

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

HUSKY INJECTION MOLDING SYSTEMS LTD. and
HUSKY INJECTION MOLDING SYSTEMS, INC.,
Petitioner,

v.

PLASTIC ENGINEERING & TECHNICAL SYSTEMS, INC.,
Patent Owner.

Case IPR2016-00433
Patent 7,845,925 B2

Before JON B. TORNQUIST, JENNIFER MEYER CHAGNON, and
JEFFREY W. ABRAHAM, *Administrative Patent Judges*.

CHAGNON, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

I. INTRODUCTION

We have jurisdiction to hear this *inter partes* review under 35 U.S.C. § 6. This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons discussed herein, we determine that Petitioner has shown, by a preponderance of the evidence, that claims 1–32 of U.S. Patent No. 7,845,925 B2 (Ex. 1001, “the ’925 patent”) are unpatentable.

A. Procedural History

Husky Injection Molding Systems Ltd. and Husky Injection Molding Systems, Inc. (collectively, “Petitioner”) filed a Corrected Petition for *inter partes* review of claims 1–32 (“the challenged claims”) of the ’925 patent. Paper 7 (“Pet.”). Petitioner provided a Declaration of Alexander H. Slocum, Ph.D. (Ex. 1004) to support its positions. Plastic Engineering & Technical Systems, Inc. (“Patent Owner”) filed a Preliminary Response. Paper 8. Pursuant to 35 U.S.C. § 314(a), on June 24, 2016, we instituted *inter partes* review to determine whether claims 1–32 are unpatentable under 35 U.S.C. § 103 as obvious in view of Moss¹ and Erhart.² See Paper 10 (“Inst. Dec.”).

After institution, Patent Owner failed to file a Patent Owner Response or a Motion to Amend on or before the deadline set forth in the Scheduling Order (Paper 11). During subsequent communications with the Board, counsel for Patent Owner stated that Patent Owner did not wish to abandon the proceedings. Instead, Patent Owner requested that it be allowed to continue to participate in the proceedings based solely on the arguments

¹ U.S. Patent No. 6,294,122 B1, issued Sept. 25, 2001 (Ex. 1002).

² U.S. Patent No. 5,557,154, issued Sept. 17, 1996 (Ex. 1003).

presented in the Patent Owner Preliminary Response. To ensure clarity of the record, we ordered Patent Owner to re-file its Preliminary Response as its Patent Owner Response (*see* Paper 12), which Patent Owner did on September 23, 2016 (Paper 13, “PO Resp.”).³ Petitioner filed a Reply (Paper 15 (“Pet. Reply”)) to the Patent Owner Response, along with a Reply Declaration of Dr. Slocum (Ex. 1009).

A combined oral hearing for Cases IPR2016-00431, IPR2016-00432, and IPR2016-00433 was held on February 15, 2017. A transcript of the hearing is included in the record. Paper 36 (“Tr.”).

Patent Owner filed a Motion for Observations regarding Dr. Slocum’s deposition testimony (Paper 24, “Obs.”), and Petitioner filed a Response thereto (Paper 28, “Resp. to Obs.”). Also before us is Patent Owner’s Motion to Exclude (Paper 23, “Mot. to Exclude”), Petitioner’s Opposition thereto (Paper 27, “Opp. Exclude”), and Patent Owner’s Reply (Paper 29).

B. Related Proceedings

Two related *inter partes* review proceedings are pending concurrently with the instant proceeding. These proceedings are IPR2016-00431 and IPR2016-00432, and they address the claims of related U.S. Patent Nos. 7,588,436 B2 and 8,192,191 B2, respectively. *See* Pet. 1. The parties do not identify any other related proceedings.

³ Patent Owner did not submit declaration testimony in support of its Preliminary Response or its Patent Owner Response.

C. The '925 Patent

The '925 patent, titled “Valve Gate Assembly,” relates to a “valve gate assembly for regulating a flow of molten material into a mold.” Ex. 1001, at [54], [57]. According to the background section of the '925 patent, in injection molding, “a manifold is typically used for conveying molten material from a central injection portion . . . to a number of cavities or multiple points within one large cavity of the mold.” *Id.* at 1:33–36. Further, “a valve gate is typically used with the manifold to regulate the flow of molten material into the cavity of the mold.” *Id.* at 1:41–43. Usually, the valve gate would include a pneumatic- or hydraulic-type actuator to move the pin of the valve gate from a fully closed position to a fully open position, the open position allowing the molten material to flow into the cavity of the mold. *See id.* at 1:48–61.

Figure 1 of the '925 patent is reproduced below:

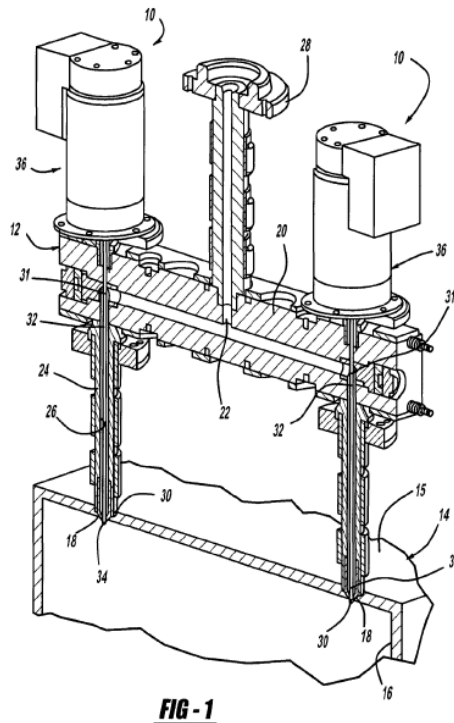


Figure 1, reproduced above, illustrates a “fragmentary perspective view of a valve gate assembly, according to the . . . invention [of the ’925 patent], illustrated in operational relationship with a manifold assembly and a mold.” *Id.* at 3:1–4. Valve gate assembly 10 cooperates with gate 30 of manifold assembly 12 to control the flow of molten material from the manifold assembly to mold 14. *Id.* at 3:66–4:1. Valve gate assembly 10 includes valve 31 for regulating the flow of the molten material. *Id.* at 4:11–14. Valve 31 may include pin 32, which is axially aligned with gate 30 and cooperates therewith to regulate the flow. *Id.* at 4:14–19. Pin 32 moves axially within flow passage 26 and can be positioned in a fully open position (i.e., at the top of its stroke) or in a fully closed position (i.e., at the bottom of its stroke), or it can be stopped at any position therebetween. *Id.* at 4:25–44.

