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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
90/009,275	09/12/2008	6137498	20522/0210592-US0	8821

7278 7590 02/16/2010

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EXAMINER	
ART UNIT	PAPER NUMBER

DATE MAILED: 02/16/2010

Please find below and/or attached an Office communication concerning this application or proceeding.

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EX PARTE REEXAMINATION COMMUNICATION TRANSMITTAL FORM

REEXAMINATION CONTROL NO. *90/009,275*.

PATENT NO. *6137498*.

ART UNIT *3992*.

Enclosed is a copy of the latest communication from the United States Patent and Trademark Office in the above identified *ex parte* reexamination proceeding (37 CFR 1.550(f)).

Where this copy is supplied after the reply by requester, 37 CFR 1.535, or the time for filing a reply has passed, no submission on behalf of the *ex parte* reexamination requester will be acknowledged or considered (37 CFR 1.550(g)).

Office Action in Ex Parte Reexamination	Control No. 90/009,275	Patent Under Reexamination 6137498	
	Examiner Christopher E. Lee	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 *11 August 2009* . 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.
2. ☐ Information Disclosure Statement, PTO/SB/08.
3. ☐ Interview Summary, PTO-474.
4. ☐ _____.

Part II SUMMARY OF ACTION

1a. ☒ Claims *1-10,14-25 and 29-60* are subject to reexamination.
1b. ☒ Claims *11-13,26-28 and 61-63* are not subject to reexamination.
2. ☐ Claims _____ have been canceled in the present reexamination proceeding.
3. ☒ Claims *4,7,8,17,20,21,42,44,45,54,57 and 58* are patentable and/or confirmed.
4. ☒ Claims *1-3,5,6,9,10,14-16,18,19,22-25,29-41,43,46-53,55,56,59 and 60* 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)

DETAILED ACTION

Receipt Acknowledgement

1. This is an *Ex Parte* Reexamination of Silvers [US 6,137,498 A; hereinafter '498 Patent]. Receipt is acknowledged of the Response filed on 11th of August 2009 (hereinafter the Response). No claim has been amended; no claim has been canceled; and no claim has been newly added since the *Ex Parte* REX Non-Final Office Action was mailed on 11th of June 2009. Currently, the claims 1-10, 14-25, and 29-60 are subject to reexamination, and the claims 11-13, 26-28, and 61-63 are not subject to reexamination.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 29-41 and 43 are rejected under 35 U.S.C. 102(b) as being anticipated by WIRED Magazine ["WIRED," published by WIRED magazine, a magazine cover, November 1995; hereinafter "WIRED"] and Patentee's Admitted Prior Art [Provisional Application 60/035,733; hereinafter "PAPA"].

Referring to claim 29, WIRED discloses an article (i.e., WIRED Magazine) comprising

- a substrate (i.e., magazine cover page) having a mosaic image (i.e., a cover portrait of Nicholas Negroponte) thereupon (See WIRED Magazine Cover),
    - said mosaic image (i.e., said cover portrait) having an appearance (i.e., a portrait of Nicholas Negroponte) that approximates a target image (i.e., an image of Nicholas Negroponte) through use of a plurality of source images (i.e., 1,548 photographic images; See WIRED Magazine Content page).

However, WIRED is silent upon the inherent characteristic of said mosaic image being generated by a process executed with a computer.

PAPA shows that the characteristic not disclosed in WIRED is inherent, such that: said mosaic image (i.e., WIRED Magazine cover portrait of Nicholas Negroponte) being generated by a process executed with a computer (See page 50) comprising the steps of:

- loading the target image (i.e., master image) into the computer (See pages 49-51);

- dividing the target image into a plurality of tile regions (i.e., said cover portrait of Nicholas Negroponte inherently discloses that an original image was divided into a plurality of tiles);
- comparing (i.e., matching) generally complex source images (i.e., the source images used to create the mosaic image of Nicholas Negroponte were generally complex) to the tile region to produce a measurement of visual similarity (See pages 50-51);
- selecting the source image with the highest measurement of visual similarity to represent the tile region (See page 50, it states "the master image now had more horizontal and vertical pixels than mosaic tiles needed for the final rendering, thus allowing the software the opportunity to compute an identical texture contrast coefficient at each grid-spot for comparison with the database."); and
- positioning the selected source image in the mosaic image at a locus corresponding to the locus of the tile region (i.e., said WIRED Magazine cover portrait of Nicholas Negroponte illustrates that said source images have been positioned in the mosaic at the location where they visually appear to be similar to said master image).

Even though WIRED does not expressly disclose that said mosaic image is generated by said process executed with said computer comprising the same steps of processing method, the claimed product is not patentable in view of WIRED because the instant claim is written in a typical product-by-process format. The determination of whether the instant claim is patentable is based on the product itself, not the process recited for creating the product. *In re Thorpe*, 777 F.2d 695 (Fed. Cir. 1985); See MPEP §2113.

Therefore, WIRED anticipates the claimed invention in the claim 29.

Referring to claims 30-41, WIRED anticipates the claimed invention in the claims 30-41, respectively, because the respective claim is written in a typical product-by-process format. The determination of whether the respective claim is patentable is based on the product itself in their independent claim 29, not the process recited for creating the product in the respective claim. *In re Thorpe*, 777 F.2d 695 (Fed. Cir. 1985); See MPEP §2113.

Therefore, WIRED anticipates the claimed invention in the claims 30-41, respectively.

Referring to claim 43, WIRED teaches said article including

- a photograph (i.e., photograph on the WIRED magazine cover page).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 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 negatived by the manner in which the invention was made.

5. Claims 1, 3, 5, 6, 9, 14, 16, 18, 19, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over PAPA [Provisional Application 60/035,733] in view of Mikihiro Ioka ["A method of Defining the Similarity of Images on the Basis of Color Information," IBM Research Report RT-0030, Tokyo Research Laboratory (1989); hereinafter "Ioka"].

Referring to claim 1, PAPA discloses a method for generating a mosaic image (See page 49, 3.1 Introduction; e.g., a final 1,548 tile mosaic of Nicholas Negroponte in Fig. 3.3 on page 51) with an appearance (i.e., a portrait of Nicholas Negroponte) that approximates a target image (i.e., master image) by utilizing a plurality of source images (i.e., 1,548 tile images; See Fig. 3.3 on page 51) and a computer (See pages 50-51), comprising the steps of:

- loading the target image (i.e., said master image) into the computer (See pages 49-51);
- dividing the target image (i.e., said master image) into a plurality of tile regions (in fact, said final 1,548 tile mosaic of Nicholas Negroponte in Fig. 3.3 shows that the original master image was divided into the plurality of tiles),
    - each tile region representing a distinct locus of the target image (See final 1,548 tile mosaic of Nicholas Negroponte in Fig. 3.3; wherein, it is apparent that the images of the mosaic are tile shaped (square) representing a distinct locus of said master image and replace the original Nicholas Negroponte image), and for each tile region:
        - dividing the tile region (i.e., tile mosaic image) into distinct sub-regions (See page 50, the last ¶, it states "the master image now had more horizontal and vertical pixels than mosaic tiles needed for the final rendering, thus allowing the software the opportunity to compute an identical texture contrast coefficient at each grid-spot for comparison with the database," which is inherently anticipates the claimed limitation "dividing the tile region into distinct sub-regions".);

- comparing (i.e., matching comparison) generally complex source images (i.e., said 1,548 tile images of Nicholas Negroponte in Fig. 3.3 are complex in general) to the tile region to produce a measurement of visual similarity (See page 50, the last ¶);
- selecting the source image with the highest measurement of visual similarity to represent the tile region (i.e., allowing the software the opportunity to compute an identical texture contrast coefficient at each grid-spot for comparison with the database; See page 50, the last ¶); and
- positioning the selected source image in the mosaic image at a locus corresponding to the locus of the tile region (i.e., 1,548 tile images of Nicholas Negroponte illustrates that said tile images have been positioned in the mosaic at the location where they visually appear to be similar to the original image in Fig. 3.3).

PAPA does not expressly teach comparing each sub-region of the tile region with a corresponding portion of each source image to produce the measurement of visual similarity.

Ioka discloses a similarity retrieval for use in an image database management system (See Introduction on page 1), wherein

- dividing a tile region (i.e., Image in Fig. 3) into distinct sub-regions (i.e., sub-areas of said Image in Fig. 3);
- comparing generally complex source images (i.e., images in database) to the tile region (i.e., query image) to produce a measurement of visual similarity (i.e., calculating composite distance D; See page 6), said comparing step including
    - comparing each sub-region of the tile region (i.e., each said sub-area in Fig. 3) with a corresponding portion of each source image to produce the measurement of visual similarity (See pages 5-6, wherein it particularly states that the similarity between image i and j was calculated for each sub-area.);
- selecting the source image with the highest measurement of visual similarity to represent the tile region (See pages 14-15, wherein, Ioka teaches that images can be sorted from best to worst using a measure of visual similarity).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included said method steps of similarity retrieval, as disclosed by Ioka, in said method for generating a mosaic image, as disclosed by PAPA, for the advantage of selecting the source image with the best similarity metric/score (See Ioka, page 14).

Referring to claim 3, Ioka teaches said comparing step including

- the further step of computing the average Root-Mean Square error of Red, Green and Blue channels (See pages 4, 10, and 13, i.e., $B_{pq} = \{(L^*_p - L^*_q)^2 + (u^*_p - u^*_q)^2 + (v^*_p - v^*_q)^2\}$, wherein, the variable B represents the distance/similarity between two coordinates p and q in the $L^* u^* v^*$ color space.).

Referring to claim 5, PAPA teaches the step of

- capturing source images (i.e., digitizing 370,000 photographs; See page 49, the first ¶), and
- storing the captured source images in a database (i.e., database images; See page 50, the last ¶).

Referring to claim 6, PAPA teaches the step of

- generating modified source images by cropping the source images captured in said capturing step to square (i.e., cropping the image and scaling to a small image; See page 49, the first ¶).

Referring to claim 9, PAPA teaches the step of

- categorizing the captured source images within the database (i.e., classifying each image by average color; See page 49, the first ¶).

