

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MICRON TECHNOLOGY INC.,

Petitioner,

v.

SONRAI MEMORY LIMITED,

Patent Owner.

Case IPR2023-00904

Patent 6,920,527

PATENT OWNER'S RESPONSE TO THE PETITION

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<i>In re Fine</i> , 837 F.2d 1071 (Fed. Cir. 1988)	16, 30, 40, 45
<i>In re Fought</i> , 941 F.3d 1175 (Fed. Cir. 2019)	7
<i>In re Magnum Oil Tools Int’l, Ltd.</i> , 829F.3d 1364 (Fed. Cir. 2016)	17

PATENT OWNER’S EXHIBIT LIST

Exhibit No.	Description
2001	Plaintiff’s Notice of IPR Petition, <i>Sonrai Memory Limited v. Micron Technology, Inc.</i> , No. 6:22-cv-0085-ADA, Dkt. No. 40 (W.D. Tex. May 22, 2023)
2002	Order Granting Motion for Entry of Scheduling Order, <i>Sonrai Memory Limited v. Micron Technology, Inc.</i> , No. 6:22-cv-0085-ADA, Dkt. No. 40 (W.D. Tex. May 22, 2023)
2003	Docket Sheet, <i>Sonrai Memory Limited v. Micron Technology, Inc.</i> , No. 6:22-cv-0085-ADA (W.D. Tex. Sept. 10, 2023)
2004	Law360 Article: <i>West Texas Judge Says He Can Move Faster Than PTAB</i>
2005	Order Granting Joint Motion for Extension of Time To Extend Venue Discovery and Claim Construction Deadlines, <i>Sonrai Memory Limited v. Micron Technology, Inc.</i> , No. 6:22-cv-0085-ADA, Dkt. No. 51 (W.D. Tex. Aug. 3, 2023)
2006	Text Order Denying Motion to Stay Pending IPR, <i>Solas OLED Ltd. v. Google, Inc.</i> , Case No. 6:19-cv-00515-ADA (W.D. Tex. June 23, 2020)
2007	Order Denying Motion to Stay Pending IPR, <i>Multimedia Content Management LLC v. DISH Network L.L.C.</i> , Case No. 6:18-cv-00207-ADA, Dkt. No. 73 (W.D. Tex. May 30, 2019)
2008	U.S. District Courts—Federal Court Management Statistics—Profiles—During the 12-Month Periods Ending June 30, 2018 Through 2023 available at https://www.uscourts.gov/statistics/table/na/federal-court-management-statistics/2023/06/30-1
2009	Micron Technology, Inc.’s Preliminary Invalidity Contentions, <i>Sonrai Memory Limited v. Micron Technology, Inc.</i> , No. 6:22-cv-0085-ADA (W.D. Tex. June 7, 2023)

Exhibit No.	Description
2010	Preliminary Invalidity Contentions, <i>Sonrai Memory Ltd. v. Kingston Technology Company, Inc. and Kingston Technology Corporation</i> , Case No. 6:21-cv-01284-ADA (Feb. 24, 2022, W.D. Tex.)
2011	Joint Claim Construction Statement, <i>Sonrai Memory Limited v. Micron Technology, Inc.</i> , No. 6:22-cv-0085-ADA, Dkt. No. 70, (W.D. Tex. October 18, 2023)
2012	Declaration of Dr. Michael C. Brogioli in Support of Patent Owner's Response
2013	Curriculum Vitae of Michael C. Brogioli, Ph.D.

LISTING OF CHALLENGED CLAIMS

Claim 1	
1[p]	A portable memory apparatus, comprising:
1[a]	a housing;
1[b]	a memory controller comprised in the housing;
1[c]	a volatile memory coupled to said memory controller comprised in the housing;
1[d]	a non-volatile memory coupled to said memory controller comprised in the housing;
1[e]	a connector positioned on the housing, wherein said connector couples said portable memory apparatus to a computer system when said connector is plugged into said computer system; and
1[f]	wherein, when said connector couples said portable memory apparatus to said computer system, said memory controller chip copies data from said non-volatile memory to said volatile memory, and said computer system accesses said data in said volatile memory through said connector.
Claim 2	
2	The portable memory apparatus of claim 1, further comprising an internal power source coupled to said portable memory apparatus.
Claim 3	
3	The portable memory apparatus of claim 2, wherein said internal power source powers said portable memory apparatus when said portable memory apparatus is unplugged from said computer system, said portable memory apparatus copies data from said volatile memory to said non-volatile memory when said portable memory apparatus is unplugged from said computer system.

Claim 4	
4	The portable memory apparatus of claim 2, wherein said internal power source is rechargeable through said connector.
Claim 5	
5	The portable memory apparatus of claim 4, wherein said internal power source comprises a battery or a capacitor.
Claim 6	
6	The portable memory apparatus of claim 1, wherein said memory controller chip transfers said non-volatile memory with data written to said volatile memory from said computer system while said portable memory apparatus is coupled to said computer system.
Claim 7	
7	The portable memory apparatus of claim 6, further comprising an indicator coupled to said portable memory apparatus, wherein said indicator indicates when data stored in said volatile memory is being transferred to said non-volatile memory.
Claim 9	
9	The portable memory apparatus of claim 1, wherein said volatile memory is selected from a group consisting of FPM DRAM, EDO DRAM, SDRAM, RDRAM, and SRAM.
Claim 10	
10	The portable memory apparatus of claim 1, wherein said connection is selected from a group consisting of USB connector, firewire connector, and ATA serial connector.
Claim 11	
11	The portable memory apparatus of claim 1, further comprising an outer impact resistant shell.

Claim 12	
12	The portable memory apparatus of claim 1, wherein said portable memory apparatus does not have any moving parts.
Claim 13	
13	The portable memory apparatus of claim 1, wherein said memory controller chip copies data from said non-volatile memory to said volatile memory after an internal power source has been recharged through said connection, that said internal power source has sufficient power to transfer data from said volatile memory to said non-volatile memory if said portable memory apparatus is unplugged from said computer system before said volatile memory is transferred to said non-volatile memory, wherein, until said internal power source recharges to said sufficient power, said computer system accesses said data on said non-volatile memory through said connector.
Claim 14	
14	The portable memory apparatus of claim 1, wherein said housing comprises a material selected from ABS plastic and polycarbonate.
Claim 15	
15[p]	A method, comprising:
15[a]	coupling a portable memory apparatus to a computer system,
15[b]	wherein said portable memory apparatus comprises a memory controller chip, a non-volatile memory, and a volatile memory;
15[c]	copying data from said non-volatile memory to said volatile memory using said memory controller chip;
15[d]	accessing said data in said volatile memory using said computer system through a connector coupled to said portable memory apparatus and said memory controller chip; and
15[e]	updating said non-volatile memory with data from said volatile memory.

Claim 16	
16	The method of claim 15, further comprising: powering said portable memory apparatus with an internal power source coupled to said portable memory apparatus, when said portable memory apparatus is unplugged from said computer system, to transfer said non-volatile memory with data from said volatile memory.
Claim 17	
17	The method of claim 15, further comprising: recharging an internal power source coupled to said portable memory apparatus.
Claim 18	
18	The method of claim 15, further comprising: indicating when data stored in said volatile memory has been transferred to said non-volatile memory.
Claim 20	
20	The method of claim 15, further comprising: copying said data from said non-volatile memory to said volatile memory after an internal power source has been recharged through said connection, such that said internal power source has sufficient power to transfer data from said volatile memory to said non-volatile memory if said portable memory apparatus is unplugged from said computer system before said volatile memory is transferred to said non-volatile memory, wherein, until said internal power source recharges to said sufficient power, said computer system accesses said data on said non-volatile memory through said connector.

I. INTRODUCTION

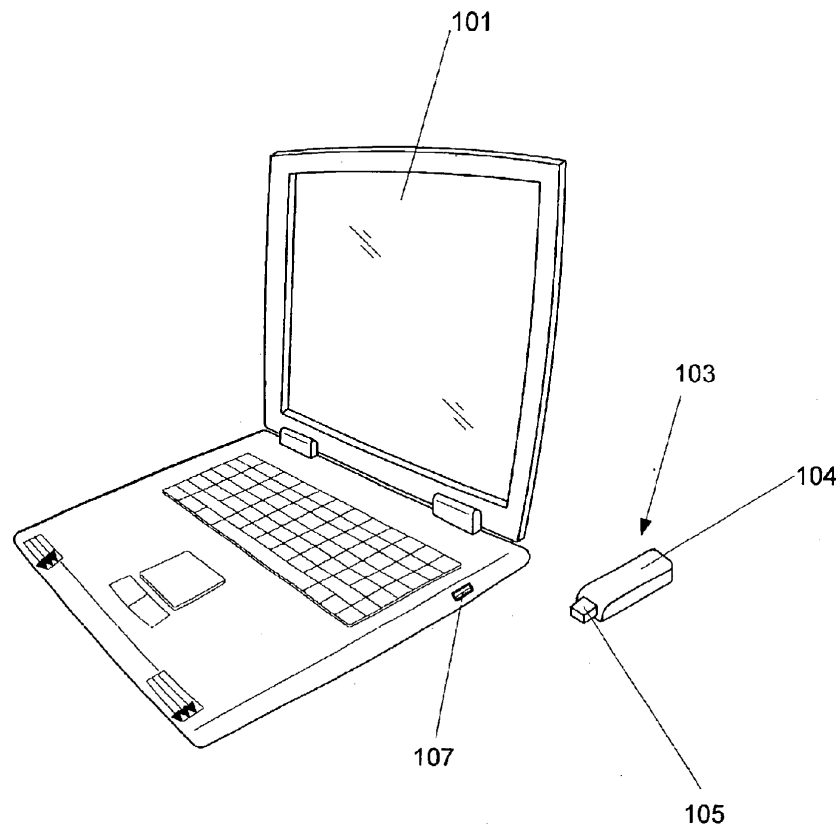
Patent Owner Sonrai Memory Ltd. (“Patent Owner”) submits this response to Petitioner Micron Technology Inc.’s (“Petitioner”) Petition, (Paper 2, “Pet.”), requesting an *inter partes* review of U.S. Patent No. 6,920,527 (Ex. 1001, “the ’527 Patent”). As discussed below, Petitioner, who relies solely on alleged obviousness, has not established that any of the challenged claims of the ’527 Patent (claims 1-7, 9-18 and 20) would have been obvious to a Person of Ordinary Skill in the Art (“POSITA”) and this Board should rule that the challenged claims are not unpatentable.

