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was not written for publication in a law journal and
is not binding precedent of the Board.

Paper No. 20

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte GREGORY NORMAN BROWN,
RAYMOND RAULFS GANSLEY,
MICHAEL LYN MENGEL and ELI GAL

Appeal No. 2001-0370
Application No. 08/978,991

ON BRIEF

Before WILLIAM F. SMITH, KRATZ, and POTEATE, Administrative
Patent Judges.

POTEATE, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 from the examiner's
refusal to allow claims 1-8, 10-13 and 18, which are all of the
claims in the application.

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Claims 1 and 11 are representative of the subject matter on appeal and a copy of these claims is appended to this decision.¹

Reference

The reference relied upon by the examiner is:

Duty et al. (Duty) 3,708,958 Jan. 09, 1973

Grounds of Rejection²

1. Claims 1-8 and 10 stand rejected under 35 U.S.C. § 102 as anticipated by Duty; and

2. Claims 1-8, 10-13 and 18 stand rejected under 35 U.S.C. § 103 as unpatentable over Duty.

We reverse as to both grounds of rejections.

Background

The invention relates to a gas-liquid contactor used for the removal of particulate matter and acidic acid from various combustion gases. Appeal Brief, Paper No. 14, received May 30, 2000, page 2. In gas-liquid contactors of the type contemplated by the invention, a contact liquid is typically introduced as a spray from multiple banks of nozzles such that the contact liquid

¹ Claims 1 and 11 were amended in an amendment under 37 CFR § 1.116 (Paper No. 15, received May 30, 2000) which has been entered. See Examiner's Answer, Paper No. 16, mailed July 10, 2000, page 2, paragraph (4). The amended version of these claims appears in the appendix.

² The examiner has withdrawn the final rejection of claims 1-8, 10-13 and 18 under 35 U.S.C. § 112, first paragraph and the rejection of claims 11-13 and 18 under 35 U.S.C. § 112, second paragraph. Examiner's Answer, Paper No. 16, mailed July 10, 2000, page 2, paragraph (6).

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flows downward through the tower contacting the combustion gas flowing in a counter current direction. *Id.*, page 3. According to appellants, in conventional gas-liquid contactors, the efficiency of the acid gas in particulate removal is reduced as a result of "wall effects" *Id.* The term "wall effects" refers to the occurrence of an annular shaped outer region between the outermost nozzles and the contactor walls wherein the spray concentration or density is lower than in the central region of the contactor. *Id.* The annular shaped region is created when the spray from the nozzles nearest the contactor wall impinge on the wall such that the contact liquid flows downwardly on the surface of the wall. *Id.* The combination of low spray concentration/density and higher gas velocity near the contactor wall causes a low liquid to gas ratio, high flu gas penetration and, a reduced absorber efficiency. *Id.*

Appellants' invention is designed to reduce wall effects. *Id.* In accordance with the invention, a deflecting means is disposed on the wall of the gas-liquid contactor to deflect a portion of the contact liquid away from the wall and to reintroduce at least a portion thereof as droplets into the center of the gas-liquid contactor. *Id.*; claims 1 and 11. The

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deflecting means has "unobstructed holes therethrough through which the flue gases flow upwardly to introduce at least some of the portion of the liquid as droplets into the passage." Claims 1 and 11.

As a result, the perforations significantly enhance contact between the slurry and the flue gases in the annular-shaped outer region of the tower 110 along the wall 114, and therefore enhance the ability of the reintroduced slurry to absorb the gases and/or particulate matter entrained in the flue gases.

Appeal Brief, page 4.

Discussion

Rejection of claims 1-8 and 10 under 35 U.S.C. § 102 as anticipated by Duty

Claim 1 is directed to a gas-liquid contactor comprising, generally, a tower having a wall forming a passage, an inlet to the passage through which flue gases are introduced, and means for introducing a liquid into the passage such that the liquid contacts the flue gases. Means disposed on the wall of the tower deflect a portion of the liquid away from the wall and reintroduce it as droplets into the passage. Claim 1 further requires that the deflecting means have unobstructed holes therethrough.

