

## Written Description Workshop

This workshop should be used as a companion to the two training modules on 35 U.S.C. 112(a) titled *Examining Claims for Compliance with 35 USC 112(a): Overview and Part I - Written Description = Focus on Electrical/Mechanical and Computer/Software-related Claims* and *Examining Claims for Compliance with 35 USC 112(a): Part II - Enablement = Focus on Electrical/Mechanical and Computer/Software-related Claims*. The workshop reinforces the principles of the training using a fact specific hypothetical example and an analysis that is based on the facts of this example. During examination, every application will turn on its own set of facts.

### I. INSTRUCTIONS

The following material will be used to simulate examination under 35 U.S.C. 112(a) of a hypothetical application that claims benefit of the filing date of an earlier filed provisional application. The technological discussion has been simplified for teaching purposes. Relevant excerpts from both the provisional and non-provisional applications are provided. Original and amended claims are presented for examination to determine whether **written description** support is provided as required by 35 U.S.C. 112(a). Assume for this exercise that there is a reason to question whether the provisional application provides § 112(a) support for the non-provisional claims. For purposes of this workshop, other patentability considerations for these claims under §§ 112(a)(enablement), 112(b), 112(d), 101, 102, and 103 need not be addressed.

As noted above, prior to taking this workshop, the Computer Based Training (CBT) video titled **Examining Claims for Compliance with 35 U.S.C. 112(a): Overview & Part I – Written Description, Focus on Electrical/Mechanical and Computer/Software-related Claims** should have been viewed. For background, familiarity with MPEP sections 2161, 2162, and 2163 will also be helpful.

### II. HYPOTHETICAL INVENTION 1: PARTIAL DISCLOSURE

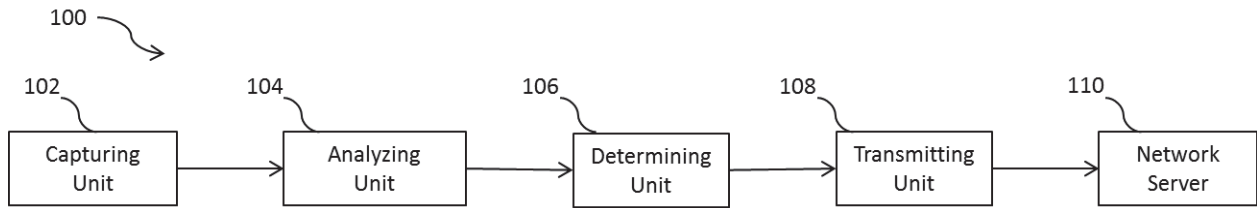
#### **Background and State of the Art**

The invention relates to facial recognition technology to provide keyless entry. When a user approaches a secured access point, a device captures the user's image, analyzes the captured image using a facial recognition technique, compares the analyzed captured image to a database of stored images of verified users, and upon verifying the user, unlocks the access point for the verified user.

Facial recognition software essentially works through an image reader recognizing a face and software that measures various features of the face and then compares the measured values with stored values in a database. Image readers typically capture an image as an array of pixels or picture elements, which are the smallest controllable element of a picture represented on a screen. There are many different software techniques for performing the steps involved in facial recognition. Depending on the technique, different types of results with varying accuracy can be obtained. The field of image recognition is developing rapidly and many new techniques are currently being introduced.

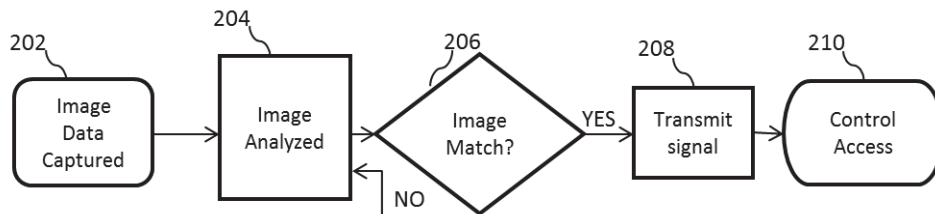
**Relevant Excerpt from Provisional Specification**

[0001] A block diagram of the functional units of the information processing device 100 according to exemplary embodiments is described with reference to Figure 1. Figure 1 shows the information processing device 100 including a capturing unit 102 that captures an image of an object as pixel values, an analyzing unit 104 that analyzes the pixel values of the captured image, a determining unit 106 that determines when the image includes a predetermined object image based on whether the captured image includes predetermined pixel values corresponding to the predetermined object image, and a transmitting unit 108 that wirelessly transmits a signal to a network server 110 that controls entry at an access point when the image is determined to include the predetermined object image.



