

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 12

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte VADLAMANNATI VENKATESWAR, PRAVEEN K. GANAPATHY,
RALPH E. PAYNE, and ARUNABHA GHOSE

Appeal No. 2000-0975
Application No. 08/956,402

ON BRIEF

Before JERRY SMITH, RUGGIERO, and BLANKENSHIP, Administrative Patent
Judges.

BLANKENSHIP, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 1-14.

We affirm-in-part.

BACKGROUND

The invention is directed to raster image processing in a printing system having a main processor and several parallel processors. Claim 1 is reproduced below.

1. A method of processing print data, comprising the steps of:
 - providing a main processor and a single semiconductor chip including a plurality of parallel processors for processing print data;
 - performing language interpretation tasks on said print data with said main processor, including a task of dividing up said print data into lists corresponding to bands on a page of said print data;
 - performing geometry and rasterization processing upon said print data bands with said parallel processors, such that several of said bands are rendered in parallel into a frame buffer; and
 - transferring rasterized data from said frame buffer to a print engine for a first page while the above steps are repeated for a next page.

The examiner relies on the following references:

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| Gauthier | 5,594,860 | Jan. 14, 1997 (filed Jan. 27, 1995) |
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Molnar et al. (Molnar), A Sorting Classification of Parallel Rendering, IEEE Computer Graphics and Applications, pp. 23-32 (Jul. 1994).

Guttag et al. (Guttag), A Single-Chip Multiprocessor for Multimedia: The MVP, IEEE Computer Graphics & Applications, pp. 53-64 (Nov. 1992).

Claims 1-14 stand rejected under 35 U.S.C. § 103 as being unpatentable over Gauthier, Molnar, and Guttag.

Claim 15 has been allowed.

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We refer to the Final Rejection (mailed Jul. 8, 1999) and the Examiner's Answer (mailed Nov. 30, 1999) for a statement of the examiner's position and to the Brief (filed Nov. 1, 1999) and the Reply Brief (filed Jan. 11, 2000) for appellants' position with respect to the claims which stand rejected.

OPINION

Appellants' parroting of the language of instant claim 1 (Brief at 4-5), coupled with allegations that such combination is not taught or suggested by the references, does nothing to convince us of error in the rejection set forth by the examiner. We refer to the examiner's findings in support of the prima facie case of obviousness for claim 1, set forth at pages 4 and 5 of the Answer (and the further treatment at pages 5 and 6 in the section responsive to the Brief's arguments). We consider the examiner's findings and ultimate determination to be well founded.

Appellants appear to argue, at page 2 of the Reply Brief, that the fact that the Guttag reference taken alone fails to disclose or suggest the instantly claimed invention tends to show nonobviousness. However, we note that the rejection of claim 1 relies on Guttag for the limited purpose of teaching a plurality of parallel processors on a single semiconductor chip. We further note that the inquiry into obviousness is not based on resolving the question of what would have been obvious to "Guttag et al.," nor, for that matter, based on resolving the question of what would have been obvious to the instant group of inventors.

We do not agree with appellants' characterization (Reply Brief at 2, final ¶) that the rejection fails to demonstrate "suggestion." The Answer points to specific sections of the references where suggestion is deemed to reside, and appellants have not explained why the findings should be considered erroneous. Even so, the suggestion to modify the art to produce the claimed invention need not be expressly stated in one or all the references used to show obviousness. The test is whether the combined teachings of the prior art, taken as a whole, would have rendered the claimed invention obvious to one of ordinary skill in the art. In re Napier, 55 F.3d 610, 613, 34 USPQ2d 1782, 1784 (Fed. Cir. 1995).

The remainder of appellants' arguments in defense of claim 1 consist of pointing out deficiencies in individual references. The arguments do not speak to the combination of the references applied. Nonobviousness cannot be established by attacking references individually where the rejection is based upon the teachings of a combination of references. In re Merck & Co., 800 F.2d 1091, 1097, 231 USPQ 375, 380 (Fed. Cir. 1986) (citing In re Keller, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981)).

Having not persuaded us of error in the rejection of claim 1, we sustain the section 103 rejection of the claim.

For substantially the same reasons, we also sustain the rejection of independent claim 10. Our understanding of the claim's scope is based on appellants' definition of "paths" at page 6, lines 10 and 11 of the instant specification. "Paths" are simply

graphic objects that are generated by a main processor and passed to a graphics processor, as described by Gauthier at columns 6 and 7 and shown in Figure 3 (queue 38 associated with graphics processor 18).

