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Paper No. 8
Filed: October 23, 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 IPR2017-01204
IPR2017-01205
Patent 9,561,314 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 an *inter partes* review of claims 1–8, 10–23, 25–27, 29, and 30 ("the challenged claims") of U.S. Patent No. 9,561,314 B2 (Ex. 1001[1], "the '314 patent"). IPR2017-01204, Paper 2 ("'1204 Pet.")[2]; IPR2017-01205, Paper 2 ("'1205 Pet.")[3]. Maquet Cardiovascular, LLC ("Patent Owner") filed a Preliminary Response in each proceeding. IPR2017-01204, Paper 7 ("'1204 Prelim. Resp."); IPR2017-01205, Paper 6 ("'1205 Prelim. Resp."). We review the Petitions according to 35 U.S.C. § 314(a), 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.

B. Related Matters

Petitioner and Patent Owner identify a number of proceedings related to the '314 patent. '1204 Pet. 1; '1205 Pet. 1; '1204 Paper 8, 1–2; '1205 Paper 7, 1–2.

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[1] The Exhibit number is the same in both of IPR2017-01204 and IPR2017-01205. References to exhibits and papers include the appropriate '1204 or '1205 prefix to indicate the relevant proceeding. When no prefix is included for an exhibit, the exhibit number (and exhibit) is the same in both proceedings.

[2] The '1204 Petition challenges claims 1–8, 10–23, 25, and 26 of the '314 patent.

[3] The '1205 Petition challenges claims 27, 29, and 30 of the '314 patent.

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 ('1204 Pet. 4, 30–93; '1205 Pet. 4, 29–102).

References	**Claim(s) Challenged**
Aboul-Hosn[4], Siess[5], and Wampler[6]	1–8, 14, 16–20, 25, and 26
Aboul-Hosn, Siess, Wampler, and Jegaden[7]	10, 11, 13, 21, 23, 27, 29, and 30
Aboul-Hosn, Siess, Wampler, and Crowley[8]	12 and 22
Aboul-Hosn, Siess, Wampler, and Wampler '712[9]	15
Aboul-Hosn, Yock[10], Siess, and Wampler	27
Aboul-Hosn, Yock, Siess, Wampler, and Jegaden	29 and 30

Petitioner provides testimony from John M. Collins, Ph.D. '1204 Ex. 1002; '1205 Ex. 1002 (collectively, "the Collins Declaration").

[4] WO 99/02204 A1, pub. Jan. 21, 1999 (Ex. 1004, "Aboul-Hosn").
[5] U.S. Pat. No. 5,921,913, iss. July 13, 1999 (Ex. 1005, "Siess").
[6] 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").
[7] O. Jegaden, *Clinical Results of Hemopump Support in Surgical Cases*, published in Temporary Cardiac Assist with an Axial Pump System, p. 61–65 (Springer 1991) (Ex. 1033, "Jegaden").
[8] U.S. Pat. No. 5,421,338, iss. June 6, 1995 ('1204 Ex. 1047, '1205 Ex. 1045, "Crowley").
[9] U.S. Pat. No. 4,625,712, iss. Dec. 2, 1986 (Ex. 1008, "Wampler '712").
[10] U.S. Pat. No. 5,061,273, iss. Oct. 29, 1991 (Ex. 1006, "Yock").

D. The '314 Patent

The '314 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, 1:27–31. Figures 1 and 3 of the '314 patent are exemplary, and are reproduced below.

