

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

VIKEN DETECTION CORPORATION,
Petitioner,

v.

AMERICAN SCIENCE AND ENGINEERING, INC.,
Patent Owner.

IPR2021-01585
Patent 7,400,701 B1

Before SCOTT A. DANIELS, CARL M. DEFRANCO JR., and
GREGG I. ANDERSON, *Administrative Patent Judges*.

Opinion for the Board filed PER CURIAM.

Concurring Opinion filed by *Administrative Patent Judge* DEFRANCO.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

American Science and Engineering, Inc. (“ASE”) is the owner of U.S. Patent No. 7,400,701 B1 (Ex. 1001, “the ’701 patent”).¹ Viken Detection Corporation (“Viken”) filed a Petition requesting *inter partes* review of all the claims of the ’701 patent, namely, claims 1–13. Paper 1 (“Pet.”). ASE filed a Preliminary Response. Paper 9 (“Prelim. Resp.”). Because we determine that Viken has demonstrated a reasonable likelihood that at least claim 1 of the ’701 patent is unpatentable, we institute an *inter partes* review of all claims as challenged in the Petition. *See* 35 U.S.C. § 314(a).

I. BACKGROUND

A. Related Matters

The ’701 patent was the subject of an infringement action filed October 19, 2020 in *American Science & Engineering, Inc., v. Viken Detection Corp.*, No. 1:20-cv-11883 (D. Mass.). *See* Pet. 65; Paper 7, 1. However, per an amended complaint, ASE removed the claim of infringement of the ’701 patent from that action.

Pending before the Office are petitions filed by Viken for *inter partes* review of two related patents, namely, U.S. Patent Nos. 8,300,763 B2 (IPR2022-00027) and 7,505,562 B2 (IPR2022-00028). Those patents are both the subject of the above-identified infringement action. Viken moved to stay the infringement action pending the outcome of our review of Viken’s petitions. *See* Ex. 3001 (Docket Entries 81–83). The district court granted the stay because “[t]hough discovery has begun, it is not yet complete, and the claim construction process has not started,” and also

¹ According to ASE, it is a wholly-owned subsidiary of OSI Systems, Inc., which publicly trades on the NASDAQ under the symbol OSIS.

because ASE “acknowledged ‘the still-early stage of this case.’” Ex. 3002 (Docket Entry 89 at 5).

B. The '701 Patent

The '701 patent is directed to a system and method for inspecting an object, such as a vehicle, by directing multiple sources of penetrating radiation at the object to determine the presence of concealed contraband, weapons, or explosives. *See* Ex. 1001, 1:3–26. According to the '701 patent, the object is moved through the inspection system to image the object's contents with penetrating radiation emitted from x-ray sources, which, in turn, is scattered for detection by multiple detectors disposed around the object. Figure 1 of the '701 patent, reproduced below, illustrates an embodiment of the inspection system.

