

Search history

Search SFT=((lead w5 batter*) and (sodium carbonate or soda ash or carbon) and (recycl* or *treatment)) and IC=(C22B13 or C22B7) (Results 141)

Search FT=((1) AND PD<(20150729)) (Results 124)

2:

Search (2) AND PD=(2014 OR 2015 OR 2013 OR 2012 OR 2009 OR 1981 OR 2011 OR 1987 OR 2010 OR 1982 OR 1999 OR 2000 OR 2006 OR 2008 OR 1996 OR 1997 OR 1998) (Results 92)

1) Family number: 4957003 (GB2023183A)

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Title: PROCESSING STORAGE BATTERY LEAD SCRAP

Abstract: A method for processing storage battery lead scrap comprises crushing the scrap, removing large metallic lead parts and organic waste containing chlorine and subjecting the remaining sulphate/oxide scrap and organic casing to grinding prior to smelting in an oxidising atmosphere to form an oxidizing melt to obtain metallic lead.

Classifications:

International (IPC 8-9): C22B13/02 C22B7/00 (Advanced/Invention);
C22B13/00 C22B7/00 (Core/Invention)

International (IPC 1-7): C22B13/00 C22B7/00 H01M10/54

CPC: C22B13/02 C22B7/001 C22B7/005 Y02P10/214

European: C22B13/02 C22B7/00B C22B7/00C

Family:

Publication number	Publication date	Application number	Application date
GB2023183 A1	19791228	GB19780026673	19780610
GB2023183 B2	19820714	GB19780026673	19780610

Priority:

GB19780026673 19780610

Probable Assignee: V NI GOR METAL I TSVET METAL

Assignee(s): (std): V NI GOR METAL I TSVET METAL

Assignee(s): VSES NI GOR METAL INST TSVET METAL

2) Family number: 49051005 (EP2333895A1)

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Title: METHOD FOR DESULPHURIZATION OF BATTERY PASTE

Abstract: The invention relates to a method of desulphurizing battery paste in the process of recycling lead-acid batteries. The paste desulphurizing stage of the method according to the invention is carried out in an aqueous solution of a defined amine or of a mixture of polyamines, wherein the said solution is saturated with carbon dioxide to remove the remainder of calcium from the solution and then filtered to isolate precipitated calcium carbonate, preferably by using pressure filtration, thereafter the battery paste is leached with the thus obtained circulating aqueous solution of the polyamine or of a mixture of polyamines, followed by filtration of the suspension obtained, preferably by using pressure filtration and washing on the filter, to obtain a desulphurized paste of low sulphur content and the circulating solution. The solution is regenerated by removing therefrom the remainder of lead and carbon dioxide by acting upon it with sulphuric acid and then filtered to separate lead sulphate and recycled to the basic process. The circulating amine solution is regenerated with calcium hydroxide in a crystallizer to obtain a gypsum suspension, which is separated by pressure filtration and washed on the filter to produce gypsum and the circulating solution, wherein the concentration of the polyamine or of the mixture of polyamines in the solution is adjusted by admixing a new portion of the polyamine or of the mixture of polyamines, and the adjusted solution is returned to the start of the process.

Classifications:

International (IPC 8-9): C22B13/00 H01M10/54 (Advanced/Invention)

CPC: H01M10/54 C22B13/045 H01M10/06 Y02W30/84 Y02P10/212

European: C22B13/04R H01M10/54 T01M10/06 Y02E60/12

Family:

Publication number	Publication date	Application number	Application date
DE602009007554 D1	20120809	DE200960007554T	20091221
EP2333895 A1	20110615	EP20090460056	20091221
EP2333895 B1	20120613	EP20090460056	20091221
ES2389396 T3	20121025	ES20090460056T	20091221
PL216507 B1	20140430	PL20090389639	20091123
PL389639 A1	20110606	PL20090389639	20091123

Priority:

PL20090389639 20091123 EP20090460056 20091221

Probable Assignee: INST METALI NIEZELAZNYCH

Assignee(s): (std): INST METALI NIE ; INST METALI NIE ELAZNYCH ; INST METALI NIEZELAZNYCH ; ORZEL BIALY S A ; ORZE BIA Y SPO KA AKCYJNA ; ORZEL BIALY SPOLKA AKCYJNA ; ORZE