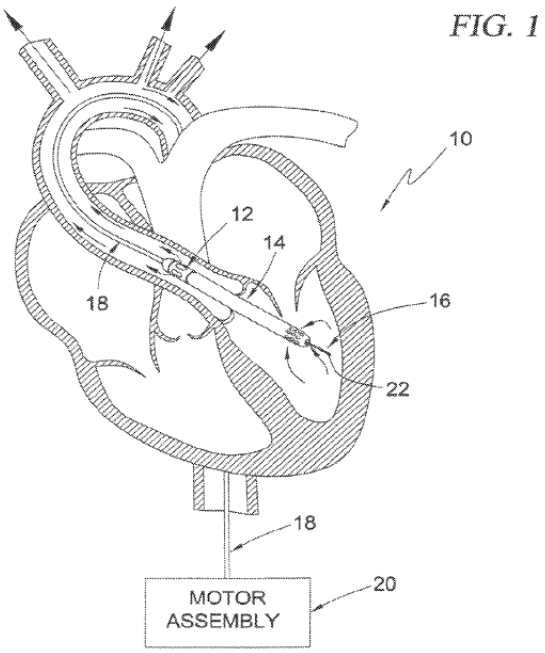

Figure 1, reproduced above, is a fragmentary section view of a human heart including an intravascular blood pump system. *Id.* at 5:25–30.

FIG. 3

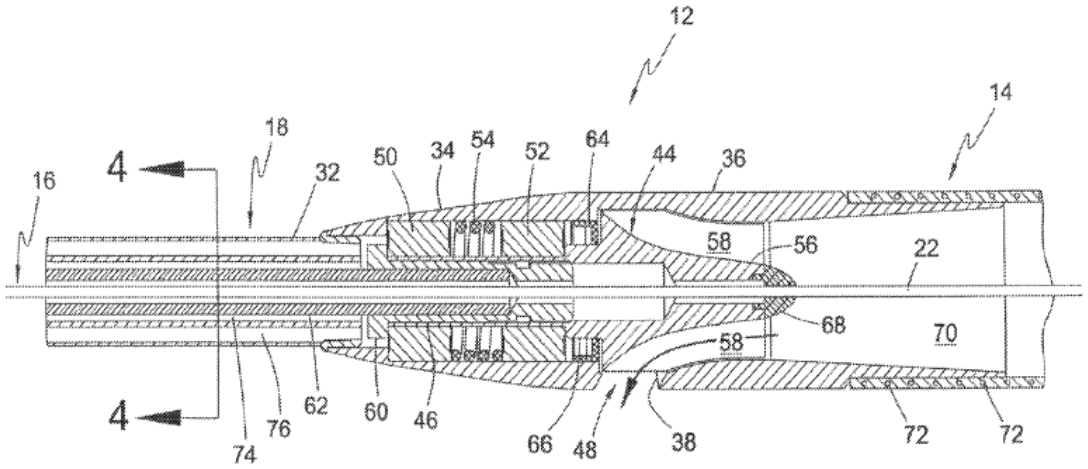

Figure 3, reproduced above, is a section view of the intravascular blood pump system shown in Figure 1. *Id.* at 5:35–38.

The ’314 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 8:54–56. 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 ’314 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, 10–23, 25–27, 29, and 30 of the '314 patent. Claims 1, 20, and 27 are independent, with claims 2–8, 10–19, 21–23, 25, 26, 29, and 30 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 the intravascular blood pump 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 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, and wherein 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, 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;

a catheter connected 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;

an elongate lumen arranged coaxially with at least a portion of the cannula and in series longitudinally with the cannula, and an end of the elongate lumen is adjacent an end of the cannula, the elongate lumen sized to slidably receive the guide wire and having a diameter sized smaller than a diameter of the cannula 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, 33:51–34:27.

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 '314 patent Specification. *See* 37 C.F.R. § 42.100(b). Applying that standard, we generally interpret the claim terms of the '314 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. '1204 Pet. 27–28; '1205 Pet. 26–28; '1204 Prelim. Resp. 13–14; '1205 Prelim. Resp. 13–14. For the purposes of this Decision, we determine that no term requires express construction.

