

UNITED STATES PATENT AND TRADEMARK OFFICE  
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BEFORE THE PATENT TRIAL AND APPEAL BOARD  
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GENERAL ELECTRIC CO.,  
Petitioner,

v.

UNITED TECHNOLOGIES CORP.,  
Patent Owner.

\_\_\_\_\_  
Case IPR2016-00862  
Patent 8,689,568 B2  
\_\_\_\_\_

Before BENJAMIN D. M. WOOD, HYUN J. JUNG, and  
RICHARD E. RICE, *Administrative Patent Judges*.

RICE, *Administrative Patent Judge*.

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

## I. INTRODUCTION

### A. *Background*

General Electric Co. (“Petitioner”) filed a Petition requesting *inter partes* review of claims 1–21 of U.S. Patent No. 8,689,568 B2 (Ex. 1001, “the ’568 Patent”). Paper 1 (“Pet.”). United Technologies Corp. (“Patent Owner”) filed a Preliminary Response. Paper 6 (“Prelim. Resp.”).

We have jurisdiction under 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.” 35 U.S.C. § 314(a). Upon considering the Petition and the Preliminary Response, we determine that Petitioner has shown a reasonable likelihood that it would prevail in showing the unpatentability of at least one of the challenged claims. Accordingly, we institute an *inter partes* review.

### B. *Related Proceedings*

Petitioner states that, to the best of its knowledge, the ’568 Patent is not involved in litigation. Pet. 1; *see also* Paper 5, 1 (indicating that Patent Owner is not aware of any related matters).

### C. *The ’568 Patent*

The ’568 Patent issued April 8, 2014 from an application filed July 9, 2012, and claims the benefit of three provisional applications each filed February 15, 2012. Ex. 1001, at (60). The ’568 Patent is titled “Cooling Hole with Thermo-Mechanical Fatigue Resistance.” *Id.* at (54). Figure 4 of the ’568 Patent is reproduced below:

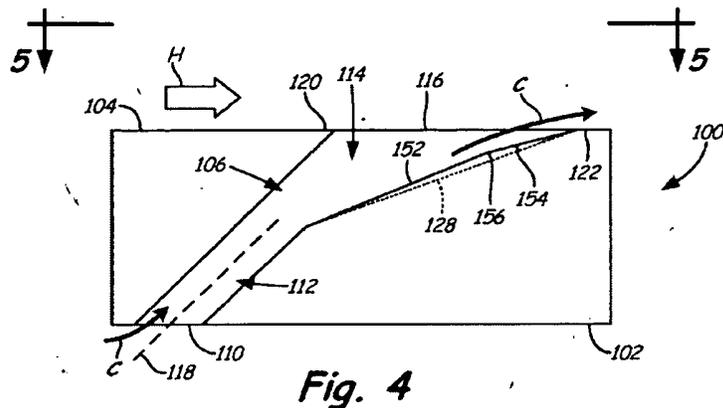
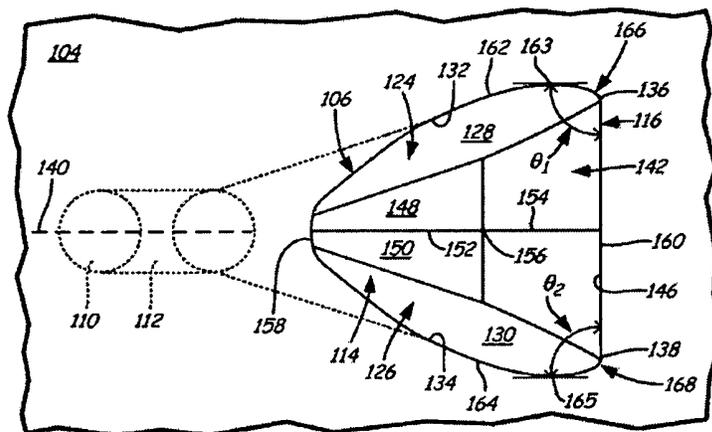


Figure 4 is a sectional view of cooling hole 106 in wall 100 of a gas turbine engine, including first wall surface 102 and second wall surface 104. *Id.* at 3:52–53, 6:16–16, 53–54. As depicted in Figure 4, cooling hole 106 includes inlet 110, metering section 112, diffusing section 114, and outlet 116. *Id.* at 6:57–59. Cooling air C enters cooling hole 106 through inlet 110 on the first wall surface and passes through metering section 112 and diffusing section 114 before exiting cooling hole 106 at outlet 116 along the second wall surface (shown in Figure 4 diffusing away from longitudinal axis 118 in diffusing section 114 as it flows toward outlet 116). *Id.* at 6:60–63, 7:34–37, Fig. 4.

Figure 5 of the '568 Patent is reproduced below:



**Fig. 5**

Figure 5 is a view of cooling hole 106 taken along line 5-5 as depicted in Figure 4 (reproduced above). *Id.* at 3:54-55. As shown in Figure 5, diffusing section 114 includes two channel-like lobes 124 and 126. Each of lobes 124, 126 diverges longitudinally and laterally from metering section 112, and each has, respectively, bottom surface 128, 130, side wall 132, 134, and trailing edge 136, 138. *Id.* at 7:45-50. Outlet 116 includes upstream end 158, downstream end (trailing edge) 160, first lateral edge 162, and second lateral edge 164. *Id.* at 9:5-6, 8-9.

According to the '568 Patent, cooling hole 106 is less susceptible to the adverse effects of thermo-mechanical fatigue due to its geometry at outlet 116. *Id.* at 9:33-34.

#### *D. The Challenged Claims*

Independent claim 1 is representative and is reproduced below:

1. A gas turbine engine component comprising:  
a wall having first and second opposing surfaces and defining a cooling hole, the cooling hole extending through the

wall from an inlet located at the first wall surface to an outlet located at the second wall surface and having:

a metering section extending downstream from the inlet; and

a diffusing section extending from the metering section to the outlet and comprising:

a first lobe diverging longitudinally and laterally from the metering section and having a trailing edge;

a second lobe diverging longitudinally and laterally from the metering section and having a trailing edge;

an upstream end located at the outlet;

a downstream end generally opposite the upstream end and located at the outlet, wherein the downstream end extends in a straight and lateral direction from an end of the first lobe to an end of the second lobe, and wherein the downstream end is at least axially coextensive with the trailing edges of the first and second lobes;

a first sidewall having a first edge extending along the outlet between the upstream end and the downstream end trailing edge, the first edge diverging laterally from the upstream end and converging laterally before reaching the downstream end; and

a second sidewall having a second edge extending along the outlet between the upstream end and the downstream end generally opposite the first sidewall, the second edge diverging laterally from the upstream end and converging laterally before reaching the downstream end.

*E. Asserted Grounds of Unpatentability*

Petitioner contends that the challenged claims are unpatentable based on the following specific grounds (Pet. 3, 12):

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