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**AMERICAN BAR ASSOCIATION**

October 28, 2014

Via e-mail: [andrew.hirshfeld@uspto.gov](mailto:andrew.hirshfeld@uspto.gov)

Mr. Drew Hirshfeld  
Deputy Commissioner for Patent Examination Policy  
United States Patent and Trademark Office  
P.O. Box 1450  
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Re: Comments of the American Bar Association Section of Intellectual  
Property on Examination under Section 112(a)

Dear Deputy Commissioner Hirshfeld:

The American Bar Association Section of Intellectual Property Law (“IPL Section”) appreciates the continued efforts by the United States Patent and Trademark Office (“USPTO”) to improve patent quality. The IPL Section encourages the USPTO to continue to bring about greater transparency to the patent system as these efforts continue. In this regard, the IPL Section thanks the USPTO for notifying stakeholders, in advance, of ongoing initiatives and upcoming training modules through postings on the USPTO’s website (*USPTO-led Executive Actions on High Tech Patent Issues*; [http://www.uspto.gov/patents/init\\_events/executive\\_actions.jsp](http://www.uspto.gov/patents/init_events/executive_actions.jsp)).

The IPL Section recognizes that a well-trained Examining Corps is essential to the issuance of quality patents. In this regard, the IPL-Section thanks the USPTO for the opportunity to submit for consideration practical examples that could form the basis of practitioner-examiner training materials on examination of Section 112(a). These examples are not intended to suggest the USPTO increase the frequency of rejections under 112(a) or that the USPTO increase its scrutiny of applications under 112(a). They are intended to provide simple fact patterns from which to illustrate the considerations under current law.

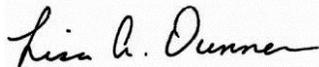
The IPL Section thanks the USPTO for its continued participation in the “Ask the Office” lecture series. This lecture series is an invaluable tool for sharing best practices with practitioners in a collaborative setting where members of the patent bar and leaders at the USPTO can openly discuss the shared responsibility for improving patent quality. We anticipate the training materials on examination of Section 112(a), along with any training materials promulgated by the USPTO, will be the basis of future “Ask the Office” CLE programs for the IPL Section.

The views expressed herein are presented on behalf of the IPL Section. They have not been approved by the House of Delegates or the Board of Governors of the American Bar Association and, accordingly, should not be construed as representing the position of the Association.

The ABA is the leading national voluntary bar organization of the legal profession, having nearly 400,000 members. Its members come from each of the fifty states, the District of Columbia, and the U.S. territories. Membership includes attorneys in private practice, government service, corporate law departments, and public interest organizations, as well as legislators, law professors, law students, and non-lawyer associates in related fields. Particularly, the IPL Section is the world's largest organization of intellectual property professionals, with nearly 23,000 members.

The IPL Section appreciates the efforts of the USPTO to improve patent quality by developing further training materials. The IPL Section shares this commitment to quality and hopes that the attached examples are of assistance to the Office in preparing training materials.

Very truly yours,

A handwritten signature in black ink that reads "Lisa A. Dunner". The signature is written in a cursive style with a clear, legible font.

Lisa A. Dunner  
Section Chair  
American Bar Association  
Section of Intellectual Property Law

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**Examples 1-3 Claims directed to a system with components having functional limitations**

**I. Example #1**

**A. Hypothetical Claim #1 (amended during prosecution)**

1. A system comprising:

an input ~~facsimile~~ telephony device configured to receive an input communication, convert the input communication to digital input packet data, and transmit the digital input packet data in a specific output order;

an output ~~facsimile~~ telephony device configured to receive the digital input packet data, store the received digital input packet data in the specific output order, and convert the digital input packet data to an output communication based on the specific output order; and

a packet-switched network configured to transmit the digital input packet data from the input ~~facsimile~~ telephony device to the output ~~facsimile~~ telephony device.

**B. Specification**

[Assume that, as of the filing date of this specification, in traditional telephony systems, both digital voice and digital data can be transmitted over circuit-switched networks, while only digital data can be transmitted over packet-switched networks.]

This specification discloses a telephony system that allows for low-cost transmission of data over a packet-switched network, such as, for example, the Internet. The telephony system includes an input telephony device and an output telephony device, both of which are connected to a packet-switched network and a circuit-switched network. The input and output telephony devices are configured to transmit and receive digital data via a packet-switched network. Telephony devices, which are broadly understood to be any device that can communicate or receive communications over a communications network, can include, for example, wired telephone devices, wireless telephone devices, facsimile devices, pager devices, etc.

In one embodiment, an input facsimile device receives an input document for facsimile transmission, scans the input document to produce scanned image data, converts the scanned image data into digital data packets, and transmits the digital data packets via a packet-switched network. To scan the input document, the input facsimile device includes an optical scanning unit. To convert the scanned data into digital data, the input facsimile device includes an analog to digital (A/D) converter. The input facsimile device further includes a digital data packetizer to

convert the digital data into digital data packets for transmission across a packet-switched network. The input facsimile device may store in one or more memory devices the digital data for subsequent transmission as digital data packets in a specific order such that the receiving or output facsimile device can compile the digital data packets and output a document that is a legible and understandable reproduction of the input document. When bandwidth becomes available, using an input/output (I/O) unit, the input facsimile device transmits the digital data in the specific order to the output facsimile device via the packet-switched network.

Upon receipt of the digital data, the output facsimile device stores the received digital data in one or more memory devices. When a sufficient number of digital data packets are received, the output facsimile device places the received digital data packets into an order corresponding to the specific order defined by the input facsimile device and converts the received digital data, based on the specific order, to image data for output as an intelligible reproduction of the document received by the input facsimile device. To convert the digital communication data into the output communication, the output facsimile device includes a digital to analog (D/A) converter. Optical scanning units, A/D and D/A converters, digital data packetizers, memory devices, and I/O devices are well-known in the art at the time of the invention. Figure 1 is a diagram of a packet-switch network configuration for facsimile image data.

### **C. Analysis of Hypothetical Claim #1 for § 112(a) – Written Description**

The exemplary claim **lacks sufficient written description**. This is an amended claim; therefore, when evaluating the claim for support, one cannot rely on the claims themselves for written description support. *See, e.g.*, MPEP 2163 (“It is now well accepted that a satisfactory description may be in the claims or any other portion of the originally filed specification. These early opinions did not address the quality or specificity of particularity that was required in the description, i.e., how much description is enough.”). The amended claim is directed to a system comprising three components, an input telephony device, an output telephony device, and a packet-switched network. Each component is then further limited by a functional description.

The specification describes “telephony devices” generally that includes the specific embodiment of wired and wireless telephone devices, facsimile devices, etc. However, generic claim language in the disclosure does not satisfy the written description requirement if it fails to support the scope of the genus claimed. *See, e.g., Ariad Pharm., Inc. v. Eli Lilly & Co.*, 598 F.3d

1336, 1350 (Fed. Cir. 2010). When a claim is directed to a genus, the written description requirement can be satisfied through sufficient description of a “representative number of species” (i.e., the species that are described are representative of the entire genus). When the specification discloses only one species encompassed within a genus, a claim that genus has sufficient written description only if the disclosure “indicates that the patentee has invented species sufficient to constitute the gen[us].” See *Enzo Biochem*, 323 F.3d at 966.

The Federal Circuit has explained that a specification cannot always support expansive claim language and satisfy the requirements of 35 U.S.C. 112 “merely by clearly describing one embodiment of the thing claimed.” *LizardTech v. Earth Resource Mapping, Inc.*, 424 F.3d 1336, 1346, 76 USPQ2d 1731, 1733 (Fed. Cir. 2005). It is unnecessary to spell out every detail of the invention in the specification; only enough must be included to convince a person of skill in the art that the inventor possessed the invention and to enable such a person to make and use the invention without undue experimentation. *LizardTech, Inc. v. Earth Res. Mapping, Inc.*, 424 F.3d 1336, 1345 (Fed. Cir. 2005). The issue is whether a person skilled in the art would understand applicant to have invented, and been in possession of, the invention as broadly claimed. See, e.g., *Noelle v. Lederman*, 355 F.3d 1343, 1350 (Fed. Cir. 2004) (“[A] patentee of a biotechnological invention cannot necessarily claim a genus after only describing a limited number of species because there may be unpredictability in the results obtained from species other than those specifically enumerated.”).

In this example, the specification provides only an example of facsimile devices. Facsimile devices cannot be said to be representative of the entire genus of telephony devices, which the specification describes as devices that operate over a communications network. Considered at the time of the invention, facsimile devices, wired telephone, wireless telephone and other telephony devices have different components and different technological capabilities. Further, each have unique data and transmission requirements and technical problems, and an example directed to solving such problems for facsimile communication would not be representative of the other communication platforms. Therefore, the term “telephony device,” as used in the claim, is broader than that disclosed. A person skilled in the art would not understand the inventor to be in possession of telephony devices other than facsimile devices. Thus, the amendment should be rejected as lacking sufficient written description.