Referring to claim 14, PAPA discloses an apparatus for generating a mosaic image (See page 49, 3.1 Introduction; e.g., a final 1,548 tile mosaic of Nicholas Negroponte in Fig. 3.3 on page 51) with an appearance (i.e., a portrait of Nicholas Negroponte) that approximates a target image (i.e., master image) by utilizing a plurality of source images (i.e., 1,548 tile images; See Fig. 3.3 on page 51) and a computer (See pages 50-51), comprising:

- a computer workstation that executes mosaic generation software (i.e., matching program; See page 50, the last ¶) being operative to divide the target image (i.e., said master image) into a plurality of tile regions (in fact, said final 1,548 tile mosaic of Nicholas Negroponte in Fig. 3.3 shows that the original master image was divided into the plurality of tiles),

- each tile region representing a distinct locus of the target image (See final 1,548 tile mosaic of Nicholas Negroponte in Fig. 3.3; wherein, it is apparent that the images of the mosaic are tile shaped (square) representing a distinct locus of said master image and replace the original Nicholas Negroponte image), said mosaic generation software (i.e., said matching program) being further operative to operate upon each tile region to:
  - divide the tile region (i.e., tile mosaic image) into distinct sub-regions (See page 50, the last ¶, it states "the master image now had more horizontal and vertical pixels than mosaic tiles needed for the final rendering, thus allowing the software the opportunity to compute an identical texture contrast coefficient at each grid-spot for comparison with the database," which is inherently anticipates the claimed limitation "dividing the tile region into distinct sub-regions".);
- compare (i.e., matching comparison) a plurality of generally complex source image portions (i.e., said 1,548 tile images of Nicholas Negroponte in Fig. 3.3 are complex in general) to the tile region to produce a measurement of visual similarity (See page 50, the last ¶);
- select the source image with the highest measurement of visual similarity to represent the tile region (i.e., allow the software the opportunity to compute an identical texture contrast coefficient at each grid-spot for comparison with the database; See page 50, the last ¶); and
- position the selected source image in the mosaic image at a locus corresponding to the locus of the tile region (i.e., 1,548 tile images of Nicholas Negroponte illustrates that said tile images have been positioned in the mosaic at the location where they visually appear to be similar to the original image in Fig. 3.3).

PAPA does not expressly teach comparing each sub-region of the tile region with a corresponding portion of each source image to produce the measurement of visual similarity.

Ioka discloses a similarity retrieval for use in an image database management system (See Introduction on page 1), wherein

- dividing a tile region (i.e., Image in Fig. 3) into distinct sub-regions (i.e., sub-areas of said Image in Fig. 3);

- comparing generally complex source images (i.e., images in database) to the tile region (i.e., query image) to produce a measurement of visual similarity (i.e., calculating composite distance D; See page 6), said comparing step including
    - comparing each sub-region of the tile region (i.e., each said sub-area in Fig. 3) with a corresponding portion of each source image to produce the measurement of visual similarity (See pages 5-6, wherein it particularly states that the similarity between image i and j was calculated for each sub-area.);
- selecting the source image with the highest measurement of visual similarity to represent the tile region (See pages 14-15, wherein, Ioka teaches that images can be sorted from best to worst using a measure of visual similarity).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have implemented said method of similarity retrieval, as disclosed by Ioka, in said mosaic generation software (i.e., matching program), as disclosed by PAPA, for the advantage of selecting the source image with the best similarity metric/score (See Ioka, page 14).

Referring to claim 16, Ioka teaches the mosaic generation software (i.e., similarity retrieval software) is

- further operative to compute the average Root-Mean Square error of Red, Green and Blue channels (See pages 4, 10, and 13, i.e., $B_{pq} = \{(L^*_p - L^*_q)^2 + (u^*_p - u^*_q)^2 + (v^*_p - v^*_q)^2\}$, wherein, the variable B represents the distance/similarity between two coordinates p and q in the $L^*u^*v^*$ color space.).

Referring to claim 18, PAPA teaches

- video equipment selected from the group consisting of a video tape player and a videodisc player (i.e., laser discs; See page 74, the first ¶),
- said video equipment being operative to capture source images (i.e., digitizing 370,000 photographs; See page 49, the first ¶) for storage in a database in the computer workstation (i.e., database images; See page 50, the last ¶).

Referring to claim 19, PAPA teaches

- modified source images are generated by cropping and resizing the captured source images to a consistent size (i.e., cropping the image and scaling to a small image; See page 49, the first ¶).

Referring to claim 22, PAPA teaches

- the captured source images are categorized within the database (i.e., classifying each image by average color; See page 49, the first ¶).

6. Claims 10 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over PAPA [Provisional Application 60/035,733] in view of Ioka ["A method of Defining the Similarity of Images on the Basis of Color Information," IBM Research Report RT-0030, Tokyo Research Laboratory (1989)] as applied to claims 1, 3, 5, 6, 9, 14, 16, 18, 19, and 22 above, and further in view of Ogle et al. ["Chabot: Retrieval from a Relational Database of Images," IEEE Computer, pages 40-48 (September 1995); hereinafter "Ogle"].

Referring to claims 10 and 23, PAPA, as modified by Ioka, discloses all the limitations of the respective claims 10 and 23, except that does not teach the captured source images are stored at different levels of resolution.

Ogle discloses a retrieval image from a relational database of images (See page 40), wherein

- storing captured source images (i.e., images in Photo CD format) at different levels of resolution (i.e., five different levels of resolutions ranging from a thumbnail 128 x 192 pixels to the highest resolution 2,048 x 3,072 pixels; See page 43, Storage)..

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have applied said method step of storing the captured images (i.e., five different levels of resolutions), as disclosed by Ogle, to said storing the captured source images in said database, as disclosed by PAPA in view of Ioka, for the advantage of providing fast browsing of the stored images on said database (See Ogle, page 43, right column, the second ¶).

7. Claims 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over PAPA [Provisional Application 60/035,733] in view of Ioka ["A method of Defining the Similarity of Images on the Basis of Color Information," IBM Research Report RT-0030, Tokyo Research Laboratory (1989)] as applied to claims 1, 3, 5, 6, 9, 14, 16, 18, 19, and 22 above, and further in

view of Adobe Brochure ["Adobe Photoshop 3.0," published by Adobe Systems Incorporated (1995); hereinafter "Adobe"].

Referring to claim 24, PAPA, as modified by Ioka, discloses all the limitations of the claim 24, except that does not teach an editing computer with software for editing the mosaic image.

Adobe discloses an Adobe Photoshop™, which was well known to one of ordinary skill in the art of computer image manipulation, wherein

- an editing computer (i.e., Sun SPARCstation®) with software (i.e., said Adobe Photoshop™) for editing a mosaic image (i.e., editing photo image; See pages 3-5).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included said editing computer (i.e., Sun SPARCstation®) with software (i.e., said Adobe Photoshop™), as disclosed by Adobe, in said apparatus for generating a mosaic image, as disclosed by PAPA in view of Ioka, for the advantage of making said mosaic image editing and processing tasks fast and easy (See Adobe, Harness Your UNIX Power at page 3).

Referring to claim 25, Adobe teaches

- a printer for printing the edited mosaic image (See Printing at page 6).

8. Claims 1, 5, 6, 9, 14, 18, 19, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over PAPA [Provisional Application 60/035,733] in view of Stricker et al.["Color Indexing with Weak Spatial Constraints," Storage and Retrieval for Still Image and Video Databases IV, Proceedings of SPIE Volume: 2670, pages 29-40 (February 1996); hereinafter "Stricker"].

Referring to claim 1, PAPA discloses a method for generating a mosaic image (See page 49, 3.1 Introduction; e.g., a final 1,548 tile mosaic of Nicholas Negroponte in Fig. 3.3 on page 51) with an appearance (i.e., a portrait of Nicholas Negroponte) that approximates a target image (i.e., master image) by utilizing a plurality of source images (i.e., 1,548 tile images; See Fig. 3.3 on page 51) and a computer (See pages 50-51), comprising the steps of:

- loading the target image (i.e., said master image) into the computer (See pages 49-51);
- dividing the target image (i.e., said master image) into a plurality of tile regions (in fact, said final 1,548 tile mosaic of Nicholas Negroponte in Fig. 3.3 shows that the original master image was divided into the plurality of tiles),

- each tile region representing a distinct locus of the target image (See final 1,548 tile mosaic of Nicholas Negroponte in Fig. 3.3; wherein, it is apparent that the images of the mosaic are tile shaped (square) representing a distinct locus of said master image and replace the original Nicholas Negroponte image), and for each tile region:
  - dividing the tile region (i.e., tile mosaic image) into distinct sub-regions (See page 50, the last ¶, it states "the master image now had more horizontal and vertical pixels than mosaic tiles needed for the final rendering, thus allowing the software the opportunity to compute an identical texture contrast coefficient at each grid-spot for comparison with the database," which is inherently anticipates the claimed limitation "dividing the tile region into distinct sub-regions".);
- comparing (i.e., matching comparison) generally complex source images (i.e., said 1,548 tile images of Nicholas Negroponte in Fig. 3.3 are complex in general) to the tile region to produce a measurement of visual similarity (See page 50, the last ¶);
- selecting the source image with the highest measurement of visual similarity to represent the tile region (i.e., allowing the software the opportunity to compute an identical texture contrast coefficient at each grid-spot for comparison with the database; See page 50, the last ¶); and
- positioning the selected source image in the mosaic image at a locus corresponding to the locus of the tile region (i.e., 1,548 tile images of Nicholas Negroponte illustrates that said tile images have been positioned in the mosaic at the location where they visually appear to be similar to the original image in Fig. 3.3).

PAPA does not expressly teach comparing each sub-region of the tile region with a corresponding portion of each source image to produce the measurement of visual similarity.

Stricker discloses a process of retrieving an image from a database that is similar to a query image (See 4 Similarity Function on pages 33-34), wherein

- dividing a tile region (i.e., Image in Fig. 1) into distinct sub-regions (i.e., subareas of said Image in Fig. 1);
- comparing generally complex source images (i.e., images in source image database; See page 34) to the tile region (i.e., source image) to produce a measurement of visual

similarity (i.e., calculating characteristics of image using a similarity function; See pages 33-34), said comparing step including

- comparing each sub-region of the tile region (i.e., each said subarea in Fig. 1) with a corresponding portion of each source image to produce the measurement of visual similarity (See page 34, wherein it particularly states that the color characteristics of a region in the target image are compared to the color characteristics of the same region in a source image.);

- selecting the source image with the highest measurement of visual similarity to represent the tile region (See page 36, wherein, Stricker teaches that the system is capable of sorting images based on measurements of similarity).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included said method steps of retrieving an image, as disclosed by Stricker, in said method for generating a mosaic image, as disclosed by PAPA, for the advantage of selecting the source image with the best similarity metric/score (See Stricker, pages 33-34, 4 Similarity Function).

Referring to claim 5, PAPA teaches the step of

- capturing source images (i.e., digitizing 370,000 photographs; See page 49, the first ¶), and
- storing the captured source images in a database (i.e., database images; See page 50, the last ¶).

Referring to claim 6, PAPA teaches the step of

- generating modified source images by cropping the source images captured in said capturing step to square (i.e., cropping the image and scaling to a small image; See page 49, the first ¶).

Referring to claim 9, PAPA teaches the step of

- categorizing the captured source images within the database (i.e., classifying each image by average color; See page 49, the first ¶).