**FIG. 1**

[0002] Next, the method for carrying out the image recognition is illustrated by the flowchart of Figure 2. According to the method, an image is captured by capturing unit 102 in step 202. The captured image is analyzed in step 204 by the analyzing unit 104, and the analysis is used in step 206 by the determining unit 106 to match the captured image to a predetermined object image. The predetermined object image is one of a plurality of stored images in a database that correspond to authorized users. If the image does not match a predetermined object image, the process goes back to step 204. If there is a match between the captured image and the predetermined object image, which represents an authorized user, the process progresses to step 208, and a signal is transmitted by the transmitting unit 108 to the network server 110. In step 210, the network server 110 controls the access point to permit entry by the authorized user.

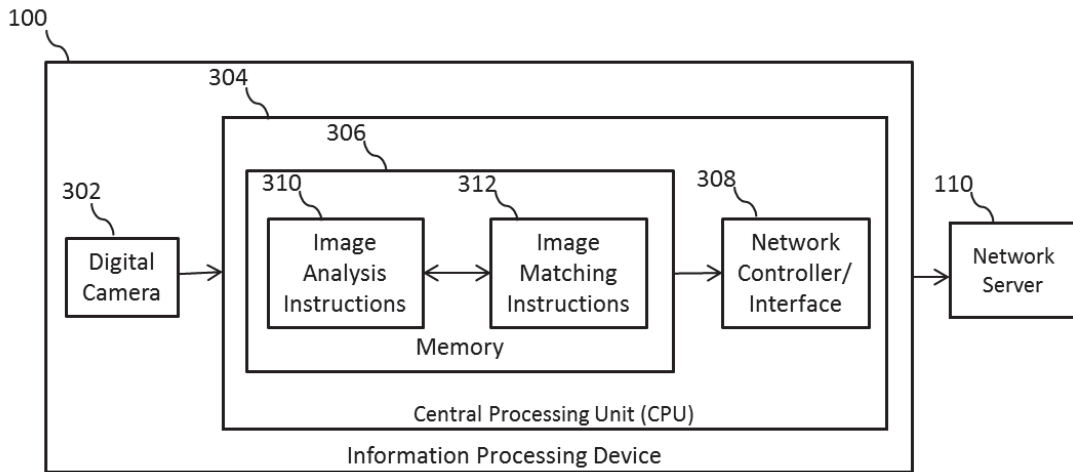


**FIG. 2**

**Relevant Excerpt from Non-Provisional Specification**

*The non-provisional application claims benefit under 35 U.S.C. 119(e) of the filing date of the earlier filed provisional application and includes the same excerpt from the provisional application above along with the following additional disclosure and claims (no claims were presented in the provisional application).*

**[0003]** Next, a hardware description of the information processing device 100 according to exemplary embodiments is described with reference to Figure 3.



**Fig. 3**

In Figure 3, the information processing device 100 shows the capturing unit 102 in the form of a digital camera 302, which is configured to capture an image in digital form. The digital camera 302 may be made up of a digital image sensor as known in the art, such as a CCD sensor or a CMOS sensor. Any other type of known image capturing device that is capable of capturing an image in digital form may be employed as the capturing unit 102.

**[0004]** Figure 3 further shows a CPU 304 which performs the processes described below. The CPU 304 provides the processor for the analyzing unit 104, the determining unit 106, and the transmitting unit 108, shown in Figure 1. The CPU 304 includes a memory 306 in which process data and software instructions are stored. The data and instructions may also be stored on a separate storage medium disk such as a hard drive (HDD) or portable storage medium or may be stored remotely. The invention is not limited by the form of computer-readable media on which the instructions 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 CPU 304 can communicate, such as a server or computer.

**[0005]** Further, the claimed processing may be provided as a utility application, background daemon, or component of an operating system, or combination thereof, executing in conjunction with CPU 304 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 used for the information processing functions may be realized by various processing circuitry elements, known to those skilled in the art. For example, CPU 304 may be a Xenon or Core processor from Intel of America or an Opteron processor from AMD of

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America, or may be other processor types that would be recognized by one of ordinary skill in the art. Alternatively, the CPU 304 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 304 may be implemented as multiple processors cooperatively working in parallel to perform the instructions of the process described above.