With respect to claim 2, we note that the “tasks” which are to be performed by the at least one of the parallel processors are not specified. The claim thus embraces geometry processing and rasterization that may be performed by a parallel processor while the main processor is performing language interpretation tasks. Gauthier at column 9, lines 13 through 19 reveals that the main processor (MPU) may be interpreting a second page while a graphics processor (GPU) is rendering bitmaps and dispatching bands for the first page. We therefore sustain the rejection of claim 2.

We also sustain the rejection of claim 3. Molnar, at pages 24 and 25, reveals that tasks may be sorted or redistributed for optimal use of the parallel processors. The artisan would have considered it obvious that some parallel processors perform tasks (e.g., geometry processing) for a “current page” while other of the parallel processors perform tasks (e.g., rasterization) for a “previous page.”

We sustain the rejection of claims 4 and 5. Molnar teaches a sort-first and a sort-middle scheme (e.g., pages 24 and 25).

We sustain the rejection of claim 6. Gutttag discloses a single-chip architecture with four parallel processors and a master processor (p. 60, Fig. 4).

Instant claim 7 recites “wherein said main processor is on a separate chip.” We agree with the examiner that the distinct functions as shown in the block diagram of

Gutttag's Figure 4 would have suggested the main processor residing on a chip separate from that of the parallel processors. Moreover, the recitation "wherein said main processor is on a separate chip" does not appear to limit the process set forth in base claim 1 in any meaningful way. We sustain the rejection of claim 7.

We do not sustain the rejections of claims 8 and 9. Unlike claim 2 (depending from base claim 1), instant claim 8 is specific with respect to the tasks which are passed to the parallel processors, and require that the parallel processors perform language interpretation tasks. The examiner has not shown disclosure or suggestion of these features of claim 8. Instant claim 9 recites, in somewhat broader language, "selecting a subset of parallel processors on said single-chip multiprocessor and using said subset to accelerate said language interpretation tasks for said current page." We cannot agree with the examiner's indication that Gauthier at column 9, lines 13 to 20 teaches selecting a subset of parallel processors and using the subset to accelerate language interpretation tasks.

We sustain the rejections of claims 11 and 12. The claims require at least one "dedicated" geometry processing (claim 11) or one "dedicated" rasterization parallel processor (claim 12). Molnar reveals, in the discussion of the "sort-middle" scheme (pp. 24-25), that it was conventional to perform geometry processing and rasterization on separate processors. The same section further teaches that such an architecture is conducive to effecting a sort-middle system, and thus would have suggested at least

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one dedicated geometry processing parallel processor and at least one dedicated rasterization parallel processor.

We sustain the rejection of claim 13. In our opinion, the requirements of the claim follow from the combined teachings of the references. Since the rasterizing step for any particular band occurs after the geometry processing of the band, and after the still earlier step of language interpretation, the artisan would have recognized that language interpretation and geometry processing may be performed on a “current page” of print data while a rasterizing step is performed on a “previous page” of print data.

We also sustain the rejection of claim 14. We have noted that Molnar teaches the benefits of separate processors for geometry processing and rasterization. The reference discloses that, although “many” do, not all such systems use separate processors for the relevant tasks. In context of the discussion at pages 24 through 25 of the reference, Molnar would have suggested use of all the parallel processors performing both geometry processing and rasterization on the primitives list, at least for the purposes of a sort-first or sort-last scheme.

We have considered all of appellants’ arguments in making the foregoing determinations. However, arguments appellants might have made, but did not rely upon, are deemed waived. See 37 CFR § 1.192(a) (“Any arguments or authorities not included in the brief will be refused consideration by the Board of Patent Appeals and

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Interferences, unless good cause is shown.”) and § 1.192(c)(8)(iv) (the brief must point out the errors in the rejection).

CONCLUSION

The rejection of claims 1-7 and 10-14 under 35 U.S.C. § 103 as being unpatentable over Gauthier, Molnar, and Guttag is affirmed. The rejection of claims 8 and 9 under 35 U.S.C. § 103 as being unpatentable over Gauthier, Molnar, and Guttag is reversed.

The examiner’s decision in rejecting claims 1-14 is thus affirmed-in-part.

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No time period for taking any subsequent action in connection with this appeal
may be extended under 37 CFR § 1.136(a).

AFFIRMED-IN-PART

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| JERRY SMITH |) | |
| Administrative Patent Judge |) | |
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| |) | BOARD OF PATENT |
| JOSEPH F. RUGGIERO |) | APPEALS |
| Administrative Patent Judge |) | AND |
| |) | INTERFERENCES |
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| HOWARD B. BLANKENSHIP |) | |
| Administrative Patent Judge |) | |

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TEXAS INSTRUMENTS INCORPORATED
P O BOX 655474, M/S 3999
DALLAS , TX 75265