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Paper No. 7
Entered: February 6, 2023

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SHENZHEN APALTEK CO., LTD.,
Petitioner,

v.

ASETEK DANMARK A/S,
Patent Owner.

IPR2022-01318
Patent 10,078,355 B2

Before MICHAEL P. TIERNEY, *Vice Chief Administrative Patent Judge*, KEVIN W. CHERRY, and JASON W. MELVIN, *Administrative Patent Judges*.

MELVIN, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

ShenZhen Apaltek Co., Ltd. ("Petitioner") filed a Petition (Paper 1, "Pet.") requesting institution of *inter partes* review of claims 1–10, 12, and 14–16 of U.S. Patent No. 10,078,355 B2 (Ex. 1001, "the '355 patent"). Asetek Danmark A/S ("Patent Owner") filed a Preliminary Response. Paper 5 ("Prelim. Resp."). In the Preliminary Response, Patent Owner notes that it has disclaimed claims 3, 4, 7, and 9–16. Prelim. Resp. 2 (citing Ex. 2002). Thus, this proceeding involves only claims 1, 2, 5, 6, and 8 ("the challenged claims"). As authorized, Petitioner filed a Preliminary Reply. Paper 6. Pursuant to 35 U.S.C. § 314 and 37 C.F.R. § 42.4(a), we have authority to determine whether to institute review.

An *inter partes* review may not be instituted unless "the information presented in the petition . . . and any response . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition." 35 U.S.C. § 314(a). For the reasons set forth below, we conclude that Petitioner has shown a reasonable likelihood it will prevail in establishing the unpatentability of at least one challenged claim, and we institute *inter partes* review.

A. REAL PARTIES IN INTEREST

Petitioner identifies itself as the real party-in-interest. Pet. 77. Patent Owner identifies Asetek Danmark A/S, Asetek USA, Inc., Asetek A/S, and Asetek Holdings, Inc. as the real parties-in-interest for Patent Owner. Paper 4, 1 (Patent Owner's Mandatory Notices).

B. Related Matters

The parties identify the following related litigations: *Asetek Danmark A/S v. CoolIT Systems, Inc.*, C.A. No. 3:19-cv-00410 (N.D. Cal.); *Cooler Master Co., Ltd. v. Asetek Danmark A/S*, C.A. No. 4:21-cv-04627 (N.D. Cal.); *Asetek Danmark A/S v. Shenzhen Apaltek Co., Ltd.*, C.A. No. 6:21-cv-00501 (W.D. Tex.) (transferred to N. D. Cal., May 6, 2022); and *Asetek Danmark A/S v. CoolIT Systems, Inc.*, C.A. No. 22-1049 (Fed. Cir.). Pet. 77; Paper 4, 1.

The parties also identify the following Office proceedings: IPR2020-00522, IPR2020-00523, and IPR2020-00524, which were filed in February 2020 and concluded in August 2021, IPR2021-01195 against U.S. Patent No. 10,613,601 and IPR2021-01196 against U.S. Patent No. 10,599,196, and U.S. Patent Application No. 17/671,197. Pet. 77–78; Paper 4, 1–2.

C. The '355 Patent

The '355 patent is titled "Cooling System for a Computer System." Ex. 1001, Code (54). It issued from an application filed June 19, 2017, as a continuation of application No. 13/861,593, which issued as Patent No. 9,733,681 B2 and claims priority to a PCT application filed May 6, 2005. *Id.* at Code (63).

The '355 patent relates to a liquid-cooling system for a computer system. *Id.* at Code (57). The specification explains, at the time of the invention, air cooling arrangements were the most-used cooling system for cooling central processing units (CPUs) in computer systems. *Id.* at 1:17–33. An alternative design known at the time of the invention was to use a cooling liquid circulating inside a closed system by means of a pumping unit

with a heat exchanger past which the cooling liquid circulates. *Id.* at 1:34–38. The specification contends that liquid cooling is generally more efficient and quieter than air cooling, but that a liquid cooling design consists of "many components," which increases the total installation time, size, and risk of leakage of the cooling liquid from the system. *Id.* at 1:39–49. Thus, one object of the invention is to provide a small and compact liquid-cooling solution that is more efficient than existing air-cooling arrangements and can be produced at low cost enabling high production volumes, be easy-to-use and implement, can be used with existing CPU types and computer systems, and requires a low level of maintenance or no maintenance at all. *Id.* at 1:53–63.

