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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.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. 27

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Ex parte ARTHUR P. D'SILVA and EDWARD J. JASELSKIS

Appeal No. 95-4369
Application 08/117,242[1]

ON BRIEF

Before BARRETT, LEE AND CARMICHAEL, Administrative Patent Judges.

LEE, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the final rejection of claims 45, 46, 48-57, 64-74, 81 and 83-84. Claims 1-44, 47, 58-63, 75-80 and 82 have been canceled (Br. at 1). No claim has been allowed.

[1] Application for patent filed September 3, 1993. According to appellants, this application is a continuation of Application 07/770,524, filed October 3, 1991, now abandoned.

References relied on by the Examiner

Jowitt et al. (Jowitt)	4,598,577	Jul. 8, 1986
Bowen et al. (Bowen)	4,802,761	Feb. 7, 1989
Kim	4,986,658	Jan. 22, 1991
Griffin et al. (Griffin)	5,085,499	Feb. 4, 1992 (filed Sep. 2, 1988)

Brewer Jr. et al. (Brewer, Jr.), "Studies of Aerosols Generated by Electrically Vaporized Thin Films for ICP-AES, Applied Spectroscopy, vol. 44, no. 3, (1990).

The Rejections on Appeal

Claims 45, 49-51, 55, 64, 66, 68-69 and 84 stand finally rejected under 35 U.S.C. § 103 as being unpatentable over Jowitt and Bowen.

Claims 46, 48, 52, 54, 56, 65, 67, 71-72 and 81 stand finally rejected under 35 U.S.C. § 103 as being unpatentable over Jowitt, Bowen and Griffin.

Claims 53 and 70 stand finally rejected under 35 U.S.C. § 103 as being unpatentable over Jowitt, Bowen and Kim.

Claims 57, 73 and 83 stand finally rejected under 35 U.S.C. § 103 as being unpatentable over Jowitt, Bowen and Brewer, Jr.

Claim 74 stands finally rejected under 35 U.S.C. § 103 as being unpatentable over Jowitt, Bowen, Brewer, Jr. and Griffin.

The Invention

The invention is directed to an apparatus and method using a remote laser to ablate a hazardous material sample, exciting the sample in a remotely located inductively coupled plasma source, and analyzing the elemental constituents of the sample in a detector remotely located from the plasma source.

Claims 45, 64, 73 and 81 are the only independent claims. Claims 45, 64 and 81 recite an aerosol transport system for transporting the material sample to the remote inductively coupled plasma source. Claim 73, on the other hand, recites not an aerosol transport system but a filter for collecting the sample. Representative claims 64 and 73 are reproduced below:

64. A method for sampling and analyzing a material located at a hazardous site, the material having a surface and elemental constituents, comprising the steps of:

a) positioning a portable sampling probe proximate the surface of the material at the hazardous site;

b) directing laser radiation from a laser source located remote from the probe onto the surface of the material through a first optical fiber, the first optical fiber having two ends, a first end coupled to said laser source and a second end mounted to the portable sampling probe, the laser radiation ablating a sample from the material;

c) transporting the sample through an aerosol transport system from said probe to a remotely located inductively coupled plasma source; and

d) exciting the sample in the plasma source to provide an emission characteristic of the elemental constituents of the sample.

73. A method for sampling and analyzing a material located at a hazardous site, the material having a surface and elemental constituents, comprising the steps of:

a) positioning a portable sampling probe proximate the surface of the material at the hazardous site;

b) directing laser radiation from a laser source located remote from the probe onto the surface of the material through an optical fiber, the optical fiber having two ends, a first end coupled to said laser source and a second end mounted to the portable probe, the laser radiation ablating a sample of the material;

c) collecting the sample in a filter mounted in the probe;

d) exciting the sample collected on said filter in an inductively coupled plasma source located remotely from the material to provide a characteristic emission of the elemental constituents of the sample; and

e) applying said emission to an elemental constituent detector located remote from the inductively coupled plasma source.

