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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* PHILIP VON SCHROETER and MICHAEL ZOELLNER

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Appeal 2010-007987  
Application 10/564,161  
Technology Center 2600

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Before MAHSHID D. SAADAT, KRISTEN L. DROESCH, and  
LYNNE E. PETTIGREW, *Administrative Patent Judges*.

PETTIGREW, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134(a) from a final rejection of claims 2-5, 8-11, 15, 19, 20, 22, and 26-34.<sup>1</sup> We have jurisdiction under 35 U.S.C. § 6(b). We affirm.

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<sup>1</sup> Claims 1, 6, 7, 12-14, 16-18, 21, and 23-25 have been cancelled.

## STATEMENT OF THE CASE

### *Introduction*

Appellants' invention relates to a method for representing a digitized, technical dental object, such as artificial dentures or a model of a tooth, on a screen based on a right-angled coordinate system with X, Y, and Z axes.

Spec. 1. Appellants' invention also relates to a method for manufacturing artificial dentures using as a basis digitized data of the area of the jaw which is to be provided with artificial dentures. *Id.*

Independent claims 34<sup>2</sup> and 19<sup>3</sup> are illustrative of the invention (disputed limitations *italicized*):

34. A method for displaying a digitized dental technical object, such as a dental prosthesis or a model of at least one tooth or of an area of the jaw to be provided with a dental prosthesis on a monitor, utilizing a right-angled coordinate system with X, Y and Z axes, whereby the Z-axis and the Y-axis and the intersection, or origin of the coordinate system, of the axes run in the image plane of the monitor and the X-axis runs perpendicular to the image plane and the dental technical object is rotated about two axes running perpendicular to each other and is shifted along the X-axis for zooming the object;

the improvement comprising, *the dental technical object is aligned along a T-axis running in a plane defined by the X-axis and the Y-axis and passing through the origin of the coordinate system and is moved to a maximum of five degrees of freedom*, whereby a rotation (Rot<sub>z</sub>) about the Z-axis is chosen as the first degree of freedom, a rotation (Rot<sub>t</sub>) about the T-axis is chosen as the second degree of freedom, a translation of the object along the T-axis is chosen as the third degree of freedom

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<sup>2</sup> Claims 2-5, 8-11, 15, and 26-31 depend from claim 34.

<sup>3</sup> Claims 20, 22, 32, and 33 depend from claim 19.

and the translation of the object along the X-axis is chosen as the fourth degree of freedom, and

a longitudinal axis of the dental technical object is formed by a traverse polygon with straight lines connecting sections of said dental technical object, for shifting the said dental technical object along the T-axis, the object is shifted along a straight line of the traverse polygon which passes through the origin of the coordinate system, and

for shifting the dental technical object along consecutive first and second straight lines forming an angle  $\beta$  which is  $\neq 180^\circ$ , the object is rotated about the angle  $\beta$  about the z-axis after completion of the shifting along the first straight line before shifting the dental technical object along the second straight line.

19. A method for manufacturing dental prostheses on the basis of digitized data of a jaw area to be provided with the dental prosthesis, computing the dental prosthesis based on the digitized data and displaying at least the dental prosthesis on a monitor, evaluating the displayed dental prosthesis by *moving the dental prosthesis on the monitor to a maximum of five degrees of freedom*, and, if necessary, modifying the displayed dental prosthesis and the subsequent manufacture of the dental prosthesis on the basis of the data that correspond to the displayed dental prosthesis.

#### *Rejections on Appeal*

The Examiner rejected claims 34, 2-5, 8-11, 26-28, and 31 under 35 U.S.C. § 103(a) as being unpatentable over Shibata (US 6,466,831 B1, Oct. 15, 2002) and Kopelman (US 6,664,986 B1, Dec. 16, 2003).

The Examiner rejected claims 15 and 29-30 under 35 U.S.C. § 103(a) as being unpatentable over Shibata, Kopelman, and Wang (US 2002/0060663 A1, May 23, 2002).

The Examiner rejected claims 19, 20, 22, 32, and 33 under 35 U.S.C. § 103(a) as being unpatentable over Kopelman, Rubbert (US 2002/0010568 A1, Jan. 24, 2002), and Shibata.

*Issues on Appeal*

1. Does the combination of references teach or suggest movement of a dental object to a maximum of five degrees of freedom, as recited in independent claims 34 and 19?

