

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

DEXCOWIN GLOBAL, INC.
Petitioner

v.

ARIBEX, INC.
Patent Owner

Case IPR: IPR2016-_____

PETITION FOR *INTER PARTES* REVIEW
OF U.S. PATENT NO. 7,224,769
UNDER 35 U.S.C. § 311

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I. STATEMENT OF RELIEF REQUESTED (37 C.F.R. § 42.22(A))

Dexcowin Global, Inc., (hereinafter “Petitioner” or “Dexco”) petitions for institution of *inter partes* review (“IPR”) of U.S. Patent 7,224,769, as reexamined, *Ex Parte* Reexamination Certificate 10295, to D. Clark Turner (“the ‘769 patent” or “Turner ‘769”), and cancellation of claims 6, 10, 14, 17, 34, 36-37, 39-53 and 55-64 of the ‘769 patent. Thus, this Petition requests cancellation of 32 claims of the ‘769 patent’s 38 claims, as reexamined. A copy of the ‘769 patent is submitted as Dexco Exhibit 1001¹ (“Dexco 1001” or “Exh. 1001”). A copy of *Ex Parte* Reexamination Certificate 10295 for the ‘769 patent is submitted as Exh. 1002. A copy of the United States Patent and Trademark Office (“PTO”) file history of the ‘769 patent is submitted as Exh. 1003, and a copy of the file history of the *Ex Parte* Reexamination is submitted as Exh. 1004.

According to the PTO Abstract of Title records the ‘769 patent is owned in its entirety by Aribex, Inc., by assignment from its inventor executed November 22, 2005, recorded December 12, 2005, as found at Reel 17577, Frame 912.

The Petition asserts *four* Grounds of Invalidity under pre-AIA 35 U.S.C. §103 (“Grounds”).

¹ For convenience, Dexco Exhibits may be referred to alternatively in the formats of Dexco Exhibit 1XXX; Dexco 1XXX; or Exh. 1XXX.

The '769 patent is directed to and claims certain portable X-ray² devices, hand-held X-ray devices, systems for X-ray analysis, methods for making a portable X-ray device and a method for analysis using a portable X-ray device.

According to the '769 patent Abstract:

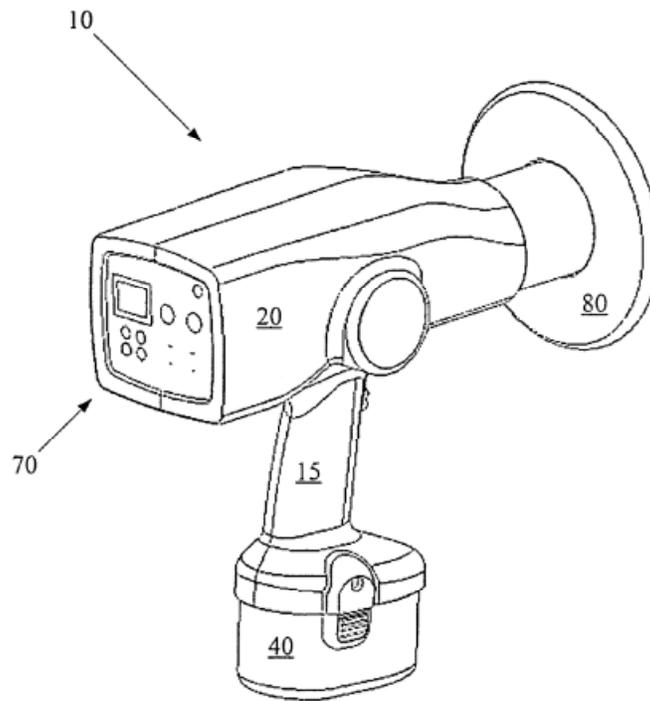
The devices have an x-ray tube powered by an integrated power system. The x-ray tube is shielded with a low density insulating material containing a high-Z substance. The devices also have an integrated display component. With these components, the size and weight of the devices can be reduced and the portability of the devices enhanced. The x-ray devices also have an x-ray detecting means that is not structurally attached to the device and therefore is free standing. Consequently, the x-ray devices can also be used as a digital x-ray camera. The portable x-ray devices are especially useful for applications where portability is an important feature such as in field work, remote operations, and mobile operations such as nursing home, home, healthcare, or teaching classrooms. This portability feature can be particularly useful in multi-suite medical and dental offices where a

² It is noted that the form "X-ray" has been established as the correct format; however, when expressed as "x-ray" in materials that are quoted, and for convenience, only the low case "x" will be used.

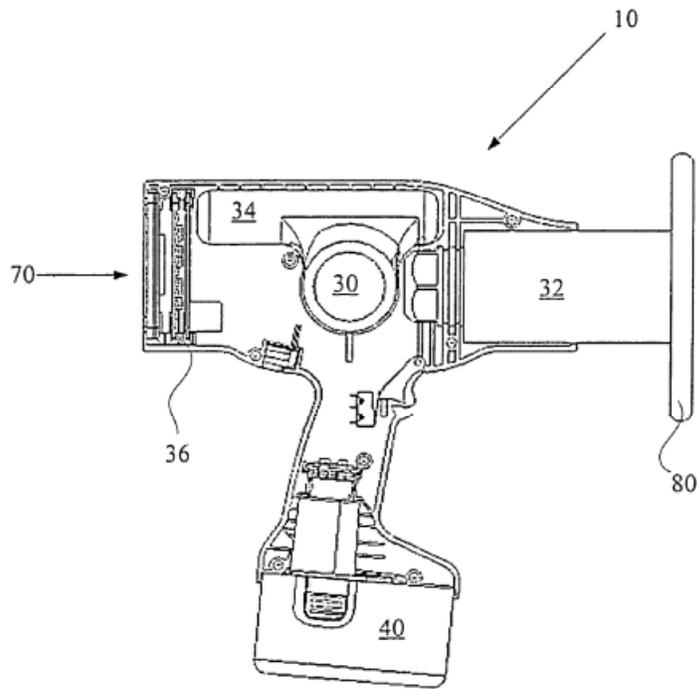
single x-ray device can be used as a digital x-ray camera in multiple offices instead of requiring a separate device in every office.

Exh. 1001, Abstract. An article entitled “How X-rays Work” provides general background information on X-ray technology and is submitted as Exh. 1005.

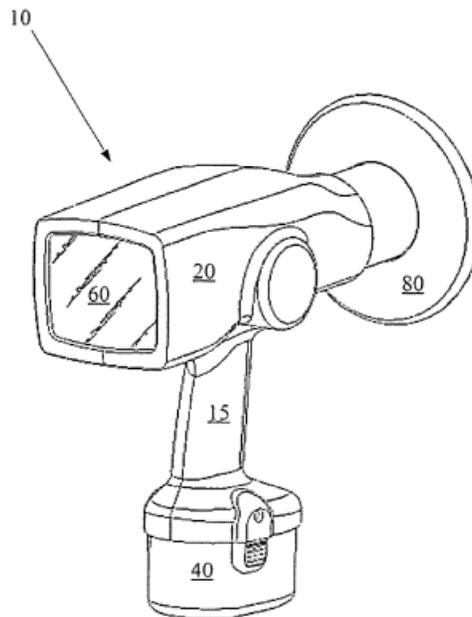
Figures 1, 2, 4 and 15 of the ‘769, reproduced below, illustrate the main structures of three embodiments of the ‘769 patent X-ray device.



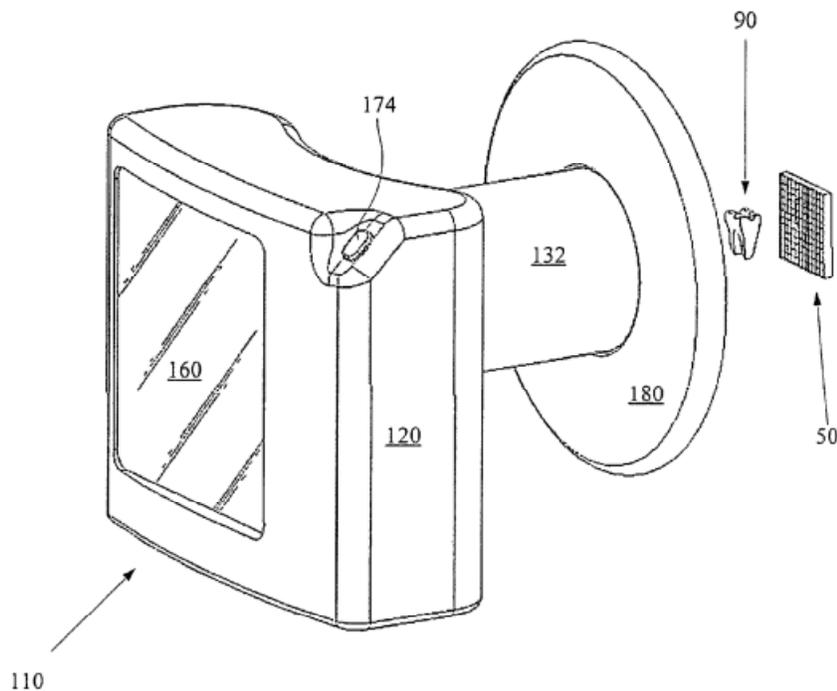
In the Figure 1 embodiment (above), the patented X-ray device 10 has a housing 20 that contains the internal components, including x-ray tube 30, power source 40, means for sensing the X-rays, such as film, CCD sensors, controller 70, radiation shielding 80 and handle 15. Figure 2 (below) additionally shows X-ray tube 30, collimator 32, power supply 34 and power management boards 36.



