information provided by the customer, and to offer the modified roof report. That is, it is old and well known to modify a product offering when a customer indicates that the product is inappropriate or inferior.

The motivation for modifying the product offering would be to offer the customer a product that is appropriate and not inferior, in order to improve the chance of making a successful sale.

Accordingly, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine the teachings of EP 966, Novak, and Official Notice to arrive at the invention specified in claims 44 and 45.

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F. Claims 1-5, 7-42, and 46-56 are rejected under pre-AIA 35 U.S.C. § 103(a) as being unpatentable over EP 966 in view of Applicant's Admitted Prior Art ("AAPA").

The rationale shown above in **Rejection B** comparing EP 966 to the claimed invention is incorporated herein by reference in its entirety.

Regarding claims 1 [and 18], the following limitations are AAPA:

1. A method comprising:

receive [receiving] a first and a second aerial image of a building having a roof, each of the aerial images providing a different view of the roof of the building;

"There are a variety of photo-grammetric algorithms that can be utilized to perform this reconstruction. One such algorithm used by the service 70 uses photographs taken from two or more view points to "triangulate" points of interest on the object in three-dimensional ("3D") space."
(436 Patent, 6:55-59)

"As noted above, a variety of automatic and semi-automatic techniques may be employed to generate a model of the roof of the building. In one embodiment, generating such a model is based at least in part on a correlation between at least two of the aerial images of the building."
(436 Patent, 8:20-24)

"In addition, programming interfaces to the data stored as part of the RES 710, such as in the RES data repository 716, can be available by standard mechanisms such as through C, C++, C#, and Java APIs; libraries for accessing files, databases, or other data repositories; through scripting languages such as XML; or through Web servers, FTP servers, or other types of servers providing access to stored data. For example, the RES data repository 716 may be implemented as one or more database systems, file systems, memory buffers, or any other technique for storing such information, or any combination of the above, including implementations using distributed computing techniques."
(436 Patent, 12:61 – 13:5, emphasis added)

correlate [correlating] the first aerial image with the second aerial image;

"... any acceptable algorithm to co-register the images... Several such algorithms are described in detail in textbooks, trade journals, and academic publications"

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('436 Patent, 6:50 – 7:7)

"As noted above, a variety of automatic and semi-automatic techniques may be employed to generate a model of the roof of the building. In one embodiment, generating such a model is based at least in part on a correlation between at least two of the aerial images of the building."

('436 Patent, 8:20-24, emphasis added)

"In some embodiments, the roof modeling engine 602 determines the corresponding feature automatically, such as by employing on one or more image processing techniques used to identify vertexes, edges, or other features of the roof. In other embodiments, the roof modeling engine 602 determines the corresponding feature by receiving, from the human operator 620 as operator input 633, indications of the feature shown in multiple images of the building."

('436 Patent, 8:49 - 8:56)

generate [generating], based at least in part on the correlation between the first and second aerial images, a three-dimensional model of the roof that includes a plurality of planar roof sections that each have a corresponding slope, area, and edges; and

"... any acceptable algorithm to co-register the images and reconstruct the three-dimensional geometry of the object identified by the reference points. There are a variety of photo-grammetric algorithms that can be utilized to perform this reconstruction. One such algorithm used by the service 70 uses photographs taken from two or more view points to "triangulate" points of interest on the object in three-dimensional ("3D") space... Repeating the process for all such reference points allows the software to build a 3D model of the structure.

The optimal choice of reconstruction algorithm depends on a number of factors such as the spatial relationships between the photographs, the number and locations of the reference points, and any assumptions that are made about the geometry and symmetry of the object being reconstructed. Several such algorithms are described in detail in textbooks, trade journals, and academic publications."

('436 Patent, 6:50 – 7:7)

"As noted above, a variety of automatic and semi-automatic techniques may be employed to generate a model of the roof of the building. In one embodiment, generating such a model is based at least in part on a correlation between at least two of the aerial images of the building."

('436 Patent, 8:20-24)

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"In some embodiments, the roof modeling engine 602 determines the corresponding feature automatically, such as by employing on one or more image processing techniques used to identify vertexes, edges, or other features of the roof. In other embodiments, the roof modeling engine 602 determines the corresponding feature by receiving, from the human operator 620 as operator input 633, indications of the feature shown in multiple images of the building."
(436 Patent, 8:49 - 8:56)

EP 966 and AAPA are analogous art because both are drawn to determining information about a building by analyzing images of the building.

