UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte KEVIN T. LEFEBVRE,
DON B. HOFFMAN
and MICHAEL T. HAMILTON

Appeal 2008-1384
Application 10/427,618[1]
Technology Center 2600

Decided: September 26, 2008

Before JOSEPH F. RUGGIERO, JOHN A. JEFFERY,
and MARC S. HOFF, *Administrative Patent Judges.*

HOFF, *Administrative Patent Judge*.

DECISION ON APPEAL

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[1] Application filed April 30, 2003. The real party in interest is Hewlett-Packard Development Company, L.P.

STATEMENT OF CASE

Appellants appeal under 35 U.S.C. § 134 from a Final Rejection of claims 1-3. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm-in-part.

Appellants' invention relates to a graphics display system in which display list logic uses bounding volumes. A modified display list is created corresponding to a specified list. The graphics display system processes the modified list sequentially and tests the bounding volumes as they are encountered. As soon as a bounding volume is encountered whose coordinates define a region that should not be rendered, further sequential processing of rendering commands in the list may be halted. If any state commands remain in the list, those commands or an equivalent set of state commands may be executed, and then processing of the list is complete (Spec. 3-4).

Claim 1 is exemplary:

1. A method for processing a display list, comprising:

receiving a definition for a client-specified display list;

creating a modified display list corresponding to the client-specified display list, the modified display list containing a series of n nested bounding volumes where n is greater than two; and upon invocation of the client-specified display list, executing the modified display list in lieu of the client-specified display list:

wherein each one of the client-specified display list and the modified display list represents one or more commands executable by a computer graphics system.

The prior art relied upon by the Examiner in rejecting the claims on appeal is:

Denneau	US 6,384,833 B1	May 7, 2002
Cobb	US 6,603,474 B1	Aug. 5, 2003

Claim 1 stands rejected under 35 U.S.C. § 102(e) as being anticipated by Cobb.

Claim 2 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Cobb.

Claim 3 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Cobb in view of Denneau.

Rather than repeat the arguments of Appellants or the Examiner, we make reference to the Appeal Brief (filed March 15, 2007), the Reply Brief (filed August 6, 2007) and the Answer (mailed June 4, 2007) for their respective details.

ISSUE

The principal issue in the appeal before us is whether the Examiner erred in holding that Cobb teaches creating a modified display list corresponding to a client-specified display list, and upon invocation of the client-specified display list, executing the modified display list in lieu of the client-specified display list.

FINDINGS OF FACT

The following Findings of Fact (FF) are shown by a preponderance of the evidence.

The Invention

1. According to Appellants, the invention relates to a graphics display system in which display list logic uses bounding volumes. A modified display list is created corresponding to a specified list. The graphics display system processes the modified list sequentially and tests the bounding volumes as they are encountered. As soon as a bounding volume is encountered whose coordinates define a region that should not be rendered, further sequential processing of rendering commands in the list may be halted. If any state commands remain in the list, those commands or an equivalent set of state commands may be executed, and then processing of the list is complete (Spec. 3-4).

Cobb

2. Cobb teaches a method and apparatus for rendering drawings in a data processing system, in which occluders within the set of objects are selected using a plurality of bounding boxes and complexity data. These occluders are used to identify visible objects from the set of objects (col. 1, ll. 8-11; col. 2, ll. 1-8).

3. Cobb Figure 8A illustrates pseudo code 802, which includes the commands to "create N objects" and "initialize each object." These commands are executed if, and only if, the new scene flag is TRUE. If a new scene is not being drawn, these commands are not executed (Fig. 8A; col. 6, ll. 42-43).

4. Cobb teaches saving the graphics state during a process for identifying a minimal set of objects visible from a given view because the graphics processing system is used to perform occlusion processing. This processing would otherwise disrupt the graphical display observed by the user. Upon completion of the occlusion processing, the graphics state is restored so that the user does not see anything on the display other than the desired scene (col. 6, ll. 49-56).

