

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CANON INC., and CANON U.S.A., INC.,
Petitioner,

v.

HIDEHIKO NAKAJIMA,
Patent Owner.

PGR2018-00090
Patent 9,813,625 B2

Before MICHAEL R. ZECHER, STACEY G. WHITE, and
JOHN P. PINKERTON, *Administrative Patent Judges*.

PINKERTON, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
35 U.S.C. § 328(a)

I. INTRODUCTION

We have jurisdiction under 35 U.S.C. § 6. This Final Written Decision is issued pursuant to 35 U.S.C. § 328(a) and 37 C.F.R § 42.73. For the reasons that follow, we determine Petitioner has proven, by a preponderance of the evidence, that claims 1–6 of U.S. Patent No. 9,813,625 B2 (Ex. 1001, “the ’625 patent”) are unpatentable.

A. *Procedural History*

Canon Inc. and Canon U.S.A., Inc. (collectively “Petitioner”) filed a Petition requesting a post-grant review of claims 1–6 of the ’625 patent. Paper 2 (“Pet.”). Hidehiko Nakajima (“Patent Owner”) filed a Preliminary Response. Paper 6 (“Prelim. Resp.”). Pursuant to 35 U.S.C. § 324, we instituted a post-grant review of all challenged claims on all challenges presented in the Petition. Paper 7 (“Dec. to Inst.”).

Patent Owner did not file a patent owner response, Petitioner did not file a reply, and no oral hearing was held in this proceeding.¹ Despite the lack of additional briefing, Petitioner is still required to meet its burden to establish the unpatentability of the challenged claims. Thus, in making this decision, we reviewed Petitioner’s arguments and evidence anew to determine whether Petitioner met its burden to establish the unpatentability of the challenged claims by a preponderance of the evidence. 35 U.S.C. § 326(e) (“In a post-grant review instituted under this chapter, the petitioner

¹ Patent Owner filed a Patent Owner Statement, but, for reasons discussed in our August 26, 2019 Order, that paper was expunged. *See* Paper 14; *see also* Ex. 1025 (transcript of the conference call that led to the August 26, 2019 Order).

shall have the burden of proving a proposition of unpatentability by a preponderance of the evidence.”).

B. Related Proceedings

Petitioner has filed two petitions requesting an *inter partes* review of claims 1–9 of U.S. Patent 9,264,614 B2 (“the ’614 patent”), the parent patent of the ’625 patent: IPR2018-00499 and IPR2018-00501. Pet. 2, 77; Paper 4, 1. On July 24, 2018, a trial was instituted in each of these proceedings. Pet. 2 (*see* IPR2018-00499, Paper 9; IPR2018-00501, Paper 9). On July 23, 2019, Final Written Decisions were entered in each of these proceedings in which claims 1–9 of the ’614 patent were determined to be unpatentable. *See* IPR2018-00499, Paper 19; IPR2018-00501, Paper 19.

There is also a pending district court action regarding a related patent involving Petitioner and Patent Owner (*HS Asset & Tech., LLC v. Canon USA, Inc.*, No. 1:16-cv-06339 (E.D.N.Y.)). Pet. 1–2, 77; Paper 4, 1.

C. The '625 Patent

The '625 patent generally is directed to a digital camera that includes a rotary switch, a selector switch,² and a restricting member. Ex. 1001, 2:37–39. The Specification explains that the “selector switch is configured to independently switch between two states,” a restricted and a non-restricted state. *Id.* at 3:24–28, 2:43–46. Figure 1B of the '625 patent is shown below.

FIG.1B

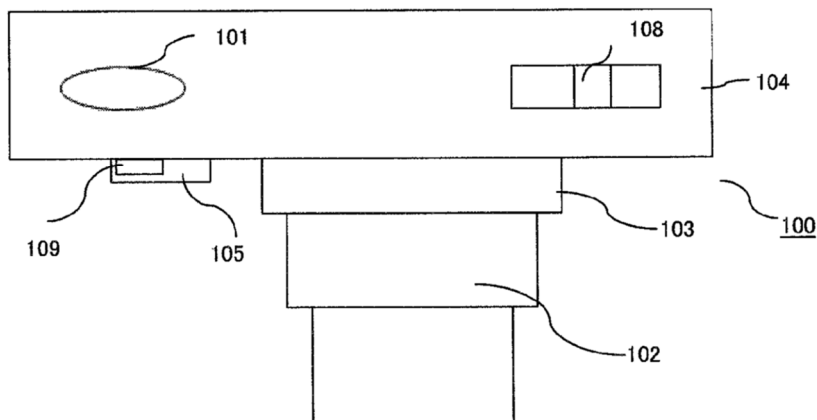


Figure 1B is a schematic diagram of a top view of digital camera 100 according to the first embodiment. Ex. 1001, 4:44–46. Figure 1B shows a “rotary switch” as ring 103 around lens-barrel 102. *Id.* at 4:46–50. Figure 1B also shows shutter 101 for photographing, power switch 108, selector

² Although the Specification uses both of the terms “switching unit” (*see* Ex. 1001, 2:37–43) and “selector switch” (*see id.* at 3:24–28) to refer to a device configured to switch between a restricted and a non-restricted state, we use the term “selector switch” in the Final Written Decision because claim 1 recites “a selector switch.”

switch 105 for switching a mode for continuous or discrete output values in the rotary ring, and function button 109 for further mode switching disposed on the outer surface of chassis 104. *Id.* at 4:50–57. Although it is not shown in Figure 1B, the '625 patent explains that rotary ring 103 is set to be smoothly rotated by rotation mechanism 118 (e.g., a ball bearing) disposed between the rotary ring and chassis 104. *Id.* at 5:1–4.

The '625 patent states that digital cameras may include a number of functions, such as focusing, zooming, exposure, shutter speed, ISO (sensitivity), and switching of imaging modes. *Id.* at 1:31–34. The '625 patent acknowledges that rotary switches, such as ring 103, that control these various camera functions were well known prior to the invention of the '625 patent. *Id.* at 1:55–2:9. The '625 patent also acknowledges that camera functions typically known to have discrete values were controlled using a rotary switch whose “rotation is locked in a specific position,” whereas functions known to have continuous values were controlled using a rotary switch that “continuously rotates” without locking in a specific position. *Id.* at 2:19–25.

In the '625 patent, the selector switch is configured to independently switch between “a restricted state where an operation of the rotary switch causes a clicking feel; and a non-restricted state where an operation of the rotary switch does not cause a clicking feel.” *Id.* at 3:50–54. The '625 patent explains that “[a] function with discrete output values [such as one of a shutter speed and aperture] is assigned to the restricted state, and a function with continuous output values [such as one of focusing and zoom

magnification of a lens] is assigned to the non-restricted state.” *Id.* at 3:59–61, 2:50–55.

The '625 patent describes that the restricted state (i.e., clicking feel) and non-restricted state (i.e., smooth feel) are generated mechanically by restricting member 107 engaging or disengaging a trough or depressed portion between projecting portions 201 on rotary switch 103. *Id.* at 5:37–45. Figures 3A and 3B of the '625 patent are reproduced below.

FIG.3A

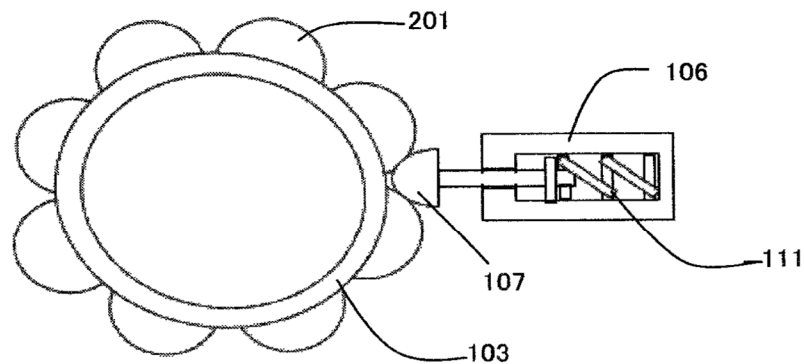
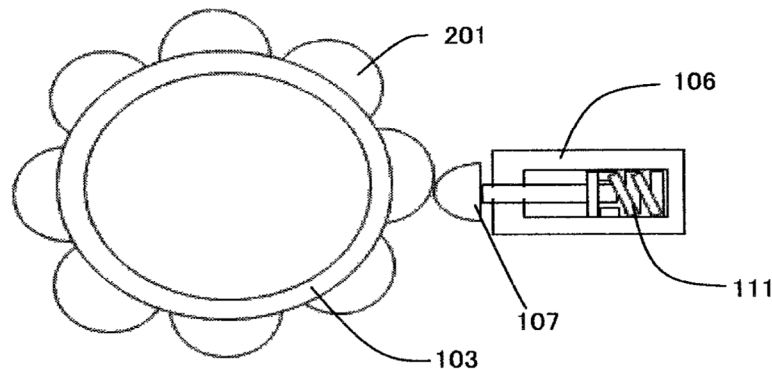


FIG.3B



Figures 3A and 3B are conceptual diagrams illustrating the operation when selector switch 105 is set to a restricted state. *Id.* at 5:28–31. These

figures show projecting portions 201 in semi-circular shapes evenly disposed on the periphery of rotary ring 103. *Id.* at 5:21–23. They also show fixed portion 106 disposed adjacent, and to the right of, ring 103, in which restricting portion 107 is coupled to the fixed portion via spring 111. *Id.* at 5:12–17. The '625 patent explains that when selector switch 105 is set to a restricted state, fixed portion 106 moves to approach rotary ring 103 inside chassis 104. *Id.* at 5:31–33. When rotary ring 103 is rotated, the rotary ring is in a fixed position, as shown in Figure 3A. *Id.* at 5:35–37. When restricting portion 107 has a position other than the trough between the projecting portions, as shown in Figure 3B, restricting portion 107 moves to the closest trough by the pressing force of spring 111, causing the clicking feel to the user. *Id.* at 5:37–45.

D. Illustrative Claim

Among the challenged claims, claim 1 is independent and claims 2–6 depend directly from claim 1. Claim 1 is reproduced below (with paragraph lettering added as in the Petition):

1. (a) A digital camera, comprising:

(b) a rotary switch, rotatably mounted in a peripheral area of a lens barrel, wherein the rotary switch has a plurality of depressed/trough portions concentrically arranged with respect to an axis of rotation of the rotary switch,

(c) a photographing function is assigned to the rotary switch, the rotation of the rotary switch is detected, a value is outputted based on a detected rotation of the rotary switch, and the photographing function is controlled based on the value;

(d) a restricting member comprising a mechanical structure configured to press against the depressed/trough

portions in of the rotary switch and selectively engages with the depressed/trough portions during rotation of the rotary switch for generating a clicking feel; and

(e) a selector switch comprising a coupling mechanism configured to adjust a force applied by the restricting member against the depressed/trough portions for switching between a restricted state with the clicking feel and a non-restricted state free of the clicking feel at a time of photographing

(f) wherein the rotary switch is configured to rotate without exerting mechanical control over a mechanism separate from the rotation and the selector switch.

Ex. 1001, 11:28–12:17.

D. Grounds of Unpatentability at Issue and Evidence Relied Upon

As discussed further *infra*, Petitioner contends that, despite claiming priority to a chain of applications dating back to July 12, 2012, the effective filing date of the '625 patent's claims is no earlier than January 7, 2016, the actual filing date in the United States. Pet. 9, 15. Petitioner also contends that, because the '625 patent has at least one claim with an effective filing date on or after March 16, 2013, the '625 patent is subject to the post-grant review provisions of the Leahy-Smith America Invents Act ("AIA").³ *Id.* at 3, 15–16. Petitioner argues that all the prior art relied on in the Petition was published more than one year before the '625 patent's effective filing date of

³ Leahy-Smith America Invents Act ("AIA"), Pub. L. No. 112-29, 125 Stat. 284 (2011).

January 7, 2016, and is, therefore, prior art under 35 U.S.C. § 102(a)(1).⁴ *Id.* at 9.

The claims challenged and the specific statutory grounds of unpatentability on which trial was instituted are set forth in the table below.

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
Claims 1–6	112(a)	Written Description
Claims 1–6	112(b)	Indefiniteness
Claims 1–6	103	Tanaka, ⁵ Tesch ⁶
Claims 1, 3, 4, 6	103	Kawaji, ⁷ Mikamo ⁸
Claims 2, 5	103	Kawaji, Mikamo, Ishigaki ⁹

⁴ “A person shall be entitled to a patent unless (1) the claimed invention was . . . described in a printed publication . . . before the effective filing date of the claimed invention.” 35 U.S.C. § 102(a)(1) (2012).

⁵ Japanese Patent Application Publication No. 2011/39385, published Feb. 24, 2011 (Ex. 1003, “Tanaka”); Ex. 1004 (certified English translation of Tanaka).

⁶ U.S. Patent No. 2,906,188, issued Sept. 29, 1959 (Ex. 1005, “Tesch”).

