

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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte TIMOTHY M. ROSE  
and  
A. GREGORY BRUCE

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Appeal No. 1995-4867  
Application 07/993,482<sup>1</sup>

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ON BRIEF

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Before WINTERS and WILLIAM F. SMITH, Administrative Patent Judges, and  
MCKELVEY, Senior Administrative Patent Judge.

WILLIAM F. SMITH, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 from the final rejection of claim 31, the only claim pending in the application. Claim 31 reads as follows:

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<sup>1</sup> Application for patent filed December 18, 1992. According to applicants, this application is a continuation of Application 07/750,710, filed August 20, 1991; which is a division of Application 07/264,098, filed October 28, 1988; which is a continuation-in-part of Application 07/240,768, filed September 2, 1988, which is a continuation-in-part of application 07/115,139, filed October 30, 1987, all abandoned.





examiner has discounted or dismissed this language in considering the patentability of claim 31. As stated in the paragraph bridging pages 6-7 of the examiner's answer, "[f]irst, it is important to note that appellants are claiming a compound (i.e., an expression cassette), not a method of secreting a polypeptide. Such an intended use carries no patentable weight." We disagree with the examiner that this language recites only an intended use and carries "no patentable weight."

It is axiomatic the claims are read in light of the supporting specification. In re Zletz, 893 F.2d 319, 321-22, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989); In re Moore, 439 F.2d 1232, 1235, 169 USPQ 236, 238 (CCPA 1971). As set forth at page 3, lines 7-13 of the specification, the expression cassettes of the present invention allow for secretion of a polypeptide. As explained at page 18, lines 1-11 of the specification:

[w]here the product is retained in the host cell, the cells are harvested, lysed and the product isolated and purified by extraction, precipitation, chromatography, electrophoresis, and the like. Where the product is secreted into the periplasmic space, the cells are harvested and the product is liberated by destruction of the cell wall, e.g., by hypotonic shock and the like. Where the product is secreted into the medium, the nutrient medium may be collected and the product isolated by conventional means, for example, affinity chromatography."

As recognized by the examiner, the subject matter before us in this appeal is a compound. As stated in In re Papesch, 315 F.2d 381, 391, 137 USPQ 43, 51 (CCPA 1963), "From the standpoint of the patent law, a compound and all of its properties are inseparable; they are one and the same." Appellants describe a number embodiments of

the present invention in the specification of this application. As set forth above, one embodiment involves an expression cassette where the polypeptide product is secreted into the periplasmic space of the host cell. Another embodiment is where the polypeptide product is secreted into the culture medium. Claim 31 is directed to the latter embodiment. In other words, claim 31 is not inclusive of any expression cassette which composes the DNA segments set forth in the body of the claim. Rather, claim 31 is inclusive of only those expression cassettes having the required DNA segments which allow for the “secretion of a disulfide bond-containing polypeptide in a biologically active, mature form from an E. coli host cell into the culture medium.” That language describes a property of the claimed compound and must be given effect in determining the patentability of the claim.

## 2. Prima facie obviousness

With this claim interpretation in mind, the examiner's case of prima facie obviousness quickly falls apart. One way of defining prima facie obviousness is where the prior art relied upon contains a “detailed enabling methodology for practicing the claimed invention, a suggestion to modify the prior art to practice the claimed invention, and evidence suggesting that it would be successful.” In re O'Farrell, 853 F.2d 894, 902, 7 USPQ2d 1673, 1680 (Fed. Cir. 1988). Here, the examiner apparently was successful in locating prior art which describes each of the DNA segments required by claim 31 on

appeal. Assuming this prior art suggests combining the disparate elements in the manner required by claim 31 on appeal, we conclude that the relied upon references do not suggest the requisite reasonable expectation of success.

For example, the examiner's rejection is premised upon modification of the "vectors of Crowl and Maniatis." (examiner's answer, page 5). While Crowl does describe vectors useful for expressing human immune interferons, Crowl does not describe the secretion of the interferon from the host cells into the culture medium. Maniatis does discuss the secretion of foreign genes expressed in E. coli at page 433 as follows:

Vectors that allow fusion of foreign genes to DNA encoding a signal sequence may be useful for exporting proteins out of the cytoplasm, especially if the signal peptide is cleaved during export of the protein. Export of the proteins may assist in subsequent purification and may serve to isolate them from cytoplasmic proteases. However, the factors that determine whether a given protein will be secreted when it is fused with a particular leader peptide have not been elucidated.

Secretion of foreign proteins expressed in host cells is discussed in Chang at page 6, lines 15-21 as follows:

"Secretion" refers to transport through the cytoplasmic membrane. Whether or not the protein appears in the medium is dependent on the presence or absence of an outer membrane: in the presence of outer membrane the secreted protein will be found in the periplasm, in the absence of outer membrane it will be in the medium.

As set forth in the paragraph bridging pages 2-3 of Chang, E. coli is a gram-negative bacteria where the cytoplasmic membrane is encased in an outer cell membrane wall.

Thus, one seeking to secrete foreign proteins from an E. coli host cell using knowledge from Chang would only reasonably expect the protein to be found in the periplasm, not in the culture medium due to the outer cell membrane wall. Miyake states in the paragraph bridging the columns on page 1429 that the secretion mechanism in E. coli is still unknown. Miyake sets forth in the first full paragraph of the left hand column of page 1430 their expectation that a chimeric protein “should be transported across the inner membrane to the periplasmic space as a mature form” where it can be extracted and recovered. All of these disclosures teach away from an expectation of successfully constructing an expression cassette having the properties required by claim 31 on appeal.

In our view, these teachings provide evidence that constructing an expression cassette capable of the “secretion of a disulfide bond-containing polypeptide in a biologically active, mature form from an E. coli host cell into the culture medium” would have been highly problematic at the time of the present invention. To whatever extent it may be concluded that it would have been obvious to select the components of the DNA segment of claim 31 and arrange them in the manner required by that claim, we do not find that the prior art relied upon would have reasonably suggested that such an expression cassette would allow for the secretion of a disulfide bond-containing polypeptide in a biologically active, mature form from an E. coli host cell into the culture medium.”

Appeal No. 1995-4867  
Application 07/993,482

The decision of the examiner is reversed.

REVERSED

Sherman D. Winters	)	
Administrative Patent Judge	)	
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	)	
	)	
William F. Smith	)	BOARD OF PATENT
Administrative Patent Judge	)	APPEALS AND
	)	INTERFERENCES
	)	
	)	
Fred E. McKelvey, Senior	)	
Administrative Patent Judge	)	

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