Trials@uspto.gov
571-272-7822

Paper No. 8
Filed: October 20, 2017

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ABIOMED, INC. and ABIOMED R&D, INC.,
Petitioner,

v.

MAQUET CARDIOVASCULAR, LLC,
Patent Owner.

Cases IPR2017-01201
IPR2017-01202
IPR2017-01203
Patent 9,545,468 B2

Before BART A. GERSTENBLITH, JEREMY M. PLENZLER, and KEVIN W. CHERRY, *Administrative Patent Judges*.

CHERRY, *Administrative Patent Judge*.

DECISION
Denying *Inter Partes* Review
37 C.F.R. § 42.108

I. INTRODUCTION

A. Background

Abiomed, Inc. and Abiomed R&D, Inc. (collectively, "Petitioner") filed Petitions to institute *inter partes* review of claims 1–8, 10–24, and 26 ("the challenged claims") of U.S. Patent No. 9,545,468 B2 (Ex. 1001[1], "the '468 patent"). IPR2017-01201, Paper 1 ("'1201 Pet.")[2]; IPR2017-01202, Paper 1 ("'1202 Pet.")[3]; IPR2014-01203, Paper 1 ("'1203 Pet.")[4]. Maquet Cardiovascular, LLC ("Patent Owner") filed a Preliminary Response in each proceeding. IPR2017-01201, Paper 6 ("'1201 Prelim. Resp."); IPR2017-01202, Paper 6 ("'1202 Prelim. Resp."); IPR2017-01203, Paper 6 ("'1203 Prelim. Resp."). We review the Petitions according to 35 U.S.C. § 314, which provides that an *inter partes* review may not be instituted "unless . . . there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition." Upon consideration of the Petitions and Patent Owner's Preliminary Responses, we do not institute an *inter partes* review for any of the challenged claims.

---

[1] The Exhibit number is the same in IPR2017-01201, IPR2017-01202, and IPR2017-01203. References to exhibits and papers include the appropriate '1201, '1202, or '1203 prefix to indicate the relevant proceeding. When no prefix is included for an exhibit, the exhibit number (and exhibit) is the same in each proceeding.

[2] The '1201 Petition challenges claims 1–3, 5, 6, 8, 14, 16, 18, 20, and 21 of the '468 patent.

[3] The '1202 Petition challenges claims 4, 7, 10–13, 15, 17, and 19 of the '468 patent.

[4] The '1203 Petition challenges claims 22–24 and 26 of the '468 patent.

B. Related Matters

Petitioner and Patent Owner identify a number of proceedings related to the '468 patent. '1201 Pet. 1; '1202 Pet. 1; '1203 Pet. 1; '1201 Paper 3, 1–2; '1202 Paper 3, 1–2; '1203 Paper 3, 1–2.

C. Asserted Grounds of Unpatentability and Evidence of Record

Petitioner contends that the challenged claims are unpatentable under 35 U.S.C. § 103(a) as set forth below ('1201 Pet. 4, 27–102; '1202 Pet. 4, 27–101; '1203 Pet. 4, 29–98).

References	Claims Challenged
Aboul-Hosn[5], Jegaden[6], Siess[7], and Wampler[8]	1–8, 11–16, 18–24, and 26
Aboul-Hosn, Yock[9], Siess, and Wampler	1–8, 11–16, 18–24, and 26
Aboul-Hosn, Jegaden, Siess, Wampler, and Wampler '712[10]	10 and 17
Aboul-Hosn, Yock, Siess, Wampler, and Wampler '712	10 and 17

Petitioner provides testimony from John M. Collins, Ph.D. '1201 Ex. 1002; '1201 Ex. 1002; '1203 Ex. 1002 (collectively, "the Collins Declaration").

[5] WO 99/02204 A1, pub. Jan. 21, 1999 (Ex. 1004, "Aboul-Hosn").
[6] O. Jegaden, *Clinical Results of Hemopump Support in Surgical Cases*, published in Temporary Cardiac Assist with an Axial Pump System, 61–65 (Springer-Verlag 1991) (Ex. 1033, "Jegaden").
[7] U.S. Pat. No. 5,921,913, iss. July 13, 1999 (Ex. 1005, "Siess").
[8] Richard K. Wampler & Raymond A. Riehtl, *Clinical Experience with the Hemopump Left Ventricular Assist Device*, published in Supported Complex and High Risk Coronary Angioplasty, Ch. 14, 231–49 (Springer 1st ed. 1991) (Ex. 1007, "Wampler").
[9] U.S. Pat. No. 5,061,273, iss. Oct. 29, 1991 (Ex. 1006, "Yock").
[10] U.S. Pat. No. 4,625,712, iss. Dec. 2, 1986 (Ex. 1008, "Wampler '712").

