

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ZERO GRAVITY INSIDE, INC.,
Petitioner,

v.

FOOTBALANCE SYSTEM OY,
Patent Owner.

IPR2015-01769
Patent 7,793,433 B2

Before MEREDITH C. PETRAVICK, JEREMY M. PLENZLER, and
TIMOTHY J. GOODSON, *Administrative Patent Judges*.

PETRAVICK, *Administrative Patent Judge*.

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

I. INTRODUCTION

A. Background

Zero Gravity Inside, Inc. (“Petitioner”) filed a Petition requesting *inter partes* review of claims 1–7 of U.S. Patent No. 7,793,433 B2 (Ex. 1001, “the ’433 patent”) pursuant to 35 U.S.C. §§ 311–319. Paper 1 (“Pet.”). Footbalance System OY (“Patent Owner”) filed a Preliminary Response to the Petition. Paper 16 (“Prelim. Resp.”).

We have jurisdiction under 35 U.S.C. § 314(a), which provides that an *inter partes* review may not be instituted “unless . . . the information presented in the petition . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.”

We determine that Petitioner has demonstrated that there is a reasonable likelihood that it would prevail with respect to at least one of the challenged claims. For the reasons described below, we institute an *inter partes* review of claims 1–7.

B. Related Proceedings

The parties indicate that the ’433 patent is at issue in *Footbalance System Inc. et al. v. Zero Gravity Inside, Inc. et al.*, Case No. 15-cv-01058, in the U.S. District Court for the Southern District of California. Pet. 1; Paper 5, 1.

In addition the ’433 patent is related to U.S. Patent No. 8,171,589 B2, which was the subject of a petition for *inter partes* review in proceeding IPR2015-01770. Institution was denied in proceeding IPR2015-01770.

C. Foot Anatomy

The claims at issue in this proceeding define claim elements relative to the metatarsophalangeal joint and plantar arch of the foot. Reproduced below is Figure 6 of the Declaration of Dr. Chimba Mkandawire, with some of Dr. Mkandawire's annotation omitted.

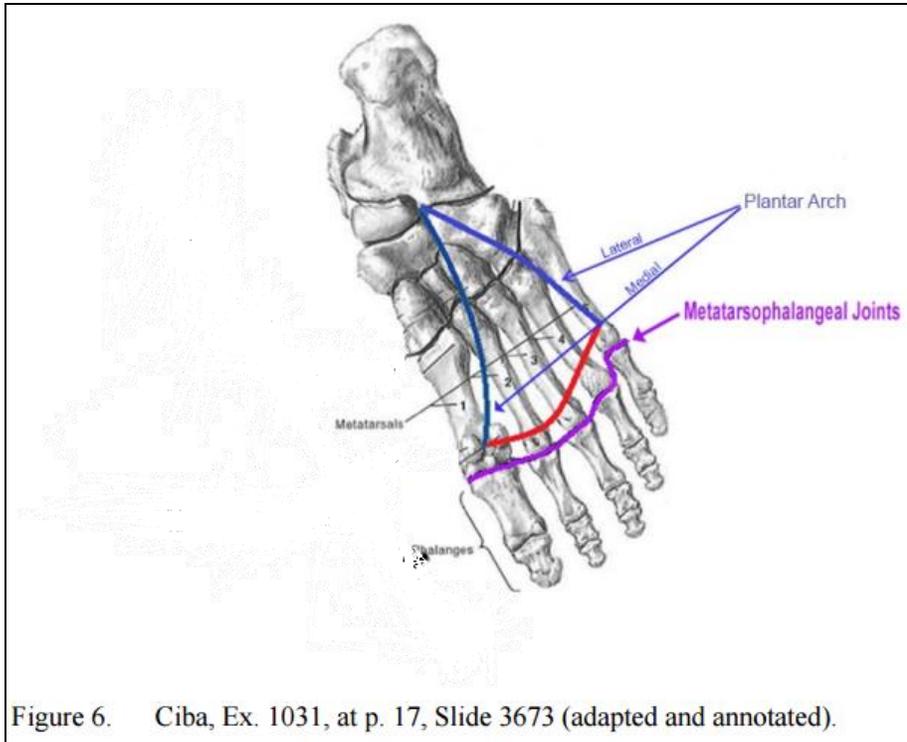


Figure 6. Ciba, Ex. 1031, at p. 17, Slide 3673 (adapted and annotated).

Figure 6 reproduces a figure from The CIBA Collection of Medical Illustrations (*see* Ex. 1031, 17) depicting the bones of the foot and with annotations to show the locations of the metatarsophalangeal joint and plantar arch. Pet. 21. As can be seen from Figure 6 above, the foot includes five metatarsals connected to five phalanges at the metatarsophalangeal joint. *See also* Prelim. Resp. 20 (depicting the same location of the metatarsophalangeal joint on a figure of the foot).

D. The '433 Patent

The '433 patent is titled “Individually Formed Footwear and Related Method” and issued on September 14, 2010 from an application filed on July 14, 2006. Ex. 1004, [22], [45], [54].

The '433 patent discloses a method of forming a customized insole for footwear. *Id.* at col. 2, ll. 44–59, col. 7, l. 60–col. 8, l. 40, Fig. 2. The method includes molding a preformed insole to a person’s foot by heating a preformed insole while the preformed insole is in contact with the foot. *Id.* The preformed then is allowed to cool. *Id.* The cooled preformed retains the molded shape because it includes a middle layer of thermoplastic material. *Id.* at col. 5, l. 60–col. 4, l. 14.

Figure 1 of the '433 patent is reproduced below.