Assignee(s): METALI NIE INST ; INSTYTUT METALI NIE ELAZNYCH ; INSTYTUT METALI NIEZELAZNYCH ; METALI NIEZELAZNYCH INST ; ORZEL BIALY SA

Inventor(s): (std): BUZEK UCJA ; MIESZEK ZBIGNIEW ; GOTFRYD LESZEK ; SZO OMICKI ZBIGNIEW ; BUZEK ; AND SACUTE ; SZO ; BUZEK LUCJA ; LESZEK GOTFRYD ; LUCJA BUZEK ; WASILEWSKI WOJCIECH ; PRAJSNAR RYSZARD ; MROZOWSKI JAN ; MYCZKOWSKI ZBIGNIEW ; SZOLOMICKI ZBIGNIEW ; CHMIELARZ ANDRZEJ ; RASZKA URSZULA ; MULAWA LESZEK ; SMIESZEK ZBIGNIEW

Agent(s): HAVERKAMP JENS PROF DIPL GEOL DRRERNAT ; MASLOWSKI ANDRZEJ

Designated states: AL AT BA BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

3) Family number: 34114026 (US2010040938A)

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Title: LEAD RECYCLING

Abstract: The present invention describes a method of recycling lead from lead containing waste, the method comprising the steps of mixing the battery paste with aqueous citric acid solution so as to generate lead citrate; isolating lead citrate from the aqueous solution; and converting the lead citrate to lead and/or lead oxide.

Classifications:

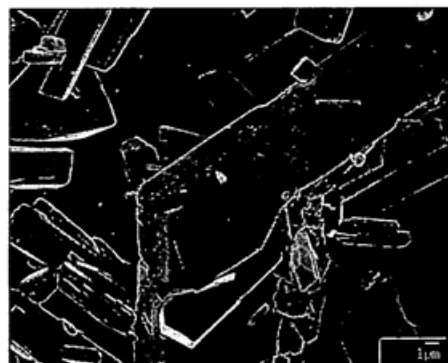
International (IPC 8-9): C01G21/00 C01G21/06 C22B13/00 C22B3/04 C22B7/00 H01M10/54 H01M6/52 (Advanced/Invention); C22B13/00 C22B7/00 H01M10/54 H01M6/00 (Core/Invention)

CPC: C22B13/045 C22B3/165 C22B7/007 H01M4/56 H01M6/52 H01M10/06 H01M10/54 Y02W30/84 Y02P10/234

European: C22B13/04R C22B3/16B2G C22B7/00D1 H01M10/54 H01M6/52 T01M10/06 T01M4/56 Y02E60/12

US: 423/92 423/98 429/49 429/49P 562/400 75/432 75/432S 75/711 75/711S 75/714 75/743

PatBase - US2010040938_AA



Family:

Publication number	Publication date	Application number	Application date
CN101573461 A	20091104	CN200780041628	20071106
CN101573461 B	20120808	CN200780041628	20071106
EP2089553 A1	20090819	EP20070824458	20071106
GB200622249 A0	20061220	GB20060022249	20061108
IN02216KN2009 A	20090703	IN2009KN02216	20090615
RU2009117620 A	20101220	RU20090117620	20071106
RU2486266 C2	20130627	RU20090117620	20071106
US2010040938 AA	20100218	US20070513707	20071106
US8323376 BB	20121204	US20070513707	20071106
WO08056125 A1	20080515	WO2007GB04222	20071106

Priority:

GB20060022249 20061108 WO2007GB04222 20071106

Probable Assignee: CAMBRIDGE ENTERPRISE LTD

Assignee(s): (std): CAMBRIDGE ENTPR LTD ; UNIV CAMBRIDGE TECH ; SONMEZ SEREF ; KOTZEVA VEGA PETROVA ; KUMAR RAMACHANDRAN VASANT ; KEMBRIDZH EHNTERPRAJZ LTD

Assignee(s): CHANCELLOR MASTERS AND SCHOLARS OF UNIV OF CAMBRIDGE ; CHANCELLOR MASTERS AND SCHOLARS OF UNIV OF CAMBRID ; CAMBRIDGE UNIV TECHNICAL SERVICES LTD ; CAMBRIDGE UNIVERSITY TECHNICAL SERVICES LIMITED ; CAMBRIDGE ENTERPRISE LIMITED ; CAMBRIDGE ENTERPRISE LTD