D. The '468 Patent

The '468 patent "relates generally to blood pumps and, more particularly, to an improved intra-vascular blood pump having a guide mechanism which provides the ability to selectively guide the intravascular pump to a desired location within a patient's circulatory system." Ex. 1001, 1:28–32. Figures 1 and 3 of the '468 patent are exemplary, and are reproduced below.

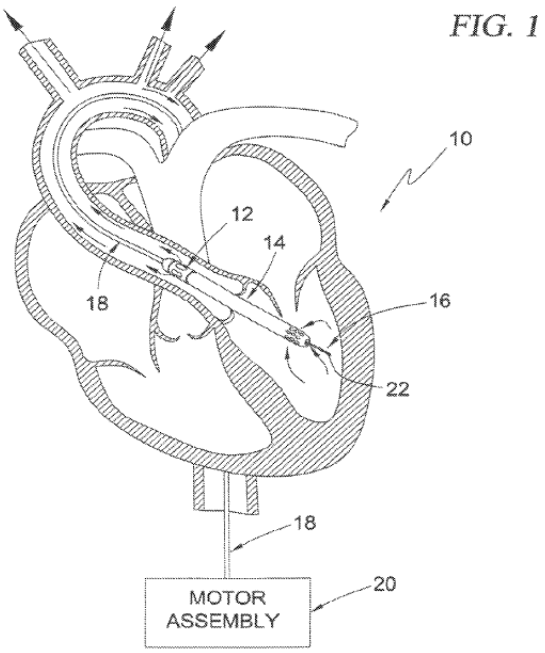

Figure 1, reproduced above, is a fragmentary section view of a human heart including an intravascular blood pump system. *Id.* at 5:25–30.

FIG. 3

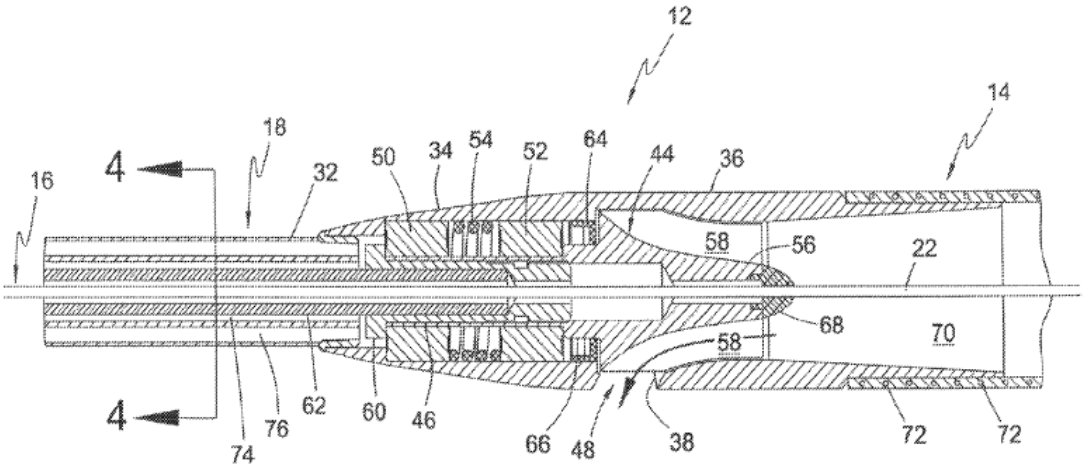

Figure 3, reproduced above, is a section view of the intravascular blood pump system shown in Figure 1. *Id.* at 5:35–38.