⁷ Japanese Patent Application Publication No. 2003/177294, published June 27, 2003 (Ex. 1006, “Kawaji”); Ex. 1007 (certified English translation of Kawaji).

⁸ U.S. Patent Publication No. 2003/0160891, published Aug. 28, 2003 (Ex. 1008, “Mikamo”).

⁹ U.S. Patent Publication No. 2008/0197004, published Aug. 21, 2008 (Ex. 1009, “Ishigaki”).

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
Claims 1, 3–6	103	Kawaji, Kimura ¹⁰
Claim 2	103	Kawaji, Kimura, Ishigaki

In addition to the cited references, Petitioner relies upon the Declaration of William Plummer, Ph.D. Ex. 1002.

E. Level of Skill in the Art

Petitioner contends that a person of ordinary skill in the art at the time of the '625 patent would have had a bachelor's degree in optical engineering, mechanical engineering, electrical engineering, optics or physics, with at least three years of experience working in optical engineering, a master's degree in one of the above disciplines with at least two years of experience working in optical engineering, a Ph.D. in one of the above disciplines focusing on optical engineering, or other equivalent experience. Pet. 35 (citing Ex. 1002 ¶ 48). In the Institution Decision, we adopted Petitioner's proposed description of the level of ordinary skill in the art. Dec. on Inst. 11. Patent Owner did not file a Patent Owner Response and, therefore, has not expressed a position on the level of ordinary skill in the art. Based on the subject matter at issue and the prior art of record, we adopt Petitioner's proposal and apply this level of ordinary skill in the art for purposes of this Final Written Decision.

¹⁰ Japanese Utility Model Publication No. H06-35325, published on Sept. 14, 1994 (Ex. 1010, "Kimura"); Ex. 1011 (certified English translation of Kimura).

II. ANALYSIS

A. State of the Proceeding and Petitioner's Burden

As mentioned above, Patent Owner did not file a response to the Petition. Thus, we proceed to this Final Written Decision, without the benefit of additional arguments or evidence presented by the parties during the trial phase. *Id.* This does not mean, however, that Petitioner will prevail on its assertions. Paper 14, 7. As stated in the August Order, “we will review the Petition and its associated evidence to determine if Petitioner has met its burden to establish the unpatentability of the challenged claims by a preponderance of the evidence.” *Id.* (quoting 35 U.S.C. § 326(e)); *see also Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378–79 (Fed. Cir. 2015) (holding that Petitioner has the ultimate burden of persuasion to prove unpatentability by a preponderance of the evidence).

B. Eligibility for Post-Grant Review

The post-grant review provisions set forth in Section 6(d) of the AIA apply only to patents subject to the first-inventor-to-file provisions of the AIA. *See* AIA § 6(f)(2)(A) (“The amendments made by subsection (d) . . . shall apply only to patents described in section 3(n)(1).”). Patents subject to the first-inventor-to-file provisions are those that issue from applications “that contain[] or contained at any time . . . a claim to a claimed invention that has an effective filing date as defined in section 100(i) of title 35, United States Code, that is on or after” March 16, 2013. AIA § 3(n)(1)(A). Our rules require that each petitioner for post-grant review certify that the challenged patent has an effective filing date that renders the patent available for post-grant review. 37 C.F.R. § 42.204(a). In addition, “[a] petition for a

post-grant review may only be filed not later than the date that is 9 months after the date of the grant of the patent or of the issuance of a reissue patent (as the case may be).” 35 U.S.C. § 321(c); *see also* 37 C.F.R. § 42.202(a) (accord).

Petitioner states that “at least one claim of the ’625 patent has an effective filing date on or after March 16, 2013 such that [post-grant review] is eligible.” Pet. 3. Petitioner contends that, despite claiming priority to a chain of applications dating back to 2012, the challenged claims are not entitled to claim the benefit of any applications filed earlier than the ’625 patent’s actual filing date of January 7, 2016, because the prior applications do not provide written description support for at least three claim limitations. *Id.* at 15–17 (citing Ex. 1001, code (22)). Petitioner also states the Petition was “filed less than nine months after the issuance of the ’625 patent.” Pet. 3.

As discussed *infra*, we determine that Petitioner has demonstrated that the ’625 patent’s Specification and the priority documents fail to provide written description support for the claim 1 limitation of “wherein the rotary switch is configured to rotate without exerting mechanical control over a mechanism separate from the rotation and the selector switch.” Thus, we determine that at least one claim of the ’625 patent has an effective filing date of January 7, 2016, which is on or after March 16, 2013. Also, the Petition was filed on August 6, 2018, which is not more than nine months after the November 7, 2017, issue date of the ’625 patent. Ex. 1001, code (45). Thus, on the full record before us, we determine that the ’625 patent is eligible for post-grant review.

C. Claim Construction

For petitions filed before November 13, 2018, 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. § 42.200(b) (2018)¹¹. Under that standard, and absent any special definitions, we generally give claim terms their ordinary and customary meaning, which “is the meaning that the term would have to a person of ordinary skill in the art in question” at the time of the invention. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007); *see also TriVascular, Inc. v. Samuels*, 812 F.3d 1056, 1062 (Fed. Cir. 2016) (“Under a broadest reasonable interpretation, words of the claim must be given their plain meaning, unless such meaning is inconsistent with the specification and prosecution history.”). Any special definition for a claim term must be set forth in the specification with reasonable clarity, deliberateness, and precision. *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994).

Petitioner contends that we should construe the following terms or phrases: (1) “mechanical control”; (2) “a mechanism separate from the rotation and the selector”; and (3) “wherein the rotary switch is configured to rotate without exerting mechanical control over a mechanism separate

¹¹ The claim construction standard recently changed for all post-grant proceedings filed on or after November 13, 2018. *See* Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board, 83 Fed. Reg. 51,340 (Oct. 11, 2018). Because the Petition in this proceeding was filed on August 6, 2018, however, the applicable claim construction standard remains the “broadest reasonable construction,” as set forth in 37 C.F.R. § 42.200(b) (2018).

from the rotation and the selector switch.” Pet. 11–15. Petitioner asserts that all other claim terms need not be construed and should be given their ordinary and customary meaning, as understood by a person of ordinary skill in the art. *Id.* at 10. We agree with Petitioner and, therefore, we construe below the terms and phrases identified by Petitioner. We also determine that no express interpretation of any other claim term is necessary. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (“[W]e need only construe terms ‘that are in controversy, and only to the extent necessary to resolve the controversy.’” (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

1. “mechanical control”

The composite term “mechanical control” is recited in the wherein clause of independent claim 1—“wherein the rotary switch is configured to rotate without exerting mechanical control over a mechanism separate from the rotation and the selector switch” (the “wherein clause”). Ex. 1001, 12:14–17. Petitioner contends the term “mechanical,” in this context, refers to “a physical mechanism as opposed to an electrical structure” because, for example, the ’625 patent “contrasts a mechanical selector switch embodiment from an electrical embodiment.” Pet. 11 (citing Ex. 1001, 6:23–37; Ex. 1002 ¶¶ 52–53). According to Petitioner, “mechanical is used in the ’625 patent to refer to physical engagement, as opposed to electrical signaling.” *Id.* (citing Ex. 1002 ¶ 53). We note that, as an adjective, the definitions of “mechanical” include “produced or operated by a machine or tool” and “caused by, resulting from, or relating to a process that involves a

purely physical as opposed to a chemical change.” *See* WEBSTER’S NINTH NEW COLLEGIATE DICTIONARY 737 (1985) (Ex. 3001).

Petitioner also contends that “control” is generally understood “to mean ‘directing influence over’ when used to describe an act, such as in ‘exerting . . . control’ here.” Pet. 11 (citing Ex. 1018, 3; Ex. 1002 ¶ 54). Petitioner further contends that, although the ’625 patent’s Specification does not discuss “mechanical control” at all, it does use the word “control” to describe acts in a manner consistent with this meaning. *Id.* at 11–12 (citing Ex. 1001, 2:58–60 (“[T]he digital camera system controls the discrete function or the continuous function corresponding to the output.”), 7:19–21). Thus, Petitioner argues that the term “mechanical control,” as used in the ’625 patent, means “physically engaging to direct influence over.” *Id.* at 12 (citing Ex. 1002 ¶ 55).

We agree with Petitioner that, outside of independent claim 1, the composite term “mechanical control” is not used in the ’625 patent’s Specification. Regarding Petitioner’s proposed construction of “physically engaging to direct influence over,” we note that neither the Specification nor Petitioner’s definition of “control” requires or suggests “engaging.” Considering the claim terms “mechanical” and “control” in light of the Specification, the definition of “mechanical,” Petitioner’s arguments, and Petitioner’s dictionary definition of “control,” we maintain our construction from the Institution Decision and we conclude that the broadest reasonable interpretation of the term “mechanical control” is “physical influence over.” Dec. to Inst. 16.

2. “a mechanism separate from the rotation and the selector switch”

Petitioner contends that the phrase “a mechanism separate from the rotation and the selector switch” is not described in the Specification, and “it is unclear what is required to show that a mechanism is ‘separate’ from the rotation and the selector switch.” Pet. 12 (citing Ex. 1002 ¶¶ 56–57).

Petitioner also contends there is no basis to understand whether a “mechanism” is “separate from the rotation” because “rotation is an *act*,” whereas the claim is directed to the structure of a digital camera. *Id.* at 12–13 (citing Ex. 1002 ¶ 58). In any event, Petitioner asserts “there is *no* basis to determine which mechanisms are involved in ‘the rotation.’” *Id.* (citing Ex. 1002 ¶¶ 59–61). According to Petitioner, although the scope of this limitation is ambiguous and indefinite, it should be construed to at least include “any mechanism that is not part of, *e.g.*, wholly separate from, the selector switch or involved in the rotation.” *Id.* at 13 (citing Ex. 1002 ¶ 62).

Although the term “separate” is not used in the ’625 patent’s Specification outside of independent claim 1, we note that, as an adjective, the term is defined to mean “set or kept apart : detached” and “existing by itself.” Ex. 3001, 1073. Regarding the term “rotation,” we are not persuaded by Petitioner’s arguments that “separate from the rotation” is unclear and there is no basis to determine what mechanisms are involved in “the rotation.” *See* Pet. 12–13. Instead, we determine, as further discussed *infra*, that “rotation” is functional language associated with the claimed “rotary switch . . . configured to rotate.” And, the mechanisms involved in the rotation of the rotary ring include ball bearing 118. *See* Ex. 1001, Fig. 2A; 5:1–4. Thus, we conclude, as we did in our Institution Decision, that the

broadest reasonable interpretation of the phrase “a mechanism separate from the rotation and the selector switch” is “a component that is not part of (1) the rotary switch, or the ball bearing between the rotary switch and camera chassis, and (2) the selector switch and its parts.” Dec. to Inst. 18.

3. *“wherein the rotary switch is configured to rotate without exerting mechanical control over a mechanism separate from the rotation and the selector switch”*

Petitioner contends that the “wherein clause” of claim 1 is “a negative limitation that distinguishes the claimed invention from other structures by what it *is not*, as opposed to a typical structural claim which recites what the claimed structure *is*.” Pet. 14. Petitioner argues that this wherein clause should be construed as “a negative limitation that excludes structures where rotation of the rotary switch controls any mechanism other than the rotation and the selector switch.” *Id.* at 15 (citing Ex. 1002 ¶ 65).

We determine, as we did in our Institution Decision, that the “wherein clause” of claim 1 is a negative limitation because it recites that the rotary switch is configured to rotate “without” exerting mechanical control over a mechanism separate from the rotation and the selector switch. Dec. on Inst. 19. That is, this clause is a negative limitation because it states what the rotary switch does not to do. In that regard, it is well settled that negative limitations are permissible forms of expression to define the scope of a claimed invention. *See, e.g., Animal Legal Def. Fund v. Quigg*, 932 F.2d 920, 923 (Fed. Cir. 1991) (“The use of a negative limitation to define the metes and bounds of the claimed subject matter is a permissible form of expression.” (quoting a U.S. Patent and Trademark Office notice)). Furthermore, we conclude, as we did in our Institution Decision, that the

broadest reasonable interpretation of the clause “wherein the rotary switch is configured to rotate without exerting mechanical control over a mechanism separate from the rotation and the selector switch” means “wherein the rotary switch is configured to rotate so as not to exert physical influence over a component that is not part of (1) the rotary switch, or the ball bearing between the rotary switch and camera chassis, and (2) the selector switch and its parts.” Dec. on Inst. 19–20. The issue of whether this negative limitation is properly supported by the written description of the ’625 patent’s Specification and the priority documents is discussed *infra*.

