

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

DUKANE CORPORATION,
Petitioner,

v.

HERRMANN ULTRASCHALLTECHNIK GMBH & CO., KG,
Patent Owner.

Case IPR2016-00066
Patent 8,702,883 B2

Before GRACE KARAFFA OBERMANN, *Vice Administrative Patent Judge*, BRIAN P. MURPHY and MICHELLE N. ANKENBRAND, *Administrative Patent Judges*.

ANKENBRAND, *Administrative Patent Judge*.

FINAL WRITTEN DECISION

Determining Claim 6 Unpatentable
35 U.S.C. § 318(a); 37 C.F.R. § 42.73

I. INTRODUCTION

This is a Final Written Decision in an *inter partes* review challenging the patentability of claim 6 of U.S. Patent No. 8,702,883 B2 (Ex. 1001, “the ’883 patent”). We have jurisdiction under 35 U.S.C. § 6. For the reasons that follow, we determine that Petitioner demonstrates, by a preponderance of the evidence, that claim 6 is unpatentable.

A. Procedural History

Dukane Corporation (“Petitioner”) filed a Petition (Paper 2, “Pet.”) requesting an *inter partes* review pursuant to 35 U.S.C. § 311. On April 29, 2016, we instituted trial to determine whether claim 6 of the ’883 patent is unpatentable under 35 U.S.C. § 102¹ as anticipated by Klinstein ’816.² Paper 8 (“Institution Decision” or “Inst. Dec.”).

Hermann Ultraschalltechnik GmbH & Co., KG (“Patent Owner”) filed a Response (Paper 13, “Resp.”), and Petitioner filed a Reply (Paper 14, “Reply”). Petitioner supports its Petition and Reply with the Declarations of Leo Klinstein (Ex. 1007; Ex. 1008). Patent Owner relies on the Declaration of Ulrich Vogler (Ex. 2005). No depositions were taken, and no final oral hearing was requested by either party or conducted by the Board.

B. Related Proceedings

Petitioner and Patent Owner do not identify any related proceedings involving the ’883 patent. Pet. 2; Paper 5, 2.

¹ The relevant section of the Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112–29, took effect on March 16, 2013. Because the application from which the ’883 patent issued claims priority to a patent application that was filed before March 16, 2013, our citations to Title 35 are to the pre-AIA version.

² U.S. Patent No. 8,052,816 B2, issued November 8, 2011 (Ex. 1004).

C. The '883 Patent

The '883 patent, titled “Method for Controlling an Ultrasonic Machining Process,” issued on April 22, 2014. The '883 patent relates to a method for controlling an ultrasonic machining process, more specifically, an ultrasonic welding process. Ex. 1001, 1:5–6. In an ultrasonic welding process, a generator produces an electric alternating voltage that is converted to mechanical vibration, which, in turn, is supplied to a sonotrode, or horn, that transfers the ultrasonic vibration under pressure to one of two components to be welded together. *Id.* at 1:8–17. As the two components touch, boundary surface friction occurs between them in the “joining zone,” resulting in melting of the boundary surfaces and subsequent joining or welding of the components. *Id.* at 1:17–23. The two components typically are pressed together with the aid of the sonotrode. *Id.* at 1:23–25.

According to the '883 patent specification, in order to produce an optimal weld, the welding time must be short enough to avoid heating the component material outside of the joining zone, but must also be long enough for a uniform melting of the boundary surfaces, to ensure a lasting welding connection. *Id.* at 1:29–36. Welding methods are known that may achieve the aforementioned welding time conditions by varying the force with which the sonotrode is pressed onto the components, but the specification states that these methods are “not optimal for all applications.” *Id.* at 1:37–65.