An illustrative embodiment of such a device is depicted in Figures 7 and 8, reproduced below.

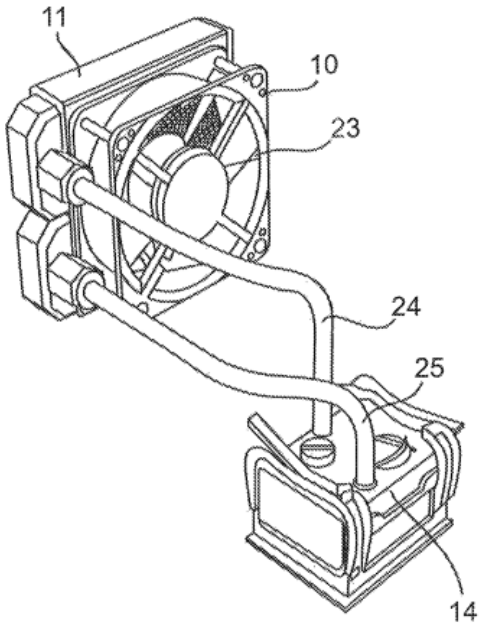


FIG. 7

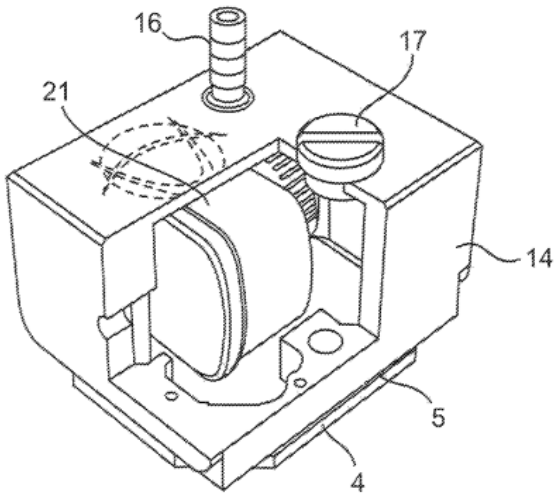


FIG. 8

Figure 7[1] is a perspective view of the cooling system showing reservoir housing 14 with the heat exchanging surface 5 (shown in Figure 8) and the pump 21 (shown in Figure 8) inside the reservoir. *Id.* at 16:16–19. Figure 8 is a cut-out view into reservoir housing 14, when the reservoir, pump 21, and heat exchanging surface 4 are situated inside the reservoir. *Id.* at 15:49–51. The reservoir has a tube inlet connection (not shown in Figure 8) through which the cooling liquid enters the reservoir. *Id.* at 15:51–53. From the tube inlet connection, the cooling liquid flows through the reservoir passing heat exchanging surface 4 and enters the inlet of the pump. *Id.* at 15:54–56. After the cooling liquid flows through the pump, the cooling liquid passes out of the outlet of the pump and further out through tube outlet connection 16. *Id.* at 15:56–58. As shown in Figure 7, tube inlet connection and tube outlet connection 16 are connected to heat radiator 11 by means of connecting tubes 24 and 25. *Id.* at 16:19–21. Cooling liquid flows into and out of the reservoir and the heat radiator through connecting tubes 24 and 25, respectively. *Id.* at 16:21–23. Heat radiator 11 (shown in Figure 7) cools the cooling liquid before it passes back into the reservoir. *Id.* at 16:26–30.

The reservoir may be provided with channels or segments for establishing a certain flow-path for the cooling liquid through the reservoir to prevent the cooling liquid passing the reservoir too quickly to take up a sufficient amount of heat from the heat exchanging surface. *Id.* at 16:51–62.