Referring to claim 14, PAPA discloses an apparatus for generating a mosaic image (See page 49, 3.1 Introduction; e.g., a final 1,548 tile mosaic of Nicholas Negroponte in Fig. 3.3 on page 51) with an appearance (i.e., a portrait of Nicholas Negroponte) that approximates a target image (i.e., master image) by utilizing a plurality of source images (i.e., 1,548 tile images; See Fig. 3.3 on page 51) and a computer (See pages 50-51), comprising:

- a computer workstation that executes mosaic generation software (i.e., matching program; See page 50, the last ¶) being operative to divide the target image (i.e., said master image) into a plurality of tile regions (in fact, said final 1,548 tile mosaic of Nicholas Negroponte in Fig. 3.3 shows that the original master image was divided into the plurality of tiles),
    - each tile region representing a distinct locus of the target image (See final 1,548 tile mosaic of Nicholas Negroponte in Fig. 3.3; wherein, it is apparent that the images of the mosaic are tile shaped (square) representing a distinct locus of said master image and replace the original Nicholas Negroponte image), said mosaic generation software (i.e., said matching program) being further operative to operate upon each tile region to:
        - divide the tile region (i.e., tile mosaic image) into distinct sub-regions (See page 50, the last ¶, it states "the master image now had more horizontal and vertical pixels than mosaic tiles needed for the final rendering, thus allowing the software the opportunity to compute an identical texture contrast coefficient at each grid-spot for comparison with the database," which is inherently anticipates the claimed limitation "dividing the tile region into distinct sub-regions".);
    - compare (i.e., matching comparison) a plurality of generally complex source image portions (i.e., said 1,548 tile images of Nicholas Negroponte in Fig. 3.3 are complex in general) to the tile region to produce a measurement of visual similarity (See page 50, the last ¶);
    - select the source image with the highest measurement of visual similarity to represent the tile region (i.e., allow the software the opportunity to compute an identical texture contrast coefficient at each grid-spot for comparison with the database; See page 50, the last ¶); and

- position the selected source image in the mosaic image at a locus corresponding to the locus of the tile region (i.e., 1,548 tile images of Nicholas Negroponte illustrates that said tile images have been positioned in the mosaic at the location where they visually appear to be similar to the original image in Fig. 3.3).

PAPA does not expressly teach comparing each sub-region of the tile region with a corresponding portion of each source image to produce the measurement of visual similarity.

Stricker discloses a process of retrieving an image from a database that is similar to a query image (See 4 Similarity Function on pages 33-34), wherein

- dividing a tile region (i.e., Image in Fig. 1) into distinct sub-regions (i.e., subareas of said Image in Fig. 1);
- comparing generally complex source images (i.e., images in source image database; See page 34) to the tile region (i.e., source image) to produce a measurement of visual similarity (i.e., calculating characteristics of image using a similarity function; See pages 33-34), said comparing step including
  - comparing each sub-region of the tile region (i.e., each said subarea in Fig. 1) with a corresponding portion of each source image to produce the measurement of visual similarity (See page 34, wherein it particularly states that the color characteristics of a region in the target image are compared to the color characteristics of the same region in a source image.);
- selecting the source image with the highest measurement of visual similarity to represent the tile region (See page 36, wherein, Stricker teaches that the system is capable of sorting images based on measurements of similarity).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included said method steps of retrieving an image, as disclosed by Stricker, in said mosaic generation software (i.e., matching program), as disclosed by PAPA, for the advantage of selecting the source image with the best similarity metric/score (See Stricker, pages 33-34, 4 Similarity Function).

Referring to claim 18, PAPA teaches

- video equipment selected from the group consisting of a video tape player and a videodisc player (i.e., laser discs; See page 74, the first ¶),

- said video equipment being operative to capture source images (i.e., digitizing 370,000 photographs; See page 49, the first ¶) for storage in a database in the computer workstation (i.e., database images; See page 50, the last ¶).

Referring to claim 19, PAPA teaches

- modified source images are generated by cropping and resizing the captured source images to a consistent size (i.e., cropping the image and scaling to a small image; See page 49, the first ¶).

Referring to claim 22, PAPA teaches

- the captured source images are categorized within the database (i.e., classifying each image by average color; See page 49, the first ¶).

9. Claims 1, 2, 5, 6, 9, 14, 15, 18, 19, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over PAPA [Provisional Application 60/035,733] in view of Lu et al. ["Efficient Image Retrieval By Color Contents," Applications of Databases, First International Conference on Applications of Databases, pages 95-108 (1994); hereinafter "Lu"].

Referring to claim 1, PAPA discloses a method for generating a mosaic image (See page 49, 3.1 Introduction; e.g., a final 1,548 tile mosaic of Nicholas Negroponte in Fig. 3.3 on page 51) with an appearance (i.e., a portrait of Nicholas Negroponte) that approximates a target image (i.e., master image) by utilizing a plurality of source images (i.e., 1,548 tile images; See Fig. 3.3 on page 51) and a computer (See pages 50-51), comprising the steps of:

- loading the target image (i.e., said master image) into the computer (See pages 49-51);
- dividing the target image (i.e., said master image) into a plurality of tile regions (in fact, said final 1,548 tile mosaic of Nicholas Negroponte in Fig. 3.3 shows that the original master image was divided into the plurality of tiles),
    - each tile region representing a distinct locus of the target image (See final 1,548 tile mosaic of Nicholas Negroponte in Fig. 3.3; wherein, it is apparent that the images of the mosaic are tile shaped (square) representing a distinct locus of said master image and replace the original Nicholas Negroponte image), and for each tile region:

- dividing the tile region (i.e., tile mosaic image) into distinct sub-regions (See page 50, the last ¶, it states "the master image now had more horizontal and vertical pixels than mosaic tiles needed for the final rendering, thus allowing the software the opportunity to compute an identical texture contrast coefficient at each grid-spot for comparison with the database," which is inherently anticipates the claimed limitation "dividing the tile region into distinct sub-regions".);

- comparing (i.e., matching comparison) generally complex source images (i.e., said 1,548 tile images of Nicholas Negroponte in Fig. 3.3 are complex in general) to the tile region to produce a measurement of visual similarity (See page 50, the last ¶);
- selecting the source image with the highest measurement of visual similarity to represent the tile region (i.e., allowing the software the opportunity to compute an identical texture contrast coefficient at each grid-spot for comparison with the database; See page 50, the last ¶); and
- positioning the selected source image in the mosaic image at a locus corresponding to the locus of the tile region (i.e., 1,548 tile images of Nicholas Negroponte illustrates that said tile images have been positioned in the mosaic at the location where they visually appear to be similar to the original image in Fig. 3.3).

PAPA does not expressly teach comparing each sub-region of the tile region with a corresponding portion of each source image to produce the measurement of visual similarity.

Lu discloses an efficient image retrieval for use in an image database management system (See Abstract on page 95), wherein

- dividing a tile region (i.e., Image) into distinct sub-regions (i.e., sub-images of said Image; See page 99);
- comparing generally complex source images (i.e., painting images; See pages 103-104) to the tile region (i.e., query image) to produce a measurement of visual similarity (i.e., computing histograms; See page 99), said comparing step including
    - comparing each sub-region of the tile region (i.e., each said sub-image) with a corresponding portion of each source image to produce the measurement of visual similarity (See page 101, wherein it particularly states that the similarity value at the leaf level provides the best estimate to compare two images.);

- selecting the source image with the highest measurement of visual similarity to represent the tile region (See page 101, wherein, Lu teaches how to generate a measure of visual similarity between two images, and thus, it inherently teaches selecting the image with the best similarity metric/score.).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included said method steps of efficient image retrieval, as disclosed by Lu, in said method for generating a mosaic image, as disclosed by PAPA, for the advantage of selecting the source image with the best similarity metric/score (See Lu, page 101).

Referring to claim 2, Lu teaches the step of

- employing source images having one pixel per respective sub-region (See pages 100-101, wherein it teaches "straightforward approach" to comparing images would be to compare them on a pixel by pixel basis.).

Referring to claim 5, PAPA teaches the step of

- capturing source images (i.e., digitizing 370,000 photographs; See page 49, the first ¶), and
- storing the captured source images in a database (i.e., database images; See page 50, the last ¶).

Referring to claim 6, PAPA teaches the step of

- generating modified source images by cropping the source images captured in said capturing step to square (i.e., cropping the image and scaling to a small image; See page 49, the first ¶).

Referring to claim 9, PAPA teaches the step of

- categorizing the captured source images within the database (i.e., classifying each image by average color; See page 49, the first ¶).

Referring to claim 14, PAPA discloses an apparatus for generating a mosaic image (See page 49, 3.1 Introduction; e.g., a final 1,548 tile mosaic of Nicholas Negroponte in Fig. 3.3 on page 51) with an appearance (i.e., a portrait of Nicholas Negroponte) that approximates a target

image (i.e., master image) by utilizing a plurality of source images (i.e., 1,548 tile images; See Fig. 3.3 on page 51) and a computer (See pages 50-51), comprising:

- a computer workstation that executes mosaic generation software (i.e., matching program; See page 50, the last ¶) being operative to divide the target image (i.e., said master image) into a plurality of tile regions (in fact, said final 1,548 tile mosaic of Nicholas Negroponte in Fig. 3.3 shows that the original master image was divided into the plurality of tiles),
    - each tile region representing a distinct locus of the target image (See final 1,548 tile mosaic of Nicholas Negroponte in Fig. 3.3; wherein, it is apparent that the images of the mosaic are tile shaped (square) representing a distinct locus of said master image and replace the original Nicholas Negroponte image), said mosaic generation software (i.e., said matching program) being further operative to operate upon each tile region to:
        - divide the tile region (i.e., tile mosaic image) into distinct sub-regions (See page 50, the last ¶, it states "the master image now had more horizontal and vertical pixels than mosaic tiles needed for the final rendering, thus allowing the software the opportunity to compute an identical texture contrast coefficient at each grid-spot for comparison with the database," which is inherently anticipates the claimed limitation "dividing the tile region into distinct sub-regions".);
    - compare (i.e., matching comparison) a plurality of generally complex source image portions (i.e., said 1,548 tile images of Nicholas Negroponte in Fig. 3.3 are complex in general) to the tile region to produce a measurement of visual similarity (See page 50, the last ¶);
    - select the source image with the highest measurement of visual similarity to represent the tile region (i.e., allow the software the opportunity to compute an identical texture contrast coefficient at each grid-spot for comparison with the database; See page 50, the last ¶); and
    - position the selected source image in the mosaic image at a locus corresponding to the locus of the tile region (i.e., 1,548 tile images of Nicholas Negroponte illustrates that said tile images have been positioned in the mosaic at the location where they visually appear to be similar to the original image in Fig. 3.3).

PAPA does not expressly teach comparing each sub-region of the tile region with a corresponding portion of each source image to produce the measurement of visual similarity.