Valve gate assembly 10 includes actuating system 36, which operatively cooperates with pin 32 for moving the pin between the fully open and fully closed positions. *Id.* at 4:45–48. Actuating system 36 includes actuator 38 (*see, e.g.*, Figure 2), which moves pin 32, and can “infinitely position the pin 32 between the fully closed and fully open positions, meaning that the pin 32 can come to rest at the fully closed position, the fully open position, and anywhere in between.” *Id.* at 4:52–55. The ’925 patent describes that “[t]his infinite movement can occur incrementally,” for example, in approximately 0.001 inch increments. *Id.* at 4:58–61.

The ’925 patent describes the use of controllers, amplifiers, and sensors to “properly and quickly” maintain the position of the pin and, therefore, control the flow of fluid/materials into the mold. *Id.* at

12:39–13:2. As further described in the '925 patent, the invention preferably includes a “transmission assembly which translates relative rotation between two members into linear motion.” *Id.* at 4:67–5:3.

According to the '925 patent, the valve gate assembly disclosed therein regulates the flow of material into the cavity of the injection mold “with precision.” *Id.* at 2:17–19. Other stated advantages of the invention include, for example, “regulating a flow of molten material into a mold with more control over the molding process,” “fast . . . and accurate adjustment of the valve,” and eliminating the use of hydraulics and pneumatics, each of which has particular disadvantages. *Id.* at 2:26–42; *see id.* at 1:62–2:4.

D. Illustrative Claim

Of the challenged claims, claims 1, 13, and 24 are independent. Claims 2–12 depend, directly or indirectly, from claim 1; claims 14–23 depend, directly or indirectly, from claim 13; and claims 25–32 depend, directly or indirectly, from claim 24. Claim 1 of the '925 patent, reproduced below, is illustrative of the challenged claims:

1. A valve gate assembly for an injection molding machine, comprising:

a valve operably associated with a valve gate of an injection molding manifold;

an actuator assembly operably coupled to said valve; and

an axially movable output shaft in substantial axial alignment with said valve, said actuator assembly coupled to said axially moveable output shaft through a transmission assembly, such that said actuator assembly translates motion to said output shaft and said valve through the use of said transmission assembly for driving said valve and opening said valve gate, said actuator assembly operable for providing movement of said

valve between an open position and a closed position, and stopping said valve at any position therebetween.

Ex. 1001, 13:43–57.

II. ANALYSIS

A. Patent Owner's Arguments Under 35 U.S.C. § 325(d)

Patent Owner argues that, because Moss and Erhart were considered during prosecution of the application leading to the '925 patent, we should exercise our discretion under 35 U.S.C. § 325(d) to deny institution of *inter partes* review. PO Resp. 9–16. “In determining whether to institute or order a proceeding,” the Director “may take into account whether, and reject the petition or request because, the same or substantially the same prior art or arguments previously were presented to the Office.” 35 U.S.C. § 325(d). As we have already decided to institute a proceeding, Patent Owner's argument under 35 U.S.C. § 325(d) is moot. *See id.* Even if we were to review the substance of this argument, however, for the reasons set forth in the Institution Decision, we would not exercise our discretion in this case as there is insufficient evidence that the combination of Erhart and Moss—as formulated by Petitioner—was ever considered by the Examiner or applied in any rejection of the claims. *See* Inst. Dec. 16–18.

B. Principles of Law

To prevail in its challenges to the patentability of the claims, a petitioner must establish facts supporting its challenges by a preponderance of the evidence. 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d). “In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic*

Inc. v. Avid Tech., Inc., 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)). This burden of persuasion never shifts to Patent Owner. See *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378–79 (Fed. Cir. 2015) (citing *Tech. Licensing Corp. v. Videotek, Inc.*, 545 F.3d 1316, 1326–27 (Fed. Cir. 2008)) (discussing the burdens of persuasion and production in *inter partes* review).

A claim is unpatentable as obvious under 35 U.S.C. § 103(a) if 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. See *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 ordinary skill in the art; and (4) objective evidence of nonobviousness. See *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

An obviousness analysis “need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.” *KSR*, 550 U.S. at 418; accord *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1259 (Fed. Cir. 2007). Further, an invention “composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the

prior art.” *KSR*, 550 U.S. at 418. Rather, “there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *Id.* (quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)).

At this final stage, we determine whether a preponderance of the evidence of the record shows that the challenged claims would have been obvious in view of the asserted prior art. We analyze the asserted ground of unpatentability in accordance with those principles.

C. Claim Construction

In an *inter partes* review, claim terms in an unexpired patent are given their broadest reasonable construction in light of the specification of the patent in which they appear. *See* 37 C.F.R. § 42.100(b); *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016) (upholding the use of the broadest reasonable interpretation standard). We generally give claim terms their ordinary and customary meaning. *See Translogic Tech.*, 504 F.3d at 1257 (“The ordinary and customary meaning ‘is the meaning that the term would have to a person of ordinary skill in the art in question.’” (quoting *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005) (en banc))). The parties’ dispute, however, does not require express construction of any claim term. *See, e.g., Wellman, Inc. v. Eastman Chem. Co.*, 642 F.3d 1355, 1361 (Fed. Cir. 2011) (“[C]laim terms need only be construed ‘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)); *see also* Tr. 13:1–5 (Petitioner noting that no claim construction issues remain in this case).

D. Dr. Slocum's Qualifications to Testify as to the Knowledge of One of Ordinary Skill in the Art

Patent Owner argues that Petitioner's Declarant, Dr. Slocum, is not a person of ordinary skill in the art and, thus, asserts that Dr. Slocum's Declarations may not be relied upon as evidence in this proceeding.⁴ PO Resp. 17–29. Specifically, Patent Owner contends that Dr. Slocum does not meet either Petitioner's or Patent Owner's definition of a person of ordinary skill in the art. *Id.* at 17–22, 26–29. We first address the level of ordinary skill in the art, and then turn to Dr. Slocum's qualifications.

Petitioner argues that a person of ordinary skill in the art “would have had at least a B.S. in Mechanical Engineering or the equivalent, three years of experience designing precision servo controlled systems and familiarity with injection molding machines and molding processes and the state of the art with regard to driving the various components of the machine.” Pet. 3–4 (citing Ex. 1004 ¶ 11). Patent Owner, on the other hand, argues that a person of ordinary skill in the art “would be a person having at least five years of experience designing and operating injection molding machines using hot runners (i.e., valve gates and valves or pins) and methods of controlling the actuation of such systems.” PO Resp. 23; *see* Tr. 38:11–17. According to Patent Owner, the “problems and solutions described in the specification of [the '925 patent] are not those of generic precision electromechanical motion systems,” but instead are “clearly directed to

⁴ Patent Owner also has filed a Motion to Exclude Dr. Slocum's Testimony (Ex. 1004; Ex. 1009). *See* Paper 23. We address Patent Owner's Motion to Exclude separately, below.

valve gate assemblies for injection molding machines and the actuation of such.” PO Resp. 23.

