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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(2) is not binding precedent of the Board.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. 36

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte THOMAS B. GREEN
and ROBERT G. WESTENDORF

Appeal No. 1996-1877
Application No. 08/149,716

ON BRIEF

Before CALVERT, FRANKFORT, and NASE, Administrative Patent Judges.

FRANKFORT, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 24-38, which are all of the claims pending in this application. Claims 1-23 have been canceled.

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Appellants' invention relates to a method of preparing a volatile sample from a material for gas chromatographic analysis, the method including the steps of: introducing a covered sample vial (20) containing a volatile sample into a chamber (16) of a platen (4), heating the material containing the volatile sample while the vial is being transported by the platen, agitating the vial while in the chamber (16) of the platen to enhance a transport rate of the volatile sample from the material into the headspace of the vial, and then introducing a needle to the vial (20) to withdraw at least a portion of the volatile sample from the headspace of the vial. The volatile sample withdrawn from the headspace of the vial (20), via the needle, is then fed into a gas chromatographic analysis apparatus. A copy of representative independent claims 24 and 29, reproduced from appellants' brief, is attached to this decision.

The prior art references of record relied upon by the examiner as evidence of obviousness are:

U.S. Patents

Natelson

3,324,628

Jun. 13, 1967

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Greaves et al. (Greaves) 1977	4,007,011	Feb. 8,
Chlosta et al. (Chlosta) 1984	4,476,733	Oct. 16,
Harris et al. (Harris) 1989	4,871,683	Oct. 3,

Foreign Patent

Fujitsuka (Japan)	58-80555	May 14, 1983
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Articles

Yamano et al. (Yamano)(Japan), "A Simple Method of Determining Bromide Ions in Blood Plasma of Methyl Bromide Workers by Head Space Gas Chromatography," J. Ind. Health, Vol. 29, pp. 196-201 (1987).

Jakubowski et al. (Jakubowski)(Polish), "Selection of the Conditions for the Isolation of Volatile Hydrocarbons from the Blood using the Technique 'Head Space' for the Purposes of Diagnosing Acute Poisonings of Humans," Bromat. Chem. Toksykol. Vol. 13, pp. 263-270 (1980).

Rejections

Claims 24-28, 34, 36 and 38 stand rejected under 35

U.S.C.

§ 103 as being unpatentable over Chlosta in view of Natelson or Yamano and further in view of Fujitsuka.

Claims 24-28 and 34 stand rejected under 35 U.S.C. § 103 as being unpatentable over Chlosta in view of Natelson or Yamano and further in view of Greaves.

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Claims 24-28 and 34 stand rejected under 35 U.S.C. § 103 as being unpatentable over Chlosta in view of Natelson or Yamano and further in view of Harris.

Claims 29-33, 35 and 37 stand rejected under 35 U.S.C. § 103 as being unpatentable over Chlosta in view of Natelson or Yamano and further in view of Fujitsuka and Jakubowski.

Rather than attempt to reiterate the examiner's full commentary with regard to the above noted rejections and the conflicting viewpoints advanced by the examiner and appellants regarding the rejections, we make reference to the final rejection (Paper No. 25, mailed July 19, 1994) and the examiner's answer (Paper No. 29, mailed July 7, 1995) for the reasoning in support of the rejections, and to appellants' brief (Paper No. 28, received April 20, 1995) and reply brief (Paper No. 30, received September 11, 1995) for the arguments thereagainst.

OPINION

In reaching our decision in this appeal, we have given careful consideration to appellants' specification and claims,

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to the applied prior art references, to the respective positions articulated by appellants and the examiner, and to the declarations of Donald W. Harris, Zelda Penton and Gregory G. O'Neil submitted by appellants.

In rejecting claims under 35 U.S.C. §103, the examiner bears the initial burden of presenting a prima facie case of obviousness (see In re Rijckaert, 9 F.3d 1531, 1532, 28 USPQ2d 1955, 1956 (Fed. Cir. 1993); In re Oetiker, 977 F.2d 1443, 1446, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992)), which is established when the teachings of the prior art itself would appear to have suggested the claimed subject matter to one of ordinary skill in the art (see In re Bell, 991 F.2d 781, 783, 26 USPQ2d 1529, 1531 (Fed. Cir. 1993)). The conclusion that the claimed subject matter is prima facie obvious must be supported by evidence, as shown by some objective teaching in the prior art or by knowledge generally available to one of ordinary skill in the art that would have led that individual to combine the relevant teachings of the references to arrive at the claimed invention. See In re Fine, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988).

