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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/574,041	12/17/2014	Robert D. Kenney	8888-46201	1004
81310	7590	09/28/2020	EXAMINER	
Kowert Hood Munyon Rankin & Goetzel (Apple)			SUN, HAI TAO	
1120 S. Capital of Texas Hwy			ART UNIT	
Building 2, Suite 300			PAPER NUMBER	
Austin, TX 78746			2616	
			NOTIFICATION DATE	
			DELIVERY MODE	
			09/28/2020	
			ELECTRONIC	

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* ROBERT D. KENNEY, BENJIMAN L. GOODMAN, and  
TERENCE M. POTTER

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Appeal 2019-002377  
Application 14/574,041  
Technology Center 2600

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Before ELENI MANTIS MERCADER, CARL W. WHITEHEAD JR., and  
NORMAN H. BEAMER, *Administrative Patent Judges*.

MANTIS MERCADER, *Administrative Patent Judge*.

DECISION ON APPEAL

## STATEMENT OF THE CASE

Appellant<sup>1</sup> appeals under 35 U.S.C. § 134(a) from the Examiner's Final Rejection of claims 1–12 and 14–20, which constitute all the claims pending in this application. We have jurisdiction under 35 U.S.C. § 6(b).

We reverse.

## THE INVENTION

Appellant's claimed invention is directed to a graphics unit that renders a frame of graphics data using a plurality of pass groups in which the frame of graphics data includes a plurality of frame portions. Abstract.

Independent claim 1, reproduced below, is representative of the subject matter on appeal:

1. An apparatus, comprising:

graphics circuitry configured to render a frame of graphics data using a plurality of pass groups, wherein the frame includes a plurality of frame portions, wherein each frame portion includes a plurality of pixels that is less than an entirety of pixels of the frame, and wherein the graphics circuitry comprises:

scheduling circuitry configured to:

receive a plurality of graphics processing tasks, including an initial task corresponding to each of the plurality of frame portions;

maintain, for each of the plurality of tasks, information that identifies one of the plurality of frame portions

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<sup>1</sup> We use the word "Appellant" to refer to "applicant" as defined in 37 C.F.R. § 1.42. Appellant identifies Apple Inc. as the real party in interest. Appeal Br. 3.

and pass group information that identifies one of the plurality of pass groups;

maintain age information that indicates an ordering for the plurality of frame portions wherein the ordering is based on when the corresponding initial task for each frame portion was received, such that the age information indicates, for first and second different frame portions of the plurality of frame portions, whether the initial task for the first frame portion was received before the initial task for the second frame portion, wherein the age information is maintained after completion of the initial tasks for the plurality of frame portions;

select, for execution by the graphics circuitry, a task from among the plurality of tasks based on the age information and the pass group information, wherein the selection selects a first task from a current pass group prior to selecting a second task from a different pass group, wherein the first task corresponds to a frame portion with a younger initial task than a frame portion of the second task; and

execute the selected task using one or more graphics processing elements.

Appeal Br. 26 (Claims Appendix).

## REFERENCES

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

Nishimura	US 2003/0037091 A1	Feb. 20, 2003
McDermott	US 6,584,587 B1	June 24, 2003
Aila	US 2005/0134588 A1	June 23, 2005
McCabe	US 7,119,809 B1	Oct. 10, 2006
Koduri	US 2006/0271717 A1	Nov. 30, 2006
Jiao	US 2010/0123717 A1	May 20, 2010
Duluk	US 2011/0080416 A1	Apr. 7, 2011
Lottes	US 2014/0259016 A1	Sept. 11, 2014

## REJECTIONS

The Examiner made the following rejections:

Claims 1, 8, 9, 15, 16, and 20 stand rejected under 35 U.S.C. § 103 as being unpatentable over Lottes, Jiao, Koduri, and McCabe. Final Act. 9.

Claims 2, 3, 5, 10–12, 17, and 18 stand rejected under 35 U.S.C. § 103 as being unpatentable over Lottes, Jiao, Koduri, McCabe, and Nishimura. Final Act. 25.

Claims 6 and 14 stand rejected under 35 U.S.C. § 103 as being unpatentable over Lottes, Jiao, Koduri, McCabe, and Aila. Final Act. 30.

Claims 7 and 19 stand rejected under 35 U.S.C. § 103 as being unpatentable over Lottes, Jiao, Koduri, McCabe, and Duluk. Final Act. 31.

Claim 4 stands rejected under 35 U.S.C. § 103 as being unpatentable over Lottes, Jiao, Koduri, McCabe, and McDermott. Final Act. 32.

## ISSUE

The pivotal issue is whether the Examiner's articulated reasoning provides a rational underpinning to support a legal conclusion of obviousness.