Inventor(s): (std): KUMAR RAMACHANDRAN VASANT ; PETROVA KOTZEVA VEGA ; SEREF SONMEZ ; SONMEZ SEREF ; VASANT KUMAR RAMACHANDRAN ; KOTZEVA VEGA PETROVA

Inventor(s): KUMAR RAMACHANDRAN ; KOTZEVA VEGA

Agent(s): WILLS ANDREW JONATHAN; MICHAEL BEST AND FRIEDRICH LLP; WATSON ROBERT ET AL

Designated states: AE AG AL AM AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN SV SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

4) Family number: 54323058 (WO14154160A1)

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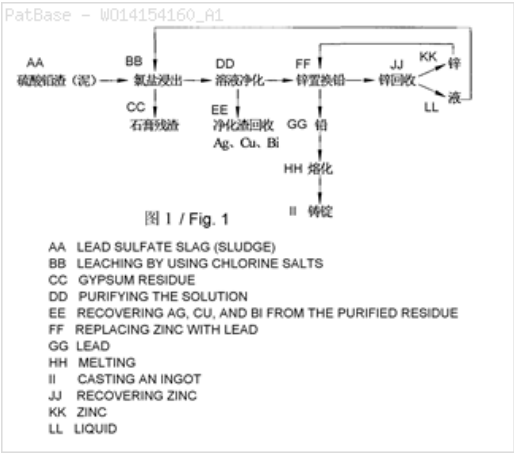
Title: HYDROMETALLURGICAL PROCESS FOR RECOVERING LEAD FROM LEAD SULFATE

Abstract: A hydrometallurgical process for recovering lead from lead sulfate; the process uses CaCl₂ + NaCl as a leach solution to leach the high leaching residue containing lead sulfate obtained from hydrometallurgy of zinc, the lead slag obtained by leaching zinc from lead-containing zinc oxide, or the lead sludge obtained by dismantling a lead-acid accumulator; replacing zinc with lead from the leached liquid; recovering zinc from the replaced liquid; the recovered zinc is returned to the lead replacement process, and the Cl-containing liquid after zinc recovery is circulated to the lead sulfate leaching process using chlorine salts. The process has low energy consumption and low cost, and is easy to apply, and can thoroughly eliminate flue gas pollution such as lead fumes, lead dust, SO₂ and the like.

Classifications:

International (IPC 8-9): C22B13/00 C22B13/06 C22B19/00

C22B3/10 C22B3/44 C22B3/46 C22B7/00 (Advanced/Invention)
CPC: C22B13/045 C22B19/30 Y02P10/214 C22B3/10 C22B3/46 Y02P10/234



Family:

Publication number	Publication date	Application number	Application date
AU2014201760 AA	20141016	AU20140201760	20140324
AU2014201760 BB	20160908	AU20140201760	20140324
CN103194615 A	20130710	CN201310100691	20130327
CN103194615 B	20140604	CN201310100691	20130327
EP2975141 A1	20160120	EP20140773683	20140327
EP2975141 A4	20160608	EP20140773683	20140327
EP2975141 B1	20181010	EP20140773683	20140327
WO14154160 A1	20141002	WO2014CN074192	20140327

Priority:

CN201310100691 20130327 WO2014CN074192 20140327

Probable Assignee: YUNNAN XIANGYUN FEILONG NON FERROUS METALS CO LTD

Assignee(s): (std): YUNNAN XIANGYUN FEILONG NON FERROUS METALS CO LTD ; YUNNAN XIANGYUN FEILONG RECYCLING TECHNOLOGY CO LTD ; YUNNAN XIANGYUNFEILONG RESOURCES RECYCLING TECH CO LTD ; YUNNAN XIANGYUNFEILONG RESOURCES RECYCLING TECHNOLOGY CO LTD

Assignee(s): YUNNAN XIANGYUNFEILONG RESOURCES RECYCLING TECHNOLOGY CO ; YUNNAN XIANGYUN FEILONG NON FERROUS METALS CO

Inventor(s): (std): SHU YUZHANG ; TIAN XILIN

Agent(s): GBIP LTD; SUN YIMING; BEIJING UTC LIANFENG INTELLECTUAL PROPERTY LAW OFFICE GENERAL PARTNERSHIP

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

5) Family number: 43509062 (US2011017020A)