Lu discloses an efficient image retrieval for use in an image database management system (See Abstract on page 95), wherein

- dividing a tile region (i.e., Image) into distinct sub-regions (i.e., sub-images of said Image; See page 99);
- comparing generally complex source images (i.e., painting images; See pages 103-104) to the tile region (i.e., query image) to produce a measurement of visual similarity (i.e., computing histograms; See page 99), said comparing step including
    - comparing each sub-region of the tile region (i.e., each said sub-image) with a corresponding portion of each source image to produce the measurement of visual similarity (See page 101, wherein it particularly states that the similarity value at the leaf level provides the best estimate to compare two images.);
- selecting the source image with the highest measurement of visual similarity to represent the tile region (See page 101, wherein, Lu teaches how to generate a measure of visual similarity between two images, and thus, it inherently teaches selecting the image with the best similarity metric/score.).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included said method of efficient image retrieval, as disclosed by Lu, in said mosaic generation software (i.e., matching program), as disclosed by PAPA, for the advantage of selecting the source image with the best similarity metric/score (See Lu, page 101).

Referring to claim 15, Lu teaches

- the source image employed for comparison with the tile region has one pixel per respective sub-region (See pages 100-101, wherein it teaches "straightforward approach" to comparing images would be to compare them on a pixel by pixel basis.).

Referring to claim 18, PAPA teaches

- video equipment selected from the group consisting of a video tape player and a videodisc player (i.e., laser discs; See page 74, the first ¶),

- said video equipment being operative to capture source images (i.e., digitizing 370,000 photographs; See page 49, the first ¶) for storage in a database in the computer workstation (i.e., database images; See page 50, the last ¶).

Referring to claim 19, PAPA teaches

- modified source images are generated by cropping and resizing the captured source images to a consistent size (i.e., cropping the image and scaling to a small image; See page 49, the first ¶).

Referring to claim 22, PAPA teaches

- the captured source images are categorized within the database (i.e., classifying each image by average color; See page 49, the first ¶).

10. Claims 46-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over WIRED ["WIRED," published by WIRED magazine, a magazine cover, November 1995] in view of PAPA [Provisional Application 60/035,733], and further in view of Ron White ["How Computers Work," published by Zeff-Davis, pages 50, 51, 63, 67, 75, and 79 (1993); hereinafter "White"].

Referring to claim 46, WIRED discloses an article (i.e., WIRED Magazine) comprising

- a substrate (i.e., magazine cover page) having a mosaic image (i.e., a cover portrait of Nicholas Negroponte; See WIRED Magazine Cover) having
    - an appearance (i.e., a portrait of Nicholas Negroponte) that approximates a target image (i.e., an image of Nicholas Negroponte) through use of a plurality of source images (i.e., 1,548 photographic images; See WIRED Magazine Content page).

However, WIRED is silent upon the inherent characteristic of said mosaic image being generated by a process executed with a computer.

PAPA shows the characteristic not disclosed in WIRED, such that: said mosaic image (i.e., WIRED Magazine cover portrait of Nicholas Negroponte) being generated by a process executed with a computer (See page 50) comprising the steps of:

- loading the target image (i.e., master image) into the computer (See pages 49-51);

- dividing the target image into a plurality of tile regions (i.e., said cover portrait of Nicholas Negroponte inherently discloses that an original image was divided into a plurality of tiles);
- comparing (i.e., matching) generally complex source images (i.e., the source images used to create the mosaic image of Nicholas Negroponte were generally complex) to the tile region to produce a measurement of visual similarity (See pages 50-51);
- selecting the source image with the highest measurement of visual similarity to represent the tile region (See page 50, it states "the master image now had more horizontal and vertical pixels than mosaic tiles needed for the final rendering, thus allowing the software the opportunity to compute an identical texture contrast coefficient at each grid-spot for comparison with the database".); and
- positioning the selected source image in the mosaic image at a locus corresponding to the locus of the tile region (i.e., said WIRED Magazine cover portrait of Nicholas Negroponte illustrates that said source images have been positioned in the mosaic at the location where they visually appear to be similar to said master image).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included said process characteristic not disclosed in WIRED, as disclosed by PAPA, in said product (i.e., said article), as disclosed by WIRED, because they both describe aspects of a photomosaic image of Nicholas Negroponte, and in combination provide a fuller picture of the product-by-process functionality for said photomosaic image of Nicholas Negroponte.

WIRED, as modified by PAPA, does not expressly teach said article is stored on a storage medium for use with said computer.

White discloses a computer data storage (See page 49), wherein

- a storage medium for use with a computer comprising a substrate (e.g., floppy disk, hard disk, CD, optical drive) for storing at least one mosaic image (i.e., image file; See pages 50, 51, and 67).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included said storage medium (i.e., said floppy disk, hard disk, CD, optical drive), as disclosed by White, in said product, as disclosed by WIRED in view of PAPA, which was well known that an image file could be stored on said substrate (i.e., floppy disk, hard disk, CD, optical drive; See White, page 50).

Even though WIRED, as modified by PAPA and White, does not expressly disclose that said mosaic image is generated by said process executed with said computer comprising the same steps of processing method, the claimed product is not patentable in view of WIRED, as modified by PAPA and White, because the instant claim is written in a typical product-by-process format. The determination of whether the instant claim is patentable is based on the product itself, not the process recited for creating the product. *In re Thorpe*, 777 F.2d 695 (Fed. Cir. 1985); See MPEP §2113.

Therefore, WIRED, as modified by PAPA and White, renders obviousness of the claimed invention in the claim 46.

Referring to claim 47, White teaches said substrate including

- a floppy disk (See page 63).

Referring to claim 48, White teaches said substrate including

- a compact disk (See page 75).

Referring to claim 49, White teaches said substrate including

- an optical disk (See page 79).

Referring to claim 50, White teaches said substrate including

- a removable hard disk (See page 67).

11. Claims 51, 53, 55, 56, and 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over PAPA [Provisional Application 60/035,733] in view of Ioka ["A method of Defining the Similarity of Images on the Basis of Color Information," IBM Research Report RT-0030, Tokyo Research Laboratory (1989)], and further in view of White ["How Computers Work," published by Zeff-Davis, pages 50, 51, 63, 67, 75, and 79 (1993)].

Referring to claim 51, PAPA discloses a computer program (i.e., software, e.g., matching program, for generating a mosaic image (See page 49, 3.1 Introduction; e.g., a final 1,548 tile mosaic of Nicholas Negroponte in Fig. 3.3 on page 51), the mosaic image to have an appearance (i.e., a portrait of Nicholas Negroponte) that approximates a target image (i.e., master image) by utilizing a plurality of source images (i.e., 1,548 tile images; See Fig. 3.3 on

pages 50-51), the computer program being operative to perform a method comprising the steps of:

- loading the target image (i.e., said master image) into a computer (See pages 49-51);
- dividing the target image (i.e., said master image) into a plurality of tile regions (in fact, said final 1,548 tile mosaic of Nicholas Negroponte in Fig. 3.3 shows that the original master image was divided into the plurality of tiles),
    - each tile region representing a distinct locus of the target image (See final 1,548 tile mosaic of Nicholas Negroponte in Fig. 3.3; wherein, it is apparent that the images of the mosaic are tile shaped (square) representing a distinct locus of said master image and replace the original Nicholas Negroponte image), and for each tile region:
        - dividing the tile region (i.e., tile mosaic image) into distinct sub-regions (See page 50, the last ¶, it states "the master image now had more horizontal and vertical pixels than mosaic tiles needed for the final rendering, thus allowing the software the opportunity to compute an identical texture contrast coefficient at each grid-spot for comparison with the database," which is inherently anticipates the claimed limitation "dividing the tile region into distinct sub-regions".);
- comparing (i.e., matching comparison) generally complex source images (i.e., said 1,548 tile images of Nicholas Negroponte in Fig. 3.3 are complex in general) to the tile region to produce a measurement of visual similarity (See page 50, the last ¶);
- selecting the source image with the highest measurement of visual similarity to represent the tile region (i.e., allowing the software the opportunity to compute an identical texture contrast coefficient at each grid-spot for comparison with the database; See page 50, the last ¶); and
- positioning the selected source image in the mosaic image at a locus corresponding to the locus of the tile region (i.e., 1,548 tile images of Nicholas Negroponte illustrates that said tile images have been positioned in the mosaic at the location where they visually appear to be similar to the original image in Fig. 3.3).

PAPA does not expressly teach comparing each sub-region of the tile region with a corresponding portion of each source image to produce the measurement of visual similarity.

Ioka discloses a similarity retrieval for use in an image database management system (See Introduction on page 1), wherein

- dividing a tile region (i.e., Image in Fig. 3) into distinct sub-regions (i.e., sub-areas of said Image in Fig. 3);
- comparing generally complex source images (i.e., images in database) to the tile region (i.e., query image) to produce a measurement of visual similarity (i.e., calculating composite distance D; See page 6), said comparing step including
    - comparing each sub-region of the tile region (i.e., each said sub-area in Fig. 3) with a corresponding portion of each source image to produce the measurement of visual similarity (See pages 5-6, wherein it particularly states that the similarity between image i and j was calculated for each sub-area.);
- selecting the source image with the highest measurement of visual similarity to represent the tile region (See pages 14-15, wherein, Ioka teaches that images can be sorted from best to worst using a measure of visual similarity).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have implemented said method steps of similarity retrieval, as disclosed by Ioka, in said computer program (i.e., matching program), as disclosed by PAPA, for the advantage of selecting the source image with the best similarity metric/score (See Ioka, page 14).

PAPA, as modified by Ioka, does not expressly teach said computer program is stored on a storage medium for use with said computer.

White discloses a computer data storage (See page 49), wherein

- a storage medium for use with a computer (e.g., floppy disk, hard disk, CD, optical drive) for storing at least one mosaic image (i.e., image file; See pages 50, 51, and 67).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included said storage medium (i.e., said floppy disk, hard disk, CD, optical drive), as disclosed by White, for storing said computer program, as disclosed by PAPA in view of Ioka, which was well known that an image file could be stored on said storage medium (i.e., floppy disk, hard disk, CD, optical drive; See White, page 50).

Referring to claim 53, Ioka teaches said comparing step including

- the further step of computing a form of a Root-Mean Square error of Red, Green and Blue channels (See pages 4, 10, and 13, i.e., $B_{pq} = \{(L^*_p - L^*_q)^2 + (u^*_p - u^*_q)^2 + (v^*_p - v^*_q)^2\}$,

wherein, the variable B represents the distance/similarity between two coordinates p and q in the $L^*u^*v^*$ color space.).

Referring to claim 55, PAPA teaches the step of

- capturing source images (i.e., digitizing 370,000 photographs; See page 49, the first ¶), and
- storing the captured source images in a database (i.e., database images; See page 50, the last ¶).

Referring to claim 56, PAPA teaches the step of

- generating modified source images by cropping the source images captured in said capturing step to square (i.e., cropping the image and scaling to a small image; See page 49, the first ¶).

Referring to claim 59, PAPA teaches the step of

- categorizing the captured source images within the database (i.e., classifying each image by average color; See page 49, the first ¶).

12. Claim 60 is rejected under 35 U.S.C. 103(a) as being unpatentable over PAPA [Provisional Application 60/035,733] in view of Ioka ["A method of Defining the Similarity of Images on the Basis of Color Information," IBM Research Report RT-0030, Tokyo Research Laboratory (1989)] and White ["How Computers Work," published by Zeff-Davis, pages 50, 51, 63, 67, 75, and 79 (1993)] as applied to claims 51, 53, 55, 56, and 59 above, and further in view of Ogle ["Chabot: Retrieval from a Relational Database of Images," IEEE Computer, pages 40-48 (September 1995)].