II. THE ’527 PATENT

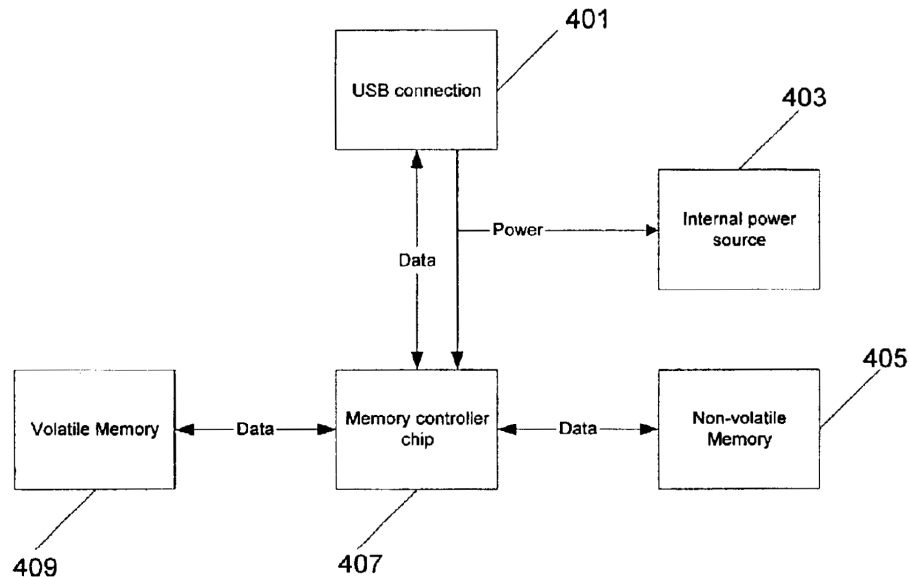
The ’527 Patent discloses and claims a novel portable memory device that connects to a computer system and comprises a memory controller, a volatile memory and a non-volatile memory with the memory controller copying data from the non-volatile memory to the volatile memory for the computer system to access through a connector. Ex. 1002, Prosecution History of the ’527 Patent, at 47 (Examiner’s Statement of Reasons for Allowance). The claims of the ’527 Patent are directed to an improved portable memory device (e.g., portable RAM drive) in which “[d]ata may be stored on a non-volatile memory when the portable RAM drive is not coupled to a computer system and stored on a volatile memory when

the portable RAM drive is coupled to the computer system. The computer system may access data on the volatile memory at a higher speed than the data on the non-volatile memory. When the portable RAM drive is plugged into the computer system, the data from the non-volatile memory may be transferred to the volatile memory for faster access by the computer system.” Ex. 1001, 1:45-54.

“The portable RAM drive 103 may include a housing 104 and a connector 105. In one embodiment, the portable RAM drive 103 may store data on a non-volatile memory and copy the data to a volatile memory when the portable RAM drive is coupled to a computer system, such as, but not limited to, a laptop 101.” *Id.*, 2:36-41.



Id., Fig. 1. A block diagram of a portable RAM drive according to one embodiment of an invention of the '527 Patent is shown below.



Id., Figure 4. A Portable RAM Drive Block Diagram. *Id.*, 2:56. As shown above, “[t]he USB connection 401 may also be a conduit for power from the computer system to the portable RAM drive to power the portable RAM drive while the portable RAM drive is connected to the computer system. The USB connection 401 may also provide power to recharge an internal power source 403 such as, but not limited to, a rechargeable battery or a capacitor.” *Id.*, 3:7-13. The internal power source disclosed in the '527 Patent provides “sufficient power to transfer the data from the volatile memory in the portable RAM drive back to the non-volatile memory in the portable RAM drive if the portable RAM drive is unplugged from the computer system with data still in the volatile memory.” *Id.*, 3:58-62. *See also*

Id., 4:43-48 (“At [step] 509, the portable RAM drive may be powered by an internal power source to transfer data from the volatile memory to the non-volatile memory if the portable RAM drive is unplugged from the computer system before the data from the volatile memory is transferred back to the non-volatile memory.”). “If the internal power source has sufficient power to transfer the data from the volatile memory back to the non-volatile memory, the computer system or the memory controller chip may transfer the data from the non-volatile memory to the volatile memory for faster access by the computer system.” *Id.*, 3:67-4:5.

III. THE ALLEGED PRIOR ART

Reference	Date	Prior Art Basis
Tsunoda	2/6/2003 (published)	§102(a)
Sukegawa	1/31/2003 (filed)	§102(e)
Tomio	1/12/2001 (published)	§102(b)
Shigeo	4/21/2000 (published)	§102(b)

The Petition presents alternate obviousness arguments based on two separate primary references. The first primary reference is Ex. 1004, U.S. Patent Application Publication No. 2003/0028733 to Tsunoda et al. (“Tsunoda”). The alternate primary reference is Ex. 1006, Japanese Published Patent Application No. 2001-005723 to Tomio Suzuki (“Tomio”).¹ Petitioner also presents

¹ Petitioner also uses Tomio as a secondary reference in four of the asserted grounds. Paper 2, Pet. at 1.

obviousness arguments using two secondary references, Ex. 1005, U.S. Patent No. 7,069,370 to Sukegawa et al. (“Sukegawa”) and Ex. 1007, Japanese Published Patent Application No. 2000-112836 to Shigeo Suzuki (“Shigeo”).

IV. CLAIM CONSTRUCTION AND THE LEVEL OF SKILL OF A PERSON OF ORDINARY SKILL IN THE ART

Patent owner contends that the terms of the claims should be construed in accordance with their plain meaning to a person of ordinary skill in the art in 2003. Patent Owner further contends that it is neither necessary nor appropriate to rewrite challenged claim 6 as Petitioner appears to suggest. Paper 2, Pet. at 23-24. Nevertheless, Patent Owner agrees with what appears to be Petitioner’s understanding that claim 6 refers to transfer of data from the volatile memory to the non-volatile memory. *See Id.*, 23.

As noted in the specification of the ’527 Patent, “[a]s used herein, ‘transfer’ may refer to copying data to another memory medium without erasing data in an originating memory medium or making changes to data stored in another memory medium to reflect changes in the data on the originating memory medium. Other transfers are also contemplated.” Ex. 1001, 3:62-67. Construing claim 6 as transfer of data from the volatile memory to the non-volatile memory is also consistent with claims 7 and 8, both of which depend from claim 6. Claim 7 recites an indicator that “indicates when data stored in said volatile memory is being

transferred to said non-volatile memory” and claim 8 recites “wherein ... until data stored in said volatile memory has been transferred to said non-volatile memory.” *Id.*, 6:61-63; 6:66-7:2. Both dependent claims refer to the transfer of data from volatile memory to non-volatile memory and correspond to the detailed description of the invention. *See, Id.*, 4:16-21 (“The portable RAM drive may depend on an indicator light or restraining device to alert a user if the portable RAM drive needs more time to transfer data back to the non-volatile memory from the volatile memory when the user is ready to unplug the portable RAM drive from the computer system.”).

Patent Owner further notes that, in the corresponding District Court litigation, Patent Owner and Petitioner agreed that the preamble to claim 15, “a portable memory apparatus,” is limiting. Ex. 2011, Joint Claim Construction Statement, *Sonrai Memory Limited v. Micron Technology, Inc.*, No. 6:22-cv-0085-ADA, Dkt. No. 70, (W.D. Tex. October 18, 2023), at 1. Patent Owner contends that the preamble to claims 1 and 15, “a portable memory apparatus,” is limiting and the claims should be construed accordingly. As stated in the ’527 Patent, “[t]he present invention relates ... specifically to portable computer storage mediums.” Ex. 1001, 1:8-9. The entirety of the detailed description in the specification is directed to a portable memory apparatus, specifically a portable RAM drive. *See, e.g., Id.*, 2:33-61, 3:18-52, 3:66-4:21, 4:28-5:60.

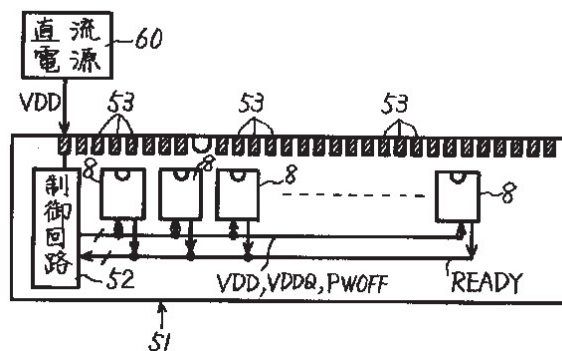
Limitations of the independent claims directly recite the “portable memory apparatus” of the preamble. *See, e.g.*, 1[e], “a connector positioned on the housing, wherein said connector couples **said portable memory apparatus** to a computer system when said connector is plugged into said computer system;” 1[f], “wherein, when said connector couples **said portable memory apparatus** to said computer system, ...”, and 15[a] “coupling **a portable memory apparatus** to a computer system, ...”. Ex. 1001, 6:29-34, 7:30-31 (emphasis added). “When limitations in the body of the claim rely upon and derive antecedent basis from the preamble, then the preamble may act as a necessary component of the claimed invention.” *Eaton Corp. v. Rockwell Int’l Corp.*, 323 F.3d 1332, 1339 (Fed. Cir. 2003). The Federal Circuit has “repeatedly held a preamble limiting when it serves as antecedent basis for a term appearing in the body of a claim.” *In re Fought*, 941 F.3d 1175, 1178 (Fed. Cir. 2019); *see also, e.g., Bio-Rad Labs., Inc. v. 10X Genomics Inc.*, 967 F.3d 1353, 1371 (Fed. Cir. 2020) (body’s reliance on preamble for antecedent basis “is a strong indication that the preamble acts as a necessary component of the claimed invention” (internal quotation marks omitted)).

Furthermore, in the District Court, Petitioner contends that the term “volatile memory coupled to said memory controller comprised in the housing” in claim 1 should be construed as “volatile memory coupled to (and separate from) said memory controller comprised in the housing.” *Id.*, at 2-3. Petitioner further

contends that the term “data” appearing in challenged claims 1, 3, 6, 15 and 16, should be construed as “user data” and that the term “housing” in claim 1 should be construed as “a protective enclosure.” *Id.*, at 3.

Notably, “Petitioner submits that no claim terms require a formal construction for purposes of addressing the Grounds in this Petition.” Paper 2, Pet. at 3. However, the claim construction positions espoused by the Petitioner in the District Court are inconsistent with Petitioner’s challenges to these claims in the Petition. For example, ground 3A is not directed to, and neither discloses nor suggests, a portable memory device. Ground 3A relies on Tomio, which is a semiconductor memory apparatus. Paper 7, Decision at 11. The disclosure in Tomio that Petitioner relies on is a memory module. Paper 2, Pet. at 42-43.

【図 11】



Ex. 1006, Fig. 11. A POSITA would not consider the memory module disclosed in Tomio to be a portable memory device in the context of the specification and claims the '527 Patent. Ex. 2012, Declaration of Dr. Michael C. Brogioli in Support

of Patent Owner’s Response, ¶ 33. The memory module in Tomio is not designed to be plugged and unplugged. *Id.* In contrast, the inventions claimed in the ’527 Patent are intended to be plugged and unplugged. *See, e.g.*, Ex. 1001, 1:51-57 (describing plugging and unplugging the portable RAM drive). *See also, Id.*, 3:48-52 (“The portable RAM drive may be coupled to the computer system through a connector on the portable RAM drive and a connector, such as, but not limited to, a USB connector, a firewire connector, and an ATA serial connector.”); 4:16-21, 39-48 (describing plugging and unplugging the portable RAM drive).

A POSITA would have had at least a Bachelor of Science in electrical engineering, computer engineering, computer science, or a related discipline, with at least two years of relevant experience in a field related to data storage and electronic memory devices. A person with more education, such as a doctorate in electrical engineering, computer engineering, computer science, or a related discipline, would also qualify as a hypothetical POSITA in lieu of fewer years of work experience.

V. ASSERTED GROUNDS OF ALLEGED UNPATENTABILITY

Petitioner asserts that the challenged claims would have been unpatentable as obvious on ten (10) grounds.

Ground	Claims	Basis	References
1A	1, 6, 9, 11-12, 14-15	§103	Tsunoda

Ground	Claims	Basis	References
1B	2-5, 16-17	§103	Tsunoda and Tomio
1C	13, 20	§103	Tsunoda, Tomio, and Shigeo
2A	1, 6-7, 9-12, 14-15, 18	§103	Tsunoda and Sukegawa
2B	2-5, 16-17	§103	Tsunoda, Sukegawa, Tomio
2C	13, 20	§103	Tsunoda, Sukegawa, Tomio, and Shigeo
3A	1-6, 9, 12, 15-17	§103	Tomio
3B	13, 20	§103	Tomio and Shigeo
4A	1-7, 9-12, 14-18	§103	Tomio and Sukegawa
4B	13, 20	§103	Tomio, Sukegawa, and Shigeo

Paper 2, Pet. at 2.