## ANALYSIS

We note that if Appellants failed to present arguments on a particular rejection, we will not unilaterally review those uncontested aspects of the rejection. *See Ex parte Frye*, 94 USPQ2d 1072, 1075 (BPAI 2010) (precedential); *Hyatt v. Dudas*, 551 F.3d 1307, 1313–14 (Fed. Cir. 2008) (The Board may treat arguments Appellants failed to make for a given ground of rejection as waived).

Appellant argues that “the Examiner’s proposed modifications interfere with functionality of the reference and the Examiner’s own mapping to other claim features” (Appeal Br. 21). Appellant contends that “the Examiner’s reasoning cannot provide a ‘rational underpinning’ when the combination destroys a reference’s functionality or interferes with the Examiner’s own mapping” (Reply Br. 4). Appellant further contends that “the Examiner’s rejection is internally inconsistent and illogical” (Reply Br. 4).

We agree. Regarding the “maintain age information” limitation, the Examiner finds, and we agree, that “Jiao teaches the ages information. The oldest thread is selected and provided to the arbiter 184 for the next cycle. In Fig. 6 and [¶ 68], Jiao teaches FIFO 156” (Ans. 16, quoting Jiao ¶ 76; *see also* Jiao Fig. 7). Jiao then teaches *a first-in-first-out queue*, and teaches an age information determination for each frame portion/task combination corresponding to the claimed limitation, and made without respect to the pass group information.

Regarding the “select, for execution” limitation, the previously-determined age information is used in conjunction with the pass group information, wherein the:

selection selects a first task from a current pass group prior to selecting a second task from a different pass group, wherein the first task corresponds to a frame portion with a younger initial task than a frame portion of the second task.

In finding that McCabe teaches the claimed “a second task from a different pass group,” the Examiner applies *a second queue that is first-in-last-out*, in which:

data is transferred to and from in a predetermined order; first-in-last-out buffer contains a second task from a different pass group; first-in-last-out contains different pass group; first-in is a second task in the stack buffer 508.

(Final Rejection 15, citing McCabe Fig. 5, 8:1–10).

The Examiner further finds the motivation to combine McCabe with the combination of Lottes, Jiao, and Koduri:

would have been *to store results of rasterization in an easy traversal and retrieval form*; to move the bitmap/pixmap from the stack buffer 508 to the frame buffer in memory 414 as taught by McCabe in col. 6, lines 60–65, and col. 7, lines 30–35.

(Ans. 29, emphasis added). The rejection is unclear whether the Examiner is finding that one skilled in the art would apply McCabe’s teaching of a first-in-last-out queue to:

- i. modify Jiao’s queue to go from last-in-first-out to first-in-last-out;  
or
- ii. add a second queue to the combination of Lottes, Jiao, and Koduri.

Under case (i), we agree with Appellant that the modification of Jiao’s queue “would substantially impair its intended functionality” (Reply Br. 4) and the combination would no longer be able to perform the claimed “maintain age information” limitation, because a first-in-last-out queue would not satisfy the limitation that:

the age information indicates, for first and second different frame portions of the plurality of frame portions, whether the initial task for the first frame portion was received before the initial task for the second frame portion.

Under case (ii), the only rationale the Examiner has supplied for adding a second queue is that it “would have been to store results of rasterization in an easy traversal and retrieval form” (Ans. 29); however, under this rationale one skilled in the art would not consider adding a second queue, but instead would consider the application of the benefits of McCabe’s data structure to Jiao’s queue. In this case, the addition of a second queue appears to be using Appellant’s disclosure as a blueprint to reconstruct the claimed invention from the isolated teachings of the prior art. *See, e.g., Grain Processing Corp. v. American Maize-Products Co.*, 840 F.2d 902, 907 (Fed. Cir. 1988).

In sum, the Examiner’s articulated reasoning fails to provide a rational underpinning to support the legal conclusion of obviousness. *See KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007). We are constrained by the record to reverse the rejection of independent claim 1, as well as independent claims 9 and 16 commensurate in scope, and all dependent claims.

### CONCLUSION

The Examiner’s articulated reasoning fails to provide a rational underpinning to support a legal conclusion of obviousness.

### DECISION

In summary:

<b>Claims Rejected</b>	<b>35 U.S.C. §</b>	<b>Reference(s)/Basis</b>	<b>Affirmed</b>	<b>Reversed</b>
1, 8, 9, 15, 16, 20	103	Lottes, Jiao, Koduri, McCabe		1, 8, 9, 15, 16, 20

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2, 3, 5, 10–12, 17, 18	103	Lottes, Jiao, Koduri, McCabe, Nishimura		2, 3, 5, 10–12, 17, 18
6, 14	103	Lottes, Jiao, Koduri, McCabe, Aila		6, 14
7, 19	103	Lottes, Jiao, Koduri, McCabe, and Duluk		7, 19
4	103	Lottes, Jiao, Koduri, McCabe, and McDermott		4
OVERALL OUTCOME				1–12, 14–20

REVERSED