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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.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. 10

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte LESTER P. BERRIMAN, JOHN M. ZABSKY, JAMES W. DAVIS and WILLIAM M. HYLTON

Appeal No. 96-0326
Application 08/083,657[1]

ON BRIEF

Before COHEN and McQUADE, Administrative Patent Judges, and CRAWFORD, Acting Administrative Patent Judge.

McQUADE, Administrative Patent Judge.

DECISION ON APPEAL

This appeal is from the final rejection of claims 1 and 3, all of the claims pending in the application.

[1] Application for patent filed June 28, 1993. According to appellants, this application is a continuation-in-part of Application 07/701,497, filed May 16, 1991, now Patent No. 5,224,346 issued July 6, 1993.

The invention relates to an apparatus for injecting ammonia into the exhaust system of an internal combustion engine to reduce the nitrogen oxide content of the exhaust gas. A copy of claims 1 and 3 as submitted with the appellants' brief is appended hereto.

The references relied upon by the examiner as evidence of anticipation and obviousness are:

Nohira et al. (Nohira)	3,779,014	Dec. 18, 1973
Gladden	4,403,473	Sep. 13, 1983

Claims 1 and 3 stand rejected:

a) under 35 USC 102(b) as being anticipated by Gladden; and

b) under 35 USC 103 as being unpatentable over Gladden in view of Nohira.

With regard to the first of these rejections, anticipation is established only when a single prior art reference discloses, expressly or under principles of inherency, each and every element of a claimed invention. RCA Corp. v. Applied Digital Data Systems, Inc., 730 F.2d 1440, 221 USPQ 385 (Fed. Cir. 1984)).

Gladden discloses an engine 10 having a plurality of combustion chambers 14. The combustion chambers communicate with a conventional catalytic converter 26 via an exhaust manifold 22 and a gas stream conduit 24. In order to reduce the

concentration of noxious nitrogen oxides in the exhaust, Gladden provides an ammonia injection device 32 which injects ammonia into the conduit 24 through a nozzle or check valve 48. The ammonia reacts with the nitrogen oxides to form nitrogen gas and water vapor, thereby reducing the concentration of the nitrogen oxides.

Claim 1 recites an apparatus comprising, inter alia, a conduit coupling the exhaust valves of a power-generating portion of an engine to a catalytic converter device, and a device which injects ammonia into the conduit at an inject location. The conduit includes a manifold connected to the exhaust valves and a downstream conduit portion connecting the manifold to the catalytic converter device. The inject location is required to lie in the manifold spaced from the exhaust valves but at a location where exhaust gases are very hot.

Claim 3 is similar to claim 1 in that it recites an engine comprising, inter alia, a conduit having an upstream end connected to the exhaust valves of a power-generating portion of the engine[2] and a downstream end connected to a catalytic converter device, and an ammonia injecting device coupled to the

[2] The term "said exhaust valves" in claim 3 lacks a proper antecedent basis in that it appears in the claim prior to the recitation that the power-generating portion of the engine includes a plurality of exhaust valves. This informality is deserving of correction in any further prosecution before the examiner.

conduit. The conduit includes a manifold having an upstream end connected to the exhaust valves and a downstream end, and a tube connecting the downstream end of the manifold to the catalytic converter device. The ammonia injecting device is required to be positioned to inject ammonia into the upstream end of the manifold.

Gladden's exhaust manifold 22 and a gas stream conduit 24 correspond, respectively, to the manifold and downstream conduit portion/tube recited in claims 1 and 3. Gladden's ammonia injecting device, however, is connected to the gas stream conduit and therefore does not meet the limitations in claims 1 and 3 requiring the ammonia inject location to lie in the manifold (claim 1) or the ammonia injecting device to be positioned to inject ammonia into the upstream end of the manifold (claim 3). The examiner's position to the contrary (see pages 3 and 4 in the answer) is not persuasive because it is based on an unreasonable interpretation of the Gladden reference. In this regard, the examiner has arbitrarily characterized part of Gladden's gas stream conduit as being a manifold and part of Gladden's catalytic converter device as being a downstream conduit portion/tube. This interpretation is clearly at odds with the express teachings of the Gladden reference.