Anticipation requires a disclosure, in a single prior art reference, of each element of the claims under

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consideration. *W.L. Gore & Assoc. V. Garlock, Inc.*, 721 F.2d 1540, 1554, 220 USPQ 303, 313 (Fed. Cir. 1983). The initial burden of establishing anticipation rests on the examiner. We find that the examiner has failed to show that Duty teaches each of the recited claim limitations with sufficient clarity and detail to establish that the subject matter of appellants' claimed invention existed in the prior art and was recognized by persons of ordinary skill in the field of the invention. See *In re Spada*, 911 F.2d 705, 708, 15 USPQ2d 1655, 1657 (Fed. Cir. 1990).

The examiner asserts that claims 1-8 and 10 are "clearly anticipated Duty et al. (figs. 2, 8 and 11; column 6, lines 23-54; column 7, lines 37-51)." Examiner's Answer, page 3. The examiner specifically identifies figure 11 of Duty as disclosing perforated deflector means having unobstructed perforations. See *id.* The examiner fails to specifically identify any teaching in Duty of the remaining claim limitations.

In any event, even if the examiner had properly identified a teaching in Duty of the remaining claim elements, we could not sustain the rejection since we do not concur with the examiner's interpretation of figure 11.

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The examiner found that:

Duty et al disclose that the embodiment of Fig. 11 is used when a flue gas stream is heavily laden with contaminants and the flow is subject to high flue pressure. One having ordinary skill in the art, given such a fact situation in the depiction of Fig. 11, which shows the perforated deflectors without adsorbent, would recognize that the apparatus as disclosed by Fig. 11 of the reference (without adsorbent) would allow for intense scrubbing of the high pressure, highly contaminated stream by increased liquid flow, without suffering from the inherent increase in pressure drop along the passage due to the inclusion of an unnecessary adsorbent layer

Examiner's Answer, page 3-4. Based on our review of Duty, we are unable to find any support in the examiner's contention that figure 11 represents an embodiment which differs from figure 2 in that it does not include activated adsorbent. Rather, we are in complete agreement with appellant that "the adsorbent 'appears to be essential' to the invention." Appeal Brief, page 15. In reviewing the description of the drawings, we note that figure 11 is identified as a schematic view "of an embodiment of the apparatus of the invention in which a fourth baffle element, a third peripheral deflector skirt and a third array of spray nozzles are employed." There is absolutely no indication that this embodiment does not include an adsorbent material. It is this additional baffle element, deflector skirt and spray nozzle array which are utilized to achieve the intense scrubbing of a

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heavily laden stack gas. Duty, column 6, lines 23-26.

The examiner further maintains that even if the apparatuses of figures 2 and 11 do include adsorbent, Duty still anticipates the invention as claimed, stating that:

[w]hether a liquid passes through the deflector of Duty et al by capillary action or dropwise, is irrelevant since the liquid which leaves the lower surface of the perforated deflector will be in the form of drops, as required by the claims on appeal.

Examiner's Answer, page 4. In so stating, the examiner makes an assumption that water passes through the adsorbent material, but does not indicate where this is taught in the reference.

Moreover, the examiner has failed to identify how the deflectors meet the claim 1 limitation of "deflecting the portion of the liquid away from the wall and reintroducing at least some of the portion of the liquid as droplets into the passage." (Emphasis added.) Accordingly, the rejection is reversed.

Rejection of claims 1-8, 10-13 and 18 under 35 U.S.C. § 103 as unpatentable over Duty³

³Appellants separately argue the patentability of claims 1-8 and 10, and claims 11-13 and 18. Appeal Brief, page 8; Examiner's Answer, page 2, paragraph (7). Accordingly, we decide this ground of rejection as to claims 1 and 11. See 37 CFR § 1.192(c)(7).

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According to the examiner, claims 1-8, 10-13 and 18 are unpatentable since "it would have been obvious for an artisan at the time of the invention, to eliminate the adsorbent and its requisite function from the scrubbing apparatus as taught by Duty et al, since such would allow for the scrubbing of highly laden gas streams without undue pressure drop across the apparatus." Examiner's Answer, pages 4-5.

