

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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CERTOR SPORTS, LLC and SCHUTT SPORTS, LLC,  
Petitioner,

v.

APALONE, INC.,  
Patent Owner.

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IPR2022-00196  
Patent 10,617,167 B2

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Before HYUN J. JUNG, JAMES J. MAYBERRY, and  
ALYSSA A. FINAMORE, *Administrative Patent Judges*.

JUNG, *Administrative Patent Judge*.

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

I. INTRODUCTION

A. *Background and Summary*

Certor Sports, LLC and Schutt Sports, LLC (collectively, “Petitioner”) filed a Petition (Paper 3, “Pet.”) requesting institution of an *inter partes* review of claims 1–11 and 18 of U.S. Patent No. 10,617,167 B2

(Ex. 1001, “the ’167 patent”). Apalone, Inc. (“Patent Owner”) did not file a Preliminary Response.

Under 35 U.S.C. § 314, 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 Petition and for the reasons explained below, we determine that Petitioner has shown a reasonable likelihood of prevailing with respect to at least one of the challenged claims.

Thus, we institute an *inter partes* review of claims 1–11 and 18 of the ’167 patent on all presented challenges.

*B. Real Parties in Interest*

Petitioner identifies Certor Sports, LLC; Schutt Sports, LLC; Schutt AcquisitionCo, LLC; Vicis AcquisitionCo, LLC; Vicis, LLC; and Innovatus VPG Offshore Equity, LP; and Innovatus Flagship Fund I, LP as real parties in interest. Pet. 88–89. Patent Owner identifies Apalone, Inc. as a real party in interest. Paper 5, 2.

*C. Related Matter*

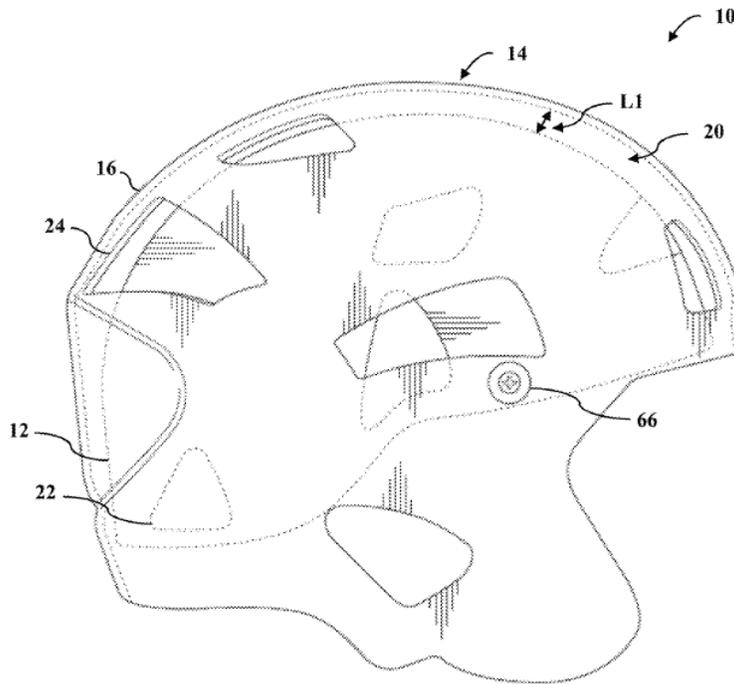
The parties identify *Apalone Inc. v. Schutt Sports LLC*, 3:21-cv-03186 (C.D. Ill.) as a related matter. Pet. 89; Paper 5, 2.

*D. The ’167 Patent (Ex. 1001)*

The ’167 patent issued on April 14, 2020 from an application filed on November 21, 2017, and claims priority to a provisional application filed on November 22, 2016. Ex. 1001, codes (22), (45), (60), 1:7–9.

The ’167 patent relates to “helmet assemblies that include a ventilated modular shell system (VMS) that may be used in sports and activities, including military activities, that require the protection of a helmet and are

conducted in high temperature environments.” Ex. 1001, 1:15–20. Figure 1 of the ’167 patent is reproduced below.



**FIG. 1**

Figure 1 “is a side view of one embodiment of the ventilated modular helmet system.” Ex. 1001, 2:34–35. VMS 10 includes inner shell 12 and cooling apparatus 14 coupled to inner shell 12. *Id.* at 4:8–10. Cooling apparatus 14 includes outer shell 16 coupled to inner shell 12 and cooling assembly 18. *Id.* at 4:10–12.

Outer shell 16 can be spaced radially outward from inner shell 12 to define climatic zone 20 between inner shell 12 and outer shell 16. Ex. 1001, 4:15–17. Cooling assembly 18 is placed in climatic zone 20 and can include cooling packets 42. *Id.* at 4:18–19, 6:31–32, Fig. 6. One or more inner vents 22 and corresponding outer vents 28 may allow air flow from climatic zone 20 onto the user’s head. *Id.* at 5:20–22, 5:33–34, 5:44–47, Figs. 3, 4.

*E. Illustrative Claim*

The '167 patent includes claims 1–18, of which Petitioner challenges claims 1–11 and 18. Of the challenged claims, claims 1, 3, and 7 are independent, and reproduced below is claim 7.

