

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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.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. 17

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte RUSSELL A. ROLAND

Appeal No. 97-4249
Application No. 08/249,400¹

ON BRIEF

Before McCANDLISH, *Senior Administrative Patent Judge*, ABRAMS
and NASE, *Administrative Patent Judges*.

ABRAMS, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal from the decision of the examiner finally
rejecting claims 1-9 and 11-20, which constitute all of the

¹ Application for patent filed May 26, 1994.

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claims remaining of record in the application, claim 10 having been canceled.

The appellant's invention is directed to a thermal storage system for buildings.

The subject matter before us on appeal is illustrated by reference to claim 1, which has been reproduced in an appendix to the Brief.

THE REFERENCES

The references relied upon by the examiner to support the final rejection are:

Wasielewski 1953	2,656,157	Oct. 20,
Holowczenko et al. (Holowczenko) 1988	4,757,690	Jul. 19,
Foley 1989	4,827,735	May 9,
Mantegazza et al. (Mantegazza) 1993	5,228,504	Jul. 20,
O'Neal 1994	5,372,011	Dec. 13,

(Filed Aug. 30, 1993)

Japanese Application (Oogushi et al. ²)	53-11343	Feb. 1, 1978
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THE REJECTIONS

The following rejections stand under 35 U.S.C. § 103:

² Our understanding of this reference was obtained from a PTO translation, a copy of which is enclosed.

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(1) Claims 1, 4-6, 9 and 17-20 on the basis of O'Neal, Oogushi and Wasielewski.

(2) Claims 2 and 3 on the basis of O'Neal, Oogushi, Wasielewski and Foley

(3) Claim 7 on the basis of O'Neal, Oogushi, Wasielewski and Holowczenko.

(4) Claim 8 on the basis of O'Neal, Oogushi, Wasielewski and Mantegazza.

(5) Claims 11-16 on the basis of O'Neal, Oogushi, Wasielewski, Holowczenko and Mantegazza.

The rejections are explained in the Examiner's, Answer.

The opposing viewpoints of the appellant are set forth in the Brief.

OPINION

All of the examiner's rejections are under 35 U.S.C. § 103. The test for obviousness is what the combined teachings of the prior art would have suggested to one of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981). In establishing a *prima facie* case of obviousness under 35 U.S.C. § 103, it is incumbent upon the examiner to provide a reason why one of ordinary skill in the art would have been led to modify a prior art reference or to combine reference teachings to arrive at the claimed invention.

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See *Ex parte Clapp*, 227 USPQ 972, 973 (BPAI 1985). To this end, the requisite motivation must stem from some teaching, suggestion or inference in the prior art as a whole or from the knowledge generally available to one of ordinary skill in the art and not from the appellant's disclosure. See, for example, *Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 1052, 5 USPQ2d 1434, 1052 (Fed. Cir.), cert. denied, 488 U.S. 825 (1988).

The appellant's invention is directed to heat storage and exchange systems that can be used in buildings. Basically speaking, these systems comprise a heat exchange medium through which flow the fluids of two interrelated circulating systems. One system removes heat from the medium through a first heat exchanger located therein, causing the medium to become cooler. The other system adds heat to the medium by means of a second heat exchanger located in the medium. A primary feature of the appellant's inventive improvements to such systems is the "interweaving" of the conduits of the first heat exchanger with the conduits of the second heat exchanger. This feature also is set forth in the claims and, as will be explained below, is a key factor in our analysis of the examiner's rejections. At this point, therefore, it is necessary for us to interpret the

term "interweaving." We begin by noting that, as explained in the appellant's specification, each of the heat exchange systems comprises a plurality of spaced, generally parallel conduit legs which, together, form a continuous conduit that actually traverses a sinuous path. The parallel legs of one of the heat exchangers are horizontally oriented, while those of the other are vertically oriented. The relationship between the legs of the two heat exchangers is best illustrated in Figure 4, where parallel legs 106 of first heat exchanger 24 are horizontally oriented, and legs 114 of second heat exchanger 26 are vertically oriented. As explained on pages 37 and 38 of the appellant's specification, and as viewed in Figure 4, the adjacent and connected (at the bottom, as shown) legs 114 of the first heat exchanger are slightly offset from one another, sufficiently to allow the horizontal legs 106 of the other heat exchanger to pass between them, much as in a woven fabric. This is what the appellant has called "interweaving" of the conduits of the first heat exchanger with regard to those of the second.

