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UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA

ASETEK DANMARK A/S,
Plaintiff,
v.
CMI USA, INC.,
Defendant.

Case No. 13-cv-00457-JST

**FINDINGS OF FACT AND
CONCLUSIONS OF LAW; ORDER
ENTERING JUDGMENT IN FAVOR OF
PLAINTIFF**

Re: ECF Nos. 234, 235, 236

This patent infringement case was tried to a jury in December 2014. ECF No. 189. On December 17, 2014, the jury returned a verdict in favor of Plaintiff Asetek Danmark A/S, finding that Defendant CMI USA, Inc.'s products infringed United States Patents No. 8,245,764 and 8,240,362 ("764 patent" and "362 patent"). ECF Nos. 218, 219.

Now before the Court are the parties' proposed findings of fact and conclusions of law, as well as CMI's memorandum of points and authorities in support of its defenses of obviousness, indefiniteness, and lack of written description. ECF Nos. 234, 235, 236. The Court has adopted the proposed findings and conclusions as stated below, and concludes that neither the '764 patent nor the '362 patent are invalid for obviousness, lack of written description, or indefiniteness.

I. FINDINGS OF FACT

A. Background and Procedural History

Asetek is a Denmark-based corporation that sells liquid cooling systems for data centers, servers, workstations, and personal computers. ECF No. 1, ¶¶ 1, 11, 12. It owns the '764 and '362 patents by assignment. ECF No. 118 at 1. The patents relate to devices that use liquid to cool computer components. See ECF No. 1, Exs. A, B.

On January 31, 2013, Asetek filed suit against CMI for infringement of claims 14, 15, and 17-19 of the '362 patent, and claims 1-15, 17, and 18 of the '764 patent, by the following CMI

United States District Court
Northern District of California

1 products: (1) Cooler Master Seidon 120M, 120XL, and 240M; (2) Cooler Master Seidon 120V
2 and 120V Plus; (3) Cooler Master Glacer 240L; and (4) Cooler Master Nepton 140XL and 280L.
3 ECF No. 1; ECF No. 130 at 1. In its complaint, Asetek “demand[ed] a jury trial on all matters
4 triable to a jury.” ECF No. 1 at 7.

5 **1. Claim construction**

6 This case was consolidated for claim construction with another patent-infringement suit
7 brought by Asetek involving the ’362 and ’764 patents. ECF No. 35 at 1 & n.1. Judge Edward M.
8 Chen presided over the joint claim construction proceeding. Id. In its claim construction brief,
9 CMI argued that because “several key claim terms are found nowhere in the written description[,]”
10 these “claims are likely invalid for indefiniteness and/or lack of written description” Asetek
11 Holdings, Inc. v. Coolit Sys. Inc., Case No. 3:12-cv-04498, ECF No. 137 at 1. But CMI suggested
12 that “the Court may decide that issue at a later time.” Id. Judge Chen agreed, reasoning that
13 “[i]nvalidity defenses are usually addressed at summary judgment.” ECF No. 35 at 13 (citation
14 omitted).

15 Judge Chen’s claim construction order also addressed several terms relating to the claims
16 in dispute at trial. See ECF No. 35. He construed the term “reservoir,” as used in both the ’362
17 and ’764 patents, to mean “a receptacle or chamber for holding a liquid or fluid.” Id. at 6, 8.
18 Asetek asked Judge Chen to construe “reservoir” to mean a single receptacle, but he declined to do
19 so, explaining that, “[t]o the extent Asetek puts a premium on the word ‘single,’ that word is
20 unnecessary because the fact that the claim term is ‘reservoir’ (singular) and not ‘reservoirs’
21 (plural) indicates that a reservoir is only one receptacle and not many.” Id. at 8. Judge Chen also
22 declined to construe the term “substantially circular passages,” and instead adopted the plain and
23 ordinary meaning of that term. Id. at 12-14.

24 **2. Summary judgment**

25 After claim construction, CMI moved for summary judgment of invalidity of the ’362 and
26 ’764 patents and non-infringement of the ’362 patent. ECF No. 86. CMI argued that the ’362 and
27 ’764 patents were invalid as both anticipated and obvious. See ECF Nos. 86, 106. But despite the
28 fact that CMI’s expert opined in his report—which CMI relied on to bring its motion for summary

1 judgment—that Asetek’s patents were invalid for lack of a written description and indefiniteness,
2 see ECF No. 99-7 at 36-42, CMI did not assert or even mention these defenses in its motion for
3 summary judgment, see ECF Nos. 86, 106. The Court denied CMI’s motion for summary
4 judgment in full, finding genuine disputes of material fact precluded judgment in CMI’s favor.
5 ECF No. 126.

6 **3. Pre-trial and trial**

7 The matter then proceeded to trial. In the parties’ joint pre-trial statement, CMI revealed
8 that it contested infringement only of the ’362 patent, and not of the ’764 patent. See ECF No.
9 130 at 4-5. CMI also asserted that the ’764 and ’362 patents were invalid as anticipated, obvious,
10 and indefinite, and because they lacked adequate written descriptions. See id. As to the defenses
11 of lack of written description and indefiniteness in particular, the parties submitted (1) a joint
12 pretrial statement, where the parties listed these defenses as “disputed factual issues,” ECF No.
13 130 at 4-5; (2) proposed joint jury instructions, where Final Instruction No. 23 addressed the lack
14 of written description defense, see ECF No. 152 at 49; (3) a proposed jury verdict form, asking the
15 jury to decide the lack of written description defense, ECF No. 155 at 6; and (4) a trial brief,
16 explaining the law governing lack-of-written-description and indefiniteness defenses, ECF No.
17 181 at 8.

18 Jury selection began on December 2, 2014. On December 11, 2014, Asetek discovered
19 that CMI had removed the lack of written description defense instruction from its final proposed
20 jury instructions. ECF No. 236-2; see ECF No. 205 at 28. In response, Asetek’s counsel emailed
21 CMI’s counsel, stating: “We gather from your verdict form that CMI USA is dropping its written
22 description and indefiniteness defenses.” ECF No. 236-2. CMI’s counsel sent two emails in
23 reply, but did not dispute or respond to Asetek’s counsel’s statement. Id. The next day, CMI also
24 removed all mention of the lack of written description defense from its revised proposed jury
25 verdict form. See ECF No. 206 at 3-5.

26 During trial, CMI did not present any evidence that the term “substantially circular” was
27 indefinite or lacked a sufficient written description, failing to question either party’s expert
28

1 regarding these topics.¹ CMI also did not raise these defenses in its pre-verdict motion for
2 judgment as a matter of law. See ECF No. 232. On December 17, 2014, the jury returned a
3 verdict in Asetek’s favor. ECF No. 219.

4 The jury found that all of the accused products infringed the claims of the ’362 patent, and
5 that CMI’s products contributorily infringed the asserted method claims of the ’362 patent. Id. at
6 1-2. Further, the jury found that the ’764 patent was not invalid as anticipated by the Koga prior
7 art reference.² Id. at 2.

8 The jury also rendered several decisions related to the question of obviousness. First, the
9 jury found that a person of ordinary skill in the field of liquid cooling at the time of inventions
10 claimed in the ’764 and ’362 patents was:

11 someone who has completed college level course work in
12 thermodynamics, fluid mechanics, and heat transfer, and would have
13 two or more years of experience in designing liquid cooling systems
14 for computers or very similar technology or one with a more
15 advanced degree in the above fields [who] may have had less
16 practical experience.

17 Id. at 3. Second, the jury described the scope and content of the prior art at the time of the claimed
18 invention as follows:

19 The prior art devices included a pump, a single-chamber reservoir
20 (as that term was used in the prior art), and a cold plate as separate
21 components that were connected using tubing or attached together
22 with clips or screws or perm[an]ently coupled. Certain prior art
23 devices had a pump and a cold plate incorporated into a single swirl
24 chamber, which provided no separation between the pumping and
25 the heat exchange functionalities of the liquid cooling device.

26 Id. Third, the jury determined the differences that existed between the claimed invention and the
27 prior art at the time of the invention. The differences included:

28 Asetek’s patented invention is directed to a closed loop liquid
cooling system in which cooling liquid is pumped continuously
between a pump head and a heat radiator (positioned remote from

1 CMI did, however, elicit some indefiniteness testimony from Dr. Tilton as it related to the term
“removably attached.” ECF No. 234 at 15; ECF No. 236 at 42 n.6; Tilton 1568:12-1570:2.

