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,
Counterclaimants.
v.
Saes Getters, S.p.A. and Saes Pure Gas, Inc,
Counterdefendants.

Civ. No. 02CV612-B (LSP)

July 15, 2003.

ORDER ON CLAIM CONSTRUCTION FOR U.S. PATENT 6,241,955

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

On July 8 and 9, 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 in U.S. Patent 6,241,955 (hereinafter the "'955 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. Spiegleman (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 '955 patent, the Court was required to resolve two major issues in claim 1 which affected the interpretation of the remaining sixteen claims. Claim 1 reads:

A method of removing a contaminant from a gas stream of hydride gas which comprises contacting said gas stream with a quantity of high surface area reduced metal oxide which has a surface area of at least 100 m^2/g and is in an oxidation state which is less than its maximum oxidation state but not lower than its lowest oxidation state in which it maintains its structural integrity, for a period of time sufficient to sequester said contaminant on said high surface area reduced metal oxide by reaction therewith or adsorption thereon and reduce concentration of said contaminant in said gas stream to not more than 100 ppb, with said high surface area reduced metal oxide being substantially unaffected by said hydride gas.

The first controversy focused on the meaning of the term "hydride gas." SAES contended that the ordinary meaning of the term hydride gas included only those gases with reaction properties similar to ammonia, and excluded, hydrogen gas. In the absence of guidance by the inventor this might have been an appropriate interpretation, but the inventor clearly stated in the specification of the ' 955 patent what the term hydride gas means. At Column 7 lines 40-46 the inventor states:

> we will refer to "hydride gases" herein as those gases in which the predominant component is a gaseous hydride or a comparable gaseous compound containing an active hydride moiety, or mixtures thereof with each and/or with non-corrosive compatible gases. Principal examples include H_2, NH_3, PH_3, AsH_3, B_2H_6, SiH_4, Si_2H_6 and their lower alkyl analogs.

This is a clear example of the inventor acting as his own lexicographer and giving a special meaning to a technical term. The Federal Circuit has held that inventors have the right to give claim terms special meanings if they explicitly define those terms in the specification. *See* Vitronics corp. v. Conceptronic, Inc., 90 F.3d 1576, 1581 (Fed.Cir.1996). Therefore, regardless of the customary meaning of the term "hydride gas" the Court holds that the inventor's definition, which included hydrogen gas, should be adopted when interpreting the claims of the '955 patent.

The next controversy addressed by the Court concerned the meaning of the phrase "not lower than its lowest oxidation state ...". Both parties agreed that for any metal the lowest oxidation state would be zero, the bare metal. SAES argued that this meant the claim language included within its scope reduction of the metal oxides to their absolute lowest oxidation state, which would be zero, the bare metal. In addition, SAES pointed to several places in the patent specification where the inventor referred to "active metal sites" as evidence that the language in claim 1 encompassed reduction of the metal oxides to the state of bare metal. However, looking at the phrase "not lower than its lowest oxidation state" in the context of the entire claim, it was clear to the Court that the claim was referring to the oxidation state of the "reduced metal oxide." To remain a metal oxide, the compound must contain both a metal atom and at least one atom of oxygen. If the metal in the metal oxide is reduced to an oxidation state of zero, it becomes bare metal and is no longer bonded to an oxygen atom; at that point it is no longer a metal oxide. As to the contention that references to "active metal sites" meant that the inventor must be claiming bare metal, it is a basic principle of patent drafting that an inventor may disclose more in the specification than is covered by the claims, and that the patentee is granted protection only for those things explicitly claimed. *See* Johnson & Johnston Associates Inc. v. R.E. Service Co., Inc., 285 F.3d 1046, 1052-54 (Fed.Cir.2002). All that the Court is concerned with during claim construction is the meaning of the claim terms, and the Court should only look to the specification if the claim is unclear on its face. *See* Vitronics 90 F.3d at 1581. Since the claim explicitly states that it is referring only to "reduced metal oxides" the Court held that the metal cannot be reduced to an oxidation state of zero, and therefore claim 1 does not include bare metal within its scope.