Referring to claim 60, PAPA, as modified by Ioka and White, discloses all the limitations of the claim 60, except that does not teach the step of storing the captured source images at different levels of resolution.

Ogle discloses a retrieval image from a relational database of images (See page 40), wherein the step of

- storing captured source images (i.e., images in Photo CD format) at different levels of resolution (i.e., five different levels of resolutions ranging from a thumbnail 128 x 192 pixels to the highest resolution 2,048 x 3,072 pixels; See page 43, Storage)..

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have applied said method step of storing the captured images (i.e., five different levels of resolutions), as disclosed by Ogle, to said storing the captured source images in said database, as disclosed by PAPA in view of Ioka and White, for the advantage of providing fast browsing of the stored images on said database (See Ogle, page 43, right column, the second ¶).

13. Claims 51, 52, 55, 56, and 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over PAPA [Provisional Application 60/035,733] in view of Lu ["Efficient Image Retrieval By Color Contents," Applications of Databases, First International Conference on Applications of Databases, pages 95-108 (1994)], and further in view of White ["How Computers Work," published by Zeff-Davis, pages 50, 51, 63, 67, 75, and 79 (1993)].

Referring to claim 51, PAPA discloses a computer program (i.e., software, e.g., matching program, for generating a mosaic image (See page 49, 3.1 Introduction; e.g., a final 1,548 tile mosaic of Nicholas Negroponte in Fig. 3.3 on page 51), the mosaic image to have an appearance (i.e., a portrait of Nicholas Negroponte) that approximates a target image (i.e., master image) by utilizing a plurality of source images (i.e., 1,548 tile images; See Fig. 3.3 on pages 50-51), the computer program being operative to perform a method comprising the steps of:

- loading the target image (i.e., said master image) into a computer (See pages 49-51);
- dividing the target image (i.e., said master image) into a plurality of tile regions (in fact, said final 1,548 tile mosaic of Nicholas Negroponte in Fig. 3.3 shows that the original master image was divided into the plurality of tiles),
    - each tile region representing a distinct locus of the target image (See final 1,548 tile mosaic of Nicholas Negroponte in Fig. 3.3; wherein, it is apparent that the images of the mosaic are tile shaped (square) representing a distinct locus of said master image and replace the original Nicholas Negroponte image), and for each tile region:

- dividing the tile region (i.e., tile mosaic image) into distinct sub-regions (See page 50, the last ¶, it states "the master image now had more horizontal and vertical pixels than mosaic tiles needed for the final rendering, thus allowing the software the opportunity to compute an identical texture contrast coefficient at each grid-spot for comparison with the database," which is inherently anticipates the claimed limitation "dividing the tile region into distinct sub-regions".);

- comparing (i.e., matching comparison) generally complex source images (i.e., said 1,548 tile images of Nicholas Negroponte in Fig. 3.3 are complex in general) to the tile region to produce a measurement of visual similarity (See page 50, the last ¶);
- selecting the source image with the highest measurement of visual similarity to represent the tile region (i.e., allowing the software the opportunity to compute an identical texture contrast coefficient at each grid-spot for comparison with the database; See page 50, the last ¶); and
- positioning the selected source image in the mosaic image at a locus corresponding to the locus of the tile region (i.e., 1,548 tile images of Nicholas Negroponte illustrates that said tile images have been positioned in the mosaic at the location where they visually appear to be similar to the original image in Fig. 3.3).

PAPA does not expressly teach comparing each sub-region of the tile region with a corresponding portion of each source image to produce the measurement of visual similarity.

Lu discloses an efficient image retrieval for use in an image database management system (See Abstract on page 95), wherein

- dividing a tile region (i.e., Image) into distinct sub-regions (i.e., sub-images of said Image; See page 99);
- comparing generally complex source images (i.e., painting images; See pages 103-104) to the tile region (i.e., query image) to produce a measurement of visual similarity (i.e., computing histograms; See page 99), said comparing step including
    - comparing each sub-region of the tile region (i.e., each said sub-image) with a corresponding portion of each source image to produce the measurement of visual similarity (See page 101, wherein it particularly states that the similarity value at the leaf level provides the best estimate to compare two images.);

- selecting the source image with the highest measurement of visual similarity to represent the tile region (See page 101, wherein, Lu teaches how to generate a measure of visual similarity between two images, and thus, it inherently teaches selecting the image with the best similarity metric/score.).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included said method of efficient image retrieval, as disclosed by Lu, in said mosaic generation software (i.e., matching program), as disclosed by PAPA, for the advantage of selecting the source image with the best similarity metric/score (See Lu, page 101).

PAPA, as modified by Lu, does not expressly teach said computer program is stored on a storage medium for use with said computer.

White discloses a computer data storage (See page 49), wherein

- a storage medium for use with a computer (e.g., floppy disk, hard disk, CD, optical drive) for storing at least one mosaic image (i.e., image file; See pages 50, 51, and 67).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included said storage medium (i.e., said floppy disk, hard disk, CD, optical drive), as disclosed by White, for storing said computer program, as disclosed by PAPA in view of Lu, which was well known that an image file could be stored on said storage medium (i.e., floppy disk, hard disk, CD, optical drive; See White, page 50).

Referring to claim 52, Lu teaches the step of

- employing source images having one pixel per respective sub-region (See pages 100-101, wherein it teaches "straightforward approach" to comparing images would be to compare them on a pixel by pixel basis.).

Referring to claim 55, PAPA teaches the step of

- capturing source images (i.e., digitizing 370,000 photographs; See page 49, the first ¶), and
- storing the captured source images in a database (i.e., database images; See page 50, the last ¶).

Referring to claim 56, PAPA teaches the step of

- generating modified source images by cropping the source images captured in said capturing step to square (i.e., cropping the image and scaling to a small image; See page 49, the first ¶).

Referring to claim 59, PAPA teaches the step of

- categorizing the captured source images within the database (i.e., classifying each image by average color; See page 49, the first ¶).

14. Claims 51, 55, 56, and 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over PAPA [Provisional Application 60/035,733] in view of Stricker ["Color Indexing with Weak Spatial Constraints," Storage and Retrieval for Still Image and Video Databases IV, Proceedings of SPIE Volume: 2670, pages 29-40 (February 1996)], and further in view of White ["How Computers Work," published by Zeff-Davis, pages 50, 51, 63, 67, 75, and 79 (1993)].

Referring to claim 51, PAPA discloses a computer program (i.e., software, e.g., matching program, for generating a mosaic image (See page 49, 3.1 Introduction; e.g., a final 1,548 tile mosaic of Nicholas Negroponte in Fig. 3.3 on page 51), the mosaic image to have an appearance (i.e., a portrait of Nicholas Negroponte) that approximates a target image (i.e., master image) by utilizing a plurality of source images (i.e., 1,548 tile images; See Fig. 3.3 on pages 50-51), the computer program being operative to perform a method comprising the steps of:

- loading the target image (i.e., said master image) into a computer (See pages 49-51);
- dividing the target image (i.e., said master image) into a plurality of tile regions (in fact, said final 1,548 tile mosaic of Nicholas Negroponte in Fig. 3.3 shows that the original master image was divided into the plurality of tiles),
    - each tile region representing a distinct locus of the target image (See final 1,548 tile mosaic of Nicholas Negroponte in Fig. 3.3; wherein, it is apparent that the images of the mosaic are tile shaped (square) representing a distinct locus of said master image and replace the original Nicholas Negroponte image), and for each tile region:
        - dividing the tile region (i.e., tile mosaic image) into distinct sub-regions (See page 50, the last ¶, it states "the master image now had more horizontal and vertical pixels than mosaic tiles needed for the final

rendering, thus allowing the software the opportunity to compute an identical texture contrast coefficient at each grid-spot for comparison with the database," which is inherently anticipates the claimed limitation "dividing the tile region into distinct sub-regions".);

- comparing (i.e., matching comparison) generally complex source images (i.e., said 1,548 tile images of Nicholas Negroponte in Fig. 3.3 are complex in general) to the tile region to produce a measurement of visual similarity (See page 50, the last ¶);
- selecting the source image with the highest measurement of visual similarity to represent the tile region (i.e., allowing the software the opportunity to compute an identical texture contrast coefficient at each grid-spot for comparison with the database; See page 50, the last ¶); and
- positioning the selected source image in the mosaic image at a locus corresponding to the locus of the tile region (i.e., 1,548 tile images of Nicholas Negroponte illustrates that said tile images have been positioned in the mosaic at the location where they visually appear to be similar to the original image in Fig. 3.3).

PAPA does not expressly teach comparing each sub-region of the tile region with a corresponding portion of each source image to produce the measurement of visual similarity.

Stricker discloses a process of retrieving an image from a database that is similar to a query image (See 4 Similarity Function on pages 33-34), wherein

- dividing a tile region (i.e., Image in Fig. 1) into distinct sub-regions (i.e., subareas of said Image in Fig. 1);
- comparing generally complex source images (i.e., images in source image database; See page 34) to the tile region (i.e., source image) to produce a measurement of visual similarity (i.e., calculating characteristics of image using a similarity function; See pages 33-34), said comparing step including
    - comparing each sub-region of the tile region (i.e., each said subarea in Fig. 1) with a corresponding portion of each source image to produce the measurement of visual similarity (See page 34, wherein it particularly states that the color characteristics of a region in the target image are compared to the color characteristics of the same region in a source image.);

- selecting the source image with the highest measurement of visual similarity to represent the tile region (See page 36, wherein, Stricker teaches that the system is capable of sorting images based on measurements of similarity).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included said method steps of retrieving an image, as disclosed by Stricker, in said mosaic generation software (i.e., matching program), as disclosed by PAPA, for the advantage of selecting the source image with the best similarity metric/score (See Stricker, pages 33-34, 4 Similarity Function).

PAPA, as modified by Stricker, does not expressly teach said computer program is stored on a storage medium for use with said computer.

White discloses a computer data storage (See page 49), wherein

- a storage medium for use with a computer (e.g., floppy disk, hard disk, CD, optical drive) for storing at least one mosaic image (i.e., image file; See pages 50, 51, and 67).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included said storage medium (i.e., said floppy disk, hard disk, CD, optical drive), as disclosed by White, for storing said computer program, as disclosed by PAPA in view of Stricker, which was well known that an image file could be stored on said storage medium (i.e., floppy disk, hard disk, CD, optical drive; See White, page 50).

Referring to claim 55, PAPA teaches the step of

- capturing source images (i.e., digitizing 370,000 photographs; See page 49, the first ¶), and
- storing the captured source images in a database (i.e., database images; See page 50, the last ¶).

Referring to claim 56, PAPA teaches the step of

- generating modified source images by cropping the source images captured in said capturing step to square (i.e., cropping the image and scaling to a small image; See page 49, the first ¶).