7. A modular helmet comprising:  
an inner shell adapted to be positioned onto a user's head, the inner shell includes a plurality of inner vents;  
an outer shell coupled to the inner shell, the outer shell spaced a distance radially from the inner shell to define a climatic zone between the inner shell and the outer shell, the outer shell includes a plurality of outer vents configured to couple the climatic zone in flow communication with ambient air; and  
a cushion assembly positioned within the climatic zone between the inner shell and the outer shell, the cushion assembly including a plurality of cushions that are coupled to the outer shell.

Ex. 1001, 13:63–14:8.

*F. Asserted Prior Art and Proffered Testimonial Evidence*

Petitioner identifies the following references as prior art in the asserted grounds of unpatentability:

<b>Name</b>	<b>Reference</b>	<b>Exhibit</b>
Roth	US 2,625,683, issued Dec. 8, 1947	1005
Liu	US 5,204,998, issued Apr. 27, 1993	1011
Bedford	US 2006/0005291 A1, published Jan. 12, 2006	1009
Princip	US 2012/0017358 A1, published Jan. 26, 2012	1006
Akamatsu	JP 2005-273119, published Oct. 6, 2005	1008

Pet. 5. Petitioner also provides a Declaration of Dr. Mark Horstemayer.

Ex. 1003.

*G. Asserted Grounds*

Petitioner asserts that claims 1–11 and 18 are unpatentable on the following grounds:

<b>Claims Challenged</b>	<b>35 U.S.C. §</b>	<b>Reference(s)/Basis</b>
7, 10	102(a)	Roth
7, 10	103	Roth
7, 10, 11	102(a)	Princip
1–6, 8, 9, 18	103	Princip, Akamatsu
3, 4, 18	102(a)	Bedford
7, 10	103	Liu

II. ANALYSIS

*A. Legal Standards*

In *inter partes* reviews, the petitioner bears the burden of proving unpatentability of the challenged claims, and the burden of persuasion never shifts to the patent owner. *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015). To institute an *inter partes* review, a petitioner must show a “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.

Petitioner contends that the challenged claims of the ’167 patent are unpatentable under §§ 102 and 103. Pet. 5. A claim is anticipated under § 102 “only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros., Inc. v. Union Oil Co. of Cal.*, 814 F.2d 628, 631 (Fed. Cir. 1987).

A claim is unpatentable under § 103 if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a

person having ordinary skill in the art to which said subject matter pertains. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) where in evidence, so-called secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). When evaluating a combination of teachings, we must also “determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.” *KSR*, 550 U.S. at 418 (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)). Whether a combination of elements produces a predictable result weighs in the ultimate determination of obviousness. *Id.* at 416–417.

*B. Level of Ordinary Skill in the Art*

Petitioner asserts that one of ordinary skill in the art “would have had Bachelor of Science degree (or equivalent degree) in Mechanical Engineering, Material Science, or another academic discipline emphasizing the design/development of helmets, in combination with at least one to two years of work experience with helmet design or development.” Pet. 9 (citing Ex. 1003 ¶¶ 13–14). Petitioner also argues that “[s]uperior education could compensate for a deficiency in work experience, and vice-versa.” *Id.* (citing Ex. 1003 ¶¶ 13–14).

Based on the preliminary record, we adopt Petitioner’s asserted level of ordinary skill only to determine whether there is a reasonable likelihood that Petitioner would prevail with respect to at least one of the claims challenged in the Petition. This level of skill in the art is consistent with the disclosure of the ’167 patent and the prior art of record. *Okajima v.*

*Bourdeau* 261 F.3d 1350, 1355 (Fed. Cir. 2001) (Citing *Litton Indus. Prods., Inc. v. Solid State Sys. Corp.*, 755 F.2d 158, 163 (Fed. Cir. 1985)).

C. *Claim Construction*

In an *inter partes* review based on a petition filed on or after November 13, 2018, the claims are construed

using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. [§] 282(b), including construing the claim in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.

37 C.F.R. § 42.100(b) (2021); see *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (en banc).

Petitioner contends that no claim construction is necessary. Pet. 5–6. Petitioner also argues that, if “attachment mechanism” is a means-plus-function term, the “function is to removably couple the inner and outer shells,” and the corresponding structure is attachment mechanism 66 with citations to the Specification and declarant testimony. *Id.* at 6. Petitioner also argues that a means-plus-function interpretation would not change Petitioner’s arguments because the asserted art discloses an attachment mechanism with the same function and uses the same or equivalent structure. *Id.*

At this preliminary stage, because determining whether Petitioner shows a reasonable likelihood of prevailing does not depend on a particular interpretation for any claim term, we determine that no claim term requires express interpretation. *Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) (“The Board is required to construe ‘only those terms that . . . are in controversy, and only to the extent necessary to resolve the

controversy.”) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

*D. Asserted Anticipation and Obviousness Based on Roth*

*1. Roth (Ex. 1005)*

Roth “relates to a type of helmet to be worn by a flyer.” Ex. 1005, 1:1–2. Figures 3 and 4 of Roth are reproduced below.