The Figure 4 embodiment, reproduced below, includes an integrated image display screen 60.



The Figures 13-16 embodiment, Figure 15 of which is reproduced below, has a housing 120 that does not contain a handle, but does contain internal components similar to those of the X-ray device 10 of Figures 1-2, and operates in substantially the same manner as Figures 1-2 embodiment of the '769 patent X-ray device 10.



As explained in the specification:

The power system of the x-ray device comprises a power source 40, power supply 34 and conversion means. The power source 40 used in the x-ray device of the invention can be any known in the art that can supply the desired amount of power, yet fit within the space limitations of the x-ray device. [Emphasis added]

Exh. 1001, '769 patent, at [3:41-47]. The '769 patent describes the “conversion means” as structure that converts the power source voltage into a voltage that can be used by a conventional X-ray tube, as follows:

The power source 40 is electrically connected to the conversion means using any connection means known in the art, including those described in the publications above. The conversion means converts the initial voltage supplied by the power source 40 to a converted voltage that is provided to the power supply 34. The conversion means generally converts the 14.4V (or similar voltage) provided by the power source 40 to a voltage ranging from about 80 to about 200V. Any conversion means known in the art that operates in this manner can be used in the invention, including power management boards 36. [Emphasis added]

Id. at [4:9-21]. The specification further describes how the conversion means functions:

The conversion means is electrically connected to the power supply 34. The power supply 34 steps up the converted voltage (i.e., the 100V) provided by the conversion means to a voltage that can be used by the x-ray tube 30. . . . Generally, the power provided by the power supply 34 to the x-ray tube 30 can range from about 20 to about 150kV. Typically, this power provided by the power supply can range from about 40kV to about 100kV.

Id. at [4: 22-33].

B. Claim Term Construction

Petitioner proposes that four terms in the challenged claims must be construed as having special meaning regarding the '769 patent and that all of the remaining claim terms be given their ordinary meaning. Under 37 C.F.R. §42.100 “[a] claim in an unexpired patent shall be given its broadest reasonable construction in light of the specification of the patent in which it appears.” *In re Cuozzo Speed Techs., LLC*, 793 F.3d 1268, 1275 (Fed. Cir. 2015).

Three of the four terms first appear, *e.g.*, in claim 6 of the '769 patent, as reexamined: (1) “portable x-ray device”; (2) “integrated”; and, (3) “internal power source”. The fourth term, (4) “high voltage” appears, *e.g.*, in dependent claim 52. Petitioner’s proposed constructions are detailed in the Declarations of Professor David M Hamby, Ph.D. (“Hamby Decl.”) and Mark I. Montrose (“Montrose Decl.”). The Hamby Decl. is submitted as Exh. 1006, and his *Curriculum Vitae* is submitted as Exh. 1007. The Montrose Decl. is submitted as Exh. 1009, and his *Curriculum Vitae* is submitted as Exh. 1010. Petitioner’s proposed claim term interpretations are set forth, in summary form, in Claim Chart 1, below. See also, Hamby Decl., Exh. 1006, at ¶¶ 12-25; Montrose Decl., Exh. 1009, at ¶¶ 7-19.

Claim Chart 1 – Claim Interpretation

Claim No.	Claim Term	Construction
6 (a)	[The device of claim 1,] A <u>portable x-ray device</u> , comprising:	The term “portable x-ray device” means a device that contains an x-ray tube (Exh. 1001 at [1: 21-22]) and that can be transported by hand carrying it from one location to a second location without support by any mechanical apparatus. <i>Id.</i> , at [3: 13-16].
(b)	a housing containing an x-ray source and an <u>integrated</u> power system containing an <u>internal power source</u> ;	The term “integrated” means “internal. <i>Id.</i> , at [1: 46-50]. The term “internal power source” means does not require utility-supplied line voltage. <i>Id.</i> , at [1: 43-46]
(c)	display means comprising an LCD screen integrated into the housing; and	
(d)	detecting means structurally unattached to the housing;	
(e)	wherein the power source can be removed from the housing.	
42	The device of claim 6, wherein the power system is configured to provide a continuous D.C. <u>high voltage</u> to the x-ray source.	The term “high voltage” means “a voltage that can be used by the x-ray tube.” <i>Id.</i> at [4: 23-25].

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alternative a simple combining the teachings of one of these portable X-ray device references with teachings of the other reference, according to known methods would have predictably yielded the results as recited in these claims, as detailed below.

A. CN '048 Is Prior Art Against the '769 Patent

The Chinese Patent Publication CN 2675048 (“CN ‘048”) was published February 2, 2005. It is submitted herewith as Exh. 1012, and its Certified English translation is submitted as Exh. 1013, titled “Portable Digital X Ray Diagnostic Apparatus”.

On March 11, 2013, during the reexamination of the ‘769 patent, the Patent Owner (Aribex) submitted a 37 C.F.R. § 1.131 declaration from the named inventor, D. Clark Turner, declaring that he conceived of and reduced to practice the claimed subject matter in the ‘769 patent, prior to the date that the CN ‘048 was available as a prior art reference (February 2, 2005). See March 11, 2013 Declaration under 37 C.F.R. §1.131, Exh. 1004. Aribex wholly relied upon this declaration in arguing to the Patent Office that CN ‘048 “cannot be used to reject the claims”. See p. 24 of Remarks/Arguments dated March 11, 2013, Exh. 1004. However, the §131 Declaration failed to comply with controlling law, and, as a factual matter, failed to establish prior invention of the claimed subject matter, as set forth below.

First, it is well-settled that a party cannot antedate a prior art reference through an inventor's own uncorroborated testimony. According to the Federal Circuit in *In re NTP, Inc.*, 654 F.3d 1279 (Fed. Cir. 2011):

A party seeking to antedate a reference based on reduction to practice must present evidence of the actual reduction to practice of the invention prior to the effective date of the reference. 37 C.F.R. § 1.131(b). **An inventor cannot rely on uncorroborated testimony to establish a prior invention date.** *Id.* It has long been the case that an inventor's allegations of earlier invention alone are insufficient — an alleged date of invention must be corroborated. *Medichem S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1170 (Fed. Cir. 2006); *Woodland Trust v. Flowertree Nursery, Inc.*, 148 F.3d 1368, 1371 (Fed. Cir. 1998).

In re NTP, Inc., 654 F.3d at 1291 (Emphasis added).

As the Federal Circuit made clear in *In re NTP*, an inventor cannot declare that he or she reduced the invention to practice by a certain date, and then corroborate this statement with his or her own self-serving testimony. Faced with a situation similar to that in the present case, the Federal Circuit in *In re NTP* emphasized that:

To substantiate this claim, **NTP relies upon the testimony of the same two inventors**, Campana and Thelen. Mr. Campana states that

"I have determined from a complete review of the documents . . . that the description of the system in the Telefind Email Integration Document which was revision 0 was written by me and was not substantially changed in the later revisions 1 and 2" 2010-1243 J.A. 1524-25. Thelen testified similarly. *Id.* at 6819-20. **The problem with NTP's argument is that it is circular. The affiants seek to corroborate their testimony with the Telefind document, but, at the same time, attempt to corroborate the date of the document with their testimony.** It would be strange indeed to say that Mr. Campana, who filed the R.131 affidavit that needs corroborating, can by his own testimony provide that corroboration.

In re NTP, Inc., 654 F.3d at 1291-1292 (emphasis added). Similarly, here, Aribex intended to corroborate Mr. Turner's testimony with documents, but at the same time, attempted to corroborate the date(s) (or other information) of these documents with his own testimony. That is precisely what the Federal Circuit found as "problematic" and a failure to comply with the corroboration requirement.

Second, the named inventor (Mr. Turner) also states in his declaration that Exhibits A-C attached to his declaration "are documents evidencing the facts in paragraph (2)." Paragraph (2) states that he "conceived of the invention disclosed and claimed in the above-captioned patent and reduced that invention to practice

prior to February 2, 2005.” However, upon closer inspection, nothing in Exhibits A-C supports Mr. Turner’s uncorroborated assertion. With respect to Exhibit A, Mr. Turner describes it as a document that “contains list of the features of an x-ray unit that I submitted to a design engineering firm”. However, this document is undated. There is also nothing in this document that shows that the any of the “features” was reduced to practice or that any of the claimed subject matter of the ‘769 patent was in fact reduced to practice, as Mr. Turner claims. With respect to Exhibit B, represented to be a copy of “notebook pages of additional ideas that [Mr. Turner] had about the x-ray unit.” This exhibit, like the Exhibit A, is undated. The notes in these “notebook pages” also appear to be “concepts” and “ideas”, and nothing in this notebook shows any reduction to practice of any concept or idea. Finally, Exhibit C is a copy of the provisional patent application that was filed by Aribex (and from which the application that issued as the ‘769 patent attempts to claim priority) in February 20, 2004. However, this application does not disclose any LCD screen integrated into the housing, as required by the ‘769 patent’s independent claims. Thus, under controlling law, there can be no valid priority claim to a date of invention based on the filing date of the provisional application.