2 The parties do not dispute that U.S. Patent No. 7,554,049 to Koga et al. (“Koga”), Korean Patent
No. 20-0314041 to Ryu (“Ryu”), and U.S. Publication No. 2004/0052663 to Laing et al. (“Laing”) are prior art to Asetek’s patents. ECF No. 235 at 4; ECF No. 236, ¶¶ 19-27.

1 the pump head). Rather than connecting together multiple separate
2 components (as in the prior art), Asetek’s patented pump head
3 design combines, into a single unit, a pump and the claimed
4 “reservoir” that has, among other things, dual chambers and is
5 bounded by a removable cold plate. Also, the claimed “reservoir” in
6 Asetek’s invention is a single receptacle that is divided into an upper
7 chamber and a lower chamber, with the upper chamber providing
8 the pumping function and the lower chamber providing the thermal
9 exchange function. In addition to providing efficient heat removal,
10 Asetek’s patented invention includes at least one of the following
11 benefits over each example of prior art: a compact (narrow) profile,
12 cost-effective manufacturing, and reduced risk of fluid leakage.

13 Id. at 4. Finally, the jury found that Asetek established all objective indicia of non-obviousness
14 that Asetek sought to prove at trial, including: (1) “commercial success of [the] product[s] due to
15 the merits of the claimed invention”; (2) “a long-felt need for the solution that is provided by the
16 claimed invention”; (3) “unsuccessful attempts by others to find the solution that is provided by
17 the claimed invention”; (4) “copying of the claimed invention by others”; (5) “unexpected and
18 superior results from the claimed invention”; and (6) “acceptance by others of the claimed
19 invention as shown by praise from others in the field or from the licensing of the claimed
20 invention.” Id.³

21 A few weeks after the trial concluded, CMI’s counsel advised Asetek’s counsel that CMI
22 would pursue written description and indefiniteness defenses in its post-trial motions, ECF No.
23 236-1, ¶ 8, a fact it subsequently confirmed at the January 12 case management conference. At
24 the conference, Asetek argued that CMI had waived the defenses by not pursuing them at trial.
25 ECF Nos. 228, 231.

26 On January 26, 2015, CMI filed its proposed findings of fact and conclusions of law, as
27 well as its memorandum of points and authorities in support of its defenses. ECF Nos. 234, 235.
28 On February 9, 2015, Asetek filed its responsive proposed findings of fact and conclusions of law.
ECF No. 236.

B. Evidence Adduced at Trial

1. Experts

³ The jury also determined that Asetek was entitled to \$404,941 in damages, representing a 14.5% royalty rate. ECF No. 219 at 5. The jury premised this determination on the notion that neither the ’362 nor the ’764 patent is invalid.

1 At trial, the parties each produced one expert to testify as to the patents-in-suit,
2 infringement, and validity. Asetek offered the testimony of Dr. David Tilton, while CMI provided
3 the testimony of Dr. Gregory P. Carman.

4 Dr. Tilton has the education and experience to qualify him as a person of ordinary skill in
5 the art under the jury's definition. See ECF No. 219 at 3. He has an academic background in
6 mechanical engineering with a specific focus in "heat transfer, fluid flow, and thermodynamics."
7 Tilton 565:14-567:9. Dr. Tilton's master's thesis was in heat pipe cooling, and his doctoral thesis
8 was in spray cooling technology. Id. at 565:20-22; 568:17-23. Spray cooling is a closed-loop
9 liquid cooling system that is related to the liquid cooling technology of the patents-in-suit. Id. at
10 568:17-569:23. Dr. Tilton has twenty years of experience at a company called Isothermal Systems
11 Research, where he developed liquid cooling products using spray cooling technology. Id. at
12 574:23-575:19. He has experience in developing liquid cooling products for high-end intelligence
13 applications for the CIA, NSA, and other intelligence agencies. Id. at 575:20-577:2.

14 Dr. Tilton has experience developing desktop liquid cooling systems for companies such as
15 Intel, Hewlett-Packard, Sun Microsystems, and Cray Research. Id. at 577:7-16; 577:22-578:9. In
16 fact, Dr. Tilton testified that his company attempted to develop a liquid cooling product for the
17 market at the time that Andre Eriksen, the named inventor on both patents-in-suit and Asetek's
18 founder and current CEO, was developing the patented inventions at issue here. Id.; Eriksen
19 276:11-18; 277:14-21; 278:10-21. Dr. Tilton was unable to develop a product that met both his
20 cost and performance targets, such that the product could succeed in the marketplace. Tilton
21 580:4-16. Thus, during his twenty years of experience developing liquid cooling products at
22 Isothermal Systems Research, Dr. Tilton contemporaneously examined the liquid cooling products
23 available in the market prior to Asetek's entry into the market, and he has first-hand knowledge of
24 the prior art technologies at issue in this case. Id. at 579:8-580:22.

25 Dr. Carman is a professor in the Mechanical and Aerospace Engineering Department at the
26 University of California at Los Angeles, for whom he has worked since 1992. Carman 709:1-11.
27 He earned a bachelor's degree in engineering and science mechanics, id. at 710:2-9, and then
28 received a master's degree in metallurgical and materials engineering from the University of

1 Alabama, where he focused on fiber composites, id. at 710:17-24. Dr. Carman then received his
2 Ph.D. in continuous fiber composites. Id. 710:25-711:4.

3 Dr. Carman’s research projects that he identified as most relevant to the technology
4 claimed in the ’362 and ’764 patents include a relatively small artificial heart pump that can be
5 used for patients waiting for heart transplants; the harvesting of thermal energy to generate
6 electricity as the thermal energy is transferred from a hot to a cold surface; and a pump system
7 used to heat and cool an alloy used in rocket nose cones. Id. at 716:5-720:8. Dr. Carman has
8 taught mechanical engineering classes, but has not worked on computer liquid cooling systems.
9 Id. at 721:14-18; 722:12-17.

10 **2. The patented inventions**

11 Asetek’s expert, Dr. Tilton, testified that the claims of both the ’764 and ’362 patents are
12 directed to a liquid cooling device comprising a specific structure—a dual-chambered reservoir
13 bounded by a cold plate. Tilton 1412:25-1413:8. In the ’362 patent, the dual chambers in the
14 “reservoir” are termed the “upper” and “lower” chambers, while in the ’764 patent, the chambers
15 are called the “pump chamber,” and the “thermal exchange chamber.” ECF No. 1, Exs. A, B. In
16 both patents, the cold plate, which forms the boundary wall of the reservoir and is placed in
17 thermal contact with the heat generating unit of a computer, is termed the “heat exchanging
18 interface.” Id. For example, claim 1 of the ’764 patent is stated below, with the recited
19 “reservoir,” “pump chamber,” “thermal exchange chamber,” and “heat exchanging interface” in
20 bold:

21 1. A cooling system for a heat-generating component, comprising:

22 A double-sided chassis adapted to mount a pump configured to
23 circulate a cooling liquid, the pump comprising a stator and an
24 impeller, the impeller being positioned on the underside of the
chassis and the stator being positioned on the upper side of the
chassis and isolated from the cooling liquid;

25 **a reservoir** adapted to pass the cooling liquid therethrough, **the**
26 **reservoir including:**

27 **a pump chamber** including the impeller and formed below the
28 chassis, the pump chamber being defined by at least an impeller
cover having one or more passages for the cooling liquid to pass
through;

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a thermal exchange chamber formed below the pump chamber and vertically spaced apart from the pump chamber, the pump chamber and the thermal exchange chamber being separate chambers that are fluidly coupled together by one or more passages; and

a heat exchanging interface, the heat-exchanging interface forming a boundary wall of the thermal exchange chamber, and configured to be placed in thermal contact with a surface of the heat-generating component; and

a heat radiator fluidly coupled to the reservoir and configured to dissipate heat from the cooling liquid.

ECF No. 1, Ex. B at 27:39-65.