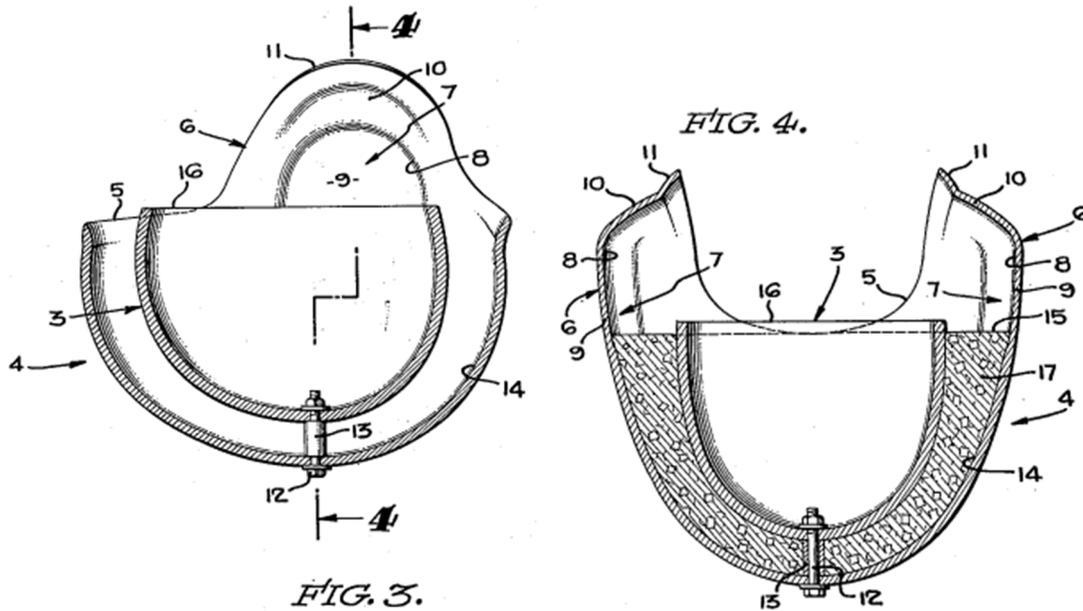


Figure 3 is a sectional view “taken in the front and rear medial plane of the helmet,” and Figure 4 is a sectional view taken on line 4–4 of Figure 3. Ex. 1005, 3:10–16.

Roth’s helmet “comprises a rigid outer shell, a layer just within the outer shell, of energy-absorbing material; and preferably includes a second, or inner layer of resilient material.” Ex. 1005, 1:51–55. Outer shell 4 “is of considerably larger dimension than the inner shell 3,” with “inner shell 3 being held approximately in a central position within the outer shell” by bolts 12 “surrounded by a short sleeve 13, which operates as a spacer or distance piece for holding the walls of the two shells spaced apart.” *Id.* at

4:49–56, 5:46–53. The spacer or distance piece “provide[s] a wall space, or molding space 14.” *Id.* at 5:52–55.

An energy-absorbing, or impact-absorbing material is placed in space 14. Ex. 1005, 5:56–57. “[I]t functions to absorb and dissipate energy delivered to the outer shell 4 during an impact blow.” *Id.* at 5:65–67; *see also id.* at 2:14–18 (indicating that the material also delays application of an impact force to the head). Roth preferably employs a material “which should be as large as possible” to “substantially cover the entire interior surface of the outer shell 14 . . . except for channels provided for ventilation.” *Id.* at 6:8–13.

According to Roth, outer shell 14 and protective layer 17 “should have an inner liner or cushioning layer 18” made of “any resilient or cushioning material” and “secured to the inner face of the protective wall 17.” Ex. 1005, 6:69–75. “[I]f relatively large blocks of energy-absorbent material are employed,” they are spaced apart “to form a ventilating channel system,” and for a “small dice of energy-absorbent material in a binder,” “a system of grooves 19” are cut “through the inner layer of rubber and the protective wall 17.” *Id.* at 7:5–11.

Roth’s helmet can also have connections through the outer shell for a “ventilating hose through which cool air is supplied to the ventilating ducts in the interior of the helmet.” Ex. 1005, 3:68–72; *see also id.* at 8:11–14 (stating that Roth’s “helmet can be ventilated by cool air delivered to it through a small flexible air hose 41”). Bolt 12 can have an opening that can be left unplugged “in line with one of the ventilating channels” so as to “give an outlet for some of the air that is circulated through the helmet.” *Id.* at 8:37–42, Fig. 5.

2. *Claims 7 and 10*

Because, according to Petitioner, Roth teaches a helmet with modules, such as an outer shell, energy-absorbing material, and inner shell of resilient material, Petitioner argues that Roth teaches “[a] modular helmet,” the preamble of independent claim 7. Pet. vi (labeling the preamble as “7[pre]”), 14 (citing Ex. 1003 ¶ 45; Ex. 1005, 1:51–55, 1:58–2:23, 4:49–56).

Regarding the limitation “an inner shell adapted to be positioned onto a user’s head,” Petitioner argues that Roth’s disclosures related to its inner shell teach the recited inner shell. Pet. vi (labeling the limitation as “7[a]”), 14–15 (citing Ex. 1003 ¶ 46; Ex. 1005, 1:35–36, 1:51–55, 4:20–25, 4:49–56, 5:44–56, 6:69–75, Figs. 3–6, 8, claim 1). For “the inner shell includes a plurality of inner vents,” Petitioner relies on openings, such as grooves or channels cut in inner layer 18. *Id.* at 15–16 (citing Ex. 1003 ¶¶ 48–50; Ex. 1005, 7:3–15, 5:45–56, 8:37–42, Figs. 5–7, claims 7, 8).