The '468 patent explains that its "intravascular blood pump system . . . overcomes the drawbacks of the prior art by providing a guide mechanism as part of the intravascular blood pump." *Id.* at 8:53–56. Intravascular blood pump system 10 includes intravascular blood pump 12, cannula 14, and guide mechanism 16. *Id.* at 9:16–19. Intravascular blood pump 12 is driven by drive cable assembly 18 and motor assembly 20. *Id.* at 9:19–20. Guide mechanism 16 is described as an "over-the-wire" mechanism having "a suitable guide element dimensioned to pass slideably through a central lumen extending through the drive cable 18, blood pump 12, and cannula 14." *Id.* at 9:20–24. An example guide element may include guide wire 22. *Id.* at 9:26–27.

The '468 patent explains that "'over-the-wire' guide mechanism 16 provides the ability to selectively guide the blood pump 12 and cannula 14 to a predetermined position in the circulatory system of a patient." *Id.* at 9:28–32. First, guide wire 22 is introduced into the patient's vascular system and

advanced to a desired location in the circulatory system. *Id.* at 9:33–38. Intravascular blood pump 12 and cannula 14 are then advanced along guide wire 22 to the location in the circulatory system. *Id.* at 9:45–49.

E. Illustrative Claim

As noted above, Petitioner challenges claims 1–8, 10–24, and 26 of the '468 patent. Claims 1 and 22 are independent, with claims 2–8, 10–21, 23, 24, and 26 depending, directly or indirectly, therefrom. Claim 1 is illustrative, and is reproduced below:

> 1. An intravascular blood pump system, comprising:
>
> an intravascular blood pump adapted to be guided to a predetermined location within the circulatory system of a patient by a guide wire and configured to provide left-heart support, the intravascular blood pump comprising a rotor having a rotor hub tapering in the distal direction, at least one blade extending radially outward from the rotor hub,
>
> a catheter coupled to a proximal end of the intravascular blood pump, a purge lumen extending through the catheter and operatively arranged to deliver purge fluid towards the intravascular blood pump;
>
> a cannula coupled to a distal end of the intravascular blood pump, one or more first ports and one or more second ports establishing fluid communication between a lumen of the cannula and an exterior region of the cannula, wherein at least one first port is located in proximity to the rotor and at least one second port is spaced apart from and located distal to the at least one first port, the cannula is configured such that when the intravascular blood pump is positioned in the patient to provide left-heart support the distal end of the cannula and the at least one second port are positioned inside the patient's heart and the proximal end of the cannula and the at least one first port are positioned in the patient's aorta, the intravascular blood pump is configured to draw blood from the patient's heart into the at least one second port through the cannula lumen and out the at least one first port to provide left-heart

support while the cannula is positioned across an aortic valve of the patient;

an elongate lumen associated with the cannula and sized to slidably receive the guide wire and dimensioned such that the guide wire passes slidably and coaxially through the elongate lumen, the elongate lumen is sized smaller cross sectionally than the cannula lumen, both the elongate lumen and the cannula lumen not extending through the rotor hub, the intravascular blood pump system configured for the guide wire to extend proximally away from the intravascular blood pump, the guide wire not passing through the rotor hub or the catheter, and the guide wire extending out of the intravascular blood pump system in a distal direction through the elongate lumen;

a pressure sensing element configured to sense pressure proximate the intravascular blood pump;

a housing connected to a proximal end of the catheter; and

first and second conduits each connected to the housing, at least one of the first conduit and second conduit in fluid communication with the purge lumen.

Ex. 1001, 33:58–34:42.

II. ANALYSIS

A. Claim Construction

Only those terms that are in controversy need to be construed, and only to the extent necessary to resolve the controversy. *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc*., 200 F.3d 795, 803 (Fed. Cir. 1999). We construe the claims using the broadest reasonable construction in light of the '468 patent Specification. *See* 37 C.F.R. § 42.100(b). Applying that standard, we generally interpret the claim terms of the '468 patent according to their ordinary and customary meaning in the context of the patent's written description. *See In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir.

2007). An inventor is entitled to be his or her own lexicographer of patent claim terms by providing a definition of the term in the specification with reasonable clarity, deliberateness, and precision. *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994). In the absence of such a definition, however, limitations are not to be read from the specification into the claims. *In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993).

Petitioner and Patent Owner each propose constructions for multiple terms. '1201 Pet. 24–26; '1202 Pet. 24–27; '1203 Pet. 26–28; '1201 Prelim. Resp. 13–14; '1202 Prelim. Resp. 13–14; '1203 Prelim. Resp. 13–14. For purposes of this Decision, we determine that no term requires express construction.