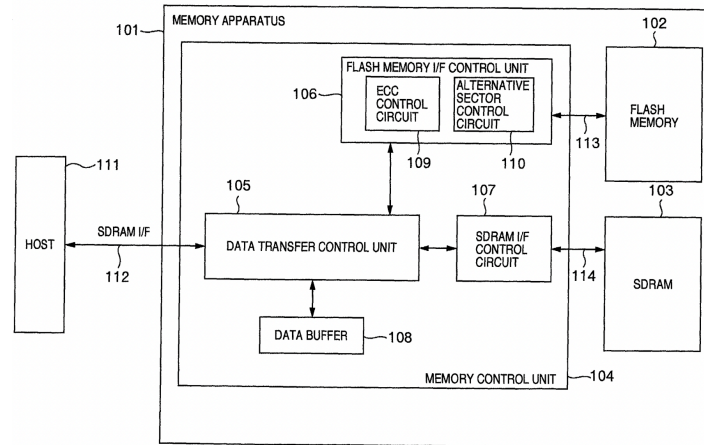
As discussed below, Petitioner has failed to establish that the challenged claims are unpatentable as obvious on any of the asserted grounds.

A. Ground 1A – Tsunoda (Claims 1, 6, 9, 11-12, and 14-15)

The Tsunoda reference does not render independent claims 1 and 15 obvious because none of the particular embodiments disclosed in Tsunoda disclose a portable memory apparatus that meets all of the limitations of claims 1 and 15. Nor does Petitioner so suggest. Rather, Petitioner relies on an amalgamation of incompatible embodiments of Tsunoda.² *See, e.g.*, Paper 2, Pet. at 20-22.

² Petitioner does not make separate arguments with respect to claim 15 for any of the asserted grounds. Petitioner instead refers back to the arguments for claims 1 and 6. *See* Paper 2, Pet. at 27-28, 41-42, 67, and 81-82.

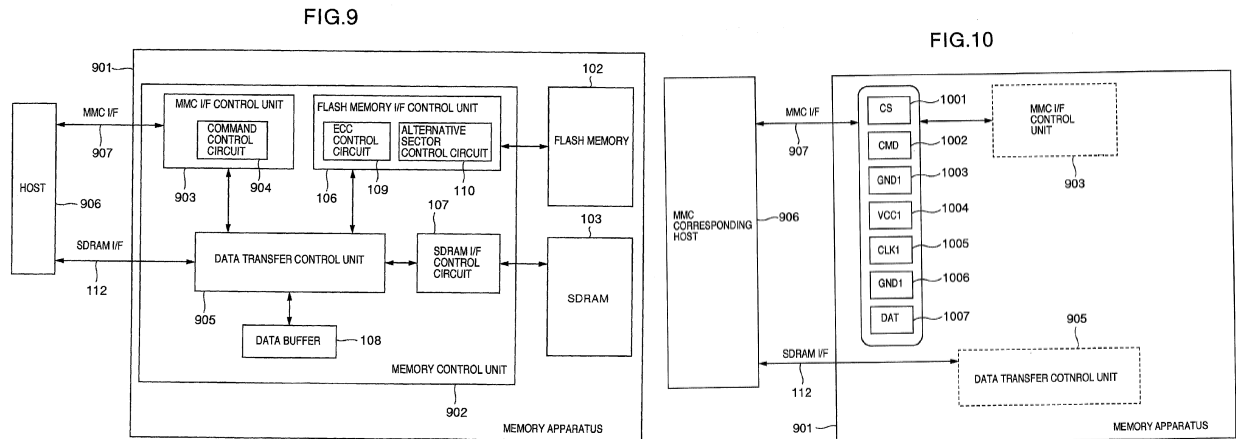
Tsunoda's first embodiment is an internal memory apparatus communicating with a CPU or ASIC in an information terminal through a synchronous DRAM interface. Ex. 1004, [0012], [0038]-[0039]; Ex. 2012, ¶34.



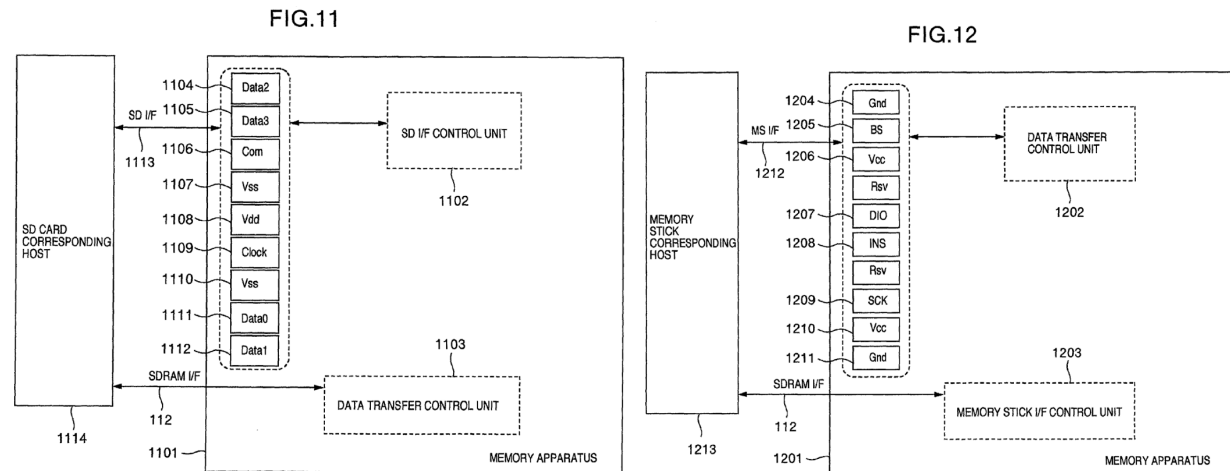
Ex. 1004, Fig. 1. Tsunoda's first embodiment is not a portable memory apparatus that could be randomly disconnected or uncoupled from a host. A POSITA would understand that features of this embodiment, such as Tsunoda's processing from a start of power supply to a stop of power supply, would have to be reimplemented for a portable memory apparatus. Ex. 2012, ¶34. *See, e.g.*, Ex. 1004, [0080], [0093], Fig. 25.

Tsunoda's second embodiment adds a MultiMediaCard (MMC) interface to the Synchronous DRAM interface. Ex. 1004, [0113], Fig. 9. Notably, Tsunoda's second embodiment is not a portable MultiMediaCard but is instead a modification of Tsunoda's first embodiment that adds a MMC interface and a MMC interface control unit. *Compare* Ex.1004, Fig. 1 *and* Fig. 9. *See also Id.*, Fig. 10. A POSITA

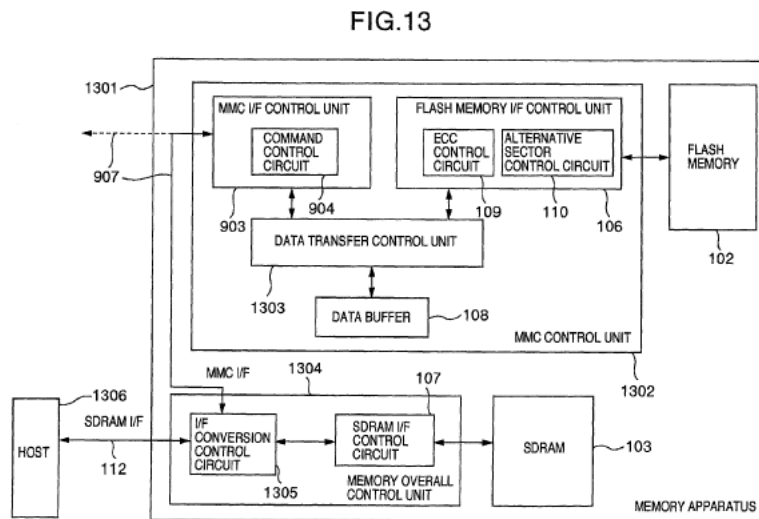
would have understood that Tsunoda's second embodiment with an SDRAM interface was not a portable memory apparatus. Ex. 2012, ¶¶35-37.



Ex. 1004, Fig. 9, 10. The alternatives to the second embodiment disclosed by Tsunoda of adding either an SD card interface (Ex. 1004, Fig. 11) or a memory stick interface (*Id.*, Fig. 12), instead of an MMC interface, along with an SDRAM interface, would still have an SDRAM interface.

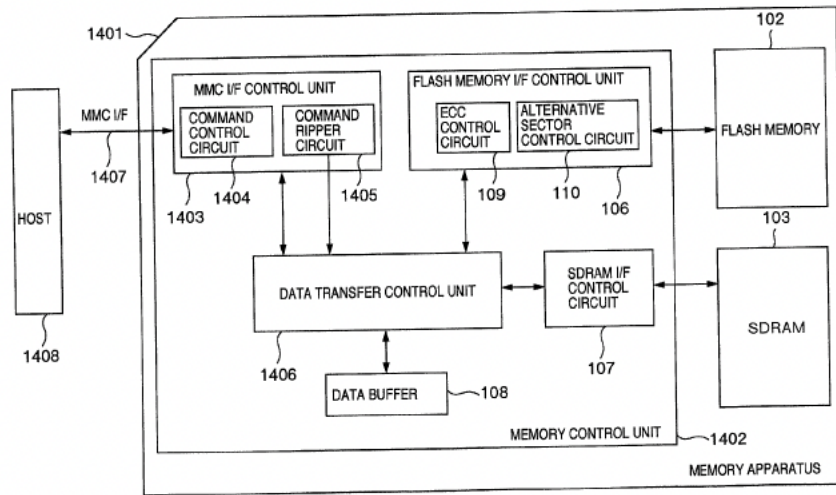


Ex. 1004, Fig. 11, 12. A POSITA would have understood that any of the disclosed alternatives to Tsunoda's second embodiment that retained an SDRAM interface was not a portable memory apparatus. Ex. 2012, ¶¶35-37.



Ex. 1004, Fig. 13. Tsunoda's Fig. 13 embodiment actually teaches away from a portable memory device because it teaches using an SDRAM interface to connect to the host and a POSITA would understand that an SDRAM interface is not a portable memory apparatus interface. Ex. 2012, ¶38.

FIG.14

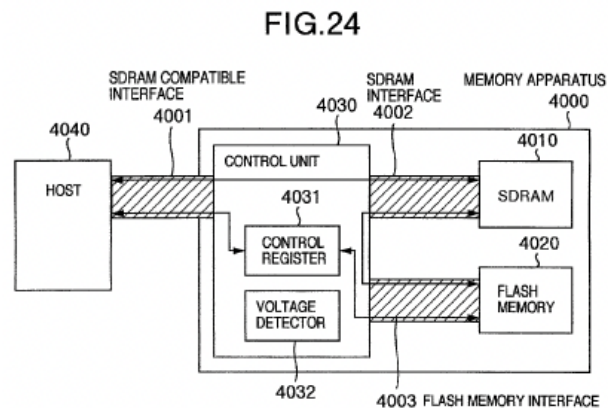


Ex. 1004, Fig. 14. Although Tsunoda's third embodiment does disclose a MultiMediaCard without an SDRAM interface (Ex. 1004, Fig. 14), Tsunoda's third embodiment does not disclose or suggest copying data from the flash memory to the SDRAM when the MultiMediaCard is coupled to the host system. Ex. 2012, ¶39.

Claim limitation 1[f] recites "when said connector couples said portable memory apparatus to said computer system, said memory controller chip copies data from said non-volatile memory to said volatile memory." This corresponds to the disclosure in the '527 Patent that "[w]hen the portable RAM drive is plugged into the computer system, the data from the non-volatile memory may be transferred to the volatile memory for faster access by the computer system." Ex. 1001, 1:51-54.