A person would have been motivated to combine EP 966 with AAPA because AAPA teaches that several functions necessary to implement EP 966 are old and well known. It would be more cost effective, and require less experimentation, to use the "algorithms ... described in detail in textbooks, trade journals, and academic publications" rather than to start from scratch.

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine EP 966 with AAPA in order to arrive at the claimed invention.

Regarding claims 2 [and 20], the following limitations are AAPA:

2. The computing system of claim 1 wherein the roof estimation module is further configured to correlate the first and second aerial images by receiving an indication of one or more corresponding points on the building shown in each of the first and second aerial images.

[20. The method of claim 18 wherein correlating the first and second aerial images includes receiving an indication of one or more corresponding points shown in each of the first and second aerial images.]

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"... any acceptable algorithm to co-register the images and reconstruct the three-dimensional geometry of the object identified by the reference points. There are a variety of photo-grammetric algorithms that can be utilized to perform this reconstruction. One such algorithm used by the service 70 uses photographs taken from two or more view points to "triangulate" points of interest on the object in three-dimensional ("3D") space... Repeating the process for all such reference points allows the software to build a 3D model of the structure.

The optimal choice of reconstruction algorithm depends on a number of factors such as the spatial relationships between the photographs, the number and locations of the reference points, and any assumptions that are made about the geometry and symmetry of the object being reconstructed. Several such algorithms are described in detail in textbooks, trade journals, and academic publications."

('436 Patent, 6:50 – 7:7)

"As noted above, a variety of automatic and semi-automatic techniques may be employed to generate a model of the roof of the building. In one embodiment, generating such a model is based at least in part on a correlation between at least two of the aerial images of the building."

('436 Patent, 8:20-24)

"In some embodiments, the roof modeling engine 602 determines the corresponding feature automatically, such as by employing on one or more image processing techniques used to identify vertexes, edges, or other features of the roof. In other embodiments, the roof modeling engine 602 determines the corresponding feature by receiving, from the human operator 620 as operator input 633, indications of the feature shown in multiple images of the building."

('436 Patent, 8:49 - 8:56)

Regarding claim 21, the following limitations are AAPA:

21. The method of claim 20 wherein receiving the indication of the corresponding point includes receiving the indication from a user.

"As noted above, a variety of automatic and semi-automatic techniques may be employed to generate a model of the roof of the building. In one embodiment, generating such a model is based at least in part on a correlation between at least two of the aerial images of the building."

('436 Patent, 8:20-24)

"In some embodiments, the roof modeling engine 602 determines the corresponding feature automatically, such as by employing on one or more image

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processing techniques used to identify vertexes, edges, or other features of the roof. In other embodiments, the roof modeling engine 602 determines the corresponding feature by receiving, from the human operator 620 as operator input 633, indications of the feature shown in multiple images of the building." ('436 Patent, 8:49 - 8:56)

That is, the '436 Patent first admits that "a variety of automatic and semi-automatic techniques" are known in the prior art, and further discloses that a "semi-automatic technique" is a technique where a computer receives some input from a human operator. Accordingly, the feature recited by claim 21 is admitted prior art.

Regarding claim 4, the following limitations are AAPA:

4. The computing system of claim 1 wherein the roof estimation module is further configured to receive the first and second aerial image from an image source computing system.

"In addition, programming interfaces to the data stored as part of the RES 710, such as in the RES data repository 716, can be available by standard mechanisms such as through C, C++, C#, and Java APIs; libraries for accessing files, databases, or other data repositories; through scripting languages such as XML; or through Web servers, FTP servers, or other types of servers providing access to stored data. For example, the RES data repository 716 may be implemented as one or more database systems, file systems, memory buffers, or any other technique for storing such information, or any combination of the above, including implementations using distributed computing techniques." ('436 Patent, 12:61 – 13:5, emphasis added)

Regarding claim 24, the following limitations are AAPA:

24. The method of claim 18 wherein transmitting the roof estimate report includes transmitting a data file that includes the one or more top plan views of the three-dimensional model.