3. Scope and content of the prior art

CMI asserts three pieces of prior art here: Patent No. 7,544,049 to Koga, et al., which is titled “Cooling Device and Centrifugal Pump to be Used in the Same Device”; Korean Patent No. 20-0314041 to Ryu, which is titled “Water Cooler for Computer Central Processing Unit Having Impeller”; and United States Patent Application 10/434307, filed May 7, 2003 by Laing, for “a Device for the Local Cooling or Heating of an Object by Means of a Fluid.” The parties agree that both Koga and Ryu are prior art to Asetek’s patents, and both are directed to cooling systems for heat-generating components of computers. Carman 1142:13-1143:7; 1255:9-1257:6; see Tr. Ex. 529 (Ryu); Tr. Ex. 535 (Koga). CMI also relies on Laing as a prior art reference to the claimed inventions. See, e.g., ECF No. 234 at 6-7.

a. Ryu

While Dr. Carman testified that Ryu discloses a dual-chambered reservoir with the upper chamber termed the “pump driver” and the lower chamber the “water jacket,” Carman 1146:13-22; 1147:3-10, 12-25; 1148:1-8; 1148:14-1149:21; 1150:17-20, Dr. Tilton disagreed, explaining that Ryu does not teach a dual-chambered reservoir, but rather describes two receptacles that are separate structural and functional components, Tilton 1441:24-1443:7; 1444:13-25. The experts agreed, however, that Ryu’s two chambers/components are connected to allow fluid to pass between them. Id. at 1442:22-1443:7; Carman 1142:13-1143:7.

Dr. Tilton further testified that Ryu neither describes nor suggests that the pump driver and water jacket can be manufactured together as one component, or that a person of ordinary skill in

1 the art would have considered combining the two into a single component, because of the specific
2 and demanding manufacturing requirements of the water jacket’s vacuum-brazed assembly. Id. at
3 1443:8-1444:12; see also ECF No. 238, Ex. 5 (depicting a vacuum-brazed structure like that used
4 to form Ryu’s water jacket). Dr. Tilton also testified, however, that it was possible that Ryu’s two
5 chambers/components could be made of the same material and therefore in a single piece. Tilton
6 1571:6-19.

7 Dr. Tilton and Eriksen agreed there are no functional differences between the cold plate,
8 fan, and radiator disclosed in the ’362 and ’764 patents and those disclosed in Ryu. Eriksen
9 467:4-16; 468:11-14; Tilton 597:12-17.

10 **b. Koga**

11 Dr. Carman testified that Koga discloses a reservoir, with a pump room/chamber and a
12 thermal exchange chamber labeled sucking channel 19. Carman 1255:9-1257:6; 1257:15-1259:2;
13 1259:18-1261:8; 1277:13-1278:3, 1279:2-1280:2; 1288:13-19. Dr. Tilton disagreed, testifying
14 that Koga is a single-chambered device, where both pumping and thermal exchange occur in the
15 pump room/reservoir. Tilton 1415:5-1416:14. Dr. Tilton explained that though some negligible
16 amount of heat exchange would occur between Koga’s sucking channel 19 and the heat-generating
17 component of a computer, because “heat transfer will always happen between two bodies that are
18 at . . . different temperatures,” a person of ordinary skill in the art would not consider sucking
19 channel 19 a thermal exchange chamber for the reasons discussed more fully in section II.A.4.,
20 infra. Tilton 1558:3-17. Rather, Dr. Tilton opined that heat exchange occurs in Koga’s pump
21 room, where turbulent flow over dimples and pins produces the vast majority of thermal exchange
22 that occurs in the device. Id. at 1415:5-19.

23 Dr. Carman also opined that Koga discloses an impeller having curved blades. Carman
24 1142:13-1143:7; 1153:3-20. Dr. Tilton did not dispute this opinion.

25 **c. Jury’s findings**

26 The jury apparently agreed with Dr. Tilton and Asetek that none of the prior art disclosed a
27 single reservoir composed of two chambers; they adopted Asetek’s position on the jury verdict
28 form with only one minor revision. See ECF No. 219 at 4 (“The prior art devices included a

1 pump, a single-chambered reservoir (as that term was used in the prior art), and a cold plate as
2 separate components Certain prior art devices had a pump and cold plate incorporated into a
3 single swirl chamber, which provided no separation between the pumping and the heat exchange
4 functionalities of the liquid cooling device.”).

5 **4. Differences between the prior art and the subject matter as a whole**

6 Dr. Tilton explained that Koga and Ryu differ in several respects. In particular, Dr. Tilton
7 explained that Koga does not disclose, teach, or suggest a dual-chambered reservoir, including
8 separate pump and thermal exchange chambers, as recited in the ’764 patent. Tilton 1414:25-
9 1416:14. Dr. Tilton also testified that Ryu is “a completely different invention in the same field of
10 practice” as the devices disclosed in Asetek’s patents. Id. at 1441:24-1442:6. Specifically,
11 nowhere does Ryu teach or suggest a dual-chambered reservoir comprising an upper/pump
12 chamber and a lower/thermal exchange chamber; instead, Ryu describes two separate receptacles
13 that are connected with screws or clips, or are laminated together. Id. at 1442:7-1443:7; 1443:12-
14 1444:12.

15 The jury agreed with Asetek that material differences distinguished Asetek’s inventions
16 from the prior art. See ECF No. 219 at 4 (“Rather than connecting together multiple separate
17 components (as in the prior art), Asetek’s patented pump head design combines, into a single unit,
18 a pump and the claimed ‘reservoir’ that has, among other things, dual chambers and is bounded by
19 a removable cold plate. Also, the claimed ‘reservoir’ in Asetek’s invention is a single receptacle
20 that is divided into an upper chamber and a lower chamber, with the upper chamber providing the
21 pumping function and the lower chamber providing the thermal exchange function.”).

22 **5. Secondary considerations/objective indicia of non-obviousness**

23 Evidence regarding secondary considerations of obviousness/objective indicia of non-
24 obviousness was also adduced at trial. The evidence related to: (1) the commercial success of
25 Asetek’s products due to the merits of the claimed invention; (2) a long-felt need for the solution
26 that the claimed invention provides; (3) unsuccessful attempts by others to find the solution that
27 the claimed invention provides; (4) copying of the claimed invention; (5) unexpected and superior
28 results of the invention; and (6) acceptance by others of the claimed invention, as shown by praise

1 from others in the field or from the licensing of the claimed invention. The jury agreed that
2 Asetek had proven the existence of all those indicia of non-obviousness. ECF No. 219 at 4.

3 **a. Commercial success**

4 Eriksen testified that Asetek’s commercial liquid cooling products have been a commercial
5 success. Eriksen 281:18-284:11; 292:14-294:22; 297:15-301:2; 309:6-310:7; 318:3-319:5;
6 425:10-19. Asetek’s commercial liquid cooling products (currently sold as “Generation III” and
7 “Generation IV” designs) embody the claimed invention of the ’362 and ’764 patents, and a nexus
8 connects the merits of the claimed invention and the commercial success of Asetek’s liquid
9 cooling products. Eriksen 309:6-310:7; 318:3-319:5; 425:10-19; Tilton 1536:10-1537:8; 1538:8-
10 16. Dr. Carman did not testify that the commercial success of Asetek’s products was due to
11 something other than the claimed invention.

12 **b. Long-felt but unresolved need**

13 Before Asetek released its products embodying the patented designs, the computing
14 industry was facing a growing but unmet need for liquid cooling systems that would overcome the
15 limitations of air-cooling and the deficiencies of prior art liquid cooling systems. Eriksen 319:24-
16 332:20. Asetek’s patented products met this need. Id.

17 **c. Unsuccessful attempts by others**

18 Prior to Asetek’s commercial success, many in the computer liquid cooling industry,
19 including Corsair, tried and failed to develop marketable closed-loop liquid cooling products.
20 Eriksen 357:5-362:10. In particular, Corsair unsuccessfully attempted to sell liquid cooling
21 products, but abandoned its unsuccessful efforts before teaming up with Asetek. Id. Similarly,
22 Dr. Tilton’s company attempted to design a computer liquid cooling system, but was unable to
23 make one that met cost and performance requirements. Tilton 580:4-16.

24 **d. Copying**

25 Cooler Master Co., Ltd./CMI USA and Zalman copied Asetek’s Generation III and
26 Generation IV commercial products, respectively. Eriksen 373:20-379:17; 401:21-409:16; see,
27 e.g., ECF No. 238-3 at 12-14, 16-17 (comparison of Asetek and CMI products).

28 **e. Unexpected and superior results**

1 Asetek's patented dual-chamber reservoir design has many unexpected and superior results
2 over prior art single-chamber designs. Eriksen 332:21-343:17; Tilton 577:25-578:7; 600:11-
3 606:5.