Accordingly, Aribex cannot rely upon the uncorroborated, self-serving, declaration of its own inventor to swear behind the prior art reference CN ‘048. Nothing that Aribex presented with Mr. Turner’s declaration supported a claim of

reduction to practice prior to February 2, 2005, as the declaration asserted, and the examiner should not have withdrawn the CN '048 reference from consideration as prior art relevant to the issue of patentability. For the foregoing reasons, CN '048 is prior art against the '769 patent.

B. Claims 6, 10, 45- 48, 50-53, 55-59, 62, 63 and 64 of the '769 Patent
Would Have Been Obvious Under Pre-AIA 35 U.S.C. § 103

Claims 6, 10, 45- 48, 50-53, 55-59, 62, 63 and 64 of the '769 patent, also referred to as the Group I claims herein, are directed to a portable X-ray device, a hand-held X-ray device and a method for analysis that generally recite basic structural features of the X-ray device and that are in common to these claims.

Those structures-in-common are:

- A housing containing an X-ray source
- An integrated power system
- An internal power source that can be removed from the housing
- An LCD display means integrated into the housing
- Detecting means structurally unattached to the housing

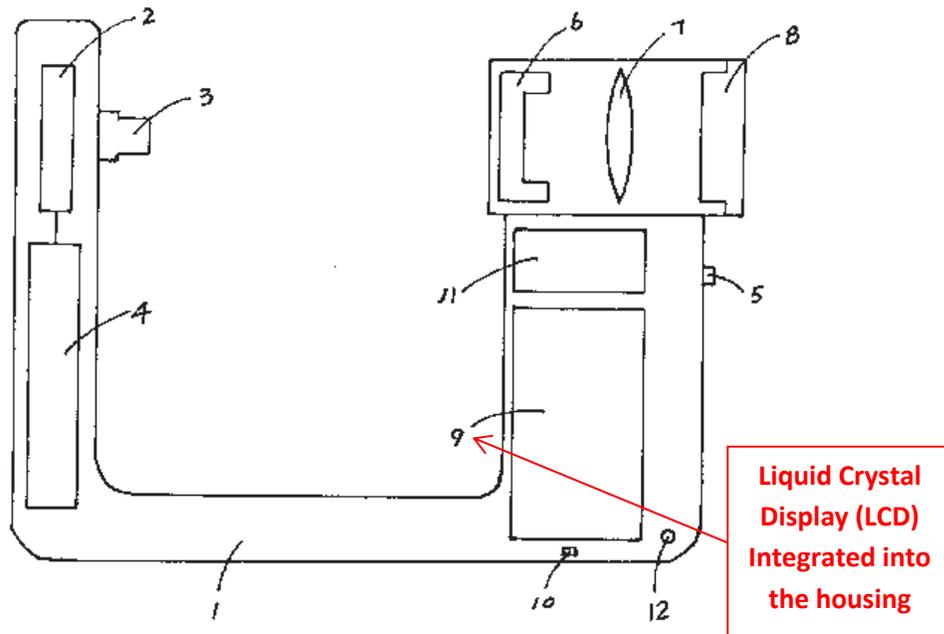
Claim 6 is illustrative and is reproduced below from the '769 patent, as reexamined:

6. **[The device of claim 1,]** *A portable x-ray device, comprising:*
a housing containing an x-ray source and an integrated power system containing an internal power source;
display means comprising an LCD screen integrated into the housing; and
detecting means structurally unattached to the housing;
wherein the power source can be removed from the housing.

1. Group I Claims Are Obvious from CN ‘048 in View of JP ‘098

Dexco requests cancellation of the Group I claims on the ground that each of these claims is obvious under Pre-AIA 35 U.S.C. §103(a) from CN ‘048 in view of Japanese Patent Publication 58-145098 (“JP ‘098”), Exh. 1014.

As described in its Certified English translation, Exh. 1013, CN ‘048 is directed to a battery-powered, portable X-ray device that includes an LCD display screen integrated into its housing. With respect to its Figure 1, reproduced below, the portable digital X-ray diagnostic device has a housing 1, referred to as a “shell,” and contains X-ray tube 2. Battery box 11 is provided with a changeable battery that functions as the internal power source. A liquid crystal display (LCD) 9 is integrated into the housing 1. The CN ‘048 X-ray device detecting means is an X-ray image intensifier 6, which is structurally attached to the housing 1. See, Hamby Decl., Exh.1006, at ¶¶ 26-29; Montrose Decl., Exh. 1009, at ¶¶ 20-23.

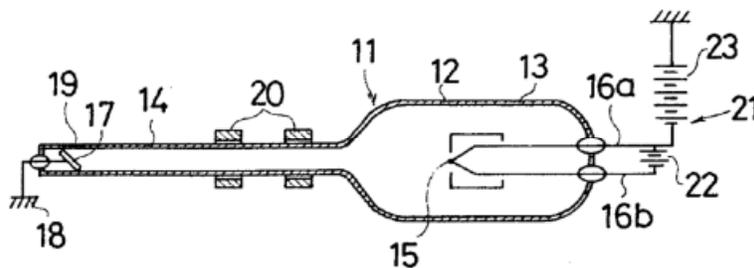


JP '098 was published August 29, 1983, and its Certified English translation is submitted as Exh. 1015. The JP '098 reference describes a portable X-ray device and its use for medical treatment, such as in the field of dentistry, for taking X-rays of the roots of teeth. JP '098 is entitled "A Portable X-ray Generating Apparatus", and its "DETAILED DESCRIPTION OF THE INVENTION" states that "[t]he invention relates to a portable X-ray generating apparatus which can, for example, be suitably used for medical treatment, etc." Exh. 1015, at [0001]³. JP '098 describes the then conventional dental X-ray practice of X-ray photography of the root of a tooth where X-ray film is placed in the oral cavity of a patient and the

³ The notation [00xx] refers to the number of the paragraph in the JP '098 specification, English translation, Exh. 1015. Thus, [0001] refers to the first paragraph under the topic heading "DETAILED DESCRIPTION OF THE INVENTION".

X-ray image of the tooth is carried out by external-ray irradiation. Exh. 1015, at [0002]. The JP '098 reference continues to explain that its X-ray device provides “a small, easy-to-handle portable X-ray generating apparatus which can be safely used as an apparatus for such medical treatment.” Exh. 1015, at [0002]-[0004]. The JP 098 X-ray device is placed in the oral cavity of the patient and then an X-ray image of the tooth is taken by the device. Either a cathode ray tube (CRT), for real-time images, or a film for photography, can be used to detect and capture the X-ray image of the tooth. In either scenario, the CRT and the film are structurally unattached to the housing of the JP '098 device. Hamby Decl., Exh. 1006, at ¶¶ 30-35; Montrose Decl, Exh. 1009, at ¶¶ 24-33. With reference to its Figure 2, reproduced below, the JP '098 X-ray tube is shown and described as follows:

[FIG. 2]

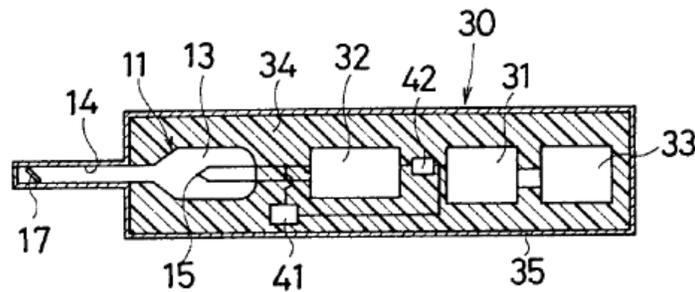


Bulb 11 has a filament 15 for generating electrons (referred to as “electron beams” in JP '098) and the filament is connected to lead wires 16a, 16b that supply a high DC voltage of approximately 60kV. Target 17 is made from metals such as tungsten, copper, and platinum and converts the electrons (the “electron beams”)

into X-rays. Circuit 22 heats filament 15 and circuit 23 provides high voltage to the filament 15 to accelerate the electrons (“electron beams”) from the filament 15 to the target 17. The tube 11 applies approximately 60kV as a high voltage and circulates a filament current of approximately 1 mA. Exh. 1015, at [0006], [0007] and [0010]; Hamby Decl., Exh 1006, at ¶ 31; Montrose Decl., Exh. 1009, at ¶ 27.

With reference to its Figure 4 embodiment, reproduced below, JP ‘098 describes and illustrates a portable X-ray device 30 as follows:

[FIG. 4]



The portable X-ray generating apparatus 30 uses X-ray tube bulb 11 and includes a rechargeable battery 31, high voltage generating circuit 32. The “energy supply source, battery 31, itself is of a low voltage and therefore [is] converted to AC by an oscillation circuit in high voltage generating circuit 32, with the voltage thereof increased by a transformer and used as a high voltage power source.” Exh. 1015, at [0011]; Hamby Decl., Exh. 1006, at ¶ 32; Montrose Decl., Exh. 1009, at ¶¶ 29-30.

