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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* WILLIAM G. SHERIDAN
and JASON HUSBAND

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Appeal 2018-008698
Application 14/684,501
Technology Center 3700

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Before JAMES P. CALVE, LISA M. GUIJT, and ALYSSA A. FINAMORE, *Administrative Patent Judges*.

CALVE, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant[1] appeals from the decision of the Examiner to reject claims 1–21.[2] We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

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[1] "Appellant" refers to "applicant" as defined in 37 C.F.R. § 1.42. Appellant identifies the real party in interest as United Technologies Corporation. *See* Appeal Br. 2.

[2] *See* Office Commc'n, mailed Sept. 5, 2018 (advising that the examined claims were filed on Jan. 19, 2017, and the Amendment, filed May 21, 2018, to cancel claim 21, was denied entry); Adv. Act., mailed Aug. 18, 2017 (denying entry of Amendment, filed Aug. 4, 2017, which cancelled claim 20 and amended claim 17).

## CLAIMED SUBJECT MATTER

Claims 1, 9, and 15 are independent. Claim 1 is reproduced below.

1. A gas turbine engine comprising:

a fan drive shaft having a radially extending surface and being connected to a fan;

a geared architecture providing a gear reduction between the fan drive shaft and a separate downstream turbine shaft, the geared architecture comprising an input gear and an output gear, the radially extending surface being situated between the output gear and the fan; and

a speed sensor located adjacent to and in an overlapping radial relationship with the radially extending surface.

## REJECTIONS

Claims 17, 20, and 21 are rejected under 35 U.S.C. § 112(b) as being indefinite.

Claims 1–3, 5, 20, and 21 are rejected under 35 U.S.C. § 103 as being unpatentable over Sheridan (US 7,704,178 B2, iss. Apr. 27, 2010), McCune (US 2013/0219913 A1, pub. Aug. 29, 2013), and Lillis (US 2012/0107094 A1, pub. May 3, 2012).

Claim 8 is rejected under 35 U.S.C. § 103 as being unpatentable over Sheridan, McCune, Lillis, and Reinhardt (US 8,511,987 B2, iss. Aug. 20, 2013).

Claims 4, 6, 7, 9–13, and 15–19 are rejected under 35 U.S.C. § 103 as being unpatentable over Sheridan, McCune, Lillis, and Cosby (US 2014/0070794 A1, pub. Mar. 13, 2014) as evidenced by Reinhardt and Cigal (US 2013/0199206 A1, pub. Aug. 8, 2013).

Claim 14 is rejected under 35 U.S.C. § 103 as being unpatentable over Sheridan, McCune, Lillis, Cosby, and Reinhardt, as evidenced by Cigal.

## ANALYSIS

### *Claims 17, 20, and 21 as Being Indefinite*

Claim 17

The Examiner determines the limitation "the speed sensor is located adjacent a radially extending *portion* of the fan drive shaft" renders claim 17 indefinite because claim 17 depends from claim 15, which requires a speed sensor to be positioned "in an overlapping radial relationship with a radially extending *surface*," and the relationship between the "portion" and "surface" is unclear. Final Act. 2 (emphasis added). The Examiner determines that a skilled artisan would not be able to determine whether "radially extending portion" in claim 17 is the same or a different element than the "radially extending surface" in claim 15, and this lack of clarity renders claim 17 indefinite. Ans. 2–3.

Appellant argues that claim 17 is not indefinite because the "radially extending portion" and the "radially extending surface" can be the same or different. The sensor can be in a radially overlapping relationship with a radially extending portion 66A and/or it also can be adjacent to a radially extending surface 98 of the fan drive shaft. Appeal Br. 4. Appellant also argues that "claim 17 is not indefinite because a worker of ordinary skill in the art would understand that the 'radially extending portion' of claim 17 refers to the 'radially extending surface' of claim 15." Reply Br. 2.

The Patent Laws set forth the standard for indefiniteness as follows:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor . . . regards as the invention.

