

***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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.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. 18

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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***Ex parte*** GEORGE R. LESTER and STEPHEN T. HOMEYER

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Appeal No. 1996-2077  
Application 08/271,922

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ON BRIEF

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Before GARRIS, ELLIS and WALTZ, ***Administrative Patent Judges***.

ELLIS, ***Administrative Patent Judge***.

***DECISION ON APPEAL***

This is an appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 1 through 20, all the claims remaining in the application. Claim 10 and 15 are illustrative of the subject matter on appeal and read as follows:

10. A method of destroying atmospheric pollutants by oxidation comprising passing air containing pollutants through a monolithic catalytic converter comprising

(a) a unitary aluminum or aluminum alloy support within a housing providing tortuous flow paths for gases passing over said support and having an integral anodized surface layer at least 2  $\mu\text{m}$  thick, said support comprising one or more plate fin elements having a plurality of fins arranged in an axial succession of offset fin rows, said anodized surface layer being formed by anodizing at a temperature of about 30°-37°C, followed by washing and optionally calcining at a temperature of about 150° to 540° C;

(b) one or more Group VIII noble metals and optionally base metals from Groups Ib, IIb, IIIa, IVa, Va, VIa, VIIa and VIII disposed on and within said anodized surface layer of (a).

15. A monolithic catalytic converter comprising

(a) a unitary aluminum or aluminum alloy support within a housing providing tortuous flow paths for gases passing over said support and having an integral anodized surface layer at least 2  $\mu\text{m}$  thick, said support comprising one or more plate fin elements having a plurality of fins arranged in an axial succession of offset fin rows, said anodized surface layer being formed by passing a direct current of about 9 amps/ft<sup>2</sup> and about 8 to 15 volts through said aluminum or aluminum alloy support as an anode in an electrolytic bath comprising 5-20 wt. % aqueous sulfuric acid at a constant temperature of about 30° to 37°C, and thereafter washing said anodized surface layer with water and optionally calcining at a temperature in the range of 150° to 540°C;

(b) one or more Group VIII noble metals and optionally base metals from Groups VIII, IIIa, and VIIa disposed on and within said anodized and calcined surface layer of (a).

The references relied upon by the examiner are:

Carr et al. (Carr)	4,405,507	Sep. 20, 1983
Moskovits	4,472,533	Sep. 18, 1984
Cornelison et al. (Cornelison)	4,672,809	Jun. 16, 1987

Appeal No. 1996-2077  
Application 08/271,922

Derwent Abstract No. J49098343 (JP 52-048594), "Anodised Aluminium Catalytic Support - Useful in Automobile Exhaust Catalytic Converters."<sup>1</sup>

D. Honicke (Honicke), "Formation of Al<sub>2</sub>O<sub>3</sub> -Coated Catalyst with a Metallic Core by Anodic Oxidation of Aluminium", ***Applied Catalysis***, Vol. 5, pp. 179-198 (1983).

Yamada, et al. (Yamada), "Preparation and Catalytic Properties of Alumina Films by Anodic Oxidation of Aluminum", ***8th International Congress on Catalysis***, Vol IV, pp. IV835-IV846 (1984).

The claims stand rejected as follows:

Claims 1 through 12 and 15 through 20 stand rejected under 35 U.S.C. § 103 as being unpatentable over Carr in view of either Yamada or Honicke or Moskovits and Cornelison.

Claims 13 and 14 stand rejected under 35 U.S.C. § 103 as being unpatentable over Carr in view of either Yamada or Honicke or Moskovits and Cornelison in further view of J49098343 (JP 52-048594).<sup>2</sup>

We have carefully considered the entire record which includes, ***inter alia***, the

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<sup>1</sup> We point out that the Abstract does not indicate the date on which it was published by Derwent.

<sup>2</sup> Although the examiner's statement of the rejection indicates that he is rejecting the claim 13 and 14 over JP 52-048594, we do not find any evidence that he ever considered the Japanese patent. Rather, he only relied on an abstract of JP 52-048594 published by Derwent.