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Secondary considerations are also an essential component of the obviousness determination. See In re Emert, 124 F.3d 1458, 1462, 44 USPQ2d 1149, 1153 (Fed. Cir. 1997) ("Without Emert providing rebuttal evidence, this prima facie case of obviousness must stand."). This objective evidence of nonobviousness includes copying, long felt but unsolved need, failure of others, see Graham v. John Deere Co., 383 U.S. 1, 17-18, 148 USPQ 459, 467 (1966), commercial success, see In re Huang, 100 F.3d 135, 139-40, 40 USPQ2d 1685, 1689-90 (Fed. Cir. 1996), unexpected results created by the claimed invention, unexpected properties of the claimed invention, see In re Mayne, 104 F.3d 1339, 1342, 41 USPQ2d 1451, 1454 (Fed. Cir. 1997); In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936-37 (Fed. Cir. 1990), licenses showing industry respect for the invention, see Arkie Lures, Inc. v. Gene Larew Tackle, Inc., 119 F.3d 953, 957, 43 USPQ2d 1294, 1297 (Fed. Cir. 1997); Pentec, Inc. v. Graphic Controls Corp., 776 F.2d 309, 316, 227 USPQ 766, 771 (Fed. Cir. 1985), and skepticism of skilled artisans before the invention, see In re Dow Chem. Co., 837 F.2d 469, 473, 5 USPQ2d 1529, 1532 (Fed. Cir. 1988). One must consider all of the applicants' evidence. See

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Oetiker, 977 F.2d at 1445, 24 USPQ2d at 1444 ("An observation by the Board that the examiner made a prima facie case is not improper, as long as the ultimate determination of patentability is made on the entire record."); In re Piasecki, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984). Whether the evidence presented suffices to rebut the prima facie case is part of the ultimate conclusion of obviousness.

When a rejection depends on a combination of prior art references, there must be some teaching, suggestion, or motivation to combine the references. See In re Geiger, 815 F.2d 686, 688, 2 USPQ2d 1276, 1278 (Fed. Cir. 1987). Although the suggestion to combine references may flow from the nature of the problem, see Pro-Mold & Tool Co. v. Great Lakes Plastics, Inc., 75 F.3d 1568, 1573, 37 USPQ2d 1626, 1630 (Fed. Cir. 1996), the suggestion more often comes from the teachings of the pertinent references, see In re Sernaker, 702 F.2d 989, 994, 217 USPQ 1, 5 (Fed. Cir. 1983), or from the ordinary knowledge of those skilled in the art that certain references are of special importance in a particular field, see Pro-Mold, 75 F.3d at 1573, 37 USPQ2d at 1630 (citing Ashland Oil, Inc.

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v. Delta Resins & Refractories, Inc., 776 F.2d 281, 297 n.24, 227 USPQ 657, 667 n.24 (Fed. Cir. 1985)). Therefore, "[w]hen determining the patentability of a claimed invention which combines two known elements, 'the question is whether there is something in the prior art as a whole to suggest the desirability, and thus the obviousness, of making the combination.'" See In re Beattie, 974 F.2d 1309, 1311-12, 24 USPQ2d 1040, 1042 (Fed. Cir. 1992) (quoting Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co., 730 F.2d 1452, 1462, 221 USPQ 481, 488 (Fed. Cir. 1984)).

With this as our background, we turn to the examiner's rejection of Claims 24-28, 34, 36 and 38 under 35 U.S.C. § 103 as being unpatentable over Chlosta in view of Natelson or Yamano and further in view of Fujitsuka. The examiner relies on Chlosta (answer, pages 3-4) to teach a basic method of preparing a volatile sample including introducing a sample vial (36) into a chamber (48) of a heated platen (46) for transporting the vial to a location for removal of at least a portion of the volatile sample from the headspace of the vial for gas chromatographic analysis, heating the vial while the vial is being transported in the platen, and introducing a

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needle (34) to the vial (36) to withdraw at least a portion of the volatile sample from the headspace of the vial. The examiner acknowledges that Chlosta does not teach agitating the vial while in the platen chamber as is required in appellants' claims 24-28, 34, 36 and 38 on appeal. The examiner alternatively relies on Natelson or Yamano to teach agitating heated sample containers during preparation of materials within the vials for gas chromatographic analysis. The examiner further relies on Fujitsuka to teach an agitating structure associated with a rotatable turntable and wherein said agitating structure allows a sample (11) to be dissolved in a liquid to prepare a sample for analysis in a liquid chromatograph. The examiner conclude from the collective teachings of the applied references that it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate an agitation step during heating as taught by Natelson or Yamano, while also using the motion of Fujitsuka, into the method of Chlosta to facilitate thorough mixing of the sample during preparation thereof.