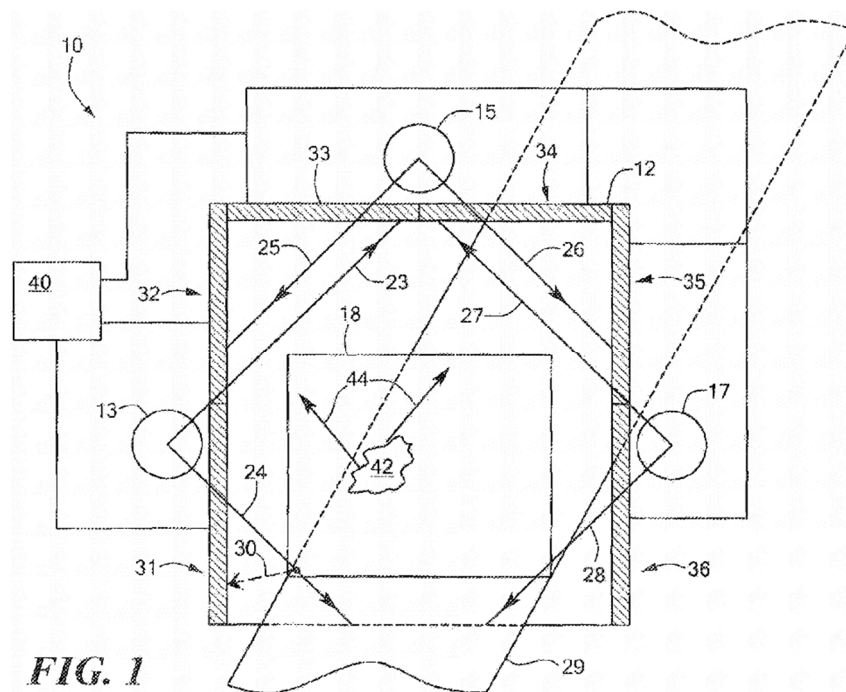


Figure 1 is a schematic cross-sectional view of the elements of inspection system 10. Object 18, such as a vehicle, is inspected as it moves through the system (i.e., into the page). Ex. 1001, 3:24–28. X-ray pencil-

beam sources 13, 15, and 17 and backscatter detectors 31–36 are arranged around object 18. *Id.* at 3:30–35, 4:23–33. “The beams from each source sweep in sequence, such that no more than one source is emitting radiation at a time. Thus, source (or ‘imager’) 13 sweeps its beam first. Radiation scattered from the object, as represented by rays 44 is received by all of the detectors.” *Id.* at 5:44–48. Although some incident radiation from each source is transmitted through the object or absorbed, a portion of the beam is scattered in all directions. *Id.* at 4:34–40. Detectors 31–36 are positioned to detect the scattered radiation and to generate “output signals,” which are “transmitted to a processor 40, and processed to obtain images of feature 42 inside the inspected object 18.” *Id.* at 4:51–54. As described in the ’701 patent, temporal sequencing of the pencil-beam sources eliminates cross-talk and permits the x-ray sources to be placed in the same plane. *Id.* at 5:33–38.

C. The Asserted Challenges

Claims Challenged	35 U.S.C. §	Basis
1–4, 10–13	102(a)(e)	Seppi ² or Seppi ’422 ³
5, 6	103	Seppi and Chalmers ⁴
7–9	103	Seppi and Grodzins ⁵
1–6, 10–13	103	Chalmers and Seppi
7–9	103	Chalmers, Seppi, and Grodzins

In support of these challenges, Viken also submits the declaration of Richard C. Lanza, Ph.D. *See* Ex. 1003. At this stage, ASE does not submit

² U.S. Patent No. 7,103,137 B2, iss. Sept. 5, 2006 (Ex. 1007, “Seppi”).

³ U.S. Patent No. 7,672,422 B2, iss. Mar. 2, 2010 (Ex. 1009, “Seppi ’422”).

⁴ U.S. Patent No. 6,459,764 B1, iss. Oct. 1, 2002 (Ex. 1008, “Chalmers”).

⁵ U.S. Patent No. 6,459,761 B1, iss. Oct. 1, 2002 (Ex. 1006, “Grodzins”).

a rebuttal declaration. We also note that, although Viken lists “Seppi ’422” as a basis for its anticipation challenge, nowhere do we discern that Viken discusses that evidence “with particularity” (35 U.S.C. § 312(a)(3)) or otherwise “identif[ies] specific portions of the evidence that support its challenge” (37 C.F.R. § 42.104(b)(5)). As such, we do not treat Seppi ’422 as part of Viken’s anticipation challenge, but understand it to have been cited simply for its formal replication of the hand-drawn figures in Seppi, which is discussed at length in the Petition. *See* Pet. 12 (“Petitioner replicates the formal figures of *Seppi 422* for the convenience of the Board as they are clearer than the hand-drawn versions in *Seppi*.”); *see also id.* 18–19, 23 (showing figure from Seppi ’422). ASE confirms this understanding. *See* Prelim. Resp. 14 (“Patent Owner (in the interest of consistency) adopts Petitioner’s convention of using figures from Seppi ’422.”).