A POSITA would not have understood that this limitation was disclosed or taught by Tsunoda because Tsunoda teaches copying data from the non-volatile memory to the volatile memory as part of a power up sequence that only applies

when there is an SDRAM compatible interface. *See, e.g.*, Ex. 1004, [0080], [0093], Fig. 25. Tsunoda teaches that the triggering event for when data is copied from the non-volatile memory to the volatile memory is powering up which is detected using voltage detector 4032 in a control unit 4030. Ex. 1004, [0067]-[0068].



Ex. 1004, Fig. 24. A POSITA would understand from Tsunoda's third embodiment disclosure that Tsunoda's third embodiment does not include a Control Unit with a Control Register and a Voltage Detector intended for use with a SDRAM compatible interface. Ex. 2012, ¶¶41-42. *See* Ex. 1004, [0054]-[0068], Fig. 14, Fig. 24 (Control Unit 4030 including Control Register 4031 and Voltage Detector 4032). Therefore, Tsunoda's third embodiment does not support a power up sequence.

Tsunoda teaches that “[p]referably the SDRAM compatible interface 4001 for interconnecting the host 4040 and the control unit 4030 has compatibility not only between the SDRAM terminal group of, for example JEIDA standard and electric characteristics, but also between the SDRAM terminal group and a package size of

the memory apparatus 4000, a terminal group size of for example a pin or a solder ball disposed on the package of the memory apparatus 4000, terminal group disposition or the like.” Ex. 1004, [0058]. A POSITA would have understood that an MMC interface alone would not be capable of providing the required SDRAM compatible interface as taught by Tsunoda. Ex. 2012, ¶____. Accordingly, a POSITA would not have found it obvious to apply “any” of Tsunoda’s features to Tsunoda’s third embodiment. *Id.*, ¶42.

Accordingly, Tsunoda does not disclose, teach or suggest the limitations of claim 1 of “a portable memory apparatus” ... “wherein, when said connector couples said portable memory apparatus to said computer system, said memory controller chip copies data from said non-volatile memory to said volatile memory.” *Id.*, ¶43.

Because Tsunoda does not disclose, teach or suggest the limitations of independent claim 1, it does not disclose, teach or suggest the limitations of claims 6, 9, 11, 12 and 14 that depend from claim 1. *In re Fine*, 837 F.2d 1071, 1076 (Fed. Cir. 1988) (“Dependent claims are nonobvious under section 103 if the independent claims from which they depend are nonobvious.”).

And, as Petitioner does not provide separate arguments for claim 15, Petitioner has not met its burden of establishing that claim 15 is unpatentable as obvious over Tsunoda. “In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is

unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)). This burden of persuasion never shifts to Patent Owner. See *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (discussing the burden of proof in *inter partes* review). Furthermore, the petitioner cannot satisfy its burden of proving obviousness by employing “mere conclusory statements.” *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016). “The petitioner must instead articulate specific reasoning, based on evidence of record, to support the legal conclusion of obviousness.” *Id.* To prevail in an *inter partes* review, Petitioner must show by a preponderance of the evidence that a patent claim is invalid. 35 U.S.C. § 316(e).

As discussed above, Petitioner has not met its burden to show that challenged claims 1, 6, 9, 11-12, and 14-15 are unpatentable and Ground 1A fails.

B. Ground 1B – Tsunoda in view of Tomio (Claims 2-5 and 16-17)

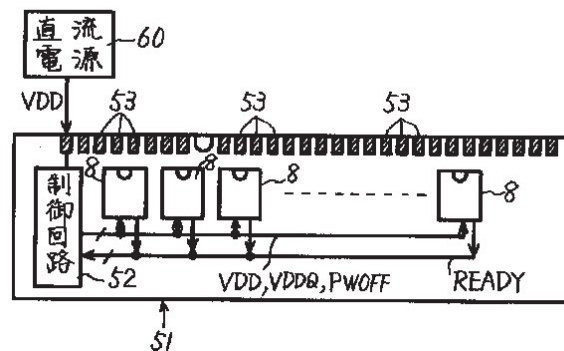
Dependent claims 2-5 and 16-17 add internal power source limitations to the independent claims.³ Ex. 1001, 6:39-53, 8:3-14. Tsunoda does not disclose or suggest an internal power source and Petitioner does not suggest otherwise. But

³ Petitioner does not make separate arguments with respect to claims 16 or 17 for any of the asserted grounds. Petitioner instead refers back to the arguments for claims 2 and 3 or claim 4. See Paper 2, Pet. at 52, 67-68, and 82.

Petitioner does argue that a POSITA would have been motivated to modify Tsunoda in view of Tomio's teachings by adding an internal power source. Paper 2, Pet. at 46-52. Petitioner is incorrect because a POSITA would not have been motivated to modify Tsunoda's disclosure of a portable memory apparatus by adding an internal power source. Ex. 2012, ¶¶44-51.

Ground 1B relies on the combination of Tsunoda and Tomio, which is also a semiconductor memory apparatus. Paper 7, Decision at 11. The disclosure in Tomio that Petitioner relies on is a memory module. Paper 2, Pet. at 42-43.

【図 11】

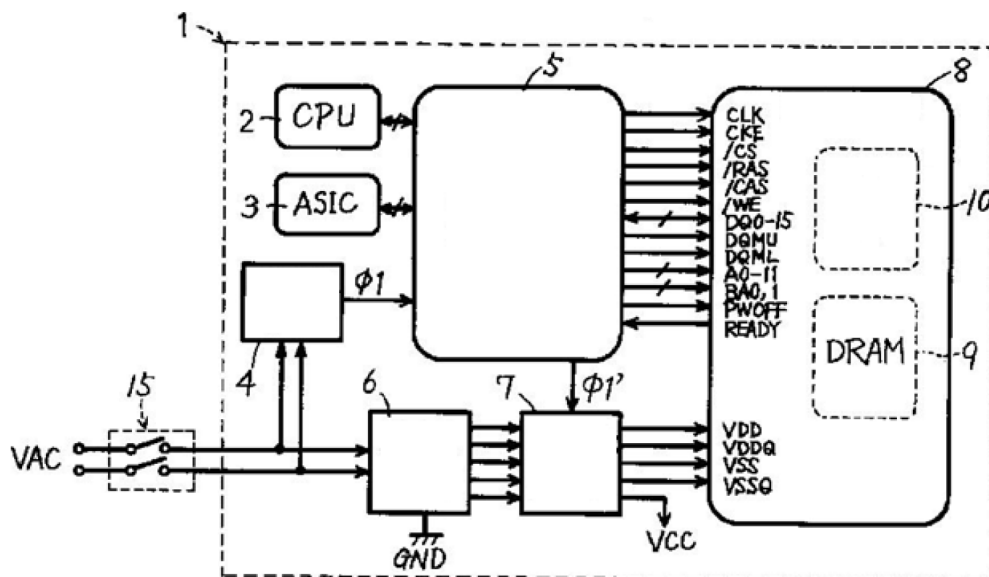


Ex. 1006, Fig. 11. A POSITA would not consider a memory module, such as that disclosed in Tomio, to be a portable memory device in the context of the specification and claims the '527 Patent. Ex. 2012, ¶ 52. The memory module in Tomio is not designed to be plugged and unplugged. *Id.* In contrast, the inventions claimed in the '527 Patent are intended to be plugged and unplugged. *See, e.g.,* Ex. 1001, 1:51-57 (describing plugging and unplugging the portable RAM drive). *See*

also, Id., 3:48-52 (“The portable RAM drive may be coupled to the computer system through a connector on the portable RAM drive and a connector, such as, but not limited to, a USB connector, a firewire connector, and an ATA serial connector.”); 4:16-21, 39-48 (describing plugging and unplugging the portable RAM drive).

Accordingly, a POSITA would not understand that Tomio’s teachings are directed to a portable memory apparatus. Tomio is instead directed to an internal memory that could shorten the startup time for a personal computer. Ex. 1006, [0004] (“ Because the transfer of data from the ROM to the DRAM is slow, a considerable amount of time is required after turning on power to the personal computer before the user can actually start working on the personal computer, and this time cannot be shortened.”).

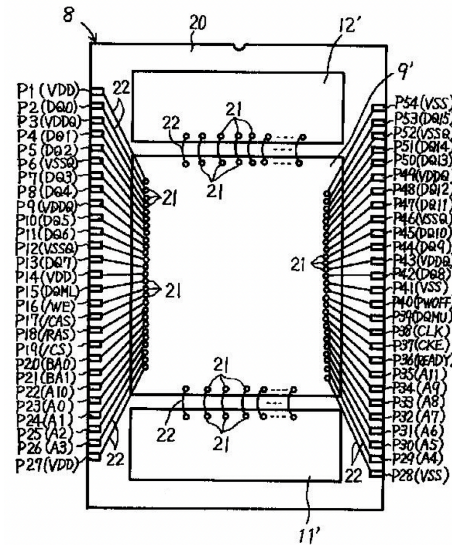
[Fig. 1]



Ex. 1006, Fig. 1. Tomio essentially discloses a boot loader that is on the motherboard of personal computer. *Id.*, [0012] (“Fig. 1 is a block diagram showing essential components on the motherboard 1 of a personal computer in an embodiment of the invention.”). *See also, Id.*, [0033] (“The cost of the motherboard 1 can also be reduced because a ROM separately mounted on the motherboard 1 becomes unnecessary and a data transfer circuit from the ROM to the main memory becomes unnecessary. Because there is no need to transfer data from the ROM to the main memory, the time from turning on the power to the personal computer becoming ready for use is shortened.”). Accordingly, Tomio is directed to a non-portable memory that is on the motherboard when a computer is turned on.

As noted above, Petitioner points to Tomio’s disclosure of a memory module 51. Paper 2, Pet. at 42. Tomio teaches using a 168-pin dual inline module. Ex. 1006, [0037]-[0038]. *See also Id.*, Fig. 7 (showing 54 connections to a single semiconductor memory).

[Fig. 7]



