

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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SPACE EXPLORATION TECHNOLOGIES CORP.,  
Petitioner,

v.

BLUE ORIGIN LLC,  
Patent Owner.

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Case IPR2014-01378  
Patent 8,678,321 B2

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Before KEN B. BARRETT, HYUN J. JUNG, and CARL M. DEFRANCO,  
*Administrative Patent Judges.*

DEFRANCO, *Administrative Patent Judge.*

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

## I. INTRODUCTION

Space Exploration Technologies Corp. (“SpaceX”) filed a Petition (“Pet.”) for *inter partes* review of U.S. Patent No. 8,678,321 B2 (“the ’321 patent”). The Petition challenges the patentability of claims 14 and 15 of the ’321 patent on the ground of obviousness under 35 U.S.C. § 103.<sup>1</sup> Blue Origin LLC, the owner of the ’321 patent, did not file a Preliminary Response to the Petition.

We have jurisdiction under 35 U.S.C. § 314(a). After considering the Petition, we conclude that the challenged claims are not amenable to construction and we are unable to reach a determination on the reasonable likelihood that SpaceX would prevail on the ground asserted in the Petition. Accordingly, we do not institute *inter partes* review of claims 14 and 15.

## II. BACKGROUND

### A. *The ’321 Patent*

Space exploration is expensive, and a reusable launch vehicle (“RLV”) provides the potential for lower cost access to space. Ex. 1101, 1:55–2:3. The ’321 patent relates to landing and recovering an RLV at sea. *Id.* at 1:42–45. As disclosed, the RLV performs a controlled landing on a sea-going platform in a manner that reduces the amount of reconditioning necessary to reuse the RLV in a subsequent launch. *Id.* at 3:10–13, 5:29–36. The RLV comprises a lower, booster stage and an upper, payload stage. *Id.* at 3:13–15. After the RLV lifts off from a coastal launch site, the booster

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<sup>1</sup> The remaining claims of the ’321 patent, claims 1–13, are the subject of another Petition filed by SpaceX in IPR2014-01376. Pet. 1.

stage propels the payload stage to a high-altitude flight profile. *Id.* at 3:42–44, Fig. 1. At a predetermined altitude, the booster stage cuts off its engines and separates from the payload stage. *Id.* at 3:64–66. The booster stage takes a trajectory over the ocean for reentry into the earth’s atmosphere, while the payload stage proceeds into orbit. *Id.* at 3:64–4:3. During reentry, the booster stage reorients itself into a “tail-first” position as it glides toward the sea-going platform. *Id.* at 4:3–8. Once the booster descends to a suitable position over the platform, the engines on the booster stage reignite to slow its descent. *Id.* at 4:51–55. The booster stage then performs a “vertical, powered landing” at low speed onto the deck of the sea-going platform. *Id.* at 4:55–57.

*B. The Challenged Claims*

Of the two challenged claims, claim 14 is independent and claim 15 depends therefrom. In particular, claim 14 recites:

14. A system for providing access to space, the system comprising:
  - a space launch vehicle, wherein the space launch vehicle includes one or more rocket engines;
  - a launch site;
  - a sea going platform;
  - means for launching the launch vehicle from the launch site a first time, wherein the means for launching include *means for igniting the one or more rocket engines* and launching the vehicle in a nose-first orientation;
    - means for shutting off the one or more rocket engines*;
    - means for reorienting the launch vehicle from the nose-first orientation to a tail-first orientation before landing;

*means for reigniting at least one of the one or more rocket engines when the launch vehicle is in the tail-first orientation to decelerate the vehicle;*

*means for landing at least a portion of the launch vehicle on the sea going platform in a body of water, wherein the*

*means for landing include means for landing in the tail-first orientation while the one or more rocket engines are thrusting; and*

*means for launching at least a portion of the launch vehicle from the launch site a second time.*

Ex. 1101, 10:45–67 (emphasis added).

