United States District Court,
S.D. California.

SAES GETTERS, S.P.A,
Plaintiff.
v.
AERONEX, INC., A California corporation, and Jeffrey J. Spiegelman, an individual,
Defendants.
Aeronex, Inc., A California corporation, and Jeffrey J. Spiegelman, an individual,
Couterclaimants.
v.
Saes Getters, S.p.A. and Saes Pure Gas, Inc,
Counterdefendants.

Civ. No. 02CV612-B(LSP)

July 15, 2003.

Paul L. Hickman, Perkins Coie, Menlo Park, CA, May Chan, Perkins Coie, Santa Monica, CA, for Plaintiff.

John M. Benassi, Stephen S. Korniczky, Paul Hastings, Janofsky and Walker, San Diego, CA, for Defendants.

ORDER ON CLAIM CONSTRUCTION FOR U.S. PATENT 5,716,588

RUDI M. BREWSTER**, Senior District Judge.**

On June 13, 2003 and July 8, 2003 this Court held hearings in accordance with Markman v. Westview Instruments, Inc. 52 F.3d 967 (Fed.Cir.1995), *aff'd,* 517 U.S. 370 (1996) to construe the claims of U.S. Patent 5,716,588 (the "'588 patent"). Appearing for plaintiff and counterdefendants SAES Getters, S.p.A. and SAES Pure Gas, Inc. (collectively "SAES") were Mr. Breton Bocchieri, Ms. May Chan, and Mr. Paul Hickman. Appearing for defendants and counterclaimants Aeronex, Inc. and Mr. Jeffrey J. Spiegelman (collectively "Aeronex") were Mr. Stephen Korniczky and Mr. Franklin Ubell. Also present were Mr. Jeffrey J. Spiegelman and Dr. Daniel Alvarez from Aeronex, Inc. and Dr. Robert Cava, an expert for SAES.

While the parties were able to agree to the meaning of most of the claim terms contained in the '588 patent the Court was required to resolve one major issue in claim 1. The claim reads:

A method for removing oxygen contaminants from ammonia contaminated with oxygen, said method comprising the steps of contacting the oxygen contaminated ammonia with a getter material including iron and manganese to sorb said oxygen contaminants from said contaminated ammonia to produce thereby ammonia substantially free of oxygen.

The issue concerned the meaning of the phrase "a getter material including iron and manganese". SAES argued that this was an open-ended phrase, which allowed the inclusion not only of the bare metals iron and manganese, but also oxides of those metals. In contrast, Aeronex argued that the claim encompassed only the bare metals and did not include oxides of either iron or manganese.

Much of the controversy focused on precisely what material would result from the method described in Example 1 of the specification at Column 6 lines 5-46. The example describes one way to prepare a getter material of iron and manganese by first oxidizing the metals and then reducing them in the presence of hydrogen at 400 (deg.) C. According to SAES this method would produce a getter material which contained oxides of iron and manganese in addition to, potentially, some bare metal. However, Aeronex argued that this method would produce exclusively bare metal and would not include oxides of either iron or manganese in the final product. To further support their contention that Claim 1 of the patent addressed bare metal exclusively, Aeronex referenced several places in the specification of the '588 patent where the inventor used the term "metals" when describing the getter material. They contended that this meant the inventor contemplated the use of bare metal alone, and did not consider metal oxides within the scope of the claimed getter material.

The Court determined that the phrase "a getter material including iron and manganese" should be interpreted as "a material including, but not limited to, iron and manganese in their pure forms and/or in their oxides". The Court was persuaded that this was the proper claim interpretation because of the chemistry involved in producing bare iron and manganese from their respective oxides. According to Dr. Cava, to produce bare iron or manganese, iron oxide or manganese oxide must be heated to a much higher temperature than the 400 (deg.) C disclosed in Example 1 of the '588 patent. While Dr. Alvarez did dispute this assertion, the specification in the other patent at issue in this case, U.S. Patent 6,241,955 (the ' "955 patent"), which was granted to Dr. Alvarez, supports Dr. Cava's view when it states that;

it has been found that, starting with the highest oxidation state [of manganese] one must heat the oxides to progressively higher temperatures in the presence of a reducing agent to achieve reduction, ultimately requiring a temperature of about 1200 (deg.) C to reduce the oxides completely to metallic manganese.

('955 patent, Column 6 lines 36-41). While the '955 patent was not prior art for the '588 patent and is extrinsic evidence, it discloses basic chemical principles and suggests that a person of ordinary skill in the art would understand that the method described in Example 1 of the '588 patent would likely yield metal oxides, and not simply bare metal. Since the method described as a preferred embodiment of the '588 patent would create metal oxides, and the use of the term "including" in the claim would allow the inclusion of materials other than the ones specified, the Court found it appropriate to interpret claim 1 to include bare iron and manganese along with their oxides. In light of this construction, disputes regarding the remaining claim terms were easily resolved.

A proposed jury instruction showing the original claim language along with how those claims should be construed is included as Appendix A. A glossary of technical terms which will be presented to the jury along with the jury instruction is included as Appendix B.

IT IS SO ORDERED.

Appendix A: Claim construction for U.S. Patent 5,716,588

Claim Number	Original Language	Interpreted Language
1	A method for removing oxygen contaminants from ammonia contaminated with oxygen, said method comprising the steps of contacting the oxygen contaminated ammonia with a getter material including iron and manganese to sorb said oxygen contaminants from said contaminated ammonia to produce thereby ammonia substantially free of oxygen.	A method for removing oxygen contaminants from ammonia contaminated with oxygen, said method comprising the steps of contacting the oxygen contaminated ammonia with a getter material *including, but not limited to, iron and manganese in their pure forms and/or in their oxides* to *absorb or adsorb* said oxygen contaminants from said contaminated ammonia to produce thereby ammonia *containing less than one part oxygen per one million parts ammonia*.
2	The method of claim 1 wherein said step of contacting said contaminated ammonia is performed at temperature of between about 50 (deg.) C and about -20 (deg.) C.	as is
3	The method of claim 2 wherein said step of contacting said contaminated ammonia is performed at temperature of about 25 (deg.) C.	as is
4	The method of claim 1 wherein said getter material is a finely divided metal powder of specific surface greater than about 100 m^2/g.	The method of claim 1 wherein said getter material is a *powdered form of a metal or metal compound having a surface area per unit mass of about 100 m^2/g*.
5	The method of claim 1 wherein said getter material is deposited on a support selected from the group consisting of zeolites, porous alumina, porous silica, and molecular sieves.	as is
6	The method of claim 5 wherein said supports have a specific surface greater than about 100 m^2/g.	*The surface area of the supporting material of claim 5 is greater than 100 m^2/g.*
7	The method of claim 1 wherein the weight ratio of said iron to said manganese in said getter material is between about 10:1 and about 1:2.	as is
8	The method of claim 7 wherein the weight ratio of said iron to said manganese in said getter material is between about 10:1 and 1:1 .	as is
15	The method of claim 1 further comprising the step of contacting said oxygen contaminated ammonia with a drying material selected from the group consisting of barium oxide, calcium oxide, strontium oxide, and zeolites.	as is
17	A method of removing oxygen contaminants from ammonia contaminated with oxygen comprising the steps of: a) contacting the oxygen contaminated ammonia with a getter material including	A method of removing oxygen contaminants from ammonia contaminated with oxygen comprising the steps of: a) contacting the oxygen contaminated ammonia with a getter material *including, but not limited to,*

	iron and manganese to sorb said oxygen contaminants from said contaminated ammonia to remove substantially said' oxygen from said contaminated ammonia gas; and	*iron and manganese in their pure forms and/or in their oxides to absorb or adsorb* said oxygen contaminants from said contaminated ammonia to *produce ammonia containing less than one part oxygen per one million parts ammonia;* and
	b) a drying material selected from the group consisting of barium oxide, calcium oxide, strontium oxide, and zeolites to remove thereby water from said ammonia gas.	b) a drying material selected from the group consisting of barium oxide, calcium oxide, strontium oxide, and zeolites to remove thereby water from said ammonia gas.
18	The method of claim 17 wherein said step of contacting said contaminated ammonia is performed at temperature between about 50 (deg.) C and about -20 (deg.) C.	as is
19	The method of claim 18 wherein said step of contacting said contaminated ammonia is performed at temperature of about 25 (deg.) C.	as is
20	The method of claim 17 wherein said getter material is finely divided metal powder of specific surface greater than about 100 m^2/g.	The method of claim 17 wherein said getter material is *a powdered form of a metal or metal compound having a surface area per unit mass of about 100 m^2/g.*
21	The method of claim 17 wherein said getter material is deposited on a support selected from the group consisting of zeolites, porous alumina, porous silica and molecular sieves.	as is
22	The method of claim 21 wherein said supports have a specific surface greater than about 100 m^2/g.	*The surface area of the supporting material of claim 21 is greater than 100 m^2/g.*
23	The method of claim 17 wherein the weight ratio of said iron to said manganese in said getter material is between about 10:1 and about 1:2.	as is
24	The method of claim 23 wherein the weight ratio of said iron to said manganese in said getter material is between about 10:1 and about 1:1.	as is
31	An apparatus for removing oxygen contaminants from ammonia contaminated with oxygen, said apparatus comprising a source of ammonia to be treated an impure gas inlet in fluid communication with a gas purification chamber and said source of ammonia, said gas purification chamber including a getter material comprising a mixture of iron and manganese, said gas purification chamber being maintained un d er conditions effective to cause the sorbtion of	An apparatus for removing oxygen contaminants from ammonia contaminated with oxygen, said apparatus comprising a source of ammonia to be treated an impure gas inlet in fluid communication with a gas purification chamber and said source or ammonia, said gas purification chamber including a getter material *including, but not limited to, iron and manganese in their pure forms and/or in their oxides,* said gas purification chamber being maintained under conditions effective to cause the *absorption or adsorption* of substantially all of the

	substantially all of the oxygen from said contaminated ammonia when said contaminated ammonia is brought into contact with said getter material to provide a purified ammonia gas that is substantially free of oxygen contaminants, said gas purification chamber being in fluid communication with a gas outlet from which said purified ammonia is released.	oxygen from said contaminated ammonia when said contaminated ammonia is brought into contact with said getter material to provide a purified ammonia gas *containing less than one part oxygen per one million parts ammonia*, said gas purification chamber being in fluid communication with a gas outlet from which said purified ammonia is released.
34	The apparatus of claim 31 wherein said getter material is a finely divided metal powder of specific surface area greater than about 100 m ^{2}/g.	The apparatus of claim 31 wherein said getter material is a *powdered form of a metal or metal compound having a surface area per unit mass of about 100 m ^{2}/g*.
35	The apparatus of claim 31 wherein said getter material is deposited on a support selected from the group consisting of zeolites, porous alumina, porous silica, and molecular sieves.	as is
36	The apparatus of claim 35 where said supports have a specific surface greater than about m ^{2}/g.	*The surface area of the supporting material of claim 35 is greater than 100 m ^{2}/g*.
37	The apparatus of claim 31 wherein the weight ratio of said iron and said manganese in said getter material is between about 10:1 and about 1:2.	as is
38	The apparatus of claim 37 wherein the weight ratio of said iron to said manganese in said getter material is between about 10:1 and about 1:1.	as is
45	The apparatus of claim 31 wherein said gas purification chamber includes a drying material selected from the group consisting of barium oxide, calcium oxide, strontium oxide and zeolites.	as is
46	The apparatus of claim 45 wherein said drying material is co-mingled with said getter material in said gas purification chamber.	as is
47	The apparatus of claim 45 wherein said drying material is isolated from said getter material in said gas purification chamber.	as is
48	The apparatus of claim 47 wherein said contaminated ammonia contacts said getter material prior to contacting said drying agent.	as is
49	The apparatus of claim 47 wherein said contaminated ammonia contacts said drying agent prior to contacting said getter material.	as is
53	A method for producing a semiconductor	A method for producing a semiconductor device

	device using high purity ammonia, comprising the steps of: a) contacting contaminated ammonia containing oxygen contaminants with a getter material including iron and manganese to sorb said oxygen contaminants from said contaminated ammonia to remove substantially said oxygen contaminants from said contaminated ammonia gas to produce a purified ammonia gas; b) introducing said purified ammonia gas to a semiconductor wafer processing chamber; and	using high purity ammonia, comprising the steps of: a) contacting contaminated ammonia containing oxygen contaminants with a getter material *including, but not limited to, iron and manganese in their pure forms and/or in their oxides to absorb or adsorb* said oxygen contaminants from said contaminated ammonia to remove substantially said oxygen contaminants from said contaminated ammonia gas to produce a purified ammonia gas *containing less than one part oxygen per one million parts ammonia;* b) introducing said purified ammonia gas to a semiconductor wafer processing chamber; and
	c) processing a semiconductor wafer in the processing chamber to produce at least one semiconductor device.	c) processing a semiconductor wafer in the processing chamber to produce at least one semiconductor device.
54	The method of claim 53 wherein said step of contacting said contaminated ammonia is performed at temperature between about 50 (deg.) C and about -20 (deg.) C.	as is
55	The method of claim 54 wherein said step of contacting said contaminated ammonia is performed at temperature of about 25 (deg.) C.	as is
56	The method of claim 53 wherein said getter material is a finely divided metal powder of specific surface area of 100 m^2/g.	The method of claim 53 wherein said getter material is a *powdered form of a metal or metal compound having a surface area per unit mass of about 100 m^2/g.*
57	The method of claim 53 wherein said getter material is deposited on a support selected from the group consisting of zeolites, porous alumina, porous silica, and molecular sieves.	as is
58	The method of claim 57 wherein said supports have a specific surface area greater than about 100 m^2/g.	*The surface area of the supporting material of claim 57 is greater than 100 m^2/g.*
60	The method of claim 59 wherein the weight ratio of said iron to said manganese in said getter material is between about 10:1 and 1:1 .	as is
67	The method of claim 53 further comprising the step of contacting said oxygen contaminated ammonia with a drying material selected from the group consisting of barium oxide, calcium oxide, strontium oxide, and zeolites.	as is

Appendix B: Glossary of technical terms

Term	Definition
Absorb	To take up by chemical or molecular action.
Adsorb	To adhere in an extremely thin layer of molecules (as of gases, solutes, or liquids) on the surfaces of solid bodies or liquids with which they are in contact.
Adsorption	Adhesion in an extremely thin layer of molecules (as of gases, solutes, or liquids) to the surfaces of solid bodies or liquids with which they are in contact; in other words, one substance sticking to the surface of another.
Alkyl Derivative	A compound containing carbon and hydrogen.
Ammonia	A colorless gas having a sharp, intensely irritating odor, the gas being lighter than air and easily liquified by pressure; chemical symbol NH_3.
Atom	The smallest, indivisible unit of a pure element.
Contacting	Bringing close enough to interact.
Contaminant	A substance that makes another substance impure or unfit for use by the introduction of unwholesome or undesirable elements.
Contaminated	Made impure or unfit for use by the introduction of unwholesome or undesirable elements.
Gas Inlet	The opening of a device through which impure gas enters a gas purification device.
Gas Outlet	The opening of a gas purification device through which the purified gas is released.
Gas Purification Chamber	The body, compartment, or main vessel of a gas purification device wherein the gas purification activities occur.
Gas Stream	A stream of gas which flows through a device, such as a gas purification device.
Hydride	A compound of hydrogen usually with a more electropositive element or group.
Hydride Gas	A gas in which the predominant component is a gaseous hydride or a comparable gaseous compound containing an active hydride moiety, or a gas having reaction properties

	equivalent to ammonia, including but not limited to the lower alkyl derivatives of ammonia and its hydride analogs. Principal examples include hydrogen (H_2), ammonia (NH_3), phosphine (PH_3), arsine (AsH_3), borane ($B_2 H_6$), silane (SiH_4), disilane ($Si_2 H_6$), and their lower alkyl derivatives such as $R_a NH_b$, where a and b are both 0-3 and a b=3.
Iron	A silver-white, malleable metal that is highly reactive chemically and oxidizes readily; chemical symbol Fe.
Manganese	A gray-white or silvery, brittle metal; chemical symbol Mn.
Metal Oxide	Oxides of metallic elements in addition to oxides of the Group 1A and 2A elements.
Mixture	A material comprising two or more components.
Moiety	Part or section.
Molecular Sieves	A microscopic porous structure; may be used to absorb water.
Oxidation State	The extent to which an element is oxidized. For metals, the lowest oxidation state is zero and corresponds to pure bare metal lacking any oxygen. Metal oxides have at least one oxygen atom bound to the metal atom; depending on how many oxygen atoms are bound to the metal atom the metal of the metal oxide may be in any one of a number of oxidation states greater than zero.
Oxygen	A colorless, odorless, tasteless, diatomic gas; chemical symbol O_2.
Porous Alumina	A compound of aluminum oxide which is filled with pores; may be used to absorb water.
Porous Silica	A class of glassy materials which are filled with pores; may be used to absorb water.
ppb	Parts per billion.
ppm	Parts per million.
Processing	Subjecting a thing to a treatment or process.
Reaction	A process in which the chemical bonds of a contaminant rearrange so that the contaminant molecule becomes part of the structure of the sorbing material and cannot be separated easily therefrom.

Semiconductor	A partially conductive material, often used in the production of electronic devices.
Semiconductor Device	A device made from a semiconductor such as a transistor, an LED, or an integrated circuit as well as passive devices such as resistors, capacitors, or inductors.
Semiconductor Wafer Processing Chamber	The place where purified ammonia is used to fabricate a semiconductor device.
Sequester	To separate a contaminant out of a gas stream.
Sorbtion	To absorb or adsorb a contaminant from a gas stream.
Source	The point of origin of a gas, such as ammonia, to be treated by a gas purification device.
Specific Surface	The surface area of a material divided by its mass, frequently expressed in units of square meters per gram (m^2/g).
Structural Integrity (relating to metal oxides)	A metal oxide has structural integrity if it can resist erosion or breakage in the presence of a flowing gas stream, and does not deteriorate by suffering reduction of its specific surface area below its required minimum amount, such as 100 m^2/g.
Substantially Unaffected	The metal oxide is not so physically damaged by exposure to hydride gas in the course of removing contaminants from the gas so as to prevent the performance of its intended function of removing contaminants from a hydride gas stream.
Weight Ratio	The weight of one active substance in relation to the weight of a second active substance.
Zeolites	Material used to absorb water.
>=	Means greater than or equal to.

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