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

Paper No. 13

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte HSUEH-CHIA CHANG
and DAVID T. LEIGHTON

Appeal No. 1998-1133
Application 08/382,296

ON BRIEF

Before WARREN, OWENS and LIEBERMAN, *Administrative Patent Judges*.

OWENS, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal from the examiner's final rejection of claims 4, 7-11 and 14-22, which are all of the claims remaining in the application.

THE INVENTION

The appellants' claimed invention is directed toward a system and method for treating exhaust gases of an internal

combustion engine. Claims 21 and 22 are illustrative:

21. Exhaust gas treatment system for treating the exhaust gases of an internal combustion engine comprising:

an exhaust pipe;

a catalytic converter having an inlet and an outlet connected in said exhaust pipe for treating exhaust gases passing through said exhaust pipe;

an igniter in said exhaust pipe having an inlet and an outlet, the inlet of said catalytic converter being connected to the outlet of said igniter, said igniter including catalyst material for raising the temperature of the exhaust gases passing through said igniter to a temperature sufficient to ignite said
catalytic converter;

a bypass passage extending around said igniter to communicate exhaust gases directly to said catalytic converter bypassing said igniter;

a control valve in said exhaust pipe shiftable from a first position in which a first portion of said exhaust gases are directed through said bypass passage and a second portion of the exhaust gases are directed through said igniter, said first portion being greater than said second portion, to a second position in which substantially all of the exhaust gases are directed through said bypass passage; and

a controller responsive to the temperature within said catalytic converter for shifting said control valve between said first and second positions, said controller switching said valve to said first position after engine start but before ignition of said catalytic converter and to said second position after ignition of said catalytic converter.

22. Method of treating exhaust gases of an internal combustion engine comprising the steps of passing a first portion of said exhaust gases through an igniter containing a catalyst material, passing a second portion of the exhaust gases through a bypass passage bypassing said igniter, said second portion being greater than said first portion, permitting said catalyst within said igniter to increase the temperature of the exhaust gases passing through the igniter, passing the exhaust gases through a catalyst bed within a catalytic converter after said first portion of the exhaust gases has passed through the igniter and the temperature of the exhaust gas has been raised to a temperature to ignite the catalyst within the catalyst bed of the catalytic converter.

THE REFERENCES

Säufferer	3,440,817	Apr. 29, 1969
Rudy	5,010,051	Apr. 23, 1991
Dunne et al. (Dunne)	5,051,244	Sep. 24, 1991
Abe et al. (Abe)	5,296,198	Mar. 22, 1994

THE REJECTIONS

The claims stand rejected under 35 U.S.C. § 103 as follows: claims 4, 7, 8, 14-19, 21 and 22 over Rudy in view of Dunne and Säufferer, and claims 9-11 and 20 over these references further in view of Abe.

OPINION

We reverse the rejection of claims 4, 7-11 and 21, and affirm the rejection of claims 14-20 and 22.

The appellants state that the claims stand or fall in two groups: 1) claims 4, 7-11 and 21, and 2) claims 14-20 and 22 (brief, page 5). We therefore limit our discussion to one claim in each group, i.e., claims 21 and 22, which are the only independent claims. *See In re Ochiai*, 71 F.3d 1565, 1566 n.2, 37 USPQ2d 1127, 1129 n.2 (Fed. Cir. 1995); 37 CFR § 1.192(c)(7)(1995).[1]

Rejection of claim 21

The appellants' claim 21 requires a controller which is capable of switching a control valve to a first position in which a first portion of exhaust gases is directed through a bypass around an igniter, and a smaller second portion of exhaust gases is directed through the igniter, after engine start-up but before ignition of a downstream catalytic converter.

Rudy discloses upstream and downstream catalysts with no bypass (abstract).

Dunne discloses a system wherein, during desorption of

[1] Our discussion does not address Abe, which was applied to dependent claims to show an electrically actuated heater upstream of a catalyst (answer, page 6).

pollutants from an adsorbent bed, a major portion of exhaust gases is bypassed around the adsorbent bed and a minor portion of exhaust gases is passed through the adsorbent bed (abstract). Immediately downstream of the adsorbent bed can be positioned a catalyst bed whose major function is to convert hydrocarbons and carbon monoxide to carbon dioxide and water (abstract; col. 10, lines 1-14). The system is switched to this condition in which a minor portion of the exhaust gases is passed through the adsorbent bed and catalyst and the remaining exhaust gases is bypassed around these components, however, only after a downstream primary catalyst bed reaches a selected temperature which typically is 350-400EC (abstract; col. 6, lines 13-17). Dunne teaches that such a primary catalyst works quite well after it has reached an operating temperature of about 300EC (col. 1, lines 31-33; col. 5, lines 46-48), which indicates that Dunne’s system is capable of switching to the above condition only after ignition of the primary catalyst rather than beforehand as required by the appellants’ claim 21.

Säufferer discloses a system wherein a bypass (5) around a quick-warm-up catalytic unit (3) is closed during start-up

of an engine, and opens increasingly as soon as the catalyst in a downstream main catalytic unit (4) reaches its response temperature (col. 1, lines 15-19; col. 2, lines 55-58 and 66-70; col. 3, lines 66-71; col. 4, lines 18-23; col. 4, line 73 - col. 5, line 3). Thus, Säufferer's system is capable of bypassing the quick-warm-up catalytic unit only after the main catalytic unit reaches its ignition temperature, not beforehand as required by the appellants' claim 21.