Further, while a packet-switched network is generally known to a person skilled in the art, a network configured “to transmit the digital input packet data from the input telephone device” is broader than the invention disclosed in the specification. The claim seeks to claim all systems carrying out the function to transmit the digital input packet data from the input telephone device to the output telephone device, but only describes the packet-switched network by function. The functional description of the network seeks to define the network by what it does rather than what it is in such a way that the term exceeds the invention described in the specification. The specification only describes such a network in the context of facsimile communications. Each type of telephony communication in the present invention presents unique technical challenges and the network configuration of the present invention that cannot be extrapolated from a single example of facsimile communications. Accordingly, the description of the network for facsimile communications would not lead to skilled in the art to conclude that the inventors were in possession of the full scope of packet-switched network for telephony devices.

## II. Example #2

### A. Hypothetical Claim #2 (amended during prosecution)

2. A system comprising:

an input ~~facsimile~~ telephony device configured to receive an input image communication, convert the input image communication to digital input packet data, and transmit the digital input packet data in an output order;

an output ~~facsimile~~ telephony device configured to receive the digital input packet data, store the received digital input packet data in the output order, and convert the digital input packet data to an output image communication; and

a packet-switched network configured to transmit the digital input packet data from the input ~~facsimile~~ telephony device to the output ~~facsimile~~ telephony device.

### B. Specification

Same as specification as Example #1.

### C. Analysis of Hypothetical Claim #2 for § 112(a) – Written Description

The exemplary claim **lacks sufficient written description**. This is an amended claim; therefore, when evaluating the claim for support, one cannot rely on the claims themselves for written description support. *See, e.g.*, MPEP 2163 (“It is now well accepted that a satisfactory

description may be in the claims or any other portion of the originally filed specification. These early opinions did not address the quality or specificity of particularity that was required in the description, i.e., how much description is enough.”). The amended claim is directed to a system comprising three general components, an input telephony device, an output telephony device, and a packet-switched network. Each component is then further limited by a functional description.

The specification describes a general category of “telephony devices” that includes the specific embodiments of wired and wireless telephone devices, facsimile devices, etc. The specification discloses an embodiment of the species of facsimile devices that receive input image data. Facsimile devices cannot be said to be representative of the entire genus of telephony devices, which the specification describes as devices that operate over a communications network. Considered at the time of the invention, facsimile devices, wired telephone, wireless telephone and other telephony devices have different components and different technological capabilities. Further, at the time of the invention, only facsimile devices were known to be capable of receiving input image data for transmission to another, similar device. Thus, each have unique data and transmission requirements and technical problems, and an example directed to solving such problems for facsimile communication would not be representative of the other communication platforms. Therefore, the term “telephony device,” is broader than that disclosed. However, the additional claim language requiring that the “input telephony device is configured to receive input image data” and the “output telephony device is configured to . . . convert the digital input packet data to an output image communication” impose limitations that narrow the claim scope to the telephony devices that transmit image data, in a manner that is analogous to the facsimile embodiment disclosed in the specification. A person of ordinary skill in the art would therefore understand the patent applicant to be in possession of the telephony devices so configured.

However, while a packet-switched network is generally known to a person skilled in the art, a network configured “to transmit the digital input packet data from the input telephone device” is broader than the invention disclosed in the specification. The claim seeks to claim all systems carrying out the function to transmit the digital input packet data from the input telephone device to the output telephone device, but only describes the packet-switched network by function. The functional description of the network seeks to define the network by what it

does rather than what it is in such a way that the term exceeds the invention described in the specification. The specification only describes such a network in the context of facsimile communications. Each type of telephony communication in the present invention presents unique technical challenges and the network configuration of the present invention that cannot be extrapolated from a single example of facsimile communication. Accordingly, the description of the network for facsimile communications would not lead a person skilled in the art to conclude that the inventors were in possession of a packet-switched network for telephony devices.

### III. Example #3

#### A. Hypothetical Claim #3 (amended during prosecution)

3. A system comprising:

an input ~~faesimile~~ telephone device configured to receive an input communication, convert the input communication to digital input packet data, and transmit the digital input packet data in a specific output order;

an output ~~faesimile~~ telephone device configured to receive the digital input packet data, store the received digital input packet data in the specific output order, and convert the digital input packet data to an output communication based on the specific output order; and

a packet-switched network configured to transmit the digital input packet data from the input ~~faesimile~~ telephone device to the output ~~faesimile~~ telephone device.

#### B. Specification

Same as specification as Example #1.

#### C. Analysis of Hypothetical Claim #3 for § 112(a) – Written Description

The exemplary claim **lacks sufficient written description**. This is an amended claim; therefore, when evaluating the claim for support, one cannot rely on the claims themselves for written description support. *See, e.g.*, MPEP 2163 (“It is now well accepted that a satisfactory description may be in the claims or any other portion of the originally filed specification. These early opinions did not address the quality or specificity of particularity that was required in the description, i.e., how much description is enough.”).

The amended claim is directed to a system comprising three general components, an input telephone device, an output telephone device, and a packet-switched network. Each component is then further limited by a functional description. The specification describes a

general category of telephony devices that includes the specific embodiments of wired and wireless telephone devices, facsimile devices, etc.

The Federal Circuit has explained that a specification cannot always support expansive claim language and satisfy the requirements of 35 U.S.C. 112 “merely by clearly describing one embodiment of the thing claimed.” *LizardTech v. Earth Resource Mapping, Inc.*, 424 F.3d 1336, 1346, 76 USPQ2d 1731, 1733 (Fed. Cir. 2005). It is unnecessary to spell out every detail of the invention in the specification; only enough must be included to convince a person of skill in the art that the inventor possessed the invention and to enable such a person to make and use the invention without undue experimentation. *LizardTech, Inc. v. Earth Res. Mapping, Inc.*, 424 F.3d 1336, 1345 (Fed. Cir. 2005). The issue is whether a person skilled in the art would understand applicant to have invented, and been in possession of, the invention as broadly claimed. *See, e.g., Noelle v. Lederman*, 355 F.3d 1343, 1350 (Fed. Cir. 2004) (“[A] patentee of a biotechnological invention cannot necessarily claim a genus after only describing a limited number of species because there may be unpredictability in the results obtained from species other than those specifically enumerated.”).

The claim lacks written description for “telephone devices,” which was added by amendment. In this example, the specification provides only an example of facsimile devices. Facsimile devices cannot be said to be representative of other species within the genus of telephony devices, such as “telephone devices.” The doctrine of inherency cannot be used to satisfy the written description requirement. When an explicit limitation in a claim “is not present in the written description whose benefit is sought it must be shown that a person of ordinary skill would have understood, at the time the patent application was filed, that the description requires that limitation.” *Hyatt v. Boone*, 146 F.3d 1348, 1353, 47 USPQ2d 1128, 1131 (Fed. Cir. 1998). “To establish inherency, the extrinsic evidence ‘must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.’” *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999) (citations omitted). At the time of filing the specification, it was not well-known in the art that telephones convert voice data to digital packet data that can be transmitted over a packet-switched network in such a way as to be capable of outputting an intelligible

reproduction of the input voice data. Here, again, the claimed function of the “telephone device” exceeds that described in the specification. Specifically, only the facsimile devices are described as being capable of converting communication data to/from digital data. Thus, the amendment should be rejected as lacking sufficient written description. *See LizardTech, Inc. v. Earth Resource Mapping, Inc.*, 424 F.3d 1336, 76 USPQ2d 1724 (Fed. Cir. 2005).

Further, while the specification discloses a genus of “telephony devices” that includes the species of “wired telephone devices” and “wireless telephone devices”, the claim term “telephone device” is not limited by “wired” or “wireless” and therefore is broader than the specification as filed. A person skilled in the art would not understand the inventor to be in possession of telephone devices other than wired or wireless telephone devices. Thus, the amendment should be rejected as lacking sufficient written description.

Further, while a packet-switched network is generally known to a person skilled in the art, a network configured “to transmit the digital input packet data from the input telephone device” is broader than the invention disclosed in the specification. The claim seeks to claim all systems carrying out the function to transmit the digital input packet data from the input telephone device to the output telephone device, but only describes the packet-switched network by function. The functional description of the network seeks to define the network by what it does rather than what it is in such a way that the term exceeds the invention described in the specification. The specification only describes such a network in the context of facsimile communications. Each type of telephony communication in the present invention presents unique technical challenges and the network configuration of the present invention that cannot be extrapolated from a single example of facsimile communication. Accordingly, the description of the network for facsimile communications would not lead a person skilled in the art to conclude that the inventors were in possession of the a packet-switched network for wired and wireless telephone devices.

**Example 4: System claim having components defined by function.**

**I. Example #4**

**A. Hypothetical Claim #4 (amended during prosecution)**

4. A system comprising:

a client

a server configured to successfully send a message to the client; and

the server further configured to store a value related to the time the message was successfully sent.

