Trials@uspto.gov
571-272-7822

Paper 8
Entered: September 20, 2017

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

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

v.

MAQUET CARDIOVASCULAR, LLC,
Patent Owner.

Cases IPR2017-01026 and IPR2017-01027
Patent 8,888,728 B2

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

PLENZLER, *Administrative Patent Judge*.

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

I. INTRODUCTION

A. Background

Abiomed, Inc., Abiomed R&D, Inc., and Abiomed Europe GmbH (collectively, "Petitioner") filed Petitions to institute an *inter partes* review of claims 1–24 ("the challenged claims") of U.S. Patent No. 8,888,728 B2 (Ex. 1001[1], "the '728 patent"). IPR2017-01026, Paper 2 ("'1026 Pet.")[2]; IPR2017-01027, Paper 2 ("'1027 Pet.")[3]. Maquet Cardiovascular, LLC ("Patent Owner") filed a Preliminary Response in each proceeding. IPR2017-01026, Paper 6 ("'1026 Prelim. Resp."); IPR2017-01027, Paper 6 ("'1027 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.

B. Related Matters

Petitioner and Patent Owner identify a number of proceedings related to the '728 patent. '1026 Pet. 2; '1027 Pet. 2; '1026 Paper 4, 1–2; '1027 Paper 4, 1–2.

---

[1] The Exhibit number is the same in both IPR2017-01026 and IPR2017-01027. References to exhibits and papers include the appropriate '1026 or '1027 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 '1026 Petition challenges claims 1–9 of the '728 patent.

[3] The '1027 Petition challenges claims 10–24 of the '728 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 (’1026 Pet. 3–5, 33–87; ’1027 Pet. 4–5, 31–94).

References	**Claim(s) Challenged**
Aboul-Hosn[4] and Siess[5]	1–4, 6, 7, 9–11, 13, and 15–24
Aboul-Hosn, Siess, and Yock[6]	5 and 12
Aboul-Hosn, Siess, and Wampler[7]	8
Aboul-Hosn, Siess, and Siess ’359[8]	14

Petitioner provides testimony from John M. Collins, Ph.D. ’1026 Ex. 1002; ’1027 Ex. 1002 (collectively, “the Collins Declaration”).

D. The ’728 Patent

The ’728 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, 1:18–22. Figures 1 and 3 of the ’728 patent are exemplary, and are reproduced below.

[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] U.S. Pat. No. 5,061,273, iss. Oct. 29, 1991 (’1026 Ex. 1006; ’1027 Ex. 1007, “Yock”).
[7] Wampler et al., *Clinical Experience with the Hemopump Left Ventricular Assist Device,* Supported Complex and High Risk Coronary Angioplasty, Ch. 14, 231–49 (Springer 1st ed. 1991) (’1026 Ex. 1007, ’1027 Ex. 1010, “Wampler”).
[8] EP 0916359 A1, pub. May 19, 1999 (’1027 Ex. 1006, “Siess ’359”).

FIG. 1

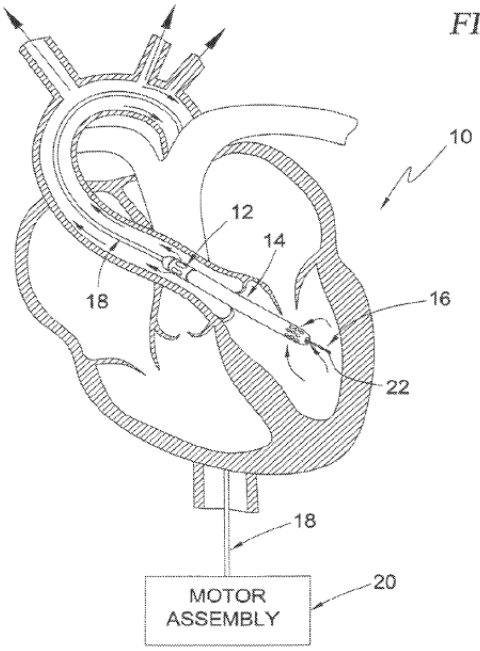

Figure 1 is a fragmentary section view of a human heart including an intravascular blood pump system. *Id.* at 5:3–7.

