CATALYTIC REACTOR FOR VOLATILE MINERALS

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ABSTRACT

This is a process of trapping natural occurring volatile gases carrying precious and other minerals in a semi-stable form. Gases trapped and carried through a container 318 apparatus to the catalytic reactor container 410 where volatile minerals are contained on an appropriate configuration of collecting media 434. A positive electrode 460 from a electrical source 430 is wrapped on the catalytic reactor container 410 in a appropriate configuration to induce an electromagnetic field. The positive electrode 460 from the catalytic reactor container is controlled by a rheostat 470. From the rheostat 470 to the electrical device causing the current draw 425. When the rheostat 470 is energized on the catalytic reactor container 410, electromagnet fields of varying intensity controlled by the rheostat are formed. Precious metals can be re-volatilized either singularly or in groups and drawn into the recovery circuit. Leaving most of the volatile elements still in the collecting media 434. The catalytic reactor container 410 containing the collecting media 434 can be cleaned of volatile minerals and reused many times. By introducing large amounts of amperage to the catalytic reactor container 410 will volatilize all remaining volatile minerals from the collecting media 434. The catalytic reactor container 410 along with the collecting media 434 can be put back in the collecting circuit again free of volatile minerals.

SIDE VIEW
CATALYTIC REACTOR FOR VOLATILE MINERALS

CROSS REFERENCE TO RELATED APPLICATIONS


BACKGROUND—FIELD OF INVENTION

[0002] The present invention relates to precious metal recovery, specifically to the volatilization and recovery of precious, and other minerals. The use of a catalytic reactor to trap the already existing in nature volatile mineral gases. And collecting them on a collecting media that inhibits precious metals and other minerals from volatilizing and to be semi stable. Thus the catalytic reactor permits the gas stream carrying the precious and other minerals to exit from the catalytic reactor. Utilizing a pre-selected electromagnetic field to selectively strip individual minerals from the catalytic reactor. Where the selected minerals are directed into the recovery extraction system in a fairly stable form.

BACKGROUND—DESCRIPTION OF PRIOR ART

[0003] Early inventors weren’t aware of volatile metals existing in nature in any quantities. Therefore this area of mineral separation and entrapment of volatile minerals was overlooked. Although a few patents dealt with trying to volatilize stable metals, none dealt with volatile metals existing in nature. Pat. No. 5,254,153- Date, Oct. 19, 1993, Cyanide Recycling Process, refers to the volatilization and the recirculating of HCN. This process doesn’t have anything to do with the already existing volatilization and entrapment of volatile metals. The U.S. Pat. No. 4,491,470, Jan. 1, 1985, the process does not use existing volatile minerals, but relies on extreme heat to volatilize stable metal gases. Pat. No. 4,226,836, Oct. 7, 1980 again uses extreme heat to volatilizing existing stable metals. U.S. Pat. No. 4,814,003, Richard Bemer, Mar. 21, 1989, using plasma arc and lazer to melt or volatilize already stable metals. There was no work done to separate and contain the already existing in nature minerals that cause the precious metals to volatilize. This invention covers an area that has been overlooked and hasn’t been covered. This invention deals with the volatile aspect of highly volatile mineral containment using a catalyst collecting media, so these volatile gases can be run through this catalyst collecting media. This process is a non-polluting environmentally clean procedure. We can find no prior art that covers the essence of this invention. The cost effectiveness of this procedure is next to nothing and the collecting media can be cleaned and recycled over and over. This invention is effective in separating the volatile minerals that cause the precious metals and other minerals to volatilize in nature everyday. These minerals will volatilize in room temperatures, exposed to sun, oxygen, electromagnetic fields and solutions so mild you can put your hands in them. This invention deals with extremely volatile metals and minerals.

SUMMARY OF INVENTION

[0004] In accordance with the present invention utilizing, catalytic reactor for volatile minerals.

[0005] Objects and Advantages

[0006] Accordingly several objects and advantages of the invention are:

[0007] (A) To provide an easy, cheap volatile mineral extraction and a recovery process to the minerals industry.

[0008] (B) Using a catalytic reactor to strip volatile metals and other minerals from solution(s), including feed material in a matter of seconds and collect and separate them singular form.

[0009] (C) To provide a clean extraction of precious metals, excluding and trapping and containment many of the problem contaminates.

[0010] (D) To further the environmental clean up of volatile contaminates using the catalytic reactor.

[0011] (E) Provide a process that can extract volatile metals and other minerals without contaminating the air, water sources, or other aqueous solution(s) or the processing site, recovering volatile minerals in an environmentally sound and responsible manner.

[0012] (F) Further objects and advantages are that it opens up thousands of potential ore bodies, water sources, industrial wastes, sewage and numerous other possibilities that could potentially have precious metals or other valuable minerals that at the present time are being volatilized and not recovered.

[0013] (G) Further objects and advantages are to provide small business an opportunity to operate their own company, from a small start-up cost.

[0014] (H) Further objects and advantages are the reactor catalyst collecting media can be cleaned and reused again and again.