To that end, the specification describes a method for controlling ultrasonic machining or welding by altering certain welding variables (referred to as “group S” variables) until certain target variables (referred to as “group Z” variables) are met. Specifically, during a first machining

interval a first welding variable of the group S is kept constant until a first target variable of the group Z reaches a predetermined value and, during a second machining interval that adjoins the first interval, a second welding variable of the group S is kept constant until a second target variable of the group Z reaches a predetermined value. *Id.* at 2:5–21. Group S welding variables include the: (1) frequency (f) of the ultrasonic vibration of the sonotrode, (2) amplitude (ü) of the ultrasonic vibration of the sonotrode, (3) force (F) the sonotrode exerts on the material to be machined, (4) power (P) the generator consumes, and (5) speed (v) with which the sonotrode moves in the direction of the first component. *Id.* at 2:6–11. Group Z target variables include the: (1) force (F) the sonotrode exerts on the material to be machined, (2) power (P) the generator consumes, (3) welding time (t) that has passed since the beginning of the machining interval, during which the sonotrode transmits the ultrasonic vibration under a specific pressure into the material, (4) welding path (s), or distance, that the sonotrode has covered in the direction of the first component since the beginning of the interval, and (5) energy (E), or product of power and time. *Id.* at 2:13–20.

The first and second welding variables can be the same, but the first and second target variables are different. *Id.* at 2:41–42, 2:48–49, 4:18–21. The specification further explains the method is not limited to two machining intervals, and that it is possible to select three or more machining intervals, each having a welding variable and, preferably, different target variables. *Id.* at 3:39–42.

D. Illustrative Claims

Claim 1 is the only independent claim of the '883 patent. Patent Owner disclaimed claim 1. *See* Ex. 2002. As we explained in the Institution

Decision, claim 1 remains relevant because claim 6 is a multiple dependent claim that depends, *inter alia*, from claim 1 and, therefore, retains the limitations of claim 1. Inst. Dec. 5. Claims 1 and 6 are illustrative and recite:

1. Method for controlling an ultrasonic machining process, in which an ultrasonic vibration of the frequency f is transmitted with the aid of a sonotrode made to carry out an ultrasonic vibration under a pressure into the material to be machined, wherein, during a first machining interval, a first welding variable of the group S, consisting of the frequency f of the ultrasonic vibration, the amplitude $\ddot{u}$ of the ultrasonic vibration of the sonotrode, the force F , which the sonotrode exerts on the material to be machined, the power P , which the generator delivers, and the speed v , with which the sonotrode is moved in the direction of the material to be machined, f is kept constant)^[3] until a first target variable of the group Z, consisting of the force F , the power P , the welding time t since the beginning of this machining interval, during which the excited sonotrode transmits the ultrasonic vibration under pressure into the material to be machined, the welding path s , which the sonotrode has covered since the beginning of the machining interval, and the energy E , calculated from the product of P and t , adopts a predetermined value, and, during a second machining interval, which adjoins the first machining interval, a second welding variable of the group S is kept constant until a second target variable of the group Z adopts a

³ The language “ f is kept constant)” is a mistake in the patent resulting from an Office printing error. See Ex. 1003, 28, 31. The claim language should read “is kept constant.” *Id.* We explained in the Institution Decision that the “error correction remains relevant despite Patent Owner’s disclaimer of claim 1, because the remaining claims depend from claim 1.” Inst. Dec. 5–6 n.2. We further authorized Patent Owner to file a request to correct the error pursuant to 37 C.F.R. § 1.322. *Id.* The prosecution file history does not indicate that Patent Owner filed such a motion.

predetermined value, wherein the first and the second target variable differ.⁴

Ex. 1001, 4:23–46.

6. Method according to any one of claims 1 to 3, characterised [sic] in that the first machining interval ends when the first target variable adopts the predetermined value or when a fourth target variable of the group Z adopts a predetermined value.

Id. at 4:58–62.⁵

II. DISCUSSION

Petitioner bears the burden of proving unpatentability of the challenged claims, and that burden never shifts to Patent Owner. *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015). To prevail, Petitioner must establish the facts supporting its challenge by a preponderance of the evidence. 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d). For the reasons given below, we determine that Petitioner has met its burden with respect to claim 6.

