UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte IRINA BOGUSLAVSKY,
ANGELO CHIRAFISI, and
MICHAEL P. TOBEN

Appeal 2007-3578
Application 10/269,700
Technology Center 1700

Decided: February 28, 2008

Before EDWARD C. KIMLIN, PETER F. KRATZ, and
LINDA M. GAUDETTE, *Administrative Patent Judges*.

KRATZ, *Administrative Patent Judge*.

DECISION ON APPEAL

1This is a decision on an appeal from the Examiner's final rejection of claims 1, 4-8, 11, 12, 14-16, and 18-21, the only claims that remain pending in this application. We have jurisdiction pursuant to 35 U.S.C. § 6. Oral arguments were presented on January 24, 2008.

Appellants' invention is directed to a composition said to be useful for stripping tin and tin alloys from a substrate and a method for stripping tin and/or tin alloys from a steel substrate using such a composition. Claims 1 and 15 are illustrative and reproduced below:

> 1. A composition suitable for stripping of tin and tin-alloys from a substrate comprising:
>
> a) one or more organic sulfonic acids selected from the group consisting of methanesulfonic acid, ethanesulfonic acid, propanesulfonic acid, phenysulfonic acid, tolylsulfonic acid and halobenzenesulfonic acid;
>
> b) one or more nitro-substituted organic compounds comprising one or more water-solubility enhancing substituents;
>
> c) sulfuric acid;
>
> d) one ore more non-ionic surfactant having cloud points of 50 to 80˚ C in amounts of 0.05 to 2g/L; and
>
> e) one or more corrosion inhibitors selected from the group consisting of N-acyl α-amino acids and N-acyl α-amino acid salts.
>
> 15. A method for electrolytic stripping of tin and tin-alloys from a steel substrate comprising the steps of:
>
> a) contacting the steel substrate containing tin or tin-alloy with the composition of claim 1; and
>
> b) applying sufficient anodic potential to the steel substrate to at least partially remove the tin or tin-alloy.

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

Mekjean	3,257,299	Jun. 21, 1966
Tomaiuolo	4,439,338	Mar. 27, 1984
Fisk	4,606,890	Aug. 19, 1986
Chen	4,678,552	Jul. 7, 1987
Jackson	4,964,920	Oct. 23, 1990
Haruta	5,035,749	Jul. 30, 1991
Clubley	5,055,230	Oct. 8, 1991.

Claims 1, 4-8, 11, 12, and 21 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Haruta in view of Jackson, and either Fisk or Clubley. Claim 14 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Haruta, Jackson, either Fisk or Clubley, and Tomaiuolo. Claims 15, 16, and 18-20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Chen in view of Haruta, Jackson, either Fisk or Clubley, and Mekjean.[1]

We affirm as to the Examiner's first two stated obviousness rejections and reverse the third stated obviousness rejection. Our reasoning follows.

Under 35 U.S.C. § 103, the factual inquiry into obviousness requires a determination of: (1) the scope and content of the prior art; (2) the differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) secondary considerations. *See Graham v. John Deere Co.,* 383 U.S. 1, 17-18 (1966).

In considering the question of the obviousness of the claimed invention in view of the prior art relied upon, we are further guided by the basic principle that the question under 35 U.S.C. § 103 is not merely what the references expressly teach but what they would have suggested to one of

[1] A rejection of claim 21 under 35 U.S.C. § 112, first paragraph as failing to comply with the written description requirement was withdrawn by the Examiner (Ans. 3).

ordinary skill in the art at the time the invention was made. *See Merck & Co. v. Biocraft Labs., Inc.,* 874 F.2d 804, 807 (Fed. Cir. 1989) and *In re Keller,* 642 F.2d 413, 425 (CCPA 1981). That is, the question of obviousness cannot be approached on the basis that an artisan having ordinary skill would have known only what they read in the references, because such artisan is presumed to know something about the art apart from what the references disclose. *See In re Jacoby,* 309 F.2d 513, 516 (CCPA 1962). Nor is it necessary that suggestion or motivation be found within the four corners of the references themselves. Indeed, a conclusion of obviousness may be made from common knowledge and common sense of the person of ordinary skill in the art without any specific hint or suggestion in a particular reference. *See In re Bozek*, 416 F.2d 1385, 1390 (CCPA 1969).

