

The opinion in support of the decision being entered today was *not* written for publication and 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 XIAOLAN ZENG, WEI ZHANG, and ALEXANDER C. SCHNEIDER

Appeal No. 2006-3040  
Application No. 10/261,196

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ON BRIEF

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

JERRY SMITH, Administrative Patent Judge.

This is a decision on the appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 1 and 3-52, which constitute all the claims pending in this application. The examiner has now indicated that claims 48-52 contain allowable subject matter [answer, page 13]. Therefore, this appeal is directed to the rejection of claims 1 and 3-47.

The disclosed invention pertains to methods and apparatus for segmenting an anatomical image. The disclosed invention particularly relates to a first step of presegmenting the image at a reduced resolution to identify a particular region and a second step of further segmenting the identified region at a higher resolution to identify finer anatomical structures.

Representative claim 1 is reproduced as follows:

1. A method of segmenting an anatomical image comprising:
  - presegmenting the image at a reduced image resolution to identify at least one region from an image background, thereby forming a presegmented image;
  - transferring the presegmented image to an image having a first resolution higher than said reduced image resolution; and
  - segmenting further the identified region in the image having the first resolution into finer anatomical structures.

The examiner relies on the following references:

Schneider	5,531,227	July 02, 1996
Gur et al. (Gur)	5,627,907	May 06, 1997
Bick et al. (Bick)	6,185,320	Feb. 06, 2001
Vining	6,272,366	Aug. 07, 2001

The following rejections are on appeal before us:

1. Claims 1, 3-18, 23-28, 35, and 40-45 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the teachings of Bick and Schneider.
2. Claims 19-22, 34, 36-39, 46, and 47 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the teachings of Bick and Schneider in view of Vining.
3. Claims 29-33 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the teachings of Bick and Schneider in view of Gur.

Rather than repeat the arguments of appellants or the examiner, we make reference to the brief and the answer for the respective details thereof.

#### OPINION

We have carefully considered the subject matter on appeal, the rejections advanced by the examiner and the evidence of obviousness relied upon by the examiner as support for the rejections. We have, likewise, reviewed and taken into consideration, in reaching our decision, the appellants' arguments set forth in the brief along with the examiner's

rationale in support of the rejections and arguments in rebuttal set forth in the examiner's answer.

It is our view, after consideration of the record before us, that the evidence relied upon and the level of skill in the particular art would have suggested to one of ordinary skill in the art the obviousness of the invention as set forth in the claims on appeal.

Accordingly, we affirm.

In rejecting claims under 35 U.S.C. § 103, it is incumbent upon the examiner to establish a factual basis to support the legal conclusion of obviousness. See In re Fine, 837 F.2d 1071, 1073, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). In so doing, the examiner is expected to make the factual determinations set forth in Graham v. John Deere Co., 383 U.S. 1, 17, 148 USPQ 459, 467 (1966). The examiner must articulate reasons for the examiner's decision. In re Lee, 277 F.3d 1338, 1342, 61 USPQ2d 1430, 1433 (Fed. Cir. 2002). In particular, the examiner must show that there is a teaching, motivation, or suggestion of a motivation to combine references relied on as evidence of obviousness. Id. at 1343, 61 USPQ2d at 1433-34. The examiner cannot simply reach conclusions based on the examiner's own understanding or experience - or on his or her assessment of what would be basic knowledge or common sense. Rather, the examiner must point to some concrete evidence in the record in support of these findings. In re Zurko, 258 F.3d 1379, 1386, 59 USPQ2d 1693, 1697 (Fed. Cir. 2001). Thus the examiner must not only assure that the requisite findings are made, based on evidence of record, but must also explain the reasoning by which the findings are deemed to support the examiner's conclusion. However, a suggestion, teaching, or motivation to combine the relevant prior art teachings does not have to be found explicitly in the prior art, as the teaching,

motivation, or suggestion may be implicit from the prior art as a whole, rather than expressly stated in the references. The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art. In re Kahn, 441 F.3d 977, 987-88, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006) (citing In re Kotzab, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1316-17 (Fed. Cir. 2000)). See also In re Thrift, 298 F.3d 1357, 1363, 63 USPQ2d 2002, 2008 (Fed. Cir. 2002). These showings by the examiner are an essential part of complying with the burden of presenting a prima facie case of obviousness. See In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). If that burden is met, the burden then shifts to the applicant to overcome the prima facie case with argument and/or evidence. Obviousness is then determined on the basis of the evidence as a whole and the relative persuasiveness of the arguments. See id.; In re Hedges, 783 F.2d 1038, 1039, 228 USPQ 685, 686 (Fed. Cir. 1986); In re Piasecki, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984); and In re Rinehart, 531 F.2d 1048, 1052, 189 USPQ 143, 147 (CCPA 1976). Only those arguments actually made by appellants have been considered in this decision. Arguments which appellants could have made but chose not to make in the brief have not been considered and are deemed to be waived [see 37 CFR § 41.37(c)(1)(vii)(2004)].