Opinion

Our opinion is based solely on the arguments raised by the appellants in their brief. We do not address and offer no opinion on arguments which could have been raised but were not set forth in the brief.

The invention of claims 45, 64, 73 and 81 requires a laser remotely located from the location where the material being

ablated by the laser beam is located, an inductively coupled plasma source remotely located from the site of ablation, and a detector receiving the output emission from the plasma source, which detector is remotely located from the plasma source. In short, both the laser and the plasma source have to be located remote from where the material sample is ablated, and the detector receiving emissions from the plasma source is remotely located from the plasma source. According to the appellants and the specification, this arrangement minimizes contamination of persons and equipment by the material being ablated and analyzed.

The rejection of claims 45, 49-51, 55, 64, 66, 68-69 and 84 over Jowitt and Bowen

Jowitt discloses a material gathering and analyzing method using a laser to ablate the material and a remotely located inductively coupled plasma source to analyze the material. According to the examiner, the only difference between Jowitt's system and the system of the rejected claims is that Jowitt's laser is not remotely located from the site of ablation of the materials (answer at 3). The examiner relied on Bowen to show that a laser can be remotely located from where the laser beam is applied in a device for analyzing contaminants (answer at 3-4).

The appellants argue that the laser used in the claimed invention is a high energy laser for ablating the material to be

analyzed, whereas in Bowen the laser is a low energy laser which is used for conducting Raman spectroscopy for analyzing contaminant components in liquid or gaseous media. The appellants argue that remotely locating the laser is against the teaching of Jowitt. The appellants also argue that Bowen's in-situ analysis of materials teaches away from the present invention in which the analysis is accomplished at a remote location. These arguments fail to demonstrate error in the examiner's position.

One cannot attack references individually where the rejection is based on the combined teachings of the references as a whole. One cannot attack reference showings individually. In re Merck & Co., 800 F.2d 1091, 1097, 231 USPQ 375, 380 (Fed. Cir. 1986); In re Young, 403 F.2d 754, 757, 159 USPQ 725, 728 (CCPA 1968). The test for obviousness is what the combined teachings of the references would have suggested to those of ordinary skill in the art. In re Keller, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981).

Bowen was relied on merely to show that a laser does not have to be located at the precise location where its emission is applied. Rather, it may be remotely located and its emission can be channeled to the site of application through an optical fiber.

This teaching transcends the purported distinction based on what the laser beam is being applied to do, e.g., high energy ablation of materials or low energy application for Raman spectroscopy. The appellants have not asserted, much less demonstrated, that the state of the art was such that laser energy sufficient for material ablation could not be channeled through an optical fiber. In light of Bowen, it would have been obvious to one with ordinary skill in the art that remotely locating the laser is an alternative to locating the laser at the site of ablation. Remotely locating the laser is also not "against" the teaching of Jowitt. The appellants have not pointed to anything in Jowitt which would suggest to one with ordinary skill in the art that the laser must be located at the site of material ablation.

The appellants further argue that Jowitt neither teaches or suggests a "**separate**" aerosol transport system, "but teaches the use of a byproduct aerosol resulting from the laser/metal interaction" (Br. at 12, lines 3-16). The argument is not commensurate in scope with the claimed invention and thus is rejected. None of claims 45, 64 and 81 requires a "separate" aerosol transport system which does not make use of a byproduct aerosol resulting from material ablation.

The appellants further argue that in Jowitt, the inductively coupled plasma source is not remotely located from the detector as is specifically required by all of claims 45, 64, 73 and 81. It is not altogether clear what the claim term "remotely located" means. The specification does not particularly define it. No minimum distance is specified, either for defining remoteness or a boundary of contamination. The claims also do not specify a functional requirement for the remoteness of the location. The specification discloses merely that the emissions from the inductively coupled plasma source is not directly observed by the spectrometer, but through a lens 36 which focuses the emissions 37 into an optical fiber 38 for transmission. Accordingly, we interpret "remotely located" as it applies to the placement of the plasma source relative to the detector to mean an arrangement wherein the emissions from the plasma source is not directly viewed by the detector but through a transmission medium such as an optical fiber link.

