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Paper 7
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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SPACE EXPLORATION TECHNOLOGIES CORP.,
Petitioner,

v.

BLUE ORIGIN LLC,
Patent Owner.

Case IPR2014-01376
Patent 8,678,321 B2

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

DEFRANCO, *Administrative Patent Judge*.

DECISION
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 1–13 of the '321 patent under 35 U.S.C. §§ 102 and 103.[1] 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 SpaceX has demonstrated a reasonable likelihood that it would prevail in showing unpatentability of the challenged claims. Thus, we institute an *inter partes* review of claims 1–13 of the '321 patent.

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. *Id*. at 1:55–2:3. The '321 patent relates to landing and recovering an RLV at sea. Ex. 1001, 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 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

[1]The remaining claims of the '321 patent, claims 14 and 15, are the subject of another Petition filed by SpaceX in IPR2014-01378. Pet. 1.

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. Challenged Claims

Of the challenged claims, claims 1, 8, and 13 are independent. Claim 1 is directed to a method for "operating a space launch vehicle," and claims 8 and 13 are directed to a method for "transporting a payload to space." Claim 1 is illustrative:

> 1. A method for operating a space launch vehicle, the method comprising:
>
> launching the space vehicle from earth in a nose-first orientation, wherein launching the space launch vehicle includes igniting one or more rocket engines on the space launch vehicle;
>
> reorienting the space launch vehicle to a tail-first orientation after launch;
>
> positioning a landing structure in a body of water; and
>
> vertically landing the space launch vehicle on the landing structure in the body of water in the tail-first orientation while providing thrust from at least one of the one or more rocket engines.

Ex. 1001, 8:59–9:4.

C. Evidence of Record

SpaceX relies upon the following prior art as its basis for challenging the claims of the '321 patent, and it also proffers the declaration testimony of Dr. Marshall H. Kaplan (Ex. 1016).

References	Patents/Printed Publications	Date	Exhibit
Ishijima	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, at 192–200	1998	1003
Lane	U.S. Patent No. 5,873,549	Feb. 23, 1999	1004
Mueller	U.S. Patent No. 5,927,653	Jul. 27, 1999	1005
Kindem	U.S. Patent No. 6,024,006	Feb. 15, 2000	1006
Waters	J. Waters et al., *Test Results of an F/A-18 Automatic Carrier Landing Using Shipboard Relative GPS*, PROCEEDINGS OF THE ION 57TH ANNUAL MEETING AND THE CIGTF 20TH BIENNIAL GUIDANCE TEST SYMPOSIUM, at 841–851	2001	1007
Spencer	U.S. Patent No. 6,450,452 B1	Sep. 17, 2002	1008

D. Asserted Grounds of Unpatentability

SpaceX challenges the patentability of claims 1–13 based on the following grounds:

Ground	Basis	Challenged Claims
§ 102	Ishijima	1–3
§ 103	Ishijima and Mueller	4, 5
§ 103	Ishijima and Kindem	6
§ 103	Ishijima, Spencer, and Waters	7
§ 103	Ishijima and Lane	8, 9, 12, 13
§ 103	Ishijima, Lane, and Mueller	10
§ 103	Ishijima, Lane, and Waters	11

III. ANALYSIS

A. Claim Construction

In an *inter partes* review, claim terms in an unexpired patent are given their broadest reasonable construction in the context of the patent in which they appear. 37 C.F.R. § 42.100(b). SpaceX proposes a construction for five claim terms, namely, "space launch vehicle," "nose-first orientation," "tail-first orientation," "positional information," and "deploying . . . flared control surfaces." Pet. 13–18. Based on our review of the record, however,

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