2. Does the combination of references teach or suggest aligning a dental object along a T-axis running in a plane defined by the X-axis and Y-axis, translating the object along the T-axis, and rotating the object about the T-axis, as recited in independent claim 34?

3. Did the Examiner provide sufficient reasoning for combining the references?

ANALYSIS

We have reviewed the Examiner's rejections in light of Appellants' arguments that the Examiner has erred. We disagree with Appellants' conclusions. We adopt as our own the findings and reasoning set forth in the Examiner's Answer. We highlight and address specific findings and arguments for emphasis.

With respect to the first issue on appeal, Appellants contend that Shibata does not suggest a display system that restricts movement of an object to five degrees of freedom, as recited in claims 34 and 19. App. Br. 9-10. With respect to the second issue on appeal, Appellants contend that Shibata does not suggest an additional T-axis relative to which an object is aligned and moved, as recited in claim 34. App. Br. 10.

We agree with the Examiner's response to Appellants' arguments. Ans. 13-15. As explained by the Examiner, Shibata discloses a computer-implemented, three-dimensional Cartesian coordinate system. Ans. 13. In such a system, any motion of a three-dimensional rigid body can be described by one of or a combination of six independent motions—translating along the X-axis, Y-axis, and Z-axis, and rotating about the X-axis, Y-axis, and Z-axis. *Id.* Thus, a user of Shibata's system can control the movement of an object on the screen using six degrees of freedom. Ans. 14. A user, however, may choose to limit movement to five degrees of freedom. *Id.* In other words, availability of six degrees of freedom in Shibata includes availability of fewer degrees of freedom, so that it would have been obvious to reduce the degrees of freedom to five. Ans. 4, 14.

Furthermore, any alignment of the object can be described relative to the X-axis, Y-axis, and Z-axis in Shibata, and any movement of the object can be obtained by a series of movements (translations and rotations) relative to the X-axis, Y-axis, and Z-axis. Ans. 15. Thus, Shibata allows a user to align and move the object as he chooses, and therefore any alignment and movement relative the T-axis as claimed would have been obvious in view of Shibata. Ans. 5, 15. As Appellants have not presented any persuasive arguments to challenge the Examiner's analysis, we agree with the Examiner's conclusion that the prior art renders the recited claim limitations obvious.

With respect to the third issue on appeal, Appellants contend generally that the Examiner has pieced together references without any suggestion for the combination of teachings. App. Br. 9. The Examiner, however, provides sufficient reasoning for combining the references.

Ans. 6, 8, 9, 11-12. For example, the Examiner explains that one of ordinary skill in the art would understand based on Kopelman's computer-implemented modeling of 3D dental objects that Shibata's 3D-CAD (computer aided design) system would have been useful in modeling and displaying dental objects. Ans. 11-12. The Examiner also explains that it would have been obvious to combine the teachings of Kopelman, Rubbert, and Shibata to achieve the invention in claim 19 in order to provide interactive dental treatment planning and services. Ans. 9.

In addition, Appellants challenge some references individually, even though the Examiner's rejections are based on combined teachings of the references. Specifically, Appellants allege that Shibata does not teach the use of a 3D display system in a dental environment, as recited in claims 34 and 19, and that Kopelman does not suggest that a dental object can be manufactured on the basis of data corresponding to the displayed dental prosthesis, as recited in claim 19. App. Br. 9, 12. These arguments are misplaced and unpersuasive because nonobviousness cannot be established by attacking references individually when the rejection is based on a combination of references. *See In re Merck & Co.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986); *In re Keller*, 642 F.2d 413, 425 (CCPA 1981).

For these reasons, we sustain the Examiner's rejection of independent claims 34 and 19, as well as dependent claims 2-5, 8-11, 15, 20, 22, and 26-33, not argued separately.

## CONCLUSION

On the record before us, we conclude that the Examiner did not err in rejecting claims 2-5, 8-11, 15, 19, 20, 22, and 26-34 as being unpatentable under 35 U.S.C. § 103(a).

Appeal 2010-007987  
Application 10/564,161

DECISION

The Examiner's rejection of claims 2-5, 8-11, 15, 19, 20, 22, and 26-34 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)(1)(iv).

AFFIRMED

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