

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 49

**UNITED STATES PATENT AND TRADEMARK OFFICE**

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

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Ex parte CAROL T. SCHEMBRI

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Appeal No. 2003-1738  
Application No. 08/739,396

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ON BRIEF

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Before WILLIAM F. SMITH, SCHEINER, and GRIMES, Administrative Patent Judges.

GRIMES, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 4, 5, 8-11, and 37-61, all of the claims remaining. Claim 37 is representative and reads as follows:

37. A process for constructing an chemical array comprising a plurality of species of bioorganic molecules in a predetermined arrangement, said process comprising the steps of:
  - 1) for each species of said plurality of bioorganic molecules, constructing a batch of separate tiles by:
    - (a) providing a unit of a substantially planar solid material having an attachment surface;

(b) attaching said species of bioorganic molecule onto said attachment surface; and

(c) subdividing said unit of substantially planar material to form a plurality of separate tiles, a surface of each of said separate tiles comprising a portion of said attachment surface;

and

2) affixing separate tiles from the said batches of tiles in predetermined spatial positions on a support.

The examiner relies on the following reference:

Rava et al. (Rava)	5,545,531	Aug. 13, 1996
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Claims 4, 5, 8-11, 37-53, 58, and 59 stand rejected under 35 U.S.C. § 102(e) as anticipated by Rava.

Claims 4, 5, 8-11, and 37-61 stand rejected under 35 U.S.C. § 103 as obvious in view of Rava.

We reverse both rejections.

#### Background

“Arrays of immobilized probes are currently being developed for use in assays to detect and identify components in biological samples and for screening molecular libraries. The ability to screen for multiple species of molecules in a single assay test is particularly valuable for purposes of drug discovery and clinical genetics. . . . [In] prior art methods, the probe molecules are synthesized in situ on a solid support surface at predetermined locations.” Specification, page 1.

The specification discloses an alternative method of making probe arrays. Instead of forming the probes in situ on the surface of the array, each probe is synthesized on a different support (generically known as a “discrete physical entity”, page 4), which is then subdivided into smaller “tiles”. The array is then made by placing multiple tiles (each having a different probe bound to it) onto a solid support at particular spatial locations. See, e.g., the specification at pages 2-3, 6-7, and Figure 1.

#### Discussion

Claim 37, the broadest independent claim, is directed to a method of making an array “comprising a plurality of species of bioorganic molecules.” The claimed process comprises, first, constructing a batch of tiles “for each species of said plurality of bioorganic molecules” by attaching the species to a “substantially planar solid material” and subdividing the planar material to form tiles, then “affixing separate tiles from the said batches of tiles in predetermined spatial positions on a support.”

#### 1. Anticipation

The examiner rejected most of the claims, including claim 37, as anticipated by Rava. The examiner characterized the claims as “briefly recit[ing] a process for constructing an [sic] chemical array comprising a plurality of species of bioorganic molecules in a predetermined arrangement.” Examiner’s Answer, page 3. The examiner did not further discuss the limitations of the

rejected claims, but reviewed Rava's disclosure in great detail and concluded that "the reference clearly anticipates the claimed invention." See id., pages 3-5.

We disagree. The standard under § 102 is one of strict identity. "Under 35 U.S.C. § 102, every limitation of a claim must identically appear in a single prior art reference for it to anticipate the claim." Gechter v. Davidson, 116 F.3d 1454, 1457, 43 USPQ2d 1030, 1032 (Fed. Cir. 1997). See also Verdegaal Bros., Inc. v. Union Oil Co., 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987) ("A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.")

In this case, the examiner has pointed to various parts of the reference that disclose aspects of prior art products and methods that seem to meet isolated limitations of some of the claims on appeal. The examiner has not, however, pointed to any part of the reference that discloses the method of making a chemical array that is defined by instant claim 37; i.e., first attaching each probe to a separate support, then dividing those probe-derivatized supports into smaller pieces and using the pieces to make an array.

Since Rava does not identically disclose the claimed process, it does not anticipate. The rejection under 35 U.S.C. § 102(e) is reversed.

