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NIXON & VANDERHYE, P.C.
901 NORTH GLEBE ROAD, 11TH FLOOR
ARLINGTON, VA 22203

EXAMINER
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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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Ex parte IAN MICHAEL CAULFIELD

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Appeal 2019-006974
Application 15/152,781
Technology Center 2100

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Before CARL W. WHITEHEAD JR., DAVID M. KOHUT, and
IRVIN E. BRANCH, *Administrative Patent Judges*.

BRANCH, *Administrative Patent Judge*.

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134(a), Appellant[1] appeals from the
Examiner's decision to reject claims 1, 2, 4–13, and 17–21, which are all of
the pending claims. We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

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[1] We use "Appellant" to reference the applicant as defined in
37 C.F.R. § 1.42. Appellant identifies the real party in interest as "ARM
Limited." Appeal Br. 3.

STATEMENT OF THE CASE

Appellant's Invention

Appellant's invention relates to "executing micro-operations in response to instructions fetched from a data store." Spec., Abst. Claim 1, reproduced below with emphasis, is illustrative of argued subject matter.

1. Processing circuitry comprising:

execute circuitry to execute micro-operations in response to instructions fetched from a data store; and

control circuitry to determine, in dependence on availability of at least one processing resource, how many micro-operations are to be executed by the execute circuitry in response to a given set of one or more instructions fetched from the data store,

wherein said at least one processing resource comprises at least one operand required for processing of said given set of one or more instructions,

wherein the control circuitry comprises issue circuitry to issue micro-operations for execution by the execute circuitry, and the issue circuitry comprises an issue queue to queue micro-operations awaiting issue, and

wherein the issue circuitry is configured to determine in dependence on said availability of said at least one operand required for processing of said given set of one or more instructions, **whether to split a single micro-operation** queued in the issue queue into multiple micro-operations to be issued separately to the execute circuitry.

Appeal Br. 14 (Claims Appendix).

Rejection

Claims 1, 2, 4–13, and 17–21 stand rejected under

35 U.S.C. § 102(a)(1) as anticipated by Airaud (US 2014/0215189 A1;

July 31, 2014). Final Act. 3–10.

OPINION

For the following reasons, we are persuaded of error in the

Examiner's reliance on Airaud. We accordingly do not sustain the rejection

of claims 1, 2, 4–13, and 17–21.

Each independent claim recites the following argued limitation:

"determin[e] . . . whether to split a single micro-operation . . . into multiple

micro-operations." Appeal Br. 14 (claim 1), 18 (claim 21), 6–7 (identifying

the argued limitation).

The Examiner finds Airaud's invention anticipates the claimed

determination by splitting an instruction into micro-operations (herein

"μops" (plur.) or "μop" (sing.)) and then deciding whether to recombine

those μops into a single μop. Ans. 3–4. As part of this finding, the

Examiner concludes the broadest reasonable interpretation of the claimed

"determin[e] . . . whether to split" encompasses (i.e., reads on) determining

whether to maintain the above split (into μops) by deciding whether or not to

recombine the split (into a single μop). *Id.*

Appellant contends, *inter alia*, the claimed "determin[e] . . . whether

to split" does not encompass determining whether to maintain a split by

deciding whether or not to recombine the split. Reply Br. 5–6. In support,

Appellant contends the Examiner's claim interpretation is "a linguistic

sleight-of-hand . . . us[ing] the word 'split' as an adjective, . . . [whereas]

claim 1 uses 'split' as a verb for the actual splitting of a micro-op." *Id.* at 5.

Appellant further contends the Examiner disregards the above grammatical structure of the claimed "determin[e] . . . whether to split"—i.e., use of "split" as a verb—by reading the limitation on Airaud's determination of whether to: retain a split-form of the instruction (i.e., to maintain the existing μops); or generate an unsplit-form of the instruction (i.e., to recombine the μops). *Id.* at 6.

We are persuaded of error because, as Appellant argues, the Examiner's interpretation of the claimed "determin[e] . . . whether to split" does not adhere to the limitation's grammatical construction.[2] *Id.* at 5–6; *see also* Ans. 4. Before addressing the error, we note that grammar is one of a patent applicant's principal tools for "a fair chance to draft a precise claim." *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2145 (2016) ("This system—broad construction with a chance to amend—both protects the public from overly broad claims and gives the applicant a fair chance to draft a precise claim that will qualify for patent protection."). It is, therefore, no surprise the grammatical construction of claim limitations must be heeded. *See In re Hyatt*, 708 F.2d 712, 714 (Fed. Cir. 1983) ("A claim must be read in accordance with the precepts of English grammar."); *Mformation Techs., Inc. v. Research in Motion Ltd.*, 764 F.3d 1392, 1398 (Fed. Cir. 2014) (A claim's listing of steps does not impose an order unless "the claim language, as a matter of logic or grammar, requires . . . the order written."); *HTC Corp. v. IPCom GmbH & Co.*, 667 F.3d 1270, 1274–75 (Fed. Cir. 2012) ("The district court did not examine adequately the claims themselves. *Phillips[v. AWH Corp.]*, 415 F.3d [1303,] 1314 [(Fed. Cir.

