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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte MARK J. KILGARD

Appeal 2016-001148
Application 13/111,148[1]
Technology Center 2600

Before JOSEPH L. DIXON, JUSTIN BUSCH, and
NORMAN H. BEAMER, *Administrative Patent Judges*.

BEAMER, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant appeals under 35 U.S.C. § 134(a) from the Examiner's Final Rejection of claims 1–21. We have jurisdiction over the pending rejected claims under 35 U.S.C. § 6(b).

We affirm.

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[1] Appellant identifies NVIDIA Corporation as the real party in interest. (App. Br. 3.)

THE INVENTION

Appellant's disclosed and claimed invention is directed to reducing complex path objects to simpler geometric objects suitable for path rendering on a graphics processing unit. (Abstract.) Claim 1, reproduced below, is illustrative of the subject matter on appeal:

> 1. A method for reducing a path object into stencil geometry and cover geometry, the method comprising:
>
> receiving a path object that includes resolution-independent geometric path information;
>
> decomposing the path object into the stencil geometry and the cover geometry without tessellating the path object into polygons; and
>
> copying the stencil geometry and the cover geometry to a GPU-accessible memory, wherein the stencil geometry and the cover geometry are configured to be rendered via a graphics processing unit (GPU).

REJECTIONS

The Examiner rejected claims 1–9, 11–17, and 19–21 under 35 U.S.C. § 103(a) as being unpatentable over Kokojima (US 2007/0211061 A1, published Sept. 13, 2007), Papakipos et al. (US 7,142,215 B1, issued Nov. 28, 2006), and Carr et al. (US 8,379,025 B1, issued Feb. 19, 2013). (Final Act. 5–20.)

The Examiner rejected claims 10 and 18 under 35 U.S.C. § 103(a) as being unpatentable over Kokojima, Papakipos, Carr, and Brown (US 7,589,730 B1, issued Sep. 15, 2009). (Final Act. 20–22.)

ISSUE ON APPEAL

Appellant's arguments in the Briefs present the following issue:[2]

Whether the Examiner erred in finding the combination of Kokojima, Papakipos, and Carr teaches or suggests the independent claim 1 limitation, "decomposing the path object into the stencil geometry and the cover geometry without tessellating the path object into polygons," and the similar limitation recited in independent claims 11 and 19. (App. Br. 10–15.)

ANALYSIS

We have reviewed the Examiner's rejections in light of Appellant's arguments the Examiner erred. We disagree with Appellant's arguments, and we adopt as our own (1) the pertinent findings and reasons set forth by the Examiner in the Action from which this appeal is taken (Final Act. 5–22) and (2) the corresponding findings and reasons set forth by the Examiner in the Examiner's Answer in response to Appellant's Appeal Brief (Ans. 2–6). We concur with the applicable conclusions reached by the Examiner, and emphasize the following.

In finding Kokojima and Carr teach or suggest the limitation at issue, the Examiner relies on the disclosure in Kokojima of rendering vector format graphic data, including generating triangular data from the vector graphic data, and generating stencil data and coverage data from the triangular data. (Final Act. 6–7; Kokojima Abstract, Figs. 22–24, ¶¶ 84,

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[2] Rather than reiterate the arguments of Appellant and the findings of the Examiner, we refer to the Appeal Brief (filed May 25, 2015); the Reply Brief (filed Oct. 27, 2015); the Final Office Action (mailed Oct. 22, 2014); and the Examiner's Answer (mailed Aug. 27, 2015) for the respective details.

115–117, 133.) The Examiner further relies on the disclosure in Carr of rendering vector art by maintaining curves in their analytic form by subdividing the curves into monotonic curve segments. (Final Act. 9–10; Carr Abstract, Fig. 4B, col. 6, ll. 44–64.)[3]

Appellant argues:

> Kokojima discloses a two-stage processing technique for generating stencil data from vector graphics. In the first stage, a vector format graphic is decomposed into an assembly of triangles by the CPU. Kokojima at ¶ [0060]. . . .
>
> Importantly, as acknowledged by the Examiner, Kokojima does not disclose decomposing a path object into stencil geometry and cover geometry without tessellating the path object into polygons. . . .
>
> Carr generally discloses techniques for subdividing Bezier-bounded 20 vector art into a plurality of curve segments. Importantly, however, Carr is entirely silent regarding decomposing a path object into stencil geometry and cover geometry without tessellating the path object into polygons.