A. Level of Ordinary Skill in the Art

We begin our analysis by addressing the level of ordinary skill in the art. Petitioner and Mr. Klinstein describe one of ordinary skill as someone having a good working knowledge of ultrasonic welding and prior art ultrasonic welding apparatus and processes. Pet. 4; Ex. 1007 ¶ 13. According to Petitioner and Mr. Klinstein, an ordinary artisan would have

⁴ The ’883 patent was the subject of a Certificate of Correction that issued on March 22, 2016. The Certificate of Correction contains an instruction to change the language “target value” recited in claim 1 to “target variable.” Ex. 2004, 1. Our decision refers exclusively to the corrected version of claim 1.

⁵ Patent Owner also disclaimed claims 2 and 3 of the ’883 patent. Ex. 2003.

gained that knowledge through undergraduate education in electrical or mechanical engineering and at least two years of practical working experience. *Id.* Patent Owner and Mr. Vogler do not provide a separate description or definition of the ordinary artisan. *See generally* Resp.; Ex. 2005. We adopt and apply Petitioner’s and Mr. Klinstein’s description of the level of ordinary skill in the art because it is consistent with the prior art of record.

B. Claim Construction

In an *inter partes* review, claim terms in an unexpired patent are interpreted according to their broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b); *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016). Under that standard, claim terms are given their ordinary and customary meaning, as would be understood by one of ordinary skill in the art in the context of the entire disclosure. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007).

The Petition sets forth several claim terms for construction. Pet. 9–13. In the Institution Decision, we provided a preliminary construction for claim 6, but determined that no other claim or claim term required express construction. *See* Inst. Dec. 8, 15. Specifically, we determined that because claim 6 “recites the disjunctive connector ‘or,’” the scope of the claim encompasses two alternatives for ending the first machining interval: “(1) the first machining interval ends when the first target variable adopts the predetermined value, or (2) the first machining interval ends when a fourth target variable of the group Z adopts a predetermined value.” Inst. Dec. 15 (citing Ex. 1001, 4:58–62). We further found that Petitioner needed to

demonstrate that Klinstein '816 teaches one of those two options in order to anticipate claim 6. *Id.* (citing *Brown v. 3M*, 265 F.3d 1349, 1351 (Fed. Cir. 2001)).

Patent Owner disputes that determination. Resp. 5–10. In so doing, Patent Owner advances three possible constructions for claim 6, but argues that not all of those constructions are reasonable. *Id.* at 5. Specifically, Patent Owner contends that claim 6 could be construed to mean that: (1) only one of the first and fourth target variables needs to be monitored or detected⁶ to determine whether it has adopted its predetermined value and end the first machining interval; (2) both the first and fourth target variables are detected and the first machining interval may end when one of the two target variables adopts its predetermined value, or the interval may continue until the other target variable adopts its predetermined variable; or (3) both the first and fourth target variables are detected simultaneously, and the machining interval ends when the first of the two target variables adopts its predetermined value. *Id.* at 5–6. According to Patent Owner, as a matter of logic, “the reasonable construction is that the first machining interval is to be

⁶ Patent Owner generally uses the word “monitored” to describe its view of what occurs during the method of claim 6. See, e.g., Resp. 5–8. But neither the specification nor claims of the '883 patent use the word “monitored.” Patent Owner, however, indicates that “monitored” is synonymous with “detected” in the context of its arguments. *Id.* at 5 (“only one of a first and fourth target variable need be monitored (i.e. ‘detected’)”); see also, e.g., Ex. 2005, 5 (Mr. Vogler’s testimony that the ordinary artisan “would understand that claim 6 requires *detecting* both the first target variable and the fourth target variable . . .” (emphasis added)). The '883 patent also uses the word “detected.” See, e.g., Ex. 1001, 4:52–55. Accordingly, we use the term “detected” in our analysis, and in discussing Patent Owner’s arguments.

ended when the first of the two [simultaneously detected] target variables attains its respective predetermined value,” i.e., construction (3) above. *Id.* at 6; see Ex. 2005, 5–6 (citing Ex. 1001, 3:22–26).

