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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* RAYMOND CHAN, JINNAN WANG,  
ADRIEN EMMANUEL DESJARDINS, LUIS FELIPE GUTIERREZ,  
MAYA ELLA BARLEY, and GERT WIM 'T HOOFT

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Appeal 2018-001795  
Application 13/881,179  
Technology Center 3700

Before LISA M. GUIJT, LEE L. STEPINA, and  
BRENT M. DOUGAL, *Administrative Patent Judges*.

GUIJT, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant<sup>1</sup> appeals under 35 U.S.C. § 134(a) from the Examiner's rejection<sup>2</sup> of claims 1–24 under 35 U.S.C. § 103(a) as unpatentable over Jensen (US 2002/0085681 A1; published July 4, 2002) and Lee (US 2010/0030063 A1; published Feb. 4, 2010).<sup>3</sup> We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

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<sup>1</sup> Appellants identify the real party in interest as Koninklijke Philips N.V. Appeal Br. 3.

<sup>2</sup> Appeal is taken from the Final Office Action dated February 15, 2017, as supplemented by the Advisory Action dated April 17, 2017.

<sup>3</sup> The Examiner's rejection of claims 1–24 under 35 U.S.C. § 112, second paragraph as being indefinite is withdrawn. Ans. 4; Final Act. 3–4.

## STATEMENT OF THE CASE

Claims 1, 9, and 17 are the independent claims on appeal. Claim 1, reproduced below, is exemplary of the subject matter on appeal.

1. A system comprising:
  - a processor;
  - a shape sensing system coupled to an interventional device and configured to measure a shape of the interventional device in a subject;
  - a memory coupled to the processor that is configured to store an image module that is executed by the processor, said image module being configured to receive shape information from the shape sensing system and generate one or more control signals in accordance with the shape information; and
  - at least one imaging device configured to image the subject in accordance with the one or more control signals.

## ANALYSIS

Appellants argue claims 1–8 as a group. Appeal Br. 10–15. We select claim 1 as representative, with claims 2–8 standing or falling with claim 1. *See* 37 C.F.R. § 41.37(c)(1)(iv).

Regarding independent claim 1, the Examiner finds, *inter alia*, that Jensen discloses (i) an interventional device (i.e., instrument or tool 24) that measures spatial characteristics (i.e., position and/or orientation) of the device; (ii) an image module (i.e., tracking data processor 20) configured to receive the spatial characteristics and generate control signals (i.e., control or trigger commands 28) in accordance with the spatial characteristics; and (iii) an imaging device (i.e., x-ray generator 14, x-ray receptor 34, x-ray source 36) configured to image the subject in accordance with the control signals; as claimed. Final Act. 4 (citing Jensen ¶¶ 36–65); *see e.g.*, Jensen ¶¶ 28–30.

The Examiner determines that although Jensen discloses that “the means for measuring spatial characteristics of the device can include

[electromagnetic (EM)] or optical means,” Jensen fails to disclose, “*a shape sensing system configured to determine the shape of the interventional device.*” Final Act. 4–5 (emphasis added). The Examiner relies on Lee for disclosing means for sensing the position and/or orientation *and shape* of an interventional device, as the device is moved in the body, by employing EM or optical means, “to determine [and display in real-time on a corresponding image] a configuration of the device within the body.” Final Act. 5 (citing Lee ¶¶ 24–73). The Examiner reasons that it would have been obvious “to have modified Jensen such that the means for determining a configuration of the interventional device in real-time in the subject comprises the position/orientation and shape sensing device of [Lee],” because “[s]uch a modification involves the substitution of one known means for providing configuration parameters of an instrument for another providing a more robust system and yielding predictable results.” Final Act. 5.

First, Appellants argue that

[the portions of Jensen relied on by the Examiner] are completely silent with respect to the use of tracking information of an interventional device to generate control signals for an imaging device in accordance with the tracking information. Jensen does disclose that a tracking module generates tracking data for the instrument and this data is sent to the tracking data processor (*see, e.g.*, Jensen, ¶¶ 36, 41 and 42). However, there is absolutely no teaching or suggestion in the cited portions of Jensen that the system is configured to generate one or more control signals for the imaging device in accordance with the tracking data for the instrument. Instead the control signals are generated by the Jensen system solely based on the tracked coordinates of the receptor [(i.e., x-ray receptor 34)], not the instrument [(i.e., instrument 24)].

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Appeal Br. 12–13<sup>4</sup>; *see also* Reply Br. 6 (“Jensen does not teach or suggest that the tracking data processor is specifically configured to generate control signals to the imaging device in accordance with the instrument coordinate information received by the tracking subsystem.”). Appellants submit, for example, with reference to the embodiment depicted in Figure 7 that “Jensen specifically discloses that the position of the instrument is used to construct an overlay of the instrument or tool on a display.” Appeal Br. 13 (citing Jensen ¶ 50, Fig. 7); Reply Br. 7.