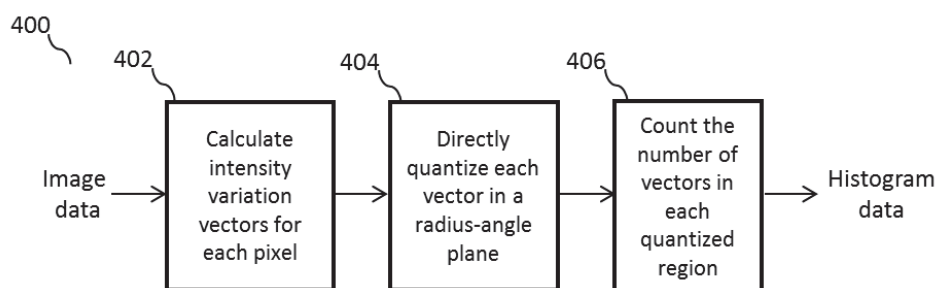
**[0006]** The device in Figure 3 also includes the transmitting unit 108 embodied as a network controller/interface 308, such as an Intel Ethernet PRO network interface card from Intel Corporation of America, for interfacing with the network server 110. As can be appreciated, the network server 110 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 server 110 can also be wired to the interface 308, such as via an Ethernet network, or can be connected wirelessly, such as via a cellular network including EDGE, 3G and 4G wireless cellular systems. The wireless connection can also be WiFi, Bluetooth, or any other wireless form of communication that is known.

**[0007]** In step 202, an image is captured by the image capturing unit 102. In the preferred embodiment, the digital camera 302 is activated by a user who desires to gain entry to the access point. The digital camera 302 captures the facial image of the user in digital form as an array of pixel values.

**[0008]** Next, the software instructions or algorithms for carrying out the process of image recognition in accordance with this invention shown in Figure 3 are described in detail. The instructions are preferably in the form of software stored in the memory 306 that control the CPU 304 to perform the functions of image analysis in step 204 and image matching in step 206 shown in Figure 2. The hardware description above, exemplified by the structure example shown in Figure 3, constitutes structure that is programmed or configured to perform the algorithms described below, which may be completely performed by the circuitry included in the single device shown in Figure 3.

**[0009]** In step 204, the analyzing unit 104 analyzes the pixel values in the captured image to generate a numerical representation of the features of the captured facial image. More specifically, the CPU 304 executes image analysis instructions 310 to analyze the pixel values that represent the image. This step is preferably performed according to the method of facial recognition known as adjacent pixel intensity difference quantization (APIDQ) histogram as shown in Figure 4. APIDQ is faster, simpler, and more-reliable than prior art statistics-based approaches for performing facial recognition, and is most suitable for use in implementing the security function of controlling access to secured areas. Using method 400, intensity variation vectors are calculated for all the pixels in a captured image in step 402. Then, in step 404, each vector is directly quantized in a radius-angle plane. The number of vectors in each quantized region is then counted in step 406 to generate a histogram for the captured image.

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**Fig. 4**

**[0010]** In step 206, the analyzed pixel values of a captured image are compared to predetermined pixel values for a plurality of users (predetermined object image) stored in the memory 306 of the CPU 304 using image matching instructions 312. When using APIDQ, the generated histogram represents the analyzed pixel values for the captured image and the instructions 312 cause the CPU 304 (determining unit 106) to calculate similarity between the generated histogram and a stored histogram of the predetermined object image. Instructions 312 cause CPU 304 to compute a distance measure between the generated histogram and the stored histogram. Any of a variety of known distance measures in the art can be computed, such as Euclidean distance, Chebyshev distance, etc.

**[0011]** When the similarity, as represented by the distance measure, exceeds a threshold value, the determining unit 106 concludes that there is a match. When there is a match, it is determined that the image represents an authorized user. In step 208, a signal is then automatically wirelessly transmitted by the transmitting unit 108 to the network server 110. If there is no match at step 206 as determined by instructions 312, the process reverts back to step 204 to analyze the next image. The network server 110 includes control software to control access to the access point, as is known. For example, the network server 110 can provide a signal that disengages a door latch at the access point.

**[0012]** In accordance with this process, the combination of the above-identified techniques of analyzing pixels and determining a match result in about a 95% accurate image detection rate and in some cases result in up to 97% accuracy. Techniques other than APIDQ for analyzing pixels have not been shown to result in levels of accuracy sufficient for performing the security function of controlling access to secured areas.

**III. HYPOTHETICAL INVENTION 1: ORIGINAL CLAIMS**

1. (Original) An information processing device for performing image recognition in accordance with a desired image detection rate comprising:
  - a capturing unit for capturing an image of an object;
  - an analyzing unit for analyzing pixel values of the captured image;
  - a determining unit for determining that the captured image includes a predetermined object image when the image includes predetermined pixel values corresponding to the predetermined object image; and
  - a transmitting unit for, when the image is determined to include the predetermined object, wirelessly transmitting a signal to a terminal to unlock a secured access point for a user associated with the predetermined object.
  
2. (Original) The information processing device of claim 1, wherein the information processing device obtains an image detection rate of at least 90% accuracy.
  
3. (Original) The information processing device of claim 2, further comprising a filter that prepares the captured digital image data for the analyzing unit.