35 U.S.C. § 112(b).

For claims in an application, "[a] claim is indefinite when it contains words or phrases whose meaning is unclear." *In re Packard*, 751 F.3d 1307, 1310, 1314 (Fed. Cir. 2014); *see Ex parte McAward*, No. 2015-006416, slip op. at 11 (PTAB Aug. 25, 2017) (precedential) (same). Furthermore,

> when the USPTO has initially issued a well-grounded rejection that identifies ways in which language in a claim is ambiguous, vague, incoherent, opaque, or otherwise unclear in describing and defining the claimed invention, and thereafter the applicant fails to provide a satisfactory response, the USPTO can properly reject the claim as failing to meet the statutory requirements of § 112(b).

*Packard*, 751 F.3d at 1311.

"[A] patent does not satisfy the definiteness requirement of § 112 merely because 'a court can ascribe *some* meaning to a patent's claims.'" *Interval Licensing LLC v. AOL, Inc.*, 766 F.3d 1364, 1371 (Fed. Cir. 2014) (quoting *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 911 (2014)). Rather, "[t]he claims, when read in light of the specification and the prosecution history, must provide objective boundaries for those of skill in the art." *Id.* (citing *Nautilus*, 572 U.S. at 911 & n.8 (determining an indefiniteness problem exists "if the claim language might mean several different things and no informed and confident choice is available among the contending definitions" (internal quotations and citation omitted))).

Here, the Specification discloses fan drive shaft 66 having radially extending portion 66A with radially extending surface 67. Spec. ¶ 40, Fig. 2. Speed sensor 90 is located adjacent to radially extending portion 66A *and* to radially extending surface 67. *Id.* at Fig. 2. Speed sensor 90A has a distal end located adjacent to radially extending flange 96 of fan drive shaft 66 *and* to its radially extending surface 98. *Id.* ¶ 42, Fig. 2.

Thus, radially extending *portion 66A* has radially extending *surface 67*, and radially extending *flange 96* has radially extending *surface 98* with sensor 90 or 90A adjacent to each of these elements. *Id.* ¶¶ 40, 42, Fig. 2.

Appellant's arguments that "radially extending portion" and "radially extending surface" can be the same or different (Appeal Br. 4) and that a skilled artisan would understand the "radially extending portion" of claim 17 refers to the "radially extending surface" of claim 15 (Reply Br. 2) highlight that the meaning of "radially extending portion" in claim 17 is unclear. The Specification describes surface 67 as part of portion 66 and surface 98 as part of flange 96. Spec. ¶¶ 40, 42. Appellant offered to amend claim 17 to recite "the radially extending surface" to address this issue and clarify the scope of claim 17 (*see* Reply Br. 1), but the amendment was not entered (Adv. Act., mailed Aug. 18, 2017) (denying entry of amendment)).

Thus, we sustain the rejection of claim 17 as being indefinite.

Claim 20

Claim 20 depends from claim 1 and recites "wherein the speed sensor and the radially extending surface are radially aligned." Appeal Br. 11 (Claims App.). The Examiner determines "radially aligned" is indefinite because the Specification does not provide a standard to ascertain the degree or scope of the invention. Final Act. 2–3. Appellant argues that claim 20 was cancelled rendering the rejection moot. Appeal Br. 4.

Appellant filed an amendment to cancel claim 20. Amendment, filed Aug. 4, 2017, at 5, 6. The amendment was not entered. Adv. Act., mailed Aug. 18, 2017. Thus, claim 20 is pending. Appellant provides no other argument traversing the rejection of claim 20 for indefiniteness. Thus, we summarily sustain this rejection. *See* 37 C.F.R. § 41.37(c)(1)(iv).

Claim 21

The Examiner determines the scope of "major portion" in claim 21 is unclear because it is not used in the Specification. Final Act. 2–3; Ans. 3. In the Reply Brief, Appellant requests cancellation of claim 21 and asserts the rejection is no longer contested. Reply Br. 2. The proposed amendment cancelling claim 21 was not entered. *See* Office Commc'n, mailed Sept. 5, 2018 (advising the Amendment, filed May 21, 2018, to cancel claim 21, was denied entry). Thus, we summarily sustain the rejection of claim 21 as being indefinite. *See* 37 C.F.R. § 41.37(c)(1)(iv).