As for “an outer shell coupled to the inner shell,” Petitioner relies on Roth’s disclosures related to its rigid outer shell and (1) screws and bolts or (2) cushioning layer, either of which couples Roth’s outer layer 4 and inner layer 18. Pet. vi (labeling the limitation as “7[b]”), 16–17 (citing Ex. 1003 ¶¶ 51–54; Ex. 1005, 1:51–55, 4:49–51, 4:55–5:7, 5:45–56, 6:13–7:2, Figs. 2–8, claims 1, 16). For “the outer shell spaced a distance radially from the inner shell to define a climatic zone between the inner shell and the outer shell,” Petitioner argues that Roth has space 14 between outer shell 4 and inner shell 3 or inner layer 18. *Id.* at 17–18 (citing Ex. 1003 ¶ 55; Ex. 1005, Abstract, 4:7–20, 5:45–56, 6:6–7, 9:58–62, Figs. 1–6).

Regarding “the outer shell includes a plurality of outer vents configured to couple the climatic zone in flow communication with ambient air,” Petitioner argues that Roth’s screws and bolts 12 space apart the

asserted outer and inner shells. Pet. 18 (citing Ex. 1003 ¶¶ 56–60; Ex. 1005, 5:45–56). Petitioner also argues that, although Roth shows in Figure 4 one bolt/screw combination, one of ordinary skill in the art would have understood “Roth describes using more such combinations.” *Id.* (citing Ex. 1003 ¶¶ 56–60; Ex. 1005, 5:45–56). Petitioner further argues that the bolt/screw combinations create vents for air circulation and, thus, one of ordinary skill in the art would have understood that these vents couple Roth’s climatic zone in flow communication with ambient air. *Id.* at 18–19 (citing Ex. 1003 ¶¶ 56–60; Ex. 1005, 8:37–42).

Petitioner additionally argues that Roth describes a connection for a ventilating hose that supplies cool air, and, thus, one of ordinary skill in the art

would have understood or found obvious that this vent opening couples the climatic zone in flow communication with ambient air when it receives ambient air (*e.g.*, through the hose 41 or otherwise) that is supplied to the helmet interior via the grooves 19 defined in the climatic zone between the outer shell 14 and inner layer 18.

Pet. 19–20 (citing Ex. 1003 ¶¶ 56–60; Ex. 1005, 3:68–72, 8:11–17, Fig. 12).

For “a cushion assembly positioned within the climatic zone between the inner shell and the outer shell,” Petitioner relies on disclosures related to Roth’s layer of energy absorbing material. Pet. vi (labeling the limitation as “7[c]”), 20–21 (citing Ex. 1003 ¶¶ 61–62; Ex. 1005, 1:51–55, 2:10–30, 5:57–6:74, Fig. 5, claim 16). As for “the cushion assembly including a plurality of cushions that are coupled to the outer shell,” Petitioner argues that Roth’s energy absorbing layer 17 is divided into separate pieces or blocks with ventilation channels in between and are attached to the outer shell “by any ‘convenient’ attachment means, *e.g.*, ‘a suitable cement.’” *Id.*

at 21–22 (citing Ex. 1003 ¶ 63; Ex. 1005, 6:7–36, 7:3–15, Figs. 3–8, claim 2).

Petitioner, thus, contends that “Roth anticipates or renders obvious Claim 7.” Pet. 22 (citing Ex. 1003 ¶ 65); *see also id.* at 10–13 (asserting what Roth discloses or teaches).

Claim 10 depends from claim 7 and recites “wherein the plurality of inner vents includes a first amount of inner vents and the plurality of outer vents includes a second amount of outer vents that is a different than the first amount of inner vents.” Ex. 1001, 14:16–19. Petitioner refers to its arguments for claim 7 to contend that Roth’s ventilation channel and grooves disclose the recited inner vents and that the vents created by bolt/screw combinations and the vent opening for the hose connection disclose the recited outer vents. Pet. 23. Petitioner also argues the Roth has a different number of inner vents and outer vents and “Roth does not require or even disclose the same number of inner layer and outer shell vents.” *Id.* (citing Ex. 1003 ¶ 66; Ex. 1005, 7:3–15, 8:37–42, Figs. 3–7). Petitioner further argues that one of ordinary skill in the art “would have understood from Roth’s disclosure that the number of inner and outer vents need not be equal and can, of course, differ.” *Id.* (citing Ex. 1003 ¶ 66).

Petitioner alternatively argues that one of ordinary skill in the art would have found it obvious to modify Roth to have different number of inner and outer vents. Pet. 23 (citing Ex. 1003 ¶ 67). According to Petitioner, Roth’s goal of ventilation does not require having the same number of inner and outer vents; it was well known to have different number of inner and outer vents; and it would have been obvious to implement various configurations of inner and outer vents. *Id.* (citing Ex. 1003 ¶ 67;

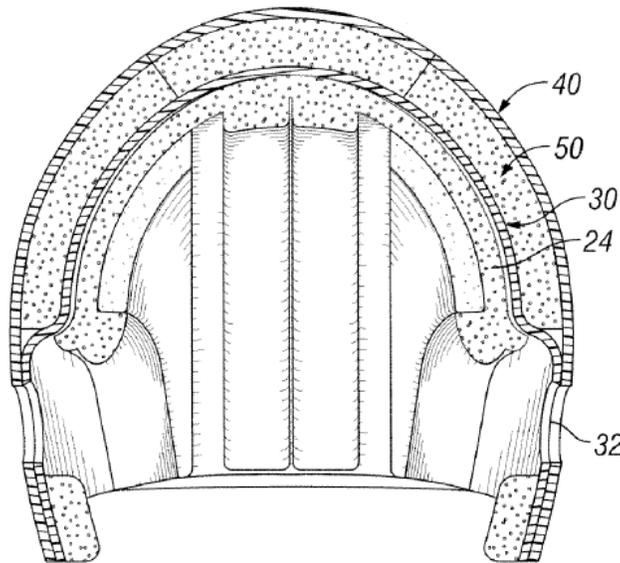
Ex. 1005, 1:46–50, 5:44–55, 7:3–15, 8:37–42, Figs. 3–7; Ex. 1006, Figs. 1, 3, 11, 12; Ex. 1011, 2:3–7, 2:33–37, Fig. 1, claims 1–3; Ex. 1012, 4:52–54).