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**IV. WORKSHEET – ORIGINAL CLAIMS**

Analysis: For each of the claims:

1. determine the broadest reasonable interpretation (BRI) of the claim (remember to consider whether the claims invoke 112(f));
2. analyze whether each of the claim limitations has adequate written description support in the **provisional** application;
3. analyze whether each of the claim limitations has adequate written description support in the **non-provisional** application, and
4. identify which features are unsupported if support is lacking.

*(During examination, analysis of the provisional and non-provisional applications for support can occur in whichever order you typically examine.)*

Original Claim 1: \_\_\_\_\_

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Original Claim 2: \_\_\_\_\_

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\_\_\_\_\_

Original Claim 3: \_\_\_\_\_

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\_\_\_\_\_

**V. HYPOTHETICAL INVENTION 1: AMENDED CLAIMS**

1. (Amended) An information processing device for performing image recognition in accordance with a desired image detection rate comprising:

a capturing unit for capturing an image of an object;

an analyzing unit for analyzing pixel values of the captured image, wherein the analyzing unit comprises a central processing unit having a memory with instructions stored therein for causing the central processing unit to analyze the pixel values of the captured image;

a determining unit for determining that the captured image includes a predetermined object image when the image includes predetermined pixel values corresponding to the predetermined object image; and

a transmitting unit for, when the image is determined to include the predetermined object, wirelessly transmitting a signal to a terminal to unlock a secured access point for a user associated with the predetermined object.

2. (Amended) The information processing device of claim 1, wherein the instructions stored in the memory cause the central processing unit to analyze the pixel values of the captured image according to adjacent pixel intensity difference quantization (APIDQ) histogram resulting in the information processing device obtains an image detection rate of ~~at least~~ 90% up to about 95% accuracy.

3. (Amended) The information processing device of claim 2, further comprising a Gaussian high pass filter that prepares the captured digital image data for the analyzing unit.



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**VI. WORKSHEET – AMENDED CLAIMS**

Analysis: For each of the claims:

1. determine the broadest reasonable interpretation (BRI) of the amended claim (remember to consider whether the claims invoke 112(f));
2. analyze whether each of the claim limitations has adequate written description support in the **provisional** application;
3. analyze whether each of the claim limitations has adequate written description support in the **non-provisional** application, and
4. identify which features are unsupported if support is lacking.

Amended Claim 1:

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Amended Claim 2:

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Amended Claim 3:

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## VII. ANSWERS/DISCUSSION POINTS

### Original Claim 1

*BRI: Independent claim 1 invokes 35 U.S.C. §112(f) because the claim limitations satisfy the three prong test for applying 112(f) by using terms that are a substitute for “means” (“capturing unit”, “analyzing unit”, “determining unit” and “transmitting unit”). These elements use the term “unit”, which in this case is a generic placeholder for the structure that performs the claimed functions. The generic placeholders are modified by functional language; and the generic placeholders are not modified by sufficiently definite structure, material, or acts for performing the claimed functions. See MPEP 2181 for more details. Because claim 1 invokes 35 U.S.C. 112(f), it must be interpreted to cover the corresponding structure, materials, or acts described in the specification as performing each entire claimed function and “equivalents thereof.”*

*Therefore, with respect to the provisional application and the “corresponding structure, material, or acts,” in general, the provisional specification only discloses generic “units” as part of the information processing device but provides no description of sufficiently definite structure that performs the claimed functions. There is no description of a processor and programming sufficient to perform the functions, which would be required to support the claimed specialized functions. Additional analysis is set forth below.*

*With respect to the non-provisional application, the capturing unit is a digital camera and equivalents, the analyzing unit is the CPU programmed with disclosed APIDQ instructions and equivalents to that method for image recognition (shown in Figure 4), the determining unit is the CPU programmed with instructions for calculating a similarity of the generated histogram and the stored histogram and determining whether a threshold is exceeded and equivalent methods (no flowchart but prose description is adequate), and the transmitting unit is the disclosed network controller/interface and equivalents.*

### Provisional Specification: Does NOT Provide Adequate Written Description to Support Each Element of Original Claim 1

Original claim 1 is not entitled to the benefit of the filing date of the provisional application. The provisional specification only discloses generic “units” as part of the information processing device but provides no description of sufficiently definite structure that performs the claimed functions. There is no description of a processor and programming sufficient to perform the functions, which would be required to support the claimed specialized functions.