*Claims 1–3, 5, 20, and 21*
*Rejected over Sheridan, McCune, and Lillis*

Regarding claim 1, the Examiner finds that Sheridan teaches a gas turbine engine with fan drive shaft 20 connected to fan 18 and geared architecture 22 therebetween as claimed but is silent about a speed sensor. Final Act. 4. The Examiner relies on McCune to teach speed sensor 45 in similar gas turbine engine 20 with fan drive shaft 44 connected to fan 22 via geared architecture 42, where speed sensor 45 is adjacent to fan drive shaft 44 between the output gear and fan as claimed. *Id.* (citing McCune, Figs. 1, 2). The Examiner determines it would have been obvious to include this sensor at this location in Sheridan to preemptively shut down the engine during an over speed event as McCune teaches. *Id.* (citing McCune ¶ 45).

The Examiner finds that McCune teaches that speed sensor 45 can be placed adjacent any satisfactory location to include bumps or other features of drive shaft 44, but McCune is silent regarding the particular geometry of such features or their radially extending surfaces located adjacent to and in overlapping radial relationship to the sensor. *Id.* (citing McCune ¶¶ 39, 44).

The Examiner cites Lillis to teach gas turbine drive shaft 16 with radially extending feature 24 and surface 28 positioned adjacent to and in an overlapping relationship with speed sensor 20. *Id.* The Examiner reasons it would have been obvious to include this feature on Sheridan's fan drive shaft adjacent to and in an overlapping radial relationship with McCune's speed sensor to measure rotational speed and vibrations for wear. *Id.* at 4–5.

Appellant argues that it would not have been obvious to combine the three references as the Examiner proposes. Appeal Br. 5. Appellant argues that preemptively shutting down the engine during an overspeed event can be achieved with many different sensor locations such as the one depicted in Figures 1–2 of McCune, and the rejection provides no reason for using the claimed sensor location "between the outer gear and the fan." *Id.*

This argument is not persuasive because McCune positions sensor 45 adjacent to blades of fan rotor 22 and between outer gear 42 and fan 22 in Figures 1 and 2, as claimed. McCune ¶ 39. The Examiner correctly finds that McCune teaches the claimed location of a sensor "situated between the output gear and the fan." Final Act. 4 (McCune "illustrates that speed sensor 45 is situated at a position between the geared architecture and the fan in Figs. 1 & 2 (corresponding to a location between the output gear of the geared architecture and the fan in SHERIDAN)."); Ans. 4–5 ("Figs. 1-2 [of McCune] themselves suggest the claimed location."). Appellant does not apprise us of error in that finding. 37 C.F.R. § 41.37(c)(1)(iv); *In re Jung*, 637 F.3d 1356, 1365 (Fed. Cir. 2011) (approving of Board's practice to require an applicant to identify the alleged error in an examiner's rejection). Arguing that McCune's speed sensor is not adjacent to a radially extending surface (Reply Br. 2) is not persuasive as Lillis is relied on for this feature.

For similar reasons, Appellant's argument that Lillis does not situate its sensor 20 between an output gear of a geared architecture and a fan, or provide any reason to use Appellant's sensor location, is not persuasive (*see* Appeal Br. 5–6) because McCune is relied on to teach this claimed location and does as discussed above. *See* Final Act. 4; Ans. 4–5.

The Examiner correctly finds that McCune locates speed sensor 45 between output gear 42 and fan 22 at a position adjacent to "bumps or other features on the shaft 44 driving the fan hub." Ans. 5; McCune ¶ 39, Fig. 1. The Examiner recognizes that McCune does not illustrate the bumps or other features on fan drive shaft 44, so the Examiner looks to Lillis to teach such features extending radially on a drive shaft adjacent to a speed sensor. Final Act. 4; Ans. 4–5. The Examiner explains that Lillis "is relied upon to teach a specific configuration of the radially extending surface with respect to the sensor, corresponding to the 'bumps or other features,' i.e., rotational target features, described by McCune at ¶0039." Ans. 5.

