

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 32

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte ALBERT RIJKEBOER  
and ROELOF D. HONG

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Appeal No. 94-2858  
Application 07/873,715<sup>1</sup>

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ON BRIEF

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Before JOHN D. SMITH, GARRIS and OWENS, Administrative Patent Judges.

JOHN D. SMITH, Administrative Patent Judge.

**DECISION ON APPEAL**

This is an appeal pursuant to 35 USC § 134 from the final rejection of claims 2 through 47, 49 and 53.

Representative claim 53 is reproduced below:

53. A process for the production of aluminum hydroxide

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<sup>1</sup> Application for patent filed April 22, 1992. According to applicants, the application is a continuation of Application 07/489,560, filed March 7, 1990.

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by digesting bauxite with alkali solution and precipitating aluminum hydroxide from the digestion solution, comprising the steps of:

(a) combining bauxite and an alkali solution having a caustic concentration of at least 180 grams per liter expressed as sodium carbonate and partially digesting the bauxite in a first digestion step at a first digestion temperature of from 80 to 155EC. to yield a first digestion product,

(b) separating said first digestion product of step (a) into a liquid phase and a solid/liquid slurry, said liquid phase having a reduced free caustic concentration in relation to that of said alkali solution, and recovering said liquid phase and said solid/liquid slurry as separate streams,

(c) preheating at least a portion of said liquid phase stream having said reduced free caustic concentration and combining said preheated portion of said liquid phase stream and said stream recovered in step (b),

(d) digesting the resulting admixture of step (c) comprised of said liquid phase formed in step (b) in a second digestion step at an elevated second digestion temperature higher than the first digestion temperature of step (a) of from 140 to 320EC. to yield a second digestion product,

(e) cooling said second digestion product by recovering heat therefrom, said liquid phase stream being preheated in step (c) with heat recovered from said second digestion product,

(f) separating the second digestion product of step (d) after being cooled in step (e) into a supersaturated sodium aluminate solution and undissolved solids material;

(g) precipitating aluminum hydroxide from the supersaturated sodium aluminate solution obtained in step (f) and separating aluminum hydroxide from the resulting spent liquor; and

(h) recycling said spent liquor to step (a) for use as said alkali solution.

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The references of record relied upon by the examiner are:

McDaniel	4,324,769	Apr. 13, 1982
Yamada et al. (Yamada)	4,426,363	Jan. 17, 1984

The appealed claims stand finally rejected under 35 USC § 103 over McDaniel in view of Yamada.

We reverse.

The subject matter on appeal is directed to a process for the production of aluminum hydroxide by digesting bauxite with alkali solution and precipitating aluminum hydroxide from the digestion solution. As evident from step (h) of claim 53, the source of the alkali solution used to digest bauxite is a spent liquor recycle stream. Such a step is conventional in the well known prior art Bayer process wherein spent liquor, obtained after precipitating aluminum hydroxide from the digestion solution in a later stage in the Bayer process, is used as the aqueous alkali solution for digestion. See the specification at page 1, lines 13 through 16.

As appellants' point out, the principal object of the claimed invention is to provide a method for the production of aluminum hydroxide from bauxite, which in its essential form includes two bauxite digestion stages, with intermediate

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solid/liquid separation to produce a liquid having a reduced free caustic concentration for use in the second digestion stage. This has the effect of reducing corrosion on the downstream process equipment. See the specification at page 5, lines 1 through 10. Moreover, this feature is clearly set forth in steps (b) and (c) of appealed claim 53 which indicate that the liquid phase, after separation, has a reduced free caustic concentration in relation to that of the alkali solution, and that at least a portion of this liquid phase having the reduced free caustic concentration is preheated prior to recombination with the solid/liquid slurry stream before the second digestion stage. It is this claimed feature which distinguishes the subject matter defined by the appealed claims from that of the conventional Bayer process as well as that of the applied references, particularly the McDaniel reference.

It appears to be the basic position of the examiner that the Figure 2 embodiment of McDaniel ?reads on? the process defined by appealed claim 53. We cannot subscribe to the examiner's position. More particularly, the examiner argues that the spent liquor stream 80 in the McDaniel process corresponds to the claimed ?liquid phase having a reduced free caustic concentration in relation to that of the alkali solution?. See the Answer at

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pages 9 and 10. However, as adequately explained in appellants' Brief and Reply Brief, the spent liquor stream in McDaniel does not have a reduced free caustic concentration in relation to the alkali solution used for digesting the bauxite. This is because spent liquor results from the known precipitation step which increases, not reduces, the free caustic in the solution.

Particularly see the chemical equations set forth in the Reply Brief at page 3. Moreover, we point out that spent liquor stream 80 in the McDaniel process is compositionally identical to stream 93 used as a recycle for digesting the bauxite. Accordingly, we reject the examiner's contention that the process claimed on appeal ?reads on? the process described by McDaniel. Since the examiner has failed to explain how the Yamada disclosures remedy the basic defect in the stated rejection, we are constrained to reverse the rejection of the appealed claims under 35 USC § 103.

The decision of the examiner is reversed.

**REVERSED**

JOHN D. SMITH  
Administrative Patent Judge

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TERRY J. OWENS	)	
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