The housing 35 has a first portion [the left side as shown in Figure 4] that contains X-ray tube 11. The X-ray tube 11 is powered by an internal power system that includes high voltage circuit 32 and rechargeable battery 31, which together provide a high voltage, continuous DC power to the tube 11. The battery 31 is an internal power source. The apparatus 30 also includes a “switch 41 for heating filament 15” and “switch 42 for applying a high voltage to filament 15”. Switch 42 “can selectively perform . . . operations for operating only for a continuously necessary time for continuous irradiation.” Exh. 1015, at [0013]; Hamby Decl. Exh 1006, at ¶ 33. During operation “X-rays are output from target 17, allowing a transmission image of the root of the tooth, etc. [,] in dental medical treatment to be easily observed or photographed.” Exh. 1015, at [0015]; Hamby Decl. Exh. 1006, at ¶ 33. Thus, the JP ‘098 device provides an X-ray output such that images of dental roots can be easily observed, and it has a current load sufficient for radiographic imaging.

In conventional X-ray imaging of teeth when film is used to capture the image, a small piece of film is typically placed in the mouth of the patient, adjacent a tooth and the X-ray device is then pointed toward that tooth, and energized to create a radiographic image of the tooth. That piece of film is not attached to the X-ray device, but is separate from the device. The JP ‘098 reference explains that its portable X-ray device can be “safely used as an apparatus for such [dental]

medical treatment . . . without being connected to an external wire, high voltage power source.” Exh. 1015 at [0002], [0004]; Hamby Decl. Exh. 1006, at ¶¶ 34-35. JP ‘098 also states that its portable X-ray device can be used to obtain a “transmission image by X-rays” using a “channel plate”, “frame photographing”, Exh. 1015, at [0013], and “a transmission image of the root of tooth, etc. in dental medical treatment to be easily . . . photographed.” Exh. 1015, at [0013], [0015]; Hamby Decl., Exh 1006, at ¶ 35. Thus, one of its normal intended uses is in the field of dentistry for taking X-ray images of teeth and recording those images on film or channel plate and displaying the images in real-time on a CRT. In such applications neither the film nor the channel plate is attached to the X-ray device. Hamby Decl. Exh. 1006, at ¶ 35.

Each of claims 6, 10, 45- 48, 50-53, 55-59, 62, 63 and 64 of the ‘769 patent would have been obvious at least as of March 21, 2005, from the teachings of the CN ‘048 publication in view of the JP ‘098 publication. All of the elements and limitations of claims 6, 10, 45- 48, 50-53, 55-59, 62, 63 and 64 of the ‘769 patent are found in the portable X-ray device described and taught in the CN ‘048 reference, *except* for the limitation that the detecting means is structurally unattached to the housing. However, as described and shown above, the JP ‘098 reference teaches a portable X-ray device that does have detecting means, each of which is unattached to the housing. Specifically, one of its normal intended uses is

in the field of dentistry for taking X-ray images of teeth and recording those images on film, or a channel plate and then displaying the images in real-time on a CRT. In such applications neither the film nor the channel plate is attached to the X-ray device. Combining teachings of the CN '048 reference with teachings of the JP '098 reference according to then known methods would have yielded predictable results as related to the field of technology of the '769 patent. Specifically, it would have been obvious to a person of ordinary skill in this field to have modified the CN '048 portable X-ray device to have used a film or a channel plate that was structurally unattached to the housing, as taught by JP '098. See, Hamby Decl, 1006, at ¶¶ 40-42.

For all the above reasons, claims 6, 10, 45- 48, 50-53, 55-59, 62, 63 and 64 of the '769 patent would have been obvious at the time of the invention of the '769 patent, based on its priority date, and should be cancelled.

2. Group I Claims Are Obvious from JP '098 in View of CN '048

Each of claims 6, 10, 45- 48, 50-53, 55-59, 62, 63 and 64 of the '769 patent would have been obvious at least as of March 21, 2005, from the teachings of the JP '098 publication in view of the CN '048 publication. As discussed above, all of the elements and limitations of claims 6, 10, 45- 48, 50-53, 55-59, 62, 63 and 64 of the '769 patent are found in the portable X-ray device described and taught in the

JP '098 reference except for the LCD display means and the removable power source.

It would have been obvious to have modified the portable X-ray device of the JP '098 reference by including in it an LCD display means as taught by the CN '048 reference. *See* Hamby Decl., Exh. 1006. ¶ 43. Not only would this combination have been another example of combining teachings of one reference (JP '098) with teachings of another reference (the CN '048 display means) according to then known methods that would yield predictable results as related to the field of technology of the '769 patent, such a combination was virtually invited by the '769 patent specification. Specifically, the '769 patent stated:

The x-ray device may also contain means for displaying the x-rays detected by the detecting means. Any display means that displays the detected x-rays in a manner that can be understood by the operator of the device can be used for the invention. Examples of displaying means that can be used include film, imaging plates, a digital image displays such as cathode ray tubes (CRT) or liquid crystal display (LCD) screens.

Exh. 1001, at [6:34-41].

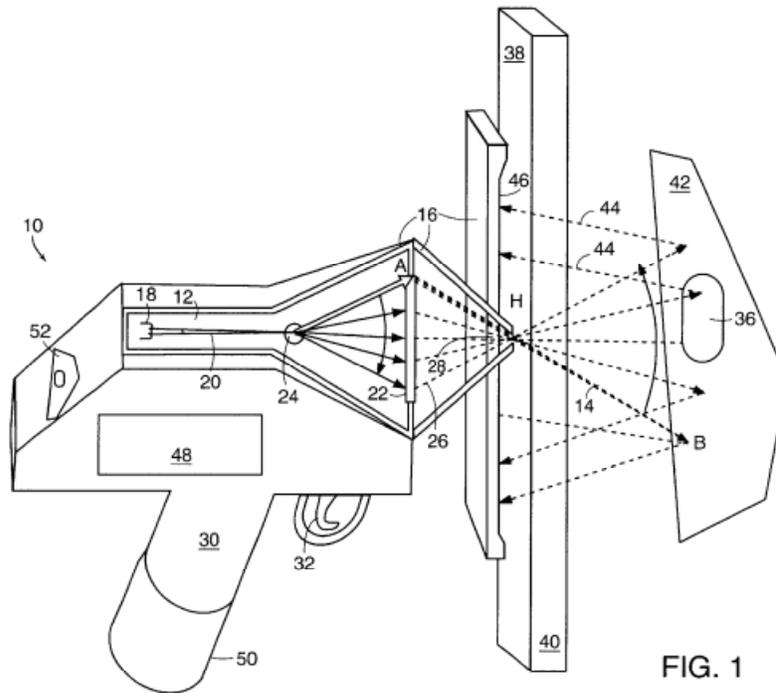
Finally, with respect to the removable power source, CN '048 includes a changeable battery that is positioned in box 11, and it would have been obvious to

have modified the portable X-ray device of the JP '098 reference to have the battery removable, such as taught by the CN '048 reference. This combination would have been another example of combining teachings of one reference (JP '098) with teachings of another reference (the CN '048 battery box 11 and battery) according to then known methods that would have yielded predictable results as related to the field of technology of the '769 patent.

3. Group I Claims Are Obvious from JP '098 in View of CN '048; and Vice-Versa, and Further in View of U.S. Patent 6,282,260 to Grodzins

Claims 6, 10, 45- 48, 50-53, 55-59, 62, 63 and 64 of the '769 patent are challenged under pre-AIA 35 U.S.C. § 103(a) as obvious from the teachings of JP '098 in view of CN '048 (and vice-versa), and further in view of United States Patent 6,282,260 (“the ‘260 patent” or “Grodzins ‘260” or “Grodzins”). A copy of Grodzins is submitted as Dexco 1018.

Grodzins '260 describes and illustrates a hand-held X-ray device that includes a display 52 that is integrated into the housing, as shown below in Figure 1.



Grodzins explains the image and image display features of his portable X-ray device as follows:

The term “image” refers to a mapping of raw or processed detector signals to positions in the plane, and . . . may be displayed visually on a display 52 such as a video monitor.

Exh. 1018, at Fig. 1; [3:24-37; especially 33-37].

Grodzins ‘260 is an additional reference showing that use of an image display integrated into the housing of a portable, hand-held X-ray device was well

known to those of ordinary skill in this field of technology by early 2004. *See* Hamby Decl., Exh. 1006, ¶¶ 36-38; Montrose Decl., Exh. 1010, at ¶ 34.

Moreover, combining the teachings of Grodzins '260 with the teachings of CN '048 and/or JP '098 would have been an obvious method of having an image display incorporated in the housing of a portable X-ray device for several reasons. First, Grodzins already had such an X-ray device. Second, Grodzins' display was positioned and functioned just as recited in the claims of the '769 patent and therefore was an example of a display means that the '769 patent specification said "can be used in the invention" at Exh. 1001, at [6:44-51]. Third, having an image display integrated into the housing of the portable device itself was simply an application of a known technique [integrated image display of Grodzins] to a known device that was ready for improvement [in the case of the X-ray device of JP'098] and the resulting X-ray device's image display capability was predictable. Fourth, the combination of Grodzins' image display integrated into the JP '098 portable X-ray device housing would have yielded the predictable result that the thus-modified portable X-ray device would have had a housing with an integrated image display that provided the operator of the device with the capability to understand the detected X-rays. And, fifth, the use of an LCD screen in the portable X-ray device of the CN '048 reference establishes that the use of LCD

screens in portable, hand-held X-ray devices was well-known to those skilled in this field by at least early 2004. *See* Hamby Decl., Exh. 1006, ¶¶ 38-39.