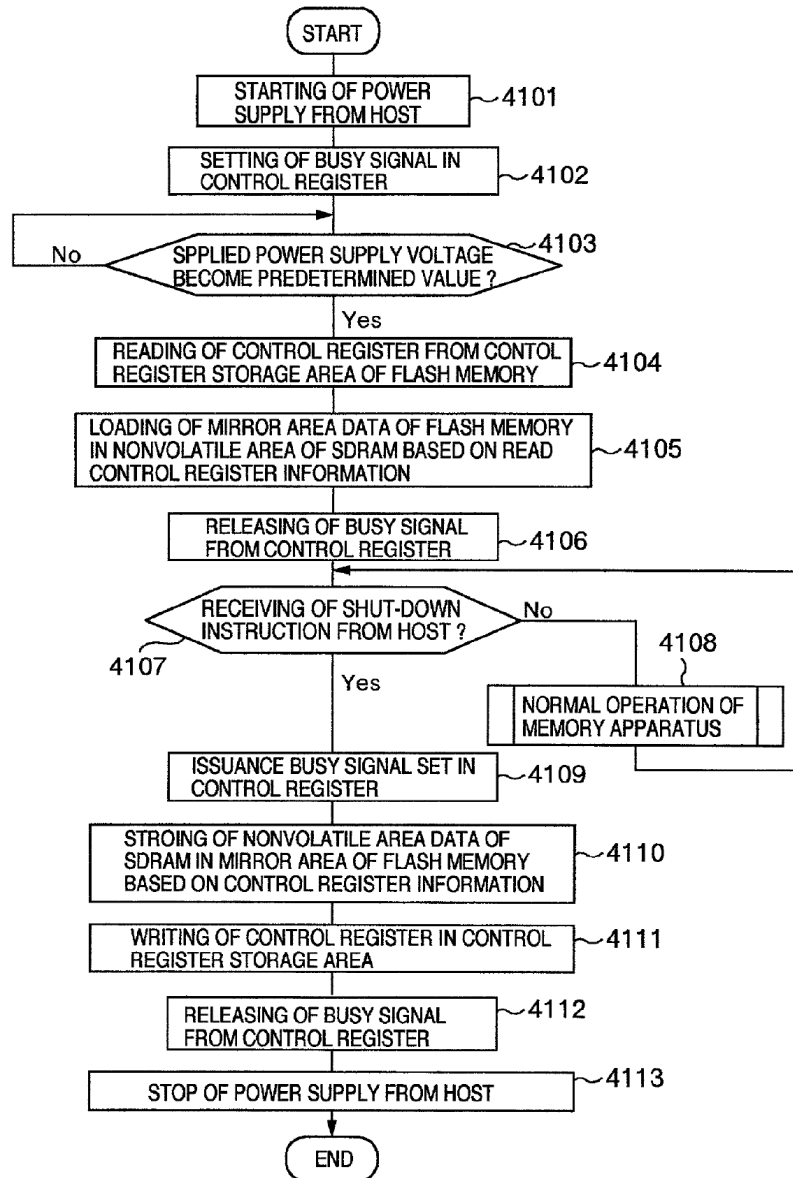
Ex. 1006, Fig. 7. A POSITA would not look to Tomio for a portable memory apparatus because of the problems that would be encountered plugging and unplugging a portable memory apparatus with this many connections. Ex. 2012, ¶53. As discussed in Ex. 1007, Shigeo, even low power can corrupt a memory connection. *See* Ex. 1007, [0061]. *See also* Paper 2, Pet., at 84 (“Shigeo explains that information stored in RAM ‘becomes corrupted’ when the battery does not have enough power to power the RAM, ...”). A POSITA would have known that unplugging Tomio’s memory apparatus would likely corrupt the volatile memory and would therefore not be motivated to copy data from the volatile memory to the non-volatile memory when Tomio’s memory apparatus (or one of Tsunoda’s SDRAM interface embodiments) was unplugged from the computer. Ex. 2012, ¶54.

Neither Tsunoda or Tomio disclose unplugging a portable memory apparatus. A POSITA would have known that unplugging memory without previous notification to the host device would create significant problems and could be catastrophic. *Id.*, ¶¶66-67. There would be a loss of data integrity and possible damage to the host or the portable memory apparatus. *Id.* A POSITA would have recognized that the data corruption could result in an unacceptable data loss to the user. *Id.* Accordingly, claims 3 and 16 would have been non-obvious to a POSITA. *Id.*

As Dr. Brogioli explains, “[t]he problems inherent in unplugging a memory apparatus with numerous connectors such as Tomio’s memory apparatus (or one of Tsunoda’s SDRAM interface embodiments) including, e.g., floating electrical signal values, necessary modification of logic and command structure, etc., would have meant that combining Tomio’s and Tsunoda’s teachings would have required more than combining known prior art elements according to known methods and would not have yielded predictable results.” Ex. 2012, ¶68.

Petitioner admits that “Tsunoda does not account for the situation where power is abruptly turned off (by unplugging or power outage) ...”. Paper 2, Pet. at 45. Tsunoda instead teaches a process that prevents the host from shutting off power until Tsunoda’s memory apparatus completes processing. Ex. 1004, Fig. 25.

FIG.25



Ex. 1004, Fig. 25. Tsunoda teaches issuing a busy signal that prevents the host from stopping supply of power to the memory apparatus until the busy signal is released by the memory apparatus. *Id.* [0085]-[0087]. Because Tsunoda already discloses a method to ensure data transfer is completed before power is shut off, adding an

internal power source to ensure that the memory apparatus can transfer the data from the volatile memory to the non-volatile memory would unnecessarily add components and complexity to the memory apparatus. Ex. 2012, ¶45. Accordingly, a POSITA would not be motivated to add an internal power source to Tsunoda's memory apparatus. *Id.*

Tsunoda's third embodiment teaching of a portable memory apparatus as a MultiMediaCard (Ex. 1004, Fig. 14) is incompatible with Tomio's rechargeable battery because of the physical size limitations of a MultiMediaCard form factor. Ex. 2012, ¶48.

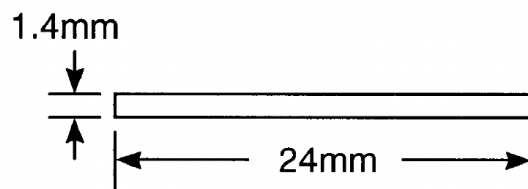


FIG. 6B
(PRIOR ART)

Ex. 1006, Fig. 6B. A MultiMediaCard has specific size limitations set by the standard, including a height of 1.4mm. Ex. 1008, 2:16-20, 4:35-36, Fig. 6B (showing the form factor of a MultiMediaCard). Ex. 2012, ¶48. A POSITA would have known that an internal power source would not have fit onto Tsunoda's MMC

embodiment. *Id.*, ¶48. A POSITA would also have recognized that “the MMC interface includes a very limited pin count and a low power electrical interface that would not—without significant, costly, and impractical re-engineering and modifications—have the ability to recharge a battery, such as the rechargeable battery in Tomio.” Ex. 2012, ¶49.

The combination of Tsunoda in view of Tomio does not render dependent claims 2-5 and 16-17 obvious because a POSITA would not be motivated to combine the teachings of Tsunoda and Tomio to add an internal power supply to the portable memory apparatus of Tsunoda for the aforementioned reasons. *See* Ex. 2012, ¶¶48-51.

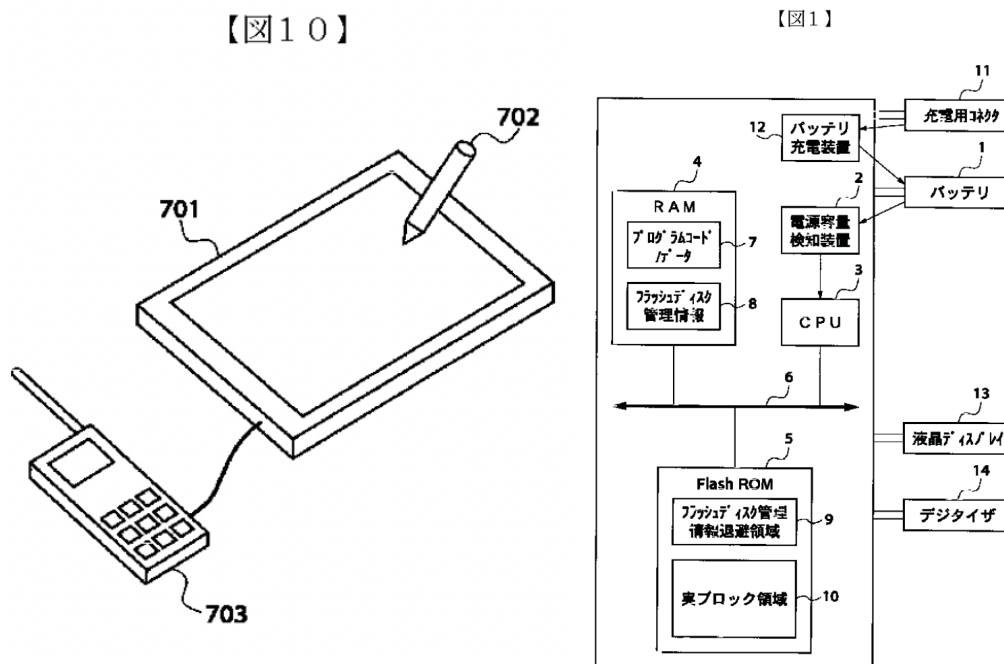
As discussed above, Petitioner has not met its burden to show that challenged claims 2-5 and 16-17 are unpatentable and Ground 1B fails.

C. Ground 1C – Tsunoda in view of Tomio and Shigeo (Claims 13 and 20)

Dependent claims 13 and 20 add additional internal power supply related limitations to the independent claims. Ex. 1001, 7:14-25; 8:24-37. The combination of Tsunoda in view of Tomio and Shigeo does not render dependent claims 13 and 20 unpatentable for the same reasons the combination of Tsunoda and Tomio would not have rendered dependent claims 2-5 and 16-17 unpatentable as obvious. A POSITA would not have added an internal power supply to the memory apparatus

of Tsunoda and, in the absence of an internal power supply, would not have looked to Shigeo's teachings regarding an information processing device running low on battery power. Ex. 2012, ¶56.

Furthermore, Shigeo discloses an information processing device, such as a mobile information terminal, that is driven by a battery or dry cell (e.g., flashlight battery). Ex. 1007, [0001]. Shigeo's information processing device is not a memory apparatus, let alone a portable memory apparatus with a connector. *See Id.*, Fig. 10, [0078] ("Fig. 10 is a diagram showing the exterior of a mobile information device that is a computer operating on battery power. In this figure, 701 is the main case that houses the CPU 104, ROM 106, RAM 107, nonvolatile RAM 103, display driver 108, and input device 110, etc.").



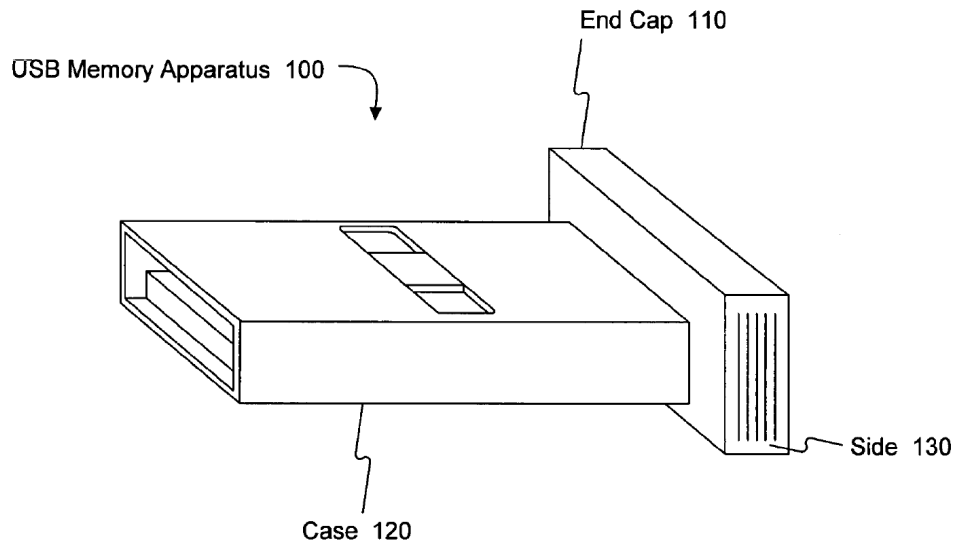
Ex. 1007, Fig. 10, Fig. 1. (1: Battery, 2: Power supply capacity detector, 11: Charging connector, 12: Battery charger, 13: Liquid crystal display, 14: Digitizer). Shigeo's information processing device includes a CPU and a power supply detecting device that periodically checks the power supply voltage and, depending on the power supply voltage detected, can interrupt the CPU or set a CPU-readable register value. Ex. 1007, [0059]. Thus, as Dr. Brogioli determined "[a] POSITA would have recognized that Shigeo's teachings regarding an information processing device are neither analogous to or applicable to a portable memory apparatus." Ex. 2012, ¶57. Accordingly, Petitioner has not carried its burden and established that dependent claims 13 and 20 would have been obvious to a POSITA and are unpatentable.

As discussed above, Petitioner has not met its burden to show that challenged claims 13 and 20 are unpatentable and Ground 1C fails.