Thus, Gladden does not disclose each and every element of the invention recited in claims 1 and 3. Accordingly, we

shall not sustain the standing 35 USC 102(b) rejection of these claims as being anticipated by Gladden.

Nor shall we sustain the standing 35 USC 103 rejection of claims 1 and 3 as being unpatentable over Gladden in view of Nohira.

Nohira discloses an engine exhaust emission control device wherein

> [e]xhaust ports 1 of an engine E are directly connected to a reductive reaction chamber 2. Mounted on exhaust ports 1 is a hydrogen supply line 4 which supplies hydrogen from a hydrogen producing means 3 and ejects the same against the ports. An injection pump 5 is mounted on line 4 [column 3, lines 8 through 13].

The hydrogen reacts with the exhaust gas from the engine in the reaction chamber 2 to reduce the concentration of nitrogen oxides therein.

Allowing that Gladden might not teach the ammonia injection location limitations discussed above in connection with the 35 USC 102(b) rejection, the examiner concludes that "[i]t would have been obvious to one skilled in the art to inject hydrogen containing ammonia further upstream in manifold 22 of Gladden to reduce NOx in view of the Nohira showing that it is desirable to do so" (answer, pages 3 and 4).

Nohira, however, shows no such thing. Nohira's use of injected hydrogen to reduce the nitrogen oxides concentration in

engine exhaust gas differs substantially from Gladden's use of ammonia to do the same, and would not have suggested modifying the Gladden apparatus in the manner advanced by the examiner. The proposed combination of these references amounts to an impermissible hindsight reconstruction of the claimed invention based on a selective picking and choosing from among isolated disclosures in the prior art. Thus, Gladden and Nohira do not justify the examiner's conclusion that the subject matter recited in claims 1 and 3 would have been obvious within the meaning of 35 USC 103.

In summary and for the above reasons, the decision of the examiner to reject claims 1 and 3 under 35 USC 102(b) as being anticipated by Gladden and under 35 USC 103 as being unpatentable over Gladden in view of Nohira is reversed.

REVERSED

IRWIN CHARLES COHEN)
Administrative Patent Judge)
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JOHN P. McQUADE) BOARD OF PATENT
Administrative Patent Judge) APPEALS AND
) INTERFERENCES
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)
MURRIEL E. CRAWFORD, Acting)
Administrative Patent Judge)

Appeal No. 96-0326
Application 08/083,657

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1. Apparatus for use with an engine having a power-generating portion that burns a hydrocarbon fuel and air and produces hot exhaust gases, having a catalytic converter device that includes a catalyst for enhancing reactions of components of said exhaust gases, and having a conduit that couples said power-generating portion to said catalytic converter device, for reducing pollution in the exhaust, comprising:

a device coupled to said conduit, which stores ammonia and injects it into said conduit at an inject location, to mix with said hot exhaust gases and pass with them along said conduit and then through said catalyst;

said power-generating portion comprises a plurality of cylinders in which said fuel and air are burned, a mechanism for applying fuel and air to said cylinders, and a plurality of exhaust valves through which burned fuel and air is exhausted and which are connected to said upstream end of said conduit, said conduit including a manifold which includes a chamber that is connected to a plurality of said exhaust valves and a downstream conduit portion which connects said manifold to said catalytic converter device;

said inject location lies in said manifold to lie spaced from said exhaust valves but at a location where exhaust gases are very hot.

3. A low pollution engine comprising:

a power-generating engine portion that burns a hydrocarbon fuel and air and produces hot exhaust gases;

a catalytic converter device which includes a catalyst;

a conduit with an upstream end connected to said exhaust valves and a downstream end connected to said catalytic converter device;

a controllable ammonia injecting device which is coupled to said conduit and which stores ammonia and injects it at a controllable rate into said conduit to mix with said exhaust gases;

said power-generating engine portion includes a plurality of cylinders in which said fuel and air is burned, and a plurality of exhaust valves each coupling one of said cylinders to the upstream end of said conduit;

said conduit includes a manifold having an upstream end connected to a plurality of said exhaust valves and a downstream end, and a tube connecting said downstream end to said catalytic converter device;

said injecting device is positioned to inject ammonia into said upstream end of said manifold.