4 **f. Acceptance by others of the claimed invention**

5 Asetek's commercial liquid cooling products have received recognition and numerous
6 awards from the computer industry, as well as government agencies. Eriksen 298:14-301:2; see,
7 e.g., ECF No. 238-3 at 4-6. Several companies in the liquid cooling industry (Enermax, Swiftech,
8 AVC) requested licenses to the '362 and '764 patents, Eriksen 432:22-438:8, and Corsair took a
9 brief license to the patents, which was terminated and replaced by a covenant not to sue, id. at
10 437:18-438:2; 444:5-445:4.

11 **g. Nexus between the claimed invention and commercial**
12 **success/copying**

13 As for the nexus between the claimed invention and the commercial success and copying
14 of the product, Dr. Tilton testified that he never prepared claim charts comparing Asetek's
15 products to the language of the claims in the '764 and '362 patents, and that his discussion in his
16 expert report of his conclusions regarding nexus was a single sentence in a footnote. Tilton
17 1574:14-1576:7.

18 At trial, however, Dr. Tilton testified that he examined examples of Asetek's Generation
19 III and Generation IV products by disassembling and analyzing their features, and that based on
20 his examination, he determined that Asetek's Generation III and IV liquid cooling products
21 practice Asetek's patented invention. Tilton 1536:10-1537:3. Further, Dr. Tilton testified that he
22 could not think of any unpatented features in Asetek's products that were driving customer
23 demand for the products. Id. at 1538:13-16. Finally, Dr. Tilton explained that the commercial
24 success of Asetek's desktop liquid cooling products is attributable to the unique characteristics of
25 the patented invention, rather than to the mere inclusion of the claimed invention in products that
26 are commercially successful for other reasons. Id. at 1537:4-8; 1538:8-12; see also Tilton 600:11-
27 606:5.

28 As for evidence that others in the market copied aspects of the claimed invention, rather

1 than merely unpatented features of Asetek’s products, Asetek presented evidence that the accused
2 Seidon products were copies of Asetek’s patented Generation III pump head design. Eriksen
3 373:20-379-25; see also ECF No. 238-3 at 12-14, 16-17 (comparison of Asetek and CMI
4 products).

5 **6. Motivation to combine**

6 Dr. Carman testified that one of ordinary skill in the art would have been motivated to
7 combine Ryu with Koga and/or Laing because each of these references is directed to the field of
8 liquid cooling, each tries to solve the same problem, and combining these prior art elements
9 according to known methods would have yielded predictable results. Carman 1161:5-1162:4.

10 Dr. Tilton testified that the claimed inventions are not simply combinations of three prior
11 art elements—a reservoir, a pump, and a cold plate—into a single unit. Tilton 1411:24-1412:24.
12 Rather, the inventions cover “very specific geometric structures, methods of construction,
13 materials of construction, the way that the fluid moves in the device, [and] the types of heat
14 transfer surfaces that are used.” Id. Significant novel engineering was involved in the design and
15 development of the “dual-chambered reservoir bounded by a cold plate” concept and recited
16 invention, and none of the prior art references CMI has cited describes a dual-chambered
17 reservoir. Id. at 1414:4-12; see also Eriksen 287:2-5; 289:1-290:7; 319:6-339:1; 339:22-343:1
18 (explaining the process of developing the claimed inventions).⁴

19 **II. CONCLUSIONS OF LAW**

20 **A. Obviousness**

21 **1. Generally**

22
23 ⁴ The parties also discuss the fact that in inter partes review by the U.S. Patent and Trademark
24 Office (“PTO”), an examiner found that all claims of the ’764 patent were invalid as anticipated
25 by Koga. See ECF No. 235 at 13; ECF No. 236 at 13-14. Because an inter partes review
26 examiner makes a determination using a lesser standard of proof than does the Court—
27 preponderance of the evidence, rather than clear and convincing evidence—and because an
28 examiner must give the prior art the broadest reasonable interpretation, In re Oetiker, 977 F.2d
1443, 1445 (Fed. Cir. 1992); Therasense, Inc. v. Becton, Dickinson & Co., 649 F.3d 1276, 1291-
92 (Fed. Cir. 2011) (citation omitted), the Court finds that the PTO’s conclusions are not relevant
to the Court’s determination here. See also ECF No. 126 at 11 (declining to rely on findings of the
PTO examiner at summary judgment).

1 A patent is invalid for obviousness if “the differences between the subject matter sought to
2 be patented and the prior art are such that the subject matter as a whole would have been obvious
3 at the time the invention was made to a person having ordinary skill in the art to which said
4 subject matter pertains.” 35 U.S.C. § 103(a). Obviousness is a question of law premised on four
5 factual considerations: (1) the scope and content of the prior art; (2) the differences between the
6 prior art and the claimed subject matter as a whole; (3) the level of ordinary skill in the art; and (4)
7 objective indicia of non-obviousness, also known as secondary considerations. KSR Int’l Co. v.
8 Teleflex Inc., 550 U.S. 398, 406-07 (2007) (citing Graham v. John Deere Co., 383 U.S. 1, 17-18
9 (1966)). Because patents are presumed valid, 35 U.S.C. § 282(a), the party asserting a patent’s
10 invalidity bears the burden of proving it by clear and convincing evidence. Pfizer, Inc. v. Apotex,
11 Inc., 480 F.3d 1348, 1359 (Fed. Cir. 2007).

12 Obviousness is evaluated from the state of the art as it existed at the time of the alleged
13 invention. 35 U.S.C. § 103(a). Courts must be cautious not to look at the invention through the
14 lens of hindsight. KSR, 550 U.S. at 421; Star Scientific, Inc. v. R.J. Reynolds Tobacco Co., 655
15 F.3d 1364, 1375 (Fed. Cir. 2011).

16 A conclusion of obviousness requires at least a suggestion of all the limitations in a claim
17 by the prior art. CFMT, Inc. v. Yieldup Int’l Corp., 349 F.3d 1333, 1342 (Fed. Cir. 2003) (citation
18 omitted). A claim that depends from a non-obvious independent claim is non-obvious because it
19 contains all the limitations of the independent claim, plus a further limitation. In re Fine, 837 F.2d
20 1071, 1076 (Fed. Cir. 1988) (citations omitted); Hartness Int’l Inc. v. Simplimatic Eng’g Co., 819
21 F.2d 1100, 1108 (Fed. Cir. 1987) (citation omitted); see 35 U.S.C. § 112(d) (“A claim in
22 dependent form shall be construed to incorporate by reference all the limitations of the claim to
23 which it refers.”).

24 An invention is not obvious under section 103 “just because it was obvious ‘to explore a
25 new technology or general approach that seemed to be a promising field of experimentation,
26 where the prior art gave only general guidance as to the particular form of the claimed invention or
27 how to achieve it.” Procter & Gamble Co. v. Teva Pharm. USA, Inc., 566 F.3d 989, 997 (Fed.
28 Cir. 2009) (quoting In re O’Farrell, 853 F.3d 894, 903 (Fed. Cir. 1988)). The nature of the

1 problem to be solved by the invention, however, can provide the motivation to combine teachings
2 from different references to arrive at the claimed system. Ruiz v. A.B. Chance Co., 357 F.3d
3 1270, 1276 (Fed. Cir. 2004) (citations omitted). And simply arranging old elements with each
4 performing the same function it is already known to perform is not patentable. KSR, 550 U.S. at
5 417 (citation omitted).

6 **2. Objective indicia of non-obviousness/secondary considerations**

7 Objective evidence of non-obviousness is “often . . . the most probative and cogent
8 evidence” available to a court evaluating the question of obviousness. Ortho-McNeil Pharm., Inc.
9 v. Mylan Labs., Inc., 520 F.3d 1358, 1365 (Fed. Cir. 2008) (quoting Catalina Lighting, Inc. v.
10 Lamps Plus, Inc., 295 F.3d 1277, 1288 (Fed. Cir. 2002)). These secondary considerations may
11 include commercial success, long-felt but unsolved need, or the prior failure of others. Graham,
12 383 U.S. at 17. Other objective indicia include whether the prior art teaches away from the
13 invention, whether others have copied the invention, whether the invention produces unexpected
14 or superior results, and whether the invention has received industry acclaim. See Ecolchem, Inc.
15 v. S. Cal. Edison Co., 227 F.3d 1361, 1376-80 (Fed. Cir. 2000), cert. denied, 532 U.S. 974 (2001);
16 Specialty Composites v. Cabot Corp., 845 F.2d 981, 991 (Fed. Cir. 1988) (citations omitted). “To
17 be afforded substantial weight, [] objective indicia of non-obviousness must be tied to the novel
18 elements of the claim at issue.” Institut Pasteur & Universite Pierre et Marie Curie v. Focarino,
19 738 F.3d 1337, 1347 (Fed. Cir. 2013) (citing In re Kao, 639 F.3d 1057, 1068 (Fed. Cir. 2011)).