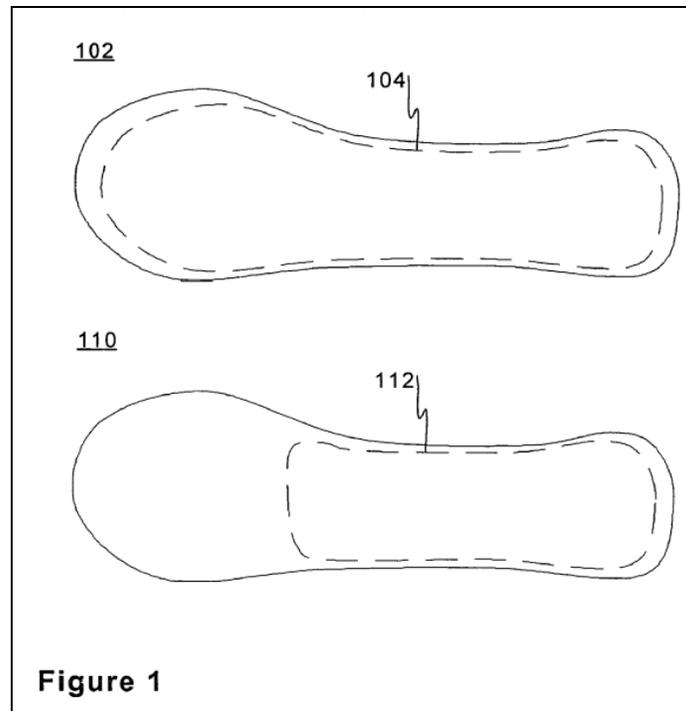


Figure 1 depicts two alternate embodiments of the preformed insole. *Id.* at col. 3, ll. 32–33. Middle layer 104 “covers laterally the whole area” of

performed insole 102. *Id.* at col. 4, ll. 23–26. Middle layer 110 “covers laterally only a part” of preformed insole 112. *Id.* at col. 4, ll. 26–27.

With respect to preformed insole 112, the ’443 patent states:

[I]t is necessary that the thermoplastic reach out lengthwise at least under the heel to under the plantar arch and in lateral direction advantageously almost to the whole width of the insole. As one feasible implementation, the thermoplastic layer is designed so as to reach out from under the heel to the metatarsophalangeal joint of the foot so that the transverse arch can be supported.

Id. at col. 4, ll. 27–34. The toe area lacks the thermoplastic material to help the foot move naturally during walking or running. *Id.* at col. 4, ll. 39–42.

Suitable thermoplastic materials for the middle layer have a glass transition (i.e., the temperature at which the material becomes plastic) between 45° C and 95° C. *Id.* at col. 3, l. 60–col. 4, l. 7. Examples of such thermoplastic materials are amorphous polyester terephthalate (“A-PET”), glycol-modified polyester terephthalate (“PETG”), acrylonitrile butadiene styrene (“ABS”), and polyvinyl chloride (“PVC”). *Id.* at col. 4, ll. 8–14.

E. Illustrative Claim

Claim 1 reproduced below, is illustrative of the ’433 patent.

1. An insole for footwear, comprising:
 - at least one layer made of thermoplastic material; and
 - a lower layer configured to be placed against the footwear,wherein said thermoplastic material is selected from the group consisting of: ABS, PVC, A-PET and PETG,
 - wherein said thermoplastic material of said at least one layer becomes plastic substantially under 95° C. and above 45° C., and

wherein the at least one layer of thermoplastic material is configured to reach out from under a heel of a foot only to the metatarsophalangeal joint of the foot, and

wherein the lower layer is configured to reach from under the heel to the metatarsophalangeal joint and extend further to a toe of the foot.

F. Asserted Grounds of Unpatentability

Petitioner asserts the following grounds of unpatentability:

Ground	Claims	Prior Art
§ 103	1–7	Dieckhaus ¹ and Foss ²
§ 103	1–7	Eschweiler ³ and Campbell ⁴

Petitioner proffers a Declaration of Dr. Haskell W. Beckham (Ex. 1002, “Beckham Decl.”) and a Declaration of Dr. Chimba Mkandawire (Ex. 1030, “Mkandawire Decl.”) to support its analysis regarding patentability in the Petition.

II. ANALYSIS

A. Claim Construction

In an *inter partes* review, the Board interprets claim terms in an unexpired patent according to the broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b); *In re Cuozzo Speed Techs., LLC*, 793 F.3d 1268, 1278–79 (Fed.

¹ U.S. Patent No. 6,543,158 B2 (issued April 8, 2003) (Ex. 1004).

² U.S. Patent Application Publication No. 2004/0209059 A1 (published Oct. 21, 2004) (Ex. 1005).

³ U.S. Patent No. 6,560,902 B1 (issued May 13, 2003) (Ex. 1006).

⁴ U.S. Patent Application Publication No. 2004/0194352 A1 (published Oct. 7, 2004) (Ex. 1007).

Cir. 2015), *cert. granted sub nom. Cuozzo Speed Techs., LLC v. Lee*, 84 U.S.L.W. 3218 (U.S. Jan. 15, 2016) (No. 15-446). Under that standard, and absent any special definitions, we give claim terms their ordinary and customary meaning, as they would be understood by one of ordinary skill in the art at the time of the invention. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007).

We determine that no explicit claim interpretations are needed for the purpose of this decision.

B. Obviousness

Section 103(a) forbids issuance of a patent when “the differences between the subject matter sought to be patented 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, and (3) the level of skill in the art. *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966); *see KSR*, 550 U.S. at 407 (“While the sequence of these questions might be reordered in any particular case, the [*Graham*] factors continue to define the inquiry that controls.”).

i. Dieckhaus and Foss

Petitioner contends that claims 1–7 would have been obvious to a person of ordinary skill in the art⁵ over Dieckhaus and Foss. Pet. 26–43.

a. Dieckhaus

Dieckhaus is a U.S. patent titled “Footwear Insole Insert” and issued on April 8, 2003. Ex. 1004, [54], [43]. Dieckhaus discloses insoles that are moldable to a foot when heat and pressure are applied. *Id.* at col. 4, ll. 23–49. Figures 1 and 2 of Dieckhaus are reproduced below.