Similarly, Patent Owner argues that the construction we provided in the Institution Decision (construction (1) above) is not the broadest reasonable construction because it reads out of claim 6 an implicit limitation, i.e., detecting both the first and fourth target variables. *Id.* at 6–7. According to Patent Owner and Mr. Vogler, a person of ordinary skill in the art would understand claim 6 to include such detecting in order to “ascertain[] that the respective predetermined values have been reached.” *Id.* at 9; see Ex. 2005, 4. Patent Owner and Mr. Vogler point to an embodiment of the ’883 patent as support for those arguments. *Id.* at 7 (citing Ex. 1001, 3:22–26); Ex. 2005, 5 (citing same).

Petitioner, on the other hand, argues that we should maintain our preliminary construction of claim 6. Reply 5–9. In that regard, Petitioner argues “claim 6 does not explicitly require that either [target] variable be detected.” *Id.* at 8. Relying on the claim differentiation doctrine, Petitioner points to the differences between claims 4 and 6; namely, that claim 4 expressly recites detection of a target variable, whereas claim 6 does not. *Id.* at 8. Petitioner argues in the alternative that, even if the Board were to conclude that detection is required by claim 6, the claim “clearly requires only one of the two target variables to adopt a predetermined value as the sole criterion for ending the first machining interval. Thus, claim 6 would require detection of either the first target variable or the fourth target variable, not both.” *Id.* at 8–9 (citing Ex. 1008 ¶¶ 11–15). According to Petitioner, this is so because claim 6 uses the disjunctive “or” to specify two

alternative options for ending the first machining interval. *See* Pet. 41; Reply 5.

At issue here is whether claim 6 requires detecting more than one target variable, i.e., whether both the first and fourth target variables must be detected. We begin by noting that claim 6 does not expressly recite that either the first or the fourth target variable is “detected.” It does not follow, however, that claim 6 requires no detection at all, as Petitioner appears to argue. *See* Reply 8 (“even if detection were to be read into claim 6, despite its presence in claim 4 and absence from claim 6”). Petitioner’s argument in that regard is inconsistent with other arguments in the Petition and Reply, as well as Mr. Klinstein’s testimony. *See, e.g.*, Pet. 6–7 (describing an embodiment of the ’883 patent in which the target variable time is detected and measured). In particular, Mr. Klinstein testifies that an ordinary artisan “would understand claim 6 to refer to at least three alternate configurations,” each of which requires detecting at least one target variable: (1) in the first configuration, the first and fourth target variables are the same, and one of those target variables is detected; (2) in the second configuration, the first and fourth target variables are different, but only one of them is detected; and (3) in the third configuration, the first and fourth target variables are different, and both of them are detected. Ex. 1008 ¶ 14. As both Petitioner and Mr. Klinstein concede, claim 6 requires detection of at least one target variable despite the fact that the claim does not expressly recite detection. Indeed, Petitioner does not explain how it would be possible for the method to determine when a target variable adopts a predetermined value without detecting that target variable. Accordingly, we find a construction of claim 6 that eliminates detection altogether to be unreasonably broad.

We are persuaded, however, by Petitioner’s alternative argument that claim 6 requires detecting only one target variable, not both. See Reply 8–9. As noted in our Institution Decision and above, claim 6 recites two options for ending the first machining interval. Inst. Dec. 15; Ex. 1001, 4:58–62 (“the first machining interval ends when the first target variable adopts the predetermined value or when a fourth target variable of the group Z adopts a predetermined value”). Using the disjunctive connector “or” designates the two options for ending the first machining interval “as distinct alternatives to one another.” *Wasica Fin. GmbH v. Continental Auto. Sys., Inc.*, No. 2015-2078, 2017 WL 1228579, at *5 (Fed. Cir. Apr. 4, 2017) (citing *SkinMedica, Inc. v. Histogen Inc.*, 727 F.3d 1187, 1199 (Fed. Cir. 2013) (“The disjunctive ‘or’ plainly designates that a series describes alternatives.”); *Schumer v. Lab. Comput. Sys.*, 308 F.3d 1304, 1311 (Fed. Cir. 2002) (“We have consistently interpreted the word ‘or’ to mean that the items in the sequence are alternatives to each other.”)). Thus, the plain language of claim 6 indicates that only one of the two recited target variables needs to be detected, and that the machining interval ends when the detected target variable adopts its predetermined value.