[0015] (I) Provide a process that will strip from the catalytic reactor collecting media minerals singular or in groups by controlling the electromagnetic field around the catalytic reactor or the main reactor.

DRAWING FIGURES

[0016] FIG. 1, is relating to the actual catalytic converter. It captures the essence of the invention in relation to trapping volatile minerals.

[0017] FIG. 2, is relating to the volatile mineral electromagnetic separating and cleaning process of the collecting media material inside the catalytic reactor.

[0018] Reference Numerals in Drawings

[0019] FIG. 1 Cut Away

[0020] 310- Bottom Perforations

[0021] 315- Volatile Gases

[0022] 318- Container

[0023] 326- Gas Exit Line
FIG. 1 Cut Away

Referring now to FIG. 1, the catalytic reactor container 334 houses the collecting media 330, the top of the said catalytic reactor container 334 can be attached to the top, or in this case the bottom of the container 318 top, as in FIG. 1, or it can be set away from the main reactor as in FIG. 2. The air containing the volatile gases 315 is pushed through the bottom aperture or perforations 310 located in the bottom of the catalytic reactor container 334. The volatile gases 315 are subjected to a appropriate configuration of collecting media 330. Where volatile minerals build up on the collecting media 330. Semi stable metal and minerals the can be sent individually to the recovery circuit utilizing a selected electromagnetic field induced by a rheostat 470. The gases now free of volatile minerals, proceeds through the catalytic reactor container 334 gas exit line 326 to be scrubbed and released. FIG. 1 captures the essence of the collecting ability of the invention.

FIG. 2 Cut Away

Referring now to FIG. 2, collecting media 434 and the catalytic reactor container 410. The collecting media 434 laden with volatile minerals is located inside of the catalytic reactor container 410. A positive electrode 460 is wrapped on the catalytic reactor 410 in an appropriate manner. This electrode when energized creates a corona effect or an electromagnetic field in and around the catalytic reactor container 410. From there to the rheostat 470, which controls the electrical devise voltage to the catalytic reactor container 410. The positive electrode may be either alternating current or direct current. The negative electrode 435 by passes the catalytic reactor container 410 and goes from the electrical source 430 ground bar, to the device that causes the current draw 425, which in turn is controlled by the rheostat 470. When energized, the collecting media 440 gives up the volatile minerals they are re-volatilized either singularly or all together and are drawn into the recovery system for volatile metals and minerals.

FIG. 1, Alternative Embodiments

There are also additional possibilities with regard to different types of scrubbing and collecting medium. Each one selectively removes unwanted volatile minerals from the air stream. The placement of the catalytic reactor may be attached to the main reactor volatilization unit or detached any number of feet away.

FIG. 2 Additional Alternative Embodiments

The collecting media can be configured or alloyed in different ways, using wool, or metals or minerals may be impregnated in a porous medium. Or they may be ran through consecutive sheets of the metal or the metal could be in shards or shot to collect the volatile minerals. It could also be non metallic in nature such as carbons, zeolite or resin beads or of that nature. Or different combinations of electrode configurations, or types of rheostat. Also different configurations of electromagnetic field. The electromagnetic field intensity could be also controlled by different types of controllers.

Advantages

From the description above, a number of advantages of the collecting media and selectively stripping process becomes evident.

(A) Providing a low cost volatile mineral containment process to the minerals industry.

(B) Providing a clean, environmentally sound process to contain and dispose of volatile minerals.

(C) Provide a process for municipalities to use the collecting media process on municipal water intakes and sewage and storm water to extract existing volatile minerals and metals from these solutions. The extraction process could offset the cost of providing water and sewer to the municipality.

(D) It would also provide an opportunity for conventional mineral extraction operations to use the volatile mineral collection media and selective extraction process on their waste water to increase their profitability.

(E) Open up thousands of ore bodies and water and solution sources to be utilized to produce precious metals or other minerals by removing the volatility from the precious metals and recovering same.

(F) Cost advantage by recycling the catalytic reactor collecting media material by stripping the volatile minerals from the collecting media.

Operation—FIG. 1, and 2

In a cut away drawing of FIG. 1, the minerals and volatile gases 315 are forced up through an aperture or bottom perforations 310 of the catalytic reactor container 334. In FIG. 1, the catalytic reactor container 334 is attached to the bottom side of the container 318 top. The volatile gases 315 are stripped of their volatile minerals on the collecting media 330. The now stripped gases are sent down the gas exit line 326 to be scrubbed and released. The internal catalytic reactor container 334 can be selectively stripped of it's minerals by using the main reactors electromagnetic field coupled with a rheostat 470 to control the selective electromagnetic field.

In the cut away drawing of FIG. 2, the catalytic reactor container 410 is wrapped with an energized wire 420. The positive electrode 460 is wrapped on the catalytic
reactor container 410 in an appropriate manner. The energized wire 420 wrapped on the catalytic reactor container 410 in an appropriate manner, is controlled by a rheostat 470 type apparatus. The rheostat 470 also controls the device that creates a current draw 425, thus causing a varied and controlled energized field or corona effect around the catalytic reactor container 410. The collecting media 434 inside the catalytic reactor container 410 contains and traps volatile minerals. The negative electrode 435 by passes the container and terminates at the electrical device causing the current draw 425.

