Google LLC,
Petitioner
v.
138 East LCD Advancements Limited,
Patent Owner

U.S. Pat. No. 7,486,807
IPR2024-00960
Oral Argument September 30, 2025

Patent Owner's Oral Hearing Demonstrative Exhibit

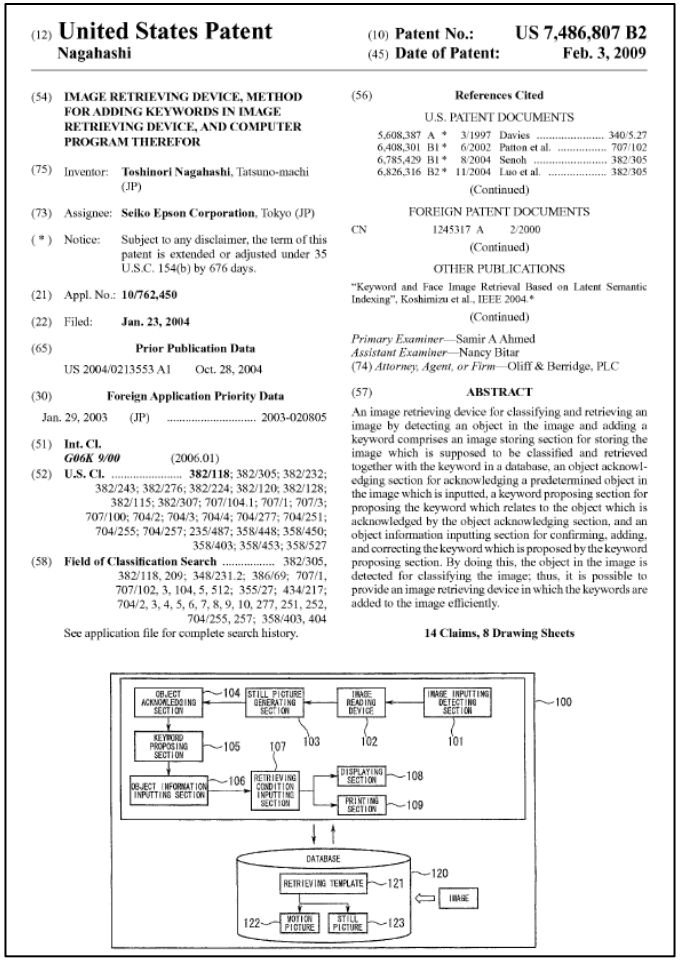
Agenda

- ’807 Patent Background
  - Object detection vs. object similarity determination
- Claim Construction and the Unrebutted Testimony of Dr. Papanikolopoulos
- Ground 1: Stubler Does not Anticipate or Render Obvious Claims 1-14.
- Ground 2: Stubler in View of Wang Does Not Render Dependent Claims 2-4 and 9-12 obvious.

’807 Patent Background

- The ’807 Patent, entitled “Image Retrieving Device, Method For Adding Keywords In Image Retrieving Device, And Computer Program Therefor” generally relates to techniques for associating and storing keyword metadata with digital image files and objects appearing in the digital image files.

(EX1001 at Title, POR at 6.)



(12) **United States Patent**
Nagahashi

(10) **Patent No.: US 7,486,807 B2**
(45) **Date of Patent: Feb. 3, 2009**

(54) **IMAGE RETRIEVING DEVICE, METHOD FOR ADDING KEYWORDS IN IMAGE RETRIEVING DEVICE, AND COMPUTER PROGRAM THEREFOR**

(75) Inventor: **Toshinori Nagahashi**, Tatsuno-machi (JP)

(73) Assignee: **Seiko Epson Corporation**, Tokyo (JP)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 676 days.

(21) Appl. No.: **10/762,450**

(22) Filed: **Jan. 23, 2004**

(65) **Prior Publication Data**

US 2004/0213553 A1 Oct. 28, 2004

(30) **Foreign Application Priority Data**

Jan. 29, 2003 (JP) 2003-020805

(51) **Int. Cl.**
G06K 9/00 (2006.01)

(52) **U.S. Cl.** **382/118**; 382/305; 382/232; 382/243; 382/276; 382/224; 382/120; 382/128; 382/115; 382/307; 707/104.1; 707/1; 707/3; 707/100; 704/2; 704/3; 704/4; 704/277; 704/251; 704/255; 704/257; 235/487; 358/448; 358/450; 358/403; 358/453; 358/527

(58) **Field of Classification Search** 382/305, 382/118, 209; 348/231.2; 386/69; 707/1, 707/102, 3, 104, 5, 512; 355/27; 434/217; 704/2, 3, 4, 5, 6, 7, 8, 9, 10, 277, 251, 252, 704/255, 257; 358/403, 404

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,608,387 A * 3/1997 Davies 340/5.27
6,408,301 B1 * 6/2002 Patton et al. 707/102
6,785,429 B1 * 8/2004 Senoh 382/305
6,826,316 B2 * 11/2004 Luo et al. 382/305

(Continued)

FOREIGN PATENT DOCUMENTS

CN 1245317 A 2/2000

(Continued)

OTHER PUBLICATIONS

“Keyword and Face Image Retrieval Based on Latent Semantic Indexing”, Koshimizu et al., IEEE 2004.*

(Continued)

Primary Examiner—Samir A Ahmed
Assistant Examiner—Nancy Bitar
(74) *Attorney, Agent, or Firm*—Oliff & Berridge, PLC

(57) **ABSTRACT**

An image retrieving device for classifying and retrieving an image by detecting an object in the image and adding a keyword comprises an image storing section for storing the image which is supposed to be classified and retrieved together with the keyword in a database, an object acknowledging section for acknowledging a predetermined object in the image which is inputted, a keyword proposing section for proposing the keyword which relates to the object which is acknowledged by the object acknowledging section, and an object information inputting section for confirming, adding, and correcting the keyword which is proposed by the keyword proposing section. By doing this, the object in the image is detected for classifying the image; thus, it is possible to provide an image retrieving device in which the keywords are added to the image efficiently.