Appeal No. 1996-2077  
Application 08/271,922

specification, the appellants' main Brief (Paper No. 12) and Reply Brief (Paper No. 14) as well as the examiner's Answer (Paper No. 13) and Supplemental Answer (Paper No. 15), and we find ourselves in substantial agreement with the appellants' position. Accordingly, we **reverse** both rejections.

### ***Discussion***

The present invention is directed to monolithic catalytic converters and their use for destroying ozone and other atmospheric pollutants, as well as a method of preparing an anodized catalytic layer on the surface of an aluminum or an aluminum alloy. The catalytic converters are said to be lightweight, compact devices useful in reducing or eliminating ozone in the air supplied to aircraft cabins. Specification, p. 3.

The examiner has premised his conclusion of obviousness primarily on the teachings of Carr and Cornelison in conjunction with either one of Yamada, Honicke or Moskovits. According to the examiner, Carr discloses "an aluminum carrier or support having a plurality of flow-through channels oriented in the general direction of gas flow, at least one platinum group metal including platinum, palladium, rhodium ... and at least one nonprecious group VIII metal oxide or aluminate, such as an oxide or aluminate of iron, cobalt or nickel forming a thin deposit on the support... ." Answer, p. 4. The examiner argues that "The apparatus and method of Carr et al[.] are substantially the same as the instantly claimed," but he acknowledges that neither the anodized surface layer of the aluminum support, nor the specific structure of the support are disclosed. ***Id.***

Appeal No. 1996-2077  
Application 08/271,922

To compensate for the latter deficiency, the examiner turns to Cornelison, which discloses a catalytic converter for diesel engines which traps particulates in exhaust gas. Cornelison, col. 1, lines 11-15. The examiner relies on the disclosure of Cornelison of a catalytic converter comprising at least one strip of metal which “defines a tortuous flow path for exhaust gas from the engine.” *Id.*, col. 2, lines 19-20. As his initial premise, the examiner states that

It would have been obvious to one having ordinary skill in the art to provide a specific structure for the catalytic support in the modified apparatus of Carr et al[.] as taught by Cornelison et al[.] to provide a tortuous flow path for the exhaust gas for increasing contacting surface area of the gas with the catalyst thereof, thereby providing a more efficient and complete catalytic reaction between ozone-containing gas and the catalyst material thereof [ Answer, p. 5].

It is this initial premise, on which all of the examiner’s conclusions of obviousness are based, which we find to be fatally defective.

It is well established that the examiner has the initial burden under § 103 to establish a ***prima facie*** case of obviousness. ***In re Oetiker***, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992); ***In re Piasecki***, 745 F.2d 1468, 1471-72, 223 USPQ 785, 787-88 (Fed. Cir. 1984). To that end, the examiner must show that some objective teaching or suggestion in the applied prior art, or knowledge generally available in the art would have led one of ordinary skill in the art to combine the references to arrive ***at the claimed invention***. ***Pro-Mold & Tool Co. v. Great Lakes Plastics, Inc.***, 75 F.3d 1568, 1573, 37 USPQ2d 1626, 1629 (Fed. Cir. 1996). Here,

we find no basis for the examiner's assertion that one of ordinary skill in the art would have been motivated to modify the support for the catalytic converter described by Carr to include a tortuous flow path in the manner described by Cornelison. Cornelison teaches that the objective of the alternating series of U bends in the metal strip in the catalytic converter disclosed therein, is to allow the slow build up and retention of particles in the converter so that they can be burned off intermittently. Cornelison, col. 4, lines 40-56. This design enables the particles in diesel exhaust to be distributed throughout the converter so that the "pressure drop" (the difference in pressure at the input end and the pressure at the output end of the converter) builds up slowly, thus allowing the engine to function more efficiently. *Id.*, and at col. 1, line 64- col. 2, line 9. Cornelison does not teach or suggest that this design would provide a more efficient and complete catalytic reaction between the exhaust gas and the oxidation catalyst which coats the strip. Thus, it is not clear to us how the examiner arrives at his conclusion that such a modification would provide a more efficient and complete catalytic reaction between an ozone-containing gas and an ozone-decomposition catalyst. Moreover, it is not clear to us that one of ordinary skill in the art of ozone converters would be motivated to turn to the art of catalytic converters for diesel engines to arrive at the claimed invention. On this record, the only place where we find a suggestion to modify a support for a catalytic converter capable of destroying ozone with a "plurality of fins arranged in an axial succession of offset fin rows" to provide a tortuous flow path for gases, is in the appellants' specification. Thus, we find