20 Evidence of a long-felt and unresolved need in the industry for the solution offered by the
21 patented invention supports a finding that the invention was not obvious at the time the invention
22 was made. Procter & Gamble, 566 F.3d at 998. “[C]opying the claimed invention, rather than one
23 within the public domain, is [also] indicative of non-obviousness.” Windsurfing Int’l Inc. v.
24 AMF, Inc., 782 F.2d 995, 1000 (Fed. Cir. 1986) (citations omitted).

25 To indicate non-obviousness, the commercial success of the product must be due to the
26 merits of the claimed invention, beyond what was readily available in the prior art. J.T. Eaton &
27 Co. v. Atl. Paste & Glue Co., 106 F.3d 1563, 1571 (Fed. Cir. 1997). When the patentee has
28 demonstrated commercial success and “the successful product is the invention disclosed and

1 claimed in the patent, it is presumed that the commercial success is due to the patented invention.”
2 Id. The challenger bears the burden to prove that the commercial success is instead “due to
3 extraneous factors other than the patented invention, such as advertising, [or] superior
4 workmanship” Demaco Corp. v. F. Von Langsdorff Licensing Ltd., 851 F.2d 1387, 1393
5 (Fed. Cir. 1988). The party asserting invalidity must provide evidence to rebut the presumed
6 nexus between the patented invention and commercial success. Winner Int’l Royalty Corp. v.
7 Wang, 202 F.3d 1340, 1351-52 (Fed. Cir. 2000); Demaco, 851 F.2d at 1393.

8 Unexpected superior properties of an invention suggest that the invention was not obvious
9 to one of ordinary skill in the art at the time of the claimed invention, because “that which would
10 have been surprising to a person of ordinary skill in a particular art would not have been obvious.”
11 In re Soni, 54 F.3d 746, 750 (Fed. Cir. 1995); see also Procter & Gamble, 566 F.3d at 997.

12 Unexpected results that inherently flow from a claimed invention are evidence of non-obviousness
13 of the invention that need not be described in the patent’s text. Knoll Pharm. Co. v. Teva Pharms.
14 USA, Inc., 367 F.3d 1381, 1385 (Fed. Cir. 2004).

15 “Praise for the invention, including awards accorded to the inventors for their invention,
16 [is] further evidence of the” non-obviousness of the invention. Corning Glass Works v. Sumitomo
17 Elec. U.S.A. Inc., 671 F. Supp. 1369, 1398 (S.D.N.Y. 1987), aff’d, 868 F.2d 1251 (Fed. Cir.
18 1989). Appreciation of the invention by those of ordinary skill in the art is further evidence that
19 the invention was not obvious when it was invented. See, e.g., Vulcan Eng’g Co. v. Fata
20 Aluminum, Inc., 278 F.3d 1366, 1373 (Fed. Cir. 2002); In re Piasecki, 745 F.2d 1468, 1473-74
21 (Fed. Cir. 1984). Licensing of the patented invention by others in the industry also supports a
22 finding of non-obviousness, as it tends to show industry recognition. Institut Pasteur, 738 F.3d
23 1344, 1346-67.

24 **3. Weight to be given expert testimony**

25 The Court must rely substantially on expert testimony to resolve the issue of obviousness.
26 Indeed, in cases involving complex technology, expert testimony is necessary to establish
27 invalidity on grounds of obviousness. Proveris Scientific Corp. v. Innovasystems, Inc., 536 F.3d
28 1256, 1260, 1267 (Fed. Cir. 2008).

1 Given the respective qualifications and experience of Drs. Tilton and Carman, the Court
2 finds that, generally, Dr. Tilton’s testimony regarding computer liquid cooling system technology
3 and the level of ordinary skill of a practitioner in the art is entitled to greater weight than is Dr.
4 Carman’s.⁵ See Crom Corp. v. Crom, 677 F.2d 48, 51 (9th Cir. 1982) (concluding that the district
5 court properly permitted expert testimony, but cautioned the jury specifically that the expert’s lack
6 of experience in the patented technology was a factor for the jury to consider in assessing the
7 weight to be given the expert’s testimony); Quiet Tech. DC-8, Inc. v. Hurel-Dubois UK Ltd., 326
8 F.3d 1333, 1341 (11th Cir. 2003) (acknowledging that an expert’s qualifications may bear on the
9 reliability of the proffered testimony); see also ECF No. 126 at 2-4 (explaining in order on motion
10 to exclude Dr. Carman’s testimony that Dr. Carman’s experience in the field of liquid cooling
11 systems for computers is a consideration that goes to the weight of his testimony) (citation
12 omitted).

13 While Dr. Carman certainly has impressive qualifications, and the Court has no doubt that
14 he is able to understand and apply the thermodynamic and mechanical sciences underlying the
15 claimed inventions, Dr. Tilton has significantly more firsthand experience in this particular
16 technology. He therefore has more background knowledge underlying his opinions about the
17 technology and the perspective of a person of ordinary skill in the art than does Dr. Carman.
18 Finally, having observed the testing of both witnesses on cross-examination, the Court finds Dr.
19 Tilton’s testimony in its totality to be the more credible.

20 **4. ’764 Patent**

21 **a. The prior art**

22 The Court has considered the full scope of CMI’s obviousness arguments related to the
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24 ⁵ Of course, in a case tried to a jury, only the jury enjoys the role of choosing the weight it assigns
25 to witness testimony as it pertains to matters of fact, and courts must be careful not to invade that
26 province. Apple Inc. v. Motorola, Inc., 757 F.3d 1286, 1314 (Fed. Cir. 2014). But in this case, the
27 Court also has a role in making legal decisions based at least in part on expert testimony; when
28 making those decisions, the Court must assign relative weights to conflicting expert testimony. In
any event, it appears that the jury assigned more weight to Dr. Tilton’s testimony than Dr.
Carman’s with respect to all of the jury’s factual findings: the jury adopted Asetek’s position,
with only minor variations, on all factual issues the jury decided. See ECF No. 219.

1 '764 patent and finds them unpersuasive. CMI has not established by clear and convincing
2 evidence that the asserted claims of the '764 patent are obvious based on Ryu in combination with
3 Koga and/or Laing. Rather, the Court is persuaded by substantial evidence that Koga, Ryu, and/or
4 Laing do not teach, disclose, or suggest each and every limitation of the asserted claims of the
5 '764 patent. Accordingly, the Court concludes that the prior art, and in particular Ryu and Koga,
6 do not render the '764 patent invalid for obviousness.

7 Specifically, the Court concludes that CMI has not proven, by clear and convincing
8 evidence, that Koga discloses, suggests, or teaches a dual-chambered reservoir, including separate
9 pump and thermal exchange chambers, all of which are required for each of the asserted claims of
10 the '764 patent. Dr. Tilton testified that Koga discloses a single-chambered device, where both
11 pumping and thermal exchange occur, not a dual-chambered device with separate pump and
12 thermal exchange chambers that, in combination, form a reservoir. Tilton 1415:5-1416:14;
13 1422:23-1424:13;1424:15-1425:2; 1429:13-1430:5. The jury agreed. See ECF No. 219 at 3-4.
14 And so long as the jury's implicit and explicit factual findings regarding the scope and content of
15 the prior art, and the differences between the claimed invention and the prior art, are supported by
16 substantial evidence—which they are, given Dr. Tilton's testimony—the Court must accept those
17 findings. Kinetic Concepts, Inc. v. Smith & Nephew, Inc., 688 F.3d 1342, 1360 (Fed. Cir. 2012).
18 Thus, despite Dr. Carman's testimony to the contrary, the Court finds that Koga is a single-
19 chambered device that lacks separate pump and thermal exchange chambers.