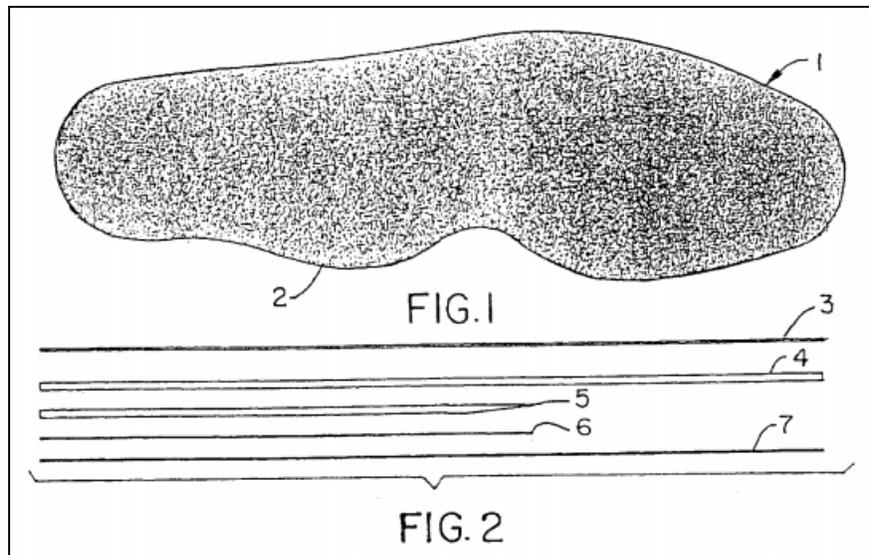


Figure 1 of Dieckhaus depicts an embodiment of an insole, and Figure 2 depicts the layers that make up the insole. *Id.* at col. 4, ll. 35–38. The insole includes a thermoplastic layer 6 and lower layer 7. *Id.* at col. 5, l. 60–col. 6, l. 59. Thermoplastic layer 6 has thermoplastic attributes when heated

⁵ Petitioner contends that a person of ordinary skill in the art as of July 2006 would possess at least a Bachelor’s degree in biomechanics or material science or an equivalent degree and would have at least two years of practical experience in the field of designing shoes, orthotics, or shoe insoles. Pet. 14.

in the range of 130° F (approximately 54° C) to 190° F (approximately 87° C). *Id.* at col. 6, ll. 1–6.

As can be seen from Figures 1 and 2 above, lower layer 7 extends the entire length of the insole from the heel to the toe, but lower layer 6 “extends from the back or heel portion of the insole, to approximately just short of the ball section of the foot” or “only extend[s] partially towards the front of the insert.” *Id.* at col. 7, ll. 14–27; *see also* col. 8, ll. 51–53 (claim 4 requiring a layer of thermosetting polymeric material that “extends less than the length of the shoe insert”).

Dieckhaus states that “this product can be expanded to include a variety of different components, in its structure, such as moldable heel pads . . . or may include three-quarter length inserts” (*id.* at col. 8, ll. 8–12) and discloses an alternate half form of the insole that “extends just to that portion behind the ball of the sole of the foot” (*id.* at col. 7, ll. 28–50; Figs. 4–5).

b. Foss

Foss is a U.S. patent titled “Anti-Microbial Fiber and Fibrous Products” and issued on October 21, 2004. Ex. 1005, [54], [43]. In one embodiment, Foss discloses using thermoplastic resins as a layer of an insole for footwear. *Id.* ¶¶ 314, 317. Foss states:

The inner layer(s) could be made of basically any thermoplastic resin, such as: PE, PP, PET, PS, PCT, Polyamide (nylon), Acrylic, PVC, etc. The surface layer(s) could be made of the same polymers plus some low temperature ones such as PETG, Polycaprolactone, EVA, etc.

Id. ¶ 317; *see also id.* ¶¶ 312 (disclosing acrylonitrile, which can include ABS), 365 (disclosing that A-PET and PETG are polymers with a low melting temperature).

c. Claim 1

Petitioner contends that claim 1 is obvious over Dieckhaus and Foss. Pet. 26–35. According to Petitioner, Dieckhaus discloses all of the limitations of claim 1 except for explicitly disclosing that: 1) the thermoplastic material is ABS, PVC, A-PET or PETG and 2) the layer of thermoplastic material is configured to reach out from under a heel of a foot only to the metatarsophalangeal joint of the foot. *Id.* Petitioner, however, argues that these limitations would have been obvious given the disclosure of Foss and the general knowledge of a person of ordinary skill in the art. *Id.*

i. “wherein said thermoplastic material is selected from the group consisting of: ABS, PVC, A-PET and PETG”

Petitioner contends that it would have been obvious to one of ordinary skill in the art to make the thermoplastic material of Dieckhaus from ABS, PVC, A-PET, or PETG, which Foss teaches are known thermoplastic materials used in insoles for shoes. Pet. 27–32. According to Petitioner, such a modification is suggested by Dieckhaus and is nothing more than a simple substitution of one known thermoplastic for another to obtain a predictable result. *Id.* at 29–31.

Patent Owner responds that this limitation would not have been obvious to one of ordinary skill in the art. Prelim. Resp. 32–41. According

to Patent Owner, “Dieckhaus is strictly limit to two woven fabrics — R-310 and A41EE — and provides no motivation to use any other materials.” *Id.* at 33. Patent Owner also argues that Foss does not teach that ABS, PVC, A-PET, or PETG are suitable for molding insoles. *Id.* at 35–40.