**B. Specification**

The server can comprise a RAM, a processor, a storage medium, and a clock for generating a time indication of a message dispatch time. The server can also have an I/O port for sending and receiving messages. The clock provides the current time, which is used for generating the time indication of the message dispatch time. The server can transmit a message to the client, the client can then send a success indication that identifies the success or failure of the transmission. The success indication can be, for example, a message stating “success” or “failure.” In the example, since the message is binary, it need only require one bit. After the message is successfully sent, the server stores the message and the success indication, and preferably appends the dispatch time to the message before storing the message.

**C. Analysis of Hypothetical Claim #4 for § 112(a) – Written Description**

The exemplary claim **lacks sufficient written description**. The claim is directed to a system comprising a client and a server wherein the server is configured to successfully send a message to the client and to store a value related to the time the message was successfully sent. The claim is broader than the description of the invention in the specification such that specification fails to describe the invention as claimed sufficiently to convey to a person of skill in the art that the patentee had possession of the claimed invention at the time of the application, i.e., that the patentee invented what is claimed. *LizardTech, Inc. v. Earth Res. Mapping, Inc.*, 424 F.3d 1336, 1345 (Fed. Cir. 2005). Specifically, the specification discloses storing the “dispatch time.” This is the time the message was sent or dispatched, as opposed to the time the message was received, or the time that the server received the completion indication. The claim, instead, recites the phrase “value related to the time the message was successfully” that is broader than the disclosed dispatch time. The phrase reads on embodiments not contemplated by

the inventor. As such a person skilled in the art would not understand the inventor to be in possession of the invention as claimed. The written description does not support this amendment because the term “related to” is broader than the disclosed dispatch time. Thus, the claim should be rejected as lacking sufficient written description. *See LizardTech, Inc. v. Earth Resource Mapping, Inc.*, 424 F.3d 1336, 76 USPQ2d 1724 (Fed. Cir. 2005). The specification discloses communicating a message of “success” or “failure,” such that a person of ordinary skill in the art would accept that the inventor was in possession of an invention limited to receiving a message that indicates success as a way of determining success. Without clarifying how success is determined and which time is recorded, the claims will not be commensurate with the scope of the written description.

#### **D. Variations that Satisfy the Written Description Requirement**

Assuming that the specification of the patent lacks sufficient structure for performing the recited function, the applicant may be able to propose a method claim narrowly tailored to the embodiment described and enabled by the specification. The following claim captures that embodiment:

V1. A method comprising:

- sending a message from a server to a client;
- recording a time that the message was sent;
- receiving a success indication from the client; and
- storing the time, the message, and the success indication in a storage medium.

V2. A method comprising:

- recording a dispatch time for a message;
- transmitting the message from a server to a client;
- receiving a success indication from the client; and
- storing the dispatch time, the message, and the success indication in a storage medium.

V3. A method comprising:

- transmitting a message to a client;
- receiving, from the client, an indication of whether the message was successfully received; and
- storing a time that the message was transmitted.

**Examples 5-9 for Computer-Implemented Inventions**

**I. Examples #5 and #6**

**A. Hypothetical Claims #5 and #6**

5. An information processing apparatus for performing image recognition comprising:  
means for capturing an image of an object;  
means for analyzing the pixel values of the captured image;  
means for determining that the image includes a predetermined object when the image includes predetermined pixel values corresponding to the predetermined object;  
and

means for, when the image is determined to include the predetermined object, wirelessly transmitting the image to a mobile terminal associated with the predetermined object.

6. An information processing apparatus for performing image recognition comprising:  
a capturing unit for capturing an image of an object;  
an analyzing unit for analyzing the pixel values of the captured image;  
a determining unit for determining that the image includes a predetermined object when the image includes predetermined pixel values corresponding to the predetermined object; and

a transmitting unit for, when the image is determined to include the predetermined object, wirelessly transmitting the image to a mobile terminal associated with the predetermined object.

**B. Specification**

Next, a block diagram of the functional units of the information providing device according to exemplary embodiments is described with reference to Figure 1. Figure 1 shows that the information processing device includes a capturing unit 101, that captures an image of an object; an analyzing unit 102, that analyzes the pixel values of the captured image; a determining unit 103, that determines determining that the image includes a predetermined object when the image includes predetermined pixel values corresponding to the predetermined object; and a transmitting unit 104 for, when the image is determined to include the predetermined object, wirelessly transmitting the image to a mobile terminal associated with the predetermined object.

Next, a method or flowchart for carrying out a process of performing image recognition is shown on Figure 2. The method shows in step 201 that pixel values of a captured image are compared to predetermined pixel values stored for a plurality of users (predetermined objects) stored in the database. In step 202 when there is a match between the pixel values of the image and the predetermined pixel values of one of the users, it is determined that the image includes the user. In step 203, the image is then automatically wirelessly transmitted to a mobile terminal of the user based on pre-stored mobile terminal contact information stored in the database.

### **C. Analysis of Hypothetical Claims #5 and #6**

#### **i. § 112(f)**

Both claims 5 and 6 invoke 35 U.S.C. §112(f) because the claim limitation uses the term “means” or a term used as a substitute for “means” (such as “\_\_\_\_\_ unit”) that is a generic placeholder for performing the claimed function; the term “means” or the generic placeholder is modified by functional language; and the term “means” or the generic placeholder is not modified by sufficient structure, material, or acts for performing the claimed function.

#### **ii. § 112(a) – Written Description**

Both claims 5 and 6 **fail to comply with the written description requirement of 35 U.S.C. §112(a)**. If a claim limitation invokes 35 U.S.C. 112(f) or pre-AIA 35 U.S.C. 112, para. 6, it must be interpreted to cover the corresponding structure, materials, or acts in the specification and “equivalents thereof.” A means- (or step-) plus- function claim limitation is adequately described under 35 U.S.C. 112(a) or pre-AIA 35 U.S.C. 112, para. 1, if: (1) The written description adequately links or associates adequately described particular structure, material, or acts to the function recited in a means- (or step-) plus- function claim limitation; or (2) it is clear based on the facts of the application that one skilled in the art would have known what structure, material, or acts perform the function recited in a means- (or step-) plus- function limitation. In this case, only generic “units” are shown as part of the information processing apparatus. Additionally, even assuming that a computer or CPU is inherent for achieving any of the shown “units”, the flowchart of Fig. 2 does not provide a complete algorithm corresponding to the claims because the step for analyzing the pixel values of the image is not shown as part of the process. For a computer-implemented means-plus-function claim limitation invoking 35 U.S.C. 112(f) or pre-AIA 35 U.S.C. 112, sixth paragraph, a general purpose computer is usually only sufficient as the corresponding structure for performing a general computing function (e.g.,

“means for storing data”), but the corresponding structure for performing a specific function is required to be more than simply a general purpose computer or microprocessor. *In re Katz*, Interactive Call Processing Patent Litigation, 639 F.3d 1303, 1316, 97 USPQ2d 1737, 1747 (Fed. Cir. 2011). To claim a means for performing a specific computer-implemented function and then to disclose only a general purpose computer as the structure designed to perform that function amounts to pure functional claiming. *Aristocrat Techs. Australia Pty Ltd. v. Int’l Game Tech.*, 521 F.3d 1328 at 1333, 86 USPQ2d at 1239. In this instance, the structure corresponding to a 35 U.S.C. 112(f) or pre-AIA 35 U.S.C. 112, sixth paragraph claim limitation for a computer-implemented function must include the algorithm needed to transform the general purpose computer or microprocessor disclosed in the specification. *Aristocrat*, 521 F.3d at 1333, 86 USPQ2d at 1239; *Finisar Corp. v. DirecTV Group, Inc.*, 523 F.3d 1323, 1340, 86 USPQ2d 1609, 1623 (Fed. Cir. 2008); *WMS Gaming, Inc. v. Int’l Game Tech.*, 184 F.3d 1339, 1349, 51 USPQ2d 1385, 1391 (Fed. Cir. 1999). The corresponding structure is not simply a general purpose computer by itself but the special purpose computer as programmed to perform the disclosed algorithm. *Aristocrat*, 521 F.3d at 1333, 86 USPQ2d at 1239. Thus, the specification must sufficiently disclose an algorithm to transform a general purpose microprocessor to the special purpose computer. *See Aristocrat*, 521 F.3d at 1338, 86 USPQ2d at 1241.

In this case, it is presumed that “means for analyzing the pixel values of the captured image” is not a general computing function, and therefore it needs to be included in the flowchart or algorithm of Fig. 2 to transform the general purpose computer or microprocessor disclosed in the specification to a special purpose computer. Therefore, the specification does not provide a disclosure of the computer and algorithm in sufficient detail to demonstrate to one of ordinary skill in the art that the inventor possessed the invention including how to program the disclosed computer to perform all of the claimed functions.

#### **D. Variations that Meet the Written Description Requirement**

##### **i. Alternative Specification**

Next, a block diagram of the functional units of the information providing device according to exemplary embodiments is described with reference to Figure 1. Figure 1 shows that the information processing device includes a capturing unit 101, that captures an image of an object; an analyzing unit 102, that analyzes the pixel values of the captured image; a determining unit 103, that determines determining that the image includes a predetermined object when the

image includes predetermined pixel values corresponding to the predetermined object; and a transmitting unit 104 for, when the image is determined to include the predetermined object, wirelessly transmitting the image to a mobile terminal associated with the predetermined object.