D. Unpatentability of Claims 1–6 for Lack of Written Description, and Effective Filing Date of Claims 1–6

Petitioner contends that the challenged claims have an effective filing date of January 7, 2016, because the priority documents lack written description support for at least three claim limitations: (1) the “wherein clause” of claim 1; (2) a selector switch and restricting member configured to press against the depressed/trough portions “in the direction of the axis of rotation of the rotary switch,” as recited in claim 2; and (3) “a state detection switch” configured to detect a selected state based on a position of the selector switch, as recited in claim 3. Pet. 15–27. Petitioner also contends that the challenged claims lack written description support under § 112(a) in the context of the ’625 patent’s Specification for the same reasons that the claims lack written description support for priority purposes. *Id.* at 35–36.

Because Petitioner’s contentions concerning the effective filing date and written description issues are closely related, we consider these issues together.

1. *Priority Claim of '625 Patent*

The '625 patent matured from Application No. 14/990,467 (“the '467 application”), filed on January 7, 2016, which is a continuation application of Application No. 14/599,397 (“the '397 application”), filed on January 16, 2015, now the '614 patent, which is a continuation of PCT/JP2013/069228 (“the PCT application”), filed on July 14, 2013. Ex. 1001, code (63). According to the '625 patent, the PCT application “is based upon and claims the benefit of priority from the prior Japanese Patent Application No. 2012-159132 [(“the Japanese '132 application”)], filed on Jul[y] 18, 2012.” *Id.* at 1:10–14, code (30). Petitioner contends that “all priority claims fail because neither the Japanese '132 application, the '397 application, nor the PCT application (collectively ‘the Prior Applications’) has written description support” for the subject matter of at least the three aforementioned limitations. Pet. 17.

2. *Applicable Law*

We, once again, reiterate that Petitioner has the ultimate burden of persuasion to prove unpatentability by a preponderance of the evidence. *Dynamic Drinkware*, 800 F.3d at 1378–79.

“Under [35 U.S.C.] section 119, the claims set forth in a United States application are entitled to the benefit of a foreign priority date if the corresponding foreign application supports the claims in the manner required by section 112, ¶ 1.” *In re Gosteli*, 872 F.2d 1008, 1010 (Fed. Cir. 1989). Moreover, when a priority claim involves a chain of priority documents, “each application in the chain leading back to the earlier application must

comply with the written description requirement of 35 U.S.C. § 112.”¹²
Lockwood v. Am. Airlines, Inc., 107 F.3d 1565, 1571 (Fed. Cir. 1997).

As the U.S. Court of Appeals for the Federal Circuit has noted, however, “[i]n order to satisfy the written description requirement, the disclosure as originally filed does not have to provide *in haec verba* support for the claimed subject matter at issue.” *Purdue Pharma L.P. v. Faulding Inc.*, 230 F.3d 1320, 1323 (Fed. Cir. 2000). Rather, “the test for sufficiency is whether the disclosure of the application relied upon reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date.” *Ariad Pharm., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (en banc).

“Negative claim limitations are adequately supported when the specification describes a reason to exclude the relevant limitation.” *Inphi Corp. v. Netlist, Inc.*, 805 F.3d 1350, 1355 (Fed. Cir. 2015) (quoting *Santarus, Inc. v. Par Pharm., Inc.*, 694 F.3d 1344, 1351 (Fed. Cir. 2012)). “[P]roperly describing alternative features—without articulating advantages or disadvantages of each feature—can constitute a ‘reason to exclude’ under the standard articulated in *Santarus*.” *Id.*

¹² 35 U.S.C. § 112(a) and the first paragraph of pre-AIA 35 U.S.C. § 112 each require that the “specification shall contain a written description of the invention”

3. *Analysis Regarding “wherein clause” of Claim 1*

The “wherein clause”¹³ of claim 1 recites that “the rotary switch is configured to rotate without exerting mechanical control over a mechanism separate from the rotation and the selector switch.” Petitioner argues that none of the Prior Applications “contain any reference to ‘rotat[ing] without exerting mechanical control’ or any statement that the rotation must not exert mechanical control over any other mechanism.” Pet. 18 (citing Exs. 1013, 1015, 1016; *see also* Ex. 1001). According to Petitioner, the Prior Applications only discuss what the rotary switch controls, and there is no discussion of “what it does *not* exert control over.” *Id.*; *see also id.* at 20 (arguing the same). Petitioner also argues that, “[e]ven if there was disclosure that the rotary switch exerts mechanical control over ‘the rotation,’ that alone is insufficient to provide written description for the negative limitation requiring that the rotation of the rotary switch also must not exert mechanical control over other mechanisms. ‘A patentee cannot necessarily claim the absence of something just because that something was not disclosed in the written description. What is required is an indication that the inventor invented a device that did not have that something.’” *Id.* at 20–21 (citing *CaptionCall, L.L.C. v. Ultratec, Inc.*, IPR2015-00636, Paper 97 at 108–09 (PTAB Sept. 7, 2016)). Petitioner further argues that this limitation claims a rotary switch exerting control over the selector switch

¹³ The “wherein clause” of claim 1 of the ’625 patent was added as part of a preliminary amendment filed prior to the first office action, pursuant to which original claims 1–8 were canceled and new claims 9–11 were added. *See* Ex. 1017, 179 (see independent claim 9, which is now claim 1).

(and not the other way around), but there is no disclosure of a rotary switch controlling the selector switch in the Prior Applications or the '625 patent's Specification. *Id.* at 21–22. According to Petitioner, “if anything, the selector switch indirectly controls the rotary switch via the restricting member.” *Id.* at 22 (citing Ex. 1002 ¶ 74).

Based on the record, we determine Petitioner has demonstrated, by a preponderance of the evidence, that the “wherein clause” limitation lacks written description support in the Prior Applications and the '625 patent's Specification. First, as explained in our claim construction analysis above, we are persuaded by Petitioner's argument that the limitation “wherein the rotary switch is configured to rotate without exerting mechanical control over a mechanism separate from the rotation and the selector switch” is a negative limitation. *See supra* Section II.C.3. We have construed the limitation to mean that the rotary switch “is configured to rotate so as not to exert physical influence over a component that is not part of (1) the rotary switch, or the ball bearing between the rotary switch and camera chassis, and (2) the selector switch and its parts.” We are persuaded that this is a negative limitation because it excludes rotary switches configured to exert physical influence over any physical component other than the rotary switch and ball bearing with which it rotates, as well as the selector switch and its parts.

Second, we determine Petitioner has demonstrated that the Prior Applications and the '625 patent's Specification fail to provide written description support for the negative limitation of the “wherein clause.” Based on our review of the record, we are persuaded by Petitioner's

arguments that the Prior Applications and the '625 patent's Specification do not disclose or suggest that the rotary switch is not to exert physical influence over parts other than those used in rotation of the rotary switch and the selector switch, or even discourages using the rotary switch to control other parts. Pet. 18–19 (citing Ex. 1001, Ex. 1013, Ex. 1015, Ex. 1016). In that regard, we agree with Petitioner's argument that there is no discussion in the Prior Applications and the '625 patent's Specification of what the rotary switch “does *not* exert control over.” *See id.* at 18, 20. Rather, the negative limitation effectively introduces a new concept that is not reasonably supported by the original disclosure. *See, e.g., Omega Eng'g, Inc. v. RaytekCorp.*, 334 F.3d 1314, 1323 (Fed. Cir. 2003) (finding no express disclaimer or independent lexicography in the written description to justify adding negative limitation).¹⁴

Third, we also agree with Petitioner that the Prior Applications and the '625 patent disclose only what the rotary switch controls. Pet. 18. For example, Figure 4 and its related descriptions in the Prior Applications, and corresponding Figure 4 and its description in the '625 patent, disclose that the selector switch selects between two states, and as a result, the selected function is detected, and rotation of the rotary switch controls the selected function. *See* Ex. 1001 (the '625 patent), Fig. 4, 6:56–7:37; Ex. 1013 (Japanese '132 application), Fig. 4, ¶ 32; Ex. 1015 (PCT application), Fig. 4,

¹⁴ Not only do we determine that the negative limitation is not supported, but also we determine the Prior Applications, and the '625 patent's Specification, do not describe “a reason to exclude” the negative limitation or articulate advantages or disadvantages of the negative limitation. *See Inphi*, 805 F.3d at 1355.

¶ 32; Ex. 1016 ('397 application), Fig. 4, 6:56–7:13. However, we find that nothing in Figure 4 and its description in the Prior Applications, and nothing in the '625 patent's Specification, provides written description support for what the rotary switch does not exert control over, because Figure 4 and its description do not sufficiently inform one of ordinary skill in the art that the rotary switch was not used for the purpose of exerting physical influence over any camera parts other than those used in rotation of the rotary switch and the selector switch. *Cf., e.g., Krippelz v. Ford Motor Co.*, 667 F.3d 1261, 1268 (Fed. Cir. 2012) (“This court has repeatedly cautioned against overreliance on drawings that are neither expressly to scale nor linked to quantitative values in the specification.”). *But cf., e.g., In re Mraz*, 455 F.2d 1069, 1072 (CCPA 1972) (stating “that things patent drawings show clearly are [not] to be *disregarded*”).

For these reasons, we find that Petitioner has demonstrated that the disclosures of each of the Prior Applications, and of the '625 patent's Specification, do not reasonably convey to those skilled in the art that the inventor had possession of the “wherein clause” limitation as of the filing dates of these documents. *Ariad Pharm.*, 598 F.3d at 1351. Thus, we find that Petitioner has demonstrated by a preponderance of the evidence that claim 1 of the '625 patent is unpatentable for lack of written description under § 112(a). For that reason, we also find that dependent claims 2–6, which depend from claim 1, are unpatentable for lack of written description under § 112(a).

We further find that Petitioner has shown by a preponderance of the evidence that Patent Owner's priority claim fails because the Prior

Applications fail to provide written description support for the “wherein clause” limitation of claim 1. Thus, we determine that the earliest effective filing date for claim 1 and dependent claims 2–6 is January 7, 2016, the filing date of the ’467 application that matured into the ’625 patent.

4. *Analysis Regarding Claim 2*

Claim 2 depends from claim 1 and further recites “wherein the axial direction is parallel to an optical axis of the digital camera at a direction extending internally from a rear side of the digital camera, and the restricting member is inserted into the depressed/trough portions along the axial direction.” Ex. 1001, 12:18–22. Petitioner refers to “the direction of the axis of rotation of the rotary switch” as “the Axial Arrangement” and contends that subject matter requiring both “a selector switch” (as recited in claim 1) and “a restricting member” configured to press against the depressed/trough portions in the Axial Arrangement (as recited in claim 2) is not supported by the Prior Applications or the ’625 patent’s Specification. Pet. 22. In particular, Petitioner argues that although the third embodiment shown in Figures 7A–C of the Prior Applications and the ’625 patent discloses restricting member 707 pressing in the direction of the axis of rotation of the rotary switch, “that embodiment lacks a ‘selector switch.’” *Id.* at 23 (citing Ex. 1013 ¶¶ 36–37, Figs. 7B–C; Ex. 1015 ¶¶ 36–37, Figs. 7B–C; Ex. 1016, 8:36–9:10, Figs. 7B–C; *see also* Ex. 1001, 8:54–9:30, Figs. 7B–C). Petitioner also argues that, in contrast, the embodiments that employ a “selector switch” all have “the restricting member moving *orthogonal* to the axis of rotation to engage the rotary ring.” *Id.* at 24 (citing Ex. 1013 ¶ 26, Figs. 2A, 3A, 3B; Ex. 1015 ¶ 26, Figs. 2A, 3A, 3B; Ex. 1016, 5:16–43,

Figs. 2A, 3A, 3B; *see also* Ex. 1001, 5:28–56, Figs. 2A, 3A, 3B). Petitioner further asserts that it is not enough that the individual elements of the claimed invention are disclosed, but the claimed combination of those elements must be described to satisfy the written description requirement. *Id.* at 24–25 (citing *Hyatt v. Dudas*, 492 F. 3d 1365, 1369–71 (Fed. Cir. 2007)).

For the same reasons, Petitioner contends that subject matter directed to the Axial Arrangement in claim 2 lacks written description support in the Prior Applications and the '625 patent's Specification. *Id.* at 36.

We agree with Petitioner's analysis and find that the cited evidence supports its arguments. Thus, we find that Petitioner has demonstrated that the disclosures of each of the Prior Applications, and of the '625 patent's Specification, do not reasonably convey to those skilled in the art that the inventor had possession of the subject matter of claim 2 as of the filing dates of these documents. *Ariad Pharm.*, 598 F.3d at 1351. For this reason, in addition to our reasoning regarding independent claim 1 in Section II.D.3 above, we find that Petitioner has demonstrated by a preponderance of the evidence that claim 2 of the '625 patent is unpatentable for lack of written description under § 112(a). We further find that Petitioner has shown by a preponderance of the evidence that Patent Owner's priority claim fails as to claim 2 and, therefore, the earliest effective filing date for claim 2 is January 7, 2016, the filing date of the '467 application that matured into the '625 patent.