14 Claims, 8 Drawing Sheets

’807 Patent Background – Goal

“[I]mages which are supposed to be classified and detected are saved in [a] database together with the[ir] keywords by the image storing section.”

(EX1001 at 4:5-7; POR at 7, EX2001, ¶ 48.)

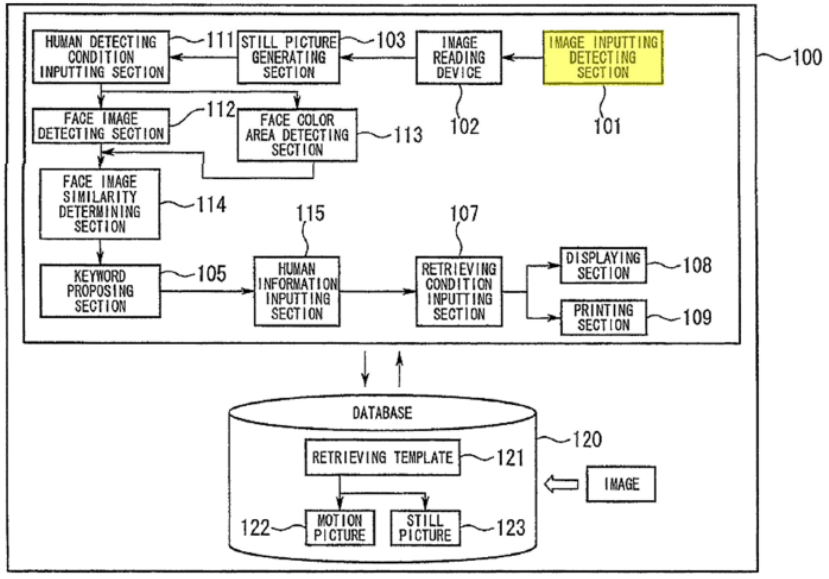
SUPERIOR KEYWORD 1	SUBORDINATE KEYWORD 2	NAME	BIRTHDAY	IMAGE
FAMILY	SECND ELDEST BROTHER	JIRO	JANUARY 1, 2003	IMAGE 1:TAKEN ON JANUARY 1, 2003 IMAGE 2:TAKEN ON FEBRUARY 1, 2003 IMAGE 3:TAKEN ON MARCH 1, 2003

’807 Patent Background – Image Capture

- Image detection may be performed by an image inputting detection section.

(EX1001 at 4:7-10; POR at 7.)

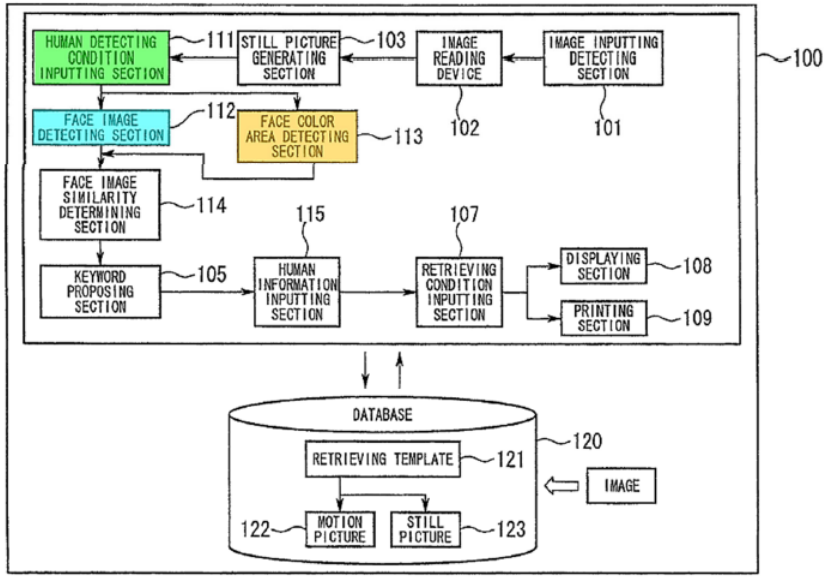
FIG.2



’807 Patent Background – Object Detection

- After image capture, object detection occurs.
- For example, the system’s human detecting condition inputting section “sets up a condition for determining whether or not a human is contained in an image.” (EX1001 at 8:15-17; POR at 8; EX2001, ¶ 50.)
- The system detects the presence of a human face either by detecting a face image or face color. (EX1001 at 8:17-20; POR at 8; EX2001, ¶ 50.)
- The face image detecting section “detects . . . whether or not a face image is contained in the image by analyzing the image” such as through frequency analysis or matching with pre-stored patterns. (EX1001 at 8:23-25; POR at 8-9; EX2001, ¶ 50.)
- The face color area detecting section may detect a face using skin color detection. (EX1001 at 11:22-30; POR at 9; EX2001, ¶ 50.)