20 Furthermore, the Court concludes that CMI has not shown that a person of ordinary skill in
21 the art would understand Koga's sucking channel 19 to constitute a thermal exchange chamber—a
22 limitation of all the asserted claims of the '764 patent. This is true for several reasons. First, all
23 indications are that the primary purpose of sucking channel 19 is as a conduit to deliver cooling
24 fluid to the rotational center of Koga's pump room. See Tilton 1416:18-1417:9; 1417:23-1418:25;
25 1429:3-12; Jury Question & Carman 1645:3-13 ("The primary purpose [of sucking channel 19] is
26 to pass fluid to the pump room"); Tr. Ex. 535 (Koga) at 4:57-67. Second, the amount of heat that
27 could be drawn off a heat-generating component by thermal exchange in sucking channel 19
28 would be inconsequential, because sucking channel 19 is a narrow-diameter channel with very

1 little surface area available to absorb heat, and because sucking channel 19 is simply a flow-
2 through conduit that does not permit coolant enough time to absorb and accumulate heat from a
3 heat-generating component. Tilton 1417:23-1418:25; 1419:8-24; 1427:11-1428:24. Third, Koga
4 teaches away from having the sucking channel sit on top of and be in thermal contact with the
5 heat-generating component, as would be required for effective heat transfer and thus cooling.
6 Tilton 1419:1-1422:17; 1438:9-1439:5; Tr. Ex. 535 (Koga) at 8:47-53, 10:33-40. And fourth,
7 Koga does not disclose or suggest that the interior of sucking channel 19 exhibits heat-exchange
8 features, as is required by dependent claim 4 of the '764 patent. Tilton 1425:8-1426:6; 1436:18-
9 1437:15; Carman 1335:9-1336:6; 1342:23-1345:17.

10 At bottom, CMI has not shown how sucking channel 19, which is not designed to induce
11 any significant amount of heat exchange, should be deemed a “thermal exchange” chamber in a
12 device whose quintessential function is to effect thermal exchange by removing heat from
13 computer components that can only function properly under relatively cool conditions. CMI has
14 not provided the Court with clear and convincing evidence that Koga discloses, suggests, or
15 teaches a thermal exchange chamber. Asetek, on the other hand, points to substantial evidence
16 that supports the jury’s verdict on this point. The Court agrees with the jury and with Dr. Tilton
17 that Koga does not disclose a dual-chambered reservoir with sucking channel 19 serving as a
18 thermal exchange chamber.

19 CMI also has not shown that Ryu discloses a reservoir—a receptacle or chamber for
20 holding a liquid or fluid that includes a pump chamber and a thermal exchange chamber—as is
21 required by all asserted claims of the '764 patent. Dr. Tilton testified that Ryu is a device
22 composed of two separate components that probably would not be manufactured as a single piece,
23 not a single receptacle with two chambers. Tilton 1442:7-1444:25; 1506:20-1507:9. In particular,
24 Dr. Tilton explained that a fundamental invention of Ryu is a “vacuum-brazed cold plate or water
25 jacket that was superior to the state of the art at the time.” *Id.* at 1442:7-21. Vacuum brazing
26 happens at extremely high temperatures under “strict guidance”; therefore, one of ordinary skill in
27 the art would not consider making Ryu’s two components—pump driver 20 and vacuum-brazed
28 water jacket 30—as one component. *Id.* at 1443:21-1444:12.

1 Further, Dr. Tilton pointed out in his testimony that Ryu’s pump chamber and water jacket
2 are not just separate components, but can be spatially separated and connected by tubing, yet still
3 meet the functional requirements of the device, unlike the device disclosed in the ’764 patent.
4 Tilton 1445:1-1447:21; see also Tr. Ex. 529 (Ryu). This testimony all suggests that Ryu does not
5 disclose a reservoir containing two separate chambers, but rather is a two-component device
6 without an individual reservoir for holding fluid.

7 Dr. Carman testified that Ryu does disclose a reservoir with two chambers, but after
8 examining Ryu, the ’764 patent, and the rest of the testimony in this case, the Court finds
9 substantial evidence to support the jury’s implicit conclusion that Ryu does not disclose a dual-
10 chambered reservoir. CMI has not met its burden to prove by clear and convincing evidence that
11 Ryu discloses a reservoir with dual chambers.

12 Finally, CMI has not shown that one of ordinary skill in the art would combine Ryu and
13 Koga to meet the limitation of “an impeller having curved blades,” as recited in claim 7 of the
14 ’764 patent. Ryu discloses straight-edged blades that are not curved. See Tr. Ex. 529 (Ryu), Fig.
15 4(c). And as Dr. Tilton explained, Ryu’s straight circulation blades are compatible with, and a
16 logical design choice for, the magnetic field coupling between the motor and the pump impeller
17 disclosed in Ryu. Tilton 1509:16-1511:19. Dr. Tilton further explained, however, that one of
18 ordinary skill in the art would not have been motivated to modify Ryu in view of Koga by adding
19 curved impeller blades, and that one of ordinary skill in the art would not have reasonably
20 expected such a modification to work, because at the higher pressures and torques that would be
21 achieved by substituting curved impeller blades in Ryu, the magnetically coupled driving
22 mechanism would decouple the motor from the pump impeller, stopping fluid circulation. Id. at
23 1511:20-1512:11. For at least this reason, CMI and Dr. Carman have not persuaded the Court by
24 clear and convincing evidence that it would be obvious or feasible to modify just Ryu’s impeller’s
25 blade-shape without altering the rest of Ryu’s pump and other structures.

26 CMI has not shown that all limitations of the asserted claims of the ’764 patent are at least
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1 suggested in prior art references. See Yieldup, 349 F.3d at 1342.⁶

2 **b. Secondary considerations**

3 The Court also concludes that the jury’s findings of the six objective indicia of non-
4 obviousness Asetek sought to prove at trial are supported by substantial evidence. See section
5 I.B.5., supra. Moreover, the Court finds substantial evidence to support the requisite nexus
6 between the claimed invention and commercial success and copying by others, and CMI has not
7 provided evidence that rebuts the presumption that such a nexus exists. See section I.B.5.g, supra;
8 J.T. Eaton & Co., 106 F.3d at 1571 (explaining that when the patentee has demonstrated
9 commercial success and “the successful product is the invention disclosed and claimed in the
10 patent, it is presumed that the commercial success is due to the patented invention.”).

11 All six objective indicia of non-obviousness that the jury found indicate that the invention
12 claimed in the ’764 patent was not obvious. This further supports the Court’s finding of non-
13 obviousness.

14 **d. Conclusion**

15 Because CMI has not shown that all the limitations of the asserted claims of the ’764
16 patent are present in prior art references, and because all objective indicia of non-obviousness that
17 were raised at trial indicate that the invention disclosed in the ’764 patent was not obvious, the
18 Court concludes that CMI has not carried its burden to prove obviousness. The Court finds that
19 the claims of the ’764 patent are not invalid for obviousness.

20 **5. ’362 Patent**

21 _____
22 ⁶ Dr. Carman testified that a person of ordinary skill in the art would be motivated to combine
23 Koga with Ryu and/or Laing to solve the problem the claimed invention was directed to. See
24 Carman 1161:5-1162:4. Even if some combination of prior art disclosed all of the limitations of
25 the patents-in-suit, the Court finds that Dr. Carman’s testimony on this point was conclusory and
26 unpersuasive. See, e.g., InTouch Techs., Inc. v. VGO Commc’ns, Inc., 751 F.3d 1327, 1352 (Fed.
27 Cir. 2014) (finding insufficient an expert’s obviousness testimony that “primarily consisted of
28 conclusory references to her belief that one of ordinary skill in the art could combine [certain prior
art] references, not that they would have been motivated to do so.”) (emphases and citation
omitted); Motorola, Inc. v. Interdigital Tech. Corp., 121 F.3d 1461, 1473 (Fed. Cir. 1997)
(choosing not to rely on conclusory expert testimony regarding invalidity) (citations omitted). Dr.
Tilton’s testimony was significantly more detailed and persuasive. See, e.g., Tilton 1411:24-
1412:24.