5. *Analysis Regarding Claim 3*

Claim 3 depends from claim 1 and further recites “a state detection switch configured to detect a selected state based on a position of the selector switch.” Ex. 1001, 12:23–25. Petitioner contends the combination of a “selector switch” (as recited in claim 1) and a “state detection switch” (as recited in claim 3) lacks written description support in the Prior Applications and in the ’625 patent’s Specification. Pet. 26. In particular, Petitioner argues that a “state detector switch” is only disclosed in the second and third embodiments as “detection switch 608” and “detector 708,” respectively (*id.* at 26–27 (citing Ex. 1013 ¶¶ 35, 37; Ex. 1015 ¶¶ 35, 37; Ex. 1016, 8:17–21, 9:2–5; *see also* Ex. 1001, 8:35, 9:21–24)), but these embodiments do not use a “selector switch” (*id.* at 27 (citing Ex. 1013 ¶¶ 34–38; Ex. 1015 ¶¶ 34–38; Ex. 1016, 7:63–9:55; *see also* Ex. 1001, 8:13–10:9)). Petitioner also argues that a “selector switch” is used only by the first embodiment where there is no need for a “state detection switch,” as the state of rotary ring 103 is detected based on the state of selector switch 105 itself. *Id.* at 27 (citing Ex. 1013 ¶ 32; Ex. 1015 ¶ 32; Ex. 1016, 6:62–64; *see also* Ex. 1001, 7:10–12). Petitioner further argues that, “[s]imilar to the Axial Arrangement limitation, claim 3 fails to have written description support from the Prior Applications because there is no disclosure in the Prior Applications concerning the combinability of the two features—*i.e.*, the selector switch and the state detection switch.” *Id.*

For the same reasons, Petitioner contends that subject matter that combines the selector switch and the state detection switch in claim 3 lacks

written description support in the Prior Applications and the '625 patent's Specification. *Id.* at 36.

We agree with Petitioner's analysis and find that the cited evidence supports its arguments. Thus, we find Petitioner has demonstrated that the disclosure of each of the Prior Applications, and the '625 patent's Specification, does not reasonably convey to those skilled in the art that the inventor had possession of the subject matter of claim 3 as of the filing dates of these documents. *Ariad Pharm.*, 598 F.3d at 1351. For this reason, in addition to our reasoning regarding independent claim 1 in Section II.D.3 above, we find that Petitioner has demonstrated by a preponderance of the evidence that claim 3 of the '625 patent is unpatentable for lack of written description under § 112(a). We further find that Petitioner has shown by a preponderance of the evidence that Patent Owner's priority claim fails as to claim 3 and, therefore, the earliest effective filing date for claim 3 is January 7, 2016, the filing date of the '467 application that matured into the '625 patent.

E. Indefiniteness of Claims 1–6

Petitioner contends that claim 1 is indefinite under § 112(b) for two reasons. First, Petitioner argues the limitation “a mechanism separate from the rotation and the selector switch” does not have a reasonably certain meaning. Pet. 36–37 (citing *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2124 (2014); *In re Packard*, 751 F.3d 1307, 1311 (Fed. Cir. 2014)). Second, Petitioner argues claim 1 is a “hybrid” claim because it is directed to an apparatus—a digital camera—that includes method steps and, therefore, it is unclear “when and how infringement would occur.” *Id.* at

37–38 (citing *IPXL Holdings, L.L.C. v. Amazon.com, Inc.*, 430 F.3d 1377, 1384 (Fed. Cir. 2005)). According to Petitioner, claim 1 is not practiced by a camera structure alone, but requires at least four method steps, “namely **assigning** a function to the rotary switch, **rotating** the rotary switch, **outputting** values based on the rotation, and **controlling** a photographing function.” *Id.* at 38.

We are not persuaded by Petitioner’s arguments that claim 1 is indefinite. Regarding the limitation “a mechanism separate from the rotation and the selector switch,” for the reasons discussed in our claim construction analysis above, we conclude that the limitation has a reasonably certain meaning and is not ambiguous, vague, incoherent, opaque or otherwise unclear—namely, it is “a component that is not part of (1) the rotary switch, or the ball bearing between the rotary switch and camera chassis, and (2) the selector switch and its parts.” *See supra* Section II.C.2. Stated differently, the aforementioned limitation of claim 1 satisfies, and this claim is definite under, both the *Nautilus* and *Packard* standards.

Regarding the issue of whether claim 1 is indefinite for claiming two distinct subject-matter classes (i.e., a “hybrid” claim), we determine that the functional limitations in apparatus claim 1 are proper because they reflect how the digital camera is to be configured (i.e., the capabilities of the recited structure), rather than activities of a user. *See MasterMine Software, Inc. v. Microsoft Corp.*, 874 F.3d 1307, 1315–16 (Fed. Cir. 2017). In *MasterMine*, the Federal Circuit expressly distinguished *IPXL Holdings*, which concerned a system claim reciting, *inter alia*, “the user uses the input means,” in reversing the district court’s finding of indefiniteness of a system claim,

which recited, *inter alia*, “receives from the user a selection . . . , and generates a database query,” because “the claims merely use permissible functional language to describe the capabilities of the claimed system, [and, therefore] it is clear that infringement occurs when one makes, uses, offers to sell, or sells the claimed system.” *MasterMine*, 874 F.3d at 1316.

Here, claim 1 recites a digital camera, comprising “a rotary switch . . . wherein . . . a photographing function is assigned to the rotary switch, the rotation of the rotary switch is detected, a value is outputted based on a detected rotation of the rotary switch, and the photographing function is controlled based on the value.” Ex. 1001, 11:28–12:3. Although claim 1 includes active verbs—assigned, detected, outputted, and controlled—these verbs represent permissible functional language used to describe capabilities of the rotary switch. *See MasterMine*, 874 F.3d at 1315–16 (“[T]he claims at issue here merely claim that the system ‘possess[es] the recited structure [which is] capable of performing the recited functions.’” (citation omitted)).

Thus, even though claim 1 is an apparatus claim that includes functional language, it does not pose the problem of determining the metes and bounds of this claim. Accordingly, we conclude that Petitioner has not demonstrated, by a preponderance of the evidence, that claim 1, and claims 2–6, which depend from claim 1, are indefinite under § 112(b).

F. Obviousness of Claims 1–6 Over Tanaka and Tesch

Petitioner contends that claims 1–6 of the ’625 patent would have been obvious over the combination of Tanaka and Tesch. Pet. 38–51. For the reasons discussed below, we determine that Petitioner has shown, by a preponderance of the evidence, that all the limitations of claims 1–6 of the

'625 patent are taught or suggested by Tanaka and Tesch and, therefore, that claims 1–6 would have been obvious over the combination of Tanaka and Tesch.

1. *Prior Art*

a. *Tanaka*

Tanaka discloses a digital camera with a multi-function rotary switch. Ex. 1004 ¶¶ 19–20. The rotary switch can be configured to control different functions, including “shutter speed, ISO sensitivity, exposure value, aperture value, white balance, zoom position of the lens barrel 3, and focal point in manual focus mode.” *Id.* ¶ 19. Rotation of the rotary switch controls a function of the camera that has been assigned to the rotary switch. *Id.* ¶ 20.

Figure 4 of Tanaka is reproduced below.

Fig. 4.

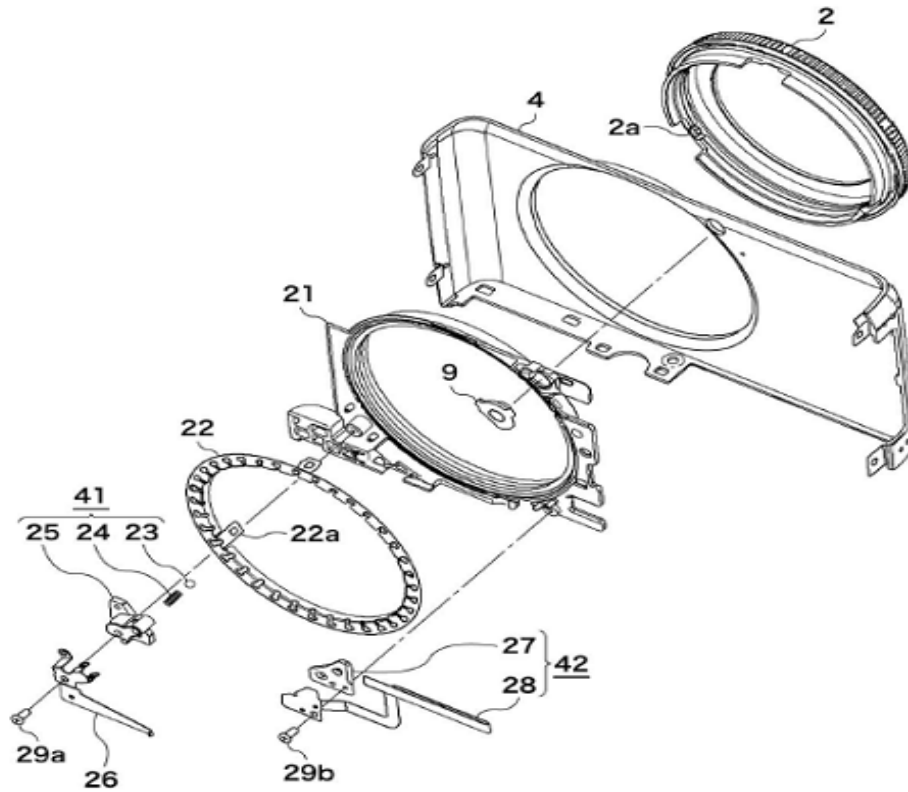
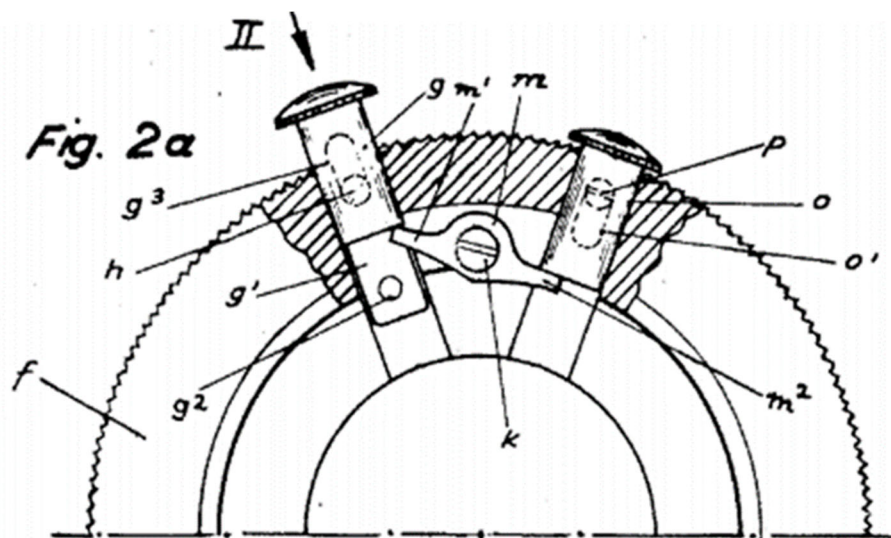
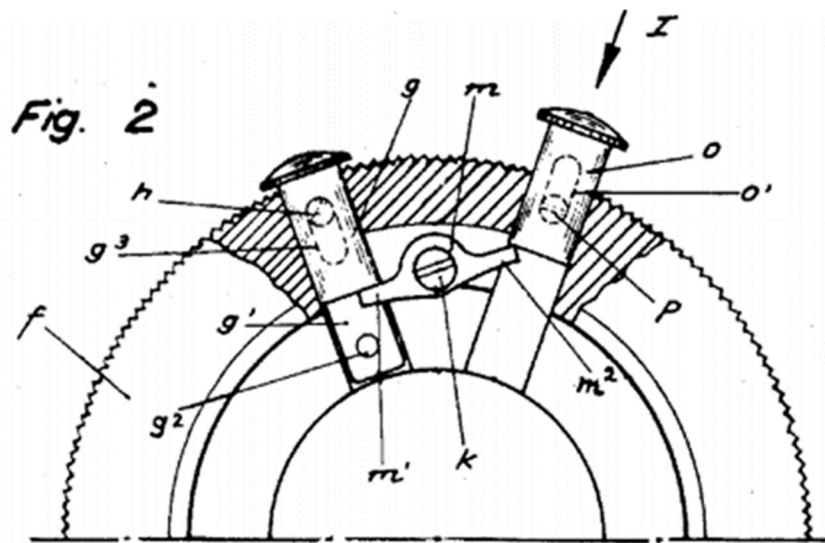


Figure 4 of Tanaka is an exploded perspective view of the front-surface cover unit of the digital camera. *Id.* ¶ 10. As shown in Figure 4 of Tanaka, Tanaka's rotary switch includes operation ring 2 and annular member 22, which rotate together to generate a clicking feel. *Id.* at Fig. 4, ¶¶ 32–33. The surface of annular member 22 has a plurality of openings. *Id.* at Fig. 4, ¶ 35. Steel ball 23 is pressured toward the openings of annular member 22 by spring 24. *Id.* at Fig. 4, ¶ 34. When the rotary switch is rotated, a clicking feel is generated each time the ball engages with an opening of annular member 22. *Id.* ¶ 35.

b. Tesch

Tesch discloses a mechanical camera switch to change the rotation of control ring *f* from a clicking feel to a smooth or free movement based on the state of the switch. Ex. 1005, 2:32–61. In the conventional rotation mode, the rotary ring rotates, or is indexed from one position to another, as the ball check or detent inside the rotary ring is pressured by the spring such that it maintains engagement and disengagement with a plurality of recesses or notches. *Id.* at Fig. 1, 2:22–31.