The requirement for such "interweaving", appears in all three of the independent claims. Claim 1 recites a first heat

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exchanger comprising a first conduit "having a generally serpentine configuration with a plurality of spaced, generally parallel legs" and a second heat exchanger with a second conduit

having the same configuration. The claim then goes on to require

"said first conduit at least partially interweaving between two or more legs of said second conduit." Claims 11 and 16 set forth

first and second heat exchangers each having a plurality of spaced, generally parallel conduits which form first and second "continuous" conduits, with "said conduits of said first heat exchanger interweaving between two or more of said conduits of said second heat exchanger." The examiner has rejected independent claim 1 as being unpatentable over O'Neal in view of Oogushi and Wasielewski, and independent claims 11 and 16 on the basis of these three references plus Holowczenko and Mantegazza. In each case, the examiner has first combined the teachings of O'Neal and Oogushi in order to, in his opinion, arrive at the basic structure recited in each of the independent claims. Be that as it may, the examiner then has taken the position that one of ordinary skill in the art would

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have found it obvious to interweave the conduits of the two heat exchangers of the modified O'Neal structure in view of the teachings of Wasielewski. We do not agree.

Wasielewski discloses a heat transfer apparatus which, in pertinent part, has a first heat exchanger comprising a plurality of spaced, parallel horizontally oriented conduit 6 and a second heat exchanger comprising a plurality of spaced, parallel vertically oriented conduits 7. These are each separate conduits, which span the distance between, respectively, vertical walls 8 and horizontal walls 9. They do not form a serpentine configuration, as required by claim 1, nor are they connected together so that they form a continuous conduit, as required by claims 11 and 16. While the rows of vertical conduits are interposed between the rows of horizontal conduits, it is our view that this does not constitute interweaving, as defined above and required by the claims. Moreover, even if one were to accept the examiner's position that Wasielewski discloses an interweaved arrangement, the examiner has not pointed out, and we fail to perceive, any teaching, suggestion or incentive which would have led one of ordinary skill in the art to modify the Oogushi serpentine conduits, as transposed into the

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O'Neal apparatus, in such a fashion. The mere fact that the prior art structure could be modified does not make such a modification obvious unless the prior art suggests the desirability of doing so. See *In re Gordon*, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984). We find such suggestion to be lacking here.

The problem of lack of suggestion exists also in the examiner's first combination of references, that is, the modification of the O'Neal apparatus on the basis of the teachings of Oogushi. The examiner has admitted that the O'Neal heat exchangers are not of serpentine configuration with a plurality of spaced, generally parallel legs (Answer, page 4). It is the examiner's position, however, that such an arrangement is shown by Oogushi, and that it would have been obvious to employ this in O'Neal "for the purpose of efficient heat transfer" (Answer, sentence bridging pages 4 and 5). This implies that Oogushi teaches that the serpentine arrangement is more efficient than those of O'Neal, the configurations of which were not disclosed. The examiner has not pointed out, nor can we discern, any such teaching in Oogushi. The fact is that in Oogushi both the prior art

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apparatus (Figure 1) and the inventive apparatus (Figure 3), utilize a pair of serpentine heat exchangers, with the improvement provided by Oogushi being the use of full length plates 11 (Figure 3) rather than partial length plates 8 (Figure 1).

The teachings of the other references applied against independent claims 11 and 16, as well as against various of the dependent claims, fail to alleviate the deficiencies pointed out above.

It is our conclusion that the teachings of the references applied against independent claims 1, 11 and 16 fail to establish a prima facie case of obviousness with regard to the subject matter recited in each, and we therefore will not sustain the rejections of these claims or of the others, all of which depend from them.

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SUMMARY

None of the rejections are sustained.

The decision of the examiner is reversed.

REVERSED

HARRISON E. McCANDLISH)	
Senior Administrative Patent Judge)	
)	
)	
)	BOARD OF PATENT
NEAL E. ABRAMS)) APPEALS
Administrative Patent Judge)	AND
)	INTERFERENCES
)	
)	
JEFFREY V. NASE)	
Administrative Patent Judge)	

NEA/jlb

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