4. Group I Claims Are Obvious from JP ‘098 in View of CN ‘048; and Vice-Versa, and Further in View of U.S. Patent 5,514,873 to Schulze-Ganzlin et al

Claims 6, 10, 45- 48, 50-53, 55-59, 62, 63 and 64 of the ‘769 patent are challenged under pre-AIA 35 U.S.C. § 103(a) as obvious from the teachings of JP ‘098 in view of CN ‘048 (and vice-versa), and further in view of United States Patent 5,514,873 to Schulze-Ganzlin et al (“the ‘873 patent” or “Schulze-Ganzlin ‘873” or “Schulze-Ganzlin”). A copy of Schulze-Ganzlin is submitted as Exh. 1021.

Schulze-Ganzlin ‘873 illustrates and describes an X-ray apparatus that includes a *portable* detector that can be used in a clinical dental environment. (*See* Exh. 1021 at [2:47-52]: “A radiation detector is shown in FIG. 1 is preferably portable and has an essentially rectangular housing 1 in which a radiation transducer 2 as well as wireless means for receiving operating energy, preferably the supply voltage, and for the outfeed of the signals are arranged.”). This portable detector has a compact structure, can be placed in the oral cavity of a patient, and detects X-ray radiation that emanates from an X-ray device, such as that of JP ‘098

(and of other portable or handheld X-ray devices taught by the various references discussed below) (*see id.*, at [2:9-31].).

Combining teachings of the CN '048 reference with teachings of the JP '098 reference (and *vice-versa*, as discussed above) according to then known methods would have yielded predictable results as related to the field of technology of the '769 patent. Specifically, it would have been obvious to a person of ordinary skill in this field to have modified the portable X-ray device such as that of CN '048 (and of JP '098) to have used a detector that is compact, portable and structurally unattached to the housing, as taught by Schulze-Ganzlin '873. *See* Montrose Decl., Exh. 1009, ¶ 35; Hamby Decl., Exh. 1006, at ¶43.

For all of the above reasons, cancellation of claims 6, 10, 45- 48, 50-53, 55-59, 62, 63 and 64 of the '769 patent is requested.

GROUND 2:

CHALLENGE TO GROUP 2 CLAIMS 14, 17, 34, 37, 39, 40, 42, 43, 44 and 61

OF THE '769 PATENT ON THE GROUND THAT EACH IS

UNPATENTABLE UNDER PRE-AIA 35 U.S.C. §103 AS OBVIOUS

A. Group 2 Claims are Obvious From the Teachings of JP '098

and/or CN '048 In View of the Teachings of Skillicorn '771

Claims 14, 17, 34, 37, 39, 40, 42, 43, 44, and 61 of the '769 patent are challenged under pre-AIA 35 U.S.C. § 103(a) as obvious from the teachings of JP

'098 and/or CN '048 in view of United States Patent 5,077,771 to Skillicorn et al ("Skillicorn '771" or "the '771 patent" or "Skillicorn"). A copy of Skillicorn '771 is submitted as Exh. 1016.

Claims 14, 17, 34, 37, 39, 40, 42, 43, 44, and 61 of the '769 patent generally recite the same elements and limitations of one or more of claims 6, 10, 45- 48, 50-53, 55-59, 62, 63 and 64 of the '769 patent as discussed above.

Claims 14, 17, 34, 37, 39, 40, 42, 43, 44, and 61 of the '769 patent additionally recite that the X-ray device includes a plurality of power supplies wherein each power supply provides a voltage ranging from about 20kV to about 50 kV.

Claim 14 is illustrative of the claims listed in the above paragraph, and recites:

14. [The camera of claim 13,] *A portable x-ray device, comprising:
a housing containing an x-ray source, an integrated power system containing an internal power source, and integrated display means comprising an LCD screen; and detecting means structurally unattached to the housing;*
wherein the power system comprises a plurality of power supplies with each power supply providing a [power] voltage ranging from about 20 kV to about 50 kV.

The structures in the '769 patent that provide power to the X-ray tube are described as follows:

The power provided by each individual power supply depends on the number of individual power supplies used, the maximum power available from the power source, and the heat-dissipating capability of the x-ray tube. Generally, the power supplied by each individual power supply is the total power needed to operate the x-ray tube divided by the number of individual power supplies. For example, the power provided by each individual power supply (when there are 2) can range from about 20 kV to about 50 kV.

Exh. 1001 at [4:46-54].

Skillicorn '771 describes a miniaturized, modular, light weight hand held X-ray source that includes a hand holdable ruggedized high impact housing 12, having handles 11, 13. The power source for the Skillicorn X-ray device is a low voltage, high current source such as a 38 volt storage battery. The Skillicorn X-ray source includes a two-part, well known Cockcroft-Walton capacitor-diode voltage multiplier stack assembly 100. The stack assembly 100 comprises two rows of cylindrical high voltage ceramic capacitors 104A and 104B as shown in Figure 4, reproduced below:

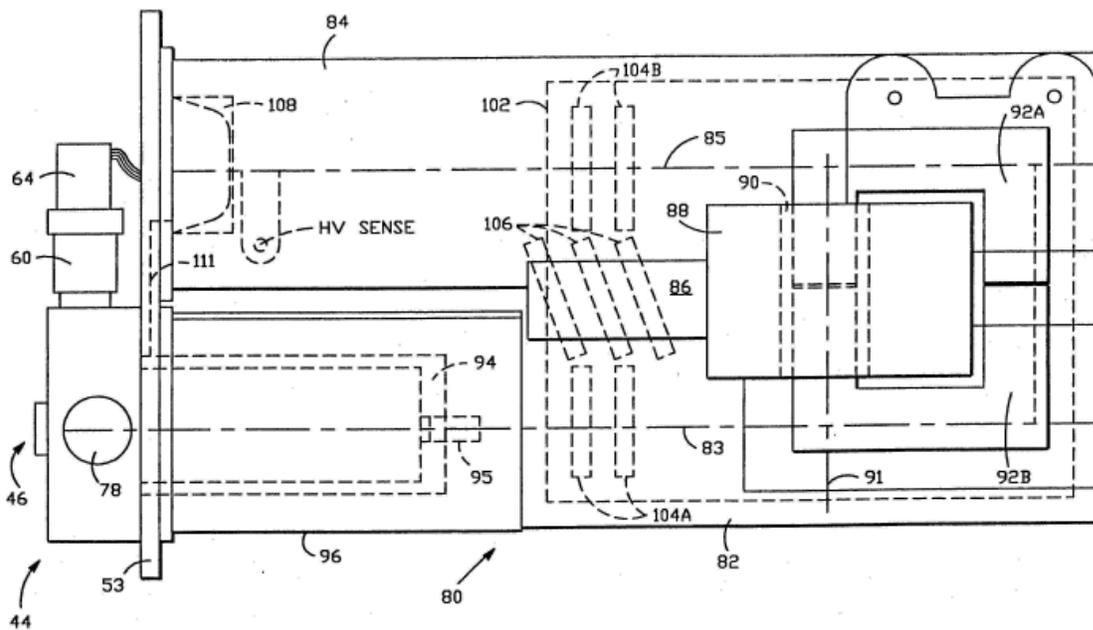


FIG. -4

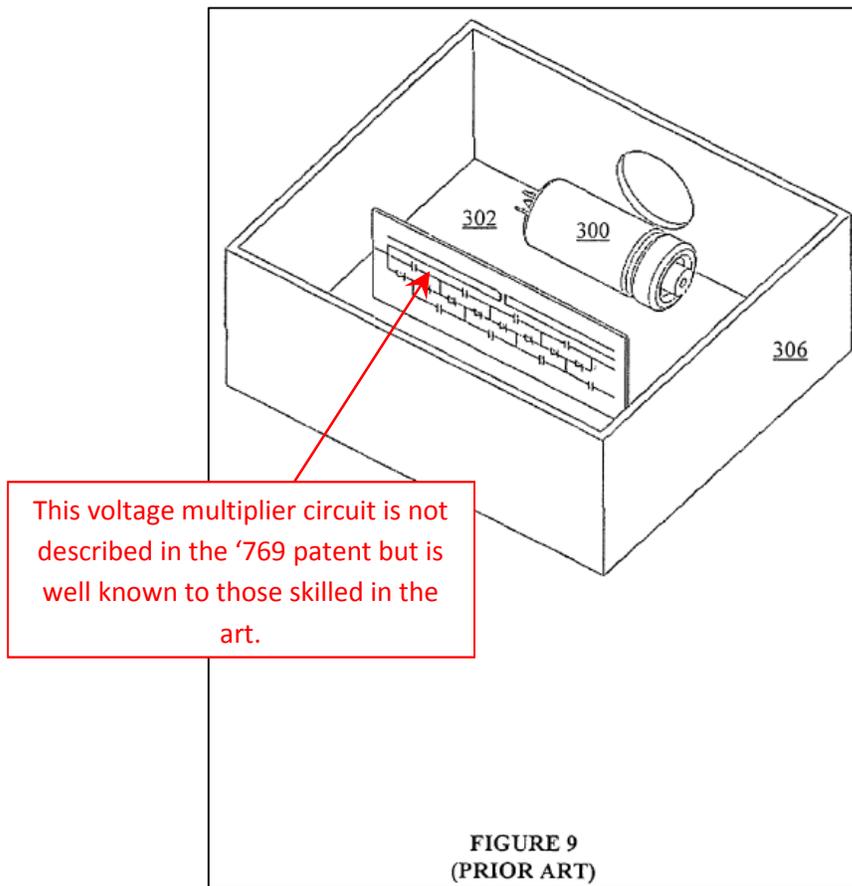
The '771 patent specification informs that "[t]he voltage multiplier stack contains a sufficient number of voltage multiplier stages so as to provide the desired maximum high voltage of 70 kilovolts." Exh. 1016, at [8:58-60]. The '771 patent also provides for setting the kilovolt output thereof between, e.g. 50kV, 60kV and 70kV. *See id.* at [9:45-48]. Thus, based on the '769 patent's description and teaching for determining the power supplied by each power supply in a portable, hand held X-ray device, each of the two Skillicorn power supplies provides voltages in the range of 25kV – 35kV, for a total output voltage range of 50V-70kV. Thus, it is certain that Skillicorn teaches the use of plural power supplies in a portable X-ray device, as recited in claim 14. It is also certain that the voltage output for each of the two Skillicorn power supplies is within the range of

output voltages described in the '769 patent and as recited in claim 14. See, Montrose Decl., Exh. 1009, at ¶¶ 38-44.

