

DECISION OF THE COMMISSIONER

IN THE MATTER OF a request for a review by the
Commissioner of Patents of the Examiner's Final
Action under Section 47 of the Patent Rules (prior
to the Amendment by Order-in-Council P.C. 1970-728
effective June 1, 1970.).

AND

IN THE MATTER OF a patent application serial number
926,815 filed March 29, 1965 for an invention entitled:

FUEL CELL APPARATUS AND METHOD

Patent Agent for Applicant: Messrs. Alex E. MacRae & Co.
Ottawa, Ontario.

In accordance with the request of the applicant in his letter of
May 29, 1970 the examiner's Final Action under Section 47 of the Patent Rules
(prior to amendment by order-in-council P.C. 1970-728 effective June 1, 1970)
has been reviewed by the Patent Appeal Board. It might be noted that appli-
cant did not wish to appear before the Patent Appeal Board.

This application relates to Fuel Cell Apparatus and Method or more
specifically Claim 16, which has been finally rejected, claims a fuel cell
which includes three significant elements:

- a) a molten, substantially anhydrous medium ... of
alkali-metal hydroxides and carbonates,
- b) in contact with an aluminum member, and
- c) means for holding (a) and (b) at a temperature
at which (a) continuously remains both molten
and substantially anhydrous.

In the Final Action under Rule 47 the examiner rejected Claim 16 in
view of U.S. Patent No. 2,244,526 to MacKay and further that the subject
matter of the claim 16 was beyond the scope of the invention.

Upon review of the grounds for rejection set forth by the examiner,
as well as all the arguments presented by the applicant, I am not satisfied
that the rejection of claim 16 is well founded.

The reference to MacKay refers to the "Process of Treating Metal Surfaces"
and more specifically is concerned with forming a coating on articles such as
aluminum by dipping such articles in a molten bath with a temperature range

of 500-900°F for one to two minutes. It is apparent that the Mackay method requires the formation of a coating that is produced by a chemical attack upon the metal itself. I quote from page 2 column 1, line 7 of the Mackay reference: "The molten bath reacts with the metal to produce a very strongly adherent coating practically integral with the metal". Now on the other hand the present invention is concerned with the avoidance of any attack on the aluminum while in contact with molten alkali metal hydroxides. In my opinion the teachings of the Mackay reference are almost diametrically opposed to the subject matter claimed in this application.

According to the first objection of the examiner and in his words, only one question has to be resolved: Is the bath in the Mackay reference considered to be an anhydrous bath? The examiner contends that the molten bath of Mackay would be anhydrous in view of the fact of the temperature range used. I find no proof of this. In fact in the affidavit by Dr. Juda, he states that the fuel cell was operated at a temperature of 500°C for three hours to ensure critical anhydrous conditions which is an absolute requirement of the present invention if corrosive attack upon aluminum by the electrolyte is to be avoided. Furthermore, I find no suggestion in the Mackay patent which would teach the necessity for an anhydrous bath, indeed, I find that an anhydrous bath would be detrimental to the process of Mackay as there would be no reaction with the aluminum which is a prime requirement in the Mackay process. In view of this, I maintain that the bath of Mackay would not be considered as an anhydrous bath; therefore, I am satisfied that the reference does not disclose the combination set forth in Claim 16.

- a) a molten, substantially anhydrous medium of alkali-metal hydroxides and carbonates,
- b) in contact with an aluminum member, and
- c) means for holding (a) and (b) at a temperature at which (a) continuously remains molten and substantially anhydrous.

The subject matter disclosed, that untreated ordinary aluminum can continuously be maintained in contact with alkali-metal hydroxides and carbonates, is all the more surprising because of the well-recognized teaching and experience in the chemical arts that alkali-metal hydroxides and carbonates rapidly attack aluminum. This disclosure is directly contrary to previous teachings in the fuel cell art that aluminum metal can not be employed in fuel cells employing alkali-metal hydroxide or carbonate electrolytes.

The examiner also rejected claim 16 in that it was beyond the scope of the invention.

In a discussion with the examiner he stated that he was concerned with division when he referred to claim 16 as being beyond the scope of the invention. I therefore agree with the examiner to the extent that Claim 16 is not beyond the scope of the disclosure. Any determination with respect to

to division will be made when prosecution is resumed.

I recommend that the 'rejections against Claim 16, taking special note of the explanation in the previous paragraph, should be withdrawn.

R.E. Thomas,
Chairman, Patent Appeal Board.

I concur with the findings of the Patent Appeal Board and I am therefore setting aside the Final Action and returning the application to the examiner for resumption of prosecution.

Decision accordingly,

A.M. Laidlaw,
Commissioner of Patents.

Dated at Ottawa, Ontario
this 9th day of November, 1970.