

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today
(1) was not written for publication in a law journal and
(2) is not binding precedent of the Board.

Paper No. 25

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte CHRISTOPHER A. CRANE, TOM J. BANNON,
DANIEL M. DONAHUE, DONALD W. ADKINS, JUDD E. HEAPE,
ANDREW K. SMITH, and THOMAS M. SIEP

Appeal No. 96-2994
Application 08/282,413¹

ON BRIEF

Before HARKCOM, Vice-Chief Administrative Patent Judge and
HAIRSTON and JERRY SMITH, Administrative Patent Judges.

JERRY SMITH, Administrative Patent Judge.

¹ Application for patent filed July 29, 1994. According to appellants, this application is a continuation of 07/801,144, filed December 02, 1991.

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DECISION ON APPEAL

This is a decision on the appeal under 35 U.S.C. § 134 from the examiner's rejection of claims 1-26, which constitute all the claims in the application. An amendment after final rejection was filed on June 2, 1995 and was entered by the examiner.

The disclosed invention pertains to a method and apparatus for modeling the relative position and the relative movement of plural objects located in a virtual reality environment.

Representative claim 1 is reproduced as follows:

1. A method of modeling relative position and relative movement of objects in a virtual reality environment, comprising the steps of:

representing graphically a first object and a second object in the virtual reality environment on a graphical display;

determining a first partitioning plane between said first object and said second object;

determining a second partitioning plane between said first object and said second object in response to either of said first object or said second object moving across said first partitioning plane; and

representing graphically on said graphical display in response to said second partitioning plane determining step

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new relative positions of said first object and said second object as a result of the relative movement of said first object and said second object to movement of a viewer within said virtual reality environment by selectively obscuring said first object and said second object according to the relative position of said first

object and said second object in said virtual reality environment to an observation point of said viewer in said virtual reality environment.

The examiner relies on the following references:

Corthout et al. (Corthout) 4,631,690 Dec. 23, 1986

Bentley, "Multidimensional Binary Search Trees Used for Associative Searching," Communications of the ACM, Volume 18, Number 9, Sept. 1975, pages 509-517.

Fuchs et al. (Fuchs), "Near Real-Time Shaded Display of Rigid Objects," Computer Graphics, Volume 17, Number 3, July 1983, pages 65-72.

Claims 1-26 stand rejected under 35 U.S.C. § 103. As evidence of obviousness the examiner offers Corthout in view of Bentley or Fuchs.

Rather than repeat the arguments of appellants or the examiner, we make reference to the briefs and the answer for the respective details thereof.

OPINION

We have carefully considered the subject matter on

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appeal, the rejection advanced by the examiner and the evidence of obviousness relied upon by the examiner as support for the rejection. We have, likewise, reviewed and taken into consideration, in reaching our decision, the appellants' arguments set forth in the briefs along with the examiner's rationale in support of the rejection and arguments in rebuttal set forth in the examiner's answer.

It is our view, after consideration of the record before us, that the evidence relied upon and the level of skill in the particular art would not have suggested to one of ordinary skill in the art the obviousness of the invention as set forth in claims 1-26. Accordingly, we reverse.

Appellants have nominally indicated that the claims do not stand or fall together [brief, page 3], but they have not specifically argued the limitations of each of the claims for nonobviousness. Simply pointing out what a claim requires with no attempt to point out how the claims patentably distinguish over the prior art does not amount to a separate argument for patentability. In re Nielson, 816 F.2d 1567, 2 USPQ2d 1525

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(Fed. Cir. 1987). Since the dependent claims have not been properly argued for separate patentability, such claims will stand or fall with the claims from which they depend. Note In re King, 801 F.2d 1324, 231 USPQ 136 (Fed. Cir. 1986); In re Sernaker, 702 F.2d 989, 217 USPQ 1 (Fed. Cir. 1983). Accordingly, we will consider the rejection against independent claims 1 and 14 as representative of all the claims on appeal before us.

In rejecting claims under 35 U.S.C. § 103, it is incumbent upon the examiner to establish a factual basis to support the legal conclusion of obviousness. See In re Fine, 837 F.2d 1071, 1073, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). In so doing, the examiner is expected to make the factual determinations set forth in Graham v. John Deere Co., 383 U.S. 1, 17, 148 USPQ 459, 467 (1966), and to provide a reason why one having ordinary skill in the pertinent art would have been led to modify the prior art or to combine prior art references to arrive at the claimed invention. Such reason must stem from some teaching, suggestion or implication in the prior art as a whole or knowledge generally available to one having

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ordinary skill in the art. Uniroyal, Inc. v. Rudkin-Wiley Corp., 837 F.2d 1044, 1051, 5 USPQ2d 1434, 1438 (Fed. Cir.), cert. denied, 488 U.S.