Given the meaning accorded the term "remotely located" as defined above, the appellants are correct that Jowitt and Bowen do not disclose or suggest remotely locating an inductively coupled plasma source from its associated detector.

For the foregoing reasons, the rejection of claims 45, 49-51, 55, 64, 66, 68, 69 and 84 over Jowitt and Bowen cannot be sustained.

The rejection of claims 46, 48, 52, 54, 56, 65, 67, 71-72 and 81 over Jowitt, Bowen, and Griffin

The appellants argue that Griffin fails to overcome the above-noted deficiencies of the combination of Jowitt and Bowen.

We disagree.

The appellants acknowledge (Br. at 13) that Griffin discloses a plasma source located on or within a probe. In Griffin, the spectrometer analyzing the emissions from the plasma source is remotely located and connected to the plasma source by an optical cable or light guide (Figure 2; column 2, lines 55-56; column 3, lines 10-16 and 53-60). The appellants argue (Br. at 14, lines 9-11): "Griffin reference does not provide a suggestion or motivation for separating the plasma source from a detector in a system in which the probe is remote from the plasma source." The argument is misplaced because it confines a reading of the reference to the particular environment or problem with which the reference is concerned and fails to appreciate the full scope of the technical teachings therein as would be appreciated by one with ordinary skill in the art.

A reference must be considered for everything it teaches by way of technology and is not limited to the particular invention it is describing and attempting to protect. EWP Corp. v. Reliance Universal Inc., 755 F.2d 898, 907, 225 USPQ 20, 25 (Fed. Cir.), cert. denied, 474 U.S. 843 (1985). A reference must be evaluated for all its teachings and is not limited to its specific embodiments. In re Bode, 550 F.2d 656, 661, 193 USPQ 12, 17 (CCPA 1977); In re Snow, 471 F.2d 1400, 1403, 176 USPQ 328, 329 (CCPA 1973).

The fact that Griffin's plasma source is located on or within the probe does not mean all of its technical disclosures have application only when the plasma source is located on or within the probe. Independent of whether the plasma source is located on or within the probe, Griffin certainly teaches that emissions from the plasma source need not be directly observed by a detector but, instead, may be channeled to the detector through a fiber optic cable. As for whether the plasma source should be located on or within the probe, that would depend on the particular working environment or the task at hand. Based on Griffin, one with ordinary skill in the art would have known that indirectly providing the emissions from a plasma source to its corresponding detector was one way to operate the detector.

The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference, nor is it that the claimed invention must be expressly suggested in any one or all of the references. Keller, 642 F.2d at 425, 208 USPQ at 881. As already discussed, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. Here, the collective teachings of Jowitt, Bowen, and Griffin would have made up for the deficiencies of only Jowitt and Bowen insofar as remotely locating the plasma source from the detector is concerned. One with ordinary skill in the art would have known that another way to operate Jowitt's inductively coupled plasma source and spectrometer is to have them connected through a fiber optic cable. The reasons for doing so need not be breath-taking or lead to an impressive or fantastic result. The mere knowledge that an alternative exists is a sufficient lead to obviousness.

For the foregoing reasons, we sustain the rejection of claims 46, 48, 54, 56, 65, 71-72 and 81 as being unpatentable over Jowitt, Bowen and Griffin.

Claim 52 further recites a "seal means attached to the housing [in the sampling probe] proximate to said opening for engagement with the surface of the material to be sampled for

substantially isolating said sampling chamber and the material from the outside environment during sampling." The examiner asserts (answer at 12, lines 8-11) that Griffin in column 10, lines 25-28, and column 11, lines 19-24, teaches such substantially isolating sealing means. We disagree.