The parties’ dispute regarding the level of ordinary skill comes down to whether the hypothetical person of ordinary skill must have specific “experience designing and operating injection molding equipment using hot runners.” *See id.* at 25–26. While we agree with Patent Owner that one of skill in the art will have some familiarity or experience in valve gate assemblies for injection molding machines, we are not persuaded by Patent Owner’s assertion that the relevant art should be defined so narrowly as to specifically require significant experience designing and operating injection molding machines. Patent Owner presents no evidence that the design of injection molding machines is particularly specialized and beyond the skill of a mechanical engineer. Thus, we disagree with Patent Owner and decline to insert any specific amount of experience with, or specialized knowledge of, injection molding machines into the definition of one of ordinary skill in the art at the time of the invention.

This conclusion is further supported by the specification of the ’925 patent. The benefits described in the ’925 patent stem from the claimed actuator assembly, rather than from any distinctions in the design of the injection molding machine. For example, the ’925 patent describes the following advantages: “regulating a flow of molten material into a mold *with more control* over the molding process,” “the valve gate assembly can *infinitely adjust* the position of the valve . . . , thereby adjusting the flow rate,” “*fast adjustment* of the valve and *accurate adjustment* of the valve to 0.001 inches,” “eliminat[ing] the use of hydraulics,” and “eliminat[ing] the use of pneumatics.” Ex. 1001, 2:26–42 (emphases added). As described

in the '925 patent, these benefits are due to actuating system 36. *See, e.g., id.* at 4:45–5:9. Manifold assembly 12 and valve pin 32 of the '925 patent, on the other hand, are described as “conventional and known in the art.” *Id.* at 4:8–10, 4:23–24.

For these reasons, we are persuaded that Petitioner’s definition more accurately reflects the level of ordinary skill, and adopt Petitioner’s definition for purposes of this Decision.⁵

Patent Owner argues that Dr. Slocum fails to adequately establish his familiarity with injection molding machines, molding processes, or computer controlled motion of injection molding equipment, and “tries to draw the Board’s focus away from injection molding machines to a more generic or academic subject matter that he deems himself qualified to give an opinion.” PO Resp. 20–21, 25–26. During the oral hearing, Patent Owner, referring to Dr. Slocum’s cross-examination testimony, argued that Dr. Slocum does not, in fact, have injection molding experience. Tr. 43:17–44:1; *see* Obs. 10–11 (citing Ex. 2006, 35:15–36:15, 121:10–122:24). Dr. Slocum, however, expressly testified that he had designed injection molding devices, made molds used for injection molding, and run injection molding machines in the lab at the Massachusetts Institute of Technology (“MIT”). Ex. 1004 ¶ 5; Ex. 2006, 31:1–4, 36:1–5; *see* Resp. to Obs. 14–15. Based on the evidence before us, we find that Dr. Slocum

⁵ The level of ordinary skill in the art further is reflected by the prior art of record. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001). Moss relates to an electric actuator for a melt flow control pin of an injection molding machine. Ex. 1002, at [54], [57]. Erhart relates to an electrically powered linear actuator with a feedback position sensor device. Ex. 1003, at [54], [57].

has sufficient familiarity with injection molding machines. Further, as discussed above, we are not persuaded that the level of ordinary skill requires any specific amount of experience with, or specialized knowledge of, injection molding machines.

The challenged claims are directed to valve gate assemblies for injection molding machines that include an actuator that moves the valve or pin of the valve gate assembly to open and close the valve gate. See Ex. 1001, 13:43–18:3; PO Resp. 23; Pet. 3. Dr. Slocum has an undergraduate degree, master’s degree, and a Ph.D. in Mechanical Engineering, all from MIT, has been a professor of engineering at MIT since 1985, and previously worked as a mechanical engineer for the National Institute for Standards and Technology. Ex. 1004 ¶¶ 2–3. Dr. Slocum states that he has experience with “molding technology, including the design of mold opening and closing systems, as well as precision machine elements and systems which would be used in computer controlled injection molding machines.” *Id.* ¶ 5. Dr. Slocum also has authored books on machine design (*id.* ¶ 4) and purports to have experience “in the field of precision machine components, including actuators employing transmission components to convert rotary motion into linear motion of an output shaft” (*id.* ¶ 7).

We note also there is no requirement of a perfect match between a declarant’s experience and the field of the art in question. See *SEB S.A. v. Montgomery Ward & Co.*, 594 F.3d 1360, 1373 (Fed. Cir. 2010); see also *Mytee Prods., Inc. v. Harris Research, Inc.*, 439 F. App’x 882, 886–87 (Fed. Cir. 2011) (non-precedential) (upholding district court’s admission of testimony of an expert who “had experience relevant to the field of the invention,” despite the admission that he was not a person of ordinary skill

in the art). A person need not be a person of ordinary skill in the art in order to testify as an expert under Fed. R. Evid. 702, but rather must be “qualified in the pertinent art.” *Sundance, Inc. v. DeMonte Fabricating Ltd.*, 550 F.3d 1356, 1363–64 (Fed. Cir. 2008) (noting that under Fed. R. Evid. 702, the expert must possess sufficient “expertise to be of assistance” to the trier of fact).

We find, based on the complete record now before us, that Dr. Slocum’s qualifications align sufficiently with the challenged subject matter and that he has sufficient expertise to be of assistance, particularly on issues related to the claimed actuating system. During the oral hearing, Patent Owner’s counsel admitted that Dr. Slocum has “a lot of expertise in actuators.” Tr. 44:9–12; *see also id.* at 45:17–22 (“JUDGE TORNQUIST: So in your opinion is Dr. Slocum qualified to testify about force-absorbing mechanisms in actuators? MR. WARN: I think there is no question that Dr. Slocum is very skilled in that art. He knows a lot about that subject.”). We, thus, are persuaded that Dr. Slocum is qualified to testify as to the knowledge of a person of ordinary skill in the art of the ’925 patent.

E. Obviousness in View of Moss and Erhart

Petitioner contends that the challenged claims are unpatentable under 35 U.S.C. § 103 as obvious in view of Moss and Erhart. Pet. 3, 14–59. Patent Owner disagrees. *See* PO Resp. 16–17, 29–37. We have reviewed the entire record before us, including the parties’ contentions and any supporting evidence presented during this trial. For the reasons explained below, we determine that Petitioner has demonstrated, by a preponderance of the evidence, that claims 1–32 are unpatentable as obvious in view of Moss and Erhart.