D. Ground 2A – Tsunoda in view of Sukegawa (Claims 1, 6-7, 9-12, 14-15, and 18)

Sukegawa does not disclose, teach or suggest the use of volatile memory in a portable memory apparatus. Sukegawa teaches minimizing the size of a USB drive with NAND flash memory. Ex. 1005, 2:27-30 ("an improved USB flash drive that is reduced in size [and] is less expensive"). Sukegawa teaches a USB flash drive where "the number of parts within the USB flash drive is reduced and the physical

size of the drive can be drastically reduced such that all or a majority of the apparatus' circuitry is incorporated within the USB connector shield case.” *Id.*, 4:39-43.



Ex. 1005, Fig. 1. Sukegawa teaches that the flash drive should be small enough to be “mounted within the USB connector shield case.” *Id.*, 4:35-36. Sukegawa teaches that a USB connector shield case is “a Plug Housing (more generally referred to as a USB connector shield case 120) that extends from an overmold boot (not shown) on an end of the connector opposite the contact terminals 400A–D.” *Id.*, 7:29-32. “The USB connector shield case 120 for the Series A Plug measure 12 millimeters (mm) wide ± 0.10 mm, 4.5 mm tall ± 0.10 mm, and a minimum of 11.75 mm deep.” *Id.*, 7:35-37.

As discussed above, neither of the independent claims (1 and 15) (or the claims depending therefrom) would have been obvious to a POSITA in view of Tsunoda alone. Tsunoda does not disclose, teach or suggest a memory apparatus

with a USB interface. Tsunoda's discussion of other interfaces, such as a DDR-SRAM (double data rate SDRAM) interface, suggest a higher speed interface, not a slower interface. *See* Ex. 1004 [0094]. Tsunoda explicitly discloses using an SD card interface with the SDRAM interface or a memory stick interface with the SDRAM interface, but notably does not disclose using a USB interface in any capacity. *Id.*, [0117]-[0119]; Ex. 2012, ¶59.

In fact, none of the prior art identified by Petitioner discloses a volatile memory apparatus with a USB interface, let alone a portable memory apparatus with high-speed memory like synchronous DRAM. A POSITA would have known that a USB interface is not an SDRAM interface. A POSITA would have known that a USB interface is not an MMC interface. A POSITA would have further understood that a USB interface is not an SDRAM-compatible interface. Ex. 2012, ¶¶60-63.

A POSITA would not have combined the teachings of Tsunoda and Sukegawa. Ex. 2012, ¶59. A POSITA would not have been motivated to use a USB interface with Tsunoda's memory apparatus. *Id.*, ¶¶59-62. In view of the differences between an MMC interface and a USB interface, a POSITA would not have considered using a USB interface with Tsunoda's memory apparatus as simply the predictable result of combining known prior art elements according to known methods. *Id.* The Petition does not discuss how this would have been done, and Tsunoda's omission of any disclosure or suggestion of a USB interface is telling.

Modifying Tsunoda's memory apparatus with a USB interface would not have been within the level of a POSITA without undue experimentation. *Id.*, ¶62.

A POSITA would also have known that Tsunoda's teachings of additional components were incompatible with Sukegawa's teachings of a minimally sized flash drive that should be small enough to fit in a USB connector shield. *Id.*, ¶37. By way of example, Sukegawa does not disclose or suggest SDRAM, a Data Transfer Control Unit, or a SDRAM I/F Control Unit. *Compare* Ex. 1005, Fig. 2 and Ex. 1004, Fig. 14.

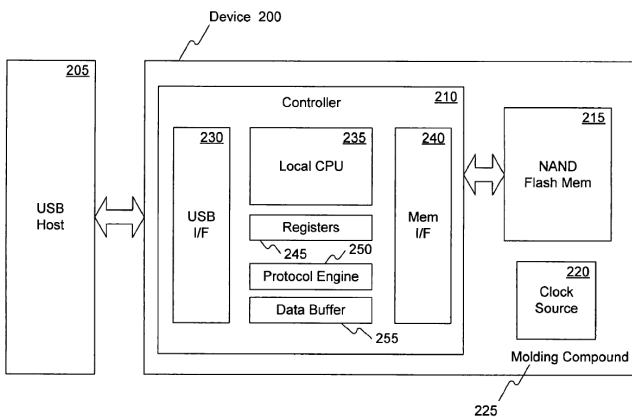
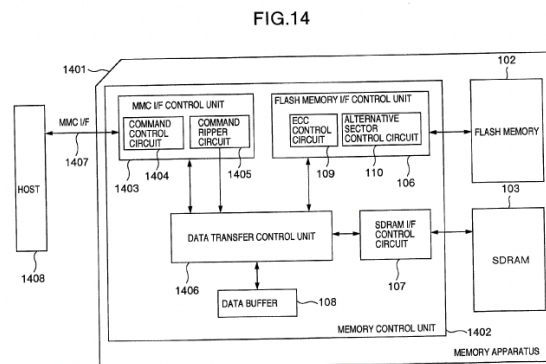


FIG. 2



Ex. 1005 (Sukegawa), Fig. 2; Ex. 1004 (Tsunoda), Fig. 14. Accordingly, the combination of Tsunoda in view of Sukegawa does not render independent claims 1 and 15 unpatentable as obvious. Because Tsunoda and Sukegawa do not disclose, teach or suggest the limitations of independent claim 1, they do not disclose, teach or suggest the limitations of claims 6, 9, 11, 12 and 14 that depend from claim 1. *In re Fine*, 837 F.2d 1071, 1076 (Fed. Cir. 1988) (“Dependent claims are nonobvious

under section 103 if the independent claims from which they depend are nonobvious.”).

And, as Petitioner does not provide separate arguments for claims 15 or 18, Petitioner has not met its burden of establishing that claims 15 and 18 are unpatentable as obvious over Tsunoda and Sukegawa.

As discussed above, Petitioner has not met its burden to show that challenged claims 1, 6-7, 9-12, 14-15, and 18 are unpatentable and Ground 2A fails.

E. Ground 2B – Tsunoda in view of Sukegawa and Tomio (Claims 2-5 and 16-17)

Dependent claims 2-5 and 16-17 add internal power source limitations to the independent claims.⁴ Ex. 1001, 6:39-53, 8:3-14. As discussed above with respect to Ground 1B, claims 2-5 and 16-17 would not have been obvious to a POSITA in view of Tsunoda and Tomio and are not unpatentable. The combination of Tsunoda in view of Sukegawa and Tomio does not render dependent claims 2-5 and 16-17 obvious because the combination of Tsunoda and Tomio would not have motivated a POSITA to add an internal power supply to the memory apparatus of Tsunoda. Ex. 2012, ¶64.

⁴ Petitioner does not make separate arguments with respect to claims 16 or 17 for any of the asserted grounds. Petitioner instead refers back to the arguments for claims 2 and 3 or claim 4. See Paper 2, Pet. at 52, 67-68, and 82.

Petitioner does not provide arguments for the combination of Tsunoda, Sukegawa and Tomio that are separate from Petitioner's arguments for the combination of Tsunoda and Tomio. *See* Paper 2, Pet. at 42-52. Accordingly, Petitioner's arguments with respect to the combination of Tsunoda, Tomio and Sukegawa fail for the same reasons.

Moreover, Sukegawa's teaching of a USB memory device without volatile memory would have, in fact, taught away from modifying Tsunoda with Tomio's teaching of a battery. Ex. 2012, ¶64. Sukegawa's recognition of "an urgent need for an improved USB flash drive that is reduced in size, [and] is less expensive, ..." would have taught away from additional expense and complexity. Ex. 1005, 2:27-28; Ex. 2012, ¶64. *See also* Ex. 1005, 4:39-40 ("In this way, the number of parts within the USB flash drive is reduced and the physical size of the drive can be drastically reduced ..."). A rechargeable battery would have added size and expense to a portable memory apparatus.

Claim 3 recites in part "wherein said internal power source powers said portable memory apparatus when said portable memory apparatus is unplugged from said computer system, said portable memory apparatus copies data from said volatile memory to said non-volatile memory when said portable memory is unplugged from said computer system." A POSITA would not have found this limitation, or the similar limitation in claim 16, obvious in light of Tsunoda, Sukegawa and Tomio.

Ex. 2012, ¶¶65-67. First, there is no disclosure in Tsunoda, Tomio, or Sukegawa related to a memory device being unplugged. As Dr. Brogioli explains, “if the memory device in Tsunoda were removed from the host by the user, without a priori knowledge by the host, it would create multiple unacceptable and potentially catastrophic problems. To begin, allowing a device to be removed from the host at a point in time that is random from the host’s perspective, precludes the host from being able to perform an orderly set of commands to ensure data and control integrity of the device. Commands and signals cannot be sent back and forth in an orderly manner to ensure proper command signaling protocol and data integrity, but abruptly removing the device presents an issues whereby the electrical signals at the device interface can be in seemingly random states upon removal. This would have undesirable and potentially electrically damaging effects on the system.” Ex. 2012, ¶¶66. Furthermore, data integrity of file content in the non-volatile memory cannot be ensured because the device may be in a state of processing a transaction when power is removed. *Id.*

As discussed above, Petitioner has not met its burden to show that challenged claims 2-5 and 16-17 are unpatentable over Tsunoda in view of Sukegawa and Tomio and Ground 2B fails.

F. Ground 2C – Tsunoda in view of Sukegawa, Tomio and Shigeo (Claims 13 and 20)

Dependent claims 13 and 20 add additional internal power supply limitations to the independent claims. Ex. 1001, 7:14-25; 8:24-37. The combination of Tsunoda in view of Sukegawa, Tomio and Shigeo does not render dependent claims 13 and 20 unpatentable for the same reasons the combination of Tsunoda and Tomio would not have rendered dependent claims 2-5 and 16-17 unpatentable as obvious. A POSITA would not have added an internal power supply to the memory apparatus of Tsunoda and, in the absence of an internal power supply, would not have looked to Shigeo’s teachings regarding an information processing device running low on battery power. Ex. 2012, ¶69.

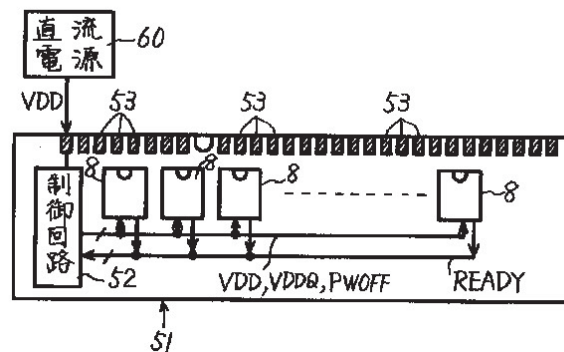
Petitioner does not explain how Sukegawa would affect this analysis. *See* Paper 2, Pet. at 82-88. There are no citations to Sukegawa in Petitioner’s discussion of Ground 2C. In fact, Petitioner does not offer any argument as to why Sukegawa would change the analysis, instead repeatedly asserting that a POSITA would have been motivated by the asserted combinations “(each with or without Sukegawa)” to achieve the alleged benefits. *See Id.* at 84-86, 88 (emphasis added). Petitioner therefore fails to meet its burden of establishing unpatentability over Tsunoda in view of Sukegawa, Tomio and Shigeo.

As discussed above, Petitioner has not met its burden to show that challenged claims 13 and 20 are unpatentable over Tsunoda in view of Sukegawa, Tomio and Shigeo and Ground 2C fails.

G. Ground 3A –Tomio (Claims 1-6, 9, 12, and 15-17)

Ground 3A relies solely on Tomio, which is a non-portable semiconductor memory apparatus. Paper 7, Decision at 11. The disclosure in Tomio that Petitioner relies on is a memory module. Paper 2, Pet. at 52-53.