5. Cobb teaches the desirability of saving execution time by not rendering objects that are blocked by visible objects (col. 9, ll. 23-28).

6. The occlusion_cull routine includes a command at its outset to "save current graphics state," and a command at its conclusion to "restore previous graphics state" (Fig. 8B).

Denneau

7. Denneau teaches distributing the geometric processing of an ordered sequence of graphics commands over a set of processors (col. 1, ll. 50-52).

PRINCIPLES OF LAW

Anticipation of a claim requires a finding that the claim at issue reads on a prior art reference. *Atlas Powder Co. v. IRECO, Inc.*, 190 F.3d 1342, 1346 (Fed. Cir. 1999) (quoting *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 781 (Fed. Cir. 1985)).

Analysis of whether a claim is patentable over the prior art under 35 U.S.C. § 102 begins with a determination of the scope of the claim. We determine the scope of the claims in patent applications not solely on the

basis of the claim language, but upon giving claims their broadest reasonable construction in light of the specification as it would be interpreted by one of ordinary skill in the art. *In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004). The properly interpreted claim must then be compared with the prior art.

In an appeal from a rejection for anticipation, the Appellants must explain which limitations are not found in the reference. *See Gechter v. Davidson*, 116 F.3d 1454, 1460 (Fed. Cir. 1997) ("[W]e expect that the Board's anticipation analysis be conducted on a limitation by limitation basis, with specific fact findings for each *contested* limitation and satisfactory explanations for such findings.")(emphasis added). *See also In re Kahn*, 441 F.3d 977, 985-86 (Fed. Cir. 2006) ("On appeal to the Board, an applicant can overcome a rejection [under § 103] by showing insufficient evidence of *prima facie* obviousness or by rebutting the *prima facie* case with evidence of secondary indicia of nonobviousness.") (quoting *In re Rouffet*, 149 F.3d 1350, 1355 (Fed. Cir. 1998)).

"Section 103 forbids issuance of a patent when 'the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.'" *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1734 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including (1) the scope and content of the prior art, (2) any differences between the claimed subject matter and the prior art, (3) the level of skill in the art, and (4) where in evidence, so-called

secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966). *See also KSR*, 127 S. Ct. at 1734 ("While the sequence of these questions might be reordered in any particular case, the [*Graham*] factors continue to define the inquiry that controls.")

In *KSR*, the Supreme Court emphasized "the need for caution in granting a patent based on the combination of elements found in the prior art," *id.* at 1739, and discussed circumstances in which a patent might be determined to be obvious. In particular, the Supreme Court emphasized that "the principles laid down in *Graham* reaffirmed the 'functional approach' of *Hotchkiss*, 11 How. 248." *KSR*, 127 S. Ct. at 1739 (citing *Graham v. John Deere Co.*, 383 U.S. 1, 12 (1966) (emphasis added)), and reaffirmed principles based on its precedent that "[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." *Id.* The Court explained:

> When a work is available in one form of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.

Id. at 1740. The operative question in this "functional approach" is thus "whether the improvement is more than the predictable use of prior art elements according to their established functions." *Id.*

ANALYSIS

Claim 1

The Examiner finds that Cobb teaches all the elements of the invention recited in claim 1, including (a) creating a modified display list corresponding to the client-specified display list, the modified display list containing a series of n nested bounding volumes where n is greater than 2, and (b) executing the modified display list in lieu of the client-specified display list (Ans. 3, 8).

The Examiner cites pseudo code 802 in Figure 8A of Cobb as teaching a modified display list corresponding to the client-specified display list, because pseudo code 802 includes commands to "'*create N objects corresponding to N display lists*'" and "'*initialize each object with {…}*'" (Ans. 3).

