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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* KENICHI ISHIBASHI, KAZUMI MOCHIZUKI, and  
YASUNOBU KONDO

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Appeal 2016-007422  
Application 13/867,275  
Technology Center 2800

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Before PETER F. KRATZ, N. WHITNEY WILSON, and  
DEBRA L. DENNETT, *Administrative Patent Judges*.

KRATZ, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on an appeal under 35 U.S.C. § 134 from the Examiner's final rejection of claims 1–8. We have jurisdiction pursuant to 35 U.S.C. § 6.

Appellants' claimed invention is directed to an electrical conductor comprising aluminum alloy wires that are twisted together.

Claim 1 is illustrative and reproduced below:

1. An electric wire comprising a conductor obtained by twisting together aluminum alloy wires, wherein the conductor is formed with a conductor twist pitch of 7 to 36 times a predetermined diameter thereof, and a composition of an aluminum alloy before formation of the aluminum alloy wires contains 0.1 to less than 1.0% by weight of Fe, 0 to 0.08% by

weight of Zr, 0.02 to 2.8% by weight of Si, and 0.05 to 0.63% by weight of Cu and/or 0.03 to 0.45% by weight of Mg, with the remainder being Al and unavoidable impurities.

The Examiner relies on the following prior art references as evidence in rejecting the appealed claims:

Fujiwara	US 2003/0111256 A1	June 19, 2003
Detian	US 7,544,886 B2	June 9, 2009
Susai	US 7,550,675 B2	June 23, 2009

The Examiner maintains the following grounds of rejection:

1. Claims 1–8 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Fujiwara in view of Susai.

2. Claims 1–8 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Fujiwara in view of Detian.

We affirm the stated rejections. Our reasoning follows.

Appellants argue the rejected claims together as a group.

Accordingly, we select claim 1 as the representative claim on which we decide this appeal as to both grounds of rejection.

#### Rejection 1.

Appellants do not dispute the Examiner’s determination that “Fujiwara discloses an electric wire comprising a conductor obtained by twisting together aluminum alloy wires (stranded wire, see abstract), wherein the conductor is formed of a composition of an aluminum alloy” which composition corresponds to the composition of the aluminum alloy, as claimed (Final Act. 2; Fujiwara ¶¶ 22–29; *see generally* App. Br.).

The Examiner finds that “Susai et al. discloses a conductor which is formed with a conductor twist pitch” that falls within the claimed ranges “of 7 to 36 or 10 to 30 times the predetermined diameter of the conductor” (claims 1 and 4) as evinced by Example 2. In Example 2, the conductor twist pitch is 25 times the “diameter of the conductor (Ex. 2, cross section area of the conductor being  $0.5 \text{ mm}^2 = 0.7979 \text{ mm}$  in diameter, twist pitch = 20 mm, therefore  $20 \text{ mm} \div 0.7979 \text{ mm} = 25$ , which means  $0.7979 \times 25 =$  twist pitch 20 mm)” (Final Act. 3).

Based on the combined teachings of Fujiwara and Susai, the Examiner determines that it would have been obvious for one of ordinary skill in the art to make the twisted wire conductor of Fujiwara with a conductor twist pitch value that is a multiple of the conductor diameter, as claimed, given that Susai exemplifies forming a twisted wire conductor with a twist pitch value being a multiple of conductor diameter value falling within the claimed range as a workable exemplified embodiment for a similar twisted wire conductor (Final Act. 3, 8).

Appellants argue that the Examiner’s calculation is a “manipulation of Susai’s disclosed values” which “does not rise to the level of disclosure by Susai itself of a mathematical relationship between the strand pitch and the conductor diameter” rendering “Susai’s alleged disclosure of a strand pitch of 25 times the conductor diameter” as being “merely coincidental” (App. Br. 11). However, Appellants do not directly dispute the Examiner’s calculation as failing to show that the Example 2 conductor of Susai would have a conductor twist pitch to conductor diameter ratio (25) that falls within the range required by claim 1.

Consequently, we are not persuaded of reversible error in the Examiner's findings and calculation as to Susai's teaching/suggestion "of a strand pitch [conductor twist pitch] of 25 times the conductor diameter" by Appellants' characterization of Example 2 of Susai as being a "coincidental" disclosure (*id.*).

Moreover, Appellants contend that Susai attributes the bending performance of Example 2 to the aluminum alloy composition and argue that Susai teaches away from achieving a desired flexibility of a conductor via a mathematical relationship between the twist pitch and conductor wire diameter and that the only guidance toward the claimed subject matter including the claimed conductor twist pitch to conductor diameter relationship is found in Appellants' Specification, which suggests the rejection is premised on impermissible hindsight (App. Br. 12–16).

However, while not explicitly described by Fujiwara, the conductor of Fujiwara (like the conductor of Susai) has a certain diameter and the conductor of Fujiwara would be expected to have a certain twist pitch value for the stranded wire structure. Appellants have not satisfactorily explained why an ordinarily skilled artisan in forming the twisted wire conductor of Fujiwara would not have been led to form the electrical conductor with a conductor cross-sectional area (and corresponding diameter) and twist pitch as taught/suggested by Example 2 of Susai as being a workable construction for a flexible twisted wire conductor, and, consequently, representing workable diameter and workable twist pitch values for the conductor of Fujiwara (Ans. 4–6).