On this record, we are persuaded that it would have been obvious to one of ordinary skill in the art to use ABS, PVC, A-PET, or PETG as the thermoplastic material in Dieckhaus’ moldable insole. Contrary to Patent Owner’s argument, Dieckhaus is not “strictly” limited to R-310 and A41EE. Although Dieckhaus discloses in its description of the preferred embodiment that the thermoplastic material is R-3103 (Ex. 1004, col. 6, ll. 29–33) or alternatively E41AA (*id.* at col. 7, ll. 61–62), Dieckhaus does not limit the thermoplastic material to only these exact materials. *See id.* at col. 8, ll. 16–21 (stating that the description of the preferred embodiment is for illustrative purposes only and variations may occur to one of ordinary skill in the art), col. 8, ll. 48–50 (claim 3 defining the polymeric material as having certain attributes, not as R-3103 or E41AA).

Dieckhaus discloses that the thermoplastic material has thermoplastic attributes, inherent of its woven polymer treated strands, and which when subject to heat, in the range of 130° F. [i.e., 54° C] to 190° F. [87° C], can immediately have pressure applied to it, such as the bottom of the foot of the wearer, when the insert has been added into a shoe. *Id.* at col. 6, ll. 1–6. Dieckhaus also discloses that the purpose of the thermoplastic material layer is to add moldability to the insert and to further add heel and arch support. *Id.* at col. 6, ll. 44–47.

Like Dieckhaus, Foss discloses insoles for footwear. *See Ex. 1005 ¶¶ 148–154, 307–323, 442–451, Figs. 14–15.* Foss discloses an insole

having support layers that “could be made of basically any thermoplastic resin, such as: . . . PET, . . . PVC, etc.” or PETG. *Id.* ¶ 317; *see also id.* ¶¶ 312 (disclosing acrylonitrile, which can include ABS), 365 (disclosing that A-PET and PETG are polymers with a low melting temperature).

Dr. Beckham testifies that one of ordinary skill in the art would know that ABS, PVC, A-PET, and PETG are thermoplastic materials known to be used for insoles; that the glass transition temperatures of these thermoplastics are known; and that the low glass transition temperatures of these thermoplastic materials makes them suitable for molding against a person’s foot. Beckham Decl. ¶¶ 47–50, 102–103, 105.

Given the above, and on this record, we determine that it would have been obvious to one of ordinary skill in the art to use any of ABS, PVC, A-PET, and PETG as the thermoplastic material in the insole of Dieckhaus, because such a modification is the simple substitution of one known suitable thermoplastic material for another. *See KSR*, 550 U.S. at 418 (when a structure already known in the prior art “is altered by the mere substitution of one element for another known in the field, the combination must do more than yield a predictable result); *Sinclair & Carroll Co, Inc. v. Interchemical Corp.*, 325 U.S. 327, 335 (1945) (“Reading a list and selecting a known compound to meet known requirements is no more ingenious than selecting the last piece to put into the last opening in a jig-saw puzzle.”); *In re Leshin*, 227 F.2d 197, 199 (CCPA 1960) (selection of a known plastic to make a container of a type made of plastics prior to the invention was held to be obvious).

ii. “wherein the at least one layer of thermoplastic material is configured to reach out from under a heel of a foot only to the metatarsophalangeal joint of the foot”

Claim 1 requires that “the at least one layer of thermoplastic material is configured to reach out from under a heel of a foot only to the metatarsophalangeal joint of the foot.” Petitioner contends that Dieckhaus discloses this limitation because a person of ordinary skill in the art “would understand [Dieckhaus] as teaching a range of sizes, including a $\frac{3}{4}$ -length support layer because the size was standard to provide support to the plantar and transverse arches.” *Id.* (citing Mkandawire Decl. ¶ 62).

Additionally, Petitioner contends that this limitation is obvious over Dieckhaus and the knowledge of a person of ordinary skill in the art. Pet. 34. Petitioner argues that a person of ordinary skill in the art would have varied the length “to provide support to the foot, account for variability in foot structure and function, and ultimately be comfortable to the end user.” *Id.* (citing Mkandawire Decl. ¶ 61).

Patent Owner responds that Dieckhaus does not disclose this limitation because “Dieckhaus only describes a ‘fabric layer 6’ extending to ‘just short of the ball section of the foot,’ an area that excludes the metatarsophalangeal joint.” Prelim. Resp. 24 (quoting Ex. 1004, col. 7, ll. 15–17); *see* Prelim. Resp. 24–32. Patent Owner also argues that the analysis in the Petition is insufficient to demonstrate that this limitation would have been obvious to one of ordinary skill in the art. Prelim. Resp. 32.

Contrary to Patent Owner’s argument, Dieckhaus does not disclose that thermoplastic layer 6 can *only* extend to just short of the ball section of the foot. Although the preferred embodiment of Dieckhaus includes a thermoplastic layer 6 that “extends from the back or heel portion of the

insole, to approximately just short of the ball section of the foot” (Ex. 1004, col. 7, ll. 14–18), Dieckhaus suggests that the insole can be other lengths that only extend partially towards the front of the insert, such as a half-length or a $\frac{3}{4}$ -length (*see id.* at col. 7, ll. 20–32, col. 8, ll. 8–12, 51–53). We are persuaded by Petitioner that Dieckhaus discloses a range of lengths for the thermoplastic layer 6 that would include a thermoplastic layer that is configured to reach out from under a heel of a foot only to the metatarsophalangeal joint of the foot.