The examiner interprets "ignition" in view of the appellants' specification as being the condition at which the exhaust gases about to enter the downstream catalytic unit are at about 700EK (427EC) (answer, page 7). The examiner relies (answer, page 7) upon statements in the appellants' specification that the exhaust gases are heated such that they are at a temperature of 700EK at the catalytic converter inlet (page 4, lines 1-4; page 6, lines 20-25; page 7, lines 2-5). The examiner argues that the catalytic converter response temperatures disclosed by Dunne and Säufferer of, respectively, 300EC (col. 1, lines 31-33) and 250-300EC (col. 3, lines 5-9), are below 700EK and that, therefore, Dunne and Säufferer bypass the upstream catalytic unit at a temperature

below what the appellants consider to be the temperature required for ignition (answer, page 8).

The appellants' specification does not specifically define "ignition". According to the appellants' specification, 700EK is the temperature at which an ordinary catalytic converter will rapidly ignite at its leading edge (page 2, lines 22-24). The specification indicates that poor light off behavior can be obtained at 600EK (327EC) (page 1, lines 26-28). When we give the term "ignition" its broadest reasonable interpretation in view of the specification, *see In re Zletz*, 893 F.2d 319, 321, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989); *In re Sneed*, 710 F.2d 1544, 1548, 218 USPQ 385, 388 (Fed. Cir. 1983), we find that it refers to the temperature at which the leading edge of a catalytic converter lights off.[2] As discussed above, contrary to the requirement of the appellants' claim 21, both Dunne and Säufferer disclose systems which require this temperature before the above-discussed bypass condition is reached.

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[2] The appellants' argument is consistent with this interpretation (reply brief, pages 2-3).

Accordingly, we conclude that the examiner has not carried the burden of establishing a *prima facie* case of obviousness of the system recited in claim 21. We therefore reverse the rejection of this claim and the claims which depend therefrom.

Rejection of claim 22

Dunne discloses a method for treating exhaust gases of an engine which can be an internal combustion engine (col. 4, lines 34-39). At a point in the method where hydrocarbons are being desorbed from an adsorbent bed which is followed by a catalytic bed (which corresponds to the appellants' igniter), a minor portion of the exhaust gases is passed through the adsorbent and catalytic bed, and a major portion of the exhaust gases is bypassed around the adsorbent and catalytic bed (abstract; col. 10, lines 1-14). The catalytic bed converts hydrocarbons and carbon monoxide to carbon dioxide and water (col. 10, lines 7-9). These combustion reactions necessarily increase the temperature of the exhaust gases passing through the catalytic bed. The exhaust gases from the catalytic bed are passed to a catalytic converter after the

temperature of the exhaust gases has been raised to a temperature to ignite the catalyst within the catalyst bed of the catalytic converter (abstract; col. 1, lines 31-33; col. 6, lines 14-18).

Säufferer discloses a method for treating exhaust gases of an internal combustion engine (col. 1, lines 23-25). When the engine is started, a bypass (5) around a quick-warm-up catalytic unit (which corresponds to the appellants' igniter) is closed (col. 4, lines 73-74). However, a valve (7) is opened increasingly by a heat sensitive device (12) in a downstream catalytic converter unit (4) as soon as the catalytic converter unit reaches its response temperature, until the largest portion of the exhaust gases bypasses the quick-warm-up catalytic unit (col. 3, lines 66-71; col. 4, lines 18-23; col. 4, line 73 - col. 5, line 3). The catalyst in the quick-warm-up catalytic unit increases the temperature of the exhaust gases passing through it (col. 3, lines 52-62). The exhaust gases from the quick-warm-up catalytic unit are passed to the catalytic converter after the temperature of the exhaust gases has been raised to a temperature to ignite the catalyst within the catalyst bed of the catalytic converter

(col. 4, lines 18-23; col. 4, line 75 - col. 5, line 3).

For the above reasons, the applied prior art would have fairly suggested, to one of ordinary skill in the art, the method recited in the appellants' claim 22.

The appellants argue that Dunne and Säufferer do not disclose bypassing any of the exhaust gases around an upstream unit at start-up (brief, page 10). The appellants' claim 22, however, does not require such bypassing at start-up. What the claim requires is that catalyst within an igniter is permitted to increase the temperature of exhaust gases passing through the igniter and that exhaust gases are passed through a catalyst bed within a catalytic converter after a first portion of the exhaust gases has passed through the igniter and the temperature of the exhaust gases has been raised to a temperature to ignite the catalyst within catalyst bed of the catalytic converter. As discussed above, both Dunne and Säufferer meet these requirements.

The appellants argue that Dunne's adsorbent zone is not a catalyst (reply brief, page 2). Dunne, however, teaches that a catalytic unit can be placed immediately after the adsorbent zone and before the primary catalytic unit (col. 10, lines 1-14).

For the above reasons we conclude that the method recited in the appellants' claim 22 would have been obvious to one of ordinary skill in the art within the meaning of 35 U.S.C. § 103. We therefore affirm the rejection of this claim and the claims which depend therefrom.

DECISION

The rejections under 35 U.S.C. § 103 of claims 4, 7, 8 and 21 over Rudy in view of Dunne and Säufferer, and claims 9-11 over these references further in view of Abe, are reversed. The rejections under 35 U.S.C. § 103 of claims 14-19 and 22 over Rudy in view of Dunne and Säufferer, and claim 20 over these references further in view of Abe, are affirmed.

No time period for taking any subsequent action in connec- tion with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED-IN-PART

CHARLES F. WARREN Administrative Patent Judge	)	
TERRY J. OWENS Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
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