Figures 2 and 2a of Tesch are reproduced below.



Figures 2 and 2a of Tesch are front-elevation views of a setting ring showing two gliders, *g* and *o*, operatively connected by a lever *m*, that are used to switch rotation of control ring *f* from the detent click mode to a smooth mode. *Id.* at 2:5–9, 58–63. As explained in Tesch, when slider *g* is depressed into the inward position, as shown in Figure 2, slider *g* separates the detent from the notches, so the ring moves smoothly. *Id.* at 2:32–38. When slider *o* is pressed inwardly as shown in Figure 2a, lever *m* pushes

slider g upwards, thereby enabling the detent to engage with the notches on the ring and produce a clicking feel when the ring is rotated. *Id.* at 2:46–59.

2. *Applicable Law*

A claim is unpatentable under § 103 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. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) when in evidence,¹⁵ objective evidence of non-obviousness, i.e., secondary considerations. *See Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

A patent claim “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. An obviousness determination requires finding “both ‘that a skilled artisan would have been motivated to combine the teachings of the prior art references to achieve the claimed invention, and that the skilled artisan would have had a reasonable expectation of success in doing so.’” *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1367–68 (Fed. Cir. 2016) (citation omitted); *see KSR*, 550 U.S. at 418 (for an obviousness analysis, “it can be important to identify a reason that would

¹⁵ There is no evidence of objective indicia of non-obviousness in this proceeding. *See generally* Pet.

have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does”). A reason to combine or modify the prior art may be found explicitly or implicitly in market forces, design incentives, the “interrelated teachings of multiple patents,” “any need or problem known in the field of endeavor at the time of invention and addressed by the patent,” and “the background knowledge, creativity, and common sense of the person of ordinary skill.” *Perfect Web Techs., Inc. v. InfoUSA, Inc.*, 587 F.3d 1324, 1329 (Fed. Cir. 2009) (quoting *KSR*, 550 U.S. at 418–21). Further, an assertion of obviousness “cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *KSR*, 550 U.S. at 418 (quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)); *In re NuVasive, Inc.*, 842 F.3d 1376, 1383 (Fed. Cir. 2016) (a finding of a motivation to combine “must be supported by a ‘reasoned explanation’” (citation omitted)).

We analyze the challenges presented in the Petition under § 103 in accordance with the above-stated principles.

3. *Analysis of Claims*

a. *Independent Claim 1*

First, Petitioner contends, and we agree, that Tanaka teaches a “digital camera,” as recited in the preamble (a). Pet. 39 (citing Ex. 1004 ¶¶ 1, 10, Fig 1; Ex. 1002 ¶ 113). Second, Petitioner contends that Tanaka teaches a “rotary switch,” as recited in limitation (b), comprising operation ring 2 that is fitted around a lens barrel and is rotationally operable, annular member 22 that is integrated with the operation ring and rotates therewith, and detecting

means 42 for detecting the rotation direction and amount. *Id.* (citing Ex. 1004 ¶ 8, Fig. 4; Ex. 1002 ¶ 114). Petitioner also contends that Tanaka discloses a rotary switch having a plurality of depressed/trough portions, namely, “annular member 22 which rotates integrally with the operation ring 2, [having] a plurality of openings 22b.” *Id.* at 40 (citing Ex. 1004 ¶ 32, Fig. 4; Ex. 1002 ¶ 115). Petitioner further contends that openings 22b are circularly arranged around the same axis as the axis of rotation of the rotary switch. *Id.* (citing Ex. 1004, Figs. 4, 8; Ex. 1002 ¶ 115). We agree with Petitioner’s showing, as summarized above, and we find that Tanaka teaches limitation (b).

Third, Petitioner contends that Tanaka teaches “a photographing function is assigned to the rotary switch, the rotation of the rotary switch is detected, a value is outputted based on a detected rotation of the rotary switch, and the photographing function is controlled based on the value,” as recited in limitation (c). *Id.* at 40–41. In particular, Petitioner argues Tanaka’s photographing function, e.g., “shutter speed, ISO sensitivity, exposure value, aperture value, white balance, zoom position of the lens barrel 3, and focal point in manual focus mode,” is assigned to Tanaka’s rotary switch. *Id.* at 40 (citing Ex. 1004 ¶ 19; *see also id.* ¶¶ 15–18; Ex. 1002 ¶ 116). Petitioner also contends that Tanaka discloses “the rotation of the rotary switch is detected” (*id.* at 41 (citing Ex. 1004 ¶ 8 (“detecting means [42]”); Ex. 1002 ¶ 117)) and the set value of the shutter speed is outputted and controls the actual shutter speed (*id.* at 41 (citing Ex. 1004 ¶ 16; Ex. 1002 ¶ 118)). We agree with Petitioner’s showing, as summarized above, and we find that Tanaka teaches limitation (c).

Fourth, Petitioner contends that Tanaka discloses a “restricting member,” as recited in limitation (d). *Id.* at 41–42. Specifically, Petitioner contends Tanaka discloses a restricting member comprising steel ball 23 and spring 24, which presses against and selectively engages the narrow section 22x and opening 22b (i.e., depressed trough portions) of annular member 22 during rotation of operation ring 2 and annular member 22. *Id.* at 41 (citing Ex. 1004 ¶ 35, Fig. 5; Ex. 1002 ¶ 119). Petitioner also contends that Tanaka’s restricting member creates a clicking feel when the rotary switch is rotated. *Id.* at 42 (citing Ex. 1004 ¶ 35, Ex. 1002 ¶ 119). For these reasons, we agree with Petitioner, and we find that Tanaka teaches limitation (d).

Fifth, Petitioner contends that the combination of Tanaka and Tesch teaches a “selector switch,” as recited in limitation (e). *Id.* at 42–46. According to Petitioner, Tesch discloses “a selector switch comprising two radially movable sliders *g* and *o* that work together in combination with lever *m* to allow engagement and disengagement of a restricting member (comprising spring-urged detent *i* and *j*) with corresponding troughs/depressions (recesses *c*’) on a rotary switch.” *Id.* at 42 (citing Ex. 1005, 1:36–40, 1:52–56, 2:32–59, Figs. 2, 2a; Ex. 1002 ¶ 120). Petitioner also contends that, when slider *g* is pressed, the inner part of slider *g*, lug *g*’, blocks ball *i* from engaging with recesses *c*’, causing a non-restricted state with a smooth feel. *Id.* at 43 (citing Ex. 1005, Fig. 1, 2:22–42; Ex. 1002 ¶ 121). Petitioner further contends that lug *g*’ is configured to adjust a force applied by the ball *i* against the recesses *c*’ and is, therefore, a coupling mechanism. *Id.* (citing Ex. 1002 ¶ 122). Petitioner argues that when the user wishes to revert to the restricted mode, “the user moves stem

o downwards, and the lever *m* pushes stem *g* upwards, thus ‘caus[ing] a withdrawal of lug *g*’ whereby ball check *i* re-engages the nearest notch *c*’ for normal indexing operation.” *Id.* at 44 (citing Ex. 1005, 2:55–59).

Petitioner also argues that adding a mechanical state changing switch, like one taught by Tesch, to Tanaka’s multi-function ring would have been obvious. *Id.* at 44 (citing Ex. 1002 ¶¶ 102–111). Petitioner further argues that a person of ordinary skill in the art would have been motivated to selectively remove the clicking feel from Tanaka’s ring and add Tesch’s mechanical selector switch for switching between a clicking and non-clicking feel for an operation ring to obtain the advantages of adopting the selectable click feel. *Id.* at 45–46 (citing Ex. 1002 ¶¶ 109–111). In addition, Petitioner argues that “[a]dding Tesch’s mechanical state changing switch to Tanaka’s multifunction operation ring would have been a simple, obvious and predictable way to provide this functionality.” *Id.* at 46 (citing Ex. 1002 ¶ 109). We agree with Petitioner’s showing, as summarized above, and we find that the combination of Tanaka and Tesch teaches a “selector switch,” as recited in limitation (e). We also determine that Petitioner has articulated a sufficient motivation for combining the teachings of these references.

Sixth, Petitioner contends that the combination of Tanaka and Tesch discloses the “wherein” clause, limitation (f). *Id.* at 47 (citing Ex. 1002 ¶ 124). Petitioner argues that because the “wherein” clause is a negative limitation that excludes structures where rotation of the rotary switch controls any mechanism other than the rotation and the selector switch, this “allows the rotary switch to control the rotation and the selector switch; but does not require it to control them.” *Id.*; *see also* Ex. 1002 ¶ 65. In that

regard, Petitioner contends a person of ordinary skill in the art “would have understood that Tanaka’s rotary switch is not designed to mechanically control any mechanism other than the rotation and the selector switch Moreover, there is no disclosure that Tanaka’s rotary switch mechanically controls anything.” *Id.* (citing Ex. 1002 ¶ 124). Petitioner also contends that Tanaka teaches the rotary switch is configured to rotate without exerting “mechanical control” because none of Tanaka’s parameters are controlled mechanically, but are controlled electrically. *Id.* (citing Ex. 1004 ¶¶ 19, 36–42; Ex. 1002 ¶ 124). Based on these arguments and evidence as set forth in the Petition, we agree that the combination of Tanaka and Tesch teaches the “wherein” clause of limitation (f). In particular, we agree with Petitioner’s argument that the “wherein” clause does not require the rotary switch to control the rotation and selector switch, but permits it to do so because it is a negative limitation that expressly excludes the rotary switch from exerting physical influence over certain components. *See Ex parte Grasselli*, 231 USPQ 393, 394 (BPAI 1983), *aff’d mem.*, 738 F.2d 453 (Fed. Cir. 1984) (“[T]he express exclusion of certain elements implies the permissible inclusion of all other elements not so expressly excluded.”).

Thus, based on the full record, we determine Petitioner has shown that the combination of Tanaka and Tesch teaches preamble 1(a) and limitations 1(b)–(f), and has articulated a sufficient motivation to combine the teachings of these references, with a reasonable expectation of success in doing so. Accordingly, we determine Petitioner has demonstrated, by a preponderance of the evidence, that claim 1 would have been obvious in view of the combination of Tanka and Tesch.

b. Dependent Claims 2–6

Claims 2–6 depend from independent claim 1. The Petition sets forth arguments and evidentiary support for each of claims 2–6. *See* Pet. 47–51. We have reviewed Petitioner’s arguments and determine Petitioner has shown, by a preponderance of the evidence, that the combination of Tanaka and Tesch teaches or suggests the additional limitations of claims 2–6.

For example, regarding claim 2, Petitioner contends Tanaka teaches restricting member (steel ball 23 and spring 24) is pressed into the openings 22b in a direction parallel to the optical axis of the camera. Pet. 48 (citing Ex. 1004, Figs. 4, 5; Ex. 1002 ¶ 125). Regarding claim 3, Petitioner contends the combination of Tanaka and Tesch discloses “a state detector switch configured to detect a selected state based on a position of the selector switch.” *Id.* at 48 (citing Ex. 1002 ¶¶ 126–127). In particular, Petitioner argues that “Tesch’s lever m , and its two arms m^1 and m^2 , are together a state detection switch.” *Id.* (citing Ex. 1005, Figs. 2, 2a, 2:48–51). Petitioner also argues that a person of ordinary skill in the art “would have readily employed Tesch’s state detection switch into Tanaka’s camera to arrive at this claim element.” *Id.* at 49 (citing Ex. 1002 ¶ 127).

Regarding claim 4, Petitioner contends Tanaka discloses that the “photographing function is an aperture or focus.” *Id.* at 49–50 (citing Ex. 1004 ¶ 19). Regarding claim 5, Petitioner contends Tanaka discloses coiled spring 24 (a mechanical structure) is configured to press the contact point of steel ball 23 against openings 22b. *Id.* at 50 (citing Ex. 1004 Figs. 4, 5; Ex. 1002 ¶ 129). Regarding claim 6, Petitioner contends “Tanaka discloses a lens-integrated type camera as evidenced by a lens barrel 3

disposed at the front surface of the camera.” *Id.* at 51 (citing Ex. 1004, Fig. 1; Ex. 1002 ¶ 130). For the reasons set forth in the Petition, we agree with Petitioner’s arguments and evidence with respect to dependent claims 2–6.