825 (1988); Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 293, 227 USPQ 657, 664 (Fed. Cir. 1985), cert. denied, 475 U.S. 1017 (1986); ACS Hosp. Sys., Inc. v. Montefiore Hosp., 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). These showings by the examiner are an essential part of complying with the burden of presenting a prima facie case of obviousness. Note In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992).

With respect to independent claims 1 and 14, the examiner cites Corthout as teaching the graphical depiction of a virtual reality environment. The examiner notes that Corthout does not specifically disclose that hidden objects are obscured or that partitions are determined. The examiner asserts that obscuring objects is conventional in flight simulators, and that Bentley teaches that a hierarchic data structure can be viewed as defining partitions. The examiner also asserts that Fuchs teaches the use of partitions as claimed [answer, pages 4-5]. The examiner concludes that it

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would have been obvious to the artisan to modify the teachings of Corthout with the teachings of either Bentley or Fuchs since the hierarchic data of Corthout can be considered as defining partitions as suggested by Bentley or Fuchs.

With respect to the rejection of claims 1 and 14 based on Corthout and Bentley, appellants argue that there is no motivation to combine the teachings of these references absent the use of impermissible hindsight. We agree.

The examiner's position fundamentally depends on his assertion that a hierarchic data structure can be viewed as defining partitions. In the context of the claimed invention and the teachings of Corthout and Bentley, this position is untenable. Claims 1 and 14 recite the specific manner in which a first and a second partitioning plane are determined. The second partitioning plane is determined only in response to a first object in the virtual reality environment moving in a specific manner with respect to a second object in the virtual reality environment. We are unable to see any relationship between the hierarchy of a tree data structure and the movement of objects in a virtual reality environment as recited in claims 1 and 14. We also fail to see how the

associative search of a database structure as taught by Bentley has anything to do with graphically displaying a virtual reality environment. It appears to us that the examiner simply found two disparate documents which generally related the terms hierarchical and partitions in order to construct the claimed invention in hindsight. We can find no basis for the artisan to have combined Bentley's associative search of a data structure with Corthout's color picture computer.

It should be noted that independent claims 1 and 14 recite the manner in which a first object in a virtual reality environment moves with respect to a second object in that environment. Not all movements within the environment result in a change in the claimed invention. Only a movement resulting from one of the objects crossing a first partitioning plane gives rise to the determination of a second partitioning plane. Neither Corthout nor Bentley relates to the determination of partitioning planes based on the relative movement between two objects in the virtual reality environment. Corthout's flight simulator would only be concerned with observer movement rather than object movement.

Since we agree with appellants that there is no basis to combine the teachings of Corthout with Bentley, we do not sustain the rejection of the claims based on these two prior art documents.

With respect to the rejection of claims 1 and 14 based on Corthout and Fuchs, appellants argue that there is no motivation to combine the teachings of these references, and that the collective teachings of these references, even if properly combined, would not teach the invention as recited in these claims. We agree.

Although Fuchs is at least related to Corthout to the extent that they both deal with the graphical display of environments, Fuchs does not teach or suggest the method or circuitry recited in claims 1 and 14. Fuchs is primarily concerned with static world models. Fuchs notes that the binary space partitioning (BSP) algorithm requires that the entire BSP-tree must be rebuilt whenever the world model changes. This is a very time consuming process. Fuchs does suggest that the process can be simplified by limiting the movement of objects in the world model [page 68]. The types

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of simplification noted by Fuchs, however, do not suggest the determination of a second partitioning plane only when the first or second object moves across a first partitioning plane which is defined as being between the two objects.

Claims 1 and 14 require that action take place based on a specific type of relative movement between a first and second object in a virtual reality environment. The movement recited in the claims has nothing to do with the movement of the observer within the virtual reality environment. Only a specific type of movement of one object within the environment with respect to another object within the environment leads to the determination of a second partitioning plane as recited in claims 1 and 14. Such a determination is not suggested by the combined teachings of Corthout and Fuchs.

Since we agree with appellants that the combined teachings of Corthout and Fuchs do not teach or suggest the invention of independent claims 1 and 14, we do not sustain

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the rejection of these claims based on these two prior art documents. In summary, we have not sustained either of the examiner's rejections of independent claims 1 and 14. Therefore, we also do not sustain either rejection of dependent claims 2-13 and 15-26. Accordingly, the decision of the examiner rejecting claims 1-26 is reversed.

REVERSED

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Gary V. Harkcom)	
Vice Chief Administrative Patent Judge))
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)	
)	BOARD OF PATENT
Kenneth W. Hairston))
Administrative Patent Judge)	APPEALS AND
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JS/dm

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