

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MERCEDES-BENZ USA, LLC,

Petitioner,

v.

DAEDALUS PRIME LLC,

Patent Owner.

Case No.: IPR2023-01345

U.S. Patent No. 10,705,588

PATENT OWNER'S SUR-REPLY

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I. INTRODUCTION

MB USA's Reply provides no compelling reason for the Board to find in its favor concerning the challenges to claims 5, 6, 12, and 13 of the '588 patent. In particular, the Reply concedes that these challenged claims require power management circuitry or logic that include an *association* of operating frequencies of graphics processing circuitry and corresponding interconnect operating frequencies. Shakkarwar neither teaches nor suggests such features. Instead, Shakkarwar describes only a table that reports clock speeds and/or voltage levels required by specific devices. There is no association—no *mapping*—of frequencies-to-frequencies as demanded by the challenged claims. Accordingly, even if the teachings of Shakkarwar are considered in combination with those of White or Nussbaum, the result is not the invention recited in the challenged claims.

II. SHAKKARWAR FAILS TO DISCLOSE THE “MAPPING” RECITED IN CLAIMS 5 AND 12, HENCE THE CHALLENGES BASED ON WHITE OR NUSSBAUM IN VIEW OF SHAKKARWAR FAIL

MB USA relies on the teachings of Shakkarwar for the recited “mapping of selectable frequencies of the graphics processing circuitry to selectable frequencies of the interconnect” in claims 5 and 12. Reply at 2. The Reply characterizes this as an *association* between frequencies of the

graphics processing circuitry to those of the interconnect. Reply at 4. This reliance on Shakkarwar is fatal to MB USA's challenges to these claims.

MB USA's expert has admitted that claims 5 and 12 require a *mapping* of a set of possible *frequencies of the graphics processing circuitry* that can be selected to a set of possible *frequencies of the interconnect* that can be selected. *See* Ex. 2001 at 21:19 – 22:11. That is, the claims require a mapping of frequencies-to-frequencies. Yet Shakkarwar describes only a table that includes clock speeds and/or voltage levels required to process information for specific devices. Ex. 2002 at ¶ 43 (citing Shakkarwar at 7:7-10); Ex. 2001 at 24:9 – 25:2. There is no teaching or suggestion that this table has any *mapping of frequencies-to-frequencies*, let alone selectable frequencies, of the kind demanded by the challenged claims.

The Reply admits that in the '588 patent, the recited *mapping* is an *association* of operating frequencies of graphics processing circuitry and corresponding interconnect operating frequencies. Reply at 4 (citing '588 patent, Ex. 1001, at 2:44-46). An example of such a *mapping* is provided in Table 1 of the '588 patent:

TABLE 1

Table Entry	Non-Core Frequency	Minimum Interconnect Frequency
1	300	800
2	350	800
3	400	800
4	450	800
5	500	800
6	550	800
7	600	800
8	650	1500
9	700	1500
11	750	1500
12	800	1500
13	850	1500
14	900	1800
15	950	1900
16	1000	2000
17	1050	2100
18	1100	2200
19	1150	2300
20	1200	2400
21	1250	2500
22	1300	2600

Ex. 1001 at 5:14-35. The Reply admits this particular example illustrates a mapping between a “non-core domain frequency and corresponding minimum interconnect frequency.”¹ Reply at 4 (citing ’588 patent, Ex. 1001 at 4:57-61, 5:5-35).

Shakkarwar, however, provides no such *mapping* – that is, no such *association* of operating frequencies of graphics processing circuitry and

¹ “Non-Core Frequency” refers to the frequency of the graphics processing circuitry). Ex. 1001 at 4:1-4; Ex. 1013 at 35:22 - 36:17.

corresponding interconnect operating frequencies. Instead, Shakkarwar monitors bandwidth requirements and then consults a table that includes the clock speeds and/or voltage levels for processing information for a given device. Ex. 1013 at 51:13-21. The Reply alleges that, “Shakkarwar’s process of monitoring-and-determining bus frequency based on graphics bandwidth requirements before and after opening a 3-D graphics application is a ‘mapping’ of selectable interconnect and graphics processing circuitry frequencies.” Reply at 5. But neither the Petition nor the Reply can point to any power management circuitry and/or logic that includes an *association* of selectable frequencies of graphics processing circuitry to selectable frequencies of an interconnect as demanded by claims 5 and 12. Instead, as explained by Dr. Brogioli, “It looks like Shakkarwar is saying that the look-up table has just the clock speeds and voltage levels for processing information for the devices themselves or groups of devices.” Ex. 1013 at 52:17-20; *and see id.* at 54:1-11.