Such a construction is consistent with the ’883 patent specification. The specification describes an embodiment of the method in which “it is also possible for two target variables to be detected during a machining interval, for example a first target variable and a fourth target variable[,] . . . and for the machining interval to end when one of the two target variables adopts it[s] predetermined value.” Ex. 1001, 3:22–26. Unlike other embodiments, the specification does not elaborate further as to the contours of this particular embodiment, by way of example or otherwise. *Compare*

id. at 3:22–26, with *id.* at 2:24–47, 2:55–58, 3:4–19. In our view, the phrase “it is also possible” suggests that although the method can detect two target variables during the first machining interval, detection of both target variables is not required.

Patent Owner contends that construing claim 6 to require detection of only one target variable, as opposed to two target variables, results in an improper dependent claim because it does not further limit the scope of protection of claim 1. Resp. 8 (citing *Nystrom*, 424 F.3d at 1143). To avoid such impropriety, Patent Owner essentially asks us to rewrite the claim to require simultaneously detecting both target variables and ending the machining interval when the first of those target variables adopts its predetermined value. *Id.* at 5–8. There is no presumption of validity in an *inter partes* review. Accordingly, we do not construe or rewrite claims to preserve their validity.

The result here would not change if we applied such a presumption, because we are not persuaded by Patent Owner’s argument that a construction requiring detection of one target variable renders claim 6 an improper dependent claim. Rather, we agree with Petitioner that such a construction further limits the method set forth in claim 1 by specifying that the machining interval ends. See Reply 7–8. In other words, claim 1 specifies what occurs during the first and second machining intervals (i.e., a welding variable is kept constant until a target variable adopts a predetermined value), but does not recite that each machining interval ends once that predetermined value is adopted. Claim 6, on the other hand, narrows claim 1 by specifying that what occurs during the first machining interval is one of the two options for ending that machining interval.

Ex. 1001, 4:59–60 (“the first machining interval ends when the first target variable adopts the predetermined value. . .”).

Further, we note that, with Patent Owner’s proposed construction, claim 6 includes two temporal limitations: (1) the method must detect the first target variable and the fourth target variable simultaneously, and (2) the machining interval ends when the first of the two detected target variables adopts its predetermined value. *See* Resp. 5–6. We need not address those temporal limitations because we determine that claim 6 does not require detection of two target variables.

Had we determined that claim 6 requires such detection, however, we remain unpersuaded that the claim additionally requires the temporal limitations Patent Owner urges us to adopt. In that regard, Patent Owner does not direct us to any claim language or description in the ’883 patent specification that sets forth simultaneously detecting the two target variables during a machining interval, or ending the machining interval when the first of the two target variables adopts its predetermined value.

Given the foregoing, we determine that, under the broadest reasonable construction, the method of claim 6 need only detect one target variable (the first target variable or the fourth target variable) and end the machining interval when that target variable adopts its predetermined value.

C. Anticipation of claim 6 by Klinstein ’816

Petitioner contends that Klinstein ’816 anticipates claim 6. Pet. 31–42. Patent Owner responds that Klinstein ’816 cannot anticipate claim 6 because Petitioner failed to provide an analysis of each claim from which claim 6 depends, and because Klinstein ’816 does not disclose the criteria for ending the first machining interval that claim 6 requires (i.e., detecting

both target variables). Based on our review of the arguments and evidence of record, we determine that Petitioner demonstrates, by a preponderance of the evidence, that Klinstein anticipates claim 6, as explained below.