Next, a hardware description of the information providing device according to exemplary embodiments is described with reference to Figure 2. In Figure 2, the information processing apparatus includes a digital camera 201 which is configured to capture an image. The digital camera may be made up of a digital image sensor as known in the art, such as a CCD sensor or a CMOS sensor. The digital camera 101 provides the capturing unit 101 shown in Figure 1.

Figure 2 further shows a CPU 202 which performs the certain processes described below. The CPU 202 provides the analyzing unit 102 and the determining unit 103 shown in Figure 1. The process data and instructions may be stored in memory X02. These processes and instructions may also be stored on a storage medium disk X04 such as a hard drive (HDD) or portable storage medium or may be stored remotely. Further, the claimed advancements are not limited by the form of the computer-readable media on which the instructions of the inventive process are stored. For example, the instructions may be stored on CDs, DVDs, in FLASH memory, RAM, ROM, PROM, EPROM, EEPROM, hard disk or any other information processing device with which the information processing apparatus communicates, such as a server or computer.

Further, the claimed advancements may be provided as a utility application, background daemon, or component of an operating system, or combination thereof, executing in conjunction with CPU X00 and an operating system such as Microsoft Windows 7, UNIX, Solaris, LINUX, Apple MAC-OS and other systems known to those skilled in the art.

The hardware elements in order to achieve the information processing apparatus may be realized by various processing circuitry elements, known to those skilled in the art. For example, CPU X00 may be a Xenon or Core processor from Intel of America or an Opteron processor from AMD of America, or may be other processor types that would be recognized by one of ordinary skill in the art. Alternatively, the CPU X00 may be implemented on an FPGA, ASIC, PLD or using discrete logic circuits, as one of ordinary skill in the art would recognize. Further, CPU X00 may be implemented as multiple processors cooperatively working in parallel to perform the instructions of the inventive processes described above.

The device in Figure 2 also includes a network controller/interface 203, such as an Intel Ethernet PRO network interface card from Intel Corporation of America, for interfacing with network 210. As can be appreciated, the network 210 can be a public network, such as the Internet, or a private network such as an LAN or WAN network, or any combination thereof and can also include PSTN or ISDN sub-networks. The network 210 can also be wired, such as an Ethernet network, or can be wireless such as a cellular network including EDGE, 3G and 4G wireless cellular systems. The wireless network can also be WiFi, Bluetooth, or any other wireless form of communication that is known. The network controller/interface 203 provides the transmitting unit 104 shown in Figure 1.

Next, an algorithm for carrying out a process of performing image recognition is shown on Figure 3. Next, Figure 3 illustrates an exemplary algorithmic flowchart for performing the image recognition process according to one aspect of the present disclosure. The hardware description above, exemplified by the structure example shown in Fig. 2, constitutes or includes specialized corresponding structure that is programmed or configured to perform the algorithm shown in Fig. 3. For example, the algorithm shown in Fig. 3 may be completely performed by the circuitry included in the single device shown in Fig. 2.

The method shows in step 301 that an image is captured by the image capturing unit. In step 302, the analyzing unit analyzes the pixel values in the captured image. This step is performed according to the method of facial recognition known as the Adjacent Pixel Intensity Difference Quantization (APIDQ) Histogram, the specific sub-steps of which are shown in Fig. 5 and described in detail below.

In step 303, the pixel values of a captured image are compared to predetermined pixel values stored for a plurality of users (predetermined objects) stored in the database. In step 303 when there is a match between the pixel values of the image and the predetermined pixel values of one of the users, it is determined that the image includes the user. In step 304, the image is then automatically wirelessly transmitted by the transmitting unit to a mobile terminal of the user based on pre-stored mobile terminal contact information stored in the database.

**a. Analysis of Hypothetical Claims #5 and #6 in view of the Alternative Specification**

**i. § 112(f)**

As noted above, both claims 5 and 6 invoke 35 U.S.C. §112(f) because the claim limitation uses the term “means” or a term used as a substitute for “means” (such as “\_\_\_\_\_ unit”) that is a generic placeholder for performing the claimed function; the term “means” or the generic placeholder is modified by functional language; and the term “means” or the generic placeholder is not modified by sufficient structure, material, or acts for performing the claimed function.

**ii. § 112(a) – Written Description**

Both claims 5 and 6 **comply with the written description requirement of 35 U.S.C. §112(a)**. In this case, the structure which corresponds to the claimed “means” and “units” is clearly shown on Fig. 2 and described in the alternative specification. Additionally, the method of Fig. 3 provides an algorithm corresponding to the claims, and the step for analyzing the pixel values of the image are shown as part of the process. In this case, it is presumed that the description of the analyzing step 302 in Fig. 3 being a facial recognition technique according to the Adjacent Pixel Intensity Difference Quantization (APIDQ) Histogram (which is then further described in detail in Fig. 5) makes it clear to a person of ordinary skill in the art how to program the general computer to perform this specialized function, and therefore transform the general computer to a special purpose computer. Therefore, the specification does provide a disclosure of the computer and algorithm in sufficient detail to demonstrate to one of ordinary skill in the art that the inventor possessed the invention including how to program the disclosed computer to perform all of the claimed functions.

**II. Example #7:**

**A. Hypothetical Claim #7:**

7. An information processing apparatus for performing image recognition comprising:

an image capturing device configured to capture an image of an object;

processing circuitry configured to:

analyze the pixel values of the captured image, and

determine that the image includes a predetermined object when the image includes predetermined pixel values corresponding to the predetermined object; and

a network interface configured to, when the image is determined to include the predetermined object, wirelessly transmit the image to a mobile terminal associated with the predetermined object.

**B. Specification**

Same as the “Alternative Specification” for Claims 5 and 6, above:

Next, a block diagram of the functional units of the information providing device according to exemplary embodiments is described with reference to Figure 1. Figure 1 shows that the information processing device includes a capturing unit 101, that captures an image of an object; an analyzing unit 102, that analyzes the pixel values of the captured image; a determining unit 103, that determines determining that the image includes a predetermined object when the image includes predetermined pixel values corresponding to the predetermined object; and a transmitting unit 104 for, when the image is determined to include the predetermined object, wirelessly transmitting the image to a mobile terminal associated with the predetermined object.

Next, a hardware description of the information providing device according to exemplary embodiments is described with reference to Figure 2. In Figure 2, the information processing apparatus includes a digital camera 201 which is configured to capture an image. The digital camera may be made up of a digital image sensor as known in the art, such as a CCD sensor or a CMOS sensor. The digital camera 101 provides the capturing unit 101 shown in Figure 1.

Figure 2 further shows a CPU 202 which performs the certain processes described below. The CPU 202 provides the analyzing unit 102 and the determining unit 103 shown in Figure 1. The process data and instructions may be stored in memory X02. These processes and

instructions may also be stored on a storage medium disk X04 such as a hard drive (HDD) or portable storage medium or may be stored remotely. Further, the claimed advancements are not limited by the form of the computer-readable media on which the instructions of the inventive process are stored. For example, the instructions may be stored on CDs, DVDs, in FLASH memory, RAM, ROM, PROM, EPROM, EEPROM, hard disk or any other information processing device with which the information processing apparatus communicates, such as a server or computer.

Further, the claimed advancements may be provided as a utility application, background daemon, or component of an operating system, or combination thereof, executing in conjunction with CPU X00 and an operating system such as Microsoft Windows 7, UNIX, Solaris, LINUX, Apple MAC-OS and other systems known to those skilled in the art.

The hardware elements in order to achieve the information processing apparatus may be realized by various processing circuitry elements, known to those skilled in the art. For example, CPU X00 may be a Xenon or Core processor from Intel of America or an Opteron processor from AMD of America, or may be other processor types that would be recognized by one of ordinary skill in the art. Alternatively, the CPU X00 may be implemented on an FPGA, ASIC, PLD or using discrete logic circuits, as one of ordinary skill in the art would recognize. Further, CPU X00 may be implemented as multiple processors cooperatively working in parallel to perform the instructions of the inventive processes described above.

The device in Figure 2 also includes a network controller/interface 203, such as an Intel Ethernet PRO network interface card from Intel Corporation of America, for interfacing with network 210. As can be appreciated, the network 210 can be a public network, such as the Internet, or a private network such as an LAN or WAN network, or any combination thereof and can also include PSTN or ISDN sub-networks. The network 210 can also be wired, such as an Ethernet network, or can be wireless such as a cellular network including EDGE, 3G and 4G wireless cellular systems. The wireless network can also be WiFi, Bluetooth, or any other wireless form of communication that is known. The network controller/interface 203 provides the transmitting unit 104 shown in Figure 1.

