

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(2) is not binding precedent of the Board.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. 25

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte HUBERT H.A. SMIT,  
THEODORUS J.J.M. JENNESKENS,  
and JAN C. GIJSBERS

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Appeal No. 1998-1539  
Application 08/683,186

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ON BRIEF

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Before KRASS, JERRY SMITH, and LALL, Administrative Patent  
Judges.

KRASS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the final rejection of  
claims 5, 8 and 9, all of the claims remaining in the  
application.

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The invention pertains to x-ray tubes. More particularly, a thermally conductive metal cooling layer is provided for enhancing the dissipation of heat at the anode.

Independent claim 5 is reproduced as follows:

5. An X-ray tube, comprising:

a tube wall,

an anode having a transmissive target layer for generating X-rays in response to the impingement of an electron beam;

a cathode having a loop-shaped electron emissive element for generating an electron beam, the beam forming a substantially annular anode target ring on the transmissive target,

an X-ray exit window, adjacent the target layer, and

a thermally conductive metal cooling layer disposed with a surface against the transmissive target, the metal cooling layer being disposed substantially within the annular electron target ring, so as not to substantially block the electron beam, which metal cooling layer is thermally conductively connected to the tube wall, which metal cooling layer acts as a means for enhancing the dissipation of heat at least for the anode.

The examiner relies on the following references:

Jenkins	4,731,804	Mar. 15, 1988
Valkonet	4,969,173	Nov. 6, 1990

Claims 5, 8 and 9 stand rejected under 35 U.S.C. § 103 as unpatentable over Valkonet in view of Jenkins.

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Reference is made to the briefs and answer for the respective positions of appellants and the examiner.

#### OPINION

We turn, first, to the rejection of independent claim 5. The examiner explains that Valkonet teaches an x-ray tube with a loop-shaped cathode and a transmission anode/window assembly while Jenkins suggests enhancing the thermal dissipation of an x-ray tube window by applying a thin metallic layer to its surface so that the layer is in thermal contact with the metallic walls of the tube in order to conduct heat away from the window. The examiner concludes that it would have been obvious to provide the Valkonet window with a heat removal disk-shaped metal layer as taught by Jenkins.

It appears to us that the examiner has set forth a prima facie case of obviousness with regard to the subject matter of independent claim 5, explaining the differences between the prior art and the claimed subject matter, establishing the level of skill of the artisan and providing a reasonable explanation as to why the claimed subject matter as a whole would have been obvious to the skilled artisan.

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Appellants argue that the combination of Valkonet and Jenkins is improper because Jenkins does not relate to a target transmission tube and that skilled artisans would not normally look to Jenkins for solutions to a problem in the field of target transmissive x-ray tubes.

We disagree. Both Valkonet and Jenkins are concerned with the problem of heat dissipation within an x-ray tube and the skilled artisan would have been expected to have been familiar with these systems.

While appellants argue that Jenkins does not relate to cooling of the anode but only to the exit window, they point to that portion of Jenkins (column 1, lines 22-26) which recognizes that there have been heat dissipation problems in two areas of x-ray tubes, the anode structure and the exit window. It is true that the remainder of Jenkins' disclosure relates to cooling at the exit window, but it is indisputable that Jenkins recognized the heating problem at the anode and disclosed that artisans were aware of this problem.

It would appear to us that if the artisan was aware of a heating problem at both the anode and at the exit window and that artisan is faced with a solution to the heating problem

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at the exit window, via the supply of a thin metallic layer for conduction of heat away from the window, it would naturally follow for the artisan to apply that solution to heat dissipation at the anode.

Appellants' response to that is to contend that the metallic element 7 of Jenkins for cooling the exit window would be insufficient to cool the anode because the element is not thick enough. However, appellants also admit, at page 1 of the reply brief, that artisans would have been quite aware that an anode receives much more electrical power than does the exit window. Accordingly, this reinforces our position that the artisan viewing the teachings of Valkonet and Jenkins would clearly have been motivated to modify the thickness of Jenkins' metallic element 7 so as to be applicable for cooling the anode.

We also agree with the examiner that for all of appellants' arguing that the artisan would not have used the metallic element 7 of Jenkins to cool an anode because it would have been insufficient for the job, appellants have presented no objective evidence to support this allegation.

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Accordingly, we find that the examiner has established a prima facie case of obviousness with regard to the subject matter of independent claim 5 which has not been overcome by appellants in the form of arguments or objective evidence. We will sustain the rejection of claim 5 under 35 U.S.C. § 103.

We now turn to dependent claims 8 and 9.

We will not sustain the rejection of these claims because the examiner has simply failed to establish a prima facie case of obviousness with regard to the subject matter of these claims. In fact, other than a glancing reference to the "disk" nature of the cooling layer (at page 3 of the answer, the examiner says that Jenkins taught a "heat removal disk-shaped metal layer"), the examiner never even mentions dependent claims 8 and 9. The examiner has not identified what is being relied on in the applied references for the teaching of the claimed subject matter. No such identification is made in either the statement of the rejection and rationale therefor or in the "Response to argument" section of the answer. While it is not entirely clear whether appellants are arguing the merits of these claims, since appellants merely

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identify what is recited in the claims and state, generally, that the feature is "neither taught nor suggested in the references" (principal brief-page 5), the initial burden to establish a prima facie case of obviousness is the examiner's. Since the examiner pays no attention to the dependent claims, we cannot say that a prima facie case has been set forth. Accordingly, we will not sustain the rejection of claims 8 and 9 under 35 U.S.C. § 103 based on the examiner's lack of a specific rationale for rejecting such claims.

We have sustained the rejection of claim 5 under 35 U.S.C. § 103 but we have not sustained the rejection of claims 8 and 9 under 35 U.S.C. § 103.

Accordingly, the examiner's decision is affirmed-in-part.

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

Errol A. Krass )

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	Administrative Patent Judge	)	
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	Jerry Smith	)	BOARD OF
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	Administrative Patent Judge	)	APPEALS AND
		)	INTERFERENCES
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	Parshotam S. Lall	)	
	Administrative Patent Judge	)	

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