§ 103(a) Rejection of Claims 1, 4-8, 11, 12, and 21

Appellants argue the rejected claims together as a group. Accordingly, we select claim 1 as the representative claim on which we shall decide the appeal with respect to this rejection. Appellants do not contest the Examiner's determination that Haruta discloses or suggests a tin-stripping composition that includes components corresponding to the constituents called for in claim 1, items (a), (b), and (c). Compare the Appeal Brief and the Reply Brief in their entireties with the Examiner's determinations as to the teachings of Haruta with respect to the first copper or copper alloy stripping reagent thereof and the difference between the claimed stripping composition and the first stripping reagent composition of Haruta (Final Rejection 4; Ans.4).

In particular, the Examiner has determined that the additional requirement of the representative claim 1 composition for a specified corrosion inhibitor and a non-ionic surfactant ingredient are not described by Haruta as components present in the first copper stripping reagent thereof. However, the Examiner takes the position that adding such constituents to the first reagent composition of Haruta would have been obvious modifications, within the meaning of 35 U.S.C. § 103(a), based on the combined teachings of the applied references.

In making this obviousness assessment, the Examiner maintained that:

> Jackson et al. teach a method and composition for removing deposits of tin, wherein the solution comprises a non-ionic surfactant having a concentration of 0.1-5.0 g/L (column 3 lines 47-50), which is within the range of the instant claim. Jackson et al. stress that the addition of the surfactants does not significantly reduce the activity of the solution (column 3 lines 10-12); and further it is found that the final copper surface after stripping is rendered bright and shiny with the addition of the surfactants (column 3 lines 25-30). In addition, Jackson et al. teach using anthranilic acid to prevent copper corrosion (column 2 line 64 -- column 3 line 9). The surfactant of Jackson et al. would inherently have the cloud point of 50 to 80°C, since it has the same concentration as that of the instant claim.
>
> Fisk teaches a process for conditioning metal surfaces, including ferrous or copper (or their alloys) surfaces (column 1 lines 54-56), to inhibit corrosion using a composition comprising of N-lauroyl sarcosinate (column 6 lines 11-16).
>
> Clubley et al. teach a composition to inhibit corrosion of metal substrates in contact with aqueous systems comprising of N-lauroyl sarcosine (table VI). In addition, Clubley et al. teach that N-acyl sarcosine is suitable as a copper deactivator (column 10 lines 17-20).

> It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the composition of Haruta et al. by using the non- ionic surfactant concentration of Jackson et al., because the addition of non-ionic surfactants would leave a bright and shiny surface after a layer of tin is removed. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have further modified the composition of Haruta et al. and Jackson et al. by replacing the corrosion inhibitor of Jackson et al. with the corrosion inhibitor of either Fisk or Clubley et al., because such corrosion inhibitor would protect the underlying substrate from corrosion in a tin stripping process.

(Ans. 3-6)

Appellants do not dispute the Examiner's determination that it would have been obvious for one of ordinary skill in the art to add a surfactant to the first stripping composition of Haruta based on the combined teachings of Haruta and Jackson. Rather, Appellants maintain that the Examiner's assertion that the non-ionic surfactant taught by Jackson would inherently have the called for cloud point based on the commonality as to the amount of surfactant taught to be used by Jackson relative to the claimed amount has not been shown to necessarily result in the use of a surfactant with the claimed cloud point characteristic (Br. 10-11). While we agree with Appellants that the Examiner may be mistaken that Jackson necessarily describes a surfactant with the claimed cloud point property, we do not consider this argued point persuasive in establishing reversible error in the stated obviousness rejection. This is because the combined teachings of Jackson and Haruta are reasonably suggestive of employing non-ionic surfactants, which include known surfactants having the claimed cloud point characteristic, in the first stripping composition of Haruta to increase the

wetting characteristics thereof and/or the brightness/shine thereof as suggested by Jackson in using non-ionic ethoxylated fatty alcohol surfactants, including an admixture with another surfactant such as cocoamine (Jackson, col. 3, l. 16- col. 4, l. 21).