Next, an algorithm for carrying out a process of performing image recognition is shown on Figure 3. Next, Figure 3 illustrates an exemplary algorithmic flowchart for performing the image recognition process according to one aspect of the present disclosure. The hardware

description above, exemplified by the structure example shown in Fig. 2, constitutes or includes specialized corresponding structure that is programmed or configured to perform the algorithm shown in Fig. 3. For example, the algorithm shown in Fig. 3 may be completely performed by the circuitry included in the single device shown in Fig. 2.

The method shows in step 301 that an image is captured by the image capturing unit. In step 302, the analyzing unit analyzes the pixel values in the captured image. This step is performed according to the method of facial recognition known as the Adjacent Pixel Intensity Difference Quantization (APIDQ) Histogram, the specific sub-steps of which are shown in Fig. 5 and described in detail below.

In step 303, the pixel values of a captured image are compared to predetermined pixel values stored for a plurality of users (predetermined objects) stored in the database. In step 303 when there is a match between the pixel values of the image and the predetermined pixel values of one of the users, it is determined that the image includes the user. In step 304, the image is then automatically wirelessly transmitted by the transmitting unit to a mobile terminal of the user based on pre-stored mobile terminal contact information stored in the database.

### **C. Analysis of Hypothetical Claim #7**

#### **i. § 112(f)**

The above Claim 7 does not invoke 35 U.S.C. § 112(f) because the claim limitations do not use the term “means” or a term used as a substitute for “means” (such as “\_\_\_\_\_ unit”) that is a generic placeholder for performing the claimed function; Additionally, the claim recites sufficient structure, material, or acts for performing the claimed functions. In particular, the term “circuitry” by itself connotes structure (*see MIT v. Abacus Software*, 462 F.3d 1344 (Fed. Cir. 2006), see also MPEP §2181), and therefore the term “processing circuitry” should not be interpreted to invoke 35 U.S.C. §112, sixth paragraph.

#### **ii. § 112(a) – Written Description**

Example claim 7 **complies with the written description requirement of 35 U.S.C. §112(a)**. In this case, the structure already recited in the claim is clearly shown on Fig. 2 and described in the specification. Additionally, the method of Fig. 3 provides an algorithm corresponding to the claims, and the step for analyzing the pixel values of the image are shown as part of the process. Therefore, the specification does provide a disclosure of the structure in sufficient detail to demonstrate to one of ordinary skill in the art that the inventor possessed the

invention including how to program the disclosed computer to perform all of the claimed functions. Furthermore, in this case even if “processing circuitry” is considered a general claim element encompassing circuitry broadly, it is presumed that the specific processing circuitry falling within the functionally defined claim scope are well-known or sufficiently described by a representative number of species in the specification such that a person of ordinary skill in the art would accept that the Applicant was in possession of the claimed invention. It is emphasized that the determination of whether or not it is acceptable to have a claim element directed to a “genus” rather than a “species” depends on the facts of a specific application and art. An example of genus vs. species claim elements is analyzed in more detail in the next two examples.

The analysis on whether a claim meets the written description requirement is separate from a claim construction analysis. For claim construction, the meaning of claim terms are considered in light of the specification, and the written description analysis determines whether the inventor actually possessed the invention described using the claim terms. Thus, for a claim that does not invoke 112(f), a claim element may be interpreted more broadly than the specific examples in the specification, but that does not necessarily mean that the claim fails the written description requirement. Whether the written description requirement is met is evaluated in light of this construction, the specification and the context of the prior art.

For instance, in the present example, a question may arise as to whether the term “processing circuitry” covers a computer processor not mentioned in the specification. Such a question turns heavily on the interpretation given to the term “processing circuitry” based on the knowledge of a person of ordinary skill in the art, and whether the description and examples in the specification are representative enough to make it clear that the Applicant has the right to claim this genus such that even non-described species which fall into the genus would operate predictably enough to demonstrate possession by the Applicant. In this case, we presume that the term “processing circuitry” does meet this test for the given claim as a whole in the context of the hypothetical specification. However, for a different claim and specification, the use of a genus term may not pass the written description requirement, as illustrated below.

### **III. Examples #8 and #9**

#### **A. Hypothetical Claims #8 and #9 (Claim 8 is amended, claim 9 is original)**

8. (Currently Amended) An information processing apparatus comprising:

a ~~octa-core~~ processor configured to:

receive a high definition video from a broadcast media source;

encode the high definition video according to an encoding algorithm; and

output the encoded high definition video as streaming media with a delay time of no greater than X seconds from the time that the original high definition video was received.

9. (Original) An information processing apparatus comprising:

a processor configured to:

receive a video from a broadcast media source;

encode the video according to an encoding algorithm; and

output the encoded video as streaming media.

#### **B. Specification**

Next, a hardware description of the information providing device according to a first embodiment is described with reference to Figure 1. In Figure 1, the information processing apparatus includes a processor 101 which receives a broadcasted video from the set top box 102. The processor 101 is configured to encode the video according to the encoding algorithm described below, and to output the encoded video as streaming video over network interface 103.

According to a second embodiment, the broadcasted video received from set top box 102 is high definition (HD) video, and the processor 101 is a octa core processor which has eight processing cores which can operate simultaneously. The inventors have recognized that the combination of the octa core processor and the encoding algorithm makes it possible to output the encoded high definition video as streaming media with a delay time of no greater than X seconds from the time that the original high definition video was received.

#### **C. Analysis of Hypothetical Claims #8 and #9**

##### **i. § 112(f)**

Claims 8 and 9 do not invoke 35 U.S.C. §112(f) because the claim limitations do not use the term “means” or a term used as a substitute for “means” (such as “\_\_\_\_\_ unit”) that is a generic placeholder for performing the claimed function; Additionally, the claim recites sufficient structure (“processor”) for performing the claimed functions.

**ii. § 112(a) – Written Description**

**Amended Claim 8 lacks sufficient written description.** The claim has been amended to recite a general “processor” which receives high definition video, encodes the high definition video, and outputs the encoded high definition video as streaming video within X seconds. Thus, Claim 8 has been amended from a *species* (octa core processor) to a *genus* (processor). A claim that omits an element which applicant describes as an essential or critical feature of the invention originally disclosed does not comply with the written description requirement. See *Gentry Gallery*, 134 F.3d at 1480, 45 USPQ2d at 1503; *In re Sus*, 306 F.2d 494, 504, 134 USPQ 301, 309 (CCPA 1962). In this case, the octa core processor is described in the specification as being essential or critical for encoding high definition video and outputting the encoded high definition video as streaming video within X seconds.

**Original Claim 9 meets the written description requirement.** First, there is a strong presumption that an adequate written description of the claimed invention is present when the application is filed. *In re Wertheim*, 541 F.2d 257, 263, 191 USPQ 90, 97 (CCPA 1976). Thus, the rejection of an original claim for a lack of written description should be rare.

Second, this claim does not include the requirement that the video is “high definition” video, and it does require that the video is outputted as streaming media with a delay time of no greater than X seconds from the time that the original high definition video was received. The disclosure of only one species encompassed within a genus adequately describes a claim directed to that genus only if the disclosure “indicates that the patentee has invented species sufficient to constitute the gen[us].” See *Enzo Biochem*, 323 F.3d at 966, 63 USPQ2d at 1615. *Noelle v. Lederman*, 355 F.3d 1343, 1350, 69 USPQ2d 1508, 1514 (Fed. Cir. 2004) (Fed. Cir. 2004) (“[A] patentee of a biotechnological invention cannot necessarily claim a genus after only describing a limited number of species because there may be unpredictability in the results obtained from species other than those specifically enumerated.”). “A patentee will not be deemed to have invented species sufficient to constitute the genus by virtue of having disclosed a single species when ... the evidence indicates ordinary artisans could not predict the operability in the invention of any species other than the one disclosed.” *In re Curtis*, 354 F.3d 1347, 1358, 69 USPQ2d 1274, 1282 (Fed. Cir. 2004) In this case, we are presuming that it is understood in the art that a general processor can perform the functions described in Claim 9. However, the determination of whether or not it is acceptable to have a claim element directed to a “genus”

rather than a “species” depends on the features of a specific application and art. Therefore, under this presumption, a person of ordinary skill in the art could predict the operability in the invention using any type of processor for the invention of Claim 9, and therefore the written description in this case is sufficient to show that the Applicant was in possession of the claimed genus of Claim 9.

**Examples 10-14 System Claims**

**I. Example #10**

**A. Hypothetical Claim #10**

10. A system comprising:  
a database; and  
a processor in communication with the database, the processor configured to sort entries in the database.

**B. Specification**

[Although not described in the specification, various processors capable of implementing sorting algorithms and numerous sorting algorithms, including a merge sort, a bubble sort, and a quicksort, were well known to a person of ordinary skill in the art at the time of the filing of the application.]