Valve pin 41, having head 43, is positioned within melt flow channels 18 and 20 to control the flow of molten material through the apparatus. *Id.* at 5:27–32. End 32 of valve pin 41 is connected to actuator 10 (shown schematically in Figure 1). *Id.* at 5:37–39. “[V]alve pin 41 is slidably movable along its axis X such that it may be driven in a reciprocal fashion . . . within melt flow channel[s]” 18 and 20. *Id.* at 5:29–32. According to Moss, the valve pin “may be completely opened at the beginning of the injection cycle and completely closed at the end of the cycle,” and can “assume intermediate positions between the fully open and closed positions, in order to variably decrease or increase the rate of flow of the melt” to gates 7 and 9. *Id.* at 5:43–49, 5:59–6:3.

Moss notes that, due to the high pressures under which molten polymer is injected into the mold cavity of injection molding machines, hydraulic and pneumatic actuators were previously used in the art to control the movement of valve pins. *Id.* at 1:15–22. Moss further notes, however, that these actuators “are complex in design, maintenance intensive, bulky in size and relatively undesirable in environments of higher cleanliness.” *Id.* at 1:22–24. To avoid these structural and functional limitations, Moss discloses an electrically powered actuator that is “drivably interconnected” to the valve pin. *Id.* at 1:12–16, 1:28–32.

Figure 2b of Moss is reproduced below:

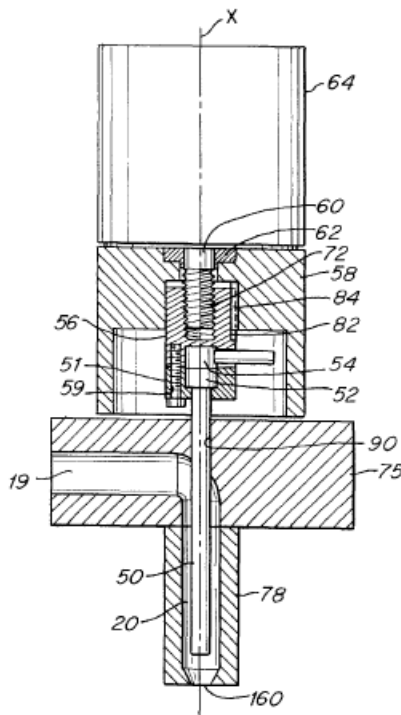


Fig. 2b

Figure 2b, reproduced above, is a cross section showing the shaft of an electric motor interconnected to an actuator screw of an embodiment of Moss. *Id.* at 4:1–14. In Figure 2b, an electric motor (not shown) is housed within housing 64. *Id.* at 8:62–64, 9:14–15. Rotably driven shaft 60 of the motor is coaxially aligned along axis X with screw 72 and pin 50 and is engaged with the top end of screw 72, such that when shaft 60 rotates, nut 56 travels along axis X. *Id.* at 9:14–19. Because end 52 of pin 50 is coupled to nut 56, screw 72 and nut 56 act as an actuating mechanism for pin 50, driving the pin along axis X. *Id.* at 9:19–23.

According to Moss, in those embodiments where the motor of the electric actuator “is coaxially aligned with the axis of the reciprocating pin, a

force absorbing mechanism is preferably used to absorb the load which would otherwise be transmitted to the motor along its axis.” *Id.* at 1:56–60; *see also id.* at 2:15–17 (“The apparatus may include a force absorbing member which absorbs forces transmitted to the rotor of the motor along its axis.”); 9:65–10:1 (noting that a bearing may be used to absorb axial forces and “relieve the rotor of such load”). For example, in the embodiment depicted in Figure 2b a thrust bearing is mounted between shaft 60 and housing 58 “to absorb axial force transmitted from pin 50 to nut 56 and screw 72,” substantially reducing or eliminating the load on shaft 60 along axis X. *Id.* at 9:32–36. Similarly, in the embodiment depicted in Figure 5a, “the end 162 of a screw 158 of an electrically driven motor is directly connected to the end 32 of a pin 50,” and therefore, the force to which the pin is subject is transmitted to the rotor of the motor. *Id.* at 9:39–65. Moss explains that “[t]o provide for absorption of such axial forces and to relieve the rotor of such load, the nut 154 is mounted in, on or to bearing 152 which is rigidly mounted to the housing of motor 64.” *Id.* at 9:65–10:1.

2. Summary of Erhart

Erhart discloses linear actuators and, in particular, electrically powered linear actuators incorporating “a feedback position sensor device.” Ex. 1003, 1:13–15. Similar to Moss, Erhart explains that hydraulic and pneumatic actuators known in the art had various limitations. *Id.* at 1:20–24. For example, Erhart notes that “[h]ydraulic systems, no matter how well maintained, leak fluid” and pneumatic driven actuators “are nearly impossible to place under electronic control due to air’s compressibility.” *Id.* at 1:27–32. Given these limitations, Erhart notes that the trend in the art was to use an electrically powered actuator having a motor linked to a

mechanical device to convert the motor's rotational motion into reciprocal or linear motion. *Id.* at 1:39–42.

According to Erhart, the “most common” method used in the art for converting a motor's rotational motion into reciprocal or linear motion was “a lead screw coupled directly to the motor output shaft with a follower unit traveling along the threads of the lead screw.” *Id.* at 1:42–45. Although these electrically powered actuators resolved some of the difficulties discussed above with respect to fluid powered systems, Erhart explains that a “motor/lead screw combination” “requires considerably more space,” results in exposure of the threaded components, and may result in “nonconcentric connection of the lead screw and follower assembly to the load.” *Id.* at 1:47–53.

In contrast to the electrically powered actuators described above, the linear actuator of Erhart is “of relatively small size (length and diameter),” the threads of its drive member and follower are not exposed, and “all force bearing components are concentrically connected to a load.” *Id.* at 2:10–14. Figures 1–3 of Erhart are reproduced below:

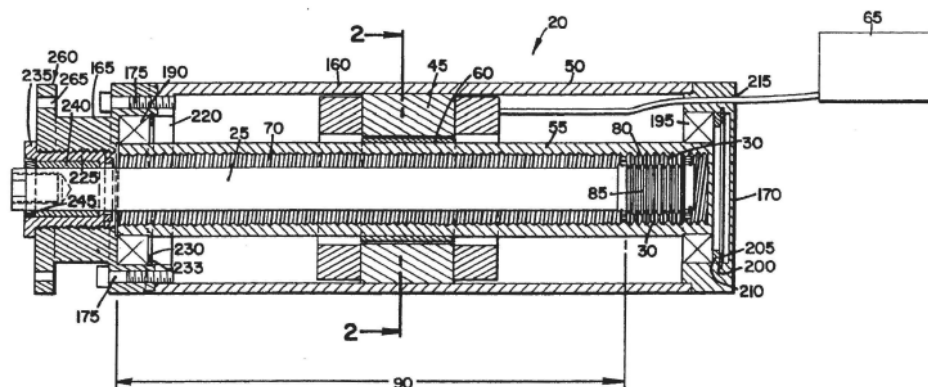


FIG. 1

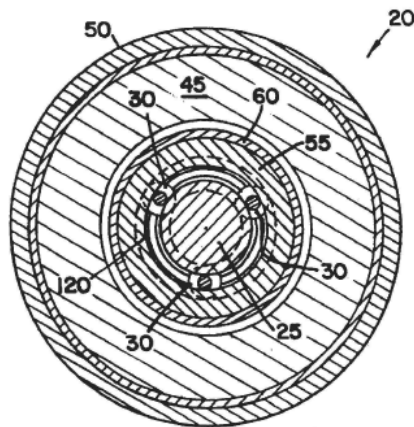


FIG. 2

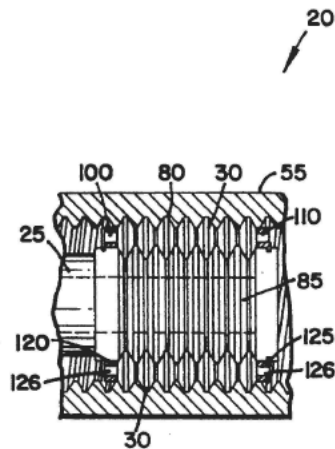


FIG. 3

Figure 1, reproduced above, illustrates an axial sectional view of one embodiment of an actuator according to Erhart, and Figures 2 and 3, also reproduced above, illustrate a sectional view taken along line 2–2 of Figure 1 and an enlarged sectional view of a portion of Figure 1, respectively. *Id.* at 2:55–61. As shown in Figure 1, the “linear actuator [of Figures 1–3 of Erhart] (designated generally at 20) . . . includes an actuator assembly (including an output shaft 25 and a plurality of transmission rollers 30), an electric motor assembly (including a stator 45) and a housing assembly 50.” *Id.* at 3:21–26. The actuator also includes armature drive cylinder 55, which includes “a central threaded bore 70 the threads of which are engaged by the transmission rollers 30.” *Id.* at 3:46–48.

As shown in Figure 3, “rings 80 define camming surfaces which are engaged by the threaded bore 70 of the armature drive cylinder 55 to move the actuator assembly along the threaded bore 70.” *Id.* at 3:60–64. Erhart explains that “rotation of the armature drive cylinder under the influence of the stator’s magnetic forces produces a corresponding rotation of the armature drive cylinder threaded bore” and “[e]ngagement of the threads of

the armature drive cylinder with those of the output shaft assembly provides a corresponding linear movement in the output shaft.” *Id.* at 2:26–32.

“[R]ear support bearing 195 is mounted to an internal surface of the circular end of seal 170 to rotationally support a rear portion of the armature drive cylinder 55.” *Id.* at 4:64–66. Front bearing 190 is mounted within first bore portion 220 of end cap 165 to rotationally support a front portion of armature drive cylinder 55. *Id.* at 5:12–15. Circumferential groove 230 of end cap 165 maintains front retainer ring 233 to secure front bearing 190 relative to housing assembly 50. *Id.* at 5:15–18.

The actuator assembly of Erhart also includes a velocity/position feedback sensor and, preferably, a “rotary position/velocity sensor.” *Id.* at 6:37–39, 7:56–57. “This sensor provides output shaft position location information to a controller which, in combination with a servo-amplifier, operates the linear actuator in a closed-loop feedback control environment.” *Id.* at 2:38–41.

3. Analysis

Patent Owner does not dispute that Erhart and Moss teach or suggest every limitation of claims 1–32 of the ’925 patent, but asserts that Petitioner has not demonstrated sufficiently that one of ordinary skill in the art would have found it obvious to combine the two references. *See* Tr. 42:1–12. Because Patent Owner does not dispute that the combination of Moss and Erhart teaches or suggests every limitation of the challenged claims, we briefly review the disclosures of Moss and Erhart and then focus on the dispute as framed by the parties: whether one of ordinary skill in the art would have sought to combine Moss and Erhart with a reasonable expectation of success.

Moss and Erhart Teach or Suggest Every Limitation of Challenged
Claims 1–32

With respect to claim 1, Moss discloses a valve gate assembly for an injection molding machine (Ex. 1002, 1:11–15, 4:41–46, 4:55–59, 5:27–29, 7:50–54, 8:21–43, Fig. 1) and a “valve operably associated with a valve gate of an injection molding manifold” (*id.* at 1:11–15, 4:41–46, 4:55–59, 5:27–29, 7:50–54, 8:21–43, Fig. 1). Pet. 27–28, 47–48; Ex. 1004 ¶¶ 66, 68–69. Figure 1 of Moss, reproduced above (*supra* Section II.E.1), shows an injection molding system in which melt material 3 is distributed by manifold 15 and injected into cavity 5 where the part is formed; melt material 3 is injected into cavity 5 through valve gates 7, 9. Ex. 1002, 4:41–59, Fig. 1; *see* Pet. 14–16; Ex. 1004 ¶ 38.

Regarding the claimed “actuator assembly operably coupled to said valve,” Moss teaches that “valve pin 41 has an end 32 for connecting to an actuator 10 (shown in FIG. 1 as a schematic representation).” Ex. 1002, 5:37–41; *see id.* at 1:27–32, 2:3–7, 2:54–57, 3:4–7, 3:14–18, 9:39–43; Pet. 48; Ex. 1004 ¶ 70. Erhart teaches a linear actuator that includes an actuator assembly. Ex. 1003, 3:21–26; Pet. 48; Ex. 1004 ¶¶ 63, 66, 70–76.

Claim 1 further recites:

an axially movable output shaft in substantial axial alignment with said valve, said actuator assembly coupled to said axially moveable output shaft through a transmission assembly, such that said actuator assembly translates motion to said output shaft and said valve through the use of said transmission assembly for driving said valve and opening said valve gate.

Moss discloses actuator 10 connected to valve pin 41. *See* Ex. 1002, 5:37–41. Erhart teaches the particular features of the claimed actuator

assembly.⁶ Ex. 1003, 3:21–29, 3:46–67, Figs. 1–3; Pet. 48; Ex. 1004 ¶¶ 71–74. In particular, Erhart teaches “output shaft 25 [of the actuator assembly] is coupled with the transmission rollers 30 to move along the threaded bore 70 on rotation of the cylinder 55.” Ex. 1003, 3:48–50. Erhart further teaches that “output shaft 25 and the transmission rollers 30 are axially aligned within the threaded bore 70 of the armature drive cylinder 55.” *Id.* at 3:55–57.