FIG.2

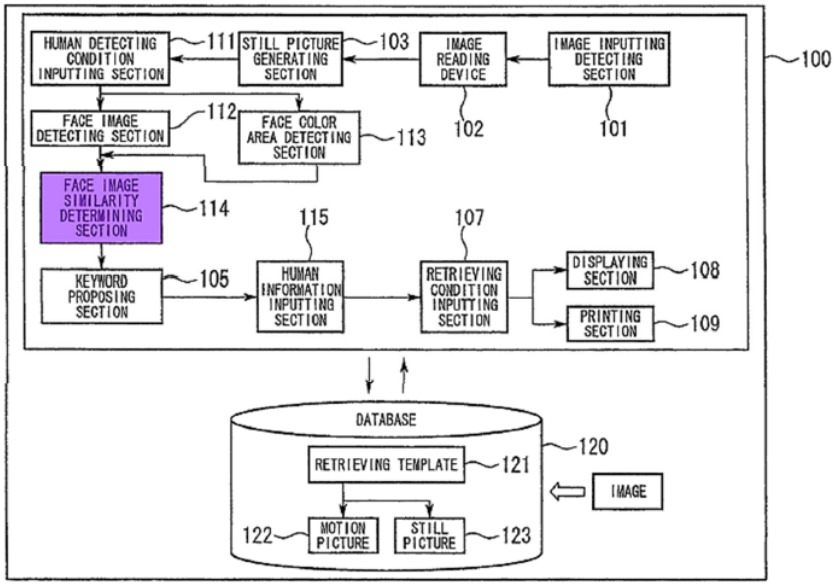


’807 Patent Background – Object Similarity Determination

- The face image similarity determining section may generate a mosaic pattern of the face image which can then be compared to other mosaic patterns stored in the database to identify specifically similar faces. (EX1001 at 11:58-67; POR at 11; EX2001, ¶ 52.)

- “[I]t is possible to employ a method which is disclosed in Japanese Unexamined Patent Application, First Publication No. Hei. 8-221547 for determining such similarity by forming a density image of a face so as to classify the category.” (EX1001 at 8:63-67; POR at 11; EX2001, ¶ 52; EX2003, EX2004.)

FIG.2



’807 Patent Background – Two Step Process

- Object Detection
  - The image retrieving device detects a general type of object, such as a human face. (EX1001 at 8:14-21; POR sat 16.)

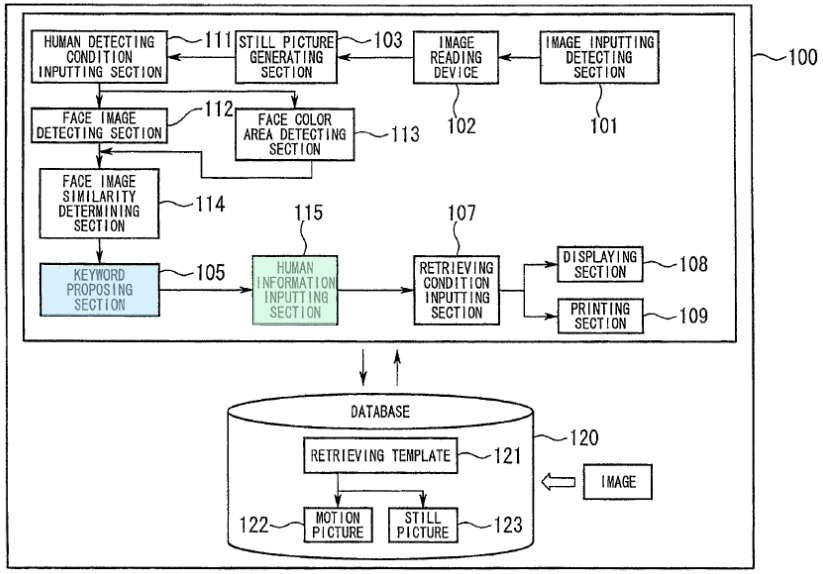
- Object Similarity Determination
  - The detected object is compared to determine whether a similar (i.e., “specific” or “very similar”) object has previously been stored in the database. (EX1001 at 8:60-67; POR at 17; EX2001, ¶ 61.)

’807 Patent Background – Keyword Proposing

- If the system acknowledges a similar, specific object in an input image, the system uses a priority-based ruleset to retrieve keyword metadata associated with that specific object from the database to present to the user for confirmation or modification. (EX1001 at 9:2-6; POR at 12-13; EX2001, ¶ 54.)

- When prompted with specific proposed keywords retrieved from the database, the user can select or correct an existing keyword or add a new one associated with the input image. (EX1001 at 12:5-10; POR at 13; EX2001, ¶ 54.)

FIG. 2



Claims of the ’807 Patent – Claim 1

1. An image retrieving device for classifying and retrieving an image by detecting an object in the image and adding a keyword, the image retrieving device comprising:

an image storing section for storing the image which is supposed to be classified and retrieved together with a keyword in a database and an object of the image being previously contained in the database;

an image inputting detecting section that detects an inputted image that is newly inputted to the image retrieving device;

an object acknowledging section for acknowledging an inputted object in the inputted image that has been detected by the image inputting detecting section;

a keyword proposing section for proposing the keyword on a display, the keyword which relates to the inputted object which is acknowledged by the object acknowledging section; and

an object information inputting section for confirming by the user, adding, and correcting the keyword which is proposed by the keyword proposing section when the inputted object acknowledged by the object acknowledging section is similar to the object of the image previously contained in the database.

(EX1001 at 13:32-54.)

Claims of the ’807 Patent – Claim 2

2. An image retrieving device according to claim 1, wherein the object acknowledging section includes:

a human detection condition inputting section for setting up conditions for determining whether or not the image contains a human;

a face image detecting section for detecting a face image in the image; and

a face image similarity determining section for detecting a face image which is detected by the face image detecting section so as to detect a similar face image stored in the database according to the detected face imaged.