【図 11】

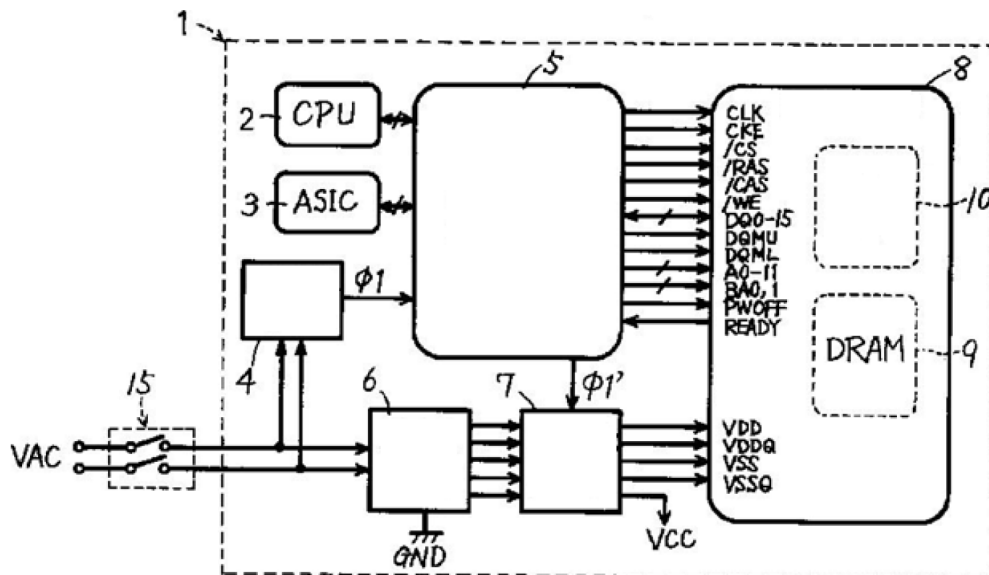


Ex. 1006, Fig. 11. A POSITA would not consider a memory module, such as that disclosed in Tomio, to be a portable memory device in the context of the specification and claims the '527 Patent. Ex. 2012, ¶ 70. The memory module in Tomio is not designed to be plugged and unplugged. *Id.*, ¶ 70. In contrast, the inventions claimed in the '527 Patent are intended to be plugged and unplugged. *See, e.g.*, Ex. 1001, 1:51-57 (describing plugging and unplugging the portable RAM drive). *See also, Id.*, 3:48-52 (“The portable RAM drive may be coupled to the

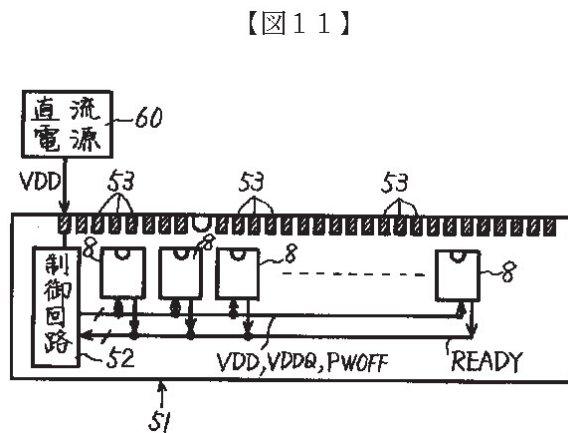
computer system through a connector on the portable RAM drive and a connector, such as, but not limited to, a USB connector, a firewire connector, and an ATA serial connector.”); 4:16-21, 39-48 (describing plugging and unplugging the portable RAM drive).

Accordingly, a POSITA would not understand that Tomio’s teachings are directed to a portable memory apparatus. Tomio is instead directed to an internal memory that could shorten the startup time for a personal computer. Ex. 1006, [0004] (“ Because the transfer of data from the ROM to the DRAM is slow, a considerable amount of time is required after turning on power to the personal computer before the user can actually start working on the personal computer, and this time cannot be shortened.”).

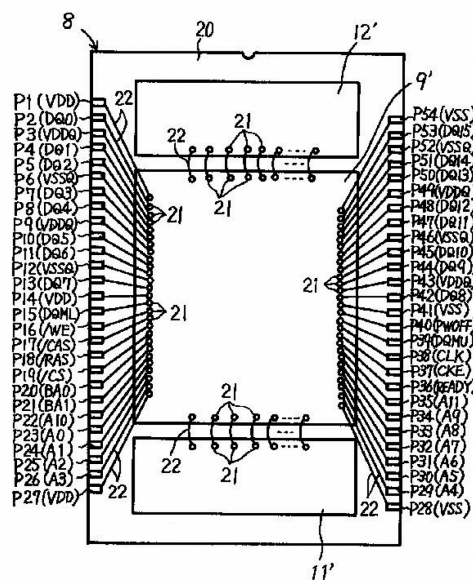
[Fig. 1]



Ex. 1006, Fig. 1. Tomio essentially discloses a boot loader that is on the motherboard of personal computer. *Id.*, [0012] (“Fig. 1 is a block diagram showing essential components on the motherboard 1 of a personal computer in an embodiment of the invention.”). *See also, Id.*, [0033] (“The cost of the motherboard 1 can also be reduced because a ROM separately mounted on the motherboard 1 becomes unnecessary and a data transfer circuit from the ROM to the main memory becomes unnecessary. Because there is no need to transfer data from the ROM to the main memory, the time from turning on the power to the personal computer becoming ready for use is shortened.”). Accordingly, Tomio is directed to a non-portable memory that is on the motherboard when a computer is turned on. A POSITA would not have understood Tomio’s disclosure of an internal memory module as teaching a portable memory apparatus. Ex. 2012, ¶71.



[Fig. 7]



Ex. 1006, Fig. 11, Fig. 7. As noted above, Petitioner points to Tomio's disclosure of a memory module 51. Paper 2, Pet. at 53-54. Tomio teaches using a 168 pin dual inline module. Ex. 1006, [0037]-[0038]. *See also Id.*, Fig. 7 (showing 54 connections to a single semiconductor memory). A POSITA would not look to Tomio for a portable memory apparatus because of the problems that would be encountered plugging and unplugging a portable memory apparatus with this many signals. Ex. 2012, ¶¶53-54. As discussed in Ex. 1007, Shigeo, even low power can corrupt a memory connection. *See* Ex. 1007, [0061]. *See also* Paper 2, Pet., at 84 ("Shigeo explains that information stored in RAM 'becomes corrupted' when the battery does not have enough power to power the RAM, ..."). A POSITA would have known that unplugging Tomio's memory apparatus would likely corrupt the volatile memory and would therefore not be motivated to copy data from the volatile memory to the non-volatile memory when Tomio's memory apparatus was unplugged from the computer. Ex. 2012, ¶53-54.

Petitioner does not assert that Tomio discloses a "housing" when claim 1 is properly construed. Petitioner contrarily asserts the opposite – that Petitioner disagrees with a construction of the term "housing" that would encompass Tomio's teachings. Paper 2, Pet., at 52 ("Patent Owner appears to advance a scope for the terms "portable" and "housing" with which Petitioner disagrees."). However, it is Petitioner that bears the burden of persuasion. This burden of persuasion never shifts

to Patent Owner. *See Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015).

It is difficult, if not impossible, to see how Petitioner can meet its burden of persuasion when Petitioner disclaims the construction of a claim term that is necessary to satisfy this claim limitation. *See, e.g.*, Paper 2, Pet. at 51-55. To the extent Petitioner urges this Board to adopt a claim construction that Petitioner deems incorrect, this Board should reject Petitioner's efforts to adopt what, at least according to the party with the burden of proof, the Petitioner, Petitioner believes to be erroneous. *See, e.g.*, IPR2021-01453, Paper 46 at 5 ("A petitioner cannot comply with [the obligation under 37 C.F.R. § 42.104(b)(3) that a petitioner state 'how the challenged claim is to be construed'] by simply implying certain constructions in the Petition without providing any legal or factual support for the constructions.")

Petitioner's intentional ambiguity is not limited to claim limitation 1[a]. Petitioner "reserves" its challenges to the claim construction to claim elements 1[b] (Paper 2, Pet. at 55-56), 1[c] (*Id.*, 57-58), 1[d] (*Id.*, 59-60), and 1[e] (*Id.*, 61-62). Petitioner's repeated assertions that Tomio's disclosure of an internal memory module does not satisfy "the 'portable' and 'housing' limitations required by the claim of the '527 patent" preclude Petitioner from satisfying its burden of persuasion that the challenged claims of the '527 Patent are unpatentable as obvious over Tomio.

Because Tomio does not disclose, teach or suggest the limitations of independent claim 1, it does not disclose, teach or suggest the limitations of claims 2-6, 9, and 12 that depend from claim 1. *In re Fine*, 837 F.2d 1071, 1076 (Fed. Cir. 1988) (“Dependent claims are nonobvious under section 103 if the independent claims from which they depend are nonobvious.”).

Tomio does not disclose or suggest unplugging a portable memory apparatus. A POSITA would have known that unplugging memory without previous notification to the host device would create significant problems and could be catastrophic. *Id.*, ¶¶66-67. There would be a loss of data integrity and possible damage to the host or the portable memory apparatus. *Id.* A POSITA would have recognized that the data corruption could result in an unacceptable data loss to the user. *Id.* Accordingly, claims 3 and 16 would have been non-obvious to a POSITA over Tomio for these reasons as well. *Id.*

In addition, for the same additional reasons discussed above as to Ground 2B, Petitioner has not shown that either of claims 3 or 16 are disclosed or rendered obvious by Tomio.

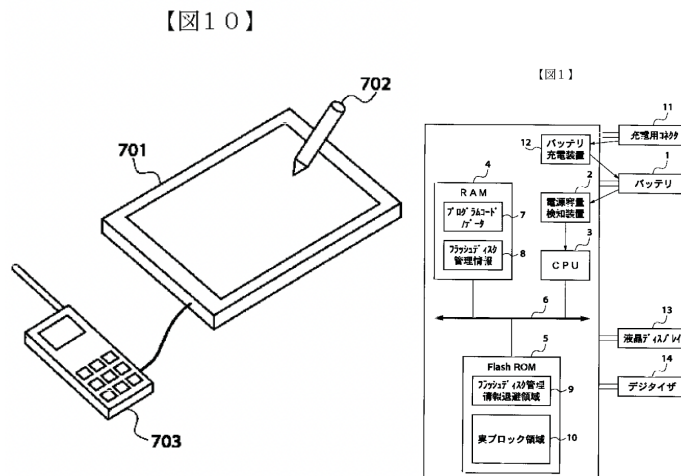
And, as Petitioner does not provide separate arguments for claims 15-17, Petitioner has not met its burden of establishing that claims 15-17 are unpatentable as obvious over Tomio for the same reasons stated above with respect to claim 1.

As discussed above, Petitioner has not met its burden to show that challenged claims 1-6, 9, 12, and 15-17 are unpatentable over Tomio and Ground 3A fails.

H. Ground 3B –Tomio in view of Shigeo (Claims 13 and 20)

Dependent claims 13 and 20 add additional internal power supply related limitations to the independent claims. Ex. 1001, 7:14-25; 8:24-37. The combination of Tomio and Shigeo does not render dependent claims 13 and 20 unpatentable for the same reasons that Tomio alone would not have rendered claims 1-6, 9, 12, and 15-17 unpatentable as obvious.

Furthermore, Shigeo discloses an information processing device, such as a mobile information terminal, that is driven by a battery or dry cell (e.g., flashlight battery). Ex. 1007, [0001]. *See Id.*, Fig. 10, [0078] (“Fig. 10 is a diagram showing the exterior of a mobile information device that is a computer operating on battery power. In this figure, 701 is the main case that houses the CPU 104, ROM 106, RAM 107, nonvolatile RAM 103, display driver 108, and input device 110, etc.”).