The Examiner correctly finds that Lillis teaches a radially overlapping arrangement in Figure 2B as advantageous to measure rotational speed and axial motion and longitudinal vibration with increased sensitivity. Final Act. 4–5. The Examiner reasons that this sensor location and orientation would improve the sensor of McCune similarly in Sheridan "to provide a sensor with increased sensitivity which measures rotational speed and vibrational characteristics indicative of wear." *Id.* at 5. The Examiner also reasons that the modification would improve the ability of the combination of Sheridan and McCune to measure motions and vibrations with a single sensor and to measure wear that indicates failures and deteriorations, as McCune desires to do, to improve maintenance and performance in Sheridan's engine. Ans. 6.

"[I]f a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 417 (2007). Furthermore, the Federal Circuit in *DyStar* advised:

> we have repeatedly held that an implicit motivation to combine exists not only when a suggestion may be gleaned from the prior art as a whole, but when the "improvement" is technology-independent and the combination of references results in a product or process that is more desirable, for example because it is stronger, cheaper, cleaner, faster, lighter, smaller, more durable, or more efficient. Because the desire to enhance commercial opportunities by improving a product or process is universal—and even common-sensical—we have held that there exists in these situations a motivation to combine prior art references even absent any hint of suggestion in the references themselves. In such situations, the proper question is whether the ordinary artisan possesses knowledge and skills rendering him *capable* of combining the prior art references.

*DyStar Textilfarben GmbH & Co. v. C.H. Patrick Co.*, 464 F.3d 1356, 1368 (Fed. Cir. 2006).

The radially overlapping relationship taught in Figure 2B of Lillis measures rotational speed *and* motion and vibrations of a drive shaft better than a sensor placed in a non-overlapping relationship. Thus, Lillis positions sensor 20 in a radially overlapping relationship with target feature 24, and adjacent to indicia 26 on radial face 28 of target feature 24, to measure speed *and* vibration better. Lillis ¶¶ 31, 32, 35–37, 39–42; Final Act. 4–5 (citing Lillis ¶¶ 20–44). Thus, an overlapping relationship improves measurement of motion and vibration *and* speed by placing sensor 20 adjacent to rotating indicia 26 to measure its rotation and shaft speed better. Lillis ¶¶ 26–32.

The sensor of McCune, as modified by teachings of Lillis, measures shaft rotational speed to detect an overspeed condition as McCune desires to do by positioning the sensor between the gears and fan (McCune ¶¶ 44, 45) and also measures vibrations to detect deterioration that requires preventive maintenance of the engine as Lillis teaches is desirable to do (Lillis ¶ 37). The Examiner explains that the arrangement of Lillis provides an additional feature to McCune's sensor, namely, detecting vibration and motion wear in addition to detecting overspeed conditions using a single sensor. Ans. 6.

Such improvements to the accuracy of measuring rotational speed of a drive shaft, as McCune and Lillis both desire, while adding the capability to measure motions and vibrations to detect wear, as Lillis teaches, provides a rational underpinning for the proposed combination. The teachings improve Sheridan's gas turbine engine similarly.

> Often, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.

*KSR*, 550 U.S. at 418; *see also Arctic Cat Inc. v. Bombardier Recreational Prods. Inc.*, 876 F.3d 1350, 1359 (Fed. Cir. 2017) ("Therefore, a motivation to combine can be found explicitly or implicitly in the prior art references themselves, in market forces, in design incentives, or in 'any need or problem known in the field of endeavor at the time of invention and addressed by the patent.'" (quoting *KSR* 550 U.S. at 420–21)).

Thus, we sustain the rejection of claim 1 and claims 2, 3, 5, 20, and 21, which are not separately argued. *See* 37 C.F.R. § 41.37(c)(1)(iv).

*Claim 8*
*Rejected over Sheridan, McCune, Lillis, and Reinhardt*

Appellant argues that claim 8 is allowable in view of its dependence on claim 1. Appeal Br. 7. Because we sustain the rejection of claim 1, this argument is not persuasive. We also sustain the rejection of claim 8.

*Claims 4, 6, 7, 9–13, and 15–19*
*Rejected over Sheridan, McCune, Lillis, Cosby, Reinhardt, and Cigal*

Appellant argues claims 4, 6, and 7 as one group and claims 9–13 and 15–19 as another group. *See* Appeal Br. 7–8.