The portions of Griffin in column 10 referred to by the examiner define a semi-permeable membrane which admits analyte into the plasma cell implemented as a quartz capillary tube 63. The portions of Griffin in column 11 referred to by the examiner define a course screen and a semi-permeable membrane to provide mechanical protection while allowing ambient air to enter the apparatus for chemical monitoring. These structural elements do not serve to substantially isolate the sampling chamber or the material to be sampled from the outside environment. Rather, they are a part of the sampling process and the sampling of materials is done through these elements. The ambient air also passes through these elements.

Claims 67 recites a similar isolating feature in method form. For the above-discussed reasons, we do not sustain the rejection of claims 52 and 67 as being unpatentable over Jowitt, Bowen and Griffin.

The rejection of claims 53 and 70
under 35 U.S.C. § 103 over Jowitt, Bowen and Kim

Claim 53 depends ultimately from claim 45. Claim 70 depends from claim 64. Both claims 45 and 64 were rejected only over Jowitt and Bowen. The examiner relied on Kim only to show the use of thermally resistant probes (answer at 12, lines 17-20). The appellants are correct that Kim as applied by the examiner does not cure the inadequacies of Jowitt and Bowen insofar as the features of the parent claims are concerned. Accordingly, the rejection of claims 53 and 70 cannot be sustained.

The rejection of claim 57 under 35 U.S.C. § 103
as being unpatentable over Jowitt, Bowen and Brewer, Jr.

Claim 57 depends from claim 45 which was rejected over Jowitt and Bowen. The examiner applied Brewer, Jr. only to show that filters have been used to collect samples (answer at 13, lines 7-9). The appellants are correct that Brewer, Jr. as applied by the examiner does not cure the inadequacies of Jowitt and Bowen insofar as the features of the parent claims are concerned. Accordingly, the rejection of claim 57 cannot be sustained.

The rejection of claims 73 and 83 under 35 U.S.C. § 103
as being unpatentable over Jowitt, Bowen and Brewer, Jr.

Claim 73 is an independent claim and claim 83 depends from claim 73. Like all other independent claims 45, 64 and 81, claim

73 requires the inductively coupled plasma source to be remotely located from the associated detector. Unlike the other independent claims 45, 64 and 81, claim 73 further requires the step of "collecting the sample in a filter mounted in the probe."

Brewer, Jr. was relied on by the examiner only to show the use of a filter to collect the sample material (answer at page 7, lines 10-11 and 14-15). As applied by the examiner, Brewer, Jr. does not make up for the deficiencies of Jowitt and Bowen with regard to remotely locating the plasma source from the associated detector. Accordingly, the rejection of claims 73 and 83 over Jowitt, Bowen and Brewer, Jr. cannot be sustained.

The rejection of claim 74 under 35 U.S.C. § 103 as being unpatentable over Jowitt, Bowen, Brewer, Jr. and Griffin

Claim 74 depends from claim 73 which has been rejected over only Jowitt, Bowen and Brewer, Jr. The appellants argue that the addition of Griffin does not overcome the deficiencies of Jowitt and Bowen with respect to the features of independent claim 73. We disagree.

With respect to remotely locating the inductively coupled plasma source from the associated detector, we have already, in the context of claims 46, 48, 52, 54, 56, 65, 67, 71-72 and 81, discussed above how Griffin makes up for the deficiencies of Jowitt and Bowen. We have also discussed, in the context of

claims 45 and 64, why Jowitt and Bowen would reasonably have suggested remotely locating the laser from the probe.