[1] We agree with Petitioner that it appears that the specification transposes the description of Figure 7 with that of Figure 8. Pet. 6 n.1. We refer to the description of "Figure 8" in the specification in our discussion of Figure 7, and we refer to the specification's discussion of "Figure 7" in our discussion of Figure 8.

Figures 17 and 20 show the internal structures of a preferred embodiment of the reservoir according to the invention and are reproduced below. *Id.* at 21:48–50.

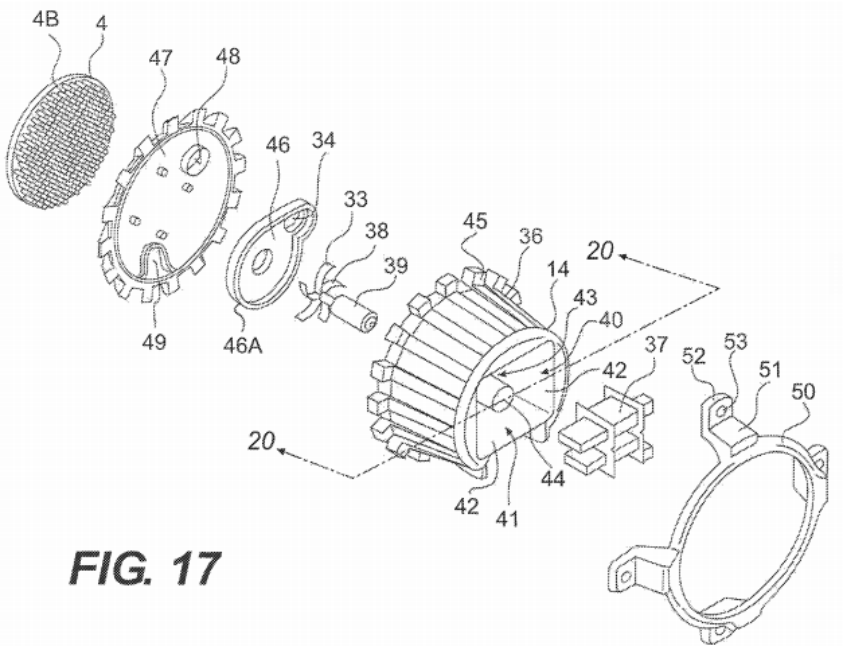


FIG. 17

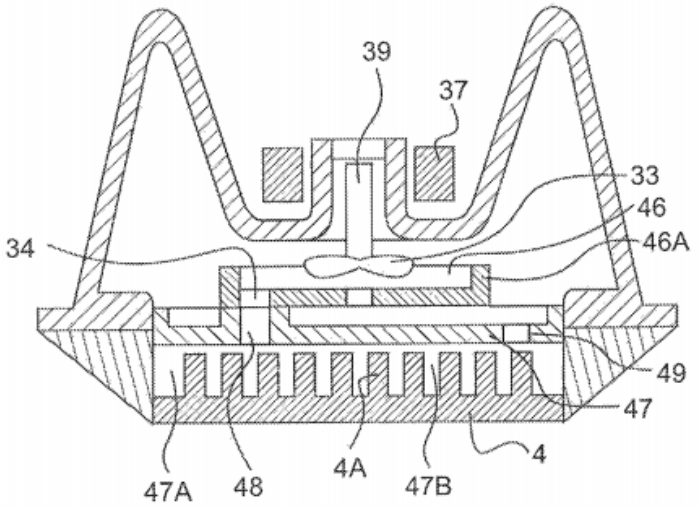


FIG. 20

Figure 17 is an exploded perspective view of a preferred embodiment of a reservoir and a pump and the heat exchanging surface. *Id.* at 10:7–9. Figure