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In the other rejections under 35 U.S.C. § 103 before us on appeal, the examiner has again relied upon Chlosta in view of Natelson or Yamano taken further in view of Greaves or Harris, and on Chlosta in view of Natelson or Yamano, Fujitsuka and Jakubowski. In each of these rejections the references to Greaves, Harris, Fujitsuka and Jakubowski are relied upon to teach or suggest the use of various forms of agitation in the preparation of samples for chromatographic analysis, with the examiner concluding in each instance that it would have been obvious to one of ordinary skill in the art to incorporate an agitation step as taught in Natelson or Yamano into the method of Chlosta using the particular motion of Greaves or Harris to facilitate thorough mixing of the sample prior to analysis. Jakubowski is relied upon to evidence knowledge in the art that different compounds for sample analysis may require different operating conditions and particularly different shaking or agitation intensities.

The Declarations of Donald W. Harris, the President and General Manager of Tekmar Company (assignee), Zelda Penton,

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with Varian Chromatograph Systems which sells the instant invention under the name "Genesis", and Gregory G. O'Neil, an employee of Tekmar Company since March 1990, provide evidence of secondary consideration bearing on the ultimate determination of obviousness under 35 U.S.C. § 103. Donald W. Harris indicates that U.S. Patent application 07/969,415 (parent of the instant application) describes a static headspace sampler constructed in the manner of the Tekmar 7000/7050 Headspace Autosampler introduced in March 1990. We agree with the appellants that the Exhibits A, B, and C, which Mr. Harris assures were published in March 1990, disclose the claimed invention. Mr. Harris points out (page 3) that Exhibits A and B show test results that indicate that the Tekmar Headspace Autosampler shows a reduction to reach equilibrium time of the sample from 60 minutes to under 10 minutes. Mr. Harris further declares (declaration, pages 4-6) that other manufactures of headspace autosamplers (i.e., Perkin Elmer, Hewlett Packard, CTC Analytics and Shimadzu Scientific Instruments, Inc.) did not include a method of preparing the sample vial having agitation of the vials during heating of the sample vials while in the platen chambers as

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set forth in the claims on appeal and shown in Exhibits H, L and M. Mr. Harris proceeds to show in Exhibits E, F, G, I, J and K that, subsequent to disclosure of appellants' invention, Perkin Elmer, Hewlett Packard and others in the field introduced headspace autosamplers falling within the bounds of appellants' claims on appeal.

Mr. Harris further states (declaration, page 4) that prior to March 1990 Tekmar company did not sell any static headspace samplers and (declaration, pages 7-8) that subsequent to the introduction of the Tekmar 7000/7050 Headspace Autosampler in March 1990 Tekmar company achieved an approximately 22% of the U.S. market for automatic headspace sampler by about April 1, 1993, while the combined market share of Hewlett Packard/DANI and Perkin Elmer were correspondingly reduced. Mr. Harris notes (declaration, pages 3-4) that Tekmar has spent approximately \$150,000.00 dollars on advertising of the Tekmar 7000/7050 Headspace Autosampler including the agitation feature.

Zelda Penton supplements Mr. Harris's statements in that Ms. Penton declares (declaration, page 2) that prior to April,

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1990, she was unaware of any manufacturer which had sold or was selling a static headspace sampler which included a built-in mixing or agitation device which agitated the sample vial while being disposed in a heated rotatable platen. Ms. Penton also stated that experimental results, comparing a method of preparing a volatile sample that included heating and vial agitation to a method that did not include both, indicated that the method of agitation substantially shortened the equilibrium time while improving the precision and sensitivity of the gas chromatographic analysis.