D. The Challenged Claims

Two of the challenged claims are independent—claims 1 and 11. The primary difference between these two claims is that claim 1 recites a “system for inspecting an object,” whereas claim 11 recites a “method” for doing the same. *Compare* Ex. 1001, 6:43–62, *with id.* at 8:1–18. Claim 1 is representative and recites:

1. An inspection system for inspecting an object characterized by motion in a direction with respect to the inspection system, the system comprising:
 - a. a first pencil-beam source for providing a first beam of penetrating radiation of specified cross-section directed in a first beam direction substantially transverse to the direction of motion of the object;
 - b. a second pencil-beam source for providing a second beam of penetrating radiation of specified cross-section substantially coplanar with, and Substantially perpendicular to,

the first beam of penetrating radiation, directed in a second beam direction, and temporally interspersed with the first beam of penetrating radiation;

c. a plurality of scatter detectors each scatter detector of which is disposed so as to detect radiation scattered from both the first beam and the second beam by any scattering material within the inspected object and for generating a scattered radiation signal; and

d. a controller for creating an image of the scattering material based solely on the scattered radiation signal.

Id. at 6:43–62.

II. ANALYSIS

A. Claim Construction

We apply the claim construction standard set forth in *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (en banc). That is, “the words of a claim ‘are generally given their ordinary and customary meaning’ . . . that the term would have to a person of ordinary skill in the art in question at the time of the invention.” *Id.* at 1312–13. Here, neither party proposes a construction of the claim terms beyond their ordinary and customary meaning. *See* Pet. 11–12; Prelim. Resp. 23. Thus, at this stage, we see no reason to expand on that sort of construction.

B. Level of Ordinary Skill in the Art

Viken’s declarant, Dr. Lanza, testifies that one skilled in the art during the relevant time frame “would be a person with a Ph.D. in physics or similar discipline and at least two years of experience working with an interdisciplinary team designing and creating systems involving penetrating radiation sources and detectors” and that “[a] person with less education but

more relevant practical experience may also meet this standard.” Ex. 1003

¶ 21. According to Viken’s declarant, that person—

would most likely have been a nuclear or experimental physicist, and would have had a good understanding of the principles of physics. He or she would also have had overview knowledge of the physical properties of x-ray sources and x-ray detectors, how x-ray sources and x-ray detectors are integrated to form imaging systems, how images are created, and how they are used for the inspection of objects.

Id. ¶ 22.

At this stage, ASE does not contest that testimony. *See* Prelim. Resp. 23 (“Patent Owner assumes Petitioner has correctly stated the level of skill in the art.”). Nor do we discern any reason to question its credibility at this stage. Thus, for purposes of institution, we review the asserted prior art mindful of the level of skill in the art as stated by Viken’s declarant.

C. Single Claim Threshold for Institution

We begin with Viken’s challenge that independent claim 1 is unpatentable as anticipated by Seppi. *See* Pet. 17. In doing so, Viken provides a detailed mapping of how Seppi meets each of the recited claim elements, along with some further explanatory support from its declarant. *See id.* at 17–26. ASE responds to Viken’s anticipatory challenge by arguing that Seppi fails to disclose two limitations of claim 1, namely, limitations c and d, as identified above. *See* Prelim. Resp. 24.

We address ASE’s arguments with respect to each of those disputed limitations below. But, before doing so, we note that ASE does not dispute Seppi’s disclosure of the first two limitations of claim 1, including the limitation reciting that the second pencil-beam is “substantially co-planar with, and substantially perpendicular to, the first beam” and “temporally

interspersed with the first beam.” *Compare* Pet. 21–24 (mapping limitation b to Seppi), *with* Prelim. Resp. 24 (disputing only Seppi’s disclosure of limitations c and d). That ASE does not dispute Seppi’s disclosure of that limitation is notable because that very limitation is what led to allowance of the claims. *See* Ex. 1002 at 282 (“The following is an examiner’s statement of reasons for allowance: . . . the prior art fails to disclose a second pencil-beam that is substantially coplanar and substantially perpendicular to the first beam of penetrating radiation, and temporally interspersed with the first beam of penetrating radiation as claimed.”). With that in mind, we address only the limitations where ASE alleges Viken’s Petition falls short.