*C. The Asserted Ground*

SpaceX challenges the patentability of claims 14 and 15 of the '321 patent on the single ground of obviousness under 35 U.S.C. § 103 based on Ishijima,<sup>2</sup> Lane,<sup>3</sup> and Mueller.<sup>4</sup>

### III. ANALYSIS

A determination of obviousness over the prior art begins with claim construction. *See In re Hiniker Co.*, 150 F.3d 1362, 1369 (Fed. Cir. 1998) (emphasizing “the name of the game is the claim”). In an *inter partes* review, a claim in an unexpired patent is given “its broadest reasonable construction in light of the specification of the patent in which it appears.” 37 C.F.R. § 42.100(b). Almost all of the limitations of claim 14 are written in “means-plus-function” format, as is the limitation of dependent claim 15.

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<sup>2</sup> Y. Ishijima et al., *Re-entry and Terminal Guidance for Vertical Landing TSTO (Two-Stage to Orbit)*, AIAA GUIDANCE, NAVIGATION, AND CONTROL CONFERENCE AND EXHIBIT, PAPER 98-4120 (1998), at 192–200 (Ex. 1103).

<sup>3</sup> U.S. Patent No. 5,873,549, issued Feb. 23, 1999 (Ex. 1104).

<sup>4</sup> U.S. Patent No. 6,158,693, issued Dec. 12, 2000 (Ex. 1105).

In proposing constructions for each of the “means for” limitations, SpaceX attempts to identify corresponding structure in the Specification for the various recited functions as required by 37 C.F.R. § 42.104(b)(3). Pet. 18–22. After reviewing SpaceX’s proposed constructions, however, we determine that SpaceX errs in its construction of at least three of claim 14’s means-plus-function limitations, namely, the “means for igniting” the rocket engines, “means for shutting off” the rocket engines, and “means for reigniting” the rocket engines. *See id.* at 19–21. SpaceX’s proposed constructions are erroneous because they seek to broaden the scope of these limitations beyond what is permissible under 35 U.S.C. § 112, ¶ 6.

At the outset, we agree with SpaceX that claims 14 and 15 recite means-plus-function limitations invoking 35 U.S.C. § 112, ¶ 6, because the various “means for” igniting, shutting off, and reigniting the engines are modified by functional language that does not include any structure for performing the recited functions. Construing means-plus-function limitations is a two-step process: (1) “define the particular function of the claim limitation”; and (2) “look to the specification and identify the corresponding structure for that function.” *Golight, Inc. v. Wal-Mart Stores, Inc.*, 355 F.3d 1327, 1333–34 (Fed. Cir. 2004) (internal quotations and citations omitted). As for the second step, the structure disclosed in the specification is “corresponding” structure “only if the specification or prosecution history clearly links or associates that structure to the function recited in the claim.” *Id.*

Our analysis focuses on the second step, as the function of the relevant limitations is readily apparent—igniting, shutting off, and reigniting the rocket engines. SpaceX contends that, although the Specification discloses that “the routine starts with booster engine ignition” and that “booster engine cutoff occurs at a predetermined altitude,” the Specification is otherwise silent on details about igniting, shutting off, or reigniting the engines, in terms of both structure and function. Pet. 19–20. Indeed, SpaceX represents that the Specification “does not disclose any structure that performs this [igniting] function” and “is entirely silent on any structure for performing this [reigniting] function.” *Id.* Unable to identify structure in the Specification corresponding to the recited functions, SpaceX urges us to construe the “means for” limitations as “*any* suitable structure” that ignites, shuts off, or reignites a rocket engine. *Id.* at 19–21. That, we cannot do.

Interpreting means-plus-function language to encompass *any* structure for performing the recited function not only violates 35 U.S.C. § 112, ¶ 6, which requires that it “be construed to cover the corresponding structure . . . described in the specification and equivalents thereof,” but also violates our standard of applying the “broadest *reasonable* construction” to claims undergoing *inter partes* review. 37 C.F.R. 42.100(b) (emphasis added); *see also In re Cuozzo Speed Techs.*, No. 2014-1301, 2015 WL 448667, at \*6 (Fed. Cir. Feb. 4, 2015) (holding that the PTO “properly adopted” the broadest reasonable interpretation standard for IPR proceedings). Thus, we decline to construe the means-plus-function limitations of claim 14 to cover

“any suitable structure” capable of performing the recited function, as SpaceX proposes.