In an embodiment, a database or other like data structure is stored on a data storage medium and includes financial data for individuals. The financial data may be arranged by various parameters, such as name, identifier, account value, and the like. A computer system, including at least one processor, is programmed and/or configured to sort the entries in the databases by using one of numerous known sorting algorithms including a merge sort, a bubble sort, and a quicksort. In a preferred embodiment, a merge sort algorithm is used for sorting the entries in a resource-efficient manner. Fig. 2 illustrates a preferred and non-limiting method for sorting the entries in the database, including a first step of identifying a parameter upon which to sort. In a second step, two adjacent entries are compared and, if out of the desired order, swapped. This second step is repeated with the second of the compared entries and the next adjacent entry until the entire database is iterated through. In a third step, steps one and two are repeated until a pass is made through the database without any swapping of adjacent entries.

**C. Analysis**

Claim 10 meets the written description requirement of 35 U.S.C. § 112(a). The claim is directed to a processor configured to sort entries in a database. While the claim arguably recites the processor in terms of its function (i.e., to sort entries), the term “processor” connotes structure, as does the listing of types of algorithms in the specification that the processor or computer system can be programmed with. Although details of a processor are not described, a processor capable of implementing a sorting algorithm was well known to a person of ordinary

skill in the art at the time the application was filed. The function of sorting entries in the database is described in the specification to include a merge sort, a bubble sort, and a quicksort. A merge sort, a bubble sort, and a quicksort were known to a person of ordinary skill in the art at the time the application was filed, and a specific algorithm is described in the specification. As such, the sorting entities are adequately described in the specification to one of ordinary skill in the art without need for further details regarding the sorting methods.

## **II. Example #11**

### **A. Hypothetical Claim #11**

11. A system comprising:
  - a database; and
  - a processor in communication with the database, the processor configured to sort entries in the database.

### **B. Specification**

In an embodiment, a database or other like data structure is stored on a data storage medium and includes financial data for individuals. The financial data may be arranged by various parameters, such as name, identifier, account value, and the like. A computer system, including at least one processor, is programmed and/or configured to manipulate the entries in the database in various ways known to those skilled in the art. As an example, the specification describes searching the database for a parameter by iterating through each entry and comparing it to a specified string.

### **C. Analysis**

Claim 11 **fails to meet the written description requirement of 35 U.S.C. § 112(a)**. The claim is directed to a processor configured to sort entries in a database. While the claim arguably recites the processor in terms of its function (i.e., to sort entries), and the term “processor” connotes structure, the written description does not provide any examples of how the processor could be configured to “sort” the entries in the database. Simply noting that the database can be manipulated and searched does not sufficiently describe how the entries are sorted. As such, the claim lacks written description because the specification, claims, and drawings, as filed, lack a description of how to sort entities. Although information which is well known in the art need not be described in detail in the specification, it must still be described. See, e.g., *Hybritech, Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1379-80, 231 USPQ 81, 90 (Fed. Cir. 1986). The

fact that methods of sorting entities are well known in the art does not remove the requirement that sorting entities must be described under the written description requirement.

### **III. Example #12**

#### **A. Hypothetical Claim #12**

12. A system comprising:  
a database; and  
means for sorting entries in the database.

#### **B. Specification**

In an embodiment, a database or other like data structure is stored on a data storage medium and includes financial data for individuals. The financial data may be arranged by various parameters, such as name, identifier, account value, and the like. A computer system, including at least one processor, is programmed and/or configured to sort the entries in the databases by using one of numerous known sorting algorithms. In a preferred embodiment, a software module is provided that is configured to, when executed, sorts the entries according to one or more parameters.

#### **C. Analysis**

Claim 12 **fails to meet the written description requirement of 35 U.S.C. § 112(a)**. The claim is directed to a means for sorting entries in the database. The use of “means for” invoke special rules of language interpretation regarding the means for under 35 U.S.C. § 112(f). When this special meaning is invoked, the means must be described in the specification. MPEP 2185. Further, the scope of the means for sorting entities is defined by its use in the specification. Stating a means for sorting entries without disclosing any sorting algorithms fails because the lack of description results in no scope for the means language. Therefore, because no structure, material, or act is described in this specification for the means for sorting entries in the database, the claim lacks written description in the specification. The use of means plus function language under 35 U.S.C. § 112(f) does not create an exception to the written description requirement. MPEP 2185(II)(A).

#### **IV. Example #13**

##### **A. Hypothetical Claim #13**

13. A system comprising:  
a database; and  
a sorting means configured to sort entries in the database.

##### **B. Specification**

In an embodiment, a database or other like data structure is stored on a data storage medium and includes financial data for individuals. The financial data may be arranged by various parameters, such as name, identifier, account value, and the like. A computer system, including at least one processor, is programmed and/or configured to sort the entries in the databases by using one of numerous known sorting algorithms including a merge sort, a bubble sort, and a quicksort. In a preferred embodiment, a merge sort algorithm is used for sorting the entries in a resource-efficient manner. Fig. 2 illustrates a preferred and non-limiting method for sorting the entries in the database, including a first step of identifying a parameter upon which to sort. In a second step, two adjacent entries are compared and, if out of the desired order, swapped. This second step is repeated with the second of the compared entries and the next adjacent entry until the entire database is iterated through. In a third step, steps one and two are repeated until a pass is made through the database without any swapping of adjacent entries.

##### **C. Analysis**

Claim 13 **meets the written description requirement of 35 U.S.C. § 112(a)**. The claim is directed to a means for sorting entries in the database. The use of “means for” invoke special rules of language interpretation regarding the means for under 35 U.S.C. § 112(f). When this is invoked, the means must be described in the specification. MPEP 2185. Further, the scope of the means for sorting entities is defined by its use in the specification. Here, an explicit algorithm is provided.

**V. Example #14**

**A. Hypothetical Claim #14**

14. A system comprising:

a database; and

a processor in communication with the database, the processor configured to sort entries in the database.

**B. Specification**

[Although not described in the specification, various processors capable of implementing sorting algorithms and numerous sorting algorithms, including a merge sort, a bubble sort, and a quicksort, were well known to a person of ordinary skill in the art at the time of the filing of the application.]

In an embodiment, a database or other like data structure is stored on a data storage medium and includes financial data for individuals. The financial data may be arranged by various parameters, such as name, identifier, account value, and the like. A computer system, including at least one processor, is programmed and/or configured to sort the entries in the databases by using one of numerous known sorting algorithms including a merge sort, a bubble sort, and a quicksort. In a preferred embodiment, a merge sort algorithm is used for sorting the entries in a resource-efficient manner.

**C. Analysis**

Claim 14 **meets the written description requirement of 35 U.S.C. § 112(a)**. The claim is directed to a processor configured to sort entries in a database. While the claim arguably recites the processor in terms of its function (i.e., to sort entries), the term “processor” connotes structure, as does the listing of types of algorithms in the specification that the processor or computer system can be programmed with. Although details of a processor are not described, a processor capable of implementing a sorting algorithm was well known to a person of ordinary skill in the art at the time the application was filed. The function of sorting entries in the database is described in the specification to include a merge sort, a bubble sort, and a quicksort. Although the specification contains no details of how to perform the any of the listed sorts, a person of ordinary skill in the art would know how to implement a merge sort, a bubble sort, and a quicksort. As such, the sorting entities are adequately described in the specification to one of ordinary skill in the art without need for further details regarding the sorting methods.

**Examples 15-17 Claims directed to a Functionally Defined Compounds: Antibodies**

**I. Example #15**

**A. Hypothetical Claim #15**

15. An isolated antibody capable of binding to Protein X.

**B. Specification**

The specification teaches that cDNA encoding a human protein, Protein X, has been isolated and fully characterized in terms of DNA sequence. The full sequence of Protein X is established using the Genetic Code. The specification speculates that Protein X is involved in human immunological system and describes various disorders relating thereto. Protein X was not made nor was its role in the human immunological system established with certainty. The specification provides various standard techniques that could be attempted in order to make and purify Protein X. The specification states that antibodies capable of binding to Protein X are part of the invention, and it asserts that these antibodies can be used therapeutically in conditions in which Protein X is over-produced. There are no examples of antibodies against Protein X.

**C. Analysis**

Claim 15 **fails to meet the written description requirement of 35 U.S.C § 112(a)**. The claim is directed to the genus of all isolated antibodies that are capable of binding to Protein X.

A review of the full context of the specification indicates that antibodies which bind to Protein X are essential to the operation of the claimed invention. Persons skilled in the art understand that binding is a purely functional description, i.e., it describes what the antibodies do, not what they are. No structure(s) responsible for the binding function appear in the specification. As the claim is only limited by function (binding), It includes antibodies irrespective of type (murine, human, humanized, chimeric, bi-functional etc.), specificity (epitope), structure (CDRs, framework, isotype), and/or variations (mutations, deletions). As long as it retains its ability to bind to the protein it falls within the scope of the claim. The actual number is incalculable.

Additionally, the specification does not: 1) describe an actual reduction to practice of the claimed invention, 2) provide drawings or structural chemical formulas for the claimed invention; 3) describe the complete structure of the claimed invention as a whole; 4) describe partial structures of the claimed antibodies; or 5) disclose a newly discovered correlation between the structure of the claimed antibodies and the function of binding to Protein X that

would permit the skilled person to distinguish antibody structures that bind Protein X from those that do not.