1. Limitation c of Claim 1

First, ASE argues that Seppi does not disclose the plurality of detectors recited in limitation c claim 1. Prelim. Resp. 24. In that regard, ASE contends that Viken “does not cite any evidence that Seppi expressly discloses that any of its detectors meet the requirements for the ‘scatter detectors’ of limitation c.” *Id.* at 25. According to ASE, the passages that Viken cites from Seppi “do not expressly disclose that any one of the detectors is disposed to detect scattered radiation from *both* a beam emitted by source 16a *and* a beam emitted by source 16e.” *Id.*

We disagree. At the outset, we note that Seppi clearly contemplates the use of an array of scatter detectors 21 for detecting the scattered radiation from multiple pencil-beam sources 16. *See* Seppi, 13:64–14:37, Fig. 1. In terms of the claim’s requirement that the detectors be disposed, i.e., positioned, to detect radiation scattered from *multiple beams*, Seppi discloses expressly that the detector array 20 is “used to detect scattered radiation by scanning the cargo container 14 with one source 16 at a time.” *Id.* at 14:30–

32. And that claim 1 recites that the first and second pencil-beams are “temporally interspersed” means that the detectors as claimed (as well as those of Seppi) need only be capable of detecting the scattered radiation from one beam at a time, not multiple beams at the same time.

To that end, Seppi explains that “[o]peration of the sources 16a-16f is cycled,” with “one source on at a time.” *Id.* at 14:1–2. It logically follows then that, although Seppi’s scanning pencil-beams, i.e., the sources of the scattered radiation, are interspersed on a temporal basis, this nonetheless results in Seppi’s detector array being able to detect scattered radiation from multiple beams, albeit one at a time. Indeed, the reasonable likelihood of that being the case is corroborated by Viken’s declarant, who testifies:

Due to the angular distribution of Compton scattering and/or other scattering effects, at least one detector of the detector array 20 of Seppi would be *‘disposed so as to detect radiation scattered from both the first beam [e.g., beam emitted from source 16a] and the second beam [e.g., beam emitted from source 16e] by any scattering material within the inspected object.*

Ex. 1003 ¶ 129. We have no reason, at least not at this stage, to doubt that un rebutted testimony from Viken’s declarant. Thus, in our view, Viken demonstrates that Seppi discloses “a plurality of scatter detectors” as claimed in limitation c.

2. Limitation d of Claim 1

Next, ASE argues that Viken fails on two fronts in attempting to show that Seppi’s detector array meets limitation d of claim 1. *First*, ASE argues that Viken fails to show that Seppi’s detector array generates a “scattered radiation signal.” Prelim. Resp. 29. We disagree. As Viken correctly explains, Seppi discloses that detector modules 21 are connected to a processor that converts “data output” from the detector modules into an

image. *See* Pet. 26 (citing Ex. 1007, 14:4–6). Just reading Seppi at face value, one cannot reasonably dispute that Seppi discloses an embodiment in which the detector modules detect “scattered radiation” and that “data” processed from those detector modules is in the form of a scattered radiation signal that results in an image. Ex. 1007, 14:4–37. And Seppi states elsewhere that “[a] processor may be electrically coupled to the detector array. The processor may be programmed to reconstruct computed tomography images *based on data received from the detector array.*” *Id.* at 5:6–10 (emphasis added); *see also id.* at 10:41–42, 58–61 (discussing “detected signals and reconstruction of images” in the context of “information from scattered radiation”). Those disclosures clearly support that Seppi’s detectors generate a scattered radiation signal for use by the processor in creating an image. Thus, we reject ASE’s argument to the contrary.

Second, ASE contends that, even if Seppi discloses generating a scattered radiation signal to create an image, Viken nonetheless fails to show that the image is created “based *solely* on the scattered radiation signal.” Because “Seppi does not disclose *which* scattered radiation signals are processed” to create the image and “Seppi also does not disclose using signals generated by any particular detectors.” Prelim Resp. 30. That argument does not persuade us for the simple reason that the claim limitation does not further specify the signal being processed, or the detector generating it, beyond reciting that the image is “based solely on the scattered radiation signal.” In that regard, Seppi expressly discloses an embodiment where transmitted radiation is “rejected, so that *only* scattered radiation is processed.” Ex. 1007, 14:4–6 (emphasis added). That passage provides

ample support for Viken's contention that Seppi discloses limitation d of claim 1.

3. Conclusion

Having reviewed the preliminary record, including Viken's showing as to how Seppi discloses each of the limitations of claim 1 (*see* Pet. 17–26), we conclude that Viken demonstrates a reasonable likelihood that claim 1 is unpatentable as anticipated by Seppi.