Based on the preliminary record, Petitioner shows a reasonable likelihood of prevailing in its anticipation and obviousness challenges to claims 7 and 10 based on Roth.

*E. Asserted Anticipation by Princip*

*1. Princip (Ex. 1006)*

Princip “relates generally to a protective helmet, and more particularly a helmet for use in contact sports such as American football, lacrosse or hockey.” Ex. 1006 ¶ 3. Figure 5 of Princip is reproduced below.



**FIG. 5**

Figure 5 is a cross-sectional view of a protective helmet. Ex. 1006 ¶ 19. Princip’s “helmet 20 has an inner shell 30 and an outer shell assembly 40.” *Id.* ¶ 32; *see also id.* ¶ 33 (providing more details about inner shell 30), ¶¶ 36–39 (providing more details about outer shell 40). “The protective helmet 20 is designed to dampen the energy of a jarring impact to the outer

shell assembly 40 before reaching the hard inner shell 30 by reducing the g-forces.” *Id.* ¶ 32.

“One or more layers of internal padding or pads 24 are attached, connected or fastened to the inner shell 30 to provide impact absorption.” Ex. 1006 ¶ 32; *see also id.* ¶ 13 (describing that impacts are absorbed “while gradually increasing the load to the inner shell and internal padding and then finally the wearer’s head”), ¶ 33 (providing more details about internal padding 24).

An “external energy absorbing layer may comprise a ‘softer’ padding layer.” Ex. 1006 ¶ 12. “[E]xternal energy absorbing layer 50 is positioned between at least a portion of the outer surface 30b of the inner shell 22 and the outer shell assembly 40.” *Id.* ¶ 32; *see also id.* ¶ 35 (describing the attachment of external padding layer 50 to inner shell 30). External energy absorbing layer 50 “reduces or dampens the amount of jarring impact transmitted from the outer shell assembly 40 to the inner shell 30” and “may comprise a cell system consisting of a layer of mini air or gel cells sandwiched between the inner shell 30 and the outer shell assembly 40.” *Id.* ¶ 35. “In an alternate embodiment, the external energy absorbing layer 50 comprises multiple individual energy absorbing layer segments corresponding substantially to the shape and size of the multiple shell panels” that comprise outer shell assembly 40. *Id.* ¶ 41.

“[H]elmet 20 includes a plurality of air vents 22 located through the front, top, and back of the helmet 20 to allow for maximum air flow and to circulate the inside helmet air through the air vents.” Ex. 1006 ¶ 42. In another embodiment, helmet 120 has inner shell 130 with vent openings 134 and internal and external padding layers 124, 150 with open spaces over vent openings 134. *Id.* ¶¶ 49–51. External padding layer 150 may also “allow

for the passage of a fluid, typically air.” *Id.* ¶ 52. Outer shell assembly 140 also has vent openings 143 “that align with the larger vent openings 134 of the inner shell 130.” *Id.* ¶¶ 54–55.

2. *Claims 7, 10, and 11*

Petitioner argues that Princip anticipates claims 7, 10, and 11 with citations to Princip and declarant testimony. Pet. 24–39. In particular, because Princip discloses a helmet with inner shell 30 and outer shell assembly 40, Petitioner contends that Principe discloses the preamble, the recited inner and outer shells, and the recited climatic zone of claim 7. *Id.* at 26–28 (citing Ex. 1003 ¶¶ 74–77; Ex. 1006, Abstract, ¶¶ 13, 32–34, 49, 50, Figs. 3–5, 10–12), 29–31 (citing Ex. 1003 ¶¶ 79–83; Ex. 1006, Abstract, ¶¶ 32, 35–38, 49, 51, 52, 54, 55, 58, Figs. 1, 4–6, 8–13, 15).

Petitioner also contends that each of the asserted inner and outer shells have a plurality of vents. Pet. 28–29 (citing Ex. 1003 ¶ 78; Ex. 1006 ¶¶ 18, 42, 50, 51, Figs. 1–3, 7–12), 31–32 (citing Ex. 1003 ¶ 85; Ex. 1006 ¶¶ 42, 54, 55, Figs. 2, 12). Petitioner further contends that the asserted vents of the outer shell couple the climatic zone in flow communication with ambient air. *Id.* at 32–34 (citing Ex. 1003 ¶¶ 86–88; Ex. 1006 ¶¶ 42, 51, 52, 54, 55, Figs. 1–3, 6, 8–13, claim 18). Petitioner relies on Princip’s energy absorbing layer or external padding layer for disclosing the recited cushion assembly. *Id.* at 34–36 (citing Ex. 1003 ¶¶ 89–94; Ex. 1006, Abstract, ¶¶ 12, 32, 35–37, 41, 49, 51–53, 56–58, Figs. 5, 6, 10, 13).

