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15/500,435	01/30/2017	Tadashi NAKANISHI	16P0172	1021
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KENJA IP LAW PC 4 North Second Street, Suite 598 San Jose, CA 95113			EXAMINER WALCK, BRIAN D	
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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* TADASHI NAKANISHI, HIROAKI NAKAJIMA,  
TOMOYUKI OKUBO, and YOSHIHIKO ODA

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Appeal 2021-002146  
Application 15/500,435  
Technology Center 1700

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Before TERRY J. OWENS, SHELDON M. McGEE, and  
JANE E. INGLESE, *Administrative Patent Judges*.

OWENS, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), the Appellant<sup>1</sup> appeals from the Examiner's decision to reject claims 1 and 2. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

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<sup>1</sup> "Appellant" refers to "applicant" as defined in 37 C.F.R. § 1.42. The Appellant identifies the real party in interest as JFE Steel Corporation. (Appeal Br. 3).

### CLAIMED SUBJECT MATTER

The claims are directed to a non-oriented electrical steel sheet.

Claim 1, reproduced below, is illustrative of the claimed subject matter:

1. A non-oriented electrical steel sheet having a chemical composition consisting of, in mass%:

C: 0.0050% or less;  
Si: 1.0% or more and 4.0% or less;  
Mn: 0.10% or more and 3.0% or less;  
Sol. Al: less than 0.0005%;  
P: more than 0.01% and 0.20% or less;  
S: 0.0050% or less;  
N: 0.0050% or less;  
Cu: 0.02% or more and less than 0.04%; and  
Ca: 0.003% or more and 0.0100% or less,  
with a balance being Fe and incidental impurities.

### REFERENCE

The prior art relied upon by the Examiner is:

Name	Reference	Date
Arai	US 2012/0009436 A1	Jan. 12, 2012

### REJECTION

Claims Rejected	35 U.S.C. §	Reference(s)/Basis
1, 2	103	Arai

### OPINION

The Appellant argues claims 1 and 2 as a group (Appeal Br. 8–20). We therefore limit our discussion to one of those claims, i.e., claim 1. Claim 2 stands or falls with that claim. *See* 37 C.F.R. § 41.37(c)(1)(iv) (2013).

Arai discloses a non-oriented electrical steel sheet that can contain 3 mass% or less Al, 5 mass% or less Cu, and a preferably 0.5 mass% or less

total content of Mo, W, Sn, Sb, Mg, Ca, Ce, and Co trace elements (¶¶ 34, 46, 50, 54). Thus, Arai's Al, Cu, and trace element contents can encompass the Al, Cu, and Ca contents in the Appellant's claim 1.

As stated in *In re Peterson*, 315 F.3d 1325, 1329–30 (Fed. Cir. 2003):

In cases involving overlapping ranges, we and our predecessor court have consistently held that even a slight overlap in range establishes a *prima facie* case of obviousness. . . .

. . .

Selecting a narrow range from *within* a somewhat broader range disclosed in a prior art reference is no less obvious than identifying a range that simply *overlaps* a disclosed range. In fact, when, as here, the claimed ranges are completely encompassed by the prior art, the conclusion is even more compelling than in cases of mere overlap. [(Citations omitted.)]

The Appellant argues that “none of the examples disclosed in Arai has Al, Cu and Ca contents falling within the claimed ranges of Al, Cu and Ca” (Appeal Br. 13).

Arai is not limited to its examples. *See In re Fracalossi*, 681 F.2d 792, 794 n.1 (CCPA 1982); *In re Mills*, 470 F.2d 649, 651 (CCPA 1972). Instead, all disclosures therein must be evaluated for what they would have fairly suggested to one of ordinary skill in the art. *See In re Boe*, 355 F.2d 961, 965 (CCPA 1966).

The Appellant argues that “[n]owhere does Arai teach that a composition of **a base steel sheet** is specifically adjusted” (Appeal Br. 13), “Arai’s disclosure of Al of 0-3%, Cu of 0-5%, Ca+Sn+Sb+Mo+W+Mg+Ce+Co of 0-0.5% (*See e.g.*, Arai paragraphs [0046], [0050] and [0054]) provides no indication of an [*sic*] lower limit or an upper limit of [*sic*] as required in the currently amended claim 1” (Appeal

Br. 12), and “Arai does **not** recognize the combination of the amounts of Al, Cu, and Ca as a result-effective variable. As such, it would **not** have been obvious to adjust the amounts of Al, Cu, and Ca in the non-oriented electrical steel sheet of Arai to arrive at the claimed range of Al, Cu, and Ca without undue experimentation” (Appeal Br. 15).

Arai would have indicated to one of ordinary skill in the art that all Al, Cu, and total trace element amounts within the disclosed ranges are effective for achieving Arai’s goal of providing a non-oriented magnetic steel sheet whose core loss in a high frequency range can be fully reduced (¶¶ 10, 46, 50, 54), including the amounts of Al, Cu, and Ca within the Appellant’s claim 1’s ranges.

The Appellant argues that “the Okubo declarations in view of other examples described in the original disclosure clearly shows unexpected results over the entire amended claimed range and presents sufficient number of test results both inside and outside the amended claimed range to show the criticality of the claimed range” (Appeal Br. 16).

The Okubo declarations show that adding Ca to a steel sheet containing ultra-low Al reduces iron loss and standard deviation of iron loss. The tests in those declarations are limited to Si contents of 1.3 and 1.6 mass% and an Mn content of 0.5 mass%. The Appellant’s claim 1, however, encompasses Si contents as high as 4.0 mass% and Mn contents as high as 3.0 mass%. The Appellant’s Specification states that Si and Mn have the effect of increasing electrical resistance to reduce iron loss (¶¶ 20, 25), which is an effect achieved by the Appellant’s addition of Ca. The declarations do not show that at the maximum content of Si and Mn within the claim 1 ranges, whereat those elements reduce iron loss to their greatest

extent, adding Ca to the steel sheet in the minimum amount within the claim 1 range provides unexpected reduction of iron loss.

The Appellant argues (Reply Br. 7): “Si has an effect of increasing electrical resistance to reduce iron loss (see paragraph [0020]), and Mn is an element effective in increasing electrical resistance to reduce iron loss, as with Si (see paragraph [0025]). That is, Si and Mn contents are not critical to the recyclability and are otherwise known in the art.”

The relevant issue is whether Si and Mn at the maximum contents in the Appellant’s claim 1’s ranges reduce iron loss to a greater extent than they do at the contents in the Okubo declaration tests. The Appellant has not provided evidence that the iron loss reduction due to Ca addition at the Si and Mn contents in the Okubo declaration tests is representative of the iron loss reduction due to Ca addition that would be obtained at the maximum Si and Mn contents within the ranges in the Appellant’s claim 1. The Okubo declarations, therefore, do not effectively rebut the Examiner’s rejection.

### CONCLUSION

For the above reasons, we are not persuaded of reversible error in the Examiner’s rejection of the Appellant’s claims. Accordingly, we affirm the rejection.

### DECISION SUMMARY

In summary:

<b>Claims Rejected</b>	<b>35 U.S.C. §</b>	<b>Reference(s)/Basis</b>	<b>Affirmed</b>	<b>Reversed</b>
1, 2	103	Arai	1, 2	

Appeal 2021-002146  
Application 15/500,435

TIME PERIOD FOR RESPONSE

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

AFFIRMED