We consider first the rejection of claims 1, 3-18, 23-28, 35, and 40-45 based on Bick and Schneider. Since appellants have only presented arguments with respect to independent claim 1, we will treat claim 1 as the representative claim for all claims subject to this rejection. The examiner has set forth how the invention of these claims is deemed to be rendered obvious by the collective teachings of Bick and Schneider

[answer, pages 4-8]. With respect to representative claim 1, the examiner essentially finds that Bick teaches the claimed invention except for teaching that feature extraction is a type of image segmentation. The examiner cites Schneider as providing this teaching. The examiner finds that it would have been obvious to the artisan to combine the teachings of Schneider with Bick [id., pages 4-5].

Appellants argue that the examiner has no basis for equating Bick's feature extraction step to the claimed segmenting step and no basis for asserting that Bick's segmenting step is carried out at a reduced resolution relative to his feature extraction step. With respect to the first point, appellants argue that feature extraction is not the same as segmentation. Appellants assert that even though Schneider defines feature extraction as a form of segmentation, such definitions do not apply to appellants' invention. With respect to the second point, appellants argue that Bick fails to point out the resolution at which segmentation step 101 is carried out, and therefore, it can not be concluded that the segmentation step is performed at a reduced resolution. Appellants assert that the examiner has been misled by Bick's use of the term "maximum resolution." Finally, appellants argue that since neither Bick nor Schneider teaches two segmenting steps as claimed, the combination of Bick and Schneider also fails to teach these steps [brief, pages 3-9].

With respect to the first point argued above, the examiner responds that Bick also teaches that feature extraction is a form of segmentation by incorporating the patent issued to Giger et al. which notes that feature extraction is performed to segment the lesion from the anatomical background. Thus, the examiner reiterates that the feature extraction step of Bick is a second segmentation step as claimed. With respect to the

second point argued above, the examiner responds that the resolution in Bick is increased at element 116, and therefore, the feature extraction step is performed at a successively higher resolution than the segmenting step. The examiner notes that the claimed reduced image resolution can be read on the original image which has a lower resolution than when the second segmentation takes place [answer, pages 13-19].

We will sustain the examiner's rejection of representative claim 1, and therefore, of all the claims subject to this rejection. We agree with the examiner that the segmenting step of claim 1 is met by the feature extraction step of Bick when claim 1 is given its broadest reasonable interpretation. Bick and the incorporated patent to Giger et al. both teach that feature extraction was generally considered in the art to be a form of segmentation done at a higher resolution. Appellants' specification has provided no definition contrary to this general understanding within the art. Therefore, appellants' argument notwithstanding, we find that Bick teaches two segmentation steps as recited in claim 1. We also agree with the examiner that the series embodiment shown in Figure 1B of Bick teaches that an image is successively subjected to feature extraction wherein the resolution is increased for each subsequent measurement. Since each feature extraction iteration in Bick constitutes a step of segmenting, and since each step of segmenting is performed at a higher resolution, Bick clearly teaches performing at least two such steps wherein the first step is performed at a lower resolution than the second step. We agree with the examiner that this series operation in Bick meets the invention as broadly recited in claim 1.

We now consider the examiner's rejections of the claims based on the additional teachings of Vining and Gur. The examiner has indicated how the invention of these

claims is deemed to be rendered obvious by the collective teachings of the applied prior art [answer, pages 8-12]. We have considered the examiner's findings in support of these rejections, and we find that the examiner has at least established a prima facie case of obviousness. Appellants have made no arguments with respect to these rejections and have simply relied on the arguments made with respect to claim 1 [brief, page 9]. Since the examiner has established a prima facie case of obviousness, and since appellants have offered no new arguments to rebut the examiner's rejections, we also sustain the examiner's rejections of the claims based on the additional teachings of Vining and Gur.

In summary, we have sustained each of the examiner's rejections of the claims on appeal. Therefore, the decision of the examiner rejecting claims 1 and 3-47 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a)(1)(iv).

AFFIRMED

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Errol A. Krass	)
Administrative Patent Judge	)
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	) BOARD OF PATENT
Jerry Smith	)
Administrative Patent Judge	) APPEALS AND
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	) INTERFERENCES
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Joseph F. Ruggiero	)
Administrative Patent Judge	)

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