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"In addition, programming interfaces to the data stored as part of the RES 710, such as in the RES data repository 716, can be available by standard mechanisms such as through C, C++, C#, and Java APIs; libraries for accessing files, databases, or other data repositories; through scripting languages such as XML; or through Web servers, FTP servers, or other types of servers providing access to stored data. For example, the RES data repository 716 may be implemented as one or more database systems, file systems, memory buffers, or any other technique for storing such information, or any combination of the above, including implementations using distributed computing techniques."
(436 Patent, 12:61 – 13:5, emphasis added)

The description of the "data file," in the context of the invention, is non-functional descriptive material. The '436 Patent discloses that transmitting a data file is admitted prior art, therefore the patentable features of claim 24 are admitted prior art.

Regarding 36, the following limitations are AAPA:

36. A non-transitory computer-readable storage medium whose contents enable a computing system to generate a roof estimate report for a building having a roof, by performing a method comprising:

receiving one or more images of the building;

generating, based on the one or more images of the building, a model of the roof that includes a plurality of planar roof sections that each have a corresponding area and edges; and

transmitting a roof estimate report that includes one or more views of the model, the report being annotated with numerical indications of the area and lengths of the edges of at least some of the plurality of planar roof sections, wherein the roof estimate report includes at least two different indicia for different types of roof properties.

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"In addition, programming interfaces to the data stored as part of the RES 710, such as in the RES data repository 716, can be available by standard mechanisms such as through C, C++, C#, and Java APIs; libraries for accessing files, databases, or other data repositories; through scripting languages such as XML; or through Web servers, FTP servers, or other types of servers providing access to stored data. For example, the RES data repository 716 may be implemented as one or more database systems, file systems, memory buffers, or any other technique for storing such information, or any combination of the above, including implementations using distributed computing techniques." ('436 Patent, 12:61 – 13:5, emphasis added)

That is, "a non-transitory computer-readable storage medium" storing "contents" is AAPA by at least the description of "standard mechanisms such as ... libraries for accessing files, databases, or other data repositories". Further, storing aerial images is AAPA by at least the description of the "several such algorithms ... described in detail in textbooks, trade journals, and academic publications" ('436 Patent, 6:50 – 7:7). Lastly, the '436 Patent discloses that a "database that contains aerial images" would *enable* a computing system to perform the claimed method (See, *e.g.*, 3:67 – 4:2; 4:16-27). This is all that is required by the claim language. Accordingly, the invention of claim 36, as a whole, is admitted prior art.

In addition to the citations shown above, the following language of claim 36 is AAPA:

receiving one or more images of the building;

"There are a variety of photo-grammetric algorithms that can be utilized to perform this reconstruction. One such algorithm used by the service 70 uses photographs taken from two or more view points to "triangulate" points of interest on the object in three-dimensional ("3D") space." ('436 Patent, 6:55-59)

"As noted above, a variety of automatic and semi-automatic techniques may be employed to generate a model of the roof of the building. In one embodiment, generating such a model is based at least in part on a correlation between at least two of the aerial images of the building." ('436 Patent, 8:20-24)

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"In addition, programming interfaces to the data stored as part of the RES 710, such as in the RES data repository 716, can be available by standard mechanisms such as through C, C++, C#, and Java APIs; libraries for accessing files, databases, or other data repositories; through scripting languages such as XML; or through Web servers, FTP servers, or other types of servers providing access to stored data. For example, the RES data repository 716 may be implemented as one or more database systems, file systems, memory buffers, or any other technique for storing such information, or any combination of the above, including implementations using distributed computing techniques."
(436 Patent, 12:61 – 13:5)

generating, based on the one or more images of the building, a model of the roof;

"... any acceptable algorithm to co-register the images and reconstruct the three-dimensional geometry of the object identified by the reference points. There are a variety of photo-grammetric algorithms that can be utilized to perform this reconstruction. One such algorithm used by the service 70 uses photographs taken from two or more view points to "triangulate" points of interest on the object in three-dimensional ("3D") space... Repeating the process for all such reference points allows the software to build a 3D model of the structure.