(EX1001 at 13:55-65.)

Claims of the ’807 Patent – Claim 7

7. A method for adding keywords in an image retrieving device for classifying and retrieving an image by detecting an object in the image and adding a keyword, the method comprising:

storing the image which is supposed to be classified and retrieved together with the keyword in a database and an object of the image being previously contained in the database;

detecting an inputted image that is newly inputted to the image retrieving device by an image inputting detection section;

acknowledging an inputted object in the inputted image that has been detected by the image inputting detecting section;

proposing a keyword on a display, the keyword which relates to the inputted object which is acknowledged by an object acknowledging section; and

confirming by the user, adding, and correcting the keyword which is proposed by the keyword proposing section when the inputted object acknowledged by the object acknowledging section is similar to the object of the image previously contained in the database.

(EX1001 at 14:17-38.)

Claims of the ’807 Patent – Claim 8

8. A computer readable medium storing a computer program for operating an image retrieving device which classifies and retrieves an image by detecting an object in the image and adding a keyword, the storage medium comprising:

storing the image which is supposed to be classified and retrieved together with a keyword in a database and an object of the image being previously contained in the database;

detecting an inputted image that is newly inputted to the image retrieving device by an image inputting detecting section;

acknowledging an inputted object in the image that has been detected by the image inputting detecting section;

proposing the keyword on a display, the keyword which relates to the inputted object which is acknowledged by an object acknowledging section; and

confirming by the user, adding, and correcting the keyword which is proposed by the keyword proposing section when the inputted object acknowledged by the object acknowledging section is similar to the object in the image previously contained in the database.

(EX1001 at 14:39-59.)

CLAIM CONSTRUCTION

Claim Construction: More than Generic Similarity

- The parties' main dispute relates to what degree of similarity between objects the challenged claims require.
  - "Similar to the object of the image previously contained in the database" means "sufficiently similar to identify the specific object of the image previously contained in the database."

Claim Construction – Specification

- The ’807 Patent refers repeatedly to identifying a “specific” object or person.

- The ’807 Patent also teaches that the similarity determination identifies faces that “coincide” with previously stored faces or are “very similar” to previously stored faces.

(POR at 15-16.)

> thus, it is possible to retrieve the image which contains a specific object among numerous images accurately and efficiently.

(EX1001 at 4:22-24.)

> the keywords which relate to the human in the image; thus, it is possible to retrieve the image which contains a specific person accurately and efficiently among numerous images.

(EX1001 at 4:51-53.)

> If it is determined that the face image coincides to the face image which is contained previously or that the face image is very similar to the face image which is contained previously, the information for such a human is proposed so as to expedite the user to confirm.

(EX1001 at 9:18-22.)

Claim Construction - Specification

- "[I]t is possible to employ a method which is disclosed in Japanese Unexamined Patent Application, First Publication No. Hei. 8-221547 for determining such similarity by forming a density image of a face so as to classify the category."

(EX1001 at 8:63-67; POR at 11; EX2001, ¶ 52; EX2003, EX2004.)

> The face image similarity determining section **114** refers to the database **120** so as to check whether or not a similar face image to the detected face image is contained. Here, it is possible to employ a method which is disclosed in Japanese Unexamined Patent Application, First Publication No. Hei. 8-221547 for determining such a similarity by forming a density image of a face so as to classify the category.

Claim Construction - Specification

- The ’807 patent provides a guiding example in which a specific person, “Jiro,” is detected by comparing an image with prior images of Jiro.

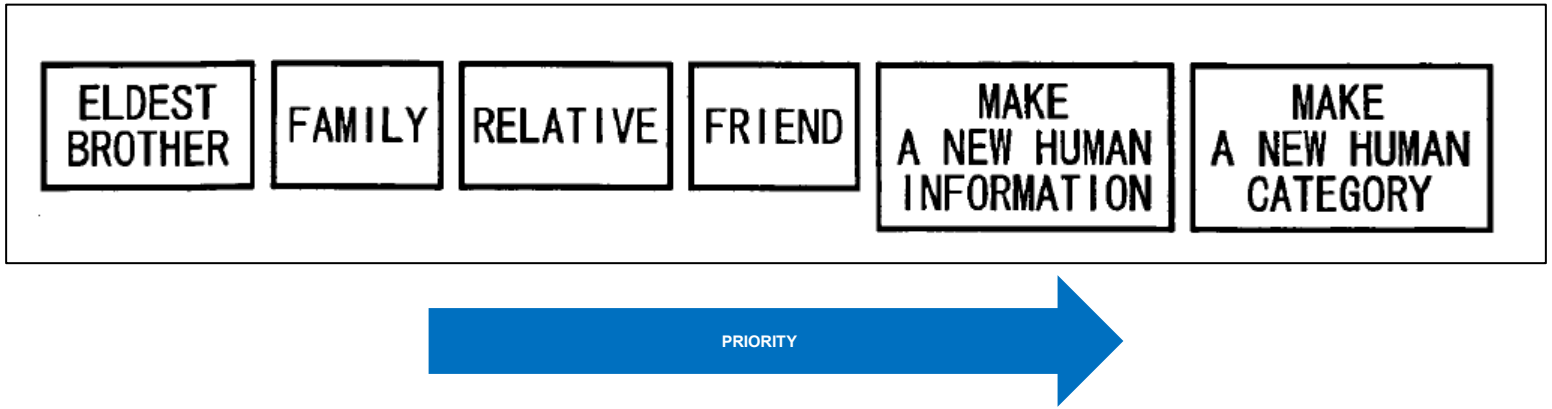
(POR at 19.)