D. Viken's Other Anticipation Challenges

Viken also relies on Seppi alone to challenge claims 2–4 and 10–13. Pet. 53–58. ASE does not treat Viken's anticipation challenge of these claims any differently from Viken's challenge of claim 1. *See* Prelim. Resp. 32–33. Instead, for independent claim 11, ASE states that “[t]he limitations of method claims 11 are analogous to the limitations of system claim 1, and the limitations of the two claims are, for the most part, parallel to one another.” *Id.* at 32. As such, ASE makes the same arguments in support of claim 11 as it made for claim 1. *See id.* Similarly, ASE states that its arguments with respect to claims 1 and 11 “apply equally to the dependent claims.” *Id.* at 33.

ASE's arguments are no more persuasive with respect to claims 2–4 and 10–13 than they are for claim 1, at least not at this stage. But keeping in mind that Viken bears the burden of establishing a likelihood of success, we have fully considered Viken's showing with respect to those claims, and, nonetheless, conclude that Viken demonstrates a reasonable likelihood that claims 2–4 and 10–13 are unpatentable as anticipated by Seppi.

E. Viken's Obviousness Challenges

ASE also challenges the claims as obvious based on an assortment of prior art that includes Seppi in combination with Chalmers and/or Grodzins. *See* Pet. 2 (Grounds 2–5). Although ASE responds separately to Viken's obviousness challenges, it does not raise any new arguments aside from arguing that the asserted combination lacks disclosure of “limitation d (‘1.d’) or step d of claim 11 (‘11.d’).” *See* Prelim. Resp. 33–35. But, as discussed above, we conclude that the record evidence supports Viken's showing that, at a minimum, Seppi discloses limitation d. Moreover, to the extent that ASE faults Viken's analysis for why one skilled in the art would have combined the teachings of Chalmers and Seppi, we are unpersuaded for the simple reason that ASE repeatedly focuses on an embodiment in Seppi—the “cone beam” embodiment—not relied upon by Viken (*see* Prelim. Resp. 36, 38–39, 41), or otherwise argues Chalmers and Seppi individually without ever acknowledging the combination of their teachings as a whole (*see id.* at 36–42). Having reviewed Viken's obviousness challenges, we determine that Viken demonstrates a reasonable likelihood that challenged claims 1–13 are unpatentable as obvious over the asserted combinations of Seppi, Chalmers, and Grodzins, even accounting for ASE's arguments to the contrary.

F. Discretionary Denial Under 325(d)

ASE urges us to deny the Petition under 35 U.S.C. § 325(d). Prelim. Resp. 42. The exercise of our discretion under § 325(d) involves a two-part framework that considers:

- (1) whether the same or substantially the same art or arguments were previously presented to the Office; and

(2) if the first part of the framework is satisfied, whether petitioner has demonstrated that the Office erred in a manner material to the patentability of challenged claims.

Advanced Bionics, LLC v. MED-EL Elektromedizinische Geräte GmbH, IPR2019-01469, Paper 6 at 8 (PTAB Feb. 13, 2020) (precedential).

We need not address the first part of the *Advanced Bionics* framework because we determine that Viken demonstrate material error under the second part of the framework. *See* Pet. 59–64. It is undisputed that Seppi forms the crux of Viken’s anticipation and obviousness challenges. It also undisputed that Seppi was neither applied nor meaningfully discussed during prosecution of the challenged patent. *See* Ex. 1002 at 284 (mentioning only that Seppi discloses “a radiation scanning unit”). Indeed, nowhere does ASE assert that the Examiner ever appreciated or otherwise discussed Seppi’s disclosure of using multiple “coplanar” and “temporally interspersed” pencil beams for generating scattered radiation, a disclosure that goes to the very heart of the claims at issue here. *See* Prelim. Resp. 45–52. That the Examiner overlooked those key aspects of Seppi’s disclosure is evident from the Examiner’s reason for allowing the challenged claims, namely, that “the prior art fails to disclose a second pencil-beam that is substantially coplanar and substantially perpendicular to the first beam of penetrating radiation, and temporally interspersed with the first beam of penetrating radiation as claimed.” Ex. 1002 at 282.