The optimal choice of reconstruction algorithm depends on a number of factors such as the spatial relationships between the photographs, the number and locations of the reference points, and any assumptions that are made about the geometry and symmetry of the object being reconstructed. Several such algorithms are described in detail in textbooks, trade journals, and academic publications."
(436 Patent, 6:50 – 7:7)

"As noted above, a variety of automatic and semi-automatic techniques may be employed to generate a model of the roof of the building. In one embodiment, generating such a model is based at least in part on a correlation between at least two of the aerial images of the building."
(436 Patent, 8:20-24)

EP 966 and AAPA are analogous art because both are drawn to determining information about a building by analyzing images of the building.

It would have been obvious to combine EP 966 with AAPA because AAPA describes that several functions necessary to implement EP 966 are old and well known. Therefore, it

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could require less experimentation and be cost effective to use the "algorithms are described in detail in textbooks, trade journals, and academic publications" rather than start from scratch.

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine EP 966 with AAPA in order to arrive at the claimed invention.

Regarding claim 37, the following limitations are AAPA:

37. The non-transitory computer-readable storage medium of claim 36 wherein generating the model includes generating a three-dimensional model based on a correlation between two of the one or more images.

"As noted above, a variety of automatic and semi-automatic techniques may be employed to generate a model of the roof of the building. In one embodiment, generating such a model is based at least in part on a correlation between at least two of the aerial images of the building."
(436 Patent, 8:20-24, emphasis added)

Regarding claim 40, the following limitations are AAPA:

40. The non-transitory computer-readable storage medium of claim 36 wherein generating the model of the roof includes automatically identifying at least some features of the roof for inclusion in the model.

"... any acceptable algorithm to co-register the images and reconstruct the three-dimensional geometry of the object identified by the reference points. There are a variety of photo-grammetric algorithms that can be utilized to perform this reconstruction. One such algorithm used by the service 70 uses photographs taken from two or more view points to "triangulate" points of interest on the object in three-dimensional ("3D") space... Repeating the process for all such reference points allows the software to build a 3D model of the structure.

The optimal choice of reconstruction algorithm depends on a number of factors such as the spatial relationships between the photographs, the number and

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locations of the reference points, and any assumptions that are made about the geometry and symmetry of the object being reconstructed. Several such algorithms are described in detail in textbooks, trade journals, and academic publications."

('436 Patent, 6:50 – 7:7)

"As noted above, a variety of automatic and semi-automatic techniques may be employed to generate a model of the roof of the building. In one embodiment, generating such a model is based at least in part on a correlation between at least two of the aerial images of the building."

('436 Patent, 8:20-24)

"In some embodiments, the roof modeling engine 602 determines the corresponding feature automatically, such as by employing on one or more image processing techniques used to identify vertexes, edges, or other features of the roof. In other embodiments, the roof modeling engine 602 determines the corresponding feature by receiving, from the human operator 620 as operator input 633, indications of the feature shown in multiple images of the building."

('436 Patent, 8:49-56, emphasis added)

Regarding claim 41, the following limitations are AAPA:

41. The non-transitory computer-readable storage medium of claim 36 wherein the contents are instructions that when executed cause the computing system to perform the method.

"In an example embodiment, components/modules of the RES 710 are implemented using standard programming techniques. For example, the RES 710 may be implemented as a "native" executable running on the CPU 703, along with one or more static or dynamic libraries. In other embodiments, the RES 710 is implemented as instructions processed by virtual machine that executes as one of the other programs 730. In general, a range of programming languages known in the art may be employed for implementing such example embodiments, including representative implementations of various programming language paradigms, including but not limited to, object-oriented (e.g., Java, C++, C#, Visual Basic.NET, Smalltalk, and the like), functional (e.g., ML, Lisp, Scheme, and the like), procedural (e.g., C, Pascal, Ada, Modula, and the like), scripting (e.g., Perl, Ruby, Python, JavaScript, VBScript, and the like), declarative (e.g., SQL, Prolog, and the like)."

('436 Patent, 12:27-43, emphasis added)

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Regarding claim 42, the following limitations are AAPA:

42. The non-transitory computer-readable storage medium of claim 36 wherein the method further comprises transmitting to a remote computing system a computer-readable data file that includes a representation of the model.