Claims 10 and 11 depend directly from independent claim 7. Ex. 1001, 14:16–23. Petitioner argues that Princip discloses their limitations. Pet. 36–39 (citing Ex. 1003 ¶¶ 96, 98–101; Ex. 1006 ¶¶ 37, 51, 56–58, Figs. 6, 11, 12, claim 18).

Based on the preliminary record, Petitioner shows a reasonable likelihood of prevailing in its challenge that Princip anticipates claims 7, 10, and 11.

*F. Asserted Obviousness Based on Princip and Akamatsu*

*1. Akamatsu (Ex. 1008)*

Akamatsu “relates to head-cooling cooling material for insertion inside a helmet or hat to cool a head.” Ex. 1008 ¶ 1. Figure 2 of Akamatsu is reproduced below.

**Fig. 2**

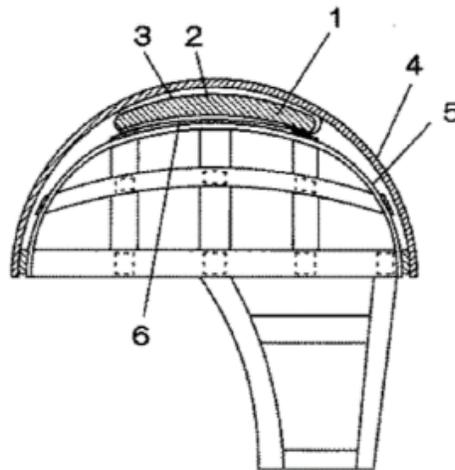


Figure 2 “is a lateral cross-section showing head-cooling cooling material anchored to a suitable site along the inside surface of a helmet.”

Ex. 1008 ¶ 25. After the cooling material is chilled in a freezer, it is

inserted into a bag-shaped receiving part 6 anchored along the vicinity of the crown portion inside a helmet 4, in the air space between the inside surface of the helmet 4 and a hat body 5 made of cloth tape that is fitted to the inside of the helmet 4.

*Id.* ¶ 26.

*2. Claims 1–6, 8, 9, and 18*

Petitioner argues that Princip and Akamatsu would have rendered obvious claims 1–6, 8, 9, and 18. Pet. 39–54. For independent claims 1 and

3 and their dependent claims 2, 4–6, and 18, Petitioner refers to its arguments for independent claim 7. *Id.* at 42 (citing Ex. 1003 ¶ 107), 51–54 (citing additionally Ex. 1003 ¶¶ 133–153). For claims 8 and 9 which depend from independent claim 7, Petitioner refers to arguments for claim 7 and argues that Akamatsu teaches the limitations of claims 8 and 9. *Id.* at 48–51 (citing Ex. 1003 ¶¶ 123–125, 129, 130; Ex. 1006 ¶¶ 34, 35, 41, 51, 53; Ex. 1008 ¶¶ 1, 10–16, 18, 19, 26, Fig. 2, claims 1–3).

Petitioner contends that one of ordinary skill in the art “would have found it obvious to implement Akamatsu’s helmet cooling teachings within Princip’s modular helmet, such that the climatic zone would further include a plurality of cooling packets.” Pet. 42 (citing Ex. 1003 ¶ 107). According to Petitioner, one of ordinary skill in the art would have been motivated to make the combination to achieve sufficient cooling and Akamatsu’s head cooling solution was well-known, applied to a similar structure, and accomplished the same goal. *Id.* at 43–44 (citing Ex. 1003 ¶¶ 108–112; Ex. 1005, 1:47–50, 7:3–15, 8:11–42, Figs. 5–8, 12, claims 7, 8; Ex. 1006, Abstract, ¶¶ 9–12, 32, 35, 42, 49–52, 54–55, Figs. 1–3, 7, claim 18; Ex. 1008, Abstract, ¶¶ 1–8, 16, 17, Fig. 2, claims 1–4; Ex. 1009 ¶¶ 27, 37–39, 41, 52–57, 64, 68, Fig. 1–4, claims 19–21; Ex. 1010, 4:25–26; Ex. 1011, 2:3–37, Fig. 1, claims 1–3; Ex. 1012, 1:67–2:9, 3:63–4:13, Figs. 1–11; Ex. 1013, 1:24–28, 2:12–18; Ex. 1014, 1:25–30; Ex. 1015, 1:36–41, 2:40–67); *see also id.* at 44–47 (arguing that Princip and Akamatsu have similar structures).

Petitioner, thus, contends that the proposed combination “would have amounted to the use of known techniques to improve similar devices in the same way” and “the combined system would perform similar functions (helmet cooling as in Akamatsu, impact protection as in Princip) that they

had been known to perform prior to the combination.” Pet. 44 (citing Ex. 1003 ¶¶ 111, 112); *see also id.* at 47 (arguing that the proposed combination “would have involved combining prior art elements according to known methods to yield a predictable result: desired cooling without compromising desired protection”) (citing Ex. 1003 ¶ 120), 49 (referring to its asserted reason to combine for claim 8) (citing Ex. 1003 ¶¶ 126, 127), 51 (arguing for claim 9 that it would have been obvious to “include at least one of those cushions having a different height—to any extent—than at least one of the cooling packs”) (citing Ex. 1003 ¶¶ 131–132).

Based on the preliminary record, Petitioner shows a reasonable likelihood of prevailing in the above-described obviousness challenge to claims 1–6, 8, 9, and 18 based on Princip and Akamatsu.

*G. Asserted Anticipation by Bedford*

*1. Bedford (Ex. 1009)*

Bedford “relates to headwear particularly suited to be worn by persons requiring headwear that will provide impact protection for the wearer.”