In this regard, we note that Appellants acknowledge that ethoxylated non-ionic surfactants having the called for cloud point property are known to be commercially available (Specification 7).[2] Furthermore, Haruta expressly provides for the addition of optional additives to the first stripping reagent, including surface finishers and solubilizers (Haruta, col. 3, ll. 62-65). As such the combined teachings of Haruta and Jackson together with Appellants' admissions in the Specification fairly suggest the addition of a known surfactant additive, like the additive called for in component (d) of representative claim 1 to the first striping reagent of Haruta, given the level of skill in the art suggested by these references.

This brings us to the last claimed compositional requirement of representative claim 1, that is, the called for one or more specified corrosion inhibitors. Appellants' principal argument against the propriety of the Examiner's obviousness rejection centers on this claimed corrosion inhibitor component and the contention that one of ordinary skill in the art would not have been motivated/led to include a corrosion inhibition ingredient in the first stripping reagent of Haruta. According to Appellants, this is because Haruta teaches that corrosion of the copper substrate is not a concern with their method, which involves a second treatment step with another reagent

[2] The starting point for Appellant's invention, for purposes of 35 U.S.C. § 103(a), is what Appellants acknowledge to be prior art. *In re Facius*, 408 F.2d 1396, 1406 (CCPA 1969); *In re Davis*, 305 F.2d 501, 503 (CCPA 1962).

for only a few seconds. In this regard, Appellants maintain Haruta's second reagent treatment is conducted for a short time to remove an underlying copper/tin intermediate layer and Haruta teaches that the copper substrate is scarcely eroded thereby (Br. 9-10; Reply Br. 9; Haruta, col. 2, l. 67- col. 3, l.4). Thus, one of ordinary skill in the art would have no reason to add a corrosion inhibitor to the first stripping composition of Haruta not withstanding the additional prior art teachings of Fisk or Clubley from Appellants' perspective.

The difficulty we have with Appellants' patentability position is that one of ordinary skill in the art would not regard Haruta as requiring or teaching the exclusion of known corrosion inhibitors, as called for in representative claim 1, item (e), in their first stripping reagent composition by their disclosure that copper substrates are minimally corroded at the end of the striping operations they disclose. Rather, it is our view that the combined teachings of the applied references would have suggested the optional employment of known copper corrosion inhibitors, such as those called for in representative claim 1, in the first stripping reagent composition of Haruta to promote further reduction of corrosion or the substantial prevention of or inhibition of copper substrate corrosion/erosion to the full extent desired. After all, the stripping composition of Haruta is disclosed and claimed as being useful for treating copper substrates associated with a printed circuit board wherein any amount of additional reduction of the erosion/corrosion of the conductive copper substrate would be a reasonably desired outcome to one of ordinary skill in the art. Indeed, immediately after indicating that other additives can be made part of the first stripping reagent, Haruta discloses that: "[t]hus, the first reagent of the present invention can

prevent formation of precipitates, and can contribute to the smooth removal of tin or tin-lead alloy" (col. 3, ll. 66-68). Thus, it is our determination that the combined teachings of the applied references reasonably would have suggested that one of ordinary skill in the art can optionally use other conventional additives, including known metal corrosion inhibitors such as the N-lauroyl sarcosinate of Fisk or the N-acyly sarcosine of Clubley, in the first stripping reagent of Haruta to obtain the expected corrosion inhibition effects thereof.

On this record, we affirm that Examiner's obviousness rejection of claims 1, 4-8, 11, 12, and 21.

§ 103(a) Rejection of Claim 14

Dependent claim 14 requires that the claimed composition is free of sulfuric acid and that the one or more nitro-substituted organic compounds thereof are present in an amount equal to or greater than 5 grams per liter. In addition to the combination of references applied against independent claim 1, as discussed above, the Examiner further relies on the additional teachings of Tomaiuolo in rejecting claim 14 separately. Appellants argue for the patentability of claim 14 based on their arguments for independent claim 1. In this regard, Appellants do not contest the Examiner's application of Tomaiuolo to the additional subject matter of claim 14. Nor do Appellants argue about the elimination of a requirement for sulfuric acid in the composition as being a patentable distinction. Because we affirm the Examiner's obviousness rejection of claim 1 for the reasons started above, it follows that we shall also affirm the Examiner's obviousness rejection of claim 14, on this record.