"In addition, programming interfaces to the data stored as part of the RES 710, such as in the RES data repository 716, can be available by standard mechanisms such as through C, C++, C#, and Java APIs; libraries for accessing files, databases, or other data repositories; through scripting languages such as XML; or through Web servers, FTP servers, or other types of servers providing access to stored data. For example, the RES data repository 716 may be implemented as one or more database systems, file systems, memory buffers, or any other technique for storing such information, or any combination of the above, including implementations using distributed computing techniques."
(436 Patent, 12:61 – 13:5, emphasis added)

"Also, the example RES 710 can be implemented in a distributed environment comprising multiple, even heterogeneous, computer systems and networks. For example, in one embodiment, the image acquisition engine 711, the roof modeling engine 712, the report generation engine 713, the interface engine 714, and the data repository 716 are all located in physically different computer systems. In another embodiment, various modules of the RES 710 are hosted each on a separate server machine and are remotely located from the tables which are stored in the data repository 716. Also, one or more of the modules may themselves be distributed, pooled or otherwise grouped, such as for load balancing, reliability or security reasons. Different configurations and locations of programs and data are contemplated for use with techniques of described herein. A variety of distributed computing techniques are appropriate for implementing the components of the illustrated embodiments in a distributed manner including but not limited to TCP/IP sockets, RPC, RMI, HTTP, Web Services (XML-RPC, JAX-RPC, SOAP, and the like)."
(436 Patent, 13:6-25, emphasis added)

The description of the "computer-readable data file," in the context of the invention, is non-functional descriptive material. The '436 Patent discloses that transmitting a data file is admitted prior art, therefore the patentable features of claim 42 are admitted prior art.

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G. Claim 6 is rejected under pre-AIA 35 U.S.C. § 103(a) as being unpatentable over EP 966 in view of AAPA, further in view of Aerodach Website.

The rationale shown above in **Rejection F** comparing EP 966 in view of AAPA to the claimed invention is **incorporated herein by reference** in its entirety. The rationale shown above in **Rejection C** comparing EP 966 in view of Aerodach Website to claim 6 is **incorporated herein by reference** in its entirety.

EP 966 in view of AAPA and Aerodach Website are analogous art because both are directed to producing a roof report by analyzing images of a roof.

A person would have been motivated to combine the teachings of EP 966 in view of AAPA and Aerodach Website in order to provide the optional *printing* functionality because some customers may prefer a "large-format plot" and dislike electronic computer data files. A person would have been further motivated to provide the optional *printing* functionality in order to process customer orders "without Internet connection," thereby reaching a larger pool of potential customers. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine the teachings of EP 966 in view of AAPA and Aerodach Website in order to arrive at the claimed invention.

H. Claim 43 is rejected under pre-AIA 35 U.S.C. § 103(a) as being unpatentable over EP 966 in view of Novak.

The rationale shown above in **Rejection F** comparing EP 966 in view of AAPA to the claimed invention is **incorporated herein by reference** in its entirety. The rationale shown

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above in **Rejection D** comparing EP 966 in view of Novak to claim 6 is **incorporated herein by reference** in its entirety.

EP 966 in view of AAPA and Novak are analogous art because both are directed to determining information about an object by analyzing images of the object.

A person would have been motivated to combine the teachings of EP 966 in view of AAPA and Novak in order to provide a system that requires only a *single* image of a building to prepare a roof estimate report, using an "accurate, low-cost analysis" of "points in a single image of a field location" (Novak, ¶ 0010). Accordingly, the combination of EP 966 in view of AAPA and Novak could reduce or eliminate the need for costly, complicated aerial stereoscopic image pairs, relying instead on the low-cost technique described by Novak. In forming the combination, it would have been obvious that the "planar geometric shapes" (Novak, ¶ 0065) of interest would be planar sections of a building roof (*e.g.*, EP 966, ¶ 0003), so that the system can provide "all relevant information, such as roof shape, roof surface, roof pitch" for, *e.g.*, cleaning a house roof (EP 966, ¶ 0003). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine the teachings of EP 966 in view of AAPA and Novak in order to arrive at the claimed invention.

I. Claims 44-45 are rejected under pre-AIA 35 U.S.C. § 103(a) as being unpatentable over EP 966 in view of Novak, further in view of Official Notice.