In addition, we are persuaded at this stage of the proceeding that it would have been obvious to one of ordinary skill in the art to configure the layer of thermoplastic material so that it reaches out from under a heel of a foot only to the metatarsophalangeal joint of the foot. Dr. Mkandawire testifies that a person of ordinary skill in the art would have found it obvious to vary the length of Dieckhaus’ thermoplastic layer 6 to provide the desired support to the foot, account for variability in foot structure and function, and ultimately be comfortable to the end user. Mkandawire Decl. ¶ 61; *see also id.* ¶¶ 34–42. Dr. Mkandawire also testifies that a person of ordinary skill in the art would have known that it was desirable to provide insoles to provide arch support. *Id.* ¶¶ 37, 42. Dr. Mkandawire’s testimony is consistent with the ’433 patent itself, which discloses that it was known to custom make shoes or insoles based on the measured characteristics, such as foot size, of a particular person. Ex. 1001, col. 1, ll. 12–29. Dr. Mkandawire’s testimony also is consistent with Dieckhaus, which discloses that it is desirable to customize an insole to a foot to add to the comfort. Ex. 1004, col. 2, l. 64–col. 3, l. 3.

On this record, we determine that Petitioner demonstrates a reasonable likelihood that claim 1 is unpatentable over Dieckhaus and Foss.

b. Claim 3

Claim 3 depends from claim 1 and additionally requires “the at least one layer of thermoplastic material reaches out at least from under the heel of the foot to under a plantar arch of the foot.”

Petitioner and Patent Owner dispute whether Dieckhaus discloses this limitation. Pet. 37–39; Prelim. Resp. 41–44. As discussed above with respect to claim 1, we determine, on this record, that it would have been obvious to one having ordinary skill in the art to configure the thermoplastic layer of Dieckhaus to reach out from under a heel of a foot only to the metatarsophalangeal joint of the foot. As can be seen from Figure 6 of the Declaration of Dr. Chimba Mkandawire, reproduced above, the plantar arch of the foot is located between the heel and the metatarsophalangeal joint on the foot and, thus, an insole that reaches out from the heel to the metatarsophalangeal joint would also *at least* reach out from under the heel of the foot to under a plantar arch of the foot.

On this record, we determine that Petitioner demonstrates a reasonable likelihood that claim 3 is unpatentable over Dieckhaus and Foss.

c. Claim 4

Claim 4 depends from claim 1 and additionally requires “said lower layer includes at least one material selected from the group consisting of non-woven polyester, and ionomerresin-ethylvinylacetate blend.”

Petitioner contends that it would have been obvious to one of ordinary skill in the art to make lower layer 7 of Dieckhaus from non-woven polyester or ionomerresin-ethylvinylacetate blend, which Foss teaches are known materials used in insoles for shoes. Pet. 39–41. According to Petitioner, such a modification is nothing more than a simple substitution of one known thermoplastic for another to obtain a predictable result. *Id.* at 42.

Patent Owner argues that the Petitioner does not sufficiently support its contention that this limitation would have been obvious to one of ordinary skill in the art. Prelim. Resp. 44–45.

On this record, we are persuaded that it would have been obvious to one of ordinary skill in the art to use a non-woven polyester or ionomerresin-ethylvinylacetate blend for Dieckhaus' lower layer 7. Dieckhaus discloses that lower layer 7 is of paper or polymer composition, and states that this material is sold as Bond-Tex and that lower layer 7 provides stability to the insert and facilitates the application of the insole to the footwear. Ex. 1004, col. 6, ll. 48–59. Foss discloses insoles for footwear. *See* Ex. 1005 ¶¶ 148–154, 307–323, 442–451, Figs. 14–15. Foss discloses that footwear components can be made from nonwoven fabric of synthetic fibers, primarily polyester (*id.* ¶ 311) or “ionomer, EVA or styrene stiffed ionomer” (*id.* ¶ 447).

Given the above and on this record, we determine that it would have been obvious to one of ordinary skill in the art to use a non-woven polyester or ionomerresin-ethylvinylacetate blend for lower layer 7 of the insole of Dieckhaus, because such a modification is the simple substitution of one known suitable thermoplastic material for another. *See KSR*, 550 U.S. at 417 (when a structure already known in the prior art “is altered by the mere

substitution of one element for another known in the field, the combination must do more than yield a predictable result.”); *see* Beckham Decl. ¶ 128.

On this record, we determine that Petitioner demonstrates a reasonable likelihood that claim 4 is unpatentable over Dieckhaus and Foss.

d. Claims 2 and 5–7

Claims 2 and 5–7 depend from claim 1. Petitioner contends that Dieckhaus discloses the additional limitations required by claims 2 and 5–7. Pet. 35–36, 42–43. Upon review of Petitioner’s evidence and analysis, we determine that Petitioner demonstrates a reasonable likelihood that claims 2 and 5–7 are unpatentable over Dieckhaus and Foss. Patent Owner makes no arguments directed to the additional limitations of claims 2 and 5–7.

ii. Eschweiler and Campbell

Petitioner contends that claims 1–7 would have been obvious to a person of ordinary skill in the art over Eschweiler and Campbell. Pet. 44–60.

a. Eschweiler

Eschweiler is a U.S. patent titled “Orthopaedic Insole” and issued on May 13, 2003. Ex. 1006, [45], [54]. Eschweiler discloses an insole having a top cover 9, a bottom cover, and a support core 5 between the covers. *Id.* at col. 2, ll. 49–52; Figs. 2–3. Figure 1 of Eschweiler is reproduced below.