FIG. 3

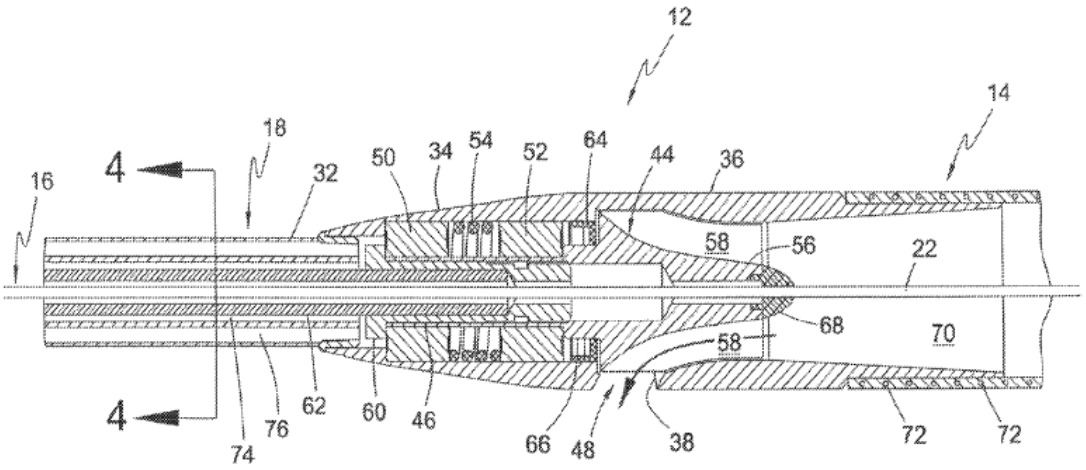

Figure 3 is a section view of the intravascular blood pump system shown in Figure 1. *Id.* at 5:12–15.

The ’728 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 6:45–48. Intravascular blood pump system 10 includes intravascular blood pump 12, cannula 14, and guide mechanism 16. *Id.* at 7:7–9. Intravascular blood pump 12 is driven by drive cable assembly 18 and motor assembly 20. *Id.* at 7:9–11. 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 7:11–14. An example guide element may include guide wire 22. *Id.* at 7:17–18.

The '728 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 7:19–22. First, guide wire 22 is introduced into the patient's vascular system and advanced to a desired location in the circulatory system. *Id.* at 7:23–28. Intravascular blood pump 12 and cannula 14 are then advanced along guide wire 22 to the location in the circulatory system. *Id.* at 7:35–39.

E. Illustrative Claim

As noted above, Petitioner challenges claims 1–24 of the '728 patent. Claims 1, 10, and 22 are independent, with claims 2–9, 11–21, 23 and 24 depending, directly or indirectly, from claim 1, 10, or 22. Claim 1 is illustrative, and is reproduced below:

> 1. An intravascular blood pump system, comprising:
>
> an 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, the hub has a distal end extending distally beyond the most distal portion of the blade and

a shroud within which the rotor is rotatably disposed;

a cannula extending from the shroud and comprising an outer cannula surface, the outer cannula surface having a substantially circular cross-section along a portion of its length;

a first lumen in fluid communication with the intravascular blood pump and operatively arranged to deliver purge fluid to the intravascular blood pump; and

a guide mechanism configured as a second lumen having a proximal end and a distal end, the guide mechanism adapted to guide a distal portion of said intravascular blood pump system to a predetermined location within the circulatory system of a patient;

wherein an axis coaxial with and extending through a portion of said guide mechanism extends through a region delimited by the outer cannula surface, and wherein the guide mechanism is configured to allow for a guide wire to slideably advance therealong.

Ex. 1001, 18:36–59.

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 '728 patent Specification. *See* 37 C.F.R. § 42.100(b). Applying that standard, we generally interpret the claim terms of the '728 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. '1026 Pet. 30–33; '1027 Pet. 28–30; '1026 Prelim. Resp. 68–70; '1027 Prelim. Resp. 67–69. For purposes of this Decision, we determine that no term requires express construction.

B. Challenges

1. Claims 1–4, 6, 7, 9–11, 13, and 15–24

Petitioner challenges claims 1–4, 6, 7, 9–11, 13, and 15–24 as unpatentable over Aboul-Hosn and Siess under 35 U.S.C. § 103(a). '1026 Pet. 34–81; '1027 Pet. 31–87. We have reviewed Petitioner's challenge, as well as Patent Owner's preliminary response to that challenge 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 the issue of whether claims 1–4, 6, 7, 9–11, 13, and 15–24 would have been obvious over Aboul-Hosn and Siess.

The deficiency in the challenge is similar for each of claims 1, 10, and 22. For simplicity, we address specifically only the challenge to claim 1 with the understanding that discussion applies equally to the challenge to claims 10 and 22.

In its challenge, Petitioner cites a combination of Aboul-Hosn's embodiments as teaching various claim features. '1026 Pet. 34–66 (citing 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.*, '1026 Prelim. Resp. 20–41. 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.