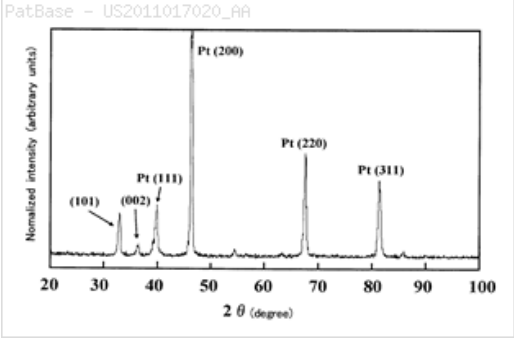
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Title: METHOD OF RECYCLING USEFUL METAL

Abstract: A method of recycling useful metals is provided. The method enables useful metals including indium, zinc, yttrium, europium, lanthanum, terbium, gadolinium, antimony, lead, copper, tin, and silver to be recovered from wastes, such as wasted flat panel displays, and recycled economically with small energy consumption. The method of recycling useful metals includes: a step in which wastes comprising various flat panel displays, e.g., liquid-crystal display panels, are crushed/powdered; a step in which the resultant particles are dissolved in an aqueous hydrofluoric acid solution; and a step in which various metal oxides and various metal fluorides which remain undissolved are filtered off and the aqueous hydrofluoric acid solution containing various metal ions is electrolyzed to deposit and recover metals for transparent-electrode oxides, such as indium and zinc, and other useful metals.

Classifications:

International (ipc 8-9): B09B3/00 B22F9/04 C02F1/62 C22B1/00 C22B11/00 C22B13/00 C22B15/00 C22B19/20 C22B19/30 C22B25/00 C22B25/06 C22B3/04 C22B3/10 C22B3/20 C22B3/46 C22B30/02 C22B58/00 C22B59/00 C22B7/00 C25C1/00 C25C7/06 (Advanced/Invention); B09B3/00 C22B1/00 C22B15/00 C25C1/00 (Advanced/Non-invention); B09B3/00 C22B1/00 C22B15/00 C22B19/00 C22B3/00 C22B58/00 C22B7/00 C25C7/00 (Core/Invention)
CPC: Y02W30/828 C22B7/007 C22B3/10 C22B3/22 C22B58/00 C25C5/04 G02F1/1343 G02F2203/68 H01J9/52 Y02P10/234 Y02P10/236 C25C1/00
European: C22B3/10 C22B3/22 C22B58/00 C22B7/00D1 C25C1/00 C25C5/04 H01J9/52 S02F1/1343 S02F203/68
US: 75/353 75/403 75/403P
JP F-Term: 4D004 4D004/AA18 4D004/AA22 4D004/AA24 4D004/BA05 4D004/CA02 4D004/CA04 4D004/CA13 4D004/CA15 4D004/CA34 4D004/CA40 4D004/CA41 4D004/CB13 4D004/CC03 4D004/CC12 4D038 4D038/AA10 4D038/AB68 4D038/AB88 4D038/BA04 4D038/BB20 4K001 4K001/AA01 4K001/AA09 4K001/AA15 4K001/AA20 4K001/AA21 4K001/AA24 4K001/AA30 4K001/AA39 4K001/AA40 4K001/BA22 4K001/CA01 4K001/DA01 4K001/DB02 4K001/DB03 4K001/DB04 4K001/DB05 4K001/DB07 4K001/DB21 4K058 4K058/AA21 4K058/BA07 4K058/BA21 4K058/BA23 4K058/BA25 4K058/BA26 4K058/BA27 4K058/BA28 4K058/BA30 4K058/BB04 4K058/CA03 4K058/CA04 4K058/CA05 4K058/FA02 4K058/FC07 4K058/FC14
JP F-Index: B09B3/00/Z B09B3/00/304/Z C02F1/62/C C22B11/00/101 C22B13/00/101 C22B15/00/105 C22B19/20/101 C22B19/30 C22B25/00/101 C22B25/06 C22B3/00/A C22B3/06 C22B3/08 C22B3/10 C22B30/02 C22B58/00 C22B59/00 C22B7/00/G C25C7/06/301/A
JP Facet: ZAB