Referring to claim 59, PAPA teaches the step of

- categorizing the captured source images within the database (i.e., classifying each image by average color; See page 49, the first ¶).

Response to Amendment

15. The declaration under 37 CFR 1.132 filed on 11th of August 2009 submitted by the sole inventor, Mr. Robert Silvers, is insufficient to overcome the rejection of claims 1-3, 5, 6, 9, 10, 14-16, 18, 19, 22-25, 29-41, 43, 46-53, 55, 56, 59, and 60 based upon the references WIRED, PAPA, Ioka, Adobe, Stricker, Ogle, Lu, and White of the record, alone and/or the combination of them, under 35 U.S.C. §102(b) or 35 U.S.C. §103(a) as set forth in the last Office action because:

- The declaration describes the commercial success of the invention, e.g., receiving awards, sales, and licensing. However, the declaration fails to ensure that there is an adequate nexus* between the product PHOTOMOSAIC® Images and the properties of the claimed subject matter "subregion comparison" in the patent under reexamination. In other words, the declarant fails to establish a probative relation between the submitted evidence, i.e., copy of awards, event pictures, letters from noteworthy individuals, and the originally disclosed properties of the claimed invention, in particular, the properties of the claimed subject matter "subregion comparison".
- Moreover, in the *ex parte* process of examining a patent application (in this particular case, re-examining a patent under reexamination), the Office lacks the means or resources to gather evidence which supports or refutes the declarant's and/or its counsel's assertion that the sale constitute commercial success. *C.f. Ex parte Remark*, 15 USPQ2d 1498, 1503 (Bd. Pat. App. & Int. 1990). Consequently, the Office must rely upon the declarant and/or its counsel to provide hard evidence of commercial success. However, the declarant fails to provide any hard evidence of commercial success to the Office (See MPEP, §716.03[R-2]).
- Regarding to the issue of licensing, the declarant fails to provide any evidentiary value of the claimed subject matter "subregion comparison" that said asserted licensing succeeded for reasons related to the unobviousness of the product or process, i.e., said

* The term "nexus" designates a factually and legally sufficient connection between the objective evidence of nonobviousness and the claimed invention so that the evidence is of probative value in the determination of nonobviousness. *DemacoCorp. v. F. Von Langsdorff Licensing Ltd.*, 851 F.2d 1387, 7 USPQ2d 1222(Fed. Cir), cert. denied, 488 U.S. 956 (1988).

licensing is not mutually beneficial or is not less expensive than defending infringement suits, etc. *In re EWP Corp. v. Reliance Universal, Inc.,* 755 F.2d 898, 225 USPQ 20 (Fed. Cir. 1985).

In view of the foregoing, when all of the evidence is considered, the totality of the rebuttal evidence of nonobviousness fails to outweigh the evidence of obviousness. Therefore, the declaration filed on 11th of August 2009 under 37 CFR §1.132 is ineffective to overcome the references in the prior art of the record.

Response to Arguments

16. Patent Owner's arguments filed on 11th of August 2009 have been fully considered but they are not persuasive.

In response to the Patent Owner's arguments with respect to "Claimed Features Missing From The WIRED Method: ... Importantly, the WIRED method lacks at least three steps called for in the method recited in independent claim 1 of the '498 patent: (i) dividing the tile region into distinct subregions; (ii) comparing each subregion of the tile region with a corresponding portion of each source image; and (iii) producing a 'measurement of visual similarity' based on subregion comparison. ..." in the Response page 4, line 6 through page 6, line 25, the Examiner respectfully disagrees.

At first, in contrary to the Patent Owner's argument, the claimed limitation "dividing the tile region into distinct sub-regions" is taught by PAPA, such that: dividing the tile region (i.e., $[width \times height]_{pixel}$ tile of mosaic image) into distinct sub-regions (i.e., [*width* x *height*] distinct pixel sub-regions; See page 50, the last ¶, it states "the master image now had more horizontal and vertical pixels than mosaic tiles needed for the final rendering, thus allowing the software the opportunity to compute an identical texture contrast coefficient at each grid-spot for comparison with the database," which is inherently anticipates the claimed limitation "dividing the tile region into distinct sub-regions".).

Furthermore, the Patent Owner asserts that although the mosaic image Nicholas Negroponte in Fig. 3.3 of PAPA divided into the mosaic tiles, the tiles were not actively divided into subregions. However, the Examiner notices that the features upon which the Patent Owner relies (i.e., actively dividing the tile region into distinct subregions) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir.

1993). In fact, said mosaic tile is actively divided into the distinct pixel subregions in order to compute an identical texture contrast coefficient at each grid-spot for comparison with the database images (See PAPA, pages 49-51).

At second, the Patent Owner states that the Examiner acknowledged the WIRED method† does not compare subregions of the tile region to corresponding portions (subregions) of the source image (See the Response, page 5, lines 29-31). Therefore, the Examiner brought the secondary reference Ioka for showing the obviousness of the claimed invention, wherein the argued element is taught by Ioka, such that: comparing generally complex source images (i.e., images in database) to the tile region (i.e., query image) to produce a measurement of visual similarity (i.e., calculating composite distance D; See page 6), said comparing step including comparing each sub-region of the tile region (i.e., each said sub-area in Fig. 3) with a corresponding portion of each source image to produce the measurement of visual similarity (See pages 5-6, wherein it particularly states that the similarity between image i and j was calculated for each sub-area.).

At third, the Patent Owner states that the Examiner acknowledged such subregion comparison is not performed in the WIRED method. Hence, the WIRED method necessarily fails to produce the claimed subject matter "measurement of visual similarity". This is what the Patent Owner misunderstands the claim rejection.

Even though PAPA does not expressly teach comparing each sub-region of the tile region with a corresponding portion of each source image, PAPA anticipates the claimed subject matter "producing measurement of visual similarity" through comparing (i.e., matching comparison) generally complex source images (i.e., 1,548 tile images of the mosaic image Nicholas Negroponte in Fig. 3.3) to the tile region (See page 50, the last paragraph). In other words, said WIRED method produces the measurement of visual similarity (i.e., computing an identical texture contrast coefficient at each grid-spot).

At last, the Patent Owner asserts as if the claimed subject matter "sub-region comparison" should be interpreted as "shape matching" (See the Response, page 6, lines 10-25). However, it is noted that the feature upon which the Patent Owner relies (i.e., shape matching) is not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van*

† PAPA introduces the mosaic image Nicholas Negroponte on WIRED magazine, and the Patent Owner named the mosaic image Nicholas Negroponte for WIRED mosaic using WIRED method in the Response.

Geuns, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). In fact, the claimed subject matter "sub-region comparison" could be interpreted such as not only the asserted interpretation "shape matching", but also the teaching "similarity calculation" from Ioka (See Fig. 3 and pages 5-6, wherein it particularly states that the similarity between image i and j was calculated for each sub-area).

Thus, the Patent Owner's argument on this point is not persuasive.

In response to the Patent Owner's arguments with respect to "Not Obvious To Modify The WIRED Method In View Of Ioka: The pending claims are not obvious over the WIRED method in view of Ioka because, *inter alia*: (i) at the time of the filing of the application that matured into the '498 patent, one of ordinary skill in the art of making computerized mosaic images would have looked to methods of matching the overall appearance of a source image to the overall appearance of a tile, not to methods of matching subregions of tiles and source images, i.e., the complex details of images and tiles; (ii) there is no indication in Ioka that its method would have been appropriate for making a mosaic image; and (iii) Ioka's method is content driven, which imposes a limitation that would be inappropriate (i.e., irrelevant and unnecessary) for computerized mosaic-making. ..." in the Response page 6, line 26 through page 9, line 6, the Examiner respectfully disagrees.

As pointed out by the Patent Owner, PAPA discloses that two parameters were calculated and used in WIRED method: average color and texture contrast of the overall tile and source image. Hence, the Patent Owner asserts that prior art mosaics were made from images that had been selected as block representation or averages of corresponding tiles, which is different from the present invention, i.e., database images are used in a more complicated fashion by treating them as anything else than mere average or block representations. Therefore, the Examiner brought Ioka reference in the rejection for the limitation which is not provided by PAPA, i.e., comparing each sub-region of the tile region with a corresponding portion of each source image to produce the measurement of visual similarity (See the paragraph 5 of the instant Office action, Claims 1, 3, 5, 6, 9, 14, 16, 18, 19, and 22 rejection under 35 U.S.C. 103(a) as being unpatentable over PAPA in view of Ioka).

Secondly, the Patent Owner states that Ioka does not compare average values of characteristic parameters of an entire image with those in a corresponding tile, and does not identify images that would be appropriate as block representations of tiles in a mosaic. This

statement from the Patent Owner is true. In fact, the primary reference PAPA discloses such operation for the computerized mosaic image instead of comparing each sub-region of the tile region with a corresponding portion of each source image to produce the measurement of visual similarity as claimed in the present invention. Therefore, the Examiner brought Ioka reference in the rejection for the limitation which is not provided by PAPA, but by Ioka. Even though the Patent Owner concerns whether the method of Ioka could be successfully applied to a method of making a computerized mosaic image, the test for obviousness is not whether the features of a secondary reference Ioka may be bodily incorporated into the structure of the primary reference PAPA; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). Furthermore, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

At third, the Patent Owner further argues that Ioka is concerned with particular objects in an image, not with similar content to a target image. Moreover, the Patent Owner argues that by removing the background of the database images, Ioka deletes shapes and colors that could create a better match for purposes of making a mosaic image. The Examiner believes that the Patent Owner misunderstands the exemplary claim 1 rejection.

The primary reference PAPA teaches all the limitations including the step of dividing the tile region (i.e., tile mosaic image) into distinct sub-regions (See page 50, the last ¶, it states "the master image now had more horizontal and vertical pixels than mosaic tiles needed for the final rendering, thus allowing the software the opportunity to compute an identical texture contrast coefficient at each grid-spot for comparison with the database," which is inherently anticipates the claimed limitation "dividing the tile region into distinct sub-regions".); the step of comparing (i.e., matching comparison) generally complex source images (i.e., said 1,548 tile images of Nicholas Negroponte in Fig. 3.3 are complex in general) to the tile region to produce a measurement of visual similarity (See page 50, the last ¶); the step of selecting the source image with the highest measurement of visual similarity to represent the tile region (i.e., allowing the software the opportunity to compute an identical texture contrast coefficient at each grid-spot for comparison with the database; See page 50, the last ¶); and the step of positioning the

selected source image in the mosaic image at a locus corresponding to the locus of the tile region (i.e., 1,548 tile images of Nicholas Negroponte illustrates that said tile images have been positioned in the mosaic at the location where they visually appear to be similar to the original image in Fig. 3.3), with the exception of comparing each sub-region of the tile region with a corresponding portion of each source image to produce the measurement of visual similarity. That is to say, it is clear that PAPA is concerned with similar content to a target image including background through the average color and texture contrast of the overall tile and source image. Ioka discloses a similarity retrieval, wherein it is concerned with particular objects in an image by the step of comparing each sub-region of the tile region (i.e., each said sub-area in Fig. 3) with a corresponding portion of each source image to produce the measurement of visual similarity (See pages 5-6, wherein it particularly states that the similarity between image i and j was calculated for each sub-area.).