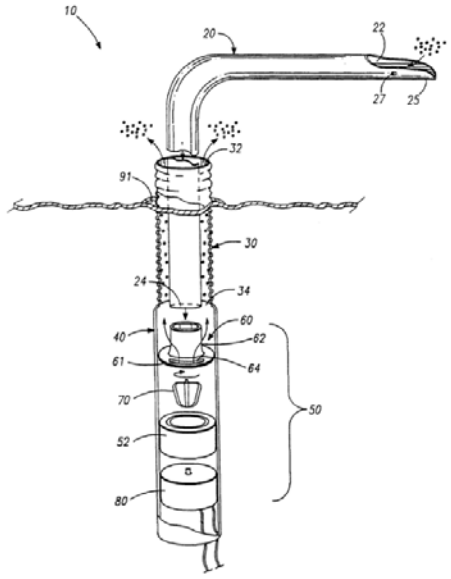

FIG.–1

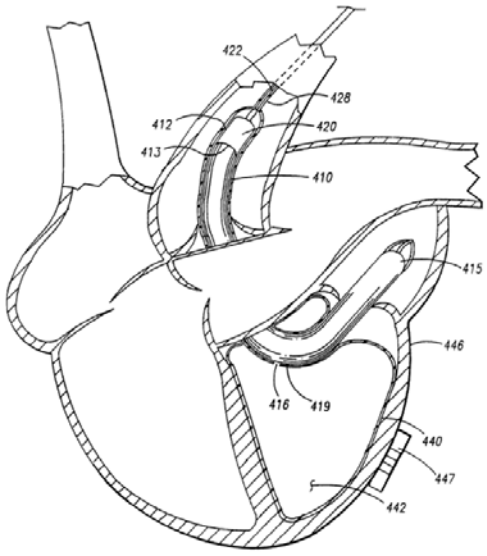

FIG.–23

Figure 1 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 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* '1026 Pet. 34–66. For example, Petitioner contends that

> Aboul-Hosn discloses that the axial flow pump system of FIGS. 1–13 with reverse flow feature can be delivered to the heart percutaneously as shown in FIG. 23, below, 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.

'1026 Pet. 35 (citing '1026 Ex. 1002 ¶ 156; 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" ('1026 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. Paragraph 156 simply states that "the pump system with the reverse flow features would include not only the axial

flow pump components . . . but also the reverse flow features including the outer cannula 30, housing cap 62 . . . to connect the inlet tube to the cannula and provide reverse flow." In the preceding paragraphs, Dr. Collins testifies that "pump 420 could include a variety of known blood pumps, including the pump system of FIGS. 1–13" ('1026 Ex. 1002 ¶ 154) and that "pump 420 would flexibly accommodate the pump described in FIGS. 1–13" (*id.* ¶ 155). 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. For example, Petitioner repeatedly asserts that certain features of the embodiments shown in Figures 1–13 and 23 *may* or *can* be used together, but fails to explain sufficiently *why* one skilled in the art would have found it obvious to combine those teachings. *See, e.g.*, '1026 Pet. 36 ("pump 420 [in FIG. 23] may also be configured without the reverse flow feature of the axial flow pump system of FIGS. 1–13), 57 ("the intravascular blood pump system shown in FIGS. 1–13 . . . may be adapted in a straight forward manner as the pump 420 in FIG. 23"), 61 ("With the guide wire 28 positioned in the desired location within the patient's vasculature, such as within the left side of the heart as shown in FIG. 23, the distal end of the cannula 20 (or cannula 411) of the blood pump can be advanced by passing over the guide wire 28 via the central passages of the cannula, the drive unit 80 and the blood pump components (e.g., central passages 73 and 82) and through a lumen of the multilumen catheter 428.").

Ultimately, the '1026 and '1027 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, 10, and 22, and claims 2–4, 6, 7, 9, 11, 13, 15–21, 23, and 24, which depend therefrom, are unpatentable over Aboul-Hosn and Siess.

2. Claims 5, 8, 12, and 14

Claims 5 and 8 depend from claim 1, and claims 12 and 14 depend from claim 10. Petitioner's challenges to those claims fail for the reasons set forth above regarding claims 1 and 10. Accordingly, we determine that Petitioner has failed to establish a reasonable likelihood of prevailing in showing that claims 5 and 12 are unpatentable over Aboul-Hosn, Siess, and Yock, that claim 8 is unpatentable over Aboul-Hosn, Siess, and Wampler, or that claim 14 is unpatentable over Aboul-Hosn, Siess, and Seiss '359.

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 '1026 Petition and the '1027 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