The Examiner responds that although Jensen may provide examples of generating control signals based on the receptor’s tracking components, Jensen discloses, for example, in paragraphs 30, 36, 38, 40–42, 48, and 63 of Jensen that “the control signals are generated based on tracking of the receptor and the patient *and tracking of the instrument,*” and that “these controls signals are used to control the imaging process.” Ans. 4 (emphasis added). In particular, the Examiner relies on the embodiment discussed at Paragraph 48 and depicted in Figure 7 for disclosing that “the tracking subsystem receives instrument coordinate information which it processes and passes along to an image processing unit [that] . . . collects exposure frames from the detector at points in time dictated by the position data from the tracking subsystem.” *Id.*

Appellants reply by arguing that paragraph 30 of Jensen states that “the trigger commands are generated by the tracking data process ‘as explained in more detail below . . ., based on the tracking component coordinates as the C-arm is moved along an image acquisition path,”

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<sup>4</sup> Appellants also submit that the Examiner’s *general* reliance on paragraphs 36–65 of Jensen and response in the Advisory Action are insufficient to support the Examiner’s findings. Appeal Br. 13.

wherein “the specific portions of Jensen which describe the generation of control signals solely disclose that the control or trigger commands for an x-ray generator are generated based on the tracking component coordinates for the receptor.” Reply Br. 6 (citing ¶¶ 43–45). Appellants also argue that paragraph 50 of Jensen, which further describes the embodiment, disclosed in paragraph 48 and depicted in Figure 7, is evidence that the *sole* use of instrument coordinate information 235 is to overlay the instrument graphic with the image slices on display 250.

Paragraph 48 of Jensen discloses, with respect to fluoroscopy imaging system 200 (as depicted in Figure 7) (emphasis added) that

tracking subsystem **220** receives patient coordinate information **225**, detector coordinate information **230** and *instrument coordinate information 235*. The tracking subsystem **220** processes the coordinate information **225-235** and passes it to an image processing unit **240** which receives exposure frames from the [fluoroscopy imaging system] detector **210** and outputs image frames to the display **250**. The image processing unit **240** includes a frame grabber **260** which collects exposure frames from the detector **210** *at points in time dictated by the position data 245* provided from the tracking subsystem **220**.

Thus, a preponderance of the evidence from Jensen’s paragraph 48 supports the Examiner’s finding that instrument coordinate information 235, which is information included in coordinate information 225–235 (i.e., position data 245), is received by image processing unit 240, and that image processing unit 240 generates control signals according to (or dictated by) the position data to image the subject (i.e., collect exposure frames).

Appellants do not specifically address paragraph 48 of Jensen, and therefore, do not apprise us of error in the Examiner’s findings based on paragraph 48. In addition, contrary to Appellants’ argument *supra*, paragraph 50 of Jensen does not expressly discuss instrument coordinate

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information 235, and to the extent paragraph 50 of Jensen does disclose that instrument coordinate information is used to overlay the instrument graphic with the image slices on the display, Jensen does not disclose doing so to the exclusion of using instrument coordinate information 235 as contributing to position data 245, which dictates (or triggers) points in time at which to collect an image, as disclosed in paragraph 48 and discussed *supra*.

Second, Appellants argue that

Lee fails to teach or suggest at least a system which includes “[an] image module being configured to receive shape information from the shape sensing system and generate one or more control signals in accordance with the shape information; and at least one imaging device configured to image the subject in accordance with the one or more control signals” as recited in independent claim 1.

Appeal Br. 14.

However, Appellants’ argument fails to address the rejection as articulated by the Examiner, which only relies on Lee for disclosing *a shape* sensing system configured to determine *the shape* of the interventional device, as set forth *supra*.

Finally, Appellants argue that “Jensen and Lee, taken both singly and in combination, fail to teach or suggest the generation of control signals for an imaging device in accordance with the shape information,” and that “a person of ordinary skill in the art would have no teaching or suggestion to utilize shape information of the instrument in order to generate control signals for the imaging device when viewing the combined teachings of Jensen and Lee.” Appeal Br. 14.

Again, however, Appellants’ argument fails to address the rejection as articulated by the Examiner, and further, does not apprise us of error in the

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Examiner’s reasoning that modifying Jensen’s fluoroscopy imaging system 200, which receives instrument coordinate information 235, to include within such instrument coordinate information *shape* information from a shape sensing system, in view of Lee, “involves the substitution of one known means for providing configuration parameters of an instrument for another providing a more robust system,” as set forth *supra*. See, e.g., Jensen, Abstract (“[a] position tracking system is included to track the *position* of . . . a surgical instrument”) (emphasis added); Lee, Abstract (“[t]he system can further include a navigation system that can determine a *position* and *shape* of the instrument relative to the anatomical structure based on the position of the at least one tracking device determined by the tracking system and the shape of the instrument as sensed by the shape sensor”) (emphasis added).

Accordingly, we affirm the Examiner’s rejection of independent claim 1, and claims 2–7 fall therewith.

*Claims 9–24*

Appellants chose not to present arguments in addition to the arguments presented for independent claim 1 *supra*, and therefore, for essentially the same reasons as stated *supra*, we sustain the Examiner’s rejection of claims 9–24. See Appeal Br. 15–17; Reply Br. 5–8.

#### DECISION

The Examiner’s decision rejecting claims 1–24 is AFFIRMED.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). See 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED