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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte DAVID E. CLEMMER, STORMY L. KOENIGER,
and STEPHEN J. VALENTINE[1]

Appeal 2010-007050
Application 11/286,608
Technology Center 2800

Before DAVID M. KOHUT, ERIC B. CHEN, and LARRY J. HUME, *Administrative Patent Judges*.

HUME, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134(a) of the Final Rejection of claims 46-56. Claims 46-81 and 87-98 are pending in the application, and are subject to the Final Rejection. However Appellants are only appealing claims 46-56 (App. Br. 2), and the rejection of claims 57-81 and 87-98 stands.[2] We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

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[1] The Real Party in Interest is Indiana University Research and Technology Corporation. (App. Br. 2.)

[2] If further prosecution should ensue, the Examiner should cancel claims 57-81 and 87-98.

STATEMENT OF THE CASE [3]

The Invention

Appellants' invention is generally directed to the field of spectrometry, and even more particularly to an ion mobility spectrometer for separating ions in time as a function of ion mobility. Spec. ¶ [0001].

Exemplary Claims

Claim 46 is an exemplary claim representing an aspect of the invention which is reproduced below (***emphasis*** added):

> 46. An ion mobility spectrometer comprising:
>
> a drift tube defining a drift tube inlet configured to receive ions and a drift tube outlet, the drift tube configured to separate the ions in time as a function of ion mobility,
>
> an ion fragmentation region,
>
> ***a source of buffer gas configured to supply buffer gas to at least the ion fragmentation region,***
>
> ***a source of doping gas configured to supply doping gas to at least the ion fragmentation region***, and
>
> at least one voltage source coupled to the ion fragmentation region, the at least one voltage source configured to selectively establish an electric field in the ion fragmentation region that is sufficient to fragment at least some of the ions via collisions with a mixture of the buffer gas and the doping gas,

[3] Our decision refers to Appellants' Appeal Brief ("App. Br.," filed June 23, 2009); Reply Brief ("Reply Br.," filed Feb. 8, 2010); Examiner's Answer ("Ans.," mailed Dec. 7, 2009); Final Office Action ("FOA," mailed Jan. 27, 2009); and the original Specification ("Spec.," filed Nov. 23, 2005).

> ***wherein the doping gas is selected such that a magnitude of the electric field that can be sustained in the ion fragmentation without breaking down in the presence of the ions and the mixture of the buffer gas and the doping gas is higher than the magnitude of the electric field that can be sustained in the ion fragmentation region without breaking down in the presence of ions and only the buffer gas***.

Prior Art

The Examiner relies upon the following prior art in rejecting the claims on appeal:

Smith	6,818,890 B1	Nov. 16, 2004
Shvartsburg	7,170,053 B2	Jan. 30, 2007
Miller	7,227,134 B2	June 5, 2007

Rejections on Appeal [4, 5]

Claims 46-56 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Shvartsburg and Miller in view of Smith.

ISSUE

Appellants argue (App. Br. 9-15; Reply Br. 2-6) that the Examiner's unpatentability rejection of claim 1 under 35 U.S.C. § 103(a) over Shvartsburg in view of Miller and Smith is in error. These contentions present us with the following issue:

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[4] We note that the rejection of claims 57-81 and 87-98 stand, as their rejection has not been appealed.

[5] We also note that the Examiner has invoked the Smith reference in the explicit statement of the rejection of claims 46-56, but does not appear to rely upon Smith for any reason in the detailed rejection of these claims. Ans. 3-6; FOA 8-10.

> *Issue*: Did the Examiner err in finding that the combination of Shvartsburg in view of Miller and Smith teaches or suggests Appellant's claimed ion mobility spectrometer that includes, *inter alia*, "a source of buffer gas configured to supply buffer gas to at least the ion fragmentation region, a source of doping gas configured to supply doping gas to at least the ion fragmentation region . . . wherein the doping gas is selected such that a magnitude of the electric field that can be sustained in the ion fragmentation without breaking down in the presence of the ions and the mixture of the buffer gas and the doping gas is higher than the magnitude of the electric field that can be sustained in the ion fragmentation region without breaking down in the presence of ions and only the buffer gas," as recited in claim 46?

ANALYSIS

We have reviewed the Examiner's rejections in light of Appellants' arguments that the Examiner has erred. We disagree with Appellants' conclusions with respect to claim 46, and we adopt as our own (1) the findings and reasons set forth by the Examiner in the action from which this appeal is taken and (2) the reasons and rebuttals set forth by the Examiner in the Examiner's Answer in response to Appellants' Arguments. However, we highlight and address specific findings and arguments regarding claim 46 for emphasis as follows.

We agree with the Examiner's finding that the combination of Shvartsburg and Miller in view of Smith teaches or suggests Appellants' claimed ion mobility spectrometer that includes, *inter alia*, "a source of buffer gas configured to supply buffer gas to at least the ion fragmentation region, a source of doping gas configured to supply doping gas to at least the ion fragmentation region . . . wherein the doping gas is selected such that a

magnitude of the electric field that can be sustained in the ion fragmentation without breaking down in the presence of the ions and the mixture of the buffer gas and the doping gas is higher than the magnitude of the electric field that can be sustained in the ion fragmentation region without breaking down in the presence of ions and only the buffer gas" as recited in claim 46. (Ans. 3-5).

Specifically with regard to the limitation "a source of doping gas," we disagree with Appellants' contention that

> [T]he term "doping" used by Miller does not refer at all to a gas that may be introduced to the IMS system, but rather refers to part of the sample that gets ionized during an instrument calibration process described in Miller . . . [and, a]s properly understood, "doping" therefore does not refer to a gas that is mixed with a buffer gas as required by appellants' claims, but is rather simply part of the ions that collide with the fragmentation gas during an ion fragmentation process disclosed by Miller.

App. Br. 11. We agree with the Examiner that a dictionary definition of a dopant is "an impurity usually added in minute amounts to pure substances in order to alter properties," and that the claimed "doping gas" may be construed as "any dopant in the form of a gas." Ans. 7 (citing Webster's Dictionary). We further agree with the Examiner that Miller teaches the use of methane gas, which may be reasonably construed as a "doping gas". Ans. 7 (citing Miller Col. 13:13-21). In further support of the Examiner's position, we note that Miller further teaches that "[t]he system 1476, like all of the previously described illustrative systems, may employ one or more dopants to enhance analysis." Miller Col. 41:6-9.

The claim recites "wherein the doping gas is selected such that a magnitude of the electric field that can be sustained in the ion fragmentation without breaking down in the presence of the ions and the mixture of the buffer gas and the doping gas is higher than the magnitude of the electric field that can be sustained in the ion fragmentation region without breaking down in the presence of ions and only the buffer gas." We also agree with the Examiner's finding that Miller teaches "tuning the IMS system to improve analysis by varying values of the applied field strength, temperature, pressure, humidity, flow rate, doping and carrier gas composition" (FOA 4 (citing Miller Col. 12:34-54)), and that Shvartsburg teaches "selecting the maximum field strength of the voltage applied to the analytical gap electrodes that it is below the threshold causing electrical breakdown of the buffer gas, where the threshold causing breakdown depends on the pressure, temperature, and composition of the selected gas." FOA 4 (citing Shvartsburg Col. 9:1-16).

We further agree with the Examiner's findings that Shvartsburg teaches that the peak amplitude of the electric field is selected to be below the threshold causing electrical breakdown of the buffer gas, which depends on the purity of the selected gas (Ans. 5 (citing Shvartsburg Col. 9:1-15)). We also agree that it therefore would have been obvious to one of ordinary skill in the art that "Shvartsburg would use a buffer gas that includes a doping gas as an impurity in accordance with Miller to improve the resolution of the ion mobility spectrometer, and would select the magnitude of the electric field applied to the electrodes of the analytical gap containing the impure buffer gas such that it does not cause electrical breakdown

thereby improving the analysis." Ans. 5 (citing Shvartsburg Col. 4:56-61 and Col. 9:1-8).

With respect to the additional limitation of "a source of buffer gas," we agree with the Examiner's findings that Miller teaches the use of a mixture of buffer gas and a doping gas, where improved analysis of the ion mobility system is provided by varying the doping and carrier gas composition. FOA 3 (citing Miller Col. 12:24-48). Further in this regard, we agree with the Examiner's finding that "Shvartsburg discloses using buffer gas mixtures containing impurities such as water to improve resolution of ion mobility spectrometry." Ans. 4 (citing Shvartsburg Col. 4:56-61).

Further, in light of the Examiner's findings above, we find Appellants' arguments that "Shvartsburg does not disclose supplying gases from two different sources of gas to an ion fragmentation region of an ion mobility spectrometer [and that n]one of the references of record show or disclose this feature" (Reply Br. 3) are misplaced, since the Examiner relies upon Miller for this teaching, cited *supra*.

In addition, we find that Appellants have mischaracterized the Examiner's reliance upon Miller by contending that "Miller simply teaches introducing a single fragmentation gas into a fragmentation region of a differential mobility spectrometer, and fragmenting a sample S in this fragmentation region in the presence of only this fragmentation gas [and that] Miller does not go any further than this, and to suggest otherwise represents an improper and erroneous reading of Miller." Reply Br. 7. We disagree, and in support of the Examiner's position, we note that Miller

clearly teaches the addition of dopant gas to the carrier gas. *See* Miller at least at Col. 12: 44-48 and Col. 41: 6-9.

Finally, the Examiner finds that "it would have been obvious to one of ordinary skill in the art that Shvartsburg would add a dopant gas in accordance with Miller in order to detect sample peaks that are fully isolated from the background thereby improving resolution of ion mobility spectra." Ans. 4 (citing Miller Col. 13:58-67 and Col. 14:1-8). Appellants do not address the Examiner's specific finding of motivation and we find the Examiner's motivation to be reasonable.

Accordingly, Appellants have not convinced us of any error in the Examiner's characterization of the cited art and related claim construction. Therefore, we sustain the Examiner's unpatentability rejection of independent claim 46. As Appellants have not provided separate arguments with respect to independent claim 53 or dependent claims 47-52 and 54-56, we similarly sustain the Examiner's unpatentability rejection of these claims.

CONCLUSIONS

The Examiner did not err with respect to the unpatentability rejection of claims 46-56 under 35 U.S.C. § 103(a) over Shvartsburg and Miller in view of Smith, and the rejection is sustained.

DECISION

The decision of the Examiner to reject claims 46-56 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv) (2011).

AFFIRMED

msc