Finally, claim 1 recites that “said actuator assembly [is] operable for providing movement of said valve between an open position and a closed position, and stopping said valve at any position therebetween.” Moss teaches that “the valve pin can assume intermediate positions between the fully open and closed positions, in order to variably decrease or increase the rate of flow of the melt through gap 8.” Ex. 1002, 5:43–49; *see* Pet. 28, 49; Ex. 1004 ¶ 75. When the Erhart actuator is utilized with the valve pin and injection molding machine of Moss, Petitioner demonstrates that the output shaft of Erhart would drive a valve operably associated with a valve gate to open and close said valve gate, and it would have been obvious to a person of ordinary skill to operate the Erhart actuator to stop the valve at any position, based on the teachings of Moss. Pet. 28; Ex. 1004 ¶¶ 71–76.

In view of these disclosures, as well as the supporting testimony of Dr. Slocum, we find the combination of Moss and Erhart teaches or suggests the subject matter of independent claim 1.

⁶ Patent Owner concedes that the actuator described in ’925 patent was known in the art and that the actuator systems of Erhart and the ’925 patent are “virtually identical.” Tr. 37:7–8; PO Resp. 15–16 (agreeing that there are “striking similarities” between the actuator of Erhart and the actuator of the ’925 patent).

With respect to independent claims 13 and 24, as well as dependent claims 2–12, 14–23, and 25–32, Petitioner provides a detailed claim chart, as well as the supporting testimony of Dr. Slocum, identifying where each element of these claims is taught or suggested in Moss and Erhart.

Pet. 28–29, 49, 55, 58 (claims 2, 14, 27); 29–30, 50–51 (claim 3); 30–31, 51–52 (claim 4); 30–31, 52 (claim 5); 31, 52 (claim 6); 31, 52 (claim 7⁷); 31–32, 52–53, 55 (claims 8, 15); 32–34, 53–54 (claim 9); 34–35, 54 (claims 10, 22); 35–38, 54, 57, 58 (claims 11, 23, 25); 38–40, 54, 57–59 (claims 12, 21, 26, 31); 40–41, 54–55 (claim 13); 41–42, 55–56 (claim 16); 42–44, 56 (claim 17); 44, 56 (claim 18); 44, 56 (claim 19); 44–46, 56–57, 59 (claims 20, 32); 46–49, 54–55, 57–58 (claim 24); 46–47, 52–53, 55–56, 58 (claim 28); 44, 56, 58–59 (claim 29); 35–38, 54, 59 (claim 30); Ex. 1004 ¶¶ 63, 66–168. Upon review of Petitioner’s arguments and supporting evidence, we credit the testimony of Dr. Slocum and adopt Petitioner’s uncontested identifications as to where Erhart and Moss teach or suggest the limitations of claims 2–32 of the ’925 patent.

⁷ Dependent claim 7 requires a camming surface of the transmission rollers to be a “slated surface of said rollers.” Ex. 1001, 14:60–62. Supported by the testimony of Dr. Slocum, Petitioner contends that the term “slated surface” is a typographical error that would be understood by one of ordinary skill in the art to refer to a “slanted surface.” Pet. 31; Ex. 1004 ¶ 103. Patent Owner does not contest Petitioner’s characterization of “slated” as a typographical error in its Patent Owner Response, nor have we been directed to any portion of the prosecution history that would suggest a different interpretation. Thus, for purposes of this Decision, we interpret “slated surface” as recited in claim 7 to mean “slanted surface.” See *Ultimax Cement Mfg. Corp. v. CTS Cement Mfg. Corp.*, 587 F.3d 1339, 1353 (Fed. Cir. 2009) (stating that courts can correct obvious typographical errors “if the correction is not subject to reasonable debate . . . and the prosecution history does not suggest a different interpretation”).

Accordingly, we find the proposed combination of Moss and Erhart teaches or suggests every limitation of challenged claims 1–32 of the '925 patent.

Reasons to Combine

Although we have found that Moss and Erhart in combination teach or suggest every limitation of challenged claims 1–32, “a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.” *KSR*, 550 U.S. at 418. We must determine, therefore, whether Petitioner provides sufficient articulated reasoning, supported by factual underpinnings, to explain why one of ordinary skill in the art would have found it obvious to combine the disclosures of Moss and Erhart to arrive at the subject matter of challenged claims 1–32. *See id.*

Erhart expressly teaches that its actuator improves upon the hydraulic- and pneumatic-type actuators discussed in Moss, as well as the electric motor/lead screw type actuators selected to replace hydraulic and pneumatic actuators in Moss’s injection molding machines. Ex. 1002, 1:11–32 (Moss explaining that traditional hydraulic and pneumatic actuators are “complex in design, maintenance intensive, bulky in size and relatively undesirable in environments of higher cleanliness”); Ex. 1003, 1:20–53, 2:10–13 (Erhart explaining that the disclosed actuators improve upon hydraulic and pneumatic actuators, as well as the motor/lead screw type actuators utilized in Moss). In particular, Erhart discloses that its planetary roller screw drive system provides better control than pneumatic and hydraulic actuators and is smaller than the motor/lead screw type actuators utilized in Moss. Ex. 1003, 1:20–32, 1:47–52, 2:9–14.

Dr. Slocum provides persuasive testimony that smaller motors and actuators were known to be desirable in injection molding machines. Ex. 1004 ¶¶ 35, 61 (asserting that large actuators/electric motors “can limit how closely gates can be positioned adjacent each other”); *see* Ex. 1002, 4:44, 4:62 (indicating that the disclosed injection molding system utilizes multiple gates); Ex. 1003, 1:43–53, 2:10–14; Pet. 23–25. Dr. Slocum also provides persuasive testimony that it was known in the art that the planetary roller screw drive system of Erhart is more efficient than the motor/lead screw system of Moss. Ex. 1004 ¶¶ 61–62 (Dr. Slocum testifying that the rolling contact roller screw of Erhart has an efficiency of about 95%, whereas the “sliding contact thread leadscrew actuator” of Moss has an efficiency of about 30%); *see* Pet. 25. Patent Owner does not provide any testimony or persuasive evidence to rebut the testimony of Dr. Slocum on these points.

Instead, Patent Owner argues that (1) Moss teaches away from the proposed combination of Moss and Erhart, (2) combining the teachings of Moss and Erhart would “destroy the principle operation of Moss,” and (3) Petitioner improperly relies on hindsight, using the ’925 patent as a blueprint for formulating its analysis. PO Resp. 17, 29, 35.