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 6,241,955

Claim Number	Original Language Interpreted Language

1	A method of removing a contaminant from a gas stream of hydride gas which comprises contacting said gas stream with a quantity of high surface area reduced metal oxide which has a surface area of at least 100 m^2/g and is in an oxidation state which is less than its maximum oxidation state but not lower than its lowest oxidation state in which it maintains its structural integrity, for a period of time sufficient to sequester said contaminant on said high surface area reduced metal oxide by reaction therewith or adsorption thereon and reduce concentration of said contaminant in said gas stream to not more than 100 ppb, with said high surface area reduced metal oxide being substantially unaffected by said hydride gas.	A method of removing a contaminant from a gas stream of hydride gas which comprises contacting said gas stream with a quantity of high surface area reduced metal oxide which has a surface area of at least 100 m^2/g and is in an oxidation state which is less than its maximum oxidation state but not lower than its lowest oxidation state *where the material remains an oxide and* in which it maintains its structural integrity, for a period of time sufficient to sequester said contaminant on said high surface area reduced metal oxide by reaction therewith or adsorption thereon and reduce concentration of said contaminant in said gas stream to not more than 100 ppb, with said high surface area reduced metal oxide *not being so physically damaged by exposure to hydride gas in the course of removing contaminants from the hydride gas so as to prevent its performance of its intended function of removing contaminants from a hydride gas stream.*
2	A method as in claim 1 wherein said concentration of said contaminant in said gas stream is reduced to not more than 50 ppb.	as is
3	A method as in claim 2 wherein said concentration of said contaminant in said gas stream is reduced to not more than 10 ppb.	as is
4	A method as in claim 1 wherein said surface area is >= 200 m^2/g.	as is
5	A method as in claim 4 wherein said surface area is in the range of 200-800 m^2/g.	as is
6	A method as in claim 1 wherein said high surface area reduced metal oxide comprises at least 80% of a first metal oxide comprising an oxide of barium, calcium, iron, lithium, manganese, molybdenum, potassium, rhenium, sodium, strontium, titanium, tungsten or vanadium.	A method as in claim 1 wherein said high surface area reduced metal oxide comprises at least 80% *by weight* of a first metal oxide comprising an oxide of barium, calcium, iron, lithium, manganese, molybdenum, potassium, rhenium, sodium, strontium, titanium, tungsten or vanadium.
7	A method as in claim 6 wherein said first metal oxide comprises an oxide of manganese of molybdenum.	as is
8	A method as in claim 6 wherein the balance of said high surface area	as is

	reduced metal oxide comprises a second metal oxide, said metal of said second oxide being barium, calcium, iron, lithium, manganese, molybdenum, potassium, rhenium, sodium, strontium, or tungsten, and said metal of said second metaloxide being different from metal of said first metal oxide.	
9	a method as in claim 6 wherein the balance of said high surface area reduced metal oxide substrate comprises a second metal oxide which provides a promoter effect, said metal of said second oxide being calcium, cobalt, molybdenum, nickel, rhenium, titanium or tungsten, and said metal of said second metal oxide being different from metal of said first metal oxide.	as is
10	A method as in claim 1 wherein said hydride gas comprises H_2, NH_3, PH_3, AsH_3, B_2H_6, SiH_4, Si_2H_6 or a lower alkyl derivative thereof.	as is
11	A method as in claim 6 wherein said first metal oxide has deposited on portions of the surface thereof a coating comprising a second metal oxide.	A method as in claim 6 wherein said first metal oxide *has a coating of a second metal oxide on portions of its surface*.
12	A method as in claim 1 wherein said high surface area reduced metal oxide is formed by reduction from a first oxidation state in which a metal thereof is in a high oxidation state to a second oxidation state in which said metal thereof is in a lower oxidation state.	as is
13	A method as in claim 14 wherein said second oxidation state is the lowest oxidation state in which said high surface area reduced metal oxide can maintain its structural integrity.	as is
14	A method as in claim 12 wherein said reduction comprises heating of said metal oxide in said first oxidation state in the presence of a reducing agent at a temperature and for a period of time	as is

	sufficient to reduce said first oxidation state to the next lower oxidation state.	
15	A method as in claim 1 wherein said contaminant is a gaseous contaminant.	as is
16	A method as in claim 14 wherein said gaseous contaminant comprises gaseous oxygen, carbon dioxide, or water.	as is
17	A method as in claim 15 wherein removal of a gaseous contaminant is preceded by or followed by a step of removal of solid particulate matter from said gas.	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_2H_6), silane (SiH_4), disilane (Sil2$_{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 0_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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