Specifically, for the “capturing unit,” the provisional specification merely repeats the functionality found in the claim language, i.e., “capturing unit 102 that captures an image of an object.” Similarly, for the “analyzing unit,” this is only described in the provisional specification as “analyzing unit 104 that analyzes the pixel value of the captured image.” The provisional specification does not indicate that the inventors had possession of the details of particular software or instructions that would implement the analyzing function. One of ordinary skill in the art would recognize that the pixel values of a captured image can be analyzed in many different ways to achieve a variety of results, for example, image enhancement, image compression, image recognition, etc. In this case, the provisional specification is silent as to how the inventor has chosen to perform this function and what types of results are needed to perform the other steps of the image recognition technique. For

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the “determining unit,” the provisional specification initially repeats the claimed function, “determining unit 106 that determines when the image includes a predetermined object image based on whether the captured image includes predetermined pixel values corresponding to the predetermined object image,” then the specification uses “determining unit 106 to match the captured image to a predetermined object image” but provides no details as to how the matching is accomplished. Finally the “transmitting unit” is described as “transmitting unit 108 that wirelessly transmits a signal to a network server” but there is no disclosure of how the inventor has chosen to transmit the signal.

Additionally, even if it is assumed that a computer or CPU is inherent for implementing any of the shown “units,” the flowchart of Figure 2 does not provide a sufficient algorithm corresponding to each of the claimed functions. In this instance, the structure corresponding to the 35 U.S.C. 112(f) claim limitations that are computer-implemented specialized functions must include a general purpose computer or computer component along with the algorithms that the computer uses to perform each claimed specialized function. Therefore, the provisional specification does not provide a disclosure of corresponding structure in sufficient detail to demonstrate to one of ordinary skill in the art that the inventor possessed the invention including how the inventor intended to program the disclosed computer to perform all of the claimed functions. Because independent claim 1 in this case is not supported by the provisional specification, neither are dependent claims 2 and 3.

***Discussion Point – Software-Related Inventions:*** It should be noted that the written description requirement under 112(a) is not satisfied by stating that one of ordinary skill in the art *could* devise an algorithm to perform the specialized programmed functions. For written description, the specification as filed must describe the claimed invention in sufficient detail so that one of ordinary skill in the art can reasonably conclude that the inventor had possession of the claimed invention. An original claim may lack written description when the claim defines the invention in functional language specifying a desired result but the specification does not sufficiently identify **how** the inventor has devised the function to be performed or result achieved. For software, this can occur when the algorithm or steps/procedure for performing the computer function are not explained at all or are not explained in sufficient detail (simply restating the function recited in the claim is not necessarily sufficient).

***Discussion Point – 112(f) Limitations:*** In this case, if the non-provisional disclosure was as sparse as this provisional with no further identification of the algorithm that performed the function, the 112(f) limitations would be indefinite under 112(b). See the prior training on 112(f) and MPEP 2181 for further explanation.

### Non-Provisional Specification: Provides Adequate Written Description to Support Each Element of Original Claim 1

As the structures for performing the entire recited functions are fully disclosed in the non-provisional specification, claim 1 has adequate written description support under 112(a). Note that if at least one of the functions was not supported by structure to perform the

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claimed function, the claim would be indefinite under 112(b) and would also lack written description support under 112(a) for the particular functional element.

Accordingly, in this case, the Office action would not include a rejection under 112(a) for lack of written description, but would need to indicate that the claims are not entitled to the benefit of the provisional application's filing date.

The examiner should:

(1) Notify applicant that the claims in the later-filed application are not entitled to the benefit of an earlier filing date because one or more conditions for receiving the benefit of an earlier filing date have not been satisfied - in this case the earlier disclosure fails to comply with the requirements of 112(a); and

(2) Conduct a prior art search based on the actual filing date of the application instead of the earlier filing date. The examiner may use an intervening reference in a rejection until applicant corrects the benefit claim or shows that the conditions for entitlement to the benefit of the prior application have been met.

For example, a sample analysis using Form Paragraphs 2.09 and 2.10 could read:

Applicant's claim for the benefit of a prior-filed application under 35 U.S.C. 119(e) or under 35 U.S.C. 120, 121, 365(c), or 386(c) is acknowledged. Applicant has not complied with one or more conditions for receiving the benefit of an earlier filing date under 35 U.S.C. 119(e) as follows:

The later-filed application must be an application for a patent for an invention which is also disclosed in the prior application (the parent or original nonprovisional application or provisional application). The disclosure of the invention in the parent application and in the later-filed application must be sufficient to comply with the requirements of 35 U.S.C. 112(a) or the first paragraph of pre-AIA 35 U.S.C. 112, except for the best mode requirement. See *Transco Products, Inc. v. Performance Contracting, Inc.*, 38 F.3d 551, 32 USPQ2d 1077 (Fed. Cir. 1994).

The disclosure of the prior-filed provisional application, (Application No. XX/XXX,XXX) fails to provide adequate support or enablement in the manner provided by 35 U.S.C. 112(a) or pre-AIA 35 U.S.C. 112, first paragraph for one or more claims of this application. In particular, the provisional specification fails to provide adequate support because it only discloses generic "units" as part of the information processing device but provides no description of sufficiently definite structure that performs the claimed functions.