1. Klinstein '816

Klinstein '816 discloses an ultrasonic welding system and method, during which an ultrasonic welding stack mounted for linear movement is pressed against a first workpiece and the energy from the welding stack is applied to the first workpiece to initiate welding. Ex. 1004, Abstract. The welding system comprises an electrically powered linear actuator coupled to the welding stack that moves the stack while applying a controlled force, speed, or combination of force and speed to the stack, and the welding system includes an ultrasonic signal generator, a booster, and a horn. *Id.* at 1:30–35, 3:21–43, Figs. 5, 6. The system further comprises a controller and at least one sensor that is configured to measure at least one corresponding control variable and to provide a signal corresponding to the control variable to the controller. *Id.* at 1:39–45.

During one welding method, called a delayed motion technique, an initial force is applied to the welding stack and the welding distance is maintained at or near zero inches until a decrease in force to a predetermined threshold force of 17 pounds is reached. *Id.* at 7:16–51, Figs. 9–11. Following that decrease in force, the control system continues the weld in accordance with a selected weld process profile. *Id.* at 7:51–55. For example, after the decrease in force, the weld speed can be held constant until a predetermined weld distance is reached, thereby ending the machining interval. *Id.* at 7:16–23, Figs. 9–11.

2. Analysis

We first address whether, in order to establish that Klinstein '816 anticipates claim 6, Petitioner must also demonstrate that Klinstein '816 anticipates each of the alternative claims from which claim 6 depends (i.e., claims 1, 2, and 3 or claim combinations 6/1, 6/2/1, and 6/3/2/1). We then consider the parties' substantive arguments regarding Klinstein '816.

a. Multiple dependency of claim 6

Patent Owner argues that because claim 6 is a multiple dependent claim that depends from claims 1, 2, or 3, Petitioner must demonstrate, by a preponderance of evidence, that Klinstein '816 anticipates each of claims 1, 2, 3, and 6 in order to establish that Klinstein '816 anticipates claim 6. Resp. 4. In other words, Patent Owner contends that it was incumbent upon Petitioner to set forth in the Petition how Klinstein '816 anticipates each of claim combinations 6/1, 6/2/1, and 6/3/2/1 to render claim 6 unpatentable.

Id. We disagree.

As set forth in 35 U.S.C. § 112:

A claim in multiple dependent form shall contain a reference, in the alternative only, to more than one claim previously set forth and then specify a further limitation of the subject matter claimed. . . . *A multiple dependent claim shall be construed to incorporate by reference all the limitations of the particular claim in relation to which it is being considered.*

35 U.S.C. § 112, fifth paragraph (emphasis added). Thus, section 112 provides that we must consider separately the limitations of each claim incorporated by reference into the multiple dependent claim. Consistent with that language, the Federal Circuit has addressed a multiple dependent claim in view of the asserted claim from which it depends, as opposed to each claim from which it depends. *See Dow Chem. Co. v. Mee Indus., Inc.*,

341 F.3d 1370, 1377 (Fed. Cir. 2003) (affirming district court’s obviousness conclusion as to a multiple dependent claim without considering separately each claim combination because although “[c]laim 21 of the [asserted] patent is a multiple-dependent claim, . . . only independent claim 14 from which it depends is asserted”).