With regard to its teaching away argument, Patent Owner contends Moss requires a force absorbing mechanism,⁸ and therefore teaches away

⁸ In our Institution Decision, we noted that Moss permissively states that the apparatus “may include” a force absorbing member, suggesting that such a device is not required. Inst. Dec. 22; Ex. 1002, 2:14–16 (“The apparatus may include a force absorbing member which absorbs forces transmitted to the rotor of the motor along its axis.”). Despite this express language in Moss, the parties agree that a person of ordinary skill in the art would have

from directly linking the rotating output shaft of an electric motor to a mechanical device, unless the motor shaft is “supported by a force absorbing mechanism within the motor.” *Id.* at 31. According to Patent Owner, Moss explains that one problem associated with injection molding is that “molten polymer is injected into the mold cavity with pressures being in excess of 50 MPa and at times in excess of 200 MPa.” *Id.* (citing Ex. 1002, 1:20–21). As a result, the pin is subjected to axial forces as molten polymer moves through the valve. *Id.* Patent Owner asserts that Moss teaches a force absorbing member must be used to avoid the transmission of axial loads from the pin to the motor. *Id.* Patent Owner, thus, argues that “the teachings of Moss, go against directly linking the actuator . . . to the pin without providing the necessary element of a force absorbing mechanism in the motor, which is precisely what [Petitioner] and their expert Professor Slocum are arguing.” *Id.* at 31–32 (noting that Dr. Slocum includes in his Declaration several figures directly linking the actuator of Erhart to the valve pin of Moss).

Petitioner argues that Patent Owner’s teaching away argument fails because “the Moss/Erhart combination employs a force absorbing member in the Erhart motor housing.” Pet. Reply 19–21; Ex. 1009 ¶¶ 9–12.

We agree with Petitioner. Petitioner’s proposed combination of prior art disclosures involves replacing the actuator assembly described by Moss with the actuator assembly of Erhart. Pet. Reply 20; Pet. 23–59. Erhart states that “[t]he stator 45 of the motor assembly is mounted about an inner surface of the cylindrical tube 160. The armature drive cylinder 55 is

understood that the actuators in Moss require a force absorbing mechanism in order to be operable. Tr. 54:1–8, 73:2–14.

rotationally supported relative to the housing assembly 50 by front and rear bearings 190 and 195.” Ex. 1003, 4:60–63, Fig. 1. Petitioner identifies bearings 190 and 195 in Erhart’s actuator assembly as force absorbing members. Pet. Reply 19–21. According to Dr. Slocum, bearings 190 and 195 are positioned inside a housing that includes Erhart’s motor and actuator. Ex. 1009 ¶¶ 10–11. As Dr. Slocum points out, this is similar to the configuration of the embodiment shown in Figure 5a of Moss, wherein bearing 152 is positioned inside a housing that includes the motor and actuator. *Id.* ¶ 10; Ex. 1002, Fig. 5a. Patent Owner acknowledges that this embodiment of Moss shows a direct connection of the actuator to the pin, and that Moss clarifies that the force absorbing mechanism is bearing 152. PO Resp. 33–35.

We credit Dr. Slocum’s testimony that a person of ordinary skill in the art would have understood Erhart’s use of the term “rotationally supported” to describe the function of bearings 190 and 195 to mean that bearings 190 and 195 allow cylinder 55 to rotate, but constrain cylinder 55 against axial movement along its longitudinal axis, thereby providing radial and axial support. Ex. 1009 ¶¶ 7, 13 (asserting that “[b]all bearings for supporting shafts, such as those taught in Erhart, can withstand large axial loads—well above those that would be imparted on the rotor in the Moss/Erhart combination”). Dr. Slocum provides a reasonable, undisputed explanation that, without constraining axial movement, Erhart’s motor would be inoperable. *Id.* ¶¶ 4–7.

We also credit Dr. Slocum’s testimony that a person of ordinary skill in the art “would have understood that it is an elemental aspect of designing a system to determine what the axial load on the rotor will be and to employ

appropriate bearings that have the capability to absorb that axial load” (Ex. 1009 ¶ 15), and would have done so when combining the teachings of Moss and Erhart in order to account for the pressures disclosed in Moss. *Id.* ¶¶ 13–15 (stating that these concepts are taught in introductory mechanical engineering curricula for undergraduates); Pet. Reply 20; Ex. 2006, 24:20–26:10, 105:13–106:10.

As noted previously, Patent Owner concedes that Dr. Slocum “is very skilled” in the art of force-absorbing mechanisms in actuators. Tr. 45:17–22. Moreover, Patent Owner offers no evidence tending to dispute Dr. Slocum’s testimony. *See, e.g.*, Pet. Reply 18; Tr. 71:16–20. For example, Patent Owner does not present a declaration addressing the function or capability of bearings 190 and 195 in Erhart, but instead relies solely on attorney arguments that a person of ordinary skill in the art “wouldn’t make the connection that [rotationally-supported bearings] support any significant axial loads.” Tr. 57:22–58:1. Attorney arguments, however, cannot take the place of evidence. *See Johnston v. IVAC Corp.*, 885 F.2d 1574, 1581 (Fed. Cir. 1989).

Counsel for Patent Owner also contends that the only valve shown in Erhart is for use with a volumetric pump, which may include bearings that support an axial load, but does not experience the same kind of load as a valve gate for an injection molding apparatus. Tr. 55:9–16. In further addressing this issue, counsel for Patent Owner states:

The[bearings] may support them that way, maybe that’s good, but there is no teaching that that would support the pressures of an actual valve gate assembly that has to resist that.

I think this particular bearing is set forth in this, you know, cap, and it doesn’t look to me like it is set up to hold the molds

of a valve pin if you are going to do that. So I don't think it would be obvious for somebody to combine that with Moss.

Tr. 55:13–21.

We are not persuaded, however, that Erhart's disclosure is limited to volumetric pumps. Although Erhart states that its actuator "can be utilized in precision volumetric pump applications," it is more generally directed towards electrically powered linear actuators intended to overcome the shortcomings of prior art actuators, such as hydraulic or pneumatically powered actuators. *See* Ex. 1003, at [57], 1:11–2:41. Thus, to the extent Patent Owner's teaching away arguments are premised on the assertion that Erhart is limited to volumetric pumps, they are misguided. *See, e.g.*, Tr. 58:8–11 ("It is just the fact that [Erhart] teaches no injection molding."); Ex. 1003, 1:16–17 ("The present invention can also optionally include a volumetric pump."), 8:42–43 ("In a preferred application of the linear actuator, a volumetric pump may be designed.").

In view of the foregoing, we find that Petitioner has presented evidence demonstrating that the combination of Moss and Erhart does not eliminate the force absorbing member required by Moss. We, therefore, determine that Moss does not teach away from the proposed combination of Moss and Erhart. *See In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994).

