

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte YOSHIHARU HASEGAWA,
HARUHIKO MIYACHI,
NAOKI YAMASHITA, and
YASUNAGA ITOH

Appeal 2008-5073
Application 10/819,372
Technology Center 1700

Decided: November 26, 2008

Before EDWARD C. KIMLIN, CHUNG K. PAK, and
THOMAS A. WALTZ, *Administrative Patent Judges*.

KIMLIN, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 3-5. Claim 4 is
illustrative:

4. A method for brazing a magnesium-containing aluminum alloy material containing from 0.2-1.0 mass % magnesium to another aluminum material in an inert gas atmosphere, comprising the steps of:

applying potassium fluorozincate having the composition $K_xZn_yF_z$, wherein x, y and z are positive integers, to a brazing part at a concentration of from 5-30 g/m² and

heating the materials at an average temperature rising rate of at least 0.1°C/second.

The Examiner relies upon the following references as evidence of obviousness:

Seseke-Koyro	US 6,432,221 B1	Aug.13, 2002
Wittebrood	US 6,753,094 B1	Jun. 22, 2004

Appellants' claimed invention is directed to a method for brazing a magnesium-containing aluminum alloy to another aluminum material. The method entails applying potassium fluorozincate at a concentration within the claimed range to a brazing part, and heating the materials at the recited rising rate of temperature.

Appealed claims 3-5 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Wittebrood in view of Seseke-Koyro.

Appellants do not present an argument that is reasonably specific to any particular claim on appeal. Accordingly, all of the appealed claims stand or fall together.

We have thoroughly reviewed each of Appellants' arguments for patentability. However, we are in complete agreement with the Examiner's reasoned analysis and application of the prior art, as well as her cogent and thorough disposition of the arguments raised by Appellants. Accordingly,

we will adopt the Examiner's reasoning as our own in sustaining the rejection of record, and we add the following for emphasis only.

There is no dispute that Wittebrood, like Appellants, discloses a method for brazing a magnesium-containing aluminum alloy material. Although Wittebrood teaches that magnesium levels in the aluminum alloy above 0.3 wt. % result in poisoning the flux material due to the formation of MgO (col. 1, lines 50 et. seq.), the reference teaches that one may braze aluminum alloys containing magnesium at levels within the scope of the appealed claims. We note that 0.3 wt. % magnesium falls directly within the claimed range of 0.2-1.0% magnesium.

As for the claimed heating at an average temperature rising rate of at least 0.1°C/second, we fully concur with the Examiner's analysis regarding the reasonable expectation that the heating rate of Wittebrood would fall within the extensive range claimed. Also, Wittebrood performs the brazing operation in an inert atmosphere and Appellants acknowledge that “[i]n an inert gas atmosphere brazing process, the temperature rising rate is about 0.59°C per second even if a rapid heating is made as shown in U.S. Patent No. 6 625 886” (Principal Br. 4). Consequently, it would be reasonable to conclude that the temperature rising rate in the Wittebrood process is about 0.59°C per second, which value is within the claimed range of at least 0.1°C/second. Furthermore, based on Appellants' admission, it would have been obvious for one of ordinary skill in the art to perform the brazing operation of Wittebrood at a temperature rising rate within the claimed range.

Wittebrood does not disclose the claimed brazing composition comprising potassium fluorozincate. However, as set forth by the Examiner,

Seseke-Koyro expressly discloses a brazing composition for magnesium-containing aluminum alloys comprising pure potassium fluorozincate or mixtures containing the same. Accordingly, we agree with the Examiner that it would have been obvious for one of ordinary skill in the art to employ the presently claimed potassium fluorozincate as a brazing composition in the brazing process of Wittebrood.

We do not agree with Appellants that Wittebrood teaches away from inert atmosphere furnace operations for magnesium-containing aluminum alloys due to poor corrosion resistance and high magnesium concentrations. In our view, one of ordinary skill in the art would have gleaned that magnesium-aluminum alloys can be used in the brazing process if the magnesium level is kept below 0.3 wt.% and, if more magnesium is desired, higher loads of flux material should be used. We note that Appellants have not established on this record that they do not experience the same reported disadvantage associated with using magnesium in concentrations at the higher level of the claimed range.

Regarding the Seseke-Koyro reference, Appellants maintain that “[t]his reference does not disclose that such an advantage would be gained by using only a potassium fluorozincate flux” (Principal Br. 5, first para.). However, as noted above, the reference expressly teaches that “pure KZnF₃” can be used as the brazing composition (col. 2, ll. 55 et seq.).

Appellants also submit that Seseke-Koyro “only supports the disclosure of Wittebrood in that Wittebrood does suggest that CAB brazing process is only suitable for aluminum alloys with a limited magnesium content” (Reply Br. 2, second para). Indeed, this argument underscores the obviousness of utilizing a potassium fluorozincate flux with alloys

containing less than 0.3 wt. % magnesium, an alloy encompassed by the appealed claims.

Appellants also contend that "[t]he zinc produced from KAlF forms a diffusion layer in the aluminum alloy material and improves the corrosion resistance of the material" (Reply Br. 2, second para.). However, as noted by the Examiner, "Seseke-Koyro et al. specifically discloses that alkali fluorozincate fluxing agents, especially potassium fluorozincate, act not only as fluxing agents but also to improve the surface quality since zinc and alkali fluoroaluminates are deposited on the surface of the components (see Seseke-Koyro et al., abstract)" (Ans. 10, second para.). Also, although Appellants point to the one example in Seseke-Koyro wherein brazing is not accomplished using potassium fluorozincate as the brazing composition, we concur with the Examiner that the totality of the reference, considered as a whole, positively teaches and suggests successful brazing of magnesium-containing aluminum alloys utilizing potassium fluorozincate as a fluxing agent in a controlled atmosphere. As noted by the Examiner, the reference specifically states "[c]ontrary to what was assumed in the prior art, alkali fluorozincates are suitable as fluxing agents for brazing aluminum or aluminum alloys, such as Mg-Al alloys at temperatures of 600°C. and below" (col. 6, ll. 1-4).

Appellants also submit that "[a]s shown in Tables 2-7 in the present specification, when the claimed brazing method is performed, superior results are obtained as compared to conducting a brazing process outside of the scope of the present claims but within the scope of the reference cited by the Examiner" (sentence bridging pages 5-6 of Principal Br.). However, Appellants have not presented the requisite analysis and explanation of the

Appeal 2008-5073
Application 10/819,372

comparative data to support the conclusion that the results would be considered truly unexpected by one of ordinary skill in the art. *In re Merck & Co.*, 800 F.2d 1091, 1099 (Fed. Cir. 1986). It is not within the province of this Board to independently review Appellants' data and ferret out results that support a demonstration of unexpected results sufficient to rebut a prima facie case of obviousness. For example, while Appellants point out that inferior brazability occurred when the magnesium content was greater than 1.0%, it would seem that this would have been an expected result in view of the Wittebrood disclosure. Just as unexpected results are evidence of nonobviousness, expected results are evidence of obviousness. *In re Skoll*, 523 F.2d 1392, 1397 (CCPA 1975).

In conclusion, based on the foregoing and the reasons well stated by the Examiner, the Examiner's decision rejecting 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)(1)(iv)(effective Sept. 13, 2004).

AFFIRMED

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