

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(2) is not binding precedent of the Board.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. 23

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte NOBUHIRO FURUKAWA, MASAHISA FUJIMOTO,
NORIYUKI YOSHINAGA and KOJI UENO

Appeal No. 1996-2805
Application 08/103,055¹

ON BRIEF

Before JOHN D. SMITH, WARREN, and KRATZ, Administrative Patent Judges.

JOHN D. SMITH, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal pursuant to 35 U.S.C. § 134 from the

¹Application for patent filed August 9, 1993. According to applicants, the application is a continuation of Application 07/850,525, filed March 13, 1992, abandoned.

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final rejection of claims 11 through 15, 17 through 22, and 24. Claims 1 through 10, 16 and 23 have been cancelled during prosecution of this application.

Claims 11 and 15 are representative and are reproduced below:

11. A secondary cell, comprising:

a positive electrode;

a negative electrode formed from materials other than lithium metal; and

a non-aqueous electrolytic solution,

said negative electrode being composed of a carbon material obtained by carbonizing a natural polymer at a temperature of from 500°C to 1000°C and having a crystallite size L_c of 10 Angstroms or less when analyzed by x-ray diffraction.

15. In a method of producing a secondary cell comprising a positive electrode, a negative electrode and a non-aqueous electrolytic solution, the improvement wherein the negative electrode is produced by a process which comprises carbonizing a natural polymer at a temperature of from 500°C to 1000°C to provide a carbon material having a crystal thickness L_c of 10 Angstroms or less when analyzed by x-ray diffraction, the negative electrode being formed from materials other than lithium metal.

The reference of record relied upon by the examiner is:

Hayashi et al. (Hayashi) 4,615,959 Oct. 7,
1986

The appealed claims stand rejected under 35 U.S.C. § 103

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as unpatentable over Hayashi.

We cannot sustain the stated rejection.

The subject matter on appeal is directed to a secondary cell which utilizes a negative electrode which is not made of lithium. As set forth in appealed claim 11, appellants' negative electrode is composed of a carbon material obtained by carbonizing a natural polymer at a temperature of from 500EC to a 1000EC and having a crystallite size LC of 10D or less when analyzed by x-ray diffraction. As clearly set forth in each of the appealed claims, appellants' negative electrode is formed from materials "other than lithium metal." More particularly, appellants have allegedly discovered that the attainment of a desired crystal thickness for their claimed carbonized carbon negative electrode prevents undesired side reactions (apparently typical for prior art lithium secondary cells) which can lead to decomposition of the electrolytic solution in the cell. Thus, appellants' claimed secondary cell is said to enjoy very high charge/discharge efficiencies as contrasted to secondary cells which use lithium for the negative electrode which suffer from the disadvantage of inferior charge/discharge cycle

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characteristics.

As evidence of obviousness of the herein claimed subject matter, the examiner relies on the Hayashi patent. Although each of the appealed claims requires a negative electrode formed from materials other than lithium metal, Hayashi's invention is directed to a secondary cell using a negative electrode formed from lithium. Referring to Figure 1 of Hayashi, it can be seen that the negative electrode of the Hayashi cell specifically includes lithium metal 7 along with carbonaceous material 6. Indeed, the entire object of Hayashi is the improvement of a lithium-containing cell. Thus, nothing in the Hayashi reference suggests any reason to use the prior art carbonaceous materials without lithium metal.

Referring to the disclosure of Hayashi at column 1, lines 12 through 15, which indicates that a secondary cell formed from a conjugated pyrolysis residue of a high polymer has been used as either the anode or a cathode as proposed in Japanese Patent Publication No. 58-93176 published June 2, 1983, the examiner contends that the elimination of lithium from the Hayashi patented secondary cell represents nothing more than the

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substitution of known anode components. However, as persuasively argued by appellants, the use of a lithium electrode is at the heart of the Hayashi patented invention. Accordingly, the modifications of the Hayashi electrode in the manner suggested by the examiner run directly contrary to the specific teachings of the Hayashi patent.

In light of the above, we cannot sustain the stated rejection of the appealed claims based on Hayashi.

REMAND TO THE EXAMINER

Appellants emphasize in their brief at page 7 that the non-applied Japanese Patent Publication No. 58-93176, referred to above, is directed to the pyrolysis of synthetic polymers to form cathodes and anodes in a secondary battery or cell. Appellants contend that nothing in this publication suggests any criticality in obtaining and using a carbon material having a crystallite size of 10D or less, much less how to select the proper starting materials and processing conditions to obtain such a material. However, we remand this application to the examiner to consider whether or not based on product-by-process principles and the legal principles regarding inherency as set forth in In re Best, 562 F.2d 1252,

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1255, 195 USPQ 430, 433, (CCPA 1977), appealed "product-by-process" claims 11 through 14 and 21 should be rejected over Japanese Patent Publication No. 58-93176. In this regard, the examiner should fully consider embodiment 1 of the Japanese Patent Publication (page 6 of the translation of this publication) which relates to the pyrolysis of a polybenzoxazole imide material to produce a film used as a negative electrode in a secondary cell. Specifically, the examiner should note that the temperature of the pyrolysis heat process for treating this polymer was raised at a certain rate so that it reached a set temperature of 950EC in two hours. In considering the relevance of the Japanese publication and specifically the Example 1 embodiment of this publication, the examiner should be aware that the comparative testing set forth in the Fujimoto 37 CFR § 1.132 declaration only compares nylon and phenol resin carbonized polymers which are carbonized at a temperature of 1000EC. See Table 2 of the Fujimoto declaration which reports the Lc for these materials. Thus, Example 1 of the Japanese Patent Publication No. 58-93176 is closer prior art than the tested examples with respect to the claimed carbonization

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temperature range of from 500EC to 1000EC.

In summary, the stated rejection of the appealed claims under Section 103 of the statute based on the disclosures in Hayashi is reversed. This application is remanded to the examiner to reconsider the product-by-process claims on a claim-by-claim basis in light of the disclosures of the Japanese Patent Publication No. 58-93176.

This application, by virtue of its "special" status requires an immediate action. Manual of Patent Examining Procedure

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§ 708.01 (7th Ed., July 1998). It is important that the Board be informed promptly of any action affecting the appeal in this case.

REVERSED AND REMANDED

JOHN D. SMITH)	
Administrative Patent Judge)	
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)	
)	BOARD OF PATENT
CHARLES F. WARREN)	APPEALS AND
Administrative Patent Judge)	INTERFERENCES
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)	
PETER F. KRATZ)	
Administrative Patent Judge)	

JDS:svt

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