Ex. 1009 ¶ 1. Figure 2 of Bedford is reproduced below.

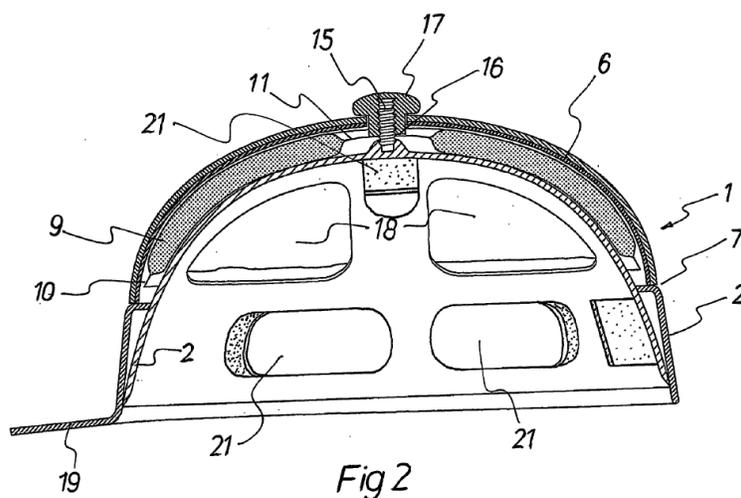


Figure 2 is a cross-sectional view of an embodiment of Bedford. Ex. 1009 ¶ 30. Helmet 1 includes inner part 2, outer part 6, and cavity 8

between the two and shaped to receive pack 9. *Id.* ¶¶ 9, 36–38. Pack 9 defines pouch 12 within which there is a freezing gel. *Id.* ¶¶ 10–12, 17, 38, 39. By replacing pack 9 with another frozen pack, one may keep cool a person wearing the hat. *Id.* ¶¶ 45, 71. Bedford indicates that its helmet can still provide protection because of its inner and outer parts 2, 6 and can be used in other activities, such as sports and construction. *Id.* ¶¶ 46, 47, 49–54, 60, 61, 67.

2. *Claims 3, 4, and 18*

Petitioner argues that Bedford anticipates independent claim 3 and its dependent claims 4 and 18 with citations to Bedford and declarant testimony. Pet. 55–69. In particular, because Bedford describes a helmet with inner impact resisting part 2 and outer impact resistant part 6, Petitioner contends that Bedford discloses the preamble and recited inner and outer shells of claim 3. *Id.* at 58–62 (citing Ex. 1003 ¶¶ 158–164; Ex. 1009, Abstract, ¶¶ 9, 36, 37, 40, 42–44, 46, 47, 49–51, 54, 60, 61, 67, 71, Figs. 1–4).

Petitioner also contends that Bedford describes replaceable pouch 9 with cooling gel and, thus, discloses the recited cooling assembly arranged as required by claim 3. Pet. 63–67 (citing Ex. 1003 ¶¶ 165–170; Ex. 1009, Abstract, ¶¶ 9–12, 17, 38–39, 45, 52–54, 56, claims 19, 20).

Claims 4 and 18 depend directly from independent claim 3. Ex. 1001, 13:53–55, 15:1–4. Petitioner argues that Bedford discloses their limitations. Pet. 67–69 (citing Ex. 1003 ¶¶ 174–180; Ex. 1009 ¶¶ 9, 12, 40, 45, 54–56, 68, Figs. 3–4, claims 19, 28).

Based on the preliminary record, Petitioner shows a reasonable likelihood of prevailing in its challenge that Bedford anticipates claims 3, 4, and 18.

*H. Asserted Obviousness Based on Liu*

*1. Liu (Ex. 1011)*

Liu “provide[s] a safety helmet including an outer shell juxtapositionally secured with an inner shell defining an air chamber between the two shells, [and] a plurality of cushioning bellows retained between the two shells.” Ex. 1011, 1:29–33. Liu’s safety helmet provides “a great dampening effect for reducing an external impact force.” *Id.* at 1:38–39. Figure 2 of Liu is reproduced below.

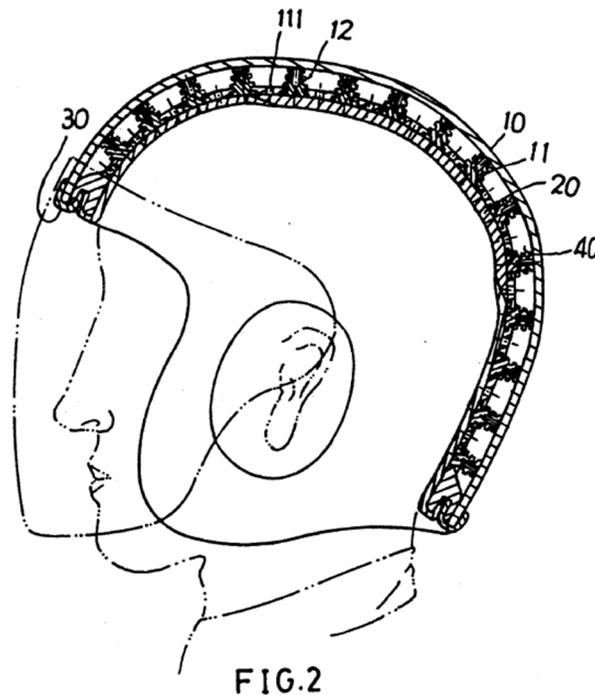


Figure 2 is a sectional view of Liu’s helmet. Ex 1011, 1:49. The helmet includes outer shell 10, inner shell 11, air chamber 40 between outer shell 10 and inner shell 11, and “a plurality of cushioning bellows 12 each bellows 12 retained between the outer shell 10 and the inner shell 11.” *Id.* at 1:56–62. The helmet also has air-penetrable layer 20 on an inside surface of inner shell 11. *Id.* at 1:62–63.