20 is a simplified schematic showing a cross-sectional view of the reservoir along plane 20-20 of Figure 17. *Id.* at 10:16–17. Reservoir housing 14 as shown in Figures 17 and 20 is in the form of a double-sided chassis having a substantially conical, circular configuration with stiffening ribs 36 extending axially along the exterior of the reservoir housing and configured to mount an electrical motor. *Id.* at 21:49–57. Reservoir housing 14 has recess 40 intended for accommodating stator 37 of an electrical motor driving impellor 33 of the pump, which is attached to shaft 38 of rotor 39 of the electric motor. *Id.* at 21:58–22:1. The specification explains that "a liquid-proof division" is made between rotor 39 of the motor, which is submerged in the cooling liquid, and the stator 37 of the pump. *Id.* at 22:10–22:14.

The enclosed space between impeller 33 and heating exchanging interface 4 is divided into two separate chambers by impeller cover 46A and intermediate member 47, as shown in Figure 20. The chamber formed by impeller 33 and impeller cover 46A is described as "pump chamber 46" and has outlet 34. *Id.* at 22:64–67.

D. CHALLENGED CLAIMS

Challenged claim 1 is independent and is reproduced below:

1. A liquid cooling system for cooling a heat-generating component of a computer, comprising:

a reservoir configured to circulate a cooling liquid therethrough, the reservoir including:

a pump chamber housing an impeller and defined at least in part by an impeller cover and a double-sided chassis, the impeller being positioned on one side of the chassis and a stator of the pump is positioned on an opposite side of the chassis;

a thermal exchange chamber disposed between the pump chamber and the heat-generating component when the system is installed on the heat-generating component;

a heat-exchanging interface forming a boundary wall of the thermal exchange chamber, the heat-exchanging interface has an outer surface configured to be placed in thermal contact with a surface of the heat-generating component and an inner surface that defines a plurality of channels that direct the flow of a cooling liquid within the thermal exchange chamber;

a heat radiator adapted to pass the cooling liquid therethrough, the heat radiator being fluidly coupled to the reservoir via fluid conduits, the heat radiator being configured to dissipate heat from the cooling liquid;

wherein the pump chamber further includes:

an inlet defined by the impeller cover positioned below a center of the impeller configured to enable the cooling liquid to flow into the center of the pump chamber;

an outlet defined by the impeller cover positioned tangentially to the circumference of the impeller.

Id. at 28:19–47. The other challenged claims depend directly from claim 1.

E. PRIOR ART AND ASSERTED GROUNDS

Petitioner asserts the following ground of unpatentability:

Claims Challenged	35 U.S.C. §	References/Basis
1, 2, 6	103	Duan[2]
5, 8	103	Duan, Wu[3]

Pet. 5. Petitioner also relies on the Declaration of George Karamanis, Ph.D. Ex. 1003.

[2] US Pub. No. 2006/0185830 A1, pub. Aug. 24, 2006 (Ex. 1004).
[3] US Pat. No. 6,894,899 B2, iss. May 17, 2005 (Ex. 1006).

II. ANALYSIS

A. 35 U.S.C. § 314(a)

Patent Owner argues that we should deny institution under § 314(a) to ensure "the fundamental fairness of the process for all parties." Prelim. Resp. 4 (quoting *General Plastic Industrial Co. v. Canon Kabushiki Kaisha*, IPR2016-01357, Paper 19 at 18 (PTAB Sept. 6, 2017) (precedential as to Section II.B.4.i)). Patent Owner relies on the fact that, in IPR2020-00522 ("the -522 IPR"), the Board determined all challenged claims here unpatentable over Duan or combinations with Duan as the primary reference. *See* Prelim. Resp. 2–4. According to Patent Owner, the *General Plastic* factors regarding multiple petitions show that we should exercise our discretion under § 314(a) to deny institution here.[4] *Id.* at 4–9.

Petitioner contends that we should institute review because Patent Owner is currently appealing the -522 IPR final written decision, without participation of the petitioner in that proceeding. Prelim. Reply 1. Petitioner submits that the issue Patent Owner has raised in that appeal is not implicated by this proceeding, and therefore proceeding here will not require we duplicate our efforts. *Id.* at 1–2. Moreover, Petitioner "stipulates that, if no claims ultimately survive the appeal, it will withdraw its IPR." *Id.* at 2.