SUPERIOR KEYWORD 1	SUBORDINATE KEYWORD 2	NAME	BIRTHDAY	IMAGE
FAMILY	SECND ELDEST BROTHER	JIRO	JANUARY 1, 2003	IMAGE 1:TAKEN ON JANUARY 1, 2003 IMAGE 2:TAKEN ON FEBRUARY 1, 2003 IMAGE 3:TAKEN ON MARCH 1, 2003

Claim Construction - Specification

- The ’807 Patent identifies a hierarchical approach to suggesting keywords, beginning with the identity of a specific person (eldest brother) and proceeding to more generic categories.

(EX1001 at 9:30-37; Sur-Reply at 11.)



Claim Construction – The Claim Language (Claim 1)

- Claim 1 is object-agnostic.
  - Does not require a specific type of object
- Requires a determination of "similar" objects, but does not require that the similarity determination occur in any particular section

(POR at 14; Sur-Reply at 4-5.)

an object acknowledging section for acknowledging an inputted object in the inputted image that has been detected by the image inputting detecting section;
a keyword proposing section for proposing the keyword on a display, the keyword which relates to the inputted object which is acknowledged by the object acknowledging section; and
an object information inputting section for confirming by the user, adding, and correcting the keyword which is proposed by the keyword proposing section when the inputted object acknowledged by the object acknowledging section is similar to the object of the image previously contained in the database.

(EX1001 at 13:42-54.)

Claim Construction – The Claim Language (Claim 2)

- Limits the invention to a specific object type: human faces
- Limits the similarity determination to the "face similarity determining section" within the "object acknowledging section"
- Adds context regarding the previously claimed similarity determination

(POR at 20-21; Sur-Reply at 4-5.)

2. An image retrieving device according to claim 1, wherein the object acknowledging section includes:

a human detection condition inputting section for setting up conditions for determining whether or not the image contains a human;

a face image detecting section for detecting a face image in the image; and

a face image similarity determining section for detecting a face image which is detected by the face image detecting section so as to detect a similar face image stored in the database according to the detected face imaged.

(EX1001 at 13:55-65.)

Claim Construction – The Claim Language (Claim 5)

- Depends from Claim 2
- Details the "negative branch," *i.e.*, what happens when a similar face is not detected
  - Shows that the face image similarity determining section is capable of determining that faces are *not* similar.

(POR at 20-21.)

> **5.** An image retrieving device according to claim **2** further comprising a keyword proposing section for proposing the keyword to the image which is inputted last in a case in which the similar face image is not detected by the face image similarity determining section.

(EX1001 at 14:8-12.)

Claim Construction – Unrebutted Expert Testimony

- Patent Owner's expert, Dr. Papanikolopoulos, addressed the proper construction of "similar to the object of the image previously contained in the database." (EX2001, ¶¶ 56-69.)

- Petitioner's expert, Dr. Stevenson, stated only that, in his opinion, none of the claim terms require further construction. (EX1003, ¶52.)

- Dr. Stevenson did not submit a declaration addressing Dr. Papanikolopoulos' opinions regarding claim construction. (Sur-Reply at 13.)

Claim Construction – Unrebutted Expert Testimony

Dr. Papanikolopoulos	Dr. Stevenson
"[I]t is my opinion that the '807 describes the invention in such a way that makes clear that the invention requires more than generic similarity between objects." (EX2001, ¶ 57.)	

Claim Construction – Unrebutted Expert Testimony

Dr. Papanikolopoulos	Dr. Stevenson
"The specification describes 'similarity' using language that makes clear to a POSITA that the level of 'similarity' is higher than generic similarity; it is similarity to the level of a specific object." (EX2001, ¶ 58.)	

Claim Construction – Unrebutted Expert Testimony

Dr. Papanikolopoulos	Dr. Stevenson
"By using words like 'coincides' and 'very similar,' it is my opinion that the specification makes clear to a POSITA that the '807 patent uses the term 'similar' to mean more than just generic, categorical similarity." (EX2001, ¶ 59.)	

Claim Construction – Unrebutted Expert Testimony

Dr. Papanikolopoulos	Dr. Stevenson
"[I]t is my opinion that a POSITA would understand based on the two-step process of identifying an object generally and then comparing it to previously stored objects to determine whether it is similar to any of the previously stored objects to support the construction of 'similar to the object of the image previously contained in the database' to mean 'sufficiently similar to identify the specific object of the image previously contained in the database.'" (EX2001, ¶ 59.)	

Institution Decision

- At institution, the Board interpreted claim 1 as only reciting "generic similarity." (Institution Decision at 15.)
  - The Board did not have the benefit of Patent Owner's full claim construction analysis.
  - The Board did not have the benefit of the unrebutted testimony of Dr. Papanikolopoulos.
  - The Board should revise its finding because the record at institution was incomplete. *TriVascular, Inc. v. Samuels*, 812 F.3d 1056, 1068 (Fed. Cir. 2016) ("[T]he Board is not bound by any findings made in its Institution Decision. At that point, the Board is considering the matter preliminarily without the benefit of a full record. The Board is free to change its view of the merits after further development of the record, and should do so if convinced its initial inclinations were wrong.") (POR at 18.)

Claim Construction – Implications of Proper Construction

- an object information inputting section for confirming by the user, adding, and correcting the keyword which is proposed by the keyword proposing section when the inputted object acknowledged by the object acknowledging section is similar to the object of the image previously contained in the database.

  – The object information inputting section performs a **particular operation** "when the inputted object acknowledged by the object acknowledging section is **similar to the object of the image previously contained in the database**."

