

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

Paper No. 46

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte YASUHIRO TANIMURA, MASAKI KUZUMOTO, JUNJI HIROTSUJI,
SHIGEKI NAKAYAMA, OSAMU MATSUOKA and MASAO NOZAKI

Appeal No. 2001-2650
Application No. 08/808,639

ON BRIEF

Before LIEBERMAN, TIMM and PAWLIKOWSKI, Administrative Patent Judges.

PAWLIKOWSKI, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 2, 26, 27, and 30-35. Claims 1, 3-7, 21-25, 28, and 29 have been cancelled. Claims 8-20 have been withdrawn from consideration. A copy of the claims on appeal is set forth in the attached appendix.

The references relied upon by the examiner as evidence of unpatentability are:

Azuma et al.	4,462,965	Jul. 31, 1984
Shimizu et al. (Shimizu)	5,520,887	May 28, 1996

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Claims 2, 26 and 27 stand rejected under 35 U.S.C. § 103 as being unpatentable over Shimizu.¹

Claims 30-35 stand rejected under 35 U.S.C. § 103 as being unpatentable over Shimizu in view of Azuma.

On page 4 of the brief, appellants state that the claims are grouped as follows: Group (I) is directed to claims 2, 26 and 27, and Group (II) is directed to claim 30-35.

Appellants state that the claims of each group stand or fall separately from each other. On page 2 of the answer, the examiner states that appellants' brief includes a statement that claims 2, 26 and 27 are argued separately and do not stand or fall with claims 30-35. We therefore consider each of the independent claims 2, 26, 27, and 30. 37 CFR 1.192(c)(7) and (c)(8)(2000).

OPINION

I. The rejection of claims 2, 26, and 27

Appellants do not dispute the examiner's findings and conclusions with regard to the steps of producing ozone, storing, and taking out stored ozone, as recited in claim 2. Appellants argue that claim 2 is distinguishable because it requires that the ozone concentration in the compressed state is in a range of from 7 to 15% by weight. Appellants state that this recited range provides a 50% or greater ozone storage efficiency. (brief, pages 4-5).

¹ Claim 2 was inadvertently omitted from the statement of the rejection in the answer, as evidenced by the discussion of claim 2 in the body of the rejection in the answer at page 4. As appellants have recognized, claim 2 is rejected (brief, page 4; reply, pages 3-4). Hence, we include claim 2 in this rejection.

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On pages 7-8 of the answer, the examiner rebuts and states that Shimizu "discloses that the condensing system (which is the adsorption/desorption system), can have a higher ozone concentration than 10 vol.% (which corresponds to 14 wt.%)". The examiner states that 14 wt.% falls within appellants' claimed range of "7-15% by weight".

On the top of page 5 of the brief, appellants do not dispute that 10% by volume is equivalent to 14% wt. Appellants argue, however, that this amount does not relate to the "storage of ozone in a compressed state".

On page 2 of the reply brief, appellants acknowledge that the ozone generating and condensing apparatus of Shimizu includes **(1)** the oxygen generator 1, **(2)** ozonizer 2, **(3)** an ozone condensing unit 3 (which includes absorbing towers 7a and 7b), and **(4)** a reaction tower 4.

We find that because appellants acknowledge that absorbing towers 7a and 7b are part of the ozone generation and condensing apparatus, we find that when Shimizu discusses the ozone concentration of the ozone generating and condensing apparatus, this includes the ozone concentration found in the absorbing towers, which is a location involving the "storage of ozone in a compressed state".

Hence, we agree with the examiner's interpretation of Shimizu set forth at the bottom of page 7 through page 8 of the answer. We therefore agree with the examiner that Shimizu makes obvious the recitation "wherein ozone concentration of said ozonized gas upon storage thereof in the compressed state is set in a range of 7-15% by weight", as set forth in claim 2.

We therefore affirm the rejection of claim 2.

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With respect to the rejection of claims 26 and 27, our comments are set forth below.