**Discussion Point - Continuation Applications:** When an application claims the benefit of the filing date of an earlier-filed application, only the claims of the later-filed application that are supported under 112(a) by the earlier-filed application are entitled to the benefit of the earlier filing date. While this example uses a provisional application to teach this point, this practice applies equally to **continuations** and **divisionals**. The parent application of a continuation or divisional must fully support the claims in the later-filed application under 112(a) or the claims in the later-filed application will not be afforded the benefit of the earlier

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date of the parent application. See MPEP 211.05 for a complete discussion of the sufficiency of disclosure in prior filed applications.

If the claims of the later-filed application are not entitled to the benefit of the earlier filing date, the examiner should notify the applicant in the next Office action using form paragraphs 2.09 and 2.10. Applicant's options would be to: (1) cancel the new matter in the later-filed application to retain the benefit claim, (2) if the claims are originally presented upon filing of a continuation, change the relationship of the later-filed application to a continuation-in-part (CIP), thus affording the new claims the filing date of the CIP, or (3) delete the benefit claim. See the note above regarding intervening references.

### **Original Claim 2**

*BRI: Original dependent claim 2 is interpreted as an information processing device that obtains an image detection rate of 90% up to and including 100% accuracy because of the "at least 90%" claim terminology.*

### **Provisional Specification: Does NOT Provide Adequate Written Description to Support Original Claim 2**

See discussion of original claim 1, from which claim 2 depends.

### **Non-Provisional Specification: Does NOT Provide Adequate Written Description to Support Original Claim 2**

Original claim 2 covers an information processing device that obtains an image detection rate of 90% up to and including 100% accuracy. The non-provisional specification discloses that the combination of techniques of analyzing pixels in accordance with the ADIPQ histogram and the determining a match only obtained up to 97% accuracy in practice. Particularly, the specification points out in paragraph [0012] that "[t]echniques other than APIDQ for analyzing pixels have not been shown to result in levels of accuracy sufficient for performing the security function of controlling access to secured areas." There is no evidence in the non-provisional specification that the inventors were in possession of an information processing device that could obtain an image detection rate of more than 97% accuracy. Thus, the non-provisional specification is not commensurate with the full scope of original claim 2.

Claim 2 should be rejected under 112(a) for lack of written description. Form Paragraphs 7.30.01 and 7.31.01 could be used. The rejection could read:

Claim 2 is rejected under 35 U.S.C. 112(a) or pre-AIA 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor or a joint inventor, or for pre-AIA the inventor(s), at the time the application was filed, had possession of the claimed invention. The limitation "at least 90%" includes rates up and including 100%. The specification includes no description of obtaining accuracy rates in excess of 97%.

**Original Claim 3**

*BRI: The filter limitation of original dependent claim 3 does not invoke 35 U.S.C. 112(f) because the claim limitation does not use the term “means” or a term used as a substitute for “means” that is a generic placeholder for performing the claimed function. One of ordinary skill in this art would recognize that the term “filter” recites sufficiently definite structure for performing the claimed function. Because original claim 3 does not invoke 35 U.S.C. 112(f), it is not limited to the structure, materials, or acts in the specification and “equivalents thereof” for performing the claimed function. Thus, original claim 3 is interpreted as covering all filters for preparing the captured digital image data for the analyzing unit.*

**Provisional Specification: Does NOT Provide Adequate Written Description to Support Original Claim 3**

See discussion of original claim 1, from which claim 3 depends.

**Non-Provisional Specification: Does NOT Provide Adequate Written Description to Support Original Claim 3**

There is no disclosure in the non-provisional specification of a filter for image processing. Although filtering techniques are well-known in the image processing art, the non-provisional specification does not indicate that the inventor had possession of the details of how the specific filtering function would be implemented to prepare the captured digital image data for the analyzing unit as claimed. For example, images can be filtered by applying a convolution operation to the image to achieve: blurring, sharpening, edge extraction or noise removal. The non-provisional specification is silent as to what effect the inventor desires to be obtained by the filter or how the inventor devised the filtering to be performed.

While an original claim may, in some instances, provide its own written description support, in this instance, the fact that the filter is recited in an original claim does not provide sufficient written description support for this claimed function. Merely pointing to an original claim does not satisfy the written description requirement, *unless* the claim itself conveys enough information to show that the inventor had possession of the claimed invention at the time of filing. The determination of whether an original claim provides its own written description support is to be evaluated on a case-by-case basis and will vary according to technology.

Claim 3 should be rejected for lack of written description support. A sample rejection using Form Paragraphs 7.30.01 and 7.31.01 could read:

Claim 3 is rejected under 35 U.S.C. 112(a) or pre-AIA 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor or a joint inventor, or for pre-AIA the inventor(s), at the time the application was filed, had possession of the claimed invention. There is no disclosure of how a filter would be implemented, what type of filter would be appropriate in this system, or what effects are to be obtained by the filter. As such, there is no indication in the specification that

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the inventors had possession of an information processing device that includes a filtering function.