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a. The prior art

CMI has also not shown that the '362 patent is invalid for obviousness. Most notably, and as discussed more fully in section II.A.4, supra, with respect to the '764 patent, neither Ryu nor Koga disclose a dual-chambered reservoir, a limitation of independent claims 14 and 17 of the '362 patent (on which all other claims asserted here—claims 15, 18, and 19—depend). See also Tilton 1522:5-25; 1530:9-23. Ryu's pump driver 30 (the alleged upper chamber) and water jacket 20 (the alleged lower chamber) are separate receptacles or components that a person of ordinary skill in the art would not consider dual "chambers" within a single "reservoir." Id. Accordingly, Ryu does not disclose or suggest the limitation "a reservoir configured to be coupled to the processing unit . . . wherein the reservoir includes an upper chamber and a lower chamber," as recited in claim 14, or the limitation "separably thermally coupling a heat exchanging interface of a reservoir with the electronic component . . . , the reservoir including an upper chamber and a lower chamber," as recited in claim 17. Also as discussed above, the jury appears to have agreed with Asetek, finding that no prior art reference disclosed a dual-chambered reservoir. See ECF No. 219 at 3-4. The jury's finding in this regard is supported by substantial evidence.

Dr. Tilton also testified that Ryu does not disclose or suggest that the "heat exchanging interface" of the claimed invention is "removably attached [or coupled] to the reservoir," as recited in claims 14 and 17 of the '362 patent. Id. at 1523:17-1524:24; 1531:2-11. As Dr. Tilton explained, Ryu's water jacket's bottom boundary wall—i.e., Ryu's heat exchanging interface—cannot be detached from the remainder of water jacket 20 because Ryu teaches that water jacket 20 is formed by vacuum-brazing a plurality of aluminum plates into a single component with no detachable interfaces. Id. Dr. Carman agreed. Carman 1368:14-18 ("Q. If one wanted to remove just the boundary wall of water jacket 20, you couldn't do that without sawing it off, or something like that; right? A. That's correct."). Dr. Tilton further explained that if water jacket 20 is removed, as suggested by Dr. Carman, then the entire "lower chamber" and not just the "heat exchanging interface" would be removed or decoupled from Ryu's alleged "reservoir." Tilton 1523:17-1524:24; 1531:2-11. Dr. Carman agreed. Carman 1367:20-1368:23.

Dr. Carman relies on Laing to provide the limitation of a removable heat exchanging

1 surface. Carman 1619:24-1620:1. But as Dr. Tilton explained, a person of ordinary skill in the art
2 would not, with any reasonable expectation of success, modify Ryu in view of Laing to have a
3 removable heat exchanging interface because Laing is a single-chamber device with a significantly
4 different heat-exchange mechanism as compared to the device disclosed in Ryu. Tilton 1532:3-
5 1533:25.

6 Given the foregoing, CMI has not shown by clear and convincing evidence that Ryu, even
7 in combination with Koga or Laing, teaches or suggests the limitation “the heat exchanging
8 interface being removably attached to the reservoir,” as recited in claim 14, or the limitation “the
9 heat exchanging interface being removably coupled to the reservoir,” as recited in claim 17.

10 Further, as discussed in section II.A.4., supra, with respect to the ’764 patent, Ryu does not
11 disclose or suggest an impeller having curved blades, a limitation of claims 14 and 17 of the ’362
12 patent. Tilton 1523:7-16. Dr. Carman conceded that Ryu does not disclose or suggest an impeller
13 having curved blades, but relies on a combination with Koga to meet that limitation. See ECF No.
14 235 at 10. But for the reasons discussed in section II.A.4, supra, CMI has not persuaded the Court
15 that a person of ordinary skill in the art would be motivated to modify Ryu to add the curved
16 blades taught by Koga, or reasonably expect the combination of Koga and Ryu to function. Tilton
17 1535:22-1536:7.

18 Thus, at the least, CMI has failed to prove by clear and convincing evidence that any
19 combination of prior art discloses, teaches, or suggests the limitations “a reservoir” including “an
20 upper chamber and a lower chamber,” the “heat exchanging interface being removably attached
21 [or coupled] to the reservoir,” and an “impeller having curved blades,” recited in independent
22 claims 14 and 17 of the ’362 patent. For that reason, the Court finds that the invention disclosed
23 in the asserted claims of the ’362 patent would not have been obvious to one of ordinary skill in
24 the art at the time it was invented.

25 Additionally, the Court finds that neither Ryu nor Koga disclose, teach, or suggest the
26 following limitation in claim 19 of the ’764 patent: “circulating the cooling liquid between the
27 upper and lower chambers includes passing the cooling liquid from the upper chamber to the
28 lower chamber through a single passageway of the one or more passageways.” Dr. Tilton

1 explained that Ryu specifically teaches that the water in Ryu flows in the opposite direction: from
2 water jacket 20, what CMI deems Ryu’s “lower chamber,” to pump driver 30, Ryu’s “upper
3 chamber.” 1524:25-1525:25. CMI counters that Ryu also discloses that cooling liquid may be
4 discharged from the (upper) pump driver to the (lower) water jacket, but the limitation in Ryu that
5 CMI cites for this proposition states the contrary: “Also, the water passing through the [lower]
6 water jacket 20 may be discharged to the [upper] pump driver 30” Tr. Ex. 529 (Ryu), at 5
7 (emphasis added). CMI has not shown by clear and convincing evidence that any combination of
8 prior art teaches, discloses, or suggests this limitation.

9 **b. Indicia of non-obviousness**

10 As discussed in section II.A.4.b., supra, the Court also finds that Asetek has proven six
11 objective indicia of non-obviousness. These weigh heavily in favor of a finding of non-
12 obviousness. See Ortho-McNeil Pharm., 520 F.3d at 1365 (explaining that objective evidence of
13 non-obviousness is “often . . . the most probative and cogent evidence” available to a court
14 evaluating the question of obviousness) (citation omitted).

15 In light of the objective indicia of non-obviousness that Asetek proved at trial, and the fact
16 that CMI has not shown that prior art references disclose, teach, or suggest all limitations of the
17 asserted claims of the ’362 patent, the Court finds that CMI has not carried its burden to prove that
18 the ’362 patent is invalid for obviousness.

19 **B. Section 112 Defenses**

20 CMI contends that, pursuant to 35 U.S.C. § 112, the term “substantially circular” renders
21 claims 14-16 of the ’362 patent invalid for (1) lack of an adequate written description, and (2)
22 indefiniteness. ECF No. 234 at 15-16; ECF No. 235 at 23-24. The relevant portion of section 112
23 provides that a patent specification:

24 shall contain a written description of the invention, and of the
25 manner and process of making and using it, in such full, clear,
26 concise, and exact terms as to enable any person skilled in the art to
27 which it pertains . . . to make and use the same The
specification shall conclude with one or more claims particularly
pointing out and distinctly claiming the subject matter which the
inventor . . . regards as the invention.

28 35 U.S.C. § 112(a), (b). Asetek contends that CMI has waived its section 112 defenses, or in the

1 alternative, that CMI has failed to carry its burden on both defenses. ECF No. 236 at 36-48. The
2 Court agrees with Asetek.

3 **1. Lack of written description**

4 The essential question in assessing the adequacy of a patent's written description is
5 whether the description of the claimed invention would allow a person of ordinary skill in the art
6 to recognize that the inventor invented what is claimed. See Ariad Pharms., Inc. v. Eli Lilly &
7 Co., 598 F.3d 1336, 1355-56 (Fed. Cir. 2010). The issue is a question of fact. Id. at 1355.
8 Because the issue is one of fact, it is generally tried to a jury. See, e.g., id.; PIN/NIP, Inc. v. Platte
9 Chem. Co., 304 F.3d 1235, 1243 (Fed. Cir. 2002).