On page 6 of the brief, appellants argue that claim 26 and 27 contain the limitations that the temperature of the absorbent is controlled when ozonized gas is absorbed, and that that the temperature of the absorbent is not controlled when the ozone is discharged.

On pages 4-5 of the answer, the examiner recognizes that Shimizu fails to specifically teach lack of temperature control in the adsorption/desorption towers upon desorption, however, the examiner states that it would have been obvious to have not controlled the temperature during the desorption step, because Shimizu discloses that the temperature is increased to desorb the ozone, and if the temperature were not controlled, it would have increased automatically, thereby facilitating the release of ozone. We find that the examiner has not supported this conclusion with evidence in the record.

Furthermore, appellants argue, on page 7 of the brief, that Shimizu discloses to control temperature both during ozone absorption and during ozone releasing. Appellants refer to column 6, lines 38-42 of Shimizu. Appellants state that accordingly, Shimizu actually teaches away from not controlling the temperature of the absorbent during ozone releasing (when ozone is discharged).

We find that at column 6, beginning at line 38, Shimizu states "[d]uring the ozone releasing, on the other hand, the ozone absorption tower 7a and 7b is heated over the ambient temperature and the inside pressure is considerably lowered from 8 kg/cm²". Hence, we agree with appellants' interpretation

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that Shimizu actually teaches away from not controlling the temperature of the absorbent when ozone is discharged.

Because the reference teaches away from a recited process step as set forth in appellants' claims 26 and 27, we find that the examiner has not set forth a prima facie of obviousness.

We therefore reverse the rejection of claims 26 and 27 under 35 U.S.C. § 103 over Shimizu.

II. The Rejection involving claim 30

Independent claim 30 requires that the pressure around the absorbent is above atmospheric pressure when the ozonized gas is absorbed and the pressure around the absorbent is below atmospheric pressure when the ozone is discharged.²

On page 5 of the answer, the examiner recognizes that Shimizu fails to teach "a desorption pressure of less than one atmosphere".

The examiner relies upon Azuma for teaching the relationship between adsorption/discharge of ozone with respect to temperature and pressure. The examiner also relies upon Azuma for teaching that the pressure around the absorbent is below atmospheric pressure when the ozone is discharged. (answer, page 5).

On page 8 of the brief, appellants argue that Azuma teaches a pressure below atmospheric pressure during the adsorption of ozonized gas. Appellants state that this is opposite from Shimizu (Shimizu teaches a pressure above atmospheric pressure during absorption of the ozonized gas).

² In view of this claim requirement, one can conclude that the pressure around the absorbent is higher when the ozonized gas is adsorbed than the pressure around the adsorbent when the ozone is discharged (released).

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Hence, appellants conclude that there is no suggestion to combine the references.

On pages 9-10 of the answer, the examiner rebuts and states that each of Azuma and Shimizu is directed to the absorption of ozone gas under pressure. The examiner also states that it is well known that use of suction (decreases pressure) to remove anything from a chamber increases the rate at which the material is removed.

We must agree with the examiner that it is common knowledge to increase the pressure if one wishes to input a gas, and to decrease the pressure (e.g., suction) if one wishes to remove a gas from a chamber.

Although Azuma teaches a pressure below atmospheric while Shimizu teaches a pressure above atmospheric during the absorption of the ozonized gas, each reference teaches the concept of operating at a higher pressure during absorption and operating at a lower pressure during desorption. See, for example, column 4, lines 19-25 of Azuma, and see column 6, lines 36-42 of Shimizu.³ In this context, we therefore find that the combination of Shimizu in view of Azuma is appropriate. We note that the suggestion to combine need not be expressed and "may come from the prior art, and filtered through the knowledge of one skilled in the art". Motorola, Inc. v. Interdigital Technology Corp., 121 F.3d 1461, 1472, 43 USPQ2d 1481, 1489 (Fed. Cir. 1997).

In view of the above we affirm the rejection of claims 30-35.

³ See also footnote 2.

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III. CONCLUSION

The rejection of claim 2 is **affirmed**.

The rejection of claims 26 and 27 is **reversed**.