The rationale shown above in **Rejection H** comparing EP 966 in view of AAPA and Novak to the claimed invention is **incorporated herein by reference** in its entirety. The

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rationale shown above in **Rejection E** comparing EP 966 in view of Novak, further in view of Official Notice to claims 44-45 is **incorporated herein by reference** in its entirety.

For the rationale set forth above in Rejection H and Rejection E, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine the teachings of EP 966, Novak, and Official Notice to arrive at the invention specified in claims 44 and 45.

VII. CONCLUSION

Claims 1-56 are rejected.

A shortened statutory period for response to this action is set to expire 2 months from the mailing date of this action.

Extensions of time under 37 CFR 1.136(a) do not apply in reexamination proceedings. The provisions of 37 CFR 1.136 apply only to "an applicant" and not to parties in a reexamination proceeding. Further, in 35 U.S.C. 305 and in 37 CFR 1.550(a), it is required that reexamination proceedings "will be conducted with special dispatch within the Office."

Extensions of time in reexamination proceedings are provided for in 37 CFR 1.550(c). A request for extension of time must be filed on or before the day on which a response to this action is due, and it must be accompanied by the petition fee set forth in 37 CFR 1.17(g). The mere filing of a request will not affect any extension of time. An extension of time will be granted only for sufficient cause, and for a reasonable time specified.

The filing of a timely first response to this final rejection will be construed as including a request to extend the shortened statutory period for an additional month, which will be granted even if previous extensions have been granted. In no event, however, will the statutory period for response expire later than SIX MONTHS from the mailing date of the final action. See MPEP § 2265.

Amendment in Reexamination Proceedings

Patent owner is notified that any proposed amendment to the specification and/or claims in this reexamination proceeding must comply with 37 CFR 1.530(d)-(j), must be formally presented pursuant to 37 CFR § 1.52(a) and (b), and must contain any fees required by 37 CFR § 1.20(c). See MPEP § 2250(IV) for examples to assist in the preparation of proper proposed amendments in reexamination proceedings.

In order to ensure full consideration of any amendments, affidavits or declarations, or other documents as evidence of patentability, such documents must be submitted in response to this Office action. Submissions after the next Office action, which is intended to be a final action, will be governed by the requirements of 37 CFR 1.116, after final rejection and 37 CFR 41.33 after appeal, which will be strictly enforced.

Service of Papers

Any paper filed with the USPTO, i.e., any submission made, by either the Patent Owner or the Third Party Requester must be served on every other party in the reexamination proceeding, including any other third party requester that is part of the proceeding due to merger of the reexamination proceedings. As proof of service, the party submitting the paper to the Office must attach a Certificate of Service to the paper, which sets forth the name and address of the party served and the method of service. Papers filed without the required Certificate of Service may be denied consideration. 37 CFR 1.550; MPEP 2266.03.

Notification of Concurrent Proceedings

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The patent owner is reminded of the continuing responsibility under 37 CFR 1.565(a) to apprise the Office of any litigation activity, or other prior or concurrent proceeding, involving Patent No. 8,078,436 throughout the course of this reexamination proceeding. The third party requester is also reminded of the ability to similarly apprise the Office of any such activity or proceeding throughout the course of this reexamination proceeding. See MPEP §§ 2207, 2282 and 2286.

All correspondence relating to this *ex parte* reexamination proceeding should be directed as follows:

By U.S. Postal Service Mail to:

Mail Stop *Ex Parte* Reexam
ATTN: Central Reexamination Unit
Commissioner for Patents P.O. Box 1450
Alexandria, VA 22313-1450

By FAX to: (571) 273-9900
Central Reexamination Unit

By hand to: Customer Service Window
Randolph Building
401 Dulany St.
Alexandria, VA 22314

By EFS-Web:

Registered users of EFS-Web may alternatively submit such correspondence via the electronic filing system EFS-Web, at

<https://efs.uspto.gov/efile/myportal/efs-registered>

EFS-Web offers the benefit of quick submission to the particular area of the Office that needs to act on the correspondence. Also, EFS-Web submissions are "soft scanned" (i.e., electronically uploaded) directly into the official file for the reexamination proceeding, which

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offers parties the opportunity to review the content of their submissions after the "soft scanning" process is complete.

Any inquiry concerning this communication or as to the status of this proceeding should be directed to the Central Reexamination Unit at telephone number (571) 272-7705.

/Jason Proctor/

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