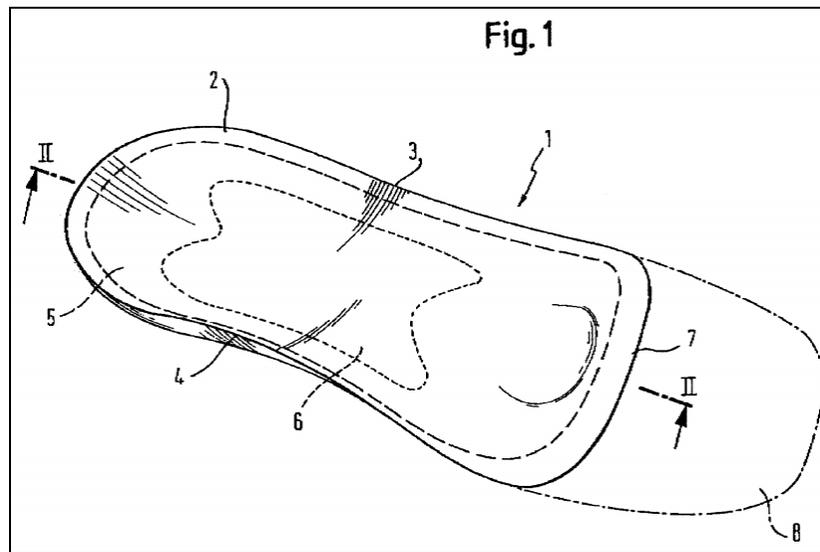


Figure 1 depicts the insole. *Id.* at col. 2, l. 24. Eschweiler discloses that the insole:

[n]ormally ends at edge 7 in the metatarsal region. However, it is also possible to design the insole 1 such that it extends over the whole foot, as is indicated by the front flap 8, the insole consists only of the combination of the two abovementioned covers . . . without any supporting force being exerted in this area, and the support cores is therefore concentrated only on the rear area of the insole.

Id. at col. 2, ll. 40–48.

Eschweiler discloses that the top and bottom cover and the support core is made of thermoplastic material. *Id.* at col. 2, l. 56.

b. Campbell

Campbell is a U.S. patent application publication titled “Orthopedic Insole for a Diabetic Shoe” and published on October 7, 2004. Ex. 1007, [43], [54]. Campbell discloses an insole that has a pre-molded portion and a heat-malleable portion, of various lengths. *Id.* ¶¶ 50, 54, Figs. 2–3. The

heat-malleable portion is made from material having a glass-transition temperature between 45° C and 75° C. *Id.* ¶ 52. Campbell discloses that suitable materials for the heat-malleable portion include PET or a thermoplastic polymer. *Id.* The heat-malleable portion can be heated above the glass-transition temperature and compressed by the user's foot to customize the insole. *Id.* ¶¶ 18–19, 32, 85.

c. Claim 1

Petitioner contends that claim 1 is obvious over Eschweiler and Campbell. Pet. 44–53. According to Petitioner, Eschweiler discloses most of the limitations of claim 1, including at least one layer of thermoplastic material is configured to reach out from under a heel of a foot only to the metatarsophalangeal joint of the foot. *Id.* Petitioner contends that Eschweiler fails to disclose that the thermoplastic material is ABS, PVC, A-PET or PETG and becomes plastic substantially under 95° C and above 45° C. *Id.* Petitioner, however, argues that these limitations would have been obvious given the disclosure of Campbell and the general knowledge of a person of ordinary skill in the art. *Id.*

i. “wherein said thermoplastic material is selected from the group consisting of: ABS, PVC, A-PET and PETG” and “wherein said thermoplastic material of said at least one layer becomes plastic substantially under 95° C and above 45° C”

Petitioner contends that it would have been obvious to one of ordinary skill in the art to make the thermoplastic material of Eschweiler a thermoplastic material that becomes plastic substantially under 95° C and above 45° C, and in particular ABS, PVC, A-PET and PETG, given the

teachings of Campbell and the general knowledge of one of ordinary skill in the art. Pet. 45–49. According to Petitioner, one of ordinary skill in the art would be motivated to make such a modification to desirably shape the insole to the user's foot. *Id.* at 47.

Patent Owner responds that one of ordinary skill in the art would not be motivated to make such a modification because it would render Eschweiler inoperable for its intended purpose. Prelim. Resp. 48–52. According to Patent Owner, the focus of Eschweiler is forming an insole of three thermoplastic layers having approximately the same melting temperature so that the insole can be made in a single step. *Id.* at 48–52.

On this record, we are persuaded by the evidence that it would have been obvious to one of ordinary skill in the art to make the insole of Eschweiler from a thermoplastic material that becomes plastic substantially under 95° C and above 45° C and in particular, ABS, PVC, A-PET, or PETG. Eschweiler discloses that the layers of its insole are made from thermoplastic material. Ex. 1006, col. 1, ll. 20–22. Campbell discloses an insole that has a heat-malleable portion made from material having a glass-transition temperature between 45° C and 75° C. Ex. 1007 ¶¶ 50, 54, 52. Campbell discloses that suitable materials for the heat-malleable portion include PET or a thermoplastic polymer. *Id.* ¶ 52. Campbell discloses that the heat-malleable portion is desirable because when heated above the glass-transition temperature and compressed by the user's foot, it takes the shape of the user's foot. *Id.* ¶¶ 18–19, 32, 85.

Dr. Beckham testifies that based on the glass-transition temperature range and example thermoplastic material disclosed in Campbell, one of ordinary skill in the art would know that ABS, PVC, A-PET and PETG are

suitable thermoplastic materials for molding in a factory or on a user's foot.
See Beckham Decl. ¶¶ 47–50, 140, 142.

Given the above, we determine that it would have been obvious to one of ordinary skill in the art to use a thermoplastic material that becomes plastic substantially under 95° C and above 45° C and in particular, ABS, PVC, A-PET and PETG as the thermoplastic material in the insole of Eschweiler, because such a modification would result in an insole that is customizable to a user's foot.

On this record, we are not persuaded by Patent Owner that Petitioner's proposed modification is contrary to the basic principles of Eschweiler because Patent Owner's argument is merely attorney argument, unsupported by any evidence. *In re Geisler*, 116 F.3d 1465, 1470 (Fed. Cir. 1997) (Attorney arguments and conclusory statements that are unsupported by factual evidence are entitled to little probative value.).

ii. “wherein the at least one layer of thermoplastic material is configured to reach out from under a heel of a foot only to the metatarsophalangeal joint of the foot”

Petitioner contends Eschweiler discloses “at least one layer of thermoplastic material is configured to reach out from under a heel of a foot only to the metatarsophalangeal joint of the foot,” as required by claim 1, because it discloses that the edge of its insole normally ends in the metatarsal region. Pet. 51 (citing Ex. 1006, col. 2, ll. 40–45). Petitioner further argues a person of ordinary skill in the art would have found it obvious to vary the length of Eschweiler's support core 5 “to provide support to the foot, account for variability in foot structure and function, and ultimately be comfortable to the end user.” Pet. 52.