The Reply hinges its contentions concerning the recited “mapping” on its reading of Shakkarwar to describe determining bandwidth requirements for a data connection based on components of a system that are active at a given time. Reply at 5-6. In MB USA’s view, it seems merely consulting a lookup table, and specifically one that includes only a list of clock speeds or

voltages for a particular device, is a “mapping.” *Id.* But this is not so. In such a scenario, there is no circuitry or logic that includes or specifies the required *association* of frequencies of one system component to another. While the look-up table² of Shakkarwar may provide a list of clock speeds for graphics processing circuitry, there is no teaching or suggestion that those clock speeds are associated with (i.e., *mapped to*) any corresponding bus frequencies in that table. Ex. 2002 at ¶¶ 43-45. The Reply even goes so far as to cite a non-final decision of a different panel of this Board in IPR2023-00547 as somehow supporting its contentions concerning

² The Reply alleges that during deposition Dr. Brogioli “refused to define ‘look-up table’ or even admit that Table 1 of the ‘588 qualified as one.”

Reply at 7 fn. 3. Not true. Dr Brogioli indicated that the ’588 patent described a mapping a frequency for a graphics unit, for example, to a frequency of an interconnect. Ex. 1013 at 22:20 – 23:4; 23:10-22 (Dr. Brogioli describing “the look-up table that’s mentioned in the ’588 patent,” as one that is “a mapping of selectable frequencies of graphics processing circuitry to selectable frequencies of the interconnect.”). When asked if Table 1 in the ’588 patent is a look-up table, he replied, “Depending on context, it might be.” *Id.* at 26:24 – 27:1.

Shakkarwar, Reply at 7, but such an assumption that was both “preliminary” and “made solely for determining whether to institute review,” *Qualcomm Inc. v. Daedalus Prime LLC*, Case No. IPR2023-00547, Paper 13, slip op. at 2 (PTAB Sept. 19, 2023), is neither binding upon this panel nor does it rise to the level of a preponderance of evidence to support MB USA’s case. *See TriVascular, Inc. v. Samuels*, 812 F.3d 1056, 1068 (Fed. Cir. 2016) (“[T]he Board is not bound by any findings made in its Institution Decision.”).

In the end, all MB USA can point to in support of its challenge is Shakkarwar’s description of consulting a table of data connection clock speeds when a change in processing conditions within a system is detected. Reply at 5-6 (citing Shakkarwar at 6:63 – 7:7). While this consultation may yield a particular needed clock speed for a bus, it does not mean the table includes the frequency-to-frequency association demanded by the claims. In fact, Shakkarwar itself belies this notion by stating specifically that bandwidth requirements can be determined based on whether a device is inactive or active and/or which modules of a device are active or not. Ex. 1006 at 6:64 - 7:17. Dr. Brogioli confirmed as much by noting, “Shakkarwar determines a frequency to change the bus [*i.e.*, the interconnect] to by using “a look-up table [that] may include a list of clock speeds . . . required to

process information for specific devices and/or groups of devices.”³ Ex. 2002 at ¶ 41; Ex. 1013 at 51:1 – 52:2.

III. CONCLUSION

For at least the foregoing reasons, and those included in the Patent Owner’s Response, the Board should find that Petition has failed to prove the unpatentability of any of claims 5, 6, 12, and 13.

Dated: October 10, 2024

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³ Dr. Brogioli also noted that the processing conditions described by Shakkarwar are not *frequencies* of any components, they are the anticipated data needs of software.

WORD-COUNT CERTIFICATE

I certify that the foregoing document complies with the type-volume limitation of 37 C.F.R. § 42.24(a) and (b) and contains 1,228 words (including words in drawings created by the Patent Owner or as annotations added by the Patent Owner to images reproduced in this document) based on the word count indicated by Microsoft® Word for Mac v. 16.84, excluding those portions exempted by the rule.

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that a copy of the foregoing:

PATENT OWNER'S SUR-REPLY

and its accompanying exhibits were served on October 10, 2024, by filing this document through the P-TACTS System as well as by delivering a copy via email directed to the attorneys of record for the Petitioner at the following addresses:

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