  – The proper construction tells us that **"similar to the object of the image previously contained in the database"** means **"sufficiently similar to identify the specific object of the image previously contained in the database."**

  – Thus, an "object of the image previously contained in the database" ***must*** be usable to determine whether an inputted object in a new image is "sufficiently similar to identify the specific object of the image previously contained in the database."

  (POR at 29-33; EX2001, ¶ 80.)

GROUND 1 – STUBLER DOES NOT ANTICIPATE OR RENDER OBVIOUS CLAIMS 1-14

Stubler Does Not Teach or Suggest the Image Storing Section

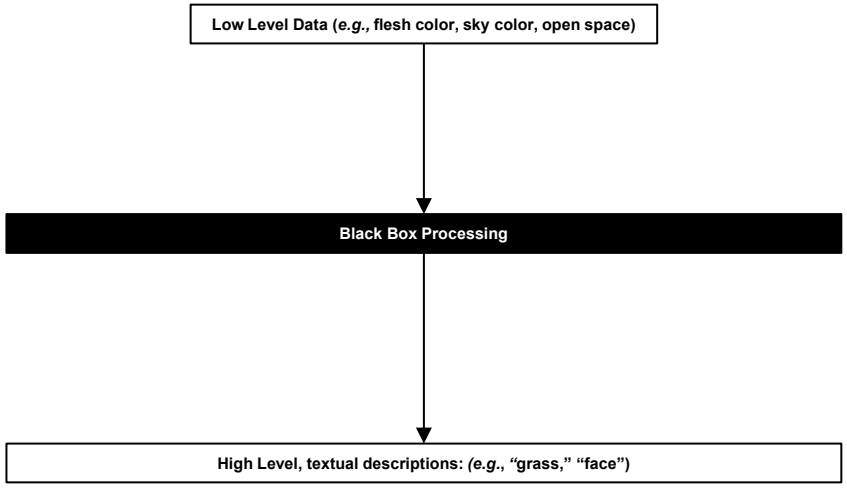
- Petitioner argues that Stubler's disclosure of "region metadata" discloses the claimed "object of the image." (Pet. at 20-21.)
- Stubler does not disclose an image storing section storing an image with an object of the image because Stubler's disclosure of "region metadata" is not usable to determine whether an inputted object in a new image is "sufficiently similar to identify the specific object of the image previously contained in the database."

(POR at 37-41.)

an image storing section for storing the image which is supposed to be classified and retrieved together with a keyword in a database and an object of the image being previously contained in the database.

Stubler's Disclosure of "region metadata"

- "Region metadata" includes "detected regional features, such as face, skin, sky, grass, open space [or] background vs. foreground." (EX1005 at ¶[0030]; EX2001, ¶ 71, POR at 22, 33-34.)
- Stubler explains that regional processing yields "high-level feature description" and not the high-level features themselves (or a representation thereof). (EX1005 at ¶[0022]; EX2001, ¶ 86; POR at 34.)
- In other words, Stubler generates region metadata, which is just a word that described at a high level what is in that region, such as "grass" or "face." (POR at 34).
- high-level region metadata is "derived from lower level data (e.g., flesh color, sky color and distribution, open space)." (EX1005 at ¶[0028]; EX2001, ¶ 87; POR at 34.)



How Does Stubler Generate Regional Metadata?

- Sung 1998 (EX1007)
  - Sung deals with **face-detection** (*i.e.*, determining the location and size of a face)
  - "face detection" is distinct from "facial recognition"
  - Output of Sung is a binary "yes" ("face") or "no" ("nonface").

(EX1007 at 1-2; EX2001, ¶ 88; POR at 35).

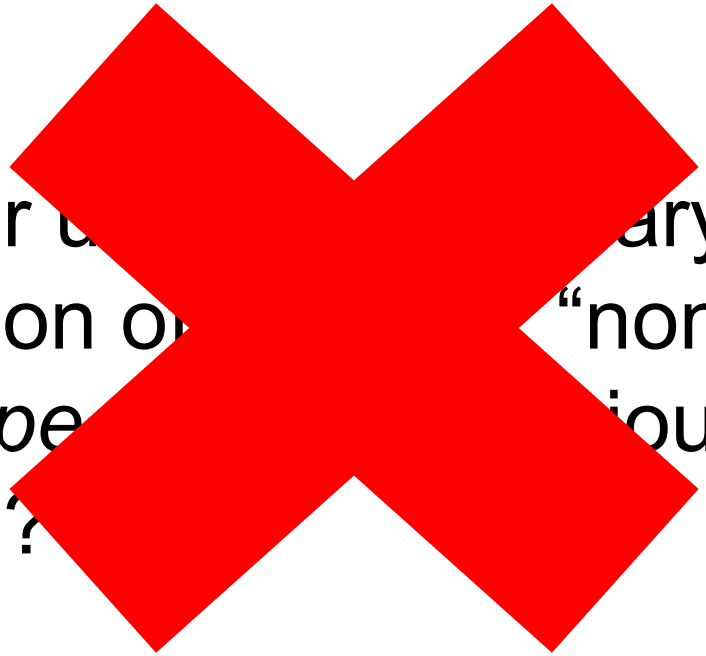
1.1 The Face-Detection Problem

Face *detection* determines the location and size of each human face (if any) in an input image. A closely related problem is face *recognition*: Compare an input face image against

Clearly, the most critical part of our system is the algorithm for classifying window patterns as "faces" or "nonfaces." Fig. 1c shows the key components of the algo-

How Does Stubler Generate Regional Metadata?