Patent Owner argues that “Eschweiler makes explicit that support core 5 must end before the metatarsophalangeal joint.” Prelim. Resp. 45. According to Patent Owner, because Eschweiler discloses that the top and bottom covers 9, 10 extend beyond the support core 5, the support core 5 reaches no further than some distance short of the metatarsophalangeal joint. *Id.* at 46.

For the same reasons as discussed above with regards to the asserted obviousness of claim 1 over Dieckhaus and Foss, we are persuaded at this stage of the proceeding that it would have been obvious to one of ordinary skill in the art to configure the layer of thermoplastic material so that it reaches out from under a heel of a foot only to the metatarsophalangeal joint of the foot. Contrary to Patent Owner’s argument, Eschweiler states that the insole “normally” ends at the distal end of the metatarsal region and not that it *must* end. Ex. 1006, col. 2, ll. 40–45. Dr. Mkandawire testifies that a person of ordinary skill in the art would know that the metatarsal region extends to the metatarsophalangeal joints. Mkandawire Decl. ¶ 70.

Dr. Mkandawire further testifies that a person of ordinary skill in the art would have found it obvious to vary the length of Eschweiler’s support core 5 “to provide support to the foot, account for variability in foot structure and function, and ultimately be comfortable to the end user.” Mkandawire Decl. ¶ 71. Dr. Mkandawire’s testimony is consistent with Campbell, which discloses that the heat-malleable portion has a variety of lengths and that “[t]he actual dimensions of the orthopedic insoles . . . will vary depending on the size of the foot, the intended use of the shoe, and other factors.” *See* Ex. 1007 ¶¶ 37, 54, 55, 74, 81.

On this record, we determine that Petitioner demonstrates a reasonable likelihood that claim 1 is unpatentable over Eschweiler and Campbell.

d. Claim 3

Claim 3 depends from claim 1 and additionally requires “the at least one layer of thermoplastic material reaches out at least from under the heel of the foot to under a plantar arch of the foot.”

Petitioner and Patent Owner dispute whether Eschweiler discloses that “the at least one layer of thermoplastic material reaches out at least from under the heel of the foot to under a plantar arch of the foot,” as required by claim 3. Pet. 54–57; Prelim. Resp. 53–54.

As discussed above with respect to claim 1, we determine, on this record, that it would have been obvious to one having ordinary skill in the art to configure the thermoplastic layer of Eschweiler to reach out from under a heel of a foot only to the metatarsophalangeal joint of the foot. As can be seen from Figure 6 of the Declaration of Dr. Chimba Mkandawire, reproduced above, the plantar arch of the foot is located between the heel and the metatarsophalangeal joint on the foot and, thus an insole that reaches out from the heel to the metatarsophalangeal joint would also *at least* reach out from under the heel of the foot to under a plantar arch of the foot.

On this record, we determine that Petitioner demonstrates a reasonable likelihood that claim 3 is unpatentable over Eschweiler and Campbell.

e. Claim 4

Petitioner contends that it would have been obvious to one of ordinary skill in the art to make the lower layer of Eschweiler from a non-woven

polyester or ionomerresin-ethylvinylacetate blend, as required by claim 4. Pet. 57–58. According to Petitioner, such a modification is nothing more than a simple substitution of one known suitable material for another. *Id.* at 58.

Patent Owner argues that Petitioner does not sufficiently support its contention that this limitation would have been obvious to one of ordinary skill in the art. Prelim. Resp. 54–55.

On this record, we are persuaded by the evidence that it would have been obvious to one of ordinary skill in the art to use a non-woven polyester or ionomerresin-ethylvinylacetate blend for Eschweiler’s lower layer. Eschweiler discloses a bottom cover 8 made from thermoplastic material. Ex. 1006, col. 2, ll. 49–58. Campbell discloses that heat-malleable insoles can be integrated with conventional insoles that consist of material such as “synthetic resin foam or elastomer covered with leather, woven fabrics, unwoven fabrics, or other materials.” Ex. 1007 ¶¶ 52–53. Dr. Beckham testifies that the disclosed unwoven fabric would include nonwoven polyester and testifies that the use of a non-woven polyester as a lower layer would be the simple substitution of one known lower layer insole material for another. Beckham Decl. ¶¶ 167, 171.

Given the above and on this record, we determine that it would have been obvious to one of ordinary skill in the art to use a non-woven polyester as a lower layer of the insole of Eschweiler.

On this record, we determine that Petitioner demonstrates a reasonable likelihood that claim 4 is unpatentable over Eschweiler and Campbell.

f. Claims 2 and 5–7

Claims 2 and 5–7 depend from claim 1. Petitioner contends that Eschweiler discloses the additional limitations required by claims 2 and 5–7. Pet. 53–54, 59–57. Upon review of Petitioner’s evidence and analysis, we determine that Petitioner demonstrates a reasonable likelihood that claims 2 and 5–7 are unpatentable over Eschweiler and Campbell. Patent Owner makes no arguments directed to the additional limitations of claims 2 and 5–7.