10 Here, the question of whether CMI waived its written description defense is
11 straightforward.⁷ While CMI identified a written description defense in its pre-trial statement, it
12 did not elicit testimony regarding this theory at trial. It therefore adduced no evidence on the
13 subject. Because CMI did not address indefiniteness at trial, Asetek was not aware that it had to
14 develop evidence to rebut this defense; requiring Asetek to do so now would unfairly prejudice
15 Asetek. See Fractus, S.A. v. Samsung Elecs. Co., 876 F. Supp. 2d 802, 838 (E.D. Tex. 2012)
16 (finding that defendant waived its indefiniteness argument by failing to present testimony or other
17 evidence in support of the defense at trial, and by failing to move for judgment as a matter of law
18 on the defense at the close of its case-in-chief or at the close of evidence; "Allowing Samsung to
19 revive its defense post-trial deprives Fractus of any opportunity to substantively respond with its

21 ⁷ Courts apply Federal Circuit precedent, rather than regional circuit precedent, to issues that are
22 unique to patent law. In re Spalding Sports Worldwide, Inc., 203 F.3d 800, 803-04 (Fed. Cir.
23 2000). While waiver, as a general principle, is not unique to patent law, courts in this district have
24 applied Federal Circuit precedent to the question of whether a patent-law-specific defense is
25 waived. See, e.g., Bd. of Trs. of Leland Stanford Univ. v. Roche Molecular Sys., Inc., 237 F.R.D.
26 618, 622-24 (N.D. Cal. 2006). Courts in other circuits also apply Federal Circuit precedent to
27 evaluate the waiver of validity defenses in patent cases. See Allergen Inc. v. Barr Labs., Inc., 808
28 F. Supp. 2d 715, 735 (D. Del. 2011), aff'd, 501 F. App'x 965 (Fed. Cir. 2013) (obviousness
defense); Fractus, S.A v. Samsung Electronics Co., LTD., 876 F. Supp. 2d 802, 838 (E.D. Tex.
2012) (indefiniteness defense); Cubist Pharms., Inc. v. Hospira, Inc., --- F. Supp. 3d ---, 2014 WL
6968046, at *23 (D. Del. Dec. 8, 2014) (derivation defense). Thus here, to the extent it is
available, the Court applies the law of the Federal Circuit to determine whether CMI waived its
indefiniteness and written description defenses.

1 own testimony or evidence to Samsung’s alleged evidence of indefiniteness.”); Allergan, Inc. v.
2 Barr Labs., Inc., 808 F. Supp. 2d 715, 735 (D. Del. 2011) (concluding that defendants waived
3 certain obviousness theories by not raising them at trial and therefore could not “switch[] horses”
4 in their post-trial motions and attempt to raise a new theory of obviousness; “As defendants did
5 not allow [plaintiff] to mount a defense at trial to the [newly-asserted] theories, the court does not
6 entertain them here.”) (citation omitted). Moreover, CMI’s actions were insufficient to place the
7 Court on notice that CMI was pursuing the defense at trial. Cf. Marine Polymer Techs. V.
8 HemCon, Inc., No. 06-cv-100-JD, 2010 WL 840470, at *1 (D.N.H. Mar. 3, 2010) (“claims,
9 defenses, theories, and arguments must be articulated and be presented with proper support in
10 order for them to be considered by the court. . . . As in all cases, matters referred to in a
11 perfunctory manner, . . . without developed argumentation, are deemed to be waived.”).

12 More to the point, CMI affirmatively withdrew its written-description defense from the
13 final jury instructions and jury verdict form before either went to the jury. Cf. Jamesbury Corp. v.
14 Litton Indus. Prods., Inc., 756 F.2d 1556, 1564 (Fed. Cir. 1985) (finding waiver of an invalidity
15 defense based on removal of jury instructions and a following oral concession at trial). And
16 because the adequacy of a patent’s written description is a question of fact, and Asetek demanded
17 a jury trial as to all questions of fact, it would violate Asetek’s Seventh Amendment right to a jury
18 trial for the Court to even consider this defense post-trial without the jury having rendered a
19 verdict on the topic.

20 Accordingly, the Court finds that CMI waived its lack-of-written description defense by
21 choosing not to pursue it at trial. See MeadWestVaco Corp. v. Rexam Beauty & Closures, Inc.,
22 731 F.3d 1258, (Fed. Cir. 2013) (concluding that defendants waived an indefiniteness defense at
23 trial by failing to raise it at trial); Lisle Corp. v. A.J. Mfg. Co., 398 F.3d 1306, 1317 (Fed. Cir.
24 2005) (same). Because CMI waived the defense and failed to present evidence regarding the
25 adequacy of the ’362 patent’s written description at trial, the Court will not address the substance
26 of that defense.⁸

27 _____
28 ⁸ The Court notes, however, that CMI elicited trial testimony from Dr. Tilton regarding the term
“substantially circular”—i.e., his statement that it was “probably correct” that the term

1 and anticipation, and it failed to elicit any testimony regarding indefiniteness of the term
2 “substantially circular.”⁹ It removed the relevant jury instruction from the set considered by the
3 Court. And it stood mute when Asetek reasonably stated its understanding that CMI had
4 withdrawn the defense. When CMI moved for judgment as a matter of law as to all issues for
5 which Asetek bore the burden of proof, it did not seek judgment relating to indefiniteness. Asetek
6 could not have guessed that it should submit rebuttal evidence on the issue.

7 Given these circumstances, neither Asetek nor the Court was put on adequate notice that
8 indefiniteness was a live issue at trial, see Marine Polymer, 2010 WL 840470, at *1, and Asetek
9 did not have an adequate opportunity to develop rebuttal evidence at trial, see Allergan, 808 F.
10 Supp. 2d at 735; Fractus, 876 F. Supp. 2d at 838. Further, because CMI did not produce
11 affirmative evidence regarding indefiniteness of the term “substantially circular,” and Asetek did
12 not have the opportunity to rebut CMI’s evidence on the issue, the Court lacks expert testimony on
13 which to rely to resolve the legal question of indefiniteness. See Proveris, 536 F.3d at 1267-68.
14 And to the extent underlying factual questions had to be resolved—such as what a person of
15 ordinary skill in the art reading the claims would understand—the jury did not have the
16 opportunity to hear evidence pertaining to those questions, nor did the jury have the opportunity
17 ultimately to resolve them. Because of the foregoing, the Court finds that CMI waived its defense
18 of indefiniteness by not pursuing it at trial.

19 The Court also finds that, even if waiver did not preclude CMI from asserting
20 indefiniteness, CMI would not prevail on that defense because: (1) CMI adduced no evidence at
21 trial regarding indefiniteness as it pertained to the term “substantially circular,” which is the only
22 term it relies on in its post-trial briefing; (2) evidence from experts is necessary to help the Court
23

24 ⁹ As mentioned in note 2, supra, CMI did attempt to elicit evidence regarding indefiniteness as it
25 related to the term “removably attached.” See Tilton 1568:12-1570:2. But CMI’s expert did not
26 opine in his expert report that the term “removably attached” was indefinite, see ECF No. 99-7,
27 and thus that theory was not one that CMI could properly pursue at trial. ECF No. 201 (granting
28 motion to preclude trial testimony outside the scope of Dr. Carman’s expert report). Moreover, in
its post-trial briefing, CMI only asserts indefiniteness based on the term “substantially circular.”
Thus, the brief testimony CMI was able to elicit regarding indefiniteness of the term “removably
attached” is not relevant here.

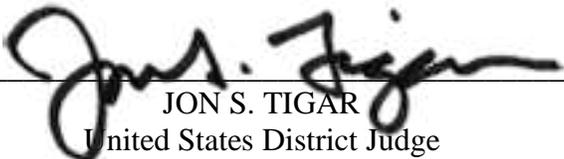
1 assess what a person of ordinary skill in the art would know or find indefinite; and (3) CMI bears
2 the burden of establishing invalidity due to indefiniteness. As a result, even if the Court did not
3 find waiver, the Court would be compelled to find that CMI did not carry its burden to prove, by
4 clear and convincing evidence, that Asetek's patents are invalid for indefiniteness.

5 **CONCLUSION¹⁰**

6 For the foregoing reasons, the Court concludes that CMI has failed to show by clear and
7 convincing evidence that the '764 and '362 patents are invalid for obviousness, lack of written
8 description, or indefiniteness. The jury having found that CMI's products infringe all asserted
9 claims of the '362 and '764 patents, the Court hereby enters judgment in favor of Asetek and
10 against CMI. Asetek shall submit to the Court a proposed form of final judgment within ten days
11 of the issuance of this order.

12 **IT IS SO ORDERED.**

13 Dated: April 21, 2015

14 
15 JON S. TIGAR
16 United States District Judge

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25 ¹⁰ "Any findings of fact in the foregoing order that constitute conclusions of law shall be deemed
26 to have been found by the Court as a matter of law. Conversely, any conclusions of law that
27 constitute findings of fact shall be deemed to have been found by the Court as a matter of fact."
28 Takeda Pharm. Co. v. Handa Pharms., LLC, Nos. C-11-00840 JCS, C-11-01609 JCS, C-11-01610
JCS, 2013 WL 9853725, at *4 n.1 (N.D. Cal. Oct. 17, 2013); see also Break-Away Tours, Inc. v.
British Caledonian Airways, 704 F. Supp. 178, 182 (S.D. Cal. 1988) (same).