Likewise, the Manual of Patent Examining Procedure (“MPEP”) advises examiners and practitioners that “a multiple dependent claim . . . does not contain all the limitations of all the alternative claims to which it refers, but rather contains in any one embodiment only those limitations of the particular claim referred to for the embodiment under consideration.” MPEP § 608.01(n)(I)(B)(4) (Eighth Edition, Rev. 9 (Aug. 2012)).⁷ The MPEP further explains that examiners should consider a multiple dependent claim “in the same manner as a plurality of single dependent claims.” *Id.* Although the MPEP does not have the force of law, the courts give deference to an agency’s interpretation of the statutes it enforces. *Ethicon, Inc. v. Quigg*, 849 F.2d 1422, 1425 (Fed. Cir. 1988) (“The MPEP states that it is a reference work on patent practices and procedures and does not have the force of law, but it ‘has been held to describe procedures on which the public can rely.’” (quoting *Patlex Corp. v. Mossinghoff*, 785 F.2d 594, 606 (Fed. Cir. 1985)); see *Hyatt v. Dudas*, 492 F.3d 1365, 1369 n.2 (Fed. Cir. 2007).

⁷ We cite to the version of the MPEP that was in effect at the time Patent Owner filed the application that issued as the ’883 patent. The current version of the MPEP, however, includes the same language regarding multiple dependent claims. See MPEP § 601.08(n) (Ninth Edition, Rev. 07.2015 (Nov. 2015)).

We find the decision in *Dow* instructive, and the MPEP’s guidance persuasive, as to how courts, examiners, and practitioners consider multiple dependent claims. Indeed, we considered claim 6 in the same manner when we instituted this *inter partes* review based on its dependency from claim 1, but not claims 2 and 3. Inst. Dec. 15 (noting that the Petition addresses the limitations of claim 6 and claim 1) *see also id.* at 5 (explaining that claim 6 retains the content of claim 1). Patent Owner’s arguments to the contrary in its Response do not persuade us that we were in error, or that Petitioner was obligated to show in the Petition how Klinstein ’816 anticipates each of claim combinations 6/1, 6/2/1, and 6/3/2/1.

b. Anticipation of claim combination 6/1

Anticipation under 35 U.S.C. § 102 requires “the presence in a single prior art disclosure of all elements of a claimed invention arranged as in the claim.” *Therasense, Inc. v. Becton, Dickinson & Co.*, 593 F.3d 1325, 1332 (Fed. Cir. 2010); *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1369 (Fed. Cir. 2008). Petitioner argues that Klinstein ’816 discloses every limitation of the claim combination 6/1 and, therefore, anticipates claim 6. Pet. 34–42. Petitioner supports its argument with citations to Klinstein ’816 that correspond to each limitation of claims 1 and 6, and with the Klinstein Declaration. *Id.* at 32–34 (citing Ex. 1004, Abstract, 3:21–28, 4:14–26, 4:52–61, 6:62–7:15, 7:16–55, 9:31–33, Figs. 9–11; Ex. 1007 ¶¶ 38–51, 57).

Patent Owner challenges Petitioner’s showing with respect to the limitations that claim 6 adds to claim 1, but does not address the merits of Petitioner’s assertions regarding the claim 1 limitations. *See generally* Resp. In the Scheduling Order, we cautioned Patent owner that any arguments for patentability not raised in the Response would be deemed waived. Paper 9,

2–3; *see also* 37 C.F.R. § 42.23(a) (“Any material fact not specifically denied may be considered admitted.”). After having reviewed the un rebutted arguments and evidence presented by Petitioner concerning the limitations of claim 1, we are persuaded by those arguments. For example, we agree with Petitioner that the ultrasonic welding method that Klinstein ’816 discloses is a “[m]ethod for controlling an ultrasonic machining process, in which an ultrasonic vibration of the frequency f is transmitted with the aid of a sonotrode made to carry out an ultrasonic vibration under a pressure into the material to be machined.” As Petitioner points out, Klinstein ’816 discloses an ultrasonic welding method during which the tip of the vibrating horn or sonotrode is brought into contact with a first workpiece. The horn transfers ultrasonic vibrational energy to the first workpiece, through direct physical contact, and applies to the first workpiece the pressure necessary to force a weld between the first workpiece and a second workpiece. Pet. 32, 35–36; Ex. 1004, 4:14–26, 4:53–61; Ex. 1007 ¶¶ 39–41.