Thus, for the reasons set forth in the Petition, as summarized above, we determine Petitioner has demonstrated, by a preponderance of the evidence, that the combination of Tanaka and Tesch would have rendered claims 2–6 obvious.

G. Obviousness of Claims 1, 3, 4, and 6 Over Kawaji and Mikamo

Petitioner contends that claims 1, 3, 4, and 6 of the ’625 patent would have been obvious over the combination of Kawaji and Mikamo. Pet. 51–62. For the reasons discussed below, we conclude Petitioner has shown, by a preponderance of the evidence, that claims 1, 3, 4, and 6 would have been obvious over the combination of Kawaji and Mikamo.

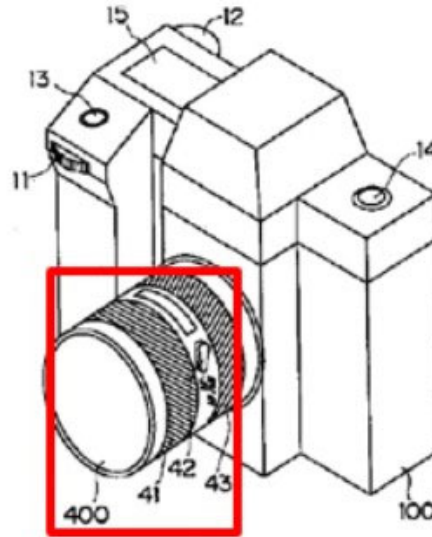
1. Prior Art

a. Kawaji

Kawaji discloses a digital camera that has a rotary switch called the “command/focus ring 41.” Ex. 1007 ¶¶ 1, 60. A color annotated version of Figure 5 of Kawaji is reproduced below.¹⁶

¹⁶ All annotations to the figures of Kawaji and Mikamo reproduced herein were made by Petitioner. *See, e.g.*, Pet. 31.

Fig. 5



This color annotated version of Figure 5 depicts an exterior perspective diagram showing Kawaji's second embodiment. Ex. 1007 ¶ 58. Kawaji's command/focus ring 41 is indicated in red. *See* Pet. 31 (citing Ex. 1007 ¶¶ 59–60; *see also* Ex. 1002 ¶ 96). Kawaji's command/focus ring switches between controlling commands and controlling manual focus. Ex. 1007 ¶ 62. When the command/focus ring controls commands, e.g., shutter speed and aperture, it produces a clicking feel when rotated. *Id.* ¶¶ 59–60, 48, 50. When the command/focus ring controls manual focus, it rotates smoothly with no clicking feel. *Id.* ¶¶ 60, 62. “[C]onversion switch 42” switches the command/focus ring between the control modes. *Id.* ¶¶ 59–60.

b. Mikamo

Mikamo discloses a video camera that has a rotary ring called a “focus ring 3.” Ex. 1008 ¶ 22. An annotated version of Figure 2 of Mikamo is reproduced below.

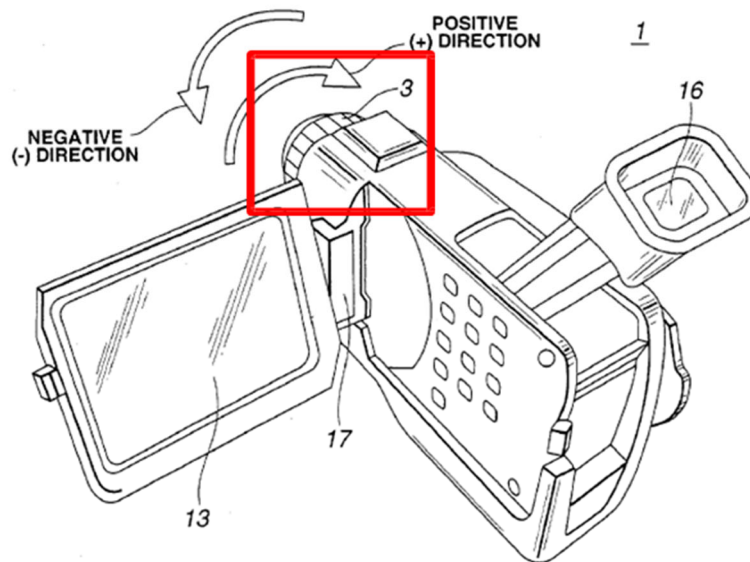


FIG.2

This annotated version of Figure 2 depicts a perspective view of a camera incorporated video tape recorder (“VTR”). Ex. 1008 ¶ 10. Mikamo’s rotary ring 3 (indicated in the red box) can switch between a “focus ring 3” and a “speed-changing ring.” *Id.* ¶ 37. In one mode (i.e., “image pick-up mode”), the rotary ring controls focus or zoom when the video camera is filming (i.e., it is in image pickup mode). *Id.* ¶¶ 36–37, 77. In another mode (i.e., “video-playback mode”), the rotary ring controls the speed of video playback (e.g., normal speed, slow motion, or fast forward). *Id.* In video-playback mode, a clicking feel is produced when the rotary ring is rotated to change playback speed. *Id.*

The click-less smooth rotation of the ring in image pick-up mode allows for continuous changes to control the focus or zoom functions. *Id.* ¶ 42. In video-playback mode, the ring controls discrete changes of the video playback speed, e.g., x2, x5 and x10. *Id.* ¶¶ 42, 51–53, Table 1, Fig. 8.

Rotation of the ring in the video-playback mode provides a clicking feel. *Id.*

¶ 42.

Figure 4 of Mikamo is reproduced below.

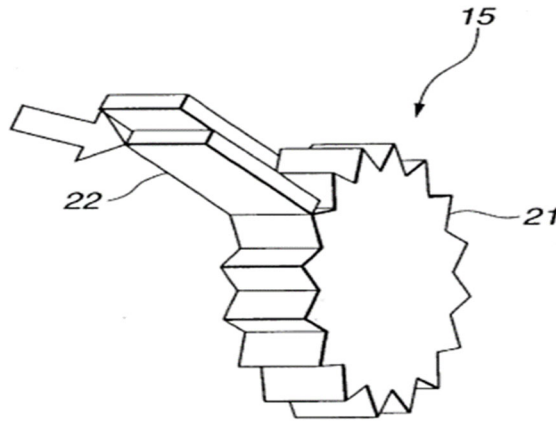


FIG.4

Figure 4 depicts an example of Mikamo's ring-load circuit 15. *Id.* ¶ 42. The clicking feel of the rotary ring is produced by ring gear 21 and tongue 22, as depicted above in Figure 4. *Id.* ¶ 42. Ring gear 21 is coupled directly to the rotary ring and rotates in the same direction as the rotary ring. *Id.*

2. *Analysis of Claims*

a. *Independent Claim 1*

First, Petitioner contends, and we agree, that Kawaji teaches a “digital camera,” as recited in the preamble (a). Pet. 52 (citing Ex. 1007 ¶ 1; Ex. 1002 ¶ 140).

Second, Petitioner contends that the combination Kawaji and Mikamo teaches a “rotary switch,” as recited in limitation (b). *Id.* (citing Ex. 1002 ¶¶ 131, 141). According to Petitioner, Kawaji discloses a rotary switch called “command/focus ring 41” that is configured to provide a clicking and non-clicking feel. *Id.* (citing Ex. 1007 ¶¶ 37, 60). Petitioner, however, contends that Kawaji does not disclose a specific mechanism embodying the switchable click-making structure. *Id.* (citing Ex. 1002 ¶ 133). Petitioner further contends that Kawaji provides specific guidance to one of ordinary skill in the art to use a click-making structure, such as Mikamo’s ring gear 21 and tongue 22 that enables rotation positions to be fixed at specified rotation angles. *Id.* at 52–53 (citing Ex. 1007 ¶ 60; Ex. 1002 ¶¶ 133–134). To support this argument, Petitioner directs us to Figures 4 and 8 of Mikamo and their corresponding descriptions. *Id.* at 53–54 (citing Ex. 1008 ¶¶ 42, 51, Figs. 4, 8; Ex. 1002 ¶¶ 134, 142–145). Petitioner then contends that, similar to Mikamo’s rotary switch, Kawaji’s command ring 927 is disposed in the front portion of the camera body illustrated in Figure 19, which further demonstrates combining the teachings of Mikamo with those of Kawaji, without affecting Kawaji’s existing operations. *Id.* at 54 (citing Ex. 1002 ¶ 138).

Turning to the rationale to combine, Petitioner contends that a person of ordinary skill in the art would have combined the teachings of Mikamo with those of Kawaji “to achieve embodying a click-making structure with a reasonable expectation of success . . . because, like Kawaji, Mikamo is directed to a multi-function rotary ring on an image-pickup device, arranged around the periphery of a lens barrel, [and] capable of switching between a

clicking and non-clicking, smooth feel mode.” *Id.* at 55 (citing Ex. 1002 ¶¶ 135, 136, 139). Petitioner then proceeds to identify certain similarities between Kawaji and Mikamo prior to asserting that “a [person of ordinary skill in the art] would have immediately recognized Mikamo’s switchable click-making structure would have readily worked in Kawaji, and the result of combining these mechanical structures would have been fully predictable.” *Id.* at 55–56 (citing Ex. 1008 ¶¶ 36, 27, 77; Ex. 1002 ¶¶ 47, 137). We agree with Petitioner’s showing, as summarized above, and we find that the combination of Kawaji and Mikamo teaches a “rotary switch,” as recited in limitation (b). We also determine that Petitioner has articulated a sufficient motivation for combining these references.

Third, Petitioner contends that Kawaji teaches “a photographing function is assigned to the rotary switch,” as recited in limitation (c). *Id.* at 56–57. In particular, Petitioner argues that, when in “autofocus (‘AF’)-only mode,” Kawaji’s command/focus ring 41 switches to command ring to control photographing functions such as shutter speed or aperture. *Id.* at 56 (citing Ex. 1007 ¶¶ 47–53, 59). Petitioner further argues that Kawaji’s command/focus ring 41 controls focus in the “AF/manual focus (‘MF’) mode.” *Id.* (citing Ex. 1007 ¶¶ 59–60; Ex. 1002 ¶ 146). Next, Petitioner contends that Kawaji teaches “the rotation of the rotary switch is detected, a value is outputted based on a detected rotation of the rotary switch,” as recited in limitation (c). *Id.* (citing Ex. 1002 ¶ 47). In particular, Petitioner argues Kawaji discloses that “[i]f the conversion switch 42 is set to AF-only mode, the command/focus ring 41 outputs information regarding how much (how many click stops were passed) and in what direction rotation occurred,

and this signal information is temporarily stored in [random access memory] 441 of an in-lens [central processing unit] 44.” *Id.* at 56–57 (quoting Ex. 1007 ¶ 61). In addition, Petitioner contends that Kawaji teaches “the photographing function is controlled based on value,” as recited in limitation (c). *Id.* at 57. According to Petitioner, Kawaji discloses that the camera uses data stored in random access memory 441 to operate photographing function assigned to command/focus ring 41. *Id.* (citing Ex. 1007 ¶¶ 59, 61; Ex. 1002 ¶ 148). For the reasons set forth in the Petition, as summarized above, we agree with Petitioner, and we find that Kawaji teaches “a photographing function is assigned to the rotary switch,” as recited in limitation (c).

Fourth, Petitioner contends that the combination of Kawaji and Mikamo teaches “a restricting member,” as recited in limitation (d). *Id.* at 57. In particular, Petitioner contend that Figure 4 of Mikamo illustrates tongue 22 acting as a restricting member because it engages with the surface notches (i.e., depressed portions or trough portions) of ring gear 21 to restrict rotation of the rotary switch to generate a clicking feel. *Id.* (citing Ex. 1008, Fig. 4; Ex. 1002 ¶ 149). Petitioner further contends that Mikamo discloses that when the rotary switch turns, the load applied to tongue 22 on ring gear 21 causes selective engagement of tongue 22 with the surface notches of ring gear 21 to generate a clicking feel. *Id.* (citing Ex. 1008 ¶ 42). We agree with Petitioner’s showing, as summarized above, and we find that the combination of Kawaji and Mikamo teaches “a restricting member,” as recited in limitation (d).