B. Challenges

1. Aboul-Hosn/Siess/Wampler Grounds

Petitioner challenges claims 1–8, 14, 16–20, 25, and 26 as unpatentable over Aboul-Hosn, Siess, and Wampler under 35 U.S.C. § 103(a). '1204 Pet. 30–86. Petitioner additionally challenges claims 10, 11, 13, 21, 23, 27, 29, and 30 as unpatentable over Aboul-Hosn, Siess, Wampler, and Jegaden. '1204 Pet. 86–91; '1205 Pet. 29–84. Petitioner challenges claims 12 and 22 as unpatentable over Aboul-Hosn, Siess, Wampler, and Crowley. '1204 Pet. 91–92. Petitioner challenges claim 15 as unpatentable over Aboul-Hosn, Siess, Wampler, and Wampler '712. '1204 Pet. 93. 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 noted above. 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. '1204 Pet. 31–54 (citing, for example, the embodiments of Figures 1–13 and 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.*, '1204 Prelim. Resp. 26–31. 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.

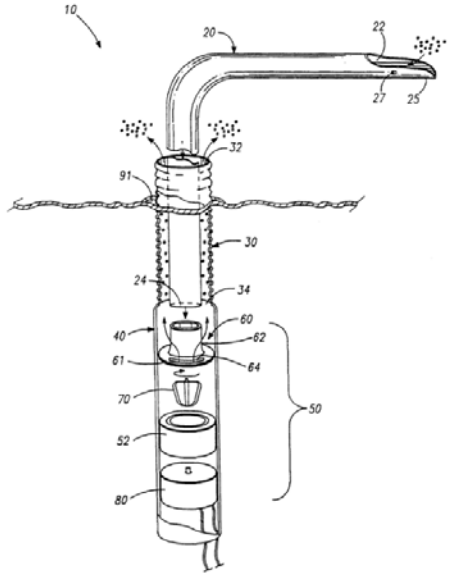

FIG.–1

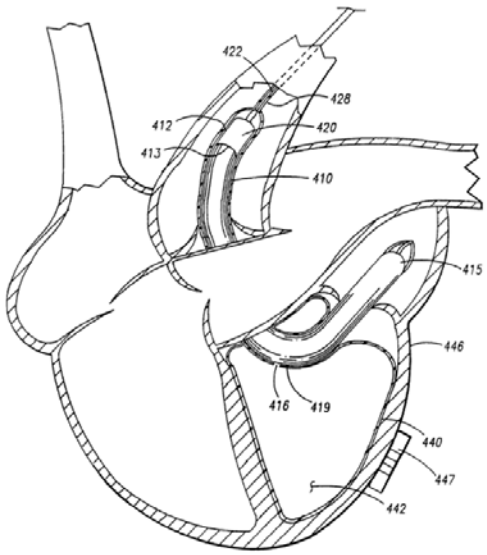

FIG.–23

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* '1204 Pet. 30–60. 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." '1204 Pet. 31 (citing '1204 Ex. 1002 ¶¶ 205–206; 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 205, Dr. Collins refers, generally, to 13 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." '1204 Ex. 1002 ¶ 205. 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 '1204 and '1205 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, 14, 16–20, 25, and 26 are unpatentable over Aboul-Hosn, Siess, and Wampler; that claims 10, 11, 13, 21, 23, 27, 29, and 30 are unpatentable over Aboul-Hosn, Siess, Wampler, and Jegaden; that claims 12 and 22 are unpatentable over Aboul-Hosn, Siess, Wampler, and Crowley; or that claim 15 is unpatentable over Aboul-Hosn, Siess, Wampler, and Wampler '712.

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

Petitioner additionally challenges claim 27 as unpatentable over Aboul-Hosn, Yock, Siess, and Wampler, and challenges claims 29 and 30 as

unpatentable over Aboul-Hosn, Yock, Siess, Wampler, and Jegaden. Those challenges also fail for the reasons set forth above. *See, e.g.*, '1205 Pet. 84–85 (relying on sections X.A.1(a)–(i) (the discussion of the Aboul-Hosn/ Siess/Wampler grounds) for the analysis of claim elements 27(a) – 27(i), respectively).

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 '1204 Petition and the '1205 Petition are each *denied* and no *inter partes* review is instituted.

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