[4] Patent Owner does not argue we should exercise discretion under § 325(d). *See generally* Prelim. Resp. Moreover, such discretion does not seem appropriate here, where the Petition includes grounds that were not presented in the -522 IPR, namely obviousness based on a combination of Duan and Wu. *Compare* IPR2020-00522, Paper 40 at 26, *with* Pet. 5.

1. Factor 1: whether the same petitioner previously filed a petition directed to the same claims of the same patent

Factor 1 may apply to petitions filed by two separate petitioners, taking into account "any relationship between those petitioners." *Valve Corp. v. Elec. Scripting Prods., Inc*., IPR2019-00062, Paper 11 at 9 (PTAB Apr. 2, 2019) (precedential) ("*Valve I*").

Patent Owner asserts that Petitioner should be considered the "same petitioner" as that in the -522 IPR because "they are represented by [the] same counsel" and "both were accused by Patent Owner of infringing the same patent claims," demonstrating a "significant relationship." Prelim. Resp. 7 (quoting *Valve I*, at 10; *Valve Corp. v. Electronic Scripting Products, Inc.*, IPR2019-00064, Paper 10 at 11 (PTAB May 1, 2019) (precedential) ("*Valve II*")).

Patent Owner does not address, however, that the *Valve* cases involved two petitioners accused of infringement based on the same product—made by one petitioner and incorporating technology licensed from the other. *Valve I*, at 9–10 (finding a significant relationship between the two petitioners "with respect to Patent Owner's assertion" of the challenged patent); *Valve II*, at 10 (same); *see* Prelim. Reply 3. Patent Owner has asserted no such relationship here, and we conclude that Patent Owner has failed to establish that Petitioner has a significant relationship with the -522 IPR petitioner. Representation by the same counsel and being accused of infringing the same patent does not create a relationship that justifies discretionarily denying institution.

Accordingly, Factor 1 weighs strongly against denying institution.

2. Factor 2: whether at the time of filing of the first petition the petitioner knew of the prior art asserted in the second petition or should have known of it; Factors 4 and 5: the length of time that elapsed between the time the petitioner learned of the prior art asserted in the second petition and the filing of the second petition; and whether the petitioner provides adequate explanation for the time elapsed between the filings of multiple petitions directed to the same claims of the same patent

The parties here are neither the same party nor related parties. Therefore, the second, fourth, and fifth *General Plastic* factors have a limited relevance. *See NetApp Inc. v. Realtime Data LLC*, IPR2017-01195, Paper 9 at 10 (PTAB Oct. 12, 2017); *Ebates Performance Marketing, Inc. v. IBM*, IPR2022-00646, Paper 10 at 9–11 (PTAB Oct. 25, 2022).

Patent Owner asserts that Petitioner was aware of Duan since the -522 IPR petition was filed (February 7, 2020). Prelim. Resp. 9. Petitioner asserts that it waited to file the Petition because Patent Owner asserted the '355 patent in a complaint against Petitioner but did not include it in the infringement contentions. Prelim. Reply 5. Thus, without settlement or the Federal Circuit affirming the -522 IPR decision, Petitioner filed this proceeding to protect its rights. *Id.*

We determine that although the second, fourth, and fifth factors have limited value, Petitioner adequately explains the time that passed before filing the Petition. Thus, Factor 2 is neutral and Factors 4 and 5 weigh against denying institution.