Fifth, Petitioner contends that the combination of Kawaji and Mikamo teaches “a selector switch,” as recited in limitation (e). *Id.* at 58–60. Accordingly to Petitioner, Kawaji’s conversion switch 42 illustrated in Figure 5 acts as a selector switch because it “toggles between (i) an AF-only mode in which ‘click stops [are] provided,’ *i.e.*, a clicking feel is provided; and (ii) an AF/MF mode in which the command/focus ring ‘rotates smoothly with no clicking feel.” *Id.* at 58 (quoting Ex. 1007 ¶ 60) (citing Ex. 1002 ¶ 150). Petitioner contends that Kawaji expressly discloses that the “means for click-making (not shown in the drawings), *operating in tandem* with the conversion switch 42, causes click stops to be provided.” *Id.* at 59 (quoting Ex. 1007 ¶ 60). Petitioner asserts that a person of ordinary skill in the art would have readily understood that Kawaji’s conversion switch 42 and its means for click-making are coupled by a certain mechanism because otherwise, they would not “operat[e] in tandem.” *Id.* (citing Ex. 1002 ¶ 151). Petitioner then turns to Mikamo to provide further details on the aforementioned coupling mechanism. *Id.* Petitioner contends that Mikamo generates an electrical signal each time the user toggles Mikamo’s power-supply switch from one state to another. *Id.* (citing Ex. 1008 ¶ 36). Petitioner also contends that, depending on the states, Mikamo’s tongue 22, which is under the control of microprocessor 9, adjusts its forces against ring gear 21. *Id.* at 59–60 (citing Ex. 1008 ¶¶ 37, 42; Ex. 1002 ¶ 152). Petitioner further argues that “[n]either claim 1 [of the ’625 patent] nor the [S]pecification excludes an electrically operated coupling mechanism, *e.g.*, an electrical connection.” *Id.* at 60. Petitioner asserts that a person of ordinary skill in the art would have readily understood that the electrical

circuitry of Mikamo's power-supply switch is the coupling mechanism that (1) electrically connects the power-supply switch to tongue 22 and (2) is configured to adjust a force applied by tongue 22. *Id.* at 60. For the reasons set forth in the Petition, as summarized above, we agree with Petitioner, and we find that the combination of Kawaji and Mikamo teaches "a selector switch," as recited in limitation (e).

Sixth, Petitioner contends that Kawaji teaches the "wherein" clause, as recited in limitation (f). *Id.* at 60. Petitioner argues that because the "wherein" clause is a negative limitation that excludes structures where rotation of the rotary switch controls any mechanism other than the rotation and the selector switch, this "allows the rotary switch to control the rotation and the selector switch; but does not require [it to control them]." *Id.* Petitioner further argues that Kawaji's rotary switch is designed to electrically control the photographing functions of the camera. *Id.* (citing Ex. 1002 ¶ 154). Petitioner argues that Kawaji discloses transmitting information regarding direction and rotation amount of the rotary switch as electrical signals, temporarily storing them in a random access memory, and allowing the central processing unit to use this information to control photographing functions. *Id.* (citing Ex. 1007 ¶¶ 37, 60). Petitioner then argues that, "[e]ven in AF/MF mode (the non-restricted state), Kawaji's rotary switch (focus ring 23)^[17] does not mechanically control any other

¹⁷ We do not interpret Petitioner's argument concerning limitation 1(f) to expressly or impliedly argue that the claimed "rotary switch" of limitation 1(b) is comprised of Kawaji's "focus ring 23," rather than Kawaji's "command/focus ring 41." Kawaji discloses that the camera of the first

functions because it is connected to the CPU [central processing unit] 24, and is not mechanically connected to the optical system 26 which includes the lens.” *Id.* at 61 (citing Ex. 1007 ¶ 62, Fig. 2; Ex. 1002 ¶ 155). Petitioner further contends that a person of ordinary skill in the art “would have understood that Kawaji’s rotary switch is not designed to mechanically control any mechanism other than the rotation and the selector switch.” *Id.* (citing Ex. 1002 ¶ 155). For the reasons stated in the Petition, as summarized above, we find that Kawaji teaches the “wherein” clause, as recited in limitation (f).

Thus, for these reasons, we determine Petitioner has shown that the combination of Kawaji and Mikamo teaches preamble 1(a) and limitations 1(b)–(f), and has articulated a sufficient motivation to combine the teachings of these references, with a reasonable expectation of success in doing so. Accordingly, we determine Petitioner has demonstrated, by a preponderance of the evidence, that claim 1 would have been obvious in view of the combination of Kawaji and Mikamo.

embodiment comprises command ring 21, zoom ring 22, and focus ring 23 (*see* Ex. 1007 ¶¶ 28, 36–39), whereas the camera of the second embodiment comprises command/focus ring 41, conversion switch 42, and zoom ring 43 (*see id.* at 58–62). Thus, we understand Petitioner’s reference to “focus ring 23” to be in the context of its argument concerning limitation 1(f) that “command/focus ring 41” (in the second embodiment) is not designed to mechanically control any mechanism other than the rotation and selector switch because command/focus ring 41 “can switch between a role equivalent to that of the command ring 21, 31 in the first embodiment and a role equivalent to the focus ring 23.” *See* Pet. 61; Ex. 1002 ¶ 155 (including annotated excerpt of Figure 2 of Kawaji).

b. Dependent Claims 3, 4, and 6

Claims 3, 4, and 6 depend from independent claim 1. The Petition sets forth arguments and evidentiary support for each of claims 3, 4, and 6. *See* Pet. 61–62. We have reviewed Petitioner’s arguments and determine Petitioner has shown, by a preponderance of the evidence, that the combination of Kawaji and Mikamo teaches or suggests the additional limitations of claims 3, 4, and 6.

For example, Petitioner contends that the combination Kawaji and Mikamo teaches “a state detection switch configured to detect a selected state based on a position of the selector switch,” as recited in claim 3. Pet. 61 (citing Ex. 1001, 12:24–26). In particular, Petitioner argues that the ’625 patent does not separately define “a state detection switch” and that “Mikamo’s microprocessor 9 qualifies as a state detection switch” because it is configured to detect a selected state based on a position of the selector switch, such as determining whether to make focus ring 3 perform the speed-changing ring function. *Id.* at 61–62 (citing Ex. 1008 ¶¶ 36, 47 (“[T]he microprocessor 9 makes the focus ring 3 function as the speed-changing ring if the focus ring 3 is rotated after the power-supply switch has selected the video playback mode”); Ex. 1002 ¶¶ 156–157). For the reasons stated in the Petition, as summarized above, we agree with Petitioner, and we find that the combination of Kawaji and Mikamo teaches the additional limitation of claim 3.

Petitioner contends that Kawaji teaches “wherein the photographing function is an aperture or a focus,” as recited in claim 4. *Id.* at 62 (citing Ex. 1001, 12:27–28). Specifically, Petitioner argues that in “the AF-only

mode,” Kawaji’s command/focus ring controls “command functions such as aperture” (*id.* (citing Ex. 1007 ¶¶ 59, 47–53; Ex. 1002 ¶ 158)) and that in “the AF/MF mode,” the rotary switch controls “focus” (*id.* (citing Ex. 1007 ¶¶ 59–60; Ex. 1002 ¶ 158)). For these reasons set forth in the Petition, we agree with Petitioner, and we find that Kawaji teaches the additional limitation of claim 4.

Petitioner contends, and we agree, that Kawaji teaches “wherein the digital camera is a lens-integrated type camera,” as recited in claim 6, because Kawaji explicitly teaches that a lens-integrated type camera can be used. *Id.* (citing Ex. 1007 ¶ 94).

Thus, for the reasons set forth in the Petition, as summarized above, we determine Petitioner has demonstrated, by a preponderance of the evidence, that the combination of Kawaji and Mikamo would have rendered claims 3, 4, and 6 obvious.

H. Obviousness of Claims 2 and 5 Over Kawaji, Mikamo, and Ishigaki

Petitioner contends that claims 2 and 5 would have been obvious over the combination of Kawaji, Mikamo, and Ishigaki. Pet. 62–67. For the reasons discussed below, we conclude Petitioner has shown, by a preponderance of the evidence, that claims 2 and 5 would have been obvious over the combination of Kawaji, Mikamo, and Ishigaki.

As previously discussed (*see supra* Section II.D.4), claim 2 depends from claim 1 and further recites “wherein the axial direction is parallel to an optical axis of the digital camera at a direction extending internally from a rear side of the digital camera and the restricting member is inserted into the depressed/trough portions along the axial direction.” Petitioner contends

that, although Kawaji and Mikamo do not disclose a restricting member being inserted in the axial direction parallel to the optical axis as claimed, this configuration was “well known and obvious” and shown, for example, in Ishigaki. *Id.* at 63 (citing Ex. 1009 ¶ 81–83, Fig. 3; Ex. 1002 ¶ 160). Figure 3 of Ishigaki is reproduced below.

FIG. 3

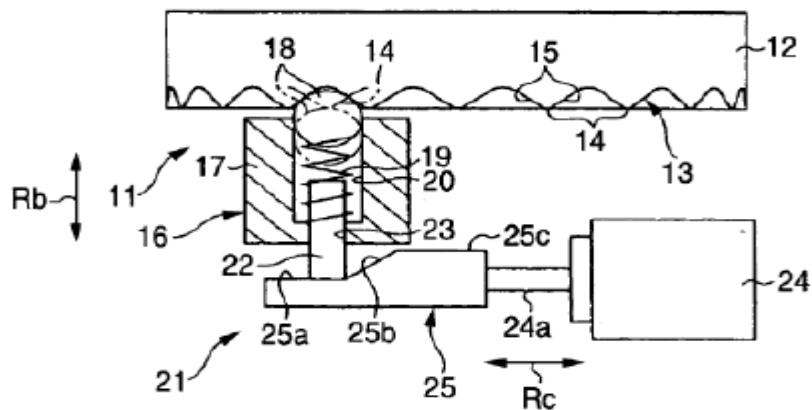


Figure 3 is a “partially-cutaway side view showing an operation restriction mechanism” of a control switch “achieved when operation of a dial knob is enabled.” Ex. 1009 ¶ 54. Ishigaki’s rotary switch, which is called “control switch 7,” generates a clicking feel when rotated. *Id.* ¶¶ 80–81. The rotary switch has a grip portion or dial knob connected via a shaft to disc-shaped member 12, whose bottom surface has a concave/convex pattern 13 (i.e., troughs), as depicted in Figure 3. *Id.* As also shown in Figure 3, spring 19 biases detent piece 18, to press against concave/convex pattern 13 in a direction parallel to the axis of the rotation of the rotary switch. *Id.* ¶ 82–83, Fig. 3. Petitioner contends that when combined with Kawaji and Mikamo, “this direction is the same as or parallel to the optical axis of

Kawaji's camera at a direction extending internally from a rear side of the camera." Pet. 63 (citing Ex. 1002 ¶ 160).

Petitioner also contends that a person of ordinary skill in the art would have been motivated to combine the teachings of Ishigaki with those of Kawaji and Mikamo to enable this "parallel" configuration because it was in common use, and the decision to use this configuration would have been "a matter of an obvious design choice." *Id.* at 64–66 (citing Ex. 1002 ¶¶ 160–162); *see also KSR*, 550 U.S. at 421 ("When there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a [person of ordinary skill in the art] has good reason to pursue the known options within his or her technical grasp."). For the reasons set forth in the Petition, as summarized above, we agree with Petitioner regarding the additional limitation of claim 2.

Claim 5 recites "wherein the mechanical structure comprises a coiled spring configured to press a contact point against the depressed/trough portions." Ex. 1001, 12:29–31. Petitioner argues that Ishigaki teaches the limitation of claim 5 because it discloses "coiled spring 19 configured to press a contact point of the detent piece 18 against the depressed portions 13." Pet. 66 (citing Ex. 1009 ¶ 82, Fig. 3). Petitioner also argues that Mikamo discloses a click-making means by using a tongue and gear structure and that a person of ordinary skill would have been motivated to look for structural elements for applying a mechanical load, as taught by Ishigaki. *Id.* at 67 (citing Ex. 1002 ¶ 165). Petitioner further argues that "[g]iven the simple mechanical nature of a coiled spring and a detent piece," a person of ordinary skill in the art would have been able to readily and

predictably use them in Kawaji and Mikamo. *Id.* (citing Ex. 1002 ¶ 166). Based on Petitioner's arguments and evidence in the Petition, as summarized above, we agree with Petitioner regarding the additional limitation of claim 5.

For these reasons, we determine Petitioner has shown that the combination of Kawaji, Mikamo, and Ishigaki teaches all limitations of claims 2 and 5, and has articulated a sufficient motivation to combine the teachings of these references, with a reasonable expectation of success in doing so. Accordingly, we determine Petitioner has demonstrated, by a preponderance of the evidence, that claims 2 and 5 would have been obvious in view of the combination of Kawaji, Mikamo, and Ishigaki.

I. Obviousness of Claims 1 and 3–6 Over Kawaji and Kimura

Petitioner contends that claims 1 and 3–6 of the '625 patent would have been obvious over the combination of Kawaji and Kimura. Pet. 67–75. For the reasons discussed below, we conclude Petitioner has shown, by a preponderance of the evidence, that claims 1 and 3–6 would have been obvious over the combination of Kawaji and Kimura.

1. *Claim 1*

With respect to the preamble (a) and limitations (c) and (e) of claim 1, Petitioner contends, and we agree, that Kawaji discloses the preamble and these limitations for the same reasons explained in regard to the combination of Kawaji and Mikamo. *See id.* at 67, 70, 73; *see supra* Section II.G.2.a.

