

The opinion in support of the decision being entered today was *not* written for publication and is *not* binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* ALLAN E. HOKANSON, DEREK WILLIAMS,  
and CHRISTOPHER S. WILLIAMS

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Appeal 2007-1000  
Application 10/315,842  
Technology Center 1700

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Decided: March 23, 2007

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Before EDWARD C. KIMLIN, CHARLES F. WARREN, and  
LINDA M. GAUDETTE, *Administrative Patent Judges*.

KIMLIN, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 1-12. Claim 1 is illustrative:

1. A method of producing phosphoric acid from phosphate ore comprising: mixing a carbon source, sulfur and silica with the phosphate ore to form a phosphate mixture; mixing sufficient quantities of the sulfur with the phosphate ore mixture to where the sulfur makes up approximately 0.5 to 4.0 percent of the phosphate mixture by weight; heating the mixture to a

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temperature of 1200°C - 1375°C; reacting the sulfur, silica and carbon with the phosphate ore such that the resulting reactions of both carbon and sulfur with the phosphate ore reduce the phosphorous content in the phosphate ore by 95% to form phosphorous gas which is ultimately oxidized to phosphorus pentoxide, wherein the reduction of the phosphate ore occurs within said temperature range and within a residency time period of two hours or less; and converting the phosphorus pentoxide to phosphoric acid.

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

Lapple	US 3,235,330	Feb. 15, 1966
Galeev	SU 1,370,073	Jan. 30, 1988

Appellants' claimed invention is directed to a method of producing phosphoric acid from phosphate ore. The method involves mixing a source of carbon, sulfur, which may be in the carbon source, and silica with the phosphate ore, and heating the mixture at the recited temperature to react the components such that the phosphorus content in the ore is reduced by 95% in the formation of phosphorus gas. The phosphorus gas is oxidized to phosphorus pentoxide which is then converted to phosphoric acid.

Appealed claims 1-12 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Lapple in view of Galeev.

Appellants have not set forth an argument that is reasonably specific to any particular claim on appeal. Accordingly, all the appealed claims stand or fall together with claim 1.

We have thoroughly reviewed each of Appellants' arguments for patentability, as well as the Declaration evidence relied upon in support thereof. However, we are in complete agreement with the Examiner's

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thorough analysis and application of the prior art, as well as her cogent 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.

Appellants do not dispute the Examiner's factual determination that Lapple, like Appellants, discloses a method for producing phosphoric acid from a phosphate ore by mixing the phosphate ore with a carbon source and silica, heating the mixture in a rotary kiln to a temperature in the range of 1200°-1500°C to produce phosphorus gas, and oxidizing the phosphorus gas to phosphorus pentoxide, which is then removed to form phosphoric acid. As recognized by the Examiner, Lapple is silent with respect to the carbon source containing any sulfur. However, Appellants also do not dispute the Examiner's factual finding that Galeev teaches a method for producing phosphorus from a mixture of phosphate ore, silica, and a source of carbon, petroleum coke, that contains high levels of sulfur, and Galeev teaches that sulfur enhances the amount of extraction of phosphorus from the ore. Accordingly, based on the uncontested findings of the Examiner regarding the disclosures of Lapple and Galeev, we fully concur with the Examiner that it would have been obvious for one of ordinary skill in the art to utilize a carbon source containing relatively high levels of sulfur in the process of Lapple to enhance the amount of phosphorus extracted from the ore.

The principal argument advanced by Appellants is that if petroleum coke having a high sulfur content is used in the Lapple process, "the extreme

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heat - 500°C to °1000C - that the petroleum coke will be exposed to prior to reaching the kiln 46 will cause any sulfur in the petroleum coke to vaporize and not be present in the kiln to increase phosphorus extraction efficiency” (principal Br. 4, second para.). The Astley Declaration is offered to support the argument that sulfur will vaporize in the Lapple process before the coke reaches the kiln. However, the Examiner has effectively refuted Appellants’ argument.

First, the Examiner correctly points out that Lapple expressly teaches that adding carbon by means of a fluid bed coater at elevated temperatures is only a preferred way of adding the carbon. The reference explains that pelletizing coal or coke with water is not desirable because the defluorinated particles do not possess good binding characteristics but that “if pelletizing is desired, an extraneous binding material other than water must be used to form acceptable pellets, which necessarily complicates the pelletizing operation” (col. 4, ll. 40-42). Consequently, if, as argued by Appellants, one of ordinary skill in the art would have understood that pretreating the coke at elevated temperatures would remove the sulfur, it would have been a matter of obviousness for one of ordinary skill in the art to perform a cost/benefit analysis in weighing the advantage of using sulfur to enhance the extraction of phosphorus against the disadvantage of complicating the pelletizing operation. Also, the Examiner properly points out that Appellants themselves preheat pellets of silica, a carbon source containing sulfur, and phosphate ore at 500°C without vaporizing and

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removing the sulfur content. Consequently, it logically follows that performing the Lapple process with a fluid bed coater at about 500°C, as taught by the reference, would necessarily retain the sulfur in the carbon source. As has often been said, what's sauce for the goose is sauce for the gander. *In re Myers*, 401 F.2d 828, 830, 159 USPQ 339, 341 (CCPA 1968). Manifestly, one of ordinary skill in the art would know the proper temperature to operate the fluid bed coater of Lapple in order to retain the sulfur in the carbon source and achieve the benefit of enhanced phosphorus extraction taught by Galeev.

Moreover, as set forth by the Examiner, Lapple specifically teaches that “[i]n the event the phosphorus values are to be recovered in the form of P<sub>2</sub>O<sub>5</sub>, it is preferred that the P<sub>2</sub>O<sub>5</sub> be formed by my direct, one-step process” wherein feed enters the kiln along with free coke (col. 5, ll. 3-5). Based on the Galeev disclosure of including sulfur in the reaction mix, it would have been obvious for one of ordinary skill in the art to utilize conventional sulfur-containing coke as the free coke in the process of Lapple.

Appellants contend in their Reply Brief that “[t]he Examiner has presented no evidence that the temperature range in the fluid bed coater 36 would not vaporize sulfur” (Reply Br. 1). However, the Examiner has made the case that the 500°C pretreatment disclosed in Appellants’ own specification is within the temperature range disclosed by Lapple.

Appellants also maintain that “[t]he Examiner has not indicated any other place in the Lapple process where the sulfur containing carbon source

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would be injected” (Reply Br. 3, second para.). Appellants further maintain that:

If it would be obvious to a person of ordinary skill in the art to mix the sulfur-containing carbon source with phosphate ore an [sic, and] inject it at any other point in the Lapple process, then it is incumbent upon the Examiner to point out the specific place in the process where it would be added, and further why a person of ordinary skill in the art would be motivated to do so.

(Reply Br. 3, third para.). However, as noted above, the Examiner particularly cited Lapple at column 5, lines 3 *et seq.* for the disclosure of a preferred method of adding free coke directly to the kiln. As for the requisite motivation, we emphasize, at the risk of redundancy, that one of ordinary skill in the art would have been motivated to employ a sulfur-containing coke for the benefits described by Galeev, as would also have been motivated to operate the fluid bed coater at about 500°C.

In conclusion, based on the foregoing and the reasons well stated by the Examiner, the Examiner’s decision rejecting the appealed claims is affirmed.

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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) (2006).

AFFIRMED

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