Patent Owner's argument that combining the teachings of Moss with those of Erhart would "destroy the principle operation of Moss" is similarly based on the premise that this combination would "eliminat[e] the force absorbing mechanisms that absorb axial forces from the pin in order to prevent loads on the motor." PO Resp. 32. For the reasons discussed above, however, we determine that Petitioner's proposed combination of the teachings of Moss and Erhart does not result in the elimination of the force

absorbing mechanism. Rather, we agree with Petitioner that “the Moss/Erhart combination employs a force absorbing member in the Erhart motor housing.” Pet. Reply 19–22. Thus, the evidence of record does not support Patent Owner’s arguments.

Patent Owner also argues that Petitioner “has engaged in impermissible hindsight to formulate [its] arguments,” asserting that Petitioner and Dr. Slocum “ignored the necessary force absorbing mechanism required by Moss,” addressed the prior art references individually, and performed a “piecemeal analysis” using the ’925 patent as a blueprint. PO Resp. 35–37. Petitioner asserts that it “provided specific motivation based on the teachings of Erhart to substitute Erhart’s actuator for the actuator of Moss” (Pet. Reply 22)—namely, “to achieve the advantages specifically taught by Erhart (e.g., smaller actuator and motor, unexposed threads)” (Pet. 24). For the reasons discussed above, we find that Petitioner has established a reason to combine the teachings of Moss and Erhart derived from the prior art itself, namely the advantages described in Erhart. Thus, the evidence of record does not support Patent Owner’s hindsight arguments.

Conclusion

Petitioner has identified where the combination of Moss and Erhart teaches or suggests every limitation of the challenged claims. Petitioner has also set forth articulated reasoning, supported by rational underpinnings, to explain why one of ordinary skill in the art would have sought to combine the two references. *See KSR*, 550 U.S. at 418. Accordingly, Petitioner has demonstrated, by a preponderance of the evidence, that claims 1–32 of the ’925 patent would have been obvious over Moss and Erhart.

III. MOTION TO EXCLUDE

Patent Owner seeks to exclude Dr. Slocum's Declarations submitted in support of the Petition (Ex. 1004) and the Reply (Ex. 1009). Mot. to Exclude 2.⁹ Patent Owner contends that Dr. Slocum is not qualified to testify as an expert with respect to the subject matter of the '925 patent, and "fails to provide and reliably apply the requisite scientific, technical or otherwise specialized knowledge, skill, expertise, training or education to testify to the opinions presented." *Id.* (citing Fed. R. Evid. 702; 37 C.F.R. § 42.62). Patent Owner further contends that Dr. Slocum's Reply Declaration testimony is not based on sufficient facts and fails to contain adequate documentation to support the statements made therein. *Id.* Patent Owner relies on the same arguments discussed and addressed in section II.D

⁹ Pursuant to our Rules, a motion to exclude evidence must be filed to preserve any previously-made objections to evidence. 37 C.F.R. § 42.64(c). The motion must identify where in the record the objections were made, and must explain the objections. *Id.* We note that Patent Owner states that "[f]rom the outset Patent Owner has objected to Dr. Slocum's testimony as an expert witness in the present proceedings. See Patent Owner Preliminary Response dated April 4, 2016 at pages 16-28." Mot. to Exclude 3. Rule 42.64(b)(1), however, requires that:

Any objection to evidence submitted during a preliminary proceeding must be filed within ten business days of the institution of the trial. Once a trial has been instituted, any objection must be filed within five business days of service of evidence to which the objection is directed. The objection must identify the grounds for the objection with sufficient particularity to allow correction in the form of supplemental evidence.

Based on the record developed during trial, we are not convinced that Patent Owner timely filed any objections to Dr. Slocum's testimony. For this reason, Patent Owner's Motion is procedurally deficient, and may be denied on this basis alone.

above, namely that Dr. Slocum does not meet either party's definition of a person of ordinary skill in the art due to his lack of personal experience with valve gate assemblies for injection molding machines. *Id.* at 5–14.

Petitioner argues, *inter alia*, that Dr. Slocum unquestionably is qualified to offer testimony on the sole technical argument Patent Owner raised in the Patent Owner response, namely that the Moss/Erhart combination “uses an actuator that lacks a force absorbing mechanism to absorb axial loads.” Opp. Exclude 2–3. Therefore, according to Petitioner, Dr. Slocum has specialized knowledge that will assist the Board in understanding a fact in issue, and the entirety of his testimony should be admitted pursuant to Fed. R. Evid. 702, with the Board determining the appropriate weight to give testimony on a particular topic. *Id.*

We agree with Petitioner. As stated above in Section II.D, we find that Dr. Slocum's qualifications align sufficiently with the challenged subject matter, and that he has sufficient expertise to be of assistance on, at a minimum, the issues related to the claimed actuating system. *See* Ex. 1004 ¶¶ 2–7; Inst. Dec. 18–20; Tr. 44:9–12. Accordingly, Dr. Slocum's testimony is permissible under Fed. R. Evid. 702, which states that “[a] witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion or otherwise if . . . the expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue.”

Furthermore, as noted in our Institution Decision, we are capable of determining the appropriate weight to be given to the testimony in Dr. Slocum's Declarations without risk of being prejudiced, confused, or misled by the testimony. In its motion, Patent Owner has not explained

adequately why we should exclude Dr. Slocum's testimony in its entirety, instead of determining the appropriate weight to be given to his testimony, especially considering we are not persuaded by Patent Owner's arguments regarding the level of ordinary skill in the art.

For the foregoing reasons, we decline to exclude Dr. Slocum's Declarations.

IV. ORDER

Accordingly, it is:

ORDERED that claims 1–32 of U.S. Patent No. 7,845,925 B2 are held *unpatentable*;

FURTHER ORDERED that Patent Owner's Motion to Exclude is *denied*; and

FURTHER ORDERED that, because this is a Final Written Decision, parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

IPR2016-00433
Patent 7,845,925 B2

PETITIONER:

Richard F. Giunta
Jason M. Honeyman
Neil P. Ferraro
WOLF, GREENFIELD & SACKS, P.C.
RGiunta-PTAB@wolfgreenfield.com
JHoneyman-PTAB@wolfgreenfield.com
NFerraroPTAB@wolfgreenfield.com

Richard J. Musgrave
HUSKY INJECTION MOLDING SYSTEMS, INC.
rmusgrave@husky.ca

PATENT OWNER:

Philip R. Warn
Gregg Ozga
WARN PARTNERS, P.C.
warn@warnpartners.com
ozga@warnpartners.com