Therefore, the combination of PAPA and Ioka with rationale for the proper combination, i.e., the advantage of selecting the source image with the best similarity metric/score (See Ioka, page 14), renders the obviousness of the claimed invention.

Even though the Patent Owner argues that the background removal of Ioka deletes shapes and colors of the tile image, PAPA is concerned with this feature, i.e., searching a similar content to a target image including background through the average color and texture contrast of the overall tile and source image.

Again, the Examiner stresses that the test for obviousness is what the combined teachings of the references would have suggested to those of ordinary skill in the art, and thus, the Patent Owner's argument on this point is not persuasive.

In response to the Patent Owner's arguments with respect to Secondary Consideration - Commercial Success of The Claimed Invention in the Response page 9, line 7 through page 10, line 10, the Examiner respectfully disagrees.

As discussed in the above, in the *ex parte* process of re-examining a patent under reexamination, the Office lacks the means or resources to gather evidence which supports or refutes the Patent Owner's and/or its counsel's assertion that the sale constitute commercial success. *C.f. Ex parte Remark*, 15 USPQ2d 1498, 1503 (Bd. Pat. App. & Int. 1990). Consequently, the Office must rely upon the declarant and/or its counsel to provide hard evidence of commercial success. However, the declarant fails to provide any hard evidence of

commercial success to the Office (See MPEP, §716.03[R-2]).

Furthermore, the mere assertion of direct nexus linking the key innovative feature of the '498 Patent, i.e., the claimed subject matter "subregion comparison," to the asserted commercial success fails to establish a probative relation between the submitted evidences, i.e., copy of awards, event pictures, letters from noteworthy individuals, and the originally disclosed properties of the claimed subject matter "subregion comparison" because the submitted copy of awards, event pictures, and letters from noteworthy individuals, could be achieved through promotional activities without involving the properties of the claimed subject matter "subregion comparison" as a matter of necessity, in general.

Thus, the Patent Owner's argument on this point is not persuasive.

In response to the Patent Owner's arguments with respect to the claims 10 and 23 rejection under 35 U.S.C. §103(a) as obvious over PAPA in view of Ioka and Oglo in the Response page 10, lines 12-22, the Examiner believes that the Patent Owner misinterprets the claim rejection.

The Patent Owner essentially argues that Oglo doesn't teach the mosaic-making, region comparison, or even image matching. However, the combination of PAPA and Ioka teaches the argued element. Moreover, in contrary to the Patent Owner's assertion, the claims 1 and 14 are rejected under 35 U.S.C. §103(a) as being unpatentable over PAPA in view of Ioka (See the paragraph 5 of the instant Office action).

Thus, the Patent Owner's argument on this point is not persuasive.

In response to the Patent Owner's arguments with respect to the claims 24 and 25 rejection under 35 U.S.C. §103(a) as obvious over PAPA in view of Ioka and Adobe in the Response page 10, line 24 through page 11, line 3, the Examiner believes that the Patent Owner misinterprets the claim rejection.

The Patent Owner essentially argues that Adobe doesn't teach the mosaic-making, region comparison, or even image matching. However, the combination of PAPA and Ioka teaches the argued element. Moreover, in contrary to the Patent Owner's assertion, the claim 14 is rejected under 35 U.S.C. §103(a) as being unpatentable over PAPA in view of Ioka (See the paragraph 5 of the instant Office action).

Thus, the Patent Owner's argument on this point is not persuasive.

In response to the Patent Owner's arguments with respect to the claims 1, 5, 6, 9, 14, 18, 19, and 22 rejection under 35 U.S.C. §103(a) as obvious over PAPA in view of Stricker in the Response page 11, line 5 through page 12, line 22, the Examiner respectfully disagrees.

The Patent Owner asserts that prior art mosaics were made from images that had been selected as block representation or averages of corresponding tiles, which was the convention in the field at that time, and there is no disclosure in the cited references that would have led one of ordinary skill to use methods of matching complex details of images and tiles - i.e., subregion comparison.

However, the Examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

In this case, let us assume, *arguendo*, that the Patent Owner's assertion is correct, i.e., methods of searching for complex database images (as disclosed in Stricker) would have been considered unfavorable and difficult to use. However, the obviousness of the claimed invention could be established by combining the teachings of the prior art to produce the claimed invention since (i) PAPA discloses making computerized mosaic image, (ii) Stricker teaches retrieving similar image from an image database (See Stricker, page 33), and (iii) rationale for the proper combination of PAPA and Stricker, such that the advantage of selecting the source image with the best similarity metric/score (See Stricker, pages 33-34, 4 Similarity Function).

Secondly, the Patent Owner argues that Stricker is not appropriate for making a mosaic image because the image search in Stricker uses a "query by example". However, there is not any reason that the "query by example" paradigm is not appropriate for making the mosaic image because the query image could be a tile, and the retrieved similar image from the image database would be used for the mosaic image.

The Patent Owner asserts as if Stricker describes only a method for finding images of highly content-specific, e.g., a school of fish. The principal paradigm of the invention of Stricker is the similarity function to determine the similarity of two images (e.g., an image of one-sixth of a person's eye as a query image and it's similar image from the image database) at query time

(See Stricker, page 33), which is not provided by PAPA, i.e., comparing each sub-region of the tile region with a corresponding portion of each source image to produce the measurement of visual similarity (See the paragraph 8 of the instant Office action, Claims 1, 5, 6, 9, 14, 18, 19, and 22 are rejected under 35 U.S.C. §103(a) as being unpatentable over PAPA in view of Stricker).

Thirdly, the Patent Owner argues that Stricker teaches away from the claimed invention because Stricker uses a fuzzy region, which is partially overlapped with a neighboring region. In other words, said fuzzy region is not distinct, and thus, it teaches away from dividing the tiles into distinct sub-regions in the claims.

However, the '498 Patent specification never defines the meaning of the term "distinct," and the dictionary (Merriam-Webster's Collegiate® Dictionary) defines the term "distinct" such as distinguishable to the eye or mind as discrete. Therefore, the claimed limitation "dividing a tile region into distinct sub-regions" could be interpreted as dividing a tile region into distinguishable sub-regions to the eye or mind as discrete (in fact, said fuzzy region could be distinguishable sub-region to the eye or mind as discrete in spite of partially being overlapped with a neighboring region), and the Examiner concludes that Stricker does not teach away from the claimed invention.

Thus, the Patent Owner's argument on this point is not persuasive.

In response to the Patent Owner's arguments with respect to the claims 1, 2, 5, 6, 9, 14, 15, 18, 19, and 22 rejection under 35 U.S.C. §103(a) as obvious over PAPA in view of Lu in the Response page 12, line 24 through page 13, line 29, the Examiner respectfully disagrees.

The Patent Owner asserts that prior art of computerized mosaics were made from images that had been selected as block representation of corresponding tiles, which was the convention in the field at that time, and there is no disclosure in the cited references that would have led one of ordinary skill to use methods of matching complex details of images and tiles to make a mosaic image.

However, the Examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir.

1992).

In this case, let us assume, *arguendo*, that the Patent Owner's assertion is correct, i.e., methods of searching for complex database images (as disclosed in Lu) would have been considered unfavorable and difficult to use. However, the obviousness of the claimed invention could be established by combining the teachings of the prior art to produce the claimed invention since (i) PAPA discloses making computerized mosaic image, (ii) Lu teaches efficiently retrieving similar image from an image database (See Lu, page 100), and (iii) rationale for the proper combination of PAPA and Lu, such that the advantage of selecting the source image with the best similarity metric/score (See Lu, page 101).

Secondly, the Patent Owner argues that PAPA and Lu are not teaching the recited features of the claims, i.e., "utilizing a plurality of source images," and "comparing each sub-region of the tile region with a corresponding portion of each source image".

In contrary to the Patent Owner's argument, PAPA teaches making a mosaic utilizing a plurality of source images, such that making a mosaic (i.e., making a portrait of Nicholas Negroponte) approximating a target image (i.e., master image) by utilizing a plurality of source images (i.e., 1,548 tile images; See PAPA, Fig. 3.3 on page 51). And, Lu teaches comparing each sub-region of the tile region with a corresponding portion of each source image, such that comparing each sub-region of the tile region (i.e., sub-images of Image; See page 99, wherein it states that, in general, at the i^{th} level, the image is subdivided into 4^{i-1} regular regions) with a corresponding portion of each source image to produce the measurement of visual similarity (See page 101, wherein it particularly states that the similarity value at the leaf level provides the best estimate to compare two images).

The combination of PAPA and Lu with rationale for the proper combination, i.e., the advantage of selecting the source image with the best similarity metric/score (See Lu, page 101), renders obviousness of the claimed invention, and thus, the Patent Owner's argument on this point is not persuasive.

In response to the Patent Owner's arguments with respect to the claims 46-50 rejection under 35 U.S.C. §103(a) as obvious over WIRED in view of PAPA and White in the Response page 14, lines 1-27, the Examiner respectfully disagrees.

The Patent Owner argues that mosaic images made by the WIRED method are materially different from the presently claimed mosaic images because of a structural limitation

"shape matching" in the claimed invention.

However, it is noted that the feature upon which the Patent Owner relies (i.e., shape matching) is not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

At second, the Patent Owner alleges that the process in the claim necessarily imparts the claimed mosaic images with significant and superior structural limitations. Even though the exemplary claim 46 recites the process step "sub-region comparison" for improving the conventional processes of making computerized mosaic image, the Examiner believes that the process steps in the claimed invention would not be expected to impart distinctive structural characteristics to the final product "computerized mosaic image" because the product in the product-by-process claim is obvious from a product of the prior art in the record (i.e., said sub-region comparison was prevalent in the art of image retrieval system at the time the invention was made). In fact, the distinctive structural characteristics to the final product "computerized mosaic image" (i.e., allowing contours and shading to transcend the boundaries of the tile regions) would be depend on not only the asserted process "sub-region comparison," but also the set of source images in the database, e.g., how many source images are used for the product mosaic image.

At third, the Patent Owner argues that White does not disclose a mosaic making , sub-region comparison, or even image matching. However, White discloses a computer data storage (See page 49), wherein a storage medium for use with a computer (e.g., floppy disk, hard disk, CD, optical drive) for storing at least one mosaic image (i.e., image file; See pages 50, 51, and 67). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included said storage medium (i.e., said floppy disk, hard disk, CD, optical drive), as disclosed by White, in said product, as disclosed by WIRED in view of PAPA, which was well known that an image file could be stored on said substrate (i.e., floppy disk, hard disk, CD, optical drive; See White, page 50).

Thus, the Patent Owner's argument on this point is not persuasive.