***Discussion Point – Original Claims:*** Merely reproducing a claim limitation in the specification, or even pointing to an original claim, does not satisfy the written description requirement, *unless* the claim itself conveys enough information to show that the inventor had possession of the claimed invention at the time of filing.

**Amended Claim 1**

*BRI: In this case, the applicant has broadened the interpretation of the analyzing unit by adding structure. Now, the amended limitation of claim 1 does not invoke 35 U.S.C. 112(f) because even though the amended limitation uses a term (i.e., “unit”) that is a generic placeholder for performing the claimed function, the generic placeholder is modified by sufficiently definite structure for performing the claimed function (i.e., a central processing unit having a memory with instructions stored therein for causing the central processing unit to analyze the pixel values of the captured image). (Note that the other limitations still invoke 112(f).) Because this amended claim limitation does not invoke 35 U.S.C. 112(f), it is not limited to the structure, materials, or acts in the specification and “equivalents thereof” for performing the claimed function. Thus, the amended claim limitation is interpreted to cover not only the disclosed APIDQ histogram technique but all ways of analyzing the pixel values of the captured image.*

**Provisional Specification: Does NOT Provide Adequate Written Description to Support Amended Claim 1**

The amendments to claim 1, which broaden the claim, do not resolve the written description issues raised with the original claim with respect to failure to disclose how the claimed functions are performed.

**Non-Provisional Specification: Does NOT Provide Adequate Written Description to Support the Amended Elements of Claim 1**

The non-provisional specification fails to provide written description support for the amended claim limitation of claim 1. Given that the amended limitation of claim 1 no longer invokes 112(f), the amended limitation is broader than originally claimed because it is no longer limited to the corresponding structure disclosed in the specification for performing the analyzing function and equivalents thereof (i.e., the CPU programmed with the disclosed APIDQ instructions shown in Figure 4) and instead covers all ways of analyzing the pixel values of the captured image. The non-provisional specification describes the CPU preferably programmed with the disclosed APIDQ instructions of Figure 4 for performing the function of analyzing the pixel values of the captured image. However, there is no disclosure of other techniques that would be suitable for performing the analyzing function.

Note though that a claim will not be found inadequate on section 112(a) ground simply because the embodiments of the specification do not contain examples explicitly covering the full scope of the claim language. That is because the patent specification is written for a person of ordinary skill in the art, and such a person comes to the patent disclosure with the knowledge of what has come before. Thus further analysis is needed.

While a claim will not usually be limited to a particular species described in the specification, it is clear from the non-provisional specification in this hypothetical example that the disclosed APIDQ histogram technique is critical to the functioning of the claimed information processing device. As emphasized in paragraph [0009], “APIDQ is faster, simpler, and more-reliable than prior art statistics-based approaches for performing facial recognition, and is



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most suitable for use in implementing the security function of controlling access to secured areas.” In fact, the non-provisional specification indicated that other ways of performing the pixel analysis step would obtain inferior results (e.g., paragraph [0012] states that “[t]echniques other than APIDQ for analyzing pixels have not been shown to obtain desired levels of accuracy sufficient for performing the security function of controlling access to secured areas.”) Further, as noted in the background discussion to this example, the field of image recognition is developing rapidly and many new techniques are currently being introduced. Thus, given the state of this technology, one of ordinary skill in the art would not have recognized that the inventor possessed the full scope of the claimed genus. As a result, there is no evidence in the non-provisional specification that the inventor had possession of other ways of performing the pixel analysis step.

Amended Claim 1 should be rejected as failing to provide written description support under 112(a). A sample rejection using Form Paragraphs 7.30.01 and 7.31.01 could read:

Claim 1 as amended is rejected under 35 U.S.C. 112(a) or pre-AIA 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor or a joint inventor, or for pre-AIA the inventor(s), at the time the application was filed, had possession of the claimed invention. The amendment broadens the analyzing unit to cover all ways of analyzing pixel values and the specification does not provide support for such a broad genus limitation. The specification indicates that the use of the disclosed species (APIDQ) is critical to achieving the accuracy rates in accordance with this invention.

**Discussion Point:** To remedy the lack of written description, the claim could be amended to recite the disclosed species (APIDQ). See discussion of amended claim 2 below.

### **Amended Claim 2**

BRI: *Amended claim 2 is interpreted as being limited to instructions stored in the memory such that the central processing unit analyzes the pixel values of the captured image according to the APIDQ histogram technique and obtains an image detection rate of 90% to about 95% accuracy.*

### **Provisional Specification: Does NOT Provide Adequate Written Description to Support Amended Claim 2**

The amendments to claim 1 and 2 in this case do not resolve the written description issues raised with the original claims.