Inner shell 11 has a plurality of venting holes 111 “for fluidically communicating the air chamber 40 defined between the two shells 10, 11, and the air-penetrable layer 20 adjacent to a wearer’s head.” Ex. 1011, 2:3–7. Inner shell 11 also has ear shields 112 on opposite sides of inner shell 11 with inner perforations 112a drilled in each ear shield 112. *Id.* at 2:22–25.

Outer shell 10 has a plurality of outer perforations 101 drilled in two opposite sides on the outer shell 10 that correspond to ear shields 112 to allow sound waves through outer perforations 101, inner perforations 112a, and air-penetrable layer 20. Ex. 1011, 2:26–32. Outer perforations “also serve for ventilating the air or moisture from or in the air chamber 40 between the outer shell 10 and the inner shell 11 and from the wearer’s head for a comfortable wearing of the helmet.” *Id.* at 2:33–37.

Cap frame 30 sealably combines outer shell 10, inner shell 11 and air-penetrable layer 20 to form the helmet. Ex. 1011, 1:63–66. According to Liu, when an external impact force acts upon its outer shell, “cushioning bellows 12 will dampen the external impact force to prevent a great shock caused by the external force to the wearer’s head.” *Id.* at 1:66–2:2; *see also id.* at 2:44–57 (describing impact force  $F$  compressing bellows 12 to dampen the external impact force).

## 2. *Claims 7 and 10*

Petitioner argues that Liu would have rendered obvious claims 7 and 10 with citations to the record. Pet. 69–82. In particular, because Liu describes a helmet with, at least, inner shell 11 and an outer shell, Petitioner argues that Liu teaches the preamble and recited inner and outer shells of claim 7. *Id.* at 71–75 (citing Ex. 1003 ¶¶ 184–190; Ex. 1011, Abstract, 1:29–32, 1:56–60, 2:3–7, 2:22–66, 3:11–15, 4:6–16, 4:18–22, Figs. 1, 2, 2A, claims 1–3). Petitioner also argues that one of ordinary skill in the art would

have understood from Liu's disclosure that "Liu's helmet enables air circulation between the helmet interior and the ambient air, through the air chamber/climatic zone and the outer vents/perforations," and, thus, "Liu's outer vents couple the climatic zone in flow communication with ambient air. *Id.* at 75–76 (citing Ex. 1003 ¶ 191).

Petitioner also contends that Liu's cushioning bellows teach the recited cushion assembly. Pet. 76–80 (citing Ex. 1003 ¶¶ 192–197; Ex. 1011, Abstract, 1:36–42, 2:8–21, 2:44–53, Figs. 2, 2A, 3, 3A). Petitioner further contends that one of ordinary skill in the art "would have found it obvious to invert Liu's cushioning arrangement so that each bellow is engageably fixed in bellow holes formed in the outer shell, instead of the inner shell" and that the "modification would have been predictable," would have "represent[ed] one of two ways in which the cushioning bellows could be engageably secured/fixed," "would [have] achieve[d] the same force dampening effect," and "would have simply involved choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success." *Id.* at 80–81 (citing Ex. 1003 ¶¶ 198, 199; Ex. 1011, 2:44–58).

Claim 10 depends directly from independent claim 7. Ex. 1001, 14:16–19. Petitioner argues that Liu, similar to the challenge based on Roth, teaches inner and outer shell vents and does not require that the number of vents in the inner and outer shells has to be the same. Petitioner contends that Liu shows more inner vents 111, 112a than outer vents 101. *Id.* at 81–82 (citing Ex. 1003 ¶ 203; Ex. 1006, Fig. 1). Petitioner also contends that, because Liu shows different number of vents and different number of vents were well known, one of ordinary skill in the art would have understood or found it obvious to have different number of vents as required by claim 10. *Id.* at 82 (citing Ex. 1003 ¶ 205; Ex. 1006 ¶¶ 18, 42, 50, 51, Figs. 1–3, 7–12).

Based on the preliminary record, Petitioner shows a reasonable likelihood of prevailing in the above obviousness challenge to claims 7 and 10 based on Liu.

### III. CONCLUSION

After considering the evidence and arguments presented in the Petition and the cited evidence, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing in proving that at least one of claims 1–11 and 18 of the '167 patent is unpatentable, and thus, we institute an *inter partes* review of all challenged claims on all presented challenges. *SAS Inst. Inc. v. Iancu*, 138 S. Ct. 1348, 1359–60 (2018).

At this stage of the proceeding, the Board has not made a final determination as to the patentability of any challenged claim or any underlying factual and legal issues.

### IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review of claims 1–11 and 18 of U.S. Patent No. 10,617,167 B2 is instituted with respect to all grounds set forth in the Petition; and

FURTHER ORDERED that, pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4(b), *inter partes* review of U.S. Patent No. 10,617,167 B2 shall commence on the entry date of this Order, and notice is hereby given of the institution of a trial.

IPR2022-00196  
Patent 10,617,167 B2

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