C. Additional Patent Owner’s Arguments

i. Alleged Unnamed Real-Parties-In-Interest

Patent Owner argues that we should deny institution because the Petition does not name all of the real-parties-in-interest as required by 35 U.S.C. § 312(a)(2). Prelim. Resp. 55–58. Patent Owner first alleges Patrik Louko, Eero Kaakkola, Sasha Hannon, and Zena Iovino are unnamed real-parties-in-interest because they are all allegedly executives and board members of Petitioner that exercise or could exercise control over Petitioner’s participation in this proceeding and because each is named as a defendant in the related district court proceeding. Pet. 56. In addition, Patent Owner alleges that Road Runner Sports Inc. is an unnamed real-party-in-interest because Road Runner Sports Inc. sells Petitioner’s allegedly infringing insole. *Id.* at 57.

Whether a non-identified party is a real party-in-interest to a proceeding is a highly fact-dependent question. Office Trial Practice Guide, 77 Fed. Reg. 48,756, 48,759 (citing *Taylor v. Sturgell*, 553 U.S. 880 (2008)). “A common consideration is whether the non-party exercised or could have

exercised control over a party's participation in a proceeding.” 77 Fed. Reg. at 48,759 (citing *Taylor*, 553 U.S. at 895). “The concept of control generally means that ‘it should be enough that the nonparty has the actual measure of control or opportunity to control that might reasonably be expected between two formal coparties.’” *Id.* (quoting Charles Wright, et al., 18A Federal Practice & Procedure §§ 4449, 4451 (2d ed. 2011)).

We are not persuaded by Patent Owner's evidence that any of Patrik Louko, Eero Kaakkola, Sasha Hannon, Zena Iovino, or Road Runner Sports, Inc. are real-parties-in-interest that should have been identified in the Petition. Merely being an alleged executor or board member of Petitioner does not establish sufficiently that Patrik Louko, Eero Kaakkola, Sasha Hannon, or Zena Iovino, in their individual capacities, exercise control or have an opportunity to exercise control of this proceeding, as opposed to in their capacities as executives or board members of Zero Gravity. Further, being a co-defendant in a related proceeding does not establish sufficiently that Patrik Louko, Eero Kaakkola, Sasha Hannon, or Zena Iovino, in their individual capacities, are real-parties-in-interest. 77 Fed. Reg. at 48,760.

Patent Owner has also not produced sufficient evidence to establish that Road Runner Sports, Inc. exercises control or has an opportunity to exercise control of this proceeding. Merely being a customer of Petitioner and selling allegedly infringing insoles does not establish that Road Runner Sports, Inc. is a real-party-in-interest.

On this record, we are not persuaded by Patent Owner to deny institution because the Petition does not name all of the real-parties-in-interest as required by 35 U.S.C. § 312(a)(2).

ii. Request to Exercise Discretion to Deny Institution

Patent Owner requests that we exercise our discretion to “deny the Petition or at least prohibit Petitioner from submitting additional arguments challenging the [’433] Patent” because Petitioner should be bound by certain written and oral representations Petitioner made in connection with an unauthorized Unopposed Motion to Terminate. Prelim. Resp. 58–59 (citing 37 C.F.R. § 42.108). According to Patent Owner, Petitioner represented in the Unopposed Motion to Terminate that “Petitioner wishes to terminate the proceeding and will not offer any additional papers or arguments challenging” the ’433 patent, and Petitioner made similar oral representations to Patent Owner. Prelim. Resp. 58–59.

Petitioner was not authorized to file the Unopposed Motion to Terminate, and we issued an Order expunging the unauthorized Motion from the record. *See* Paper 13, 2. In that same Order, we authorized the filing of a joint motion to terminate because Petitioner indicated that it wished at that time to terminate and Patent Owner did not oppose. *Id.* Patent Owner and Petitioner, however, could not come to an agreement on the joint motion and no such motion was filed. *See* Prelim. Resp. 59; Paper 14, 1. Petitioner filed a Notice of Intent to Proceed with *Inter Partes* Review (Paper 14). Patent Owner argues that Petitioner’s Notice of Intent to Proceed is contrary to its representations that it would not offer any additional papers or arguments and, thus, Petitioner should be bound by those representations. Prelim. Resp. 59.

We are not persuaded that we should exercise our discretion to deny the Petition or to prohibit Petitioner from submitting any additional arguments. Although we have discretion to deny institution, pursuant to 37

C.F.R. § 42.108, denying institution under these circumstances is not appropriate. Petitioner's representations were made at a time when the parties were attempting to come to an agreement in an effort to terminate this proceeding. We are not persuaded that Petitioner should be bound by representations made at that time because the parties ultimately failed to reach any agreement.

We also have discretion to impose sanctions against a party for misconduct, such as failure to comply with an applicable rule. 37 C.F.R. § 42.12(a)(1). Sanctions may include precluding a party from filing a paper or dismissal of a petition. 37 C.F.R. § 42.12(b)(2). Sanctioning Petitioner by precluding it from filing additional papers or arguments is also not appropriate under these circumstances. We addressed Petitioner's failure to obtain authorization prior to filing the Unopposed Motion to Terminate, as required by 37 C.F.R. § 42.29(b), by expunging the Unopposed Motion to Terminate from the record. *See* Paper 13, 2. We are not persuaded that Petitioner should be bound by representations made in the now expunged paper.

We decline to exercise our discretion to deny institution or prohibit Petitioner from submitting additional arguments.

III. CONCLUSION

On this record, we determine that Petitioner demonstrates a reasonable likelihood of prevailing on the grounds of:

- claims 1–7 being obvious over Dieckhaus and Foss; and
- claims 1–7 being obvious over Eschweiler and Campbell.

The Board has not yet made a final determination as to the patentability of any of the challenged claims.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that pursuant to 35 U.S.C. § 314(a), *inter partes* review of the '433 patent is hereby instituted commencing on the entry date of this Order, and pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial; and

FURTHER ORDERED that the trial is limited to the grounds of: claims 1–7 being obvious over Dieckhaus and Foss and claims 1–7 being obvious over Eschweiler and Campbell.

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