Claims 4, 6, and 7

Claim 4, which we select as the representative claim of this group (*see* 37 C.F.R. § 41.37(c)(1)(iv)), depends from claim 1 and recites "the radially extending surface [of the fan drive shaft] is located axially between a pair of fan drive bearings of the fan drive shaft." Appeal Br. 9 (Claims App.).

The Examiner relies on teachings of Sheridan, McCune, and Lillis to render obvious a speed sensor located adjacent to and in overlapping radial relationship with a radially extending surface of the fan drive shaft as for claim 1 above. Final Act. 7. The Examiner cites Reinhardt as evidence that this location in Sheridan is between a pair of fan drive bearings on the fan drive shaft, and between the fan and the output gear as recited in claim 4. *Id.*

The Examiner relies on Cosby, as evidenced by Cigal, to teach speed sensor 50 located adjacent to and in an overlapping relationship with a drive bearing of drive shaft 40. *Id.* (citing Cosby ¶¶ 30–32, Fig. 1; Cigal ¶ 29, Fig. 1). The Examiner determines it would have been obvious to locate the speed sensor and radially extending surface of the modified Sheridan engine in this manner, as taught by McCune, Lillis, and Cosby, to monitor fan drive shaft speed and provide a lightweight configuration. *Id.* (citing Cosby ¶¶ 2, 31).

Appellant argues that the Examiner's reason for adding Cosby to the combination lacks a rational basis because the weight reduction features of Cosby relate to the materials used by Cosby rather than the sensor location. Appeal Br. 7. Appellant argues that Cosby does not disclose a lightweight configuration or anything related to a sensor location. Reply Br. 3. Further, Appellant argues that the prior art must provide a motivation or reason for a skilled artisan to rearrange parts of a reference device. *Id.*; Appeal Br. 7–8.

The Examiner has the better position because the prior art teaches a radially extending surface that is located axially between a pair of fan drive bearings. Indeed, the teachings of Sheridan, McCune, and Lillis, discussed in the rejection of claim 1 above, suggest a speed sensor adjacent to and in an overlapping radial relationship with a radially extending surface located between a pair of fan drive bearings of a fan drive shaft as recited in claim 4.

Sheridan as modified by McCune places a speed sensor between gear train 22 and turbo fan 18 of Sheridan, as recited in claim 1. This sensor also is between a pair of fan drive bearings, as recited in claim 4. The Examiner cites Reinhardt as evidence that this location is between a pair of fan drive bearings in Sheridan. Final Act. 3 (annotating Fig. 1 of Sheridan with "A" and "B" to indicate the bearings at the location where McCune's sensor would be located in Sheridan along fan drive shaft annotated as "C"); *id.* at 7 (citing Reinhardt as evidence that these annotations "A" and "B" correspond to bearings 152, 154 described in Fig. 3 and col. 5, ll. 13–35 of Reinhardt);

Sheridan modified further by Lillis adds a radially extending surface to the fan drive shaft adjacent to and in an overlapping relationship with the speed sensor as recited in claim 1 and as discussed above. Thus, the radial surface also is between the fan drive bearings of Sheridan's fan drive shaft.

As the Examiner explains, this finding and obviousness determination are consistent with and follow from the teachings of Lillis and the prior art. In this regard, Lillis teaches to place the speed sensor between bearings 18 and adjacent to target feature 24, which extends radially from drive shaft 16 in between bearings 18. Ans. 6 (citing Lillis ¶ 20, Fig. 1). This teaching is fully consistent with McCune's teachings to place a speed sensor between the gears and fan in Sheridan, which location is between a pair of bearings.

The teachings of McCune and Lillis would motivate a skilled artisan to place McCune's speed sensor and the radially extending feature of Lillis between the fan shaft bearings of Sheridan, as recited in claim 4, to measure fan shaft speed and vibrations for the reason discussed above for claim 1.