3. Factor 3: whether at the time of filing of the second petition the petitioner already received the patent owner's preliminary response to the first petition or received the Board's decision on whether to institute review in the first petition

Patent Owner additionally asserts that the -522 IPR provided a clear roadmap for Petitioner here. Prelim. Resp. 7 (citing *Code200, UAB v. Bright Data Ltd*., IPR2022-00861, IPR2022-00862, Paper 18 at 5 (PTAB Aug. 23, 2022)). But Patent Owner asserts that Petitioner has not "materially revised" any of the positions in the -522 IPR. *Id.* at 9. We question that position, as Petitioner asserts that it presents a challenge free from the issue Patent Owner disputes on appeal from the -522 IPR. Prelim. Reply 1. To the extent changes in Petitioner's approach compared to the -522 IPR warrant discretionary denial, Patent Owner should have explained as much. We decline to find a road-mapping concern where Patent Owner asserts no material change in Petitioner's positions.

Regardless, the challenges here overlap substantially with those in the -522 IPR, and we therefore determine that any road-mapping concern is minimal. *See Code200 v. Bright Data Ltd.*, IPR2022-00861, Paper 18 at 5 (PTAB Aug. 23, 2022) (precedential) ("'[R]oad-mapping' concerns are minimized when . . . a petitioner files a later petition that raises unpatentability challenges substantially overlapping with those in the previously-filed petition and the later petition is not refined based on lessons learned from later developments.").

Thus, factor 3 weighs, at most, only somewhat in favor of exercising discretion to deny institution.

4. Factors 6 and 7: the finite resources of the Board; and the requirement to issue a final determination not later than one year after institution

Patent Owner asserts that because this challenge follows that in the -522 IPR, the Board should not invest resources in this additional proceeding. Prelim. Resp. 9. Petitioner contends that the similarities will streamline our consideration. Prelim. Reply 6.

We agree with Petitioner that having considered similar issues in the -522 IPR will allow for efficient review here. We will review the parties' contentions, recognizing the differences that Petitioner's challenge presents compared to the -522 IPR. Moreover, Petitioner's stipulation to seek dismissal of this IPR should the Federal Circuit affirm our decision in the -522 IPR means a substantially reduced risk of unnecessary use of Board resources.

Accordingly, Factors 6 and 7 weigh against discretionary denial.

5. Conclusion on discretionary denial

For the reasons discussed, the *General Plastic* factors weigh against denying institution here. Accordingly, we do not exercise our discretion to deny institution.

B. LEVEL OF ORDINARY SKILL IN THE ART

Petitioner proposes that a person of ordinary skill

> would have been knowledgeable regarding liquid cooling systems for computer systems, would have had a Bachelor of Science (B.S.) in electrical or mechanical engineering, or similar advanced post-graduate education in this area, or would have possessed at least 2-3 years of experience in liquid cooling systems for computer systems or similar systems. A POSITA would be knowledgeable of the concepts, components, and their functions described as "prior art" in the '355 patent such as,

> e.g., pumps, radiators, fans, reservoirs, and other techniques of heat dissipation and liquid cooling. (Ex-1001,1:11-47.) In addition, a POSITA would be knowledgeable about electric motors and their components (e.g., electromagnetic coils, rotors, stators, AC/DC motors, etc.)

Pet. 6–7 (citing Ex. 1003 ¶¶ 13–18). Patent Owner does not dispute this definition of a person of ordinary skill. *See generally* Prelim. Resp. For purposes of this Decision, we adopt Petitioner's proposed level of ordinary skill as it appears to be consistent with the level of skill reflected by the specification and in the asserted prior art references.

C. Claim Construction

For an *inter partes* review petition filed after November 13, 2018, we construe claim terms "using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. 282(b)." 37 C.F.R. § 42.100(b) (2019).

Based on our analysis of the issues in dispute at this stage of the proceeding, we conclude that no claim term requires express construction at this time. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017).

D. Obviousness over Duan

Petitioner maps the language of independent claim 1 to Duan's disclosures. Pet. 17–45.

Duan's system includes a cooling plate module with a cooling plate integrally formed with a liquid driving module such that the layout of the cooling plate module can be minimized to reduce space. Ex. 1004 ¶ 7. Figure 6, reproduced below, is a view of Duan's "liquid cooling cyclic mechanism." *Id.* ¶ 17.