Despite the great skill and knowledge in the antibody art about their general structure and about how to generate antibodies, a search of the patent and scientific literature reveals that there was no correlation, let alone a strong correlation, that would allow one skilled in the art to predict with a reasonable degree of confidence the antibody structures (amino acid sequences) that are responsible for binding a described protein.

The relationship between a described protein and the genus of antibodies that bind it is fundamentally different than that between a described protein and the genus of DNA molecules that encode the protein. Once a protein has been described by its amino acid sequence, the Genetic Code permits a person skilled in the art to immediately visualize the DNAs that will encode the protein. Thus, the genus of DNA polynucleotides “encoding described protein X” is described once protein X is described. However, no description of Protein X provides description of “antibodies capable of binding to Protein X” because there is no “Antibody Code” that corresponds to the Genetic Code. Even a “well characterized” protein antigen or epitope can never predict the sequence of an or any antibody that would bind to the antigen or epitope.

Considering that only a function (binding) is recited, that the art recognizes no correlation between antibody variable region structure and binding function that would allow one skilled in the art to predict with a reasonable degree of confidence the structure of an antibody from a recitation of its binding function, that the specification fails to describe an actual reduction to practice of the claimed invention, fails to provide drawings or structural chemical formulas for the claimed invention; fails to describe the complete structure of the claimed invention as a whole; fails to describe partial structures of the claimed antibodies, and fails to provide a newly discovered correlation between structure and function, it cannot be concluded that the applicant had possession of the claimed invention when the application was filed.

A genus of antibodies is claimed. Analysis of whether there is sufficient description of a “representative number of species” is meaningless because no species are disclosed. The genus inquiry is simply whether one of skill in the art would recognize that the applicant was in possession of the necessary common attributes or features of the elements possessed by the members of the genus. Such common attributes or features must be of the sort described by the “relevant identifying characteristics” – i.e., structure, physical and/or chemical properties, or

functional characteristics coupled with known or newly disclosed correlation between structure and function.

The present application does not define any structural features, necessary for binding Protein X, commonly possessed by all members of the genus. While the application discloses a functional feature of the claimed genus, there is no known or disclosed correlation between this function and the structure(s) required to achieve it. Because the genus is fundamentally defined solely by what the antibodies do, rather than what they are, there is no indication of possession of the genus. One skilled in the art cannot, for these reasons, visualize or recognize the identity of the members of the genus. Therefore, the disclosure is insufficient to show that applicant was in possession of the claimed genus.

## **II. Example #16**

### **A. Hypothetical Claim #16**

16. An isolated antibody capable of binding to Protein Y and disassociates from Protein Y with a koff rate constant of  $1 \times 10^{-2} \text{ s}^{-1}$  or less, as determined by surface plasmon resonance.

### **B. Specification**

The specification teaches genus of antibodies that are derived from the structure of a single antibody having specific changes in the CDRs of the antibody and/or framework of the antibody. There are approximately 300 antibody sequences disclosed in the specification. The identity of the antibodies vary by up to about 10%, meaning that the antibodies are approximately 90% identical to the single antibody. The surface plasmon resonance assay is described in detail and all exemplified antibodies have been tested to demonstrate the appropriate koff rate.

### **C. Analysis**

Claim 16 **fails to meet the written description requirement of 35 U.S.C § 112(a)**. A sufficient description of a genus requires the disclosure of either a representative number of species falling within the scope of the genus or structural features common to the members of the genus so that one of skill in the art can ‘visualize or recognize’ the members of the genus.” Requiring a written description of the invention plays a vital role in curtailing claims that have not been invented, and thus cannot be described. The purpose of the written description requirement is to ‘ensure that the scope of the right to exclude, as set forth in the claims, does not

overreach the scope of the inventor's contribution to the field of art as described in the patent specification.' Here, the claimed invention is a class of antibodies that are defined by their high affinity and neutralizing activity to Protein Y, a known antigen. The patent does not disclose structural features common to the members of the claimed genus. One factor in considering the question is how large a genus is involved and what species of the genus are described in the patent. If the genus is not large or, even if it is, the specification discloses species representing the genus throughout its scope, the requirement may be met. On the other hand, analogizing the genus to a plot of land, if the disclosed species only abide in a corner of the genus, one has not described the genus sufficiently to show that the inventor invented, or had possession of, the genus. He only described a portion of it. That is the case here. It is important not to take the analogy of a plot of land too far in thinking of written description issues because, even if one builds a house only in one corner of the plot, one may still own the whole plot. One describes a plot of land by its furthest coordinates, in effect drawing a perimeter fence around it. That may be akin to the function of patent claims to particularly point out and distinctly circumscribe the outer boundaries of a claimed invention. With the *written description* of a genus, however, merely drawing a fence around a perceived genus is not a description of the genus. One needs to show that one has truly invented the genus, *i.e.*, that one has conceived and described sufficient representative species encompassing the breadth of the genus. Otherwise, one has only a research plan, leaving it to others to explore the unknown contours of the claimed genus. The written description requirement guards against claims that "merely recite a description of the problem to be solved while claiming all solutions to it and . . . cover any compound later actually invented and determined to fall within the claim's functional boundaries." Here, the patent only describes one type of structurally similar antibodies and that those antibodies are not representative of the full variety or scope of the genus. All of the antibodies described in the patent were derived from a single antibody. Yet the claim covers all structurally diverse antibodies that have the limited function and there is no evidence to show whether one of skill in the art could make predictable changes to the described antibodies to arrive at other structurally diverse antibodies. The koff rate is merely a desired result, rather than the actual means for achieving that result. The antibody determines its antigen binding characteristic. In order to demonstrate that it has invented what is claimed, the patent must adequately describe representative antibodies to reflect the structural diversity of the claimed genus. Functionally

defined genus claims can be inherently vulnerable to invalidity challenge for lack of written description support, especially in technology fields that are highly unpredictable, where it is difficult to establish a correlation between structure and function for the whole genus or to predict what would be covered by the functionally claimed genus. The patent attempts to claim every antibody that would achieve a desired result, *i.e.*, high binding affinity and neutralizing activity, and covers all structurally diverse antibodies, yet the patent do not describe representative examples to support the full scope of the claims. Therefore, the claim lacks an adequate written description.

### **III. Example #17**

#### **A. Hypothetical Claim #17**

17. An isolated antibody capable of binding to Protein Y comprising six CDRs with the following amino acid sequences: HCDR1 with SEQ ID NO: 1, HCDR2 with SEQ ID NO: 2, HCDR3 with SEQ ID NO: 3, LCDR1 with SEQ ID NO: 4, LCDR2 with SEQ ID NO: 5 and LCDR3 with SEQ ID NO: 6 and disassociates from Protein Y with a koff rate constant of  $1 \times 10^{-2}$  s<sup>-1</sup> or less, as determined by surface plasmon resonance.

#### **B. Specification**

The specification teaches genus of antibodies that are derived from the structure of a single antibody having specific changes in the CDRs of the antibody and/or framework of the antibody. There are approximately 300 antibody sequences disclosed in the specification. The identity of the antibodies vary by up to about 10%, meaning that the antibodies are approximately 90% identical to the single antibody. The surface plasmon resonance assay is described in detail and all exemplified antibodies have been tested to demonstrate the appropriate koff rate.

#### **C. Analysis**

Claim 17 **meets the written description requirement of 35 U.S.C § 112(a)**. The sequences represented by the sequence listings are consensus sequences of the 300 disclosed sequences. The genus of antibodies is defined by the sequences of CDRs that are critical for binding to Protein Y at the specified high affinity and neutralizing activity. The patent discloses the structural features common to the members of the claimed genus. The specification discloses species representing the genus throughout its scope, and thus the requirement has been met.

**Example 18 Claims directed to Methods but include Claim Elements defined by Function**

(Note: This example is based on the rapamycin line of cases- *Boston Scientific Corp. v. Johnson & Johnson*, 647 F.3d 1353 (Fed. Cir. 2011), for written description and *Wyeth v. Abbott Laboratories*, 720 F.3d 1380 (Fed. Cir. 2013), for enablement. The facts are modified to be relevant to antibodies.)

**I. Example #18**

**A. Hypothetical Claim #18**

18. A method of treating disease X in a mammal by administration of an effective amount of a neutralizing antibody that binds to protein Y.

**B. Specification**

The DNA and protein sequence of protein Y were known and well characterized in the art. In addition, a murine and humanized antibody against protein Y was also known in the art. The prior art murine antibody was made by injecting protein Y into mice and screening the hybridomas for antibodies that bound to protein Y. It was subsequently humanized via the queen technology (i.e. grafting CDRs into specific human frameworks and making certain framework back mutations). The patent did not contain any structures of protein Y or the antibodies in the prior art. It also did not provide guidance as to what CDRs, frameworks, mutations within the CDR and frameworks would retain the ability of an antibody to bind to protein Y. The patent used the murine antibody from the prior art to demonstrate its neutralizing effects on protein Y using both in vitro and in vivo models of disease X. These tests were known in the art and within the skill of persons in the art.