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[2] The Examiner introduces the contested claim interpretation in the Answer and therefore Appellant's response in the Reply Brief is timely.

2005)]. . . . Modifiers should be placed next to the words they modify.
William Strunk, Jr. & E.B. White, *The Elements of Style* 30
(4th ed. 2000).”); *see also Vitronics Corp. v. Conceptronic, Inc.*,
90 F.3d 1576, 1582 (Fed. Cir. 1996) (“First, we look to the words of the
claims themselves . . . to define the scope of the patented invention.”).

  Because “split” is a verb in the claimed “determin[e] . . . whether to
split” a μop, the determination is a ***claimed choice between two actions***: do
nothing to the μop; split the μop.[3] The Examiner reads this claimed choice
on ***Airaud’s choice between two <u>other</u> actions***: do nothing to a set of μops;
recombine the μops. Even assuming (arguendo) the above difference lacks a
patentable distinction, that is an unanswered question of obviousness—not
anticipation. *See Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1371
(Fed. Cir. 2008) (“[D]ifferences between the prior art reference and a
claimed invention, however slight, invoke the question of obviousness, not
anticipation.”). The rejection accordingly could not rest on, for example,
showing (arguendo) the claimed choice between actions (i.e., do nothing or
split) and Airaud’s cited choice between actions (i.e., do nothing or
recombine) achieve a same result.

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[3] The disputed claim limitation recites, more particularly, “circuitry
. . . configured to” perform the determination. Such claim language can
prompt an issue of whether a limitation conveys only an intended use of the
invention. *See, e.g.*, *Koninklijke Philips N.V. v. Zoll Med. Corp.*,
656 F. App’x 504, 519 (Fed. Cir. 2016) (reflecting that issues of intended
use can arise for circuitry “configured to” perform a function). No such
issue arises from the Examiner’s finding that Airaud’s invention actually
performs the at-issue determination. *See, e.g.*, Ans. 3 (“Airaud teaches
. . . the decision of whether to split.”); Final Act. 4 (“[Airaud’s] control
circuitry . . . decides . . . whether multiple micro-operations . . . will be
issued.” (emphasis omitted)).

The Examiner also finds that Airaud's above splitting of an instruction into μops discloses the claimed "determin[e] . . . whether to split." Ans. 4–5. In this regard, the Examiner states *in toto*:

> Furthermore, [Airaud's] first decision of whether a single micro-op instruction will be split into multiple micro-ops is made as the instruction is sent from the decoder to . . . the issue queue. As the . . . issue control circuitry . . . coordinates activities between the decoder and issue queue circuitry (see, e.g., Airaud[] fig. 1 and para. 0048)[,] this also [discloses] . . . the claimed [determination by]issue circuitry.

Id.

The Examiner's finding does not achieve a *prima facie* case that Airaud discloses the claimed "determin[e] . . . whether to split" a μop. *See In re Jung*, 637 F.3d 1356, 1362 (Fed. Cir. 2011) (notice requirement for a finding of anticipation). Though a *prima facie* case of anticipation can sometimes be achieved by mapping specific claim features to specific disclosures of a prior art reference (*see, e.g., id.* at 1363–34), the above finding provides no such specific mapping. The finding may prompt its reader to **surmise** that the Examiner's alternative finding reads the claimed "determin[e] . . . whether to split" on Airaud's decision to "stall the operation of the decoder" (Airaud ¶ 48) that splits an instruction into μops (*id.* ¶ 16). Our decision cannot turn on such speculation. *See In re Biedermann*, 733 F.3d 329, 336 (Fed. Cir. 2013) (An affirmance cannot raise a "question . . . [of] whether the Board and the examiner properly relied on the same . . . factual underpinnings.").

OVERALL CONCLUSION

We reverse the Examiner's decision to reject claims 1, 2, 4–13, and 17–21.

DECISION SUMMARY

Claims Rejected	35 U.S.C. §	Reference	Affirmed	Reversed
1, 2, 4–13, 17–21	102(a)(1)	Airaud		1, 2, 4–13, 17–21

REVERSED