B. Challenges

1. Aboul-Hosn/Jegaden/Siess/Wampler Grounds

Petitioner challenges claims 1–8, 11–16, 18–24, and 26 as unpatentable over Aboul-Hosn, Jegaden, Siess, and Wampler under 35 U.S.C. § 103(a). '1201 Pet. 31–79; '1202 Pet. 25–79; '1203 Pet. 29–79. Petitioner additionally challenges claims 10 and 17, which depend from claim 1, as unpatentable over Aboul-Hosn, Jegaden, Siess, Wampler, and Wampler '712. '1202 Pet. 96–101. We have reviewed Petitioner's challenges, as well as Patent Owner's Preliminary Responses to those challenges and the evidence relied on in those papers. Based on our review of the record before us, we determine that Petitioner has failed to establish a reasonable likelihood of prevailing at trial on any of the challenges noted above.

The deficiency is similar for each of the challenges. For simplicity, we address specifically only the challenge to claim 1 with the understanding that the discussion applies equally to Petitioner's other challenges.

In its challenge, Petitioner cites a combination of Aboul-Hosn's embodiments as teaching various claim features. '1201 Pet. 27–68 (citing, for example, the embodiments of Figures 1–13 and Figure 23 in Aboul-Hosn). Patent Owner contends that Petitioner has failed to establish sufficiently that the features of those different embodiments are interchangeable or provide sufficient rationale to combine the teachings of those different embodiments. *See, e.g.*, '1201 Prelim. Resp. 24–30. We agree.

Aboul-Hosn "relates to the transport of fluids between various body regions and the increased stabilization of [a] body organ." Ex. 1004, 1:12–14. Aboul-Hosn's Figure 1, reproduced below, illustrates a reverse flow pump located external to the vasculature, while Figure 23, also reproduced below, illustrates an intravascular axial flow pump.

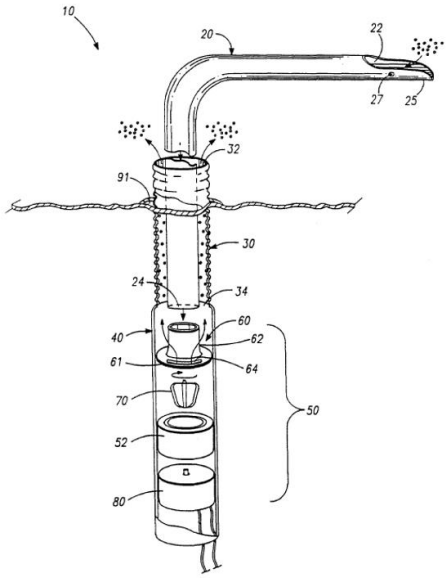

FIG.–1

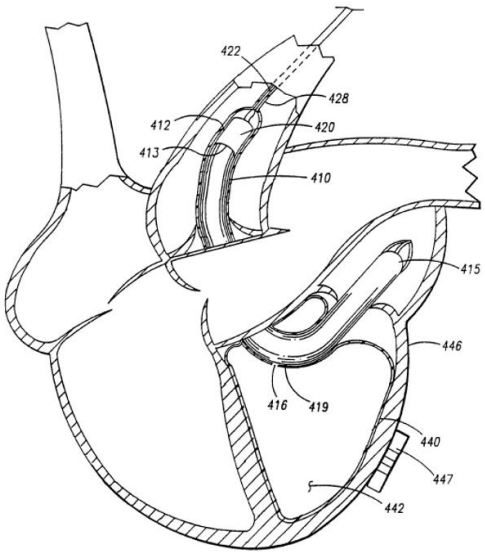

FIG.–23

Figure 1, reproduced above, is an exploded perspective section view of a reverse flow pump system with a conduit extending into a blood vessel and the pump located external to the blood vessel; Figure 23, also reproduced above, is a partial section view of the heart and a stabilization system used in cooperation with an intravascular pump. *Id.* at 8:20–23, 10:10–11.