We also agree with Petitioner that Klinstein ’816 discloses: (1) a first machining interval during which a first welding variable of the group S is kept constant until a first target variable of the group Z adopts a predetermined value; (2) a second adjoining machining interval during which a second welding variable of the group S is kept constant until a second target variable of the group Z adopts a predetermined value; and (3) the first and second target variables differ. Pet. 32–34, 36–41; Ex. 1007 ¶¶ 43–47, 49–50. As explained above, Klinstein ’816 describes a delayed motion technique with two machining (welding) intervals. During the first interval, a first welding variable, distance, is kept at zero inches until a first

target variable, force, adopts a predetermined threshold at 0.08 seconds.

Ex. 1004, 7:32–55, Figs. 9, 10. During the second interval, a second welding variable, speed, is kept constant, until a second target variable, welding path (distance), adopts a predetermined value of 0.012 inches.

Ex. 1004, 7:32–55, Fig. 9. The first and second target variables in Klinstein '816's method, force and welding path, respectively, are different.

Accordingly, Petitioner establishes, by a preponderance of the evidence, that Klinstein '816 discloses the limitations of claim 1.

Turning to claim 6, Petitioner asserts that Klinstein '816 anticipates that claim because Klinstein '816 discloses a first machining interval that ends when force or specified power or specified cumulative power (i.e., a first or a fourth target variable) adopts a predetermined value. Pet. 33–35, 41–42; Reply 7, 9. Patent Owner counters that Klinstein '816 does not anticipate claim 6 because it “fails to disclose [detecting] both the specific power and the cumulative power, and ending the first [machining] interval when a predetermined value for either [variable] is achieved.” Resp. 10–11.

We are not persuaded by Patent Owner's argument because, as explained above, we do not interpret claim 6 to require detecting both the first and fourth target variables. Under our claim construction, claim 6 requires detecting only one target variable. As we explained in the Institution Decision, “[w]hen a claim covers several alternatives, the claim may be unpatentable if any of the alternatives within the scope of the claim are taught by the prior art.” Inst. Dec. 15 (citing *Brown v. 3M*, 265 F.3d 1349, 1351 (Fed. Cir. 2001)). We find that Klinstein '816 teaches an alternative within the scope of claim 6. Specifically, as Petitioner explains, and Mr. Klinstein testifies, Klinstein '816 teaches that the first welding

interval ends when one of three different target variables that can be detected (force, specified power, or specified cumulative power) adopts a predetermined value. Pet. 33–42; Reply 9; Ex. 1007 ¶¶ 46, 57. For example, Klinstein '816 discloses that the first machining interval can end at 0.08 seconds when the target variable force adopts a predetermined value. Ex. 1004, 7:16–55, Figs. 9–11. Klinstein '816 also discloses that the first machining interval can end when one of the target variables specified power or specified cumulative power adopts a predetermined value. Ex. 1004, 6:62–7:15, 9:31–33. Patent Owner does not address those teachings or present countervailing evidence on those points.⁸ *See generally* Resp. Rather, Patent Owner's argument is based solely on its construction of claim 6, which we do not adopt. *See id.* at 10–11. Accordingly, we find Petitioner establishes, by a preponderance of the evidence, that Klinstein '816 discloses the limitations of the claim combination 6/1 and anticipates claim 6.

III. CONCLUSION

Taking account of the arguments and evidence presented during trial, Petitioner demonstrates, by a preponderance of the evidence, that claim 6 of the '883 patent is unpatentable under 35 U.S.C. § 102.

⁸ Patent Owner did not cross-examine Mr. Klinstein, and does not point to any reason to doubt the veracity of his testimony that Klinstein '816 describes welding steps that meet the limitations of claim 6. *See* Ex. 1007 ¶¶ 46, 57.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that Petitioner establishes, by a preponderance of the evidence, that claim 6 of the '883 patent is unpatentable; and

FURTHER ORDERED that this is a Final Written Decision; therefore, 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.

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