In order to prevent the impermissible use of hindsight, the examiner is required to show some motivation to modify the reference that creates the case of obviousness. *In re Rouffet*, 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1457 (Fed. Cir. 1998). Thus, the examiner must show reasons why one of ordinary skill in the art, with no knowledge of the invention, would modify the prior art in the manner claimed. *Id.* The suggestion or motivation to modify a reference may be implicit from the prior art as a whole rather than expressly stated. *In re Kotzab*, 217 F.3d, 1365, 1370, 55 USPQ2d 1313, 1316-17 (Fed. Cir. 2000). A proper analysis under § 103 requires, *inter alia*, a consideration of two factors: (1) whether the prior art would have suggested to those of ordinary skill in the art that they should make the

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claimed composition or device or carry out the claimed process, and (2) whether the claimed prior art would have revealed a reasonable expectation of success in doing so. See *In Re Dow Chemical Co.*, 837 F.2d 469, 473, 5 USPQ2d 1529, 1531 (Fed. Cir. 1988). Both the suggestion and the reasonable expectation of success must be found in the prior art, not in the applicant's disclosure. *Id.*

The examiner's findings are insufficient to show that one of ordinary skill in the art would have been motivated to modify Duty to achieve the claimed invention absent knowledge of the appellants' invention. Based on our review of the reference, Duty is able to achieve more scrubbing of heavily laden stack gas through the use of an additional baffle containing adsorbent as shown in figure 11. Thus, we cannot agree that one of ordinary skill in the art would have been motivated to eliminate the adsorbent. Moreover, as noted above, the examiner has failed to identify a teaching or suggestion in Duty of locating the deflectors such that the liquid is deflected away from the wall as required in both claims 1 and 11.

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Accordingly, we conclude that the examiner has failed to establish a *prima facie* case of obviousness and the rejection is reversed.

REVERSED

WILLIAM F. SMITH)	
Administrative Patent Judge)	
)	
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)	BOARD OF PATENT
PETER F. KRATZ)	APPEALS AND
Administrative Patent Judge)	INTERFERENCES
)	
)	
LINDA R. POTEATE)	
Administrative Patent Judge)	

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HARTMAN & HARTMAN, P.C.
552 EAST 700 NORTH
VALPARAISO, IN 46383

APPENDIX
Claims 1 and 11

1. A gas-liquid contactor comprising:

a tower having a wall forming a passage within the tower;

an inlet to the passage through which flue gases are introduced into the tower such that the flue gases flow vertically upward through the passage;

means for introducing a liquid into the passage such that the liquid contacts flue gases therein, a portion of the liquid contacting the wall such that the portion of the liquid flows on the wall; and

means disposed on the wall of the tower for deflecting the portion of the liquid away from the wall and reintroducing at least some of the portion of the liquid as droplets into the passage, the deflecting means having unobstructed holes therethrough through which the flue gases flow upwardly to introduce at least some of the portion of the liquid as droplets into the passage.

11. A wet flue gas desulfurization apparatus comprising:

a tower having a wall forming a cylindrical passage within the tower;

an inlet to the passage through which flue gases are introduced into the tower such that the flue gases flow upward through the passage;

APPENDIX (cont.)

means for spraying a liquid into the passage such that the liquid flows downwardly through the passage and contacts the flue gases therein, an annular-shaped region of the passage nearest the wall being characterized by a lower concentration of the liquid from the spraying means; and

at least one deflecting member projecting into the passage from the wall at an oblique angle to the wall for deflecting the liquid away from the wall and respraying a portion of the liquid as droplets into the passage, each of the at least one deflecting member being located below at least one of the spraying means, each of the at least one deflecting member having unobstructed holes therethrough through which the flue gases flow upwardly to introduce at least some of the portion of the liquid as droplets into the passage, the holes being sized to permit some of the liquid to flow therethrough as droplets such that the liquid is reintroduced as droplets into the annular-shaped region of the passage below the at least one deflecting member, the at least one deflecting member further reintroducing some of the portion of the liquid a distance from the wall.