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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte NAO YOSHIHARA and FUJIO KOIZUMI

Appeal 2012-002697
Application 11/548,080
Technology Center 1700

Before PETER F. KRATZ, JEFFREY T. SMITH, and
LINDA M. GAUDETTE, *Administrative Patent Judges*.

SMITH, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

This is an appeal under 35 U.S.C. § 134 from a final rejection of claims 1-16. We have jurisdiction under 35 U.S.C. § 6. The Examiner maintains and Appellants' request review of the rejection of claims 1-16 under 35 U.S.C. § 103 as unpatentable over the combination of Kuroda (U.S. Patent 6,372,056 B1, issued April 16,2002) and JP'730¹ (Japanese Kokai 2000-319730, published November 21,2000).² (App. Br. 6).

OPINION

Appellants' invention is directed to a spring steel wire rod solves a problem peculiar to spring steel wire rod containing Cr, Cu, and Ni and a high Si content which causes a surface layer of fayalite (2FeOSiO_2) to form during processing (Spec. 2-3). Claim 1 is illustrative of the subject matter on appeal and is reproduced below:

1. A spring steel wire rod comprising:

a base steel having a surface, and a surface layer on the surface of the base steel, wherein

the surface layer comprises fayalite,

the base steel consists essentially of:

C: 0.35% to 0.7% (by mass, the same is hereunder applied unless otherwise specified);

¹ We will refer to the translation of this document that was submitted to the record on August 15 2011.

² Appellants have not argued claims 1-10, 12, and 14-16 separately. Appellants have presented separate arguments for claims 11 and 13. Claims 1-10, 12, and 14-16 will stand or fall together. Claims 11 and 13 which are argued separately will also be addressed.

Si: 1.5% to 2.50%;

Mn: 0.05% to 1.0%;

Cr: 0.05% to 1.9%;

Cu: 0.05% to 0.7%;

Ni: 0.15% to 0.8%;

P: 0.02% or less (excluding 0%);

S: 0.02% or less (excluding 0%); and

the balance consisting of Fe and unavoidable impurities,

the ratio of Si to Cu (Si/Cu) in the base steel is in the range of 4.0 or more,

the difference between the concentration of Cu in the surface layer and the concentration of Cu in the base steel is 0.50% or less,

the difference between the concentration of Ni in the surface layer and the concentration of Ni in the base steel is 1.00% or less, and

the spring steel wire rod is obtained by a method comprising

a descaling process with a water shower preceding a hot-rolling process; and

a cooling process with a water shower in a finish-rolling process in the hot-rolling process.

Our initial inquiry is directed to the scope of the claimed subject matter presented for our review on appeal. It is recognized that the subject matter of claim 1 includes a description of a descaling process and a cooling

process. However, the subject matter of claim 1 is directed to a spring steel wire rod comprising a base steel having a surface, and a surface layer comprising fayalite on the surface of the base steel. The claimed invention further describes the chemical composition of the steel wire.

The dispositive issue for this rejection is: Did the Examiner err in determining that the teachings of Kuroda and JP'730 would have suggested a spring steel wire rod comprising a base steel having a surface, and a surface layer comprising fayalite on the surface of the base steel as required by the subject matter of independent claim 1?

After thorough review of the respective positions provided by Appellants and the Examiner, we answer this question in the negative and AFFIRM.

The Examiner found that Kuroda describes a spring steel comprising C, Si, Mn, Cr, Cu, Ni, P, S, and Fe all in amounts that overlap a steel composition of the claimed invention. (Ans.4-5; Kuroda, col. 4, ll. 54-67). Appellants have not disputed the Examiner's findings. (App. Br. 16-20). Rather, Appellants argue that the exemplified embodiment of Kuroda does not meet the claimed invention. (*Id.*) Kuroda discloses the compositions can comprise up to 2.5% in total of Cr, Ni, and Cu. JP'730 describes the conditions under which a similar steel composition can comprise a surface layer having fayalite on the surface of the base steel. (Ans. 7-8; JP'730 [0018]). These conditions are similar to the conditions identified in the present Specification. According to the Specification, a fayalite on the surface of a steel wire is described as follows:

fayalite is a low melting point oxide which is seen when a steel abundantly containing Si is used and is a material hard to exfoliate through ordinary pickling treatment. For example,

when a steel containing Si and Cr is heated to a temperature exceeding the eutectic temperature of fayalite and wustite (about 1,170°C), a dense melt phase wherein those oxides are and then, intricately when it is higher, Cr interwound with each other is formed and then, when it is further heated to a temperature of 1200°C or higher, Cr intrudes into the aforementioned melt phase and the fayalite, condenses at the interface with the base steel, and forms a condensed layer. (Spec. 3).

Thus we find no error in the Examiner's finding that it would have been obvious to one of ordinary skill in the art to form a fayalite phase on the surface of Kuroda's base steel composition. A person of ordinary skill in the art would have reasonably expected that subjecting Kuroda's steel composition to hot rolling at temperatures exceeding 1170°C would have resulted in the formation of a fayalite phase on the surface of Kuroda's steel composition.

Appellants argue the transitional phrase "consisting essentially" recited in claim 1 precludes the presence of other components in the base steel composition of the claimed invention. (App. Br. 18). Appellants have not identified the basic and novel characteristics of their *claimed invention*. Appellants also have not demonstrated that Kuroda and/or JP'730 contain additional elements that materially effect the base steel composition. *In re De Lajarte*, 337 F.2d 870, 874 (CCPA 1964) (Applicants have the burden of showing that a component in a reference would materially affect the basic and novel characteristics of a claimed composition.).

Appellants' remaining arguments have been fully considered. These arguments do not address why it would have been unobvious to a person of ordinary skill in the art to subject Kuroda's steel composition to hot rolling

at temperatures exceeding 1170°C or why it would have been unreasonable for a person of ordinary skill in the art to expect that subjecting Kuroda's steel composition to these process conditions would have resulted in the formation of a fayalite phase on the surface of Kuroda's steel composition.

Claim 11 and 13

The Examiner found that Kuroda describes a spring steel comprising C, Si, Mn, Cr, Cu, Ni, P, S, and Fe all in amounts that overlap a steel composition of the claimed invention. (Ans. 11-12; Kuroda, col. 4, ll. 54-67). Appellants have not disputed the Examiner's findings. (App. Br. 33-34). Just as we stated above, we find no error in the Examiner's finding that it would have been obvious to one of ordinary skill in the art to form a fayalite phase on the surface of Kuroda's base steel composition.

ORDER

The rejection of claims 1- 16 under 35 U.S.C. § 103(a) is affirmed.

TIME PERIOD

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).

AFFIRMED

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