Our review of the Specification locates minimal discussion of the igniting, shutting off, and reigniting functions recited in claim 14. Referencing a flow chart in Figure 2, the Specification states “[i]n block 202, the routine starts with booster engine *ignition* and liftoff from a launch site,” “[i]n block 204, booster engine *cutoff* occurs at a predetermined altitude,” and after reentry, “the routine proceeds to block 224 and *reignites* the booster engines.” Ex. 1101, 6:35–41, 7:19–20 (emphasis added). Those passages, however, lack any discussion of *how* the booster engine is ignited for launch, *how* the booster engine is shut off for separation, or *how* the booster engine is reignited for landing. Nor do the figures of the ’321 patent shed any light on the corresponding structure. In particular, blocks 202, 204, and 224 of Figure 2 illustrate merely that the booster engines “ignite,” “cutoff,” and “reignite” at various stages of flight. *Id.* at Fig. 2. Those labels correspond to the claimed function, but do not serve to define any structure. Indeed, the Specification makes no mention of whether the functional aspects of igniting, shutting off, and reigniting the engines are internal or external to the engines (or a combination thereof), let alone describe any structural components for performing those functions.<sup>5</sup>

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<sup>5</sup> Notably, the Specification acknowledges that “several details describing structures and processes that are well-known and often-associated with . . . launching and landing space launch vehicles are not set forth in the [written

A patent must be precise enough to notify a skilled artisan of what is claimed and what is still open to the public. *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2129 (2014) (citing *Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 373 (1996)). On the current record, we find that the '321 patent does not describe any structure for performing the functions of “igniting,” “shutting off,” and “reigniting” the rocket engines as recited in claim 14. Absent meaningful disclosure of structure for the claimed “means,” the '321 patent leaves skilled artisans to speculate about what is being claimed. In other words, the Specification’s lack of corresponding structure for the “means for igniting,” “means for shutting off,” and “means for reigniting” limitations prevents us from arriving at the proper scope for claim 14.

A lack of sufficient disclosure of structure under 35 U.S.C. § 112, ¶ 6 renders a claim indefinite and, thus, not amenable to construction. *See In re Aoyama*, 656 F.3d 1293, 1298 (Fed. Cir. 2011) (quoting *Enzo Biochem, Inc. v. Applera Corp.*, 599 F.3d 1325, 1332 (Fed. Cir. 2010) (“If a claim is indefinite, the claim, by definition, cannot be construed.”)). Because claim 14 lacks adequate structural support for some of the means-plus-function limitations, it is not amenable to construction. And without ascertaining the breadth of claim 14, we cannot undertake the necessary factual inquiry for evaluating obviousness with respect to differences between the claimed subject matter and the prior art. *Aoyama*, 656 F.3d at 1296 (the “first step”

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disclosure] to avoid unnecessarily obscuring the various embodiments of the disclosure.” Ex. 1101, 2:32–37.

of any application of the prior art is a proper construction of the claims at issue). Any comparison with the prior art asserted in the Petition would be speculative and futile. As such, our analysis begins and ends with the claims, and we are unable to determine whether there is a reasonable likelihood that SpaceX would prevail on the prior art ground asserted in the Petition against claims 14 and 15. That is because *inter partes* review is limited to grounds of anticipation and obviousness under 35 U.S.C. §§ 102 and 103, not indefiniteness under 35 U.S.C. § 112. *See* 35 U.S.C. 311(b), 37 C.F.R. § 42.104(b)(2).

#### IV. CONCLUSION

Because the challenged claims are not amenable to construction, we are unable to reach a determination on the reasonable likelihood of SpaceX prevailing on the prior art ground asserted in the Petition.

#### V. ORDER

For the foregoing reasons, it is  
ORDERED that the Petition is denied; and  
FURTHER ORDERED that no *inter partes* review will be instituted pursuant to 35 U.S.C. § 314(a) with respect to claims 14 and 15 of the '321 patent on the ground of unpatentability asserted in the Petition.

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