Moreover, ASE does not dispute that Seppi meets the first and second pencil-beam limitations of claim 1, i.e., elements a and b. *Compare* Pet. 21–24 (mapping claim elements a and b to Seppi), *with* Prelim. Resp. 24 (disputing only Seppi’s disclosure of elements c and d). Because Seppi indisputably discloses the very limitations that led to allowance of the

claims, we find that the Examiner erred by overlooking those key disclosures in Seppi. Thus, we find that Viken demonstrates material error on the part of the Examiner. As such, we decline to exercise § 325(d) discretion.

III. CONCLUSION

For the above reasons, we determine that the information presented in Viken's Petition shows a reasonable likelihood that at least claim 1 of the '701 patent is unpatentable as anticipated by Seppi. Because Viken demonstrates that at least one claim of the '701 patent meets the threshold for institution, we institute an *inter partes* review of all claims as challenged in the Petition. 37 C.F.R. § 42.108(c); *SAS Inst. v. Iancu*, 138 S. Ct. 1348, 1359–60 (2018).

IV. ORDER

Accordingly, it is:

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review of claims 1–13 of the '701 patent is *instituted*; and

FURTHER ORDERED that, pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4(b), notice is hereby given of the institution of trial, which will commence on the entry date of this Decision.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

VIKEN DETECTION CORPORATION,
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IPR2021-01585
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Before SCOTT A. DANIELS, CARL M. DEFRANCO JR., and
GREGG I. ANDERSON, *Administrative Patent Judges*.

DEFRANCO, *Administrative Patent Judge*, concurring.

I concur with the majority's decision to institute *inter partes* review. I write separately only to address an aspect of the majority's decision declining to exercise discretion under 35 U.S.C. § 325(d). In particular, I would have disposed of the § 325(d) issue under the first part of the *Advanced Bionics* framework rather than, as the majority does here, under the second part of the framework. To be clear, I do not take issue with the majority's analysis under the second part of the *Advanced Bionics* framework.

The first part of the *Advanced Bionics* framework evaluates whether the same or substantially the same prior art or arguments “previously were presented to the Office.” *Advanced Bionics, LLC v. MED-EL Elektromedizinische Geräte GmbH*, IPR2019-01469, Paper 6 at 8 (PTAB Feb. 13, 2020) (precedential). ASE argues that Viken “misapplies the standards used by the Board, which recognizes that ‘[p]reviously presented art includes art made of record by the Examiner, and art provided to the Office by the applicant, such as on an Information Disclosure Statement (IDS), in the prosecution history of the challenged patent.’” Prelim. Resp. 44 (quoting from *Advanced Bionics*, Paper 6 at 7–8). I question ASE’s suggestion that the quoted remark from *Advanced Bionics* set a “standard” for determining whether prior art has been previously presented to the Office under § 325(d).

The exercise of discretion in *Advanced Bionics* did not turn on mere citation of the art in an IDS or by the Examiner. Rather, the exercise of discretion turned on the Examiner’s application and discussion of that art. Specifically, the Board found that the asserted art, Zimmerling, “is the same art previously presented to the Office” because “the Examiner rejected [the claims] as anticipated by Zimmerling” and “Zimmerling was discussed during prosecution.” *Advanced Bionics*, Paper 6 at 13. In other words, the criteria adopted for discretionary denial of the petition in *Advanced Bionics* included not only the fact the art was made of record, but also the fact it was applied and discussed during prosecution. Anything less, in my opinion, disregards the reasoning behind the exercise of discretion in that case. And because it is undisputed here that Seppi was neither applied nor

meaningfully discussed during prosecution, I would find that Seppi does not qualify as prior art that was previously presented to the Office.⁶

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⁶ As for the other conditions under the first part of the *Advanced Bionics* framework, ASE cannot argue meritoriously that Seppi is “substantially the same” as the prior art previously applied by the Examiner because, as discussed by the majority, Seppi indisputably discloses the very limitation that the Examiner said was missing from the applied art. *See* Ex. 1002 at 282. And nowhere does ASE assert that the arguments in the Petition are the “same or substantially the same” as any arguments previously presented to the Office. *See* Prelim. Resp. 43–44.