Gregory G. O'Neil stated that he prepared a paper entitled "Analysis of Volatile Organic Compounds in Soil Using Static Headspace Extraction"(Exhibit Q). The paper includes initial test results measuring volatile aromatic compounds in soil samples in aqueous solution, with and without "mixing" (agitation). Mr. O'Neil concludes that Exhibit Q was the first to announce the possibility of obtaining reliable concentration measurements of volatile organic compounds in

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soil samples using static headspace analysis, where each soil sample is disposed in a closed vial from the time of collection until sampling and where the closed vial is agitated using Tekmar's "Optimix" feature while being heated. Mr. O'Neil observes (page 553 of Exhibit Q) that the "Optimix" form of agitation allows the sample to tumble in the vial "so analytes more easily reach the gas/liquid interface, which is required for an extraction to occur," and resulted in (page 554) a reduction in sample equilibration time from 1.5 hours without vial agitation to 1 hour with appellants' sample mixing feature.

While we are in agreement with the examiner that it would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to add an agitating step to the method and apparatus of Chlosta so as to gain the advantages thereof noted by the various references relied upon by the examiner (i.e., Fujitsuka and Natelson or Yamano; Greaves and Natelson or Yamano; or Harris and Natelson or Yamano), in route to an ultimate determination of obviousness under 35 U.S.C.

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§ 103, we must reweigh the examiner's evidence of obviousness along with the considerable evidence regarding secondary considerations submitted by appellants. When we do so, we find ourselves in agreement with appellants' position (brief, pages 22-29) that the evidence of secondary considerations outweighs the prima facie case of obviousness established by the examiner, and that the subject matter set forth in claims 24-38 of the present application would not have been obvious within the meaning of 35 U.S.C. § 103.

We find it of particular importance that prior to March 1990, Tekmar Company did not sell any static headspace samplers, and now subsequent to introduction of a sampler which operates in accordance with the method as claimed in the present application, they have achieved an approximately 22% share of the U.S. market, while the market share of Hewlett Packard/DANI and Perkin Elmer have been correspondingly reduced. It is also significant that prior to their introduction of their Model 7000/7050 Headspace Autosampler, there were apparently none on the market which included built-in mixing or agitation of a sample vial while the vial was

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disposed in a heated movable platen, and yet subsequent to the introduction by Tekmar Company, their major competitors each introduced or offered similar features on their static headspace samplers. Thus, we conclude that the evidence of secondary considerations provided by appellants outweighs the evidence relied upon by the examiner.

Accordingly, we cannot sustain the examiner's rejection of claims 24-28, 34, 36 and 38 under 35 U.S.C. § 103 as being unpatentable over Chlosta in view of Natelson or Yamano and further in view of Fujitsuka, the rejection of claims 24-28 and 34 under 35 U.S.C. § 103 as being unpatentable over Chlosta in view of Natelson or Yamano and further in view of Greaves, the examiner's rejection of claims 24-28 and 34 under 35 U.S.C.

§ 103 as being unpatentable over Chlosta in view of Natelson or Yamano and further in view of Harris, or the examiner's rejection of Claims 29-33, 35 and 37 under 35 U.S.C. § 103 as being unpatentable over Chlosta in view of Natelson or Yamano and further in view of Fujitsuka and Jakubowski.

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SUMMARY

In summary, the decision of the examiner to reject claims
24-38 under 35 U.S.C. § 103 is reversed.

REVERSED

	Ian A. Calvert)	
	Administrative Patent Judge)	
)	
)	
)	
	Charles E. Frankfort)	BOARD OF
PATENT	Administrative Patent Judge)	APPEALS AND
)	INTERFERENCES
)	
)	
	Jeffrey V. Nase)	
	Administrative Patent Judge)	

tdl

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APPENDIX

24. A method of preparing a volatile sample from a material for gas chromatographic analysis, comprising:

introducing a vial with the material containing the volatile sample and a headspace therein into a chamber of a platen for transporting the vial to a location for removal of at least a portion of the volatile sample for gas chromatographic analysis;

heating the material containing the volatile sample while the vial is being transported to the location for removal;

agitating the vial while in the chamber to enhance a transport rate of the volatile sample from the material to the headspace of the vial; and

introducing a needle to the vial to withdraw at least a portion of the volatile sample from the headspace of the vial.

29. A method of preparing for analysis by gas chromatography a gaseous sample representative of an amount of a volatile component contained in a material disposed in a vial, the gaseous sample being contained in the vial in a headspace above the material, comprising:

selecting a particular vial agitation intensity from a source of variable vial agitation intensity;

placing the vial into a chamber of a platen;

heating the material while the vial is in the chamber;

agitating the material at the particular agitation intensity by applying an oscillating motion to the vial;

transporting the vial to a sampling location by movement of the platen while the vial remains in the chamber; and

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introducing a needle to the vial to withdraw at least a portion of the gaseous sample in the headspace.