In response to the Patent Owner's arguments with respect to the claims 51, 53, 55, 56, and 59 rejection under 35 U.S.C. §103(a) as obvious over PAPA in view of Ioka and White in the Response page 14, line 29 through page 15, line 25, the Examiner respectfully disagrees.

The Patent Owner argues that mosaic images made by the WIRED method are materially different from the presently claimed mosaic images because of a structural limitation "shape matching" in the claimed invention.

However, it is noted that the feature upon which the Patent Owner relies (i.e., shape matching) is not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

At second, the Patent Owner alleges that the process in the claim necessarily imparts the claimed mosaic images with significant and superior structural limitations. Even though the exemplary claim 51 recites the method step "sub-region comparison" for improving the conventional method of making computerized mosaic image, the Examiner believes that the method steps in the claimed invention would not be expected to impart distinctive structural characteristics to the final product "computerized mosaic image" because the product in the method claim is obvious from a product of the prior art in the record (e.g., Ioka, wherein said sub-region comparison was prevalent in the art of image retrieval system at the time the invention was made). In fact, the distinctive structural characteristics to the final product "computerized mosaic image" (i.e., allowing contours and shading to transcend the boundaries of the tile regions) would be depend on not only the asserted method step "sub-region comparison," but also the set of source images in the database, e.g., how many source images are used for the product mosaic image.

At third, the Patent Owner argues that White does not disclose a mosaic making , sub-region comparison, or even image matching. However, White discloses a computer data storage (See page 49), wherein a storage medium for use with a computer (e.g., floppy disk, hard disk, CD, optical drive) for storing at least one mosaic image (i.e., image file; See pages 50, 51, and 67). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included said storage medium (i.e., said floppy disk, hard disk, CD, optical drive), as disclosed by White, for storing said computer program, as disclosed by PAPA in view of Ioka, which was well known that an image file could be stored on said storage medium (i.e., floppy disk, hard disk, CD, optical drive; See White, page 50).

Thus, the Patent Owner's argument on this point is not persuasive.

In response to the Patent Owner's arguments with respect to the claim 60 rejection under 35 U.S.C. §103(a) as obvious over PAPA in view of Ioka, White, and Oglo in the Response page 15, line 27 through page 16, line 7, the Examiner believes that the Patent Owner misinterprets the claim rejection.

The Patent Owner essentially argues that Oglo doesn't teach the mosaic-making, region comparison, or even image matching. However, the combination of PAPA, Ioka, and White, teaches the argued element. Moreover, in contrary to the Patent Owner's assertion, the claims 51 is rejected under 35 U.S.C. §103(a) as being unpatentable over PAPA in view of Ioka and White (See the paragraph 11 of the instant Office action).

Thus, the Patent Owner's argument on this point is not persuasive.

In response to the Patent Owner's arguments with respect to the claims 51, 52, 55, 56, and 59 rejection under 35 U.S.C. §103(a) as obvious over PAPA in view of Lu and White in the Response page 16, line 9 through page 17, line 6, the Examiner respectfully disagrees.

The Patent Owner argues that mosaic images made by the WIRED method are materially different from the presently claimed mosaic images because of a structural limitation "shape matching" in the claimed invention.

However, it is noted that the feature upon which the Patent Owner relies (i.e., shape matching) is not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

At second, the Patent Owner alleges that the process in the claim necessarily imparts the claimed mosaic images with significant and superior structural limitations. Even though the exemplary claim 51 recites the method step "sub-region comparison" for improving the conventional method of making computerized mosaic image, the Examiner believes that the method steps in the claimed invention would not be expected to impart distinctive structural characteristics to the final product "computerized mosaic image" because the product in the method claim is obvious from a product of the prior art in the record (e.g., Lu, wherein said sub-region comparison was prevalent in the art of image retrieval system at the time the invention was made). In fact, the distinctive structural characteristics to the final product "computerized mosaic image" (i.e., allowing contours and shading to transcend the boundaries of the tile regions) would be depend on not only the asserted method step "sub-region comparison," but

also the set of source images in the database, e.g., how many source images are used for the product mosaic image.

At third, the Patent Owner argues that White does not disclose a mosaic making , sub-region comparison, or even image matching. However, White discloses a computer data storage (See page 49), wherein a storage medium for use with a computer (e.g., floppy disk, hard disk, CD, optical drive) for storing at least one mosaic image (i.e., image file; See pages 50, 51, and 67). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included said storage medium (i.e., said floppy disk, hard disk, CD, optical drive), as disclosed by White, for storing said computer program, as disclosed by PAPA in view of Lu, which was well known that an image file could be stored on said storage medium (i.e., floppy disk, hard disk, CD, optical drive; See White, page 50).

Thus, the Patent Owner's argument on this point is not persuasive.

In response to the Patent Owner's arguments with respect to the claims 51, 55, 56, and 59 rejection under 35 U.S.C. §103(a) as obvious over PAPA in view of Stricker and White in the Response page 17, line 8 through page 18, line 6, the Examiner respectfully disagrees.

The Patent Owner argues that mosaic images made by the WIRED method are materially different from the presently claimed mosaic images because of a structural limitation "shape matching" in the claimed invention.

However, it is noted that the feature upon which the Patent Owner relies (i.e., shape matching) is not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

At second, the Patent Owner alleges that the process in the claim necessarily imparts the claimed mosaic images with significant and superior structural limitations. Even though the exemplary claim 51 recites the method step "sub-region comparison" for improving the conventional method of making computerized mosaic image, the Examiner believes that the method steps in the claimed invention would not be expected to impart distinctive structural characteristics to the final product "computerized mosaic image" because the product in the method claim is obvious from a product of the prior art in the record (e.g., Stricker, wherein said sub-region comparison was prevalent in the art of image retrieval system at the time the invention was made). In fact, the distinctive structural characteristics to the final product

"computerized mosaic image" (i.e., allowing contours and shading to transcend the boundaries of the tile regions) would be depend on not only the asserted method step "sub-region comparison," but also the set of source images in the database, e.g., how many source images are used for the product mosaic image.

At third, the Patent Owner argues that White does not disclose a mosaic making , sub-region comparison, or even image matching. However, White discloses a computer data storage (See page 49), wherein a storage medium for use with a computer (e.g., floppy disk, hard disk, CD, optical drive) for storing at least one mosaic image (i.e., image file; See pages 50, 51, and 67). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included said storage medium (i.e., said floppy disk, hard disk, CD, optical drive), as disclosed by White, for storing said computer program, as disclosed by PAPA in view of Stricker, which was well known that an image file could be stored on said storage medium (i.e., floppy disk, hard disk, CD, optical drive; See White, page 50).

Thus, the Patent Owner's argument on this point is not persuasive.

In response to the Patent Owner's arguments with respect to the claims 29-41 and 43 rejection under 35 U.S.C. §102(b) as anticipated by WIRED and PAPA in the Response page 18, line 7 through page 19, line 22, the Examiner respectfully disagrees.

At the outset, the Patent Owner merely asserts that the end product of the WIRED method and the end product of the recited process steps are not the same. However, it is clear that both of said end products are computerized mosaic images. Even though said two products are not exactly same, the product in the product-by-process claim is obvious from a product of the prior art in the record because the process step "sub-region comparison" was prevalent in the art of image retrieval system at the time the invention was made.

At second, the Patent Owner alleges that the process in the claim necessarily imparts the claimed mosaic images with significant and superior structural limitations. In other words, the Patent Owner alleges that the process step "sub-region comparison" of the product-by-process in the exemplary claim 29 imparts distinctive structural characteristics (e.g., absence of aliasing, shape matching, and contours and shading that transcend the boundaries of the source images) to the final product "computerized mosaic image". However, the Examiner believes that said distinctive structural characteristics could be achieved by not only the process step "sub-region comparison" of the product-by-process in the exemplary claim 29, but also a

large set of source images being used for the product mosaic image without considering. The Examiner emphasizes that the end product mosaic image from the invention with a limited number of source images might not be better than the end product mosaic image from the prior art with a large number of source images with regard to said distinctive structural characteristics.

Thus, the Patent Owner's argument on this point is not persuasive.

STATEMENT OF REASONS FOR PATENTABILITY AND/OR CONFIRMATION

17. Claims 4, 7, 8, 17, 20, 21, 42, 44, 45, 54, 57, and 58 are confirmed.

18. The following is an Examiner's statement of reasons for patentability and/or confirmation of the claims found patentable in this reexamination proceeding:

With respect to claims 4, 17, and 54, the claim limitation of the respective claims 4, 17, and 54 is deemed patentable over the prior art of record as the prior art fails to teach or suggest that no one source image appears more than once in the mosaic image.

With respect to claims 7, 8, 20, 21, 57, and 58, the claim limitation of the respective claims 7, 20, and 57 is deemed patentable over the prior art of record as the prior art fails to teach or suggest that, in case of a captured source image in landscape format, cropping the captured from center.

The claims 8, 21, and 58 are dependent claims of the claims 7, 20, and 57, respectively.

With respect to claims 10, 23, and 60, the claim limitation of the respective claims 10, 23, and 60 is deemed patentable over the prior art of record as the prior art fails to teach or suggest that the captured images are stored at different levels of resolution.

With respect to claim 42, the claim limitation of the claim 42 is deemed patentable over the prior art of record as the prior art fails to teach or suggest said article including printout from a digital printer.

With respect to claim 44, the claim limitation of the claim 44 is deemed patentable over the prior art of record as the prior art fails to teach or suggest said article including photographic paper.

With respect to claim 45, the claim limitation of the claim 45 is deemed patentable over the prior art of record as the prior art fails to teach or suggest said article including photographic film.

Any comments considered necessary by PATENT OWNER regarding the above statement must be submitted promptly to avoid processing delays. Such submission by the patent owner should be labeled: "Comments on Statement of Reasons for Patentability and/or Confirmation" and will be placed in the reexamination file.

Conclusion

19. **THIS ACTION IS MADE FINAL.**

A shortened statutory period for response to this action is set to expire TWO(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 effect 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.

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

By EFS: Registered users may submit via the electronic filing system EFS-Web, at http://sportal.uspto.gov/authenticate/authenticateuserlocalepf.html

By Mail to: Mail Stop *Ex Parte* Reexam
Central Reexamination Unit
Commissioner for Patents
United States Patent & Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

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

By hand: Customer Service Window
Randolph Building
401 Dulany Street
Alexandria, VA 22314

For EFS-Web transmissions, 37 CFR 1.8(a)(1)(i) (C) and (ii) states that correspondence (except for a request for reexamination and a corrected or replacement request for reexamination) will be considered timely filed if (a) it is transmitted via the Office's electronic filing system in accordance with 37 CFR 1.6(a)(4), and (b) includes a certificate of transmission for each piece of correspondence stating the date of transmission, which is prior to the expiration of the set period of time in the Office action.

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

Signed:

/Christopher E. Lee/

Primary Patent Examiner (Reexamination)
Central Reexamination Unit / Art Unit 3992

Conferees:

JESSICA HARRISON
SUPERVISORY PATENT EXAMINER