Appellants argue that Susai discloses that the material composition of the aluminum alloy and the material processes contribute to the desired

performance of the stranded wire, including flexibility, conductivity and bending resistance; however, Appellants likewise disclose that the wire alloy composition and material processes influence such wire performance characteristics (App. Br. 11–12; Spec. 5, l. 8 – 7, l. 16). Consequently, these disclosures of Susai do not constitute a lack of suggestion of or a teaching away from employing a suitable twist pitch and conductor diameter in forming the twisted wire conductor structure as exemplified by Susai’s Example 2.

In this regard, Appellants have not particularly argued, much less established, that one of ordinary skill in the art would have been led by the applied prior art, including Susai, to employ a twist pitch and conductor diameter ratio for making a suitable twisted wire conductor that falls outside the claim 1 twist pitch to diameter range. Consequently, Appellants’ argument that Susai teaches away from the claimed subject matter lacks persuasive merit (App. Br. 12–15).

Appellants argue that the Examiner relies on Appellants’ disclosure in tendering the stated rejection and, consequently, the Examiner engages in impermissible hindsight (App. Br. 15–16). As indicated above, however, the Examiner relies on Example 2 of Susai for a disclosure of a twist pitch value and corresponding conductor diameter in forming a twisted wire conductor (Final Act. 2–3, 8; Ans. 2–6). Consequently, the Examiner’s obviousness rejection over Fujiwara and Susai has not been shown by Appellants’ argument to be “based on impermissible hindsight” as contended by Appellants (App. Br. 16).

In the Reply Brief, Appellants present a new argument based on information said to be gleaned from a Japanese Publication that is asserted to

correspond to Susai's priority document which Japanese Publication is argued to show that Examples 2 and 3 of Table 1 of Susai fail to correspond to Examples 2 and 3, as referenced in columns 8 and 9 of Susai (Reply Br. 2–5). This argument is untimely and predicated on information not shown to have been previously relied upon and shown to have been accompanied by a verified translation that was previously entered into the record. In any event, we observe that even if the Examiner may have overstated and/or misapprehended the disclosure of Susai with respect to Example 2 of Table 1 and the Example 2 of Susai as presented in column 8 of Susai with respect to showing a correspondence between the Table 1 results and the flexibility of the Example 2 stranded wire conductor, the Examiner premises the rejection on Susai's teaching that the disclosed stranded wire conductor can be successfully constructed with a twist pitch and conductor size (diameter) relationship as provided for in the Example 2 (and Example 3) stranded wire conductor constructions (Ans. 3–5). In this regard, Susai teaches that the stranded wire conductors have good flexibility properties, as further evaluated in Example 3 via testing of a bundle of the stranded wire conductors and Fujiwara is concerned with forming a lightweight stranded wire aluminum alloy conductor/cable having high flexibility, among other properties (Fujiwara ¶¶ 22–29, 38, 81, 106; Susai, col. 8, l. 61– col. 9, l. 22; Fig. 3).

Thus, Appellants' arguments fail to indicate reversible error in the Examiner's obviousness rejection over Fujiwara in view of Susai.

Rejection 2.

Appellants present substantially similar arguments against the Examiner's obviousness rejection over Fujiwara in view of Detian as discussed above with respect to Rejection 1 with Fujiwara being similarly applied as previously discussed with Rejection 1 and Detian being relied upon by the Examiner to evidence that twisted wire conductors are known to be constructed with a twist pitch to diameter relationship that falls within and satisfies the relationship (range) as required by Appellants' claim 1. In this regard, the Examiner finds that Detian discloses twisted wire conductors having a conductor twist pitch of about 15.9 or about 16.6 times the conductor diameter (Final Act. 5; Detian, col. 18, ll. 28–33, col. 18, l. 65–col. 19, l. 8, col. 22, ll. 12–17; Examples 24, 27, 30).

For reasons set forth by the Examiner and for substantially similar reasons to those discussed above with respect to Rejection 1, as applied *mutatis mutandis* to Rejection 2, we do not find Appellants' "coincidental" disclosure, teaching away, and lack of suggestion (impermissible hindsight) arguments persuasive of harmful error in the Examiner's obviousness rejection over Fujiwara and Detian in Rejection 2 (App. Br. 16–22; Ans. 6–8).

As for the additional argument asserting that Detian represents non-analogous art, Appellants have not satisfactorily explained why the twisted wire conductor of Detian is not within the same field of endeavor and/or reasonably pertinent to the problems faced with respect to Appellants' twisted wire conductor. In this regard, we observe that Appellants identify copper conductors as background art, not as non-analogous art (Spec. 1).



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It follows that Appellants have not identified reversible error in Rejection 2. Thus, we shall also affirm Rejection 2.

CONCLUSION/ORDER

The Examiner's decision to reject the appealed claims is affirmed.

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

AFFIRMED