[0054] The main embodiment of the present invention, shown in FIG. 1 and FIG. 2 has several advantages. For example, existing natural volatile heavy metals are stripped from solutions and feed material along with the volatile minerals. The volatile minerals are contained and immobilized in the catalytic reactor container. They are re-volatileized selectively and singularly by the use of a variable electromagnatic field. The re-volatileized selected precious metals go on to recovery. This is all done in an environmentally clean manner, leaving the solution and feed material cleaner, devoid of volatile minerals. It also opens up possibilities of cleaning up volatile heavy metals and minerals out of sewage, runoff or irrigation waters, municipal water supplies or possibly from super fund sites, or from other similar applications.

[0055] The effectiveness of the present technique for the extraction and containment of volatile metals and other volatile minerals, is further enhanced by the short retention time of the gases in the catalytic reactor system. Letting the operator run larger volumes of solution, slurries or feed materials through the process in a short time. The process is further enhanced by the cost of setting up the catalytic apparatus. Processing the solutions or feed materials at a fraction of the cost of conventional processing. To make it even more cost effective the catalytic reactor media can be recycled again and again. The collecting media can be cleansed of all volatile minerals by running the media through a electric corona field using high amperage, removing all the volatile minerals.

CONCLUSION, RAMIFICATION, AND SCOPE OF INVENTION

[0056] Thus the reader will see that collecting media entrapment of volatile minerals as pertaining to recovery of volatile metals and minerals is a major mile stone. It is a boon in the mining industry's recovery of precious metals. The environmental ramifications of this invention will be an asset to the industry and the county. Not only is it a environmentally clean process, it is cheap and cost effective in the recovery of precious metals. Furthermore, the entrapment of volatile metal and minerals process has the additional advantages in that:

[0057] The invention not only works for solutions but it also works for waste, run off, or sewage water, and dry or wet feed materials as well.

[0058] While I believe, but will not be bound by, that even conventional ore bodies contain appreciable amounts of volatile metals. These metals are now being, and have been lost in the processing of these ores by conventional means, it can now be recovered.

[0059] It also may be utilized by municipalities utilizing the previous patents as stripping process in industrial application. Many sewage lagoons or other containment ponds may find the above applications a viable part of their process, offsets the cost of running their operation by recovering precious metals after removing the volatile minerals through the said catalytic process coupled with the catalytic reactor process.

[0060] This invention will open the door to many small miners, showing them the way to mine and recover minerals in an environmentally sound manner.

[0061] Accordingly, the scope of the invention should be determined not by the embodiment(s) illustrated, but by the appended claims and their legal equivalents.

[0062] While my above description contains many specifications, these should not be construed as limitations on the scope of the invention, but rather as an exemplification of one preferred embodiment thereof. Many other variations are possible. For example the above process may be:

[0063] Changed in size.

[0064] Connected or associated with its adjacent elements ill a different manner.

[0065] Made integrally or separately.

[0066] Use different combination of catalytic configuration.

[0067] Not limited to any collecting media used singly or in combination, or in a matrix, or in an alloy.

[0068] Not limited to just one type of catalytic reactor container.

[0069] Not limited to the size of the collecting media.

[0070] Not limited to the temperature of the volatile gases.

[0071] Not limited to the temperature of air.

[0072] Not limited to using a vacuum or positive air pressure to move volatile gases through the catalytic reactor.

[0073] Not limited to the size or composition of cleaning media.

[0074] Not limited to either alternating current or direct current used in catalytic reactor container.

[0075] Not limited to size or configuration of the electromagnetic field.

[0076] Not limited to the configuration of the electrodes.

U.S. PATENT DOCUMENTS

References Cited


1- A process for the means of entrapment of volatile metal and minerals comprising: A closed catalytic reactor vessel with electrode windings on walls of vessel, adapted to hold a collecting media as a catalyst to trap or scrub volatile metal or minerals out of mineral rich gases drawn in through a aperture in one end of the vessel and ejected out the other leaving the volatile minerals and precious metals trapped in the collecting media.

2- The means of entrapment of volatile metal and minerals in claim 1 comprising: The utilization of a collecting media of metallic wool, foil, shot, shards or a matrix of same as a catalyst to trap or scrub volatile metal or mineral gases.

3- The means of entrapment of volatile metal and minerals in claim 1 using the utilization of a collecting media of carbon or selected minerals as a catalyst to trap or scrub volatile metal and mineral gases.

4- A means of selectively extracting precious metals and other volatile minerals from catalytic reactor vessel material using a selectively predetermined controlled electromagnetic field.

5- A means of selectively extracting precious metals and other minerals as in claim 4 using alternating current utilizing predetermined amperage levels to selectively volatilize precious metals and other volatile minerals

6- A means of selectively extracting precious metals as in claim 4 comprising: varying direct voltage current to control intensity of the electromagnetic field.

7- A means of selectively extracting precious metals and minerals as in claim 4 comprising: using varying intensities of electrostatic coronas.

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