We do not agree with the Examiner's interpretation of Cobb. Figure 8A illustrates that the portion of pseudo code 802 relied upon by the Examiner, including the commands to "create N objects" and "initialize each object," is executed if, and only if, the new scene flag is TRUE (FF 3). If a new scene is not being drawn, these commands are not executed, and thus a modified display list is not created (*id.*). Therefore, even assuming that the Examiner is correct in characterizing the "N objects" of Cobb as equivalent to display lists, Cobb does not always create a modified display list, which claim 1 requires. Necessarily, if Cobb does not always create a modified display list, Cobb also cannot always execute a modified display list in lieu of the client-specified display list, as claim 1 requires. We therefore find that Cobb does not teach all the limitations of claim 1.

As a result, we do not sustain the Examiner's rejection of claim 1 under 35 U.S.C. § 102(e).

Claim 2

Appellants argue, and the Examiner concedes, that Cobb does not expressly disclose the step of processing all further state commands contained in the modified display list if a bounding volume is encountered whose coordinates define a region that should not be rendered (Ans. 5; App. Br. 9). Appellants further argue that the Examiner lacks motivation to modify Cobb to process remaining state commands after a determination that a particular bounding volume has coordinates defining a region that should not be rendered, because Cobb teaches that when an occluder is excluded, the state commands associated with that occluder are also excluded (App. Br. 10, citing Cobb col. 9, ll. 47-65).

We agree with Appellants' position. The section of Cobb relied upon by the Examiner at page 12 of the Answer (i.e., col. 6, ll. 49-56) does not teach that Cobb processes remaining state commands, even when it is determined that a particular region is not to be rendered; here, Cobb merely teaches the desirability of not disrupting the graphical display observed by the user (FF 4). Cobb acknowledges the desirability of saving execution time by not rendering objects that are blocked by visible objects (FF 5). Further, inspection of the occlusion_cull routine, which is executed to determine which objects are to be rendered and which objects need not be rendered because they are not visible from the chosen viewpoint (Fig. 8B), indicates that the graphics state is saved at the outset of the routine and restored at the end of the routine (FF 6). It would be pointless to execute

state commands during this routine, even for objects that are not to be rendered, because the command to "restore previous graphics state" at the end of the occlusion_cull routine would return the graphics state to what it was before the state commands were executed, rendering the intervening commands a nullity.

Because the Examiner failed to supply evidence in Cobb or other prior art that, at the time of Appellants' invention, it was known or desired to process state commands relating to a bounding volume whose coordinates define a region that should not be rendered, as claim 2 requires, we will not sustain the Examiner's rejection of claim 2 under 35 U.S.C. § 103(a).

Claim 3

Claim 3 depends from independent claim 1. Appellants do not present separate arguments for the patentability of claim 3, noting only that Denneau does not overcome the deficiencies in Cobb with respect to parent claim 1 (Reply Br. 10).

As discussed *supra* with respect to claim 1, because it is not necessarily the case that the drawing of a new scene occurs, Cobb does not necessarily create a modified display list or execute that modified list in lieu of a client-specified list, and as such Cobb cannot anticipate the subject matter of claim 1.

It is clear, however, that Cobb does contemplate the occurrence of the "new scene" condition. Given that teaching in Cobb, it would have been obvious to modify Cobb such that the "new scene" flag is TRUE, resulting in the creation of a modified display list, and the execution of that list in lieu of the client-specified list. We consider that such a modification of Cobb,

given Cobb's existing teaching, would merely amount to the combination of familiar elements according to known methods, yielding predictable results. *KSR*, 127 S. Ct. at 1739.

We therefore find no error in the Examiner's rejection of claim 3 under 35 U.S.C. § 103(a).

CONCLUSION OF LAW

We conclude that Appellants have not shown that the Examiner erred in rejecting claim 3. Claim 3 is not patentable.

We further conclude that Appellants have shown that the Examiner erred in rejecting claims 1 and 2. On the record before us, claims 1 and 2 have not been shown to be unpatentable.

DECISION

The Examiner's decision rejecting claim 3 is affirmed. The Examiner's decision rejecting claims 1 and 2 is reversed.

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-IN-PART

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