## 2. Obviousness

The examiner also rejected all of the claims on appeal as obvious in view of Rava. The examiner conceded that "[t]he reference do[es] not teach a method of making an array of [a] plurality of different species of bioorganic molecules,

and constructing a batch of separate tiles; and a process of constructing an array of a plurality of species of proteins (claims 54-55, 60) or peptides (claims 56-57, 61).” Examiner’s Answer, page 5.<sup>1</sup> However, the examiner concluded that Rava’s disclosure would have made obvious the method now claimed to those of ordinary skill in the art. See id., pages 5-6.

Appellants argue that the rejection is defective because, among other things,

the Examiner has not pointed to anything in Rava et al. which discloses or suggests subdividing the different units of planar material (with their different species attached) to form different batches of tiles, then affixing separate tiles from the batches to a same support.

Supplemental Appeal Brief, page 9.

We agree with Appellants that the rejection must be reversed. Prima facie obviousness requires, among other things, that the prior art disclose or suggest all of the limitations of the claimed invention. See In re Ochiai, 71 F.3d 1565, 1572, 37 USPQ2d 1127, 1133 (Fed. Cir. 1995) (proper § 103 analysis requires “a searching comparison of the claimed invention – including all its limitations – with the teaching of the prior art”); In re Lowry, 32 F.3d 1579, 1582, 32 USPQ2d 1031, 1034 (Fed. Cir. 1994) (“The Patent and Trademark Office (PTO) must consider all claim limitations when determining patentability of an invention over the prior art.”).

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<sup>1</sup> We note in passing that the examiner’s concession seems to contradict the earlier rejection for anticipation. Since we have reversed that rejection, however, we need not dwell on the apparent inconsistency.

Rava does not suggest the method that is defined by claim 37: attaching each probe to a separate support, then dividing those supports into smaller “tiles” and placing the tiles onto a support to form an array. Granted, Rava discloses arrays that are similar to those resulting from the process claimed here. See, e.g., Rava’s Figure 3, which shows a solid support with multiple chips attached.

In what may be its most relevant disclosure (column 4, lines 1-25), Rava discusses “Biological Chip Plates” that comprise multiple “biological chips in which the probe arrays of each chip is separated from the probe array of other chips.” Rava also discloses that the chips can be produced on wafers. See lines 13-18:

Wafer: A substrate having a surface to which a plurality of probe arrays are attached. On a wafer, the arrays are physically separated by a distance of at least about a millimeter, so that individual chips can be made by dicing a wafer or otherwise physically separating the array [sic, wafer?] into units having a probe array.

Taken in isolation, this sounds a lot like the method defined by claim 37. The problem, for the examiner’s rejection, is that the “chips” that Rava cuts from the wafers are different from the “tiles” of the instant claims. Rava’s chips each comprise a full array of attached probes. See column 4, lines 4-5 (“Biological Chip: A substrate having a surface to which one or more arrays of probes is attached.”) and lines 1-3 (“Array: A collection of probes at least two of which are different, arranged in a spa[t]ially defined and physically addressable manner.”).

In the instant claims, by contrast, each tile must have only a single type of probe attached. The claimed method comprises “for each species of said plurality of bioorganic molecules, constructing a batch of separate tiles by . . . attaching said species [and] . . . subdividing . . . to form a plurality of separate tiles.” Thus, Rava’s disclosure of dividing “wafers” into multiple “chips”, each comprising an “array” would not have suggested the instantly claimed method.

Nor do we find the method suggested by other parts of the reference. Rava’s disclosure with regard to methods of making biological chips is limited to in situ synthesis methods such as those discussed in the background section of the instant specification. See Rava, columns 9-10. Rava nowhere suggests making a chip by attaching pieces of individually derivatized substrate to a solid support.

Rava does not suggest the method defined by claim 37 and therefore does not support a prima facie case of obviousness. The rejection under 35 U.S.C. § 103 is reversed.

Summary

The claimed method is not taught or suggested by Rava. We therefore reverse the rejections under 35 U.S.C. §§ 102(e) and 103.

REVERSED

William F. Smith	)	
Administrative Patent Judge	)	
	)	
	)	
	)	BOARD OF PATENT
Toni R. Scheiner	)	
Administrative Patent Judge	)	APPEALS AND
	)	
	)	INTERFERENCES
	)	
Eric Grimes	)	
Administrative Patent Judge	)	

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