(App. Br. 10.) This argument is unpersuasive, because Appellant attempts to distinguish the two references individually, whereas the Examiner's rejection is based on the combination of references. Non-obviousness cannot be established by attacking references individually where, as here, the ground of unpatentability is based upon the teachings of a combination of references. *In re Merck & Co., Inc.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986). Rather, the test for obviousness is whether the combination of references, taken as a whole, would have suggested the patentee's invention to a person

[3] The Examiner relies on Papakipos for other aspects of the claims. (Final Act. 8–9.)

having ordinary skill in the art. *In re Keller*, 642 F.2d 413, 425 (CCPA 1981).

As the Examiner finds:

> Carr et al. teach decomposing a path object . . . without tessellating the path object into polygons. . . .
>
> It would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine Kokojima and Carr et al. to render a path object with two stages: decompose a path object into stencil geometry and cover geometry without tessellating the path object into polygons . . . and each monotonic curve segment is rendering using the method provided by Kokojima in second stage . . . so as to load the API's into the GPU and plug directly into the graphics pipeline to efficiently render quadratic Bezier content directly (eliminate the need for expensive CPU-side planar mapping and triangulation) and provide high performance. . . .

(Ans. 3, 6.)

Appellant further argues Carr teaches away from any combination with Kokojima because "Carr discloses that processing shapes using a stencil buffer 'can result in a significant amount of overdraw' and 'the cost of resolving such shapes with stenciling may be prohibitive.'" (App. Br. 13.) However, as the Examiner points out:

> [T[his [statement] is under the conditions processing complex shapes and on low-end GPU devices with minimal frame buffer bandwidth. If system has high-end GPU and process a simple shape, it would not be a problem. . . .

(Ans. 4.) As held in *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994):

> A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant. . . . [I]n general, a reference will teach away if it suggests that the line of development flowing from

> the reference's disclosure is unlikely to be productive of the result sought by the applicant.

We are not persuaded the reference to overdraw and cost of stenciling in Carr is sufficient to dissuade one of ordinary skill from adapting the curve segment decomposition teachings of Carr to the first stage of the Kokojima rendering technique. The appropriateness of combining Carr and Kokojima is confirmed by the suggestion in Carr of substituting the disclosed use of monotonic curve segments for tessellation:

> Embodiments may provide methods that leverage graphics hardware to efficiently render quadratic Bezier content directly, thus eliminated the need for expensive CPU-side planar mapping and triangulation.

(Carr col. 2, ll. 23–26.)

Appellant also argues the combination of Kokojima with Carr is unwarranted because "Kokojima explicitly discloses that its GPU cannot rasterize a graphic that is composed of curves." (App. Br. 14.) However, "[t]he test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference." *In re Keller*, 642 F.2d at 425. Instead, the relevant issue is "what the combined teachings of the references would have suggested to those of ordinary skill in the art." *Id.* In this instance, considering the Kokojima reference as a whole, the statement regarding curves applies to complex curves such as those illustrated in Figure 2 of Kokojima. (*See* Kokojima ¶ 60 ("the GPU cannot directly handle a graphic configured by straight lines and curves ***as shown in FIG. 2***") (emphasis added).) Kokojima ***does*** process simple curve segments that are part of the more complex graphic shown in Figure 2, thus confirming to one of ordinary skill the appropriateness of using the Carr approach of decomposing complex

curves into monotonic curve segments. (*See* Kokojima Figs. 5B, 6A, 6B, ¶ 62.)

CONCLUSION

For the reasons stated above, we sustain the obviousness rejections of independent claims 1, 11, and 19 over Kokojima, Papakipos, and Carr. We also sustain the obviousness rejections of claims 2–9, 12–17, 20, and 21 over Kokojima, Papakipos, and Carr, and of claims 10 and 18 over Kokojima, Papakipos, Carr, and Brown, which rejections are not argued separately with particularity.

DECISION

We affirm the Examiner's obviousness rejection of claims 1–21.

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