§ 103(a) Rejection of Claims 15, 16, 18-20

Our disposition of the Examiner's rejection of these claims stands on a different footing because the method claims at issue here all require the stripping of tin and/or tin alloys from steel or steel conveying equipment using a composition according to claim 1 or substantially like the claim 1 composition.

The Examiner rejects the method claims over Chen in view of Haruta, Jackson, either Fisk or Clubley, and Mekjean. Chen is relied upon by the Examiner to show "electrolytic stripping of tin and tin-alloys from metal substrates in the manufacture of printed circuit board" (Ans. 8, Chen, col. 3, ll. 5-11). In this regard, Chen discloses removing metal coatings, such as tin from a metal base, such as copper or zinc, and their alloys, via an electrolytic process wherein an aqueous electrolytic solution comprising 45-70 weight percent of an alkanesulfonic acid is employed that does not corrode copper or zinc metals (col. 2, ll. 5-54). Chen notes that prior art chemical immersion techniques employ strong acid solutions for stripping and that prior art processes employed a corrosion inhibitor, which added to costs. The Examiner acknowledges that Chen does not disclose the stripping agent composition used in the claimed process, including the use of sulfuric acid, a nitro-substituted organic compound, or the corrosion inhibitor required as components by the so-rejected appealed claims (Ans. 8). Nor does Chen describe stripping metals from a steel base, as here claimed.

The Examiner relies on Mekjean for teaching the electrolytic stripping of coatings, such as tin, from a steel or copper metallic substrate (Ans. 10). Mekjean describes prior art chemical and electrolytic stripping processes and notes that cyanide solutions represented the best of the electrolytic solutions

albeit complexities are involved (col. 3, l. 45- col. 4, l. 29). Mekjean teaches the use of a molten salt bath as the stripping composition in their electrolytic process (col. 3, ll. 3-44 and col. 4, l. 30 - col. 7, l. 14).

Based on the combined disclosures of Chen and Mekjean with the four references which were discussed above in our analysis of the Examiner's rejection of the composition of claim 1, the Examiner takes the position that the claimed process would have been rendered obvious to one of ordinary skill in the art. As best understood, the Examiner seems to assert that it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the method of Chen by using a tin-coated steel substrate therein and stripping tin from steel as suggested by Mekjean (Ans. 10) while using the first copper stripping agent of Haruta as the electrolyte (striping agent) of Chen, with the so substituted stripping solution further modified by including a non-ionic surfactant as taught by Jackson and a N-lauroyl sarcosine or a N-acyl sarcosine corrosion inhibitor as taught by Fisk and Clubley, respectively (Ans. 8-10).

Our reading of the applied references makes it clear that a rationale basis that would have led an ordinarily skilled artisan in the direction proposed by the Examiner cannot be found in the Answer. A plausible reason why one of ordinary skill in that art would have been led to the removal of tin from a steel substrate or steel equipment in a manner that the claimed process requires based on the disparate assemblage of teachings from the applied references as relied upon in the Answer is simply unpersuasive for the reasons stated in the Briefs.

The analysis supporting obviousness should be made explicit and should "identify a reason that would have prompted a person of ordinary

skill in the art to combine the elements" in the manner claimed. *KSR Int'l Co. v. Teleflex, Inc.,* 127 S. Ct. 1727, 1741 (2007).

It follows that we reverse the Examiner's obviousness rejection of claims 15, 16, and 18-20.

CONCLUSION

The decision of the Examiner to reject claims 1, 4-8, 11, 12, and 21 under 35 U.S.C. § 103(a) as being unpatentable over Haruta in view of Jackson, and either Fisk or Clubley; and to reject claim 14 under 35 U.S.C. § 103(a) as being unpatentable over Haruta, Jackson, either Fisk or Clubley, and Tomaiuolo is affirmed. The decision of the Examiner to reject claims 15, 16, and 18-20 under 35 U.S.C. § 103(a) as being unpatentable over Chen in view of Haruta in view of Jackson, either Fisk or Clubley, and Mekjean is reversed.

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-IN-PART

tf/ls

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