### **Non-Provisional Specification: Provides Adequate Written Description to Support Amended Claim 2**

While the amendment to independent claim 1 lacks written description, the amendment to dependent claim 2 remedies that problem by limiting the instructions stored in the memory

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such that the central processing unit analyzes the pixel values of the captured image according to the APIDQ histogram technique disclosed in Figure 4 of the non-provisional specification. Thus, the scope of amended claim 2 is now reasonably commensurate with the non-provisional specification.

Additionally, amended claim 2 resolves the written description problem of original claim 2 by limiting the image detection rate obtained by the information processing to device to a range (i.e., 90% to about 95%) that is fully supported by the non-provisional specification.

### **Amended Claim 3**

*BRI: Amended claim 3 is interpreted as being limited to a Gaussian high pass filter that prepares the captured digital image data for the analyzing unit.*

### **Provisional Specification: Does NOT Provide Adequate Written Description to Support Amended Claim 3**

The amendments to claims 1, 2 and 3 in this case do not resolve the written description issues raised with the original claims.

### **Non-Provisional Specification: Does NOT Provide Adequate Written Description/Amended Claim 3 Adds New Matter**

The amendment to dependent claim 3 to recite a specific type of filter does not remedy the lack of written description suffered by original claim 3. The introduction of a specific type of image filter (i.e., a Gaussian high pass filter) that prepares the image data for the analyzing unit by amendment to claim 3 after the filing of the original disclosure constitutes new matter.

A sample rejection using Form Paragraphs 7.30.01 and 7.31.01 could read:

Claim 3 is rejected under 35 U.S.C. 112(a) or pre-AIA 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor or a joint inventor, or for pre-AIA the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 3 recites a function that is not supported by the original description and additionally adds a "Gaussian high pass" filter that prepares the image data for the analyzing unit which constitutes new matter to the original disclosure.

## VIII. TALKING POINTS FOR FACILITATORS

As noted in the introduction, this workshop should be presented as a simulated examination, focusing on the application of 35 U.S.C. 112(a) written description. First, the specification should be read and then the claims construed for their broadest reasonable interpretation.

You are encouraged to discuss with the participants their understanding and assumptions regarding written description before beginning the workshop in order to establish a baseline of understanding. Then, after the workshop you should go over those assumptions to discuss any changes and new understanding to reinforce the principles of written description.

While for purposes of this workshop other patentability considerations for these claims need not be addressed, it is likely that questions regarding enablement will come up. You should be familiar with the principles of enablement and the differences between written description and enablement in order to address any questions. A few discussion points on enablement, benefit claims, and indefiniteness are listed below to assist in any answering questions.

### **Benefit of an earlier filing date – Provisional or Continuation/Divisional**

***Discussion Point:*** When examining an application that claims the benefit of an earlier filing date, proper 112(a) support in the earlier-filed application for the claims of the later-filed application should be evaluated when there is a reason to question the adequacy of the support. This typically occurs, for example, when there is an intervening prior art reference, when the later-filed claims are significantly broadened, or when the earlier-filed application appears to be significantly less substantial than the later-filed application. It is a best practice to ensure that the benefit claim is proper.

### **Original Claim 1 - Enablement**

***Discussion Point:*** In view of the *Wands* factors as they would be applied to this case, given the sophisticated state of the art and high level of predictability, it is likely that one of ordinary skill in the art could devise programming that would perform the claimed functions without undue experimentation. As such, the disclosure would be enabling under 112(a).

### **Original Claim 2 - Enablement**

***Discussion Point:*** Additionally, it should be noted that an analysis of the *Wands* factors as applied to this case would show that the non-provisional specification does not provide a description of the invention that would enable one of ordinary skill in the art to make and/or use an information processing device without undue experimentation that obtains an image detection rate of greater than 97% accuracy. In this case, a rejection under 112(a) for lack of enablement would also be appropriate.

**Original Claim 3 - Enablement**

***Discussion Point:*** In contrast to original claim 2, an analysis of the *Wands* factors as applied to this case would show that the non-provisional specification would enable one of ordinary skill in the art to make and/or use the claimed filter as, given the predictability and high level of skill in this art, the level of experimentation required would not be undue. No rejection of claim 3 for lack of enablement would be needed.

**Amended Claim 2 - Definiteness**

***Discussion Point:*** This claim adds the term “about”. Although this is a relative term, in this case it does not render the claim indefinite. The specification describes the techniques as resulting in “about a 95% accurate image detection rate” and one of ordinary skill in this art would understand the metes and bounds of this limitation given the relative precision of measuring such rates. For any relative term, one must consider the context of the term as it is used in the specification and claims of the application along with the state of the art to determine whether it is definite. MPEP 2173.05(B)(II).