- Can Stubler u… …ary determination o… …“nonface” to identify a *spe*… …iously stored in a database?



How Does Stubler Generate Regional Metadata?

- Yang 1996 (EX1009)
  - Identifies skin color in a chromatic color space
  - Used to detect or locate, generally, the presence of a face, not to identify a specific face
  - Output is a location of a face

(EX1009 at 4; EX2001, ¶ 89; POR at 35-36.)

4 A Real-time System

We have developed a real-time face tracker [22]. The system consists of an HP-9000 workstation and a Canon camera (VC-C1). The camera's panning, tilting, and zooming are controlled by the computer via a serial port. Images are obtained by a framegrabber which digitizes the analog video signal into RGB values. The objective of the system is to provide the following functions in real-time:

- Locating arbitrary human faces in various environments in real-time;
- Tracking the face in real-time by controlling the camera position and zoom after selecting a face;
- Adapting model parameters based on individual appearance and lighting conditions in real-time;
- Providing face location for user modeling applications in real-time.

How Does Stubler Generate Regional Metadata?

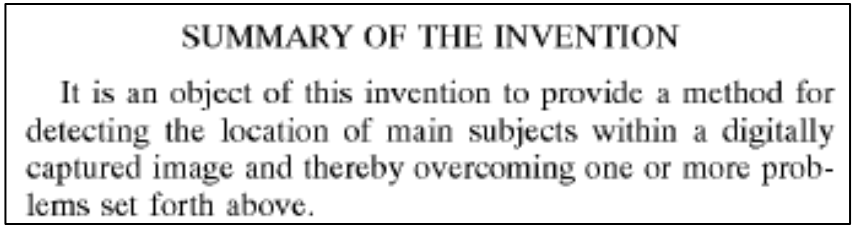


- Can Stubler us[illegible]etermination of a location of a fa[illegible]y a *specific* face previously s[illegible]se?

How Does Stubler Generate Regional Metadata?

- Luo (EX1008)
  - Luo, like Sung and Yang is concerned only with determining the location of objects.
  - Luo does not identify the object, or even save it.

(EX1008 at 3:58-60; EX2001, ¶ 90; POR at 36-37.)



SUMMARY OF THE INVENTION

It is an object of this invention to provide a method for detecting the location of main subjects within a digitally captured image and thereby overcoming one or more problems set forth above.

How Does Stubler Generate Regional Metadata?

- Can Stubler use termination of a location of an ntify a *specific* object previ database?



Stubler's Region Metadata Is Not an Object of an Image

- Stubler's "region metadata," as disclosed in Sung, Yang, and Luo is not usable to determine whether the image to be classified includes an object that is "similar to the object of the image previously contained in the database."
  - High-level feature descriptions (*e.g.*, clear sky, cloudy sky, mixed sky, face) are textual descriptions that lack sufficient information to be used to identify specific objects (*e.g.*, "Jiro"). (EX2001, ¶ 94-95; POR at 38-39.)
    - The best a system using high-level feature descriptions could do is to determine that two images contain ***a*** face, but not that they contain ***the same*** face. (EX2001, ¶ 94-95; POR at 38-39.)
  - Low-level features (color representation, area coverage, location) also lack sufficient information to be sued to identify specific objects. (EX2001, ¶ 96-97; POR at 39-40.)
    - Stubler does not disclose how such features could be used to determine whether two images contain ***the same*** object (*e.g.*, face). (EX2001, ¶ 96-97; POR at 39-40.)

Stubler Does not Teach or Suggest the Object Information Inputting Section

- This element requires a similarity determination between an inputted object and a previously stored object.
- The proper construction requires the ability to determine whether the inputted object is sufficiently similar to identify the specific object of the image previously contained in the database.
- Stubler's "region metadata" cannot be used to make such a determination and therefore cannot meet this limitation either.

(POR at 41-42; EX2001, ¶ 100.)

an object information inputting section for confirming by the user, adding, and correcting the keyword which is proposed by the keyword proposing section when the inputted object acknowledged by the object acknowledging section is similar to the object of the image previously contained in the database.

Petitioner Cannot Rely on Stubler's Reference to Turk (EX1010)

- Petitioner relies on Turk (EX1010) to allegedly show that Stubler's region metadata is usable to determine similarity.
  - This argument fails because Turk is not incorporated by reference into Stubler, nor is it included in the instituted grounds
  - This argument also fails because Stubler does not teach using the methods of Turk for similarity determinations, but for a different step (clustering).

(Pet. at 42; Reply at 20-22.)

Petitioner Cannot Rely on Stubler's Reference to Turk (EX1010)

- Turk is not part of Stubler because it is not incorporated by reference.
- Turk is not cited in the Grounds of Unpatentability.
- Therefore, Turk cannot be relied on to supply an essential element to a claim. *Bank of America, N.A. v. Nant Holdings IP, LLC*, IPR2021-01304, Paper 42, 55-56 (P.T.A.B. Feb. 1, 2023).

(POR at 23; Sur-Reply at 18-20.)

[0034] For other types of metadata, the data may already be represented in a form suitable for clustering. For instance, in the preferred embodiment time/date information is used and may be directly subjected to cluster analysis. In other cases, for example that of region metadata, the data may need to be processed for similarity by known algorithms. As an example, determination of facial similarity is described in M. Turk and A. Pentland, "Eigenfaces for Recognition", *J. Cognitive Neurosci.* 3(1)1991.

(EX1005 at ¶ [0034].)

Stubler Does Not Disclose Using Turk in the Similarity Determination

- Even if Turk were part of Stubler, Stubler teaches using Turk for clustering, not similarity evaluation.