The rejection of claims 30-35 is **affirmed**.

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

AFFIRMED-IN-PART

PAUL LIEBERMAN)	
Administrative Patent Judge)	
)	
)	
)	
)	BOARD OF PATENT
CATHERINE TIMM)	APPEALS
Administrative Patent Judge)	AND
)	INTERFERENCES
)	
)	
)	
BEVERLY A. PAWLIKOWSKI)	
Administrative Patent Judge)	

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Sughrue, Mion, Zinn, Macpeak and Seas
2100 Pennsylvania Avenue, NW
Washington, DC 20037-3202

APPENDIX

2. An electric energy converting/storing method,
comprising the steps of:

producing an ozonized gas by using electric energy during
a time period in which electric power consumption is low;
storing ozone contained in said ozonized gas; and
taking out said stored ozone as an ozone containing gas
for utilization thereof during a time period in which the
electric power consumption is high,

wherein said ozonized gas is compressed for storage
thereof in said ozone storing step,
and

wherein ozone concentration of said ozonized gas upon
storage thereof in the compressed state is set in a range of
7-15% by weight.

26. An electric energy converting/storing method,
comprising the steps of:

producing an ozonized gas by using electric energy during
a time period in which electric power consumption is low;
storing ozone contained in said ozonized gas; and
discharging said stored ozone as an ozone containing gas
for utilization thereof during a time period in which the
electric power consumption is high,

wherein ozone contained in said ozonized gas is adsorbed
by an adsorbent in a plurality of ozone adsorption/desorption
towers for storage thereof, said ozone adsorption/desorption
towers being installed in parallel with one another, wherein a
temperature of said adsorbent is controlled when said ozonized

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gas is adsorbed and said temperature of said adsorbent is not controlled when said ozone is discharged.

27. An electric energy converting/storing method, comprising the steps of:

producing an ozonized gas by using electric energy;
storing ozone contained in said ozonized gas; and
discharging said stored ozone as an ozone containing gas for utilization thereof,

wherein ozone contained in said ozonized gas is adsorbed by an adsorbent in a plurality of ozone adsorption/desorption towers for storage thereof, said ozone adsorption/desorption towers being installed in parallel with one another, wherein a temperature of said adsorbent is controlled when said ozonized gas is adsorbed and said temperature of said adsorbent is not controlled when said ozone is discharged.

30. An electric energy converting/storing method comprising the steps of:

producing an ozonized gas by using electric energy during a time period in which electric power consumption is low;

storing ozone contained in said ozonized gas, wherein said stored ozone contained in said ozonized gas is adsorbed by an adsorbent; and

discharging said stored ozone as an ozone containing gas for utilization thereof during a time period in which the electric power consumption is high,

wherein a pressure around said adsorbent is above atmospheric pressure when said ozonized gas is adsorbed and said pressure around said adsorbent is below atmospheric

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pressure when said ozone is discharged.

31. An electric energy converting/storing method, comprising the steps of:
producing an ozonized gas by using electric energy;
storing ozone contained in said ozonized gas, wherein said stored ozone contained in said ozonized gas is absorbed by an adsorbent; and
discharging said stored ozone as an ozone containing gas for utilization thereof, wherein a pressure around said adsorbent is above atmospheric pressure when said ozonized gas is adsorbed and said pressure around said adsorbent is below atmospheric pressure when said ozone is discharged.

32. An electric energy converting/storing method according to claim 30,
wherein a temperature of said adsorbent is controlled when said ozonized gas is adsorbed and said temperature of said adsorbent is not controlled when said ozone is discharged.

33. An electric energy converting/storing method according to claim 30,
wherein said ozonized gas is stored by a plurality of ozone adsorption/desorption towers.

34. An electric energy converting/storing method according to claim 31,
wherein a temperature of said adsorbent is controlled when said ozonized gas is adsorbed and said temperature of said adsorbent is not controlled when said ozone is discharged.

35. An electric energy converting/storing method according to claim 31,

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wherein said ozonized gas is stored by a plurality of ozone adsorption/desorption towers.