Thus, it would have been obvious to have used a dual power supply such as taught by Skillicorn in the CN '048 X-ray device or the JP '098 X-ray device because the use of such conventional, dual power supplies would have provided predictable results, would have been consistent with the then-conventional understanding by persons of ordinary skill in this field, and would have resulted in a portable X-ray device that generated less heat loss than a corresponding, single power supply that provided the same voltage increases, that is, voltage increases to a voltage in the range of 50kV to 70kV. See Montrose Decl., ¶ 44; see also Hamby Decl., ¶¶ 44-47.

Also, use of the Skillicorn '771 dual power supply in the CN '048 portable X-ray device or JP '098 portable X-ray device would have been a simple substitution of one known element in a prior art X-ray device for another known element in another prior art device to obtain predictable results in the field of portable X-ray devices, and which is alluded to in the '769 patent specification as follows: "any conversion means known in the art that operates in this manner can be used in the invention, including the power management boards 36". Exh. 1001, at [4:18-21].

Moreover, use of a conventional, dual power supply would have provided predictable results and would have been consistent with then-conventional understanding by persons of ordinary skill in this field, providing a combined voltage increase to a voltage level in the range of 50kV to 70kV, which is shown in Figure 9 of '769 as admitted "Prior Art", copied below. See Montrose Decl., ¶ 44.



For all of the above reasons, claims 14, 17, 34, 37, 39, 40, 42, 43, 44, and 61 would have been obvious at the time of invention of the '769 patent priority date, and should be cancelled.

**B. Group 2 Claims are Obvious From the Teachings of JP ‘098
and/or CN ‘048 In View of the Teachings of United States Patent
4,485,433 to Topich**

Claims 14, 17, 34, 37, 39, 40, 42, 43, 44, and 61 of the ‘769 patent are also being challenged under pre-AIA 35 U.S.C. § 103(a) as obvious from the teachings of JP ‘098 and/or CN ‘048 in view of the teachings of United States Patent 4,485,433 to Topich entitled “Integrated Circuit Dual Polarity High Voltage Multiplier for Extended Operating Temperature Range (“the ‘433 patent” or “Topich ‘433). Topich ‘433 was published on November 27, 1984. A copy of Topich ‘433 is submitted as Exh. 1019.

Topich ‘433 teaches an on-chip, dual polarity, high voltage multiplier and, more particularly, to a voltage multiplier having an extended operating temperature. Exh. 1019 at [3:57-60]. This reference shows that a dual power supply, such as described and claimed in the ’769 patent was well known to those skilled in this field, at least by February 20, 2004.

Use of the Topich ‘433 dual power supply in the JP ‘098 portable X-ray device or the CN ‘048 portable X-ray device would have been a simple substitution of one known element in a prior art X-ray device for another known element in another prior art device to obtain predictable results in the field of portable X-ray devices, and which is alluded to in the ‘769 patent specification as follows: “any

conversion means known in the art that operates in this manner can be used in the invention, including the power management boards 36”. Exh. 1001, at [3:65-4:62].

Thus, claims 14, 17, 34, 37, 39, 40, 42, 43, 44, and 61 of the ‘769 would have been obvious from the teachings of CN ‘048 and/or JP ‘098, as discussed above, in view of the dual power supply teachings of Topich ‘433. *See also* Hamby Decl., Exh. 1006, ¶¶ 47-50; *see also* Montrose Decl., Exh. 1009, ¶ 45.

C. Group 2 Claims are Obvious From the Teachings of JP ‘098 and/or CN ‘048 In View of the Publication “Using the Cockroft-Walton [sic] Voltage Multiplier Design in Handheld Devices” by Spencer et al dated October 2001

Claims 14, 17, 34, 37, 39, 40, 42, 43, 44, and 61 of the ‘769 patent are also being challenged under pre-AIA 35 U.S.C. § 103(a) as obvious from the teachings of JP ‘098 and/or CN ‘048 in view of the Article entitled: Using the Cockroft-Walton Voltage Multiplies Design in Handheld Devices,” published in October 2001 by the Idaho National Engineering and Environmental Laboratory (“the INEEL Article”). A copy of the INEEL Article is submitted as Exh. 1020.

The INEEL Article discloses a variation of the basic Cockroft-Walton (C-W) Voltage Multiplier circuit design that may be used to generate “multiple voltages” at sufficient currents to drive the dynodes of a photomultiplier tube. *See* Exh. 1020, “Abstract”. The INEEL Article shows that a dual power supply, such

as described and claimed in the '769 patent was well known to those skilled in this field, at least by February 20, 2004. Use of the dual power supply as described in the INEEL Article in the JP '098 portable X-ray device or the CN '048 portable X-ray device would have been a simple substitution of one known element in a prior art X-ray device for another known element in another prior art device to obtain predictable results in the field of portable X-ray devices. *See* Montrose Decl., Exh. 1009, ¶ 46; Hamby Decl. Exh 1006, ¶¶ 47-50.

Thus, claims 14, 17, 34, 37, 39, 40, 42, 43, 44, and 61 of the '769 would have been obvious from the teachings of CN '048 and/or JP '098, as discussed above, in view of the dual power supply teachings of the INEEL Article.

GROUND 3:

CHALLENGE TO GROUP 3 CLAIMS 41 AND 49 AS UNPATENTABLE

UNDER PRE-AIA 35 U.S.C. §103 AS OBVIOUS FROM THE

TEACHINGS OF CN '048 IN VIEW OF JP '098 AND FURTHER IN

VIEW OF U. S. PATENT 5,442,677 TO GOLDEN ET AL

Claims 41 and 49 are challenged under pre-AIA 35 U.S.C. § 103(a) obvious from the teachings of CN '048 in view of JP '098 and further in view of United States Patent 5,442,677 to Golden et al (“the ‘677 patent” or “Golden” or “Golden ‘677”). A copy of Golden ‘677 is submitted as Dexco 1017.

In general, claims 41 and 49 recite a portable X-ray device and include the same elements and limitations of claim 6, as discussed in Section IV. above. Additionally, claims 41 and 49 recite that the display means is controllable and that the housing of the X-ray device has a first portion that encloses the power system and a second portion of the housing is removably attached to the first portion. Claims 41 and 49 are reproduced below, with a typographical or printer's error in claim 41 ("rower" appears to mean, and is understood to mean "power"):

41. The system of claim 14, wherein the rower source can be removed from the housing.

*49. A portable x-ray device, comprising:
a housing containing an x-ray source and an integrated power system containing an internal power source;
controllable display means integrated into the housing and comprising an LCD screen, the display means configured to display a radiographic image; and
detecting means structurally unattached to the housing;
wherein a first portion of the housing encloses the power system and a second portion of the housing is removably attached to the first portion.*

First, with respect to the claim 49 requirement that the display means be controllable, the LCD screen 20 in the portable X-ray device described in CN '048 is controllable. Specifically, the device includes "an image digital processing apparatus," shown at 8 in Figures 1 and 3 of Exh. 1013. The image is "subject to digitalization and image sharpening processing". Exh. 1013, at page 2. The

display means 20 is controllable by the digital processing apparatus 8 to perform the following functions: “sorting, retrieving, zooming in and out, rotating and turning over, window level and window width adjusting, gray balance processing, image addition average processing and digital filtering processing”. Exh. 1013, at page 4. Thus, the CN ‘048 publication includes a controllable LCD screen display means.

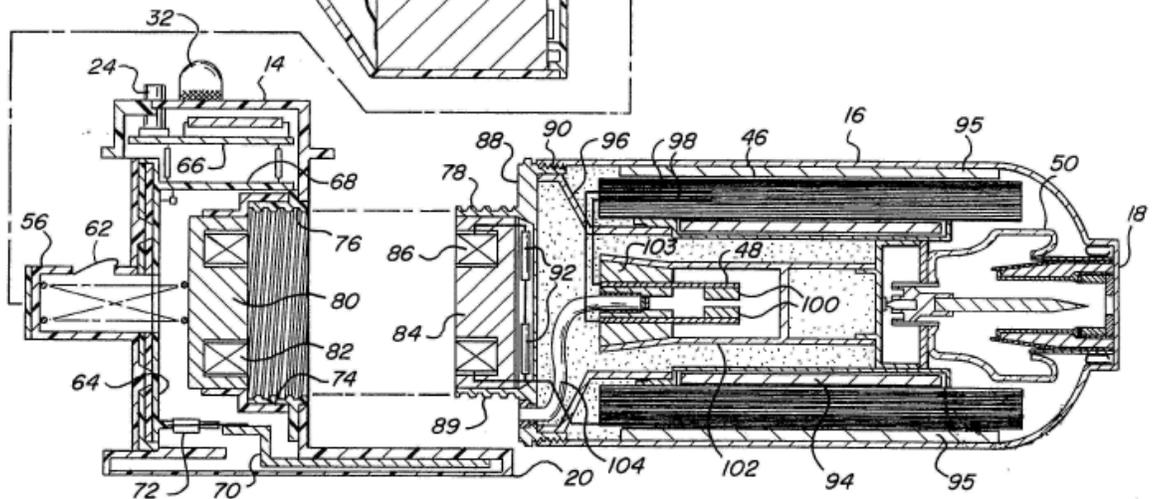
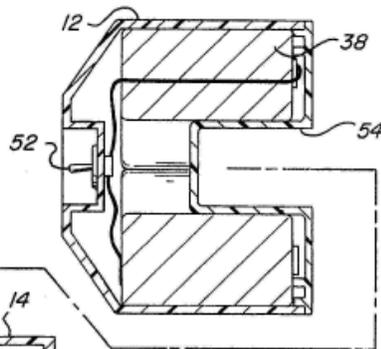
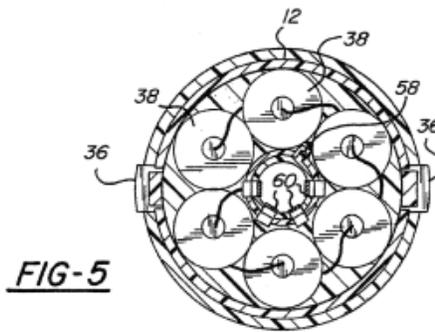
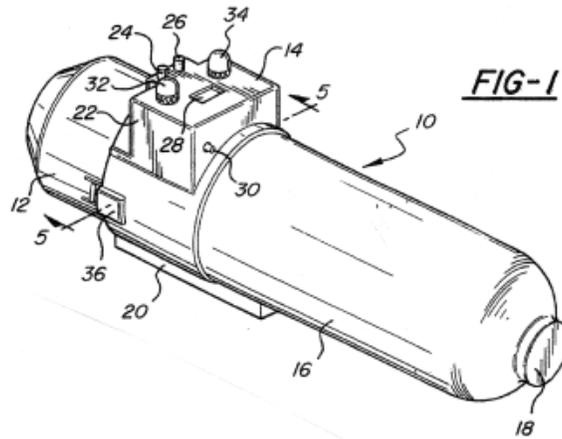
Second, with respect to the requirements that the power source can be removed (claim 41)⁴ and that a first portion of the housing encloses the power system and a second portion of the housing is removably attached to the first portion a second portion of the housing (claim 49), such a housing is described and shown in United States Patent 5,442,677 to Golden et al (“the ‘677 patent” or “Golden” or “Golden ‘677”), a copy of which is submitted as Exh. 1017.

It would have been obvious to incorporate the teaching of Golden into the portable X-ray devices of CN ‘048 and/or JP ‘098 because use of modular housings and removable power supplies were known to persons skilled in this field

⁴ Claim 41 depends from claim 14; it includes all the elements and limitations of independent claim 14. Thus, the same arguments discussed in Section IV. above with respect to claim 14 (i.e., “Ground 2” arguments), apply to claim 41. Moreover, the portable digital X-ray diagnostic device of CN ‘048 has a battery box 11 which is provided with a changeable battery that functions the internal power source. (See p. 3, Exh. 1013: “a battery box 11 is also arranged in the plastic shell and is provided with a changeable battery.”) Thus, CN ‘048 renders the removable power source of claim 14, as obvious.

and that combining the those teachings with a portable X-ray device that did have such a housing would have yielded a predicable result, i.e., a device with a housing that had a removable power supply. *See* Montrose Decl., Exh. 1009, ¶¶ 49-53; *see also* Hamby Decl., Exh. 1006, ¶¶ 51-59.

Golden '677 describes a light weight, battery powered X-ray source capable of producing high intensity X-ray emissions with low power consumption. As shown below in Figures 1, 3 and 5, Golden has a housing 10, referred to in Golden as “a small lightweight battery-powered x-ray emission source 10 having as integrated but separable components.” Exh. 1017, at [4:4-9]. The power system is located in battery module 12 and interface module 14, which is a first portion of the housing. This first portion is removably attached to the canister module 16, which is the second portion of the housing. The X-ray source is in the second portion of the housing, and is referred to by Golden as “high voltage canister module 16”. The canister module has external threads 78, and the mating end of the battery module-interface module first portion of the housing has corresponding internal threads shown at 76. Exh. 1017, at [4:4-15; 5:45-63]. Thus, as would have been appreciated by a person of ordinary skill in this technology, the battery portion of the Golden housing, with or without the interface module could be removed from the other part of the housing (either the canister 16 by itself, or together with the interface module 14).



Thus, claim 49 would have been obvious because further modifying the X-ray device of the CN '048 portable X-ray device (as modified by the teachings of the JP '098 publication to use a detecting means structurally unattached to the housing) to have the power system in a first portion of the housing and have a removable second portion of the housing. Such a modification would have been simply an example of combining teachings of one reference (Golden '677) with teachings of other references according to known methods (CN '048 and JP '098) to yield predictable results as related to the field of technology of the '769 patent. *See* Montrose Decl., Exh. 1009, ¶¶ 49-50; *see also* Hamby Decl., Exh. 1006, ¶¶ 51-59. Also, combining the teachings of the Golden '677 reference with the teachings of the CN '048 and JP '098 references would have been a simple substitution of one known element (a removably attached power system in a portion of the housing) for another (a non-removable power system in a portion of the housing). *Id.* Not only would this have been a simple substitution, but also the '769 patent specification virtually invites such a substitution, when it states:

In one aspect of the invention, the power source 40 is removable from the remainder of the x-ray device 10. In this aspect of the invention, the power source 40 comprises mechanical and electrical means for connecting the power source 40 to the x-ray device 10. **The electrical**

**and mechanical connection means can be any of those known in
the art.**

Exh. 1001, at [3: 54-58] (emphasis added). Using a modular housing and connection means as shown in Golden '677 and combining the teachings of Golden with the teachings of the CN '048 reference and the JP '098 reference according to then known methods would yield predictable results as related to the field of technology of the '769 patent.

Thus, combining the teachings of CN '048, JP '098 and Golden '677 would have been a simple substitution of one known element for another to obtain predictable results, and/or would have been a matter of simply combining prior art elements according to known methods to yield predicable results. The predictable result would have been a portable X-ray device with the features as stated in claims 41 and 49 of the '769 patent.

For all of the above reasons, claims 41 and 49 would have been obvious at the time of invention of the '769 patent, based on its priority date, and should be cancelled.

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GROUND 4:

**CHALLENGE TO GROUP 4 CLAIM 60 AS UNPATENTABLE UNDER
PRE-AIA 35 U.S.C. §103 AS OBVIOUS FROM THE TEACHINGS OF
CN '048 IN VIEW OF JP '098, IN VIEW OF SKILLICORN '771, AND
FURTHER, IN VIEW OF GRODZINS '260**

Claim 60 is challenged under pre-AIA 35 U.S.C. § 103(a) obvious from the teachings of CN '048 in view of JP '098, in view of Skillicorn '771, and further, in view of Grodzins '260.

Claim 60 recites a portable X-ray device as follows:

*60. A portable x-ray device, comprising:
a housing containing an x-ray source and an integrated power system containing an internal power source and an internal power supply;
display means comprising an LCD screen integrated into the housing;
detecting means structurally unattached to the housing;
a shield configured to reduce backscatter radiation;
wherein the integrated power system has a high current load suitable for medical or dental radiographic imaging and is configured to provide a substantially constant x-ray radiation output;
wherein the device is configured to be hand held during operation; and
wherein the power system is further configured to provide a continuous D.C. voltage ranging from about 20 kV to about 150 kV.*

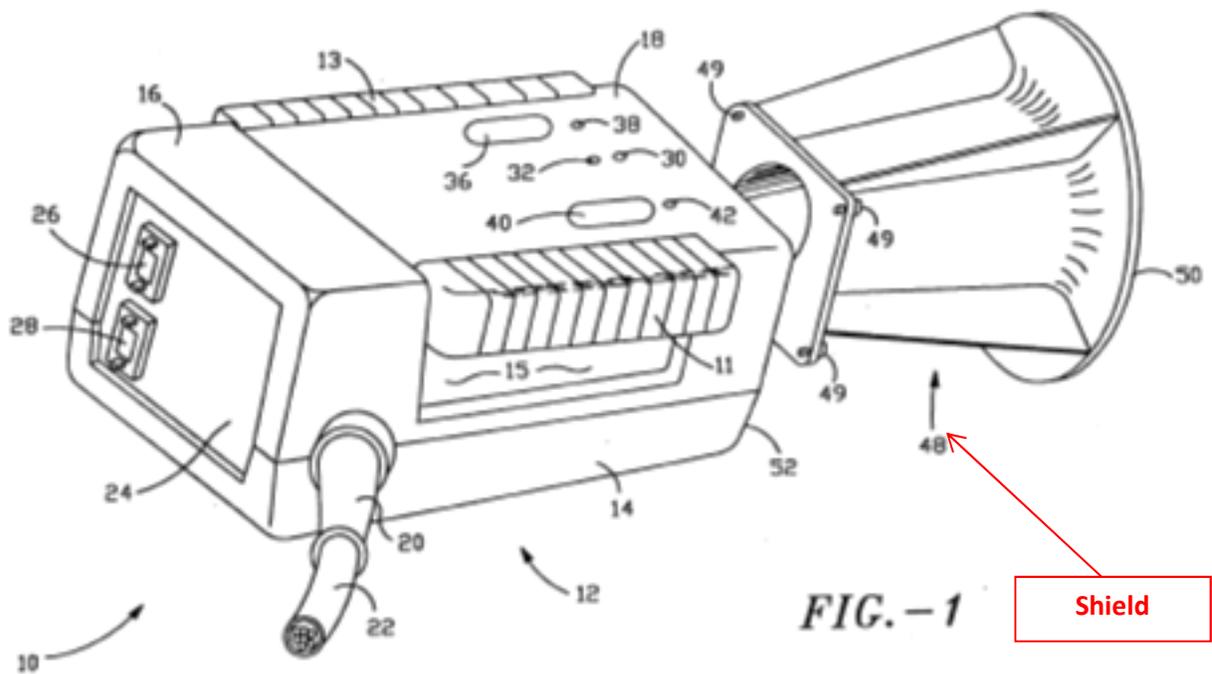
Claim 60 includes all of the elements and limitations of claims 6 and 14, and additionally requires a high current load suitable for medical and dental radiographic imaging is configured to be hand held during operation and includes “a shield configured to reduce backscatter radiation”. Thus, the above arguments with respect to claims 6 and 14, apply to claim 60.

Regarding the first additional requirement of claim 60, *i.e.*, a high current load suitable for medical and dental radiographic imaging, it is readily apparent that all of the previously cited and discussed references, *i.e.*, CN '048, JP '098 and Skillicorn '771 have such a high current load. Each of them is to be used, or is used in medical and/or dental radiographic imaging. *See* Exhs. 1013, 1015, and 1016.

Regarding the second additional requirement that the portable X-ray device is configured to be hand held during operation, it is also readily apparent that each of the portable X-ray devices shown and described in these three references is configured to be hand held during operation. *See* Exhs. 1013, 1015, and 1016.

Regarding the third additional requirement that the claim 60 portable X-ray device includes a shield configured to reduce backscatter radiation during operation, it is also readily apparent that both Skillicorn '771 and Grodzins '260 include such a shield and that it would have been obvious to have included such shield in a portable X-ray device. Specifically, and with reference to Figure 1 of

Skillicorn '771 (copied below), shield 48 is such a shield because it, together with end flange 50 “absorbs x-rays as may be back-scattered from the item undergoing x-ray examination to prevent x-ray exposure of the operator”. Exh. 1016, at Figure 1 and [7:39-49]. Copied below is Figure 1 of Skillicorn '771 (Exh. 1016):



Similarly, with reference to Figure 1 of Grodzins '260 (copied below), shield 16 is such a shield because it is “shielding” (Exh. 1017, at [2:33]) and based on the drawings and description, this shield functions as a backscattering shield.

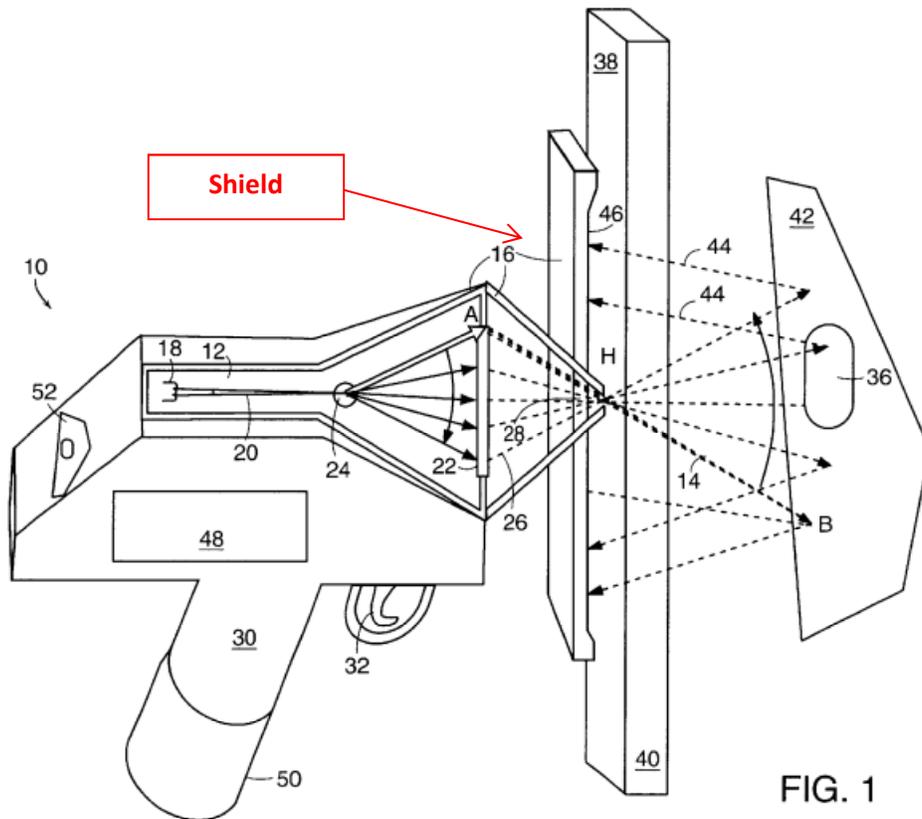


FIG. 1

Thus, the inclusion of such a backscatter shield in a portable X-ray device is yet another example of combining teachings of one reference (the Skillicorn and Grodzins backscatter shields) with teachings of one or more other references according to known methods and that would yield the predictable result of preventing exposure to the operator of the device, a common, well known goal in the field of X-ray devices used for dental and medical radiography. *See Hamby Decl., Exh. 1006, ¶¶ 60-66.*

For the above reasons claim 60 would have been obvious from the teachings of CN '048, JP '098, Skillicorn '771 and Grodzins '260, and thus, should be cancelled.

V. MANDATORY NOTICES (37 C.F.R. § 42.8(A)(1))

A. The Real Party-In-Interest (37 C.F.R. § 42.8(b)(1)):

Dexcowin Global, Inc. (“Petitioner”).

B. Notice of Related Matters (37 C.F.R. § 42.8(b)(2)):

Petitioner is concurrently-filing a petition for *inter partes* review on a related patent, U.S. Patent No. 7,496,178 (“the ‘178 patent”). The ‘178 patent claims priority from the same provisional patent application as the ‘769 patent (i.e., App. No. 60/546,575), filed on February 20, 2004.

C. Designation of Lead and Back-Up Counsel and Service Information (37 C.F.R. § 42.8(b)(3) and 42.8(b)(4)):

Lead Counsel	Back-Up Counsel
Jon E. Hokanson (Reg. No. 30,069) Lewis Brisbois Bisgaard & Smith LLP 633 W. 5 th St., Suite 4000 Los Angeles, CA 90071 Jon.Hokanson@lewisbrisbois.com Tel. No.: 213-250-1800 Fax. No.: 213-250-7900	Josephine A. Brosas (Reg. No. 66,679) Lewis Brisbois Bisgaard & Smith LLP 633 W. 5 th St., Suite 4000 Los Angeles, CA 90071 Josephine.Brosas@lewisbrisbois.com Tel. No.: 213-250-1800 Fax. No.: 213-250-7900

VI. CONCLUSION

For all of the reasons stated above, *inter partes* review should be authorized and Petitioner Dexco requests an Order to that effect.

Submitted concurrently herewith are a Power of Attorney, an Exhibit List, and copies of the references per § 42.10(b), § 42.63(e), and §42.6(d). The required fee is paid from, and the Office is authorized to charge fee deficiencies and credit overpayments to Deposit Account No. 50-3725.

LEWIS BRISBOIS BISGAARD & SMITH LLP

Dated: January 6, 2016

By: /Jon Hokanson/
Jon E. Hokanson
Reg. No. 30,069

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Case IPR: 2016-____
U.S. Patent 7,224,769

CERTIFICATE OF SERVICE

I certify that on the 6th day of January 2016, a copy of the PETITION FOR INTER PARTES REVIEW OF U.S. PATENT NO. 7,224,769 UNDER 35 U.S.C. § 311, has been served in its entirety by United States Postal Service Express Mail®:

Michael A. Fisher
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LEWIS BRISBOIS BISGAARD & SMITH LLP

Dated: January 6, 2016

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