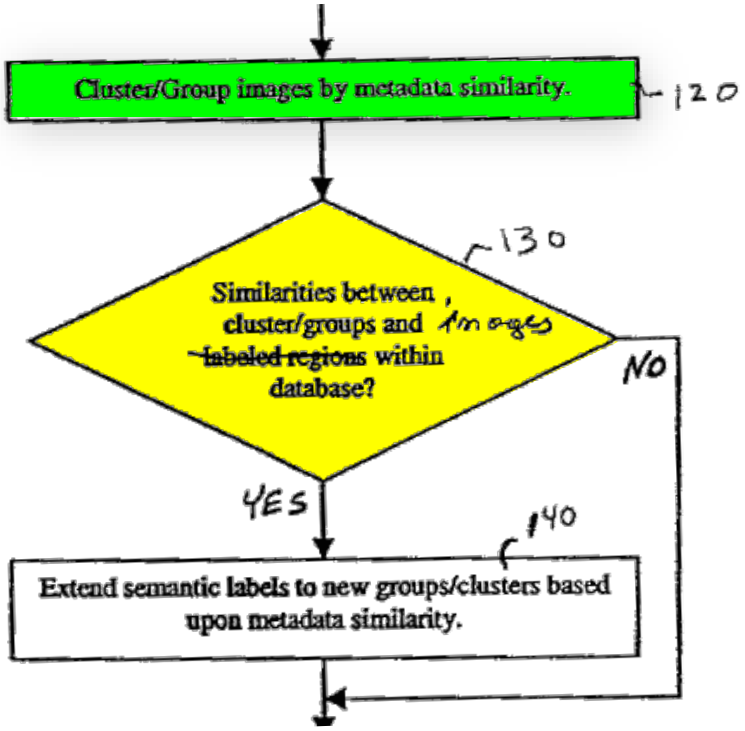
[0034] For other types of metadata, the data may already be represented in a form suitable for clustering. For instance, in the preferred embodiment time/date information is used and may be directly subjected to cluster analysis. In other cases, for example that of region metadata, the data may need to be processed for similarity by known algorithms. As an example, determination of facial similarity is described in M. Turk and A. Pentland, "Eigenfaces for Recognition", *J. Cognitive Neurosci.* 3(1)1991.

(EX1005 at ¶ [0034].)

Stubler Does Not Disclose Using Turk in the Similarity Determination

- Stubler discloses a two-step process
- First, similar images are clustered together
- Second, a similarity comparison between the clustered images and images stored in a database

(EX1005 at Fig. 2.)



Stubler Does Not Disclose Using Turk in the Similarity Determination

- In Stubler, clustering (102), and similarity evaluation(103) are separate steps.

(POR at 22-23; Sur-Reply at 22.)

[0031] Acquired images are clustered or grouped by meta-data similarity (120) based upon one or more of the foregoing objectively measurable or determinable features. Cluster analysis organizes data by abstracting underlying structure either as a grouping of individuals or as a hierarchy of groups. Typical clustering techniques are described in A. K. Jain and R. C. Dubes, *Algorithms for Clustering Data*, Prentice-Hall: 1988, particularly pp. 55-60, 89-92 and 133-135. Once the data is clustered or grouped, the presence of any similarities are evaluated (130) between the clusters and groups and the images within the database, or between the labeled regions of the clusters and groups and labeled regions of images within the database. This evaluation may be based upon event similarity (e.g., date/time), global similarity (e.g., color or texture) or region similarity (e.g., faces).

(EX1005 at ¶ [0031].)

Stubler Does Not Disclose Using Turk in the Similarity Determination

- While Stubler suggests using Turk's methods for *clustering* (102), Stubler does not suggest using Turk's methods for *similarity determination* (103).

(POR at 22-23; Sur-Reply at 22.)

[0034] For other types of metadata, the data may already be represented in a form suitable for clustering. For instance, in the preferred embodiment time/date information is used and may be directly subjected to cluster analysis. In other cases, for example that of region metadata, the data may need to be processed for similarity by known algorithms. As an example, determination of facial similarity is described in M. Turk and A. Pentland, "Eigenfaces for Recognition", *J. Cognitive Neurosci.* 3(1)1991.

(EX1005 at ¶ [0034].)

GROUND 2: STUBLER IN VIEW OF WANG DOES NOT RENDER DEPENDENT CLAIMS 2-4 AND 9-12 OBVIOUS

Ground 2 only relates to dependent claims

- Claims 2-4 depend from independent claim 1.
- Claims 9-12 depend from independent claim 8.
- Because Petitioner has failed to demonstrate the unpatentability of any independent claim by a preponderance of the evidence, ground 2 fails for the same reasons as Ground 1.

CONCLUSION

Conclusion: Claims 1-14 Should Be Upheld

- Claim construction: "similar to the object of the image previously contained in the database" means "sufficiently similar to identify the specific object of the image previously contained in the database."
  - an "object of the image previously contained in the database" must be usable to determine whether an inputted object in a new image is "sufficiently similar to identify the specific object of the image previously contained in the database."

- Validity: Petitioner fails to demonstrate by a preponderance of the evidence that Stubler anticipates or renders obvious the claimed "image storing section," including storing an "object of the image."

- Validity: Petitioner fails to demonstrate by a preponderance of the evidence that Stubler anticipates or renders obvious the claimed "object information inputting section," including taking certain actions when it is determined that an inputted object is "sufficiently similar to identify the specific object of the image previously contained in the database."

- Petitioner's challenge under Ground 2 fails because it challenges only dependent claims.