To guard against hindsight, the Examiner relies on Cosby's teaching to place a radially extending surface (tooth 42) of fan drive shaft 40 between a pair of bearings of drive shaft 40 as recited in claim 4. Final Act. 7 (citing Cosby ¶¶ 30–32, Fig. 1). Cosby also places magnetic shaft speed sensor 50 adjacent to and in overlapping relationship with the radially extending tooth components 42 on shaft 40, and between bearings, to measure the rotation speed of shaft 40. Cosby ¶¶ 30–32. Cosby teaches that shaft 40 connects fan/compressor 20 to turbine section 30 of turbine engine 10. *Id.* ¶¶ 2, 30. Thus, shaft 40 corresponds to a fan drive shaft as claimed.

The Examiner cites Cigal as evidence that Cosby's speed sensor 50 and radially extending surface 42 are positioned between bearings of a fan drive shaft as claimed. Final Act. 7. Cigal describes the features shown in Figure 1 of Cosby as bearings 38 on shaft 40 that connects fan 42 to turbine 46. Cigal ¶¶ 29, 30, Fig. 1. These teachings of Cosby and Cigal also render obvious the claimed radially extending surface between a pair of bearings.

Therefore, the prior art cited by the Examiner teaches that it would have been obvious to locate a radially extending surface of a fan drive shaft between a pair of fan drive bearings of the shaft as recited in claim 4. The teachings of Sheridan, McCune, and Lillis that render obvious claim 1 also render obvious claim 4 because they lead a skilled artisan to locate a radially extending surface between a pair of fan drive bearings adjacent to a sensor. Cosby and Cigal also teach this location for a sensor and radially extending surface, namely, between a pair of fan drive shaft bearings as claimed. Lillis also expressly teaches to place a speed sensor and radially extending surface between a pair of drive shaft bearings. *See* Final Act. 7; Ans. 6–7.

These teachings of the prior art also establish the claimed location of the speed sensor as one of a finite number of locations. In order to measure the speed of a rotating fan drive shaft by placing a sensor adjacent to a radial surface extending from the shaft, a skilled artisan is confronted with limited options regarding placement of the radially extending surface relative to the fan drive bearings. The radial surface may be located between the bearings as the prior art teaches *or* not between the bearings that support the drive shaft. The Examiner chose the location expressly taught by the prior art. *See* Ans. 6–7. Appellant has not apprised us of error in that decision.

Moreover, a skilled artisan would understand that placing the radially extending surface between the bearings that support and stabilize the drive shaft would improve measurement accuracy because the radial extension is subjected to less vibrations and movements relative to an adjacent sensor. The bearings also help to isolate the radial surface from the fan and gears.

Thus, we sustain the rejection of claim 4 and claims 6 and 7, which fall therewith.

Claims 9–13 and 15–19

Appellant argues that these claims are rejected based on the same combination and rationale as claims 4, 6, and 7 and are allowable for the same reasons argued for those claims. Appeal Br. 8. Because we sustain the rejection of claims 4, 6, and 7, this argument is not persuasive. We also sustain the rejection of claims 9–13 and 15–19.

*Claim 14*

*Rejected over Sheridan, McCune, Lillis, Cosby, Reinhardt, and Cigal*

Appellant argues that claim 14 is allowable in view of its dependence on independent claim 1. Appeal Br. 8. Because we sustain the rejection of claim 1, this argument is not persuasive. We also sustain the rejection of claim 14.

CONCLUSION

We affirm the rejections of claims 1–21.

| Claims Rejected | 35 U.S.C. § | Basis/Reference | Affirmed | Reversed |
|---|---|---|---|---|
| 17, 20, 21 | 112(b) | Indefiniteness | 17, 20, 21 | |
| 1–3, 5, 20, 21 | 103 | Sheridan, McCune, Lillis | 1–3, 5, 20, 21 | |
| 8 | 103 | Sheridan, McCune, Lillis, Reinhardt | 8 | |
| 4, 6, 7, 9–13, 15–19 | 103 | Sheridan, McCune, Lillis, Cosby, Reinhardt, Cigal | 4, 6, 7, 9–13, 15–19 | |
| 14 | 103 | Sheridan, McCune, Lillis, Cosby, Reinhardt, Cigal | 14 | |
| **Overall Outcome** | | | 1–21 | |

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED