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EXAMINER
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BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte CHRISTIAN J. MICHEL, MAURIZIO CONTI, RONALD GRAZIOSO, PETER CARL COHEN, A. ANDREW CAREY, and LARRY BYARS

Appeal 2017-011540
Application 14/485,916
Technology Center 2800

Before TERRY J. OWENS, CHRISTOPHER C. KENNEDY, and AVELYN M. ROSS, *Administrative Patent Judges*.

OWENS, *Administrative Patent Judge.*

DECISION ON APPEAL

STATEMENT OF THE CASE

The Applicant/Appellant (Siemens Medical Solutions USA, Inc.) appeals under 35 U.S.C. § 134(a) from the Examiner's rejection of claims 1, 3–6, and 8–10. We have jurisdiction under 35 U.S.C. § 6(b).

The Invention

The claims are to a computer-readable medium and method for analyze nuclear imaging detector data. Claim 1 is illustrative:

> 1. A non-transitory computer-readable medium having stored thereon a plurality of instructions, which when executed by a processor, cause the processor to analyze data from a nuclear imaging detector having a plurality of blocks arranged

in a two dimensional array, said plurality of blocks being populated with scintillator block detectors, by:

defining a checkerboard configuration for said nuclear imaging detector, wherein said plurality of blocks of said array are grouped into a first subset of blocks and a second subset of blocks;

applying said checkerboard configuration to said array;

acquiring image data from scintillator block detectors corresponding to one of said first and second subsets in accordance with said applied checkerboard configuration, for use in image reconstruction; and

ignoring image data from scintillator block detectors corresponding to the other of said first and second subsets in accordance with said applied checkerboard configuration, such that image data from the ignored subset of scintillator block detectors is not used in image reconstruction.

The References

Watson	US 6,329,657 B1	Dec. 11, 2001
Uchida	US 6,774,370 B1	Aug. 10, 2004
Nelson	US 2009/0134334 A1	May 28, 2009

The Rejections

The claims stand rejected under 35 U.S.C. § 103(a) as follows: claims 1, 4, 6, and 10 over Uchida in view of Nelson, and claims 3, 5, 8, and 9 over Uchida in view of Nelson and Watson.

OPINION

We reverse the rejections. We need address only the independent claims, i.e., claims 1 and 6. Those claims require acquiring, for use in image reconstruction, image data from either a first or second subset of a nuclear imaging detector's plurality of blocks populated with scintillator block detectors and grouped into the first and second subset in a checkerboard configuration, and ignoring image data from scintillator block detectors

corresponding to the other of the first or second subset such that image data from the ignored subset of scintillator block detectors is not used in image reconstruction.

Uchida discloses an imaging device having a two-dimensional arrangement of scintillator array (11)-containing radiation detectors (10) disposed alternately and separated from each other in a checkerboard configuration, each detector (10) facing and being spaced apart from a radiation detector (20) in a corresponding two-dimensional arrangement of scintillator array (21)-containing radiation detectors (20) (col. 4, ll. 8–11, 23–27; col. 4, l. 56 – col. 5, l. 22; col. 13, ll. 31–34; Figs. 1, 7A). Between the opposing two-dimensional arrangements of radiation detectors (10, 20) is a measurement surface (S) whereon a subject is positioned during imaging (col. 6, ll.59–65; Fig. 2). Uchida's object is "to provide a positron imaging device wherein the range of the field of view is efficiently expanded, while the constitution of the device is simplified and the costs are reduced" (col. 2, ll. 33–36).

Nelson discloses an edge-on scintillator detector array and teaches that edge-on scintillator detector arrays are alternatives to face-on scintillator detectors for x-ray and gamma ray radiography (¶¶ 6, 9). Nelson's "invention provides a method of providing electronic internal collimation by selectively ignoring specific patterns of detector elements either by not reading them or by reading them and not including their data during image reconstruction" (¶ 41). "In one aspect, specific detector elements such as vertical strips or columns of pixels can be ignored, either by not reading them or by reading them and not including their data during image reconstruction" (¶ 150), and "[i]n one aspect, selective patterns of ignored

vertical strips or columns of pixels are arranged to act as buffers between sets of active vertical strips or columns of pixels, providing internal collimation" (*id.*).

The Examiner finds (Ans. 16):

> **Uchida** merely differs from the claimed invention in that instead of "ignoring image data" from neighboring "scintillator block detectors" in a "checkerboard arrangement", the "scintillator block detectors" are spaced apart to leave empty space between the detectors. In a related field of endeavor, **Nelson** discloses a nuclear imaging detector capable of positron emission tomography (PET) using scintillator block detectors which can be ignored, either by not reading them or by reading them and not including their data in image reconstruction. The combination of the **Uchida** and **Nelson** discloses the claimed invention, since it would result in obtaining the benefit of an expanded field of view by reading out fewer detector elements spaced apart from one another, according to **Uchida**, while being able to obtain the expanded field of view pattern in a fully populated two-dimensional detector array by selectively ignoring detector elements which could act as buffers between active detector elements and provide electronic collimation, according to **Nelson** . . . .

The Examiner concludes (Final Act. 8–9):

> In view of the ability to use a checkerboard arrangement of detector elements to reduce the number of detectors used while maintaining an increased field of view as is disclosed in **Uchida et al.** at **Column 2, Lines 30-36; Column 3, Lines 10-24; Column 7, Lines 23-38; and Column 10, Lines 1-54** and in view of the ability to ignore detector elements to create buffers between active detector elements and provide internal collimation as is disclosed in **Nelson** at **Paragraphs 41 and 150-155**, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of **Nelson** with the teachings of **Uchida et al.** to obtain a two dimensional array of detectors

> that can be turned into a checkerboard configuration by ignoring alternating detector elements to maintain an increased field of view while reducing the processing cost of the full array of detectors through internal collimation.

Setting forth a prima facie case of obviousness requires establishing that the applied prior art would have provided one of ordinary skill in the art with an apparent reason to modify the prior art to arrive at the claimed invention. *See KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007).

The Examiner does not address the differences between Uchida's imaging device, which appears to be a face-on device, and Nelson's edge-on imaging device which, Nelson states, is an alternative to a face-on device (¶ 9), and establish that regardless of those differences, Nelson would have indicated to one of ordinary skill in the art that Nelson's disclosure of ignoring vertical strips or columns of pixels arranged to act as buffers between sets of active vertical strips or columns or pixels to provide internal collimation in the edge-on imaging device (¶ 150) would be applicable to Uchida's imaging device such that one of ordinary skill in the art would have had an apparent reason to place detectors in the spaces between Uchida's detectors (10, 20) and to ignore the data from either the newly-placed detectors or Uchida's detectors (10, 20).

Thus, the record indicates that the Examiner's rejections are based upon impermissible hindsight in view of the Appellant's disclosure. *See In re Warner*, 379 F.2d 1011, 1017 (CCPA 1967) ("A rejection based on section 103 clearly must rest on a factual basis, and these facts must be interpreted without hindsight reconstruction of the invention from the prior art"). Accordingly, we reverse the rejections.

DECISION

The rejections under 35 U.S.C. § 103(a) of claims 1, 4, 6, and 10 over Uchida in view of Nelson, and claims 3, 5, 8, and 9 over Uchida in view of Nelson and Watson are reversed.

The Examiner's decision is reversed.

REVERSED