**C. Analysis**

Claims 1 **fails to meet the written description requirement of 35 U.S.C § 112(a)**. The claim encompasses all antibodies that achieve the desired result of neutralizing Protein Y and as a result, treat disease X. A review of the full context of the specification indicates that antibodies which neutralize Protein Y are essential to the operation of the claimed invention. Persons skilled in the art understand that neutralizing is a purely functional description, i.e., it describes what the antibodies do, not what they are. No structure(s) responsible for the binding function appear in the specification. The patent must adequately describe the claimed methods for treating disease X, including adequate description of the antibodies that are necessary to perform the

methods. The disclosure amounts to little more than a research plan, and does not satisfy the patentee's quid pro quo.

All three USPTO written description tests fail. There is no disclosure of common structural features since there is only one antibody. The fact that it is shaped like a Y is irrelevant to the portion that binds the antigen. The same argument applies to the structure-function correlation test. Despite the great skill and knowledge in the antibody art about their general structure and about how to generate antibodies, there is no correlation that would allow one skilled in the art to predict with a reasonable degree of confidence the antibody structures (amino acid sequences) that are responsible for binding and neutralizing a described protein. The relationship between a described protein and the genus of antibodies that bind it is fundamentally different than that between a described protein and the genus of DNA molecules that encode the protein. However, no description of Protein Y provides description of "antibodies capable of neutralizing Protein Y" because there is no "Antibody Code" that corresponds to the Genetic Code.

The third test used by the USPTO is the representative number of species test (RNOS). The claim also fails under this test. The claim is directed toward a genus of antibodies with unknown boundaries. The question that underlies the representative number of species test is: how many species exactly is a representative number? 1? 10? 100? 1000? There is no mathematical constant. The USPTO Guidelines (66 Fed. Reg. 10-99 (2001)) state:

A 'representative number of species' means that the species which are adequately described are representative of the entire genus. Thus, where there is substantial variation within the genus, one must describe a sufficient variety of species to reflect the variation within the genus...

Satisfactory disclosure of a 'representative number' depends on whether one of skill in the art would recognize that the applicant was in possession of the necessary common attributes or features of the elements possessed by the members of the genus in view of the species disclosed.

The genus of antibodies is incalculable. A "neutralizing antibody that binds to protein Y" is NOT a disclosure of structure – it is a disclosure of function. The patentee was in possession of one antibody capable of neutralizing Protein Y activity. There is no teaching as to what another antibody would look like let alone whether or not it would neutralize Protein Y. It is

very unpredictable. There are complicated intermolecular forces between an antigen and an antibody as well as intramolecular forces within antigens and antibodies that make even a single amino acid change in an antibody unpredictable as to whether or not it would neutralize Protein Y. One skilled in the art cannot, for these reasons, visualize or recognize the identity of the members of the genus. Therefore, the disclosure is insufficient to show that applicant was in possession of the claimed genus.

**Example 19. Chemical Claims having Functionally Defined Claim Elements**

**I. Example #19**

**A. Hypothetical Claim #19**

19. A method for removing keratotic plugs from skin with a cosmetic article, which comprises:

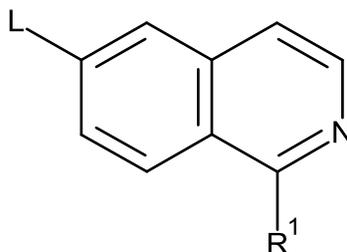
wetting the skin or said cosmetic article;

applying onto the skin said cosmetic article; and

peeling off said cosmetic article after drying; wherein said cosmetic article comprises:

a substrate consisting of woven cloth; and

on said substrate, a layer comprising a compound of the Formula I, in an amount effective to remove keratotic plugs, wherein Formula I is:



I

wherein L is a ligand that binds to receptor X; and

R1 is C1 – C4 alkyl;

or a physiologically compatible salt thereof.

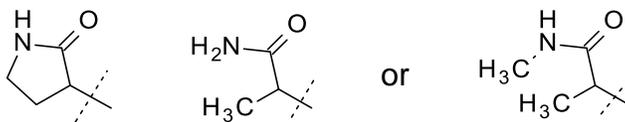
**B. Specification**

The specification describes the background of the invention and the desirability to remove keratotic plugs to maintain the health and beauty of the skin. The compounds of Formula I is defined in the specification as follows:

R1 is a linear or branched alkyl having 1 to 4 carbons.

L is a substituent that binds the compound to receptor X.

The specification describes a method of screening compounds to determine their binding affinity to receptor X and sets a minimum binding affinity. Several structural values are provided for L in the example compounds, namely:



Further, binding affinity is provided for each example compound. Particular values of R1 are described and include methyl, ethyl and isopropyl, which are also exemplified.

Other defined terms include the following:

The phrase “physiologically compatible salt” is defined as “a salt forming group that is useful in the present invention and is not particularly limited as long as it can form a salt in the presence of a compound of Formula I.” The specification further cites a textbook of physiologically compatible salts.

Examples of the salts are provided as a general list. The phrase “amount effective” is not a defined term. There are eight examples including specific embodiments of Formula I.

### C. Analysis

Claim 19 contains multiple functional elements that will be reviewed in this guidance for compliance with Section 112, namely “a substituent that binds”, “physiological compatible salt”, and “amount effective.”

#### Claims 19 fails to meet the written description requirement of 35 U.S.C § 112(a).

The claim is directed to “a substituent that binds” wherein the moiety L is defined by its function. Because of this, Claims 1 fails to meet the written description requirement of 35 U.S.C § 112(a). The phrase “a substituent that binds” describes a genus of moieties that bind to receptor X not by the structure of the moiety but by the function imparted by the moiety. To claim such a genus by function, the moieties meeting the function must have a common structural feature such that a person of ordinary skill in the art would understand the inventor to be in possession of all such compounds meeting the function, or the art must be sufficiently predictable such that the person skilled in the art would understand from the representative examples that the person of ordinary skill in the art is in possession of the invention across the full scope of the claim. Limiting Claim 1 to structurally defined moieties would obviate this rejection.

The additional claim elements defined by function, “physiologically compatible salt” and “an amount effective” do not give rise to a rejection of the claim under §112(a). The phrase “physiological acceptable salt” is well-understood to the person of ordinary skill in the art, which

is evident from the citation to the textbook. The cations and anions that meet this definition are known and fully characterized in their function to form salts. The person of ordinary skill in the art would accept that the inventor is in possession of the invention including any salts.

Similarly, the phrase “amount effective” readily communicates to persons of ordinary skill that the claimed invention must employ an amount of compound sufficient to remove keratotic plugs from the skin, thereby improving the appearance of the skin in the treated region. The precise amount meeting this function is a quantity readily understood and determined by the person of ordinary skill. It is clear from the specification that the precise amount is not critical to the person skilled in the art to understand the invention nor to accept that the inventor was in possession of the invention at the time of filing. As such, this phrase meets the written description requirement, even though the claimed is not limited to a specific quantity and neither the precise words “amount effective” nor a particular definition for these words appear in the specification. The general teachings and examples are more than adequate to show the inventor was in possession of the invention. *See Kao Corp. v. Unilever U.S., Inc.*, 334 F. Supp. 2d 527, 551 (D. Del. 2004) *aff'd*, 441 F.3d 963 (Fed. Cir. 2006).

The courts have recognized that there is no issue under §112 as to the propriety of functional definitions of uncritical amounts, noting “it may be helpful to note that such definitions are not only common but have been expressly approved in many cases including the following: *Locklin et al. v. Switzer Bros., Inc.*, 299 F.2d 160 (C.A. 9th); *Sales Affiliates, Inc. v. Hutzler Bros. Co.*, 71 F.Supp. 287 (D.C.Md.), *aff'd*, 4 Cir., 164 F.2d 260; *Ex parte Sperr*, 12 USPQ 194 (PO Bd.); *Ex parte Carter*, 52 USPQ 186 (PO Bd.); *Ex parte Kellog*, 84 USPQ 380 (PO Bd.); and *Ex parte Ebel and Drew*, 84 USPQ 202 (PO Bd.). Also, analogous ‘functional’ limitations with respect to uncritical time or temperature have been approved in claims in: *Ex parte Ebel and Drew, supra*; *Ex parte Fowler and Otis*, 46 USPQ 425 (PO Bd.); *Proctor & Gamble Mfg. Co. v. Refining, Inc.*, 135 F.2d 900 (C.A. 4th); and *Ex parte Clarke*, 98 USPQ 195 (PO Bd.).” *In re Caldwell*, 319 F.2d 254, 257-58 (C.C.P.A. 1963).

#### **D. Variations**

Limiting claim element L to the structurally defined claim elements exemplified would render the claim compliant with §112. [Note: Facts loosely based on *Kao Corp. v. Unilever U.S., Inc.*, 334 F. Supp. 2d 527, 546 (D. Del. 2004) *aff'd*, 441 F.3d 963 (Fed. Cir. 2006)]