In the context of claim 74, the feature "the step of positioning the probe by remote control" refers to remotely controlling the positioning of the probe, not remotely locating the probe from the plasma source. Note that in the appellants' specification, the probe position of the probe is controlled via a robotic arm (spec. at page 9, lines 5-7). The appellants' argument on page 21, lines 3-7, of the appeal brief is misplaced in that it confuses remotely controlling the position of the probe with remotely locating the probe from the plasma source. The appellants have failed to demonstrate error in the examiner's reliance on Griffin to show positioning the probe by remote control. We note further that Griffin's probes are designed for underground wells and the like, and it does not appear that Griffin contemplates the presence of any human operator at the precise physical location of the probe underground.

Because claim 74 depends from claim 73, it includes the feature of "collecting the sample in a filter mounted in the probe." The examiner relied on Brewer, Jr. which shows collection of sample particles on a filter. See page 375 of Brewer, Jr., lines 22-25. The appellants argue (Br. at 19, lines

10-17) that in Brewer, Jr. the collected samples are analyzed first by an electronic microscope and then by a conventional atomic absorption flame, while the claim calls for analysis by a plasma source. However, the appellants also acknowledge that the sample particles of Brewer, Jr., "in a normal system," would be directed toward an inductively coupled plasma source (Br. at 19, lines 11-12). Indeed, the sample particles collected by Brewer, Jr.'s filter are from the same source as those ordinarily directed to an inductively coupled plasma source for analysis for their elemental constituents.

We agree with the examiner that in light of Brewer, Jr.'s disclosure that sample particles can be collected on a filter and that the collected particles are from the same source as those particles ordinarily directed to a plasma source for analysis, it would have been obvious to one with ordinary skill to use a filter to collect the sample materials to be furnished to the plasma source. We have already discussed above that a reference's teachings should not be limited or confined to its preferred embodiments or the invention which it is attempting to protect. Rather, all of the technical disclosure reasonably stemming from the reference must be considered from the perspective of one with ordinary skill. Here, we see no reason

why one with ordinary skill in the art, in light of Brewer, Jr.'s teaching of collecting sample particles on a filter, would not recognize that the samples for analysis by the plasma source can be collected by a filter. Note that appellants' sample particles are furnished through ablation by laser and Brewer, Jr.'s particles are furnished by use of high voltage sparks. The appellants have presented no reasons why this difference would cause sample collection by filter to be useable in one but not the other. We do not find that to be so.

For the foregoing reasons, we sustain the rejection of claim 74 over Jowitt, Bowen, Brewer, Jr. and Griffin.

Conclusion

The rejection of claims 45, 49-51, 55, 64, 66, 68, 69 and 84 under 35 U.S.C. § 103 as being unpatentable over Jowitt and Bowen is **reversed**.

The rejection of claims 46, 48, 54, 56, 65, 71-72 and 81 under 35 U.S.C. § 103 as being unpatentable over Jowitt, Bowen and Griffin is **affirmed**.

The rejection of claims 52 and 67 under 35 U.S.C. § 103 as being unpatentable over Jowitt, Bowen and Griffin is **reversed**.

The rejection of claims 53 and 70 under 35 U.S.C. § 103 as being unpatentable over Jowitt, Bowen and Kim is **reversed**.

The rejection of claim 57 under 35 U.S.C. § 103 as being unpatentable over Jowitt, Bowen and Brewer, Jr. is **reversed**.

The rejection of claims 73 and 83 under 35 U.S.C. § 103 as being unpatentable over Jowitt, Bowen and Brewer, Jr. is **reversed**.

The rejection of claim 74 under 35 U.S.C. § 103 as being unpatentable over Jowitt, Bowen, Brewer, Jr. and Griffin is **affirmed**.

We note the anomaly of the affirmance of the rejection of dependent claims and the reversal of the rejection of those claims from which they depend. This is due to the examiner's failure to apply the Griffin reference to the broader claims.

AFFIRMED-IN-PART

LEE E. BARRETT Administrative Patent Judge	)
JAMESON LEE Administrative Patent Judge	) BOARD OF PATENT)) APPEALS AND)) INTERFERENCES
JAMES T. CARMICHAEL Administrative Patent Judge	)

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