Regarding limitation (b), Petitioner argues that the combination of Kawaji and Kimura discloses this limitation because “Kawaji discloses that the command/focus ring can be configured to provide a clicking and a non-clicking feel” (*id.* at 68 (citing Ex. 1007 ¶ 60)) and Kimura discloses a “rotary operating mechanism” where its click-making means applies a mechanical load on the rotary plate, whereby the user can feel a “click” (*id.* at 68–69 (citing Ex. 1011, 2, Figs. 1–2; Ex. 1002 ¶ 170)). Figures 1 and 2 of Kimura are reproduced below.

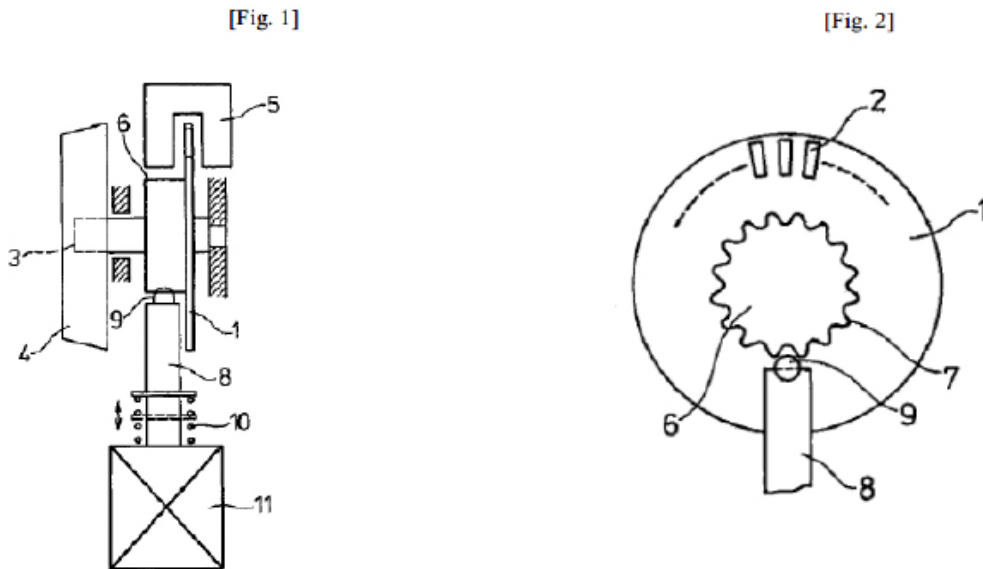


Figure 1 of Kimura depicts a switchable rotary operation mechanism that selectively provides an intermittent-type rotary operation (i.e., “clicking mode”) or a continuous-type rotary operation (i.e., “non-clicking mode”).

Ex. 1011, 1–2. Figure 2 of Kimura is a partial front view of the essential parts of Figure 1, as viewed from the left side of Figure 1 above. *Id.* at 2. Kimura’s rotary switch includes dial knob 4 connected to rotating plate 6, which has a plurality of grooves 7 on its surface. *Id.*; *see also* Figs. 1, 2. In the clicking mode, Kimura’s plunger 8, spherical protrusion 9, and spring 10 press against surface grooves 7, and generate a clicking feel; whereas in the smooth mode, they are released from the grooves. *Id.*

Petitioner argues that both Kawaji and Kimura “provide express teaching, suggestion, and motivation to combine Kimura’s switchable click-making structure to Kawaji’s camera” (Pet. 69 (citing Ex. 1002 ¶¶ 171–73)), and that a person of ordinary skill in the art “would have had ample reason to believe that the combined teachings of Kawaji and Kimura would provide the intended effect: embodying a switchable click-making structure” (*id.* at 69–70 (citing Ex. 1002 ¶ 173)). Petitioner further argues that, “[g]iven the similarities of their subject matter and teachings, a [person of ordinary skill in the art] would have immediately recognized Kimura’s switchable click-making structure would have readily worked in Kawaji, and the result of combining these mechanical structures would have been fully predictable.” *Id.* at 70 (citing Ex. 1002 ¶ 173). Thus, according to Petitioner, a person of ordinary skill in the art “would have been motivated to integrate Kimura’s switchable click-making structure into Kawaji to provide the means for click-making as indicated in Kawaji.” *Id.* We agree with Petitioner’s showing, as summarized above, and we find that Petitioner has demonstrated that the combination of Kawaji and Kimura teaches limitation (b). We also

determine that Petitioner has articulated a sufficient motivation for combining the teachings of these references.

Regarding limitation (d), Petitioner argues that the combination of Kawaji and Kimura teaches this limitation, “a restricting member comprising a mechanical structure configured to press . . . and selectively engages with the depressed/trough portions during rotation of the rotary switch for generating a clicking feel.” *Id.* at 71. As discussed above, Petitioner argues that “Kimura’s restricting member, namely plunger 8, spherical protrusion 9, and spring 10,” has a mechanical structure and generates a clicking feel in the intermittent rotary operation mode, because when knob 4 undergoes rotary operation, “plunger 8 presses onto . . . curved groove 7 of . . . rotating plate 6 in accordance with the urging force of . . . spring 10,” thus pressing protrusion 9 against grooves 7 to selectively engage thereon. *Id.* (citing Ex. 1011, 2; Ex. 1002 ¶ 178). We agree with Petitioner’s showing for the reasons summarized above, and we find that the combination of Kawaji and Kimura teaches limitation (d).

Regarding limitation (e), Petitioner argues that the combination of Kawaji and Kimura teaches this limitation, which recites “a selector switch comprising a coupling mechanism configured to adjust a force applied by the restricting member against the depressed/trough portions for switching between a restricted state with the clicking feel and a non-restricted state free of the clicking feel at a time of photographing.” *Id.* at 72–73. In particular, Petitioner argues that Kawaji discloses the selector switch for the same reasons explained in regard to the combination of Kawaji and Mikamo. *Id.* at 72; *see supra* Section II.G.2.a. Petitioner also argues that Kimura

provides more detail on the coupling mechanism. *Id.* In that regard, Petitioner argues that Kimura’s keyboard 12 is a “selector switch,” and that, when a signal from keyboard 12 is sent to interface 13 and to arithmetic controller 14 in the CPU, the controller “identifies the operating state selected by . . . keyboard 12, and sends another signal to driver 16 which in turn controls the magnetization of solenoid 11 for switching between the two states.” *Id.* (citing Ex. 1011, 2, Fig. 3; Ex. 1002 ¶ 180). Petitioner further argues that a person of ordinary skill would have understood that the electrical circuitry, including interface 13, arithmetic controller 14, driver 16, and solenoid 11, are part of “a coupling mechanism, *e.g.*, an electrical connection—which is consistent with its ordinary and customary meaning—that connects the keyboard 12 and the restricting member, and are configured to adjust a force applied by the plunger 8.” *Id.* (citing Ex. 1002 ¶ 181). Moreover, Petitioner argues that a person of ordinary skill in the art “would have recognized that this coupling mechanism could be used directly in Kawaji to implement a switchable click-making means.” *Id.* at 72–73 (citing *id.*). Based on the reasons set forth in the Petition, as summarized above, we agree with Petitioner’s showing regarding limitation (e).

Thus, for these reasons, we determine Petitioner has shown that the combination of Kawaji and Kimura teaches preamble (a) and limitations (b)–(f) of claim 1, and has articulated a sufficient motivation to combine the teachings of these references, with a reasonable expectation of success in doing so. Accordingly, we determine Petitioner has demonstrated, by a preponderance of the evidence, that claim 1 would have been obvious in view of the combination of Kawaji and Kimura.

2. *Claims 3–6*

Regarding claim 3, Petitioner argues that the combination of Kawaji and Kimura discloses “a state detection switch configured to detect a selected state based on a position of the selector switch,” as recited in claim 3. *Id.* at 73–74. Specifically, Petitioner argues that Kimura’s keyboard 12 is a “selector switch” and each state is selected by the “operating keys” of keyboard 12. *Id.* at 73 (citing Ex. 1011, 2; Ex. 1002 ¶ 184). Petitioner also argues that Kimura “explicitly discloses that ‘the arithmetic controller 14 **identifies** the operating state’” (*id.* at 74 (citing Ex. 1011, 2)), and, therefore, “Kimura’s arithmetic controller 14 qualifies as a state detection switch” (*id.* (citing Ex. 1002 ¶¶ 185–186)). For the reasons set forth in the Petition, as summarized above, we agree with Petitioner’s showing, and we find that the combination of Kawaji and Kimura teaches the additional limitation of claim 3.

Regarding claim 4, Petitioner argues, and we agree, that Kawaji discloses “wherein the photographing function is an aperture or a focus” for the same reasons explained in regard to the combination of Kawaji and Mikamo. *Id.* at 73; *see supra* Section II.G.2.b.

Regarding claim 5, Petitioner argues, and we agree, that Kimura teaches “wherein the mechanical structure comprises a coiled spring configured to press a contact point against the depressed/trough portions,” as recited in claim 5, because Kimura discloses spring 10, which is coiled and configured to press a contact point of protrusion 9 against grooves 7. *Id.* at 74–75 (citing Ex. 1011, 2, Fig. 1; Ex. 1002 ¶ 188).

Regarding claim 6, Petitioner argues, and we agree, that Kawaji discloses “wherein the digital camera is a lens-integrated type camera” for the reasons explained in regard to the combination of Kawaji and Mikamo. *Id.* at 75; *see supra* Section II.G.2.b.

Accordingly, we determine Petitioner has demonstrated, by a preponderance of the evidence, that claims 1 and 3–6 of the ’625 patent would have been obvious over the combination of Kawaji and Kimura.

J. Obviousness of Claim 2 Over Kawaji, Kimura, and Ishigaki

Petitioner contends that claim 2 of the ’625 patent would have been obvious over the combination of Kawaji, Kimura, and Ishigaki. Pet. 75–76. Claim 2 depends from claim 1 and further recites “wherein the axial direction is parallel to an optical axis of the digital camera at a direction extending internally from a rear side of the digital camera and the restricting member is inserted into the depressed/trough portions along the axial direction.” Ex. 1001, 12:18–22. Specifically, Petitioner argues that Ishigaki discloses the limitation of claim 2 for the same reasons explained in the ground based on obviousness over the combination of Kawaji, Mikamo, and Ishigaki. Pet. 75; *see supra* Section II.H. Petitioner also argues that, as previously discussed, the decision to use the “parallel” configuration was a routine design choice that would have been obvious to a person of ordinary skill in the art. *Id.* at 75–76 (citing Ex. 1002 ¶ 191).

Petitioner further argues that a person of ordinary skill in the art “would further have found it obvious to combine Kawaji, Kimura, and Ishigaki because, *inter alia*, all three references involve a rotary switch that selectively makes a clicking feel when rotated.” *Id.* at 76 (citing Ex. 1007

¶ 62; Ex. 1011, 2; Ex. 1009 ¶ 81; Ex. 1002 ¶ 191). Moreover, Petitioner argues that a person of ordinary skill in the art would have been motivated to use Ishigaki's parallel configuration "to enjoy the benefit of having different design options" and because Ishigaki's parallel configuration "could be readily adapted for use with Kimura's click-making means, and could successfully serve to restrict rotation to produce the click feel." *Id.* (citing Ex. 1002 ¶ 191). We agree with Petitioner's arguments and evidence set forth in the Petition with respect to claim 2, as summarized above.

Thus, we determine Petitioner has shown that the combination of Kawaji, Kimura, and Ishigaki teaches the additional limitation of claim 2, and has articulated a sufficient motivation to combine the teachings of these references, with a reasonable expectation of success in doing so. Accordingly, we determine Petitioner has demonstrated, by a preponderance of the evidence, that claim 2 would have been obvious in view of the combination of Kawaji, Kimura, and Ishigaki.

III. CONCLUSION¹⁸

For the foregoing reasons, we determine Petitioner has demonstrated, by a preponderance of the evidence, that claims 1–6 of the '625 patent are unpatentable. The results are summarized in the table below.

¹⁸ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner's attention to the April 2019 Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding. *See* 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application

IV. ORDER

Accordingly, it is

ORDERED that claims 1–6 of U.S. Patent 9,813,625 B2 have been shown to be unpatentable; and,

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

In summary:

Claims	35 U.S.C. §	Reference(s)/Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1–6	112(a)	Written Description	1–6	
1–6	112(b)	Indefiniteness		1–6
1–6	103	Tanaka, Tesch	1–6	
1, 3, 4, 6	103	Kawaji, Mikamo	1, 3, 4, 6	
2, 5	103	Kawaji, Mikamo, Ishigaki	2, 5	
1, 3–6	103	Kawaji, Kimura	1, 3–6	
2	103	Kawaji, Kimura, Ishigaki	2	
Overall Outcome			1–6	

or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. *See* 37 C.F.R. § 42.8(a)(3), (b)(2).

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