Appeal No. 1996-2077  
Application 08/271,922

that, from the outset, the examiner relied on impermissible hindsight in making his determination of obviousness. *In re Fritch*, 972 F.2d 1260, 1266, 23 USPQ2d 1780, 1784 (Fed. Cir. 1992)(“It is impermissible to engage in hindsight reconstruction of the claimed invention, using the applicant’s structure as a template and selecting elements from references to fill the gaps”); *Interconnect Planning Corp. v. Feil*, 774 F.2d 1132, 1138, 227 USPQ 543, 547 (Fed. Cir. 1985); *W.L. Gore & Assocs. v. Garlock, Inc.*, 721 F.2d 1540, 1553, 220 USPQ 303, 312-313 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984)(“To imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge, is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher”).

Moreover, as noted by the examiner in his rejection, the design of the support is not the only difference between the structure and method of decomposing ozone described by Carr and the present invention. Carr does not disclose an aluminum or aluminum alloy support having an anodized surface layer at least 2  $\mu\text{m}$  thick wherein said anodized surface layer is formed by anodizing at a temperature of about 30E-37E C. In attempting to compensate for these deficiencies the examiner relies on the teachings of either Yamada, Honicke or Moskovits. Answer, p. 5. The examiner argues that Yamada and Honicke disclose a method of making an aluminum oxide layer by anodic oxidation of aluminum in diluted acids such as sulfuric or phosphoric acid in a direct current of about 9 amps/ft<sup>2</sup> and

Appeal No. 1996-2077  
Application 08/271,922

10 volts at room temperature. *Id.* The examiner further argues that Moskovits discloses a method of making an aluminum oxide layer by anodic oxidation of aluminum in an acid electrolyte, such as 10% sulfuric acid or phosphoric acid “at a current and voltage suitably adjusted to provide a correct film deposition (i.e., 14 mA/cm<sup>2</sup>, 14 V, room temperature).”

*Id.*

These additional references do nothing to remedy the deficiencies in the rejection as discussed above. Moreover, contrary to the examiner’s argument, we find no teaching or suggestion in the applied prior art to employ an anodized aluminum as a catalyst support having the limitations required by the claims. For example, the examiner has brushed aside limitations such as the thickness of the anodized surface layer and that the anodization be performed at a temperature of about 30E-37E C, alleging that they are result effective variables. Answer, p. 6. However, as pointed out by the appellants, the teachings of Example 6 demonstrate the criticality of the claimed temperature range on the performance of the resulting catalyst. We find the examiner’s failure provide a substantive response to this argument to be improper.

Accordingly, the rejection is reversed.

In view of our disposition of this case, a discussion of the examiner’s rejection of claims 13 and 14 would be superfluous. That is, given our disposition of claim 10, the claim on which claims 13 and 14 depend, it logically follows that the rejection of these claims is also reversed since the abstract of JP 52-048594 does not remedy the

Appeal No. 1996-2077  
Application 08/271,922

deficiencies noted above.

***Other Issues***

Upon return of the application to the corps, the examiner should consider whether the conjunctive “and” should be added to claims 1, 5, 10 and 15, following subsection (a); and to claim 20, following subsection (c).

***REVERSED***

BRADLEY R. GARRIS	)	
Administrative Patent Judge	)	
	)	
	)	
	)	BOARD OF PATENT
JOAN ELLIS	)	APPEALS AND
Administrative Patent Judge	)	INTERFERENCES
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	)	
THOMAS A. WALTZ	)	
Administrative Patent Judge	)	

Appeal No. 1996-2077  
Application 08/271,922

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Appeal No. 1996-2077  
Application 08/271,922

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