Ex. 1007, Fig. 10, Fig. 1 (1: Battery, 2: Power supply capacity detector, 11: Charging connector, 12: Battery charger, 13: Liquid crystal display, 14: Digitizer). Shigeo's information processing device is not just a memory apparatus, let alone a portable memory apparatus with a connector. Shigeo's information processing device includes a CPU and a power supply detecting device that periodically checks the power supply voltage and, depending on the power supply voltage detected, can interrupt the CPU or set a CPU-readable register value. Ex. 1007, [0059]. A POSITA would have recognized that Shigeo's teachings regarding an information processing device are neither analogous to or applicable to a portable memory apparatus. Accordingly, Petitioner has not carried its burden and established that dependent claims 13 and 20 would have been obvious to a POSITA and are unpatentable.

As discussed above, Petitioner has not met its burden to show that challenged claims 13 and 20 are unpatentable over Tomio in view of Shigeo and Ground 3C fails.

I. Ground 4A –Tomio in view of Sukegawa (Claims 1-7, 9-12, and 14-18)

As discussed above, a POSITA would not understand that Tomio's teachings are directed to a portable memory apparatus. Tomio is instead directed to an internal memory that could shorten the startup time for a personal computer. Ex. 1006,

[0004] (“ Because the transfer of data from the ROM to the DRAM is slow, a considerable amount of time is required after turning on power to the personal computer before the user can actually start working on the personal computer, and this time cannot be shortened.”). Tomio essentially discloses a boot loader that is on the motherboard of personal computer. *Id.*, [0012] (“Fig. 1 is a block diagram showing essential components on the motherboard 1 of a personal computer in an embodiment of the invention.”). *See also, Id.*, [0033] (“The cost of the motherboard 1 can also be reduced because a ROM separately mounted on the motherboard 1 becomes unnecessary and a data transfer circuit from the ROM to the main memory becomes unnecessary. Because there is no need to transfer data from the ROM to the main memory, the time from turning on the power to the personal computer becoming ready for use is shortened.”). Accordingly, Tomio is directed to a non-portable memory that is on the motherboard when a computer is turned on.

A POSITA would not look to Tomio for a portable memory apparatus because of the problems that would be encountered plugging and unplugging a portable memory apparatus. Ex. 2012, ¶¶74-76. As discussed in Ex. 1007, Shigeo, even low power can corrupt a memory connection. *See* Ex. 1007, [0061]. *See also* Paper 2, Pet., at 84 (“Shigeo explains that information stored in RAM ‘becomes corrupted’ when the battery does not have enough power to power the RAM, ...”). A POSITA would have known that unplugging Tomio’s memory would likely corrupt the

volatile memory. Ex. 2012, ¶¶74-76. A POSITA would have known that unplugging memory without previous notification to the host device would create significant problems and could be catastrophic. *Id.* There would be a loss of data integrity and possible damage to the host or the portable memory apparatus. *Id.* A POSITA would have recognized that the data corruption could result in an unacceptable data loss to the user. *Id.* Accordingly, a POSITA would have understood that “hot swapping” would not be an available benefit using Tomio’s memory. *Id.* For these reasons, one of the purported benefits of a USB interface, so-called “hot swapping,” would have been detrimental to a portable memory apparatus combining the teachings of Tomio and Sukegawa.

Sukegawa does not disclose, teach or suggest the use of volatile memory in a portable memory apparatus. Sukegawa teaches minimizing the size of a USB drive with NAND flash memory. Ex. 1005, 2:27-30 (“an improved USB flash drive that is reduced in size [and] is less expensive”). Sukegawa teaches a USB flash drive where “the number of parts within the USB flash drive is reduced and the physical size of the drive can be drastically reduced such that all or a majority of the apparatus’ circuitry is incorporated within the USB connector shield case.” *Id.*, 4:39-43. Sukegawa teaches that the flash drive should be small enough to be “mounted within the USB connector shield case.” *Id.*, 4:35-36.

Furthermore, as Dr. Brogioli explains, “the shortened data transfer time Tomio teaches for volatile versus non-volatile memory would be nullified by a USB interface.” *Id.*, ¶75. Even with the “high data transmission speed (12 mb/sec)” identified by Petitioner, Paper 2, Pet. at 70, the USB transmission rate would be slower than the flash memory access rate. *Id.* A POSITA would not be motivated to add the complexity of a DRAM, including DRAM controller functionality, to a USB flash drive. Ex. 2021, ¶75-77.

A POSITA would not have found it obvious to use Tomio’s combination memory with a USB connector in a portable memory apparatus. *Id.*, ¶76. None of the prior art identified by Petitioner discloses DRAM with a USB connector and implementing it would not have been the predictable result of combining known prior art elements according to known methods for the reasons discussed above. Resolving the data corruption and loss issues would not have been within the level of skill of a POSITA, even with undue experimentation.

Accordingly, challenged claim 1, specifically claim limitations 1[c] and 1[f], would not have been obvious to a POSITA over the combination of Tomio and Sukegawa. Because Tomio and Sukegawa do not disclose, teach or suggest the limitations of independent claim 1, they do not disclose, teach or suggest the limitations of claims 2-7, 9-12 and 14 that depend from claim 1. *In re Fine*, 837

F.2d 1071, 1076 (Fed. Cir. 1988) (“Dependent claims are nonobvious under section 103 if the independent claims from which they depend are nonobvious.”).

Tomio does not disclose, teach or suggest unplugging a portable memory apparatus. A POSITA would have known that unplugging memory without previous notification to the host device would create significant problems and could be catastrophic. *Id.*, ¶77. There would be a loss of data integrity and possible damage to the host or the portable memory apparatus. *Id.* A POSITA would have recognized that the data corruption could result in an unacceptable data loss to the user. Accordingly, dependent claims 3 and 16 would have been non-obvious to a POSITA for these reasons as well. *Id.*

Petitioner simply cites back to its arguments for claims 1, 6, 2, 3, 4 and 7 for challenged claims 15-18 in Ground 4A. Because Petitioner’s arguments fail for claims 1-4 and 6-7 for the reasons set forth above, Petitioner’s arguments for claims 15-18 as well.

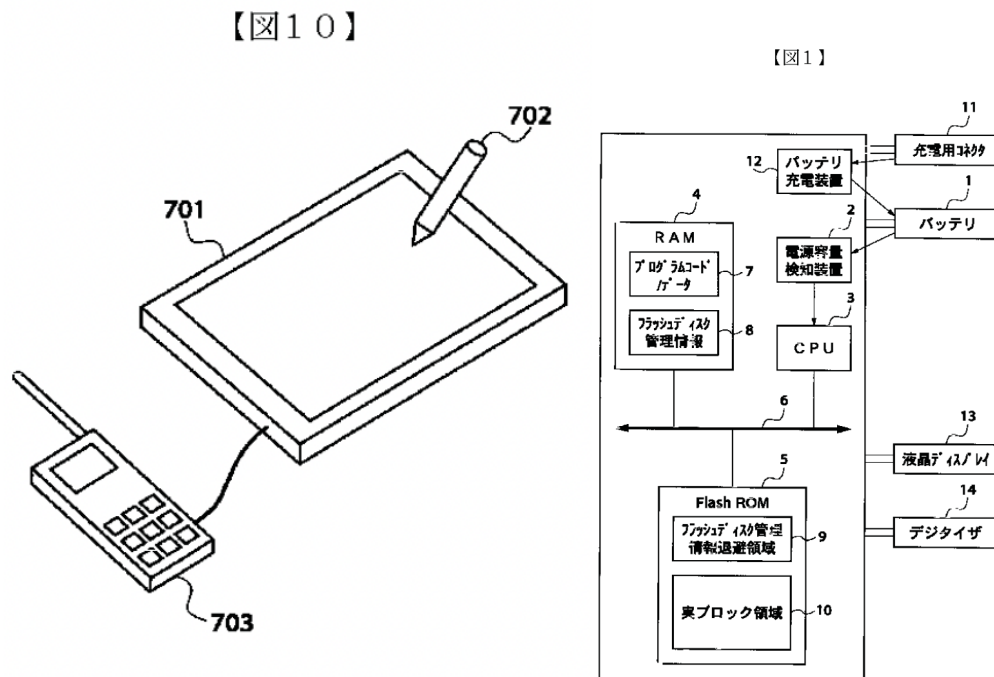
As discussed above, Petitioner has not met its burden to show that challenged claims 1-7, 9-12, and 14-18 are unpatentable and Ground 4A fails.

J. Ground 4B –Tomio in view of Sukegawa and Shigeo (Claims 13 and 20)

Dependent claims 13 and 20 add additional internal power supply related limitations to the independent claims. Ex. 1001, 7:14-25; 8:24-37. The combination

of Tomio, Sukegawa and Shigeo does not render dependent claims 13 and 20 unpatentable for the same reasons that Tomio in view of Shigeo would not have rendered claims 13 and 20 unpatentable as obvious.

Furthermore, Shigeo discloses an information processing device, such as a mobile information terminal, that is driven by a battery or dry cell (e.g., flashlight battery). Ex. 1007, [0001]. *See Id.*, Fig. 10, [0078] (“Fig. 10 is a diagram showing the exterior of a mobile information device that is a computer operating on battery power. In this figure, 701 is the main case that houses the CPU 104, ROM 106, RAM 107, nonvolatile RAM 103, display driver 108, and input device 110, etc.”).



Ex. 1007, Fig. 10, Fig. 1 (1: Battery, 2: Power supply capacity detector, 11: Charging connector, 12: Battery charger, 13: Liquid crystal display, 14: Digitizer). Shigeo’s

information processing device is not just a memory apparatus, let alone a portable memory apparatus with a connector. Shigeo's information processing device includes a CPU and a power supply detecting device that periodically checks the power supply voltage and, depending on the power supply voltage detected, can interrupt the CPU or set a CPU-readable register value . Ex. 1007, [0059]. A POSITA would have recognized that Shigeo's teachings regarding an information processing device are neither analogous to or applicable to a portable memory apparatus. A POSITA would not have would not have looked to Tomio's teachings regarding an internal memory module or Shigeo's teachings regarding an information processing device running low on battery power in the context of a portable memory apparatus. Ex. 2012, ¶78.

Petitioner does not explain how Sukegawa would affect this analysis. *See* Paper 2, Pet. at 82-88. There are no citations to Sukegawa in Petitioner's discussion of Ground 4B and, in fact, Petitioner repeatedly asserts that a POSITA would have been motivated by the asserted combinations "(each with or without Sukegawa)" to achieve the alleged benefits. *See Id.* at 84-86, 88. Accordingly, Petitioner has not carried its burden and established that dependent claims 13 and 20 would have been obvious to a POSITA and are unpatentable.

As discussed above, Petitioner has not met its burden to show that challenged claims 13 and 20 are unpatentable over Tomio in view of Sukegawa and Shigeo and Ground 4B fails.

VI. CONCLUSION

Petitioner has failed to meet its statutory burden and the Petition should be denied for all challenged claims.

Respectfully submitted,

/Brett Cooper/

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Lead counsel for Patent Owner

Date: March 11, 2024

CERTIFICATE OF WORD COUNT (37 C.F.R. § 42.24(d))

The undersigned hereby certifies that the word count in this Patent Owner Response is 9,178 words, as counted by the word-processing program Microsoft Word that was used to generate this Patent Owner Response, where such word count excludes the table of contents, table of authorities, mandatory notices, certificate of service, appendix of exhibits, claim listing, and this certificate of word count. This Patent Owner Response is in compliance with the 14,000-word limit set forth in 37 C.F.R. § 42.24(b)(1).

Date: March 11, 2024

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CERTIFICATE OF SERVICE (37 C.F.R. § 42.6(e))

The undersigned hereby certifies that the above document was served on March 11, 2024, by filing this document , along with it accompanying exhibits, through the Patent Trial and Appeal Case Tracking System as well as delivering a copy via electronic mail upon the following attorneys of record for the Petitioner:

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