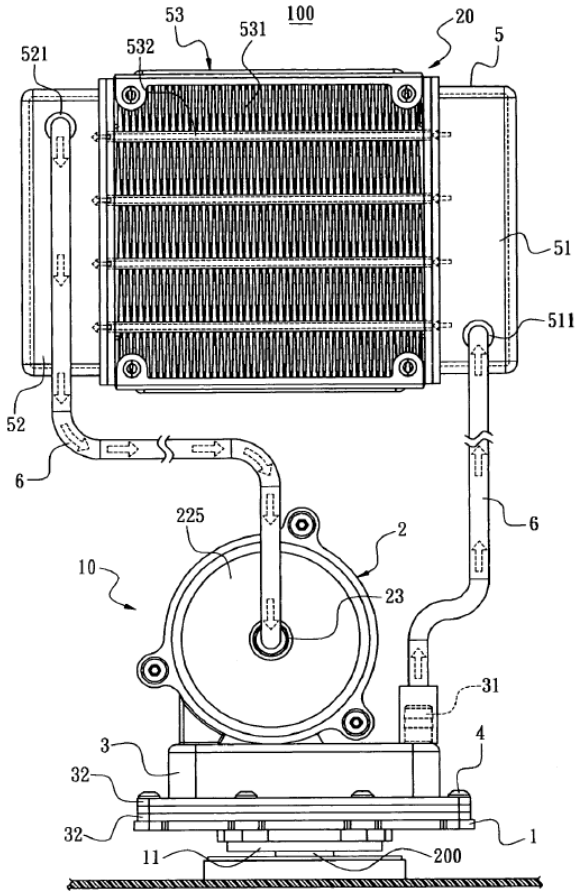


FIG. 6

Duan's Figure 6 shows liquid cooling cyclic mechanism 100 for cooling CPU 200. *Id.* ¶ 22. Liquid cooling cyclic mechanism 100 comprises cooling module 10 and water tank module 20, which is connected with cooling plate module 10 through ducts. *Id.* Cooling plate module 10 includes cooling plate 1, liquid driving module 2, and heat absorbing interface 11. *Id.* Heat absorbing face 11 is in contact with CPU 200 for dissipating heat generated by the CPU. *Id.* ¶ 26. Water tank 20 includes cooling stage 53. *Id.* ¶ 25. Driven by liquid driving module 2 (a pump), liquid heated by CPU 200 flows to cooling stage 53, where heat dissipates through heat-dissipating fins 531, and the resulting cool liquid flows back to cooling plate module 10. *Id.* ¶¶ 23–26.

We have reviewed Petitioner's contentions regarding claim 1, which Patent Owner has not addressed, and determine that they show a reasonable likelihood Petitioner will prevail with respect to obviousness of claim 1 over Duan. We reach the same conclusion regarding Petitioner's assertions for claims 2 and 6, which depend from claim 1.

E. ADDITIONAL GROUND

Petitioner presents assertions regarding obviousness of claims 5 and 8 over Duan and Wu, accounting for the additional terms in those dependent claims. Pet. 71–73. We have reviewed Petitioner's contentions regarding claims 5 and 8, which Patent Owner has not addressed, and determine that they show a reasonable likelihood Petitioner will prevail with respect to obviousness of those claims over Duan and Wu.

III. CONCLUSION

For the reasons discussed above, we conclude Petitioner has shown a reasonable likelihood of prevailing with respect to at least one claim. We have evaluated all of the parties' submissions and determine that the record supports institution.

Our determination at this stage of the proceeding is based on the evidentiary record currently before us. This decision to institute trial is not a final decision as to patentability of any claim for which *inter partes* review has been instituted. Our final decision will be based on the full record developed during trial.

IV. ORDER

Accordingly, it is

ORDERED that, pursuant to 35 U.S.C. § 314(a), *inter partes* review of claims 1, 2, 5, 6, and 8 of the '355 patent is instituted on the grounds set forth in the Petition; and

FURTHER ORDERED that, pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial commencing on the entry date of this decision.

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