Petitioner's challenge treats the various features of Aboul-Hosn's different embodiments as if they are interchangeable with one another. *See* '1201 Pet. 27–68. For example, Petitioner contends that "Aboul-Hosn discloses that the axial flow pump system of FIGS. 1–13 with or without the reverse flow feature can be delivered to the heart percutaneously by connecting the pump components illustrated in FIGS. 1–13 with the multilumen catheter 428 and adapting the inner cannula 20 and the outer conduit 30 as the stabilization cannula 411 in FIG. 23." '1201 Pet. 28 (citing '1201 Ex. 1002 ¶ 222; Ex. 1004, 8:20–9:13, 14:13–16, 29:18–30:28). The citations to Aboul-Hosn, however, do not support Petitioner's contentions.

Page 8, line 20 through page 9, line 13 of Aboul-Hosn are simply a brief description of Figures 1–12. Page 14, lines 13 through 16 of Aboul-Hosn provide a general explanation that "[t]he lengths of the inner cannula 20 and outer conduit 30 may further be varied in accordance with particular applications such as open heart surgery, or during closed heart or other laproscopic procedures which involve forming other openings to provide percutaneous access to inner body regions." Finally, page 29, line 17 through page 30, line 28 of Aboul-Hosn describes Figures 21 and 23, noting that "stabilization apparatus 410 and a pump 420 may be introduced into the body as shown in Fig. 21 through the femoral artery 430 with a catheter 428 linking the device to the exterior of the body" (Ex. 1004, 29:17–19), and, importantly, that "Figure[] 23 . . . illustrate[s a] different embodiment[] of the present invention" (*id.* at 30:20–21).

The cited portion of the Collins Declaration also fails to support sufficiently Petitioner's contentions. In paragraph 222, Dr. Collins refers, generally, to 16 pages of prior testimony and concludes that "pump 420 could include a variety of known blood pumps, including the pump system of FIGS. 1–13." '1201 Ex. 1002 ¶ 222. Dr. Collins's opinion as to what pump 420 *could* include or *would* accommodate, however, is not the same as what Aboul-Hosn teaches.

Petitioner also fails to provide a sufficient rationale to combine the teachings of Aboul-Hosn's different embodiments. Petitioner simply fails to explain sufficiently *why* one skilled in the art would have found it obvious to combine those teachings.

Ultimately, the '1201, '1202, and '1203 Petitions are deficient because of the failure to explain sufficiently and support the challenges

therein. Based on the record before us, we are left unpersuaded that the features of Aboul-Hosn's various embodiments are interchangeable or that one skilled in the art would have combined those features in the manner proposed by Petitioner. Accordingly, we determine that Petitioner has failed to establish a reasonable likelihood of prevailing in showing that claims 1–8, 11–16, 18–24, and 26 are unpatentable over Aboul-Hosn, Jegaden, Siess, and Wampler, or that claims 10 and 17 are unpatentable over Aboul-Hosn, Jegaden, Siess, Wampler, and Wampler '712.

2. Aboul-Hosn/Yock/Siess/Wampler Grounds

Petitioner additionally challenges claims 1–8, 11–16, 18–24, and 26 as unpatentable over Aboul-Hosn, Yock, Siess, and Wampler and claims 10 and 17 as unpatentable over Aboul-Hosn, Yock, Siess, Wampler, and Wampler '712. Those challenges also fail for the reasons set forth above. *See, e.g.*, '1201 Pet. 84 ("*See* element 1(a) – 1(h), Sections X.A.1(a)-(h), above. Elements 1(a) – 1(h) are the same as in Ground I").

III. SUMMARY

Petitioner has failed to establish a reasonable likelihood of prevailing on any of its challenges. Accordingly, we do not institute *inter partes* review with respect to any of the challenged claims.

IV. ORDER

For the reasons given, the '1201 Petition, '1202 Petition, and the '1203 Petition are each *denied* and no *inter partes* review is instituted.

PETITIONER:

David M. Tennant
Charles D. Larsen
Nathan Y. Zhang
WHITE & CASE LLP
dtennant@whitecase.com
charles.larsen@whitecase.com
nathan.zhang@whitecase.com

PATENT OWNER:

Michael S. Connor
Christopher TL Douglas
S. Benjamin Pleune
Lauren E. Burrow
Christopher B. Kelly
mike.connor@alston.com
christopher.douglas@alston.com
ben.pleune@alston.com
lauren.burrow@alston.com
chris.kelly@alston.com