

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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.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. 21

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte GORDON M. CAMERON

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Appeal No. 1999-2643  
Application 08/512,395

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ON BRIEF

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Before COHEN, FRANKFORT, and MCQUADE, Administrative Patent Judges.

MCQUADE, Administrative Patent Judge.

DECISION ON APPEAL

Gordon M. Cameron appeals from the final rejection of claims 1, 2 and 4. Claims 3, 5 through 8 and 15, the only other claims pending in the application, stand withdrawn from consideration pursuant to 37 CFR § 1.142(b).

The subject matter on appeal relates to "gas-to-gas heat exchangers for use in sulphuric acid manufacturing plants"

(specification, page 1). Claim 1 is illustrative and reads as follows:

1. A shell and tube, gas-to-gas heat exchanger for use in the manufacture of sulphuric acid by the contact process involving heat transfer between dry gases, said exchanger comprising a shell having a first shell portion defining a first shell space, a second shell portion defining a second shell space and a third shell portion defining a third shell space, said second shell space being located between said first and said third shell spaces; an annular tube bundle comprising a plurality of tubes within said shell and extending longitudinally through said first shell space, said second shell space and said third shell space and defining a core space free of said tubes within said bundle and an annular space free of tubes between said shell and said annular bundle; said shell having a first gas conduit means and a second gas conduit means; each of said tubes having a tube gas input means and a tube gas output means and baffle means;

the improvement wherein said first shell portion further defines a first shell aperture in communication with said first shell space and through which a first gas stream operably passes; said second shell portion further defines a second shell aperture in communication with said second shell space and through which a second gas stream operably passes; said third shell portion further defines a third shell aperture in communication with said third shell space and through which a third gas stream operably passes; said baffle means so located within said first, said second and said third shell spaces as to operatively direct said first gas, said second gas and said third gas streams, within said first shell space, said second shell space and said third shell space, respectively, in radial flow across said tube bundle; wherein said second shell space constitutes a chamber within which said second gas stream comprises a mixture of said first gas stream and said third gas stream.

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The items relied upon by the examiner as evidence of obviousness are:

Katterjohn, Jr. 1975 (Katterjohn)	3,859,735	Jan. 14,
Magari et al. 1991 (Magari)	4,991,648	Feb. 12,

The shell and tube, gas-to-gas heat exchanger for the manufacture of sulphuric acid recited in the preamble of appealed claim 1 (the admitted prior art).<sup>1</sup>

Claims 1, 2 and 4 stand rejected under 35 U.S.C. § 103 as being unpatentable over the admitted prior art in view of Katterjohn and Magari.

Reference is made to the appellant's brief (Paper No. 19) and to the examiner's answer (Paper No. 20) for the respective positions of the appellant and the examiner with regard to the merits of this rejection.

Implicit in the examiner's reliance on the preamble of Jepson-type claim 1 as admitted prior art is the concession

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<sup>1</sup> Appealed claim 1 is a Jepson-type claim. Thus, the heat exchanger recited in its preamble is impliedly admitted to be old in the art. See 37 CFR § 1.75(e) and MPEP § 2129. The appellant has not challenged this implication.

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that the heat exchanger encompassed by the admission fails to respond

to the limitations in the claim defining the appellant's

improvement. These deficiencies in the admitted prior art find no cure in Katterjohn and Magari.

Katterjohn discloses a heat exchanger which functions as a preheater for a clothes dryer or the like. This heat exchanger/preheater 10 includes a shell housing 20, an air intake chamber  $C_1$  at the bottom of the shell housing for receiving hot exhaust air from the dryer, an air discharge chamber  $C_2$  at the top of the shell housing for discharging cooled exhaust air to the atmosphere, a heat exchange chamber C between the air intake and discharge chambers, heat exchange tubes 27 for feeding the exhaust air through the heat exchange chamber from the intake chamber to the discharge chamber, inlet orifice means  $O_1$  and  $O_2$  in the shell housing at the lower and upper ends of the heat exchange chamber C for taking in ambient air, and an output passage P in the shell housing intermediate the orifices  $O_1$  and  $O_2$  for discharging to the dryer ambient air which has been preheated through scrubbing

contact with the heat exchange tubes. According to Katterjohn, this particular arrangement of elements promotes maximum heat transfer efficiency (see column 5, line 55, through column 6, line 63).

Magari discloses a prior art heat exchanger (see Figure 14) used in an acrylic acid reactor. As explained by Magari,

a plurality of reaction tubes (heat transfer tubes) **1** packed with a catalyst and disposed in parallel to one another are fixed by upper and lower header plates **2**. A heat medium serving as shell side fluid is introduced into a reactor shell **11** through an inlet nozzle **3** at the lower portion of the reactor shell **11**, and after reaction heat has been recovered, the heat medium is discharged through an outlet nozzle **4** at the upper portion of the reactor shell **11**. At that time, in order to improve the heat transfer performance of the heat medium, a plurality of baffle plates **5** are disposed within the reactor shell **11**. The arrangement is such that raw material gas formed by mixing heated fluid propylene with air may flow into the reaction tubes **1** from the above through a nozzle **6**, and after acrylic acid has been produced in the tubes **1** it is discharged through a nozzle **7** [column 1, lines 32 through 49].

In one embodiment (see Figure 16), the prior art baffle plates take the form of alternating annular and circular plates **5b**, **5b'**, which would appear to promote fluid flow radially

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inwardly and outwardly relative to the array of heat exchange tubes.

In rejecting claim 1 under 35 U.S.C. § 103, the examiner concludes (see pages 4 and 5 in the answer) that it would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide the admitted prior art heat exchanger with (1) first, second and third shell spaces and apertures of the sort recited in claim 1 in view of Katterjohn and (2) baffle means within such shell spaces to direct the gas streams therein in radial flow across the tube bundle in view of Magari, all to improve the heat transfer performance of the admitted prior art heat exchanger.

Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention absent some teaching or suggestion supporting the combination. In re Fritch, 972 F.2d 1260, 1266, 23 USPQ2d 1780, 1784 (Fed. Cir. 1992). In other words, under 35 U.S.C. § 103, the teachings of references can be combined only if there is some suggestion or incentive to do so. Id.

It goes without saying that in the heat exchanger art optimum heat transfer efficiency is usually, if not always, a

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prime consideration. Nonetheless, this general desire for high performance does not justify the particular reference combination proposed by the examiner which involves a modification of the admitted prior art heat exchanger in view of Katterjohn, and then a further modification of the initial modification in view of Magari. Having carefully evaluated the differences between the invention recited in claim 1 and the applied prior art in light of the fair teachings and suggestions of this prior art, we are satisfied that the examiner has engaged in an impermissible hindsight reconstruction of the invention by using the appellant's claims as a blueprint to selectively piece together isolated disclosures in the prior art.

Accordingly, we shall not sustain the standing 35 U.S.C. § 103 rejection of claim 1, or of claims 2 and 4 which depend therefrom, as being unpatentable over the admitted prior art in view of Katterjohn and Magari.

The decision of the examiner is reversed.

REVERSED

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IRWIN CHARLES COHEN	)	
Administrative Patent Judge	)	
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	)	BOARD OF PATENT
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CHARLES E. FRANKFORT	)	APPEALS AND
Administrative Patent Judge	)	
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JOHN P. MCQUADE	)	
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