Family:

Publication number	Publication date	Application number	Application date
CN101909770 A	20101208	CN200880124389	20081225
CN101909770 B	20140507	CN200880124389	20081225
EP2241381 A1	20101020	EP20080870074	20081225
EP2241381 A4	20111109	EP20080870074	20081225
JP2009087908 A1	20110526	JP20090548885T	20081225
JP5403814 B1	20140129	JP20090548885T	20081225
JP5403814 B2	20140129	JP20090548885T	20081225
KR101312775 B1	20130927	KR20107016969	20081225
KR20100106551 A	20101001	KR20107016969	20081225
US2011017020 AA	20110127	US20080812154	20081225
US8317896 BB	20121127	US20080812154	20081225
WO09087908 A1	20090716	WO2008JP73572	20081225

Priority:

JP20080003661 20080110 JP20090548885 20081225 WO2008JP73572 20081225

Probable Assignee: SHIBAURA INST OF TECHNOLOGY**Assignee(s):** (std): FURUYAMA TOMOYUKI ; HOMMA TETSUYA ; MORIKAKU AKIHIRO ; SHIBAURA INST TECHNOLOGY ; UBUSAWA TOMOYUKI ; TANAKA KUMPEI**Assignee(s):** SHIBAURA INSTITUTE OF TECHNOLOGY ; SHIBAURA INST OF TECHNOLOGY**Inventor(s):** (std): MORIKAKU AKIHIRO ; FURUYAMA TOMOYUKI ; TANAKA KUMPEI ; HOMMA TETSUYA ; UBUSAWA TOMOYUKI ; TETSUYA HOMMA ; TOMOYUKI UBUSAWA ; AKIHIRO MORIKAKU ; KUMPEI TANAKA ; TOMOYUKI FURUYAMA**Agent(s):** BETTEN AND RESCH; PEARNE AND GORDON LLP; KUDO ICHIRO**Designated states:** AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW**6) Family number: 2003068 (FR2513904B)**

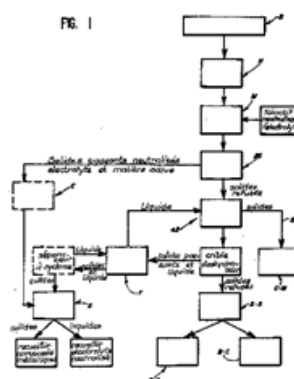
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Title: PROCEDE ET INSTALLATION POUR RECUPERER DES COMPOSANTS D'ACCUMULATEURS

Abstract: Accumulator scrap is milled, and is then fed down a vertical column in counter-current to an ascending stream of liq. The upward velocity of the liq. carries all the nonmetallic scrap upwards to a separator, from which the liq. can be reclaimed; but the metallic scrap falls to the base of the column, where it can be removed, pref. by a screw feeder. The column pref. has a dia. of 380 mm; and the liq. is pref. water flowing up the column at 1700-1900 litres/minute or at a speed of 15 metres/minute. The initial scrap pref. consists of polymers and a metal, esp. Pb; and is crushed; it is then pref. mixed with a soluble alkali to neutralise acid electrolyte in the scrap. All the materials in the scrap can be reclaimed, e.g. from Pb-acid, or Ni-Zn batteries.

Classifications:**International (ipc 8-9):** B03B11/00 B03B5/62 B03B9/00 B03B9/06 C22B1/00 C22B13/00 H01M10/54 (Advanced/Invention); B03B11/00 B03B5/00 B03B9/00 C22B1/00 C22B13/00 H01M10/54 (Core/Invention)**International (ipc 1-7):** B03B5/00 B03B5/62 B03B7/00 B03B9/00 B29B17/02 C22B3/00 C22B7/00 H01M10/54**CPC:** H01M10/54 B03B5/623 B03B9/061 B03B11/00 C22B1/005 C22B13/00 Y02W30/524 Y02W30/84 Y02P10/212 Y02W30/521**European:** B03B11/00 B03B5/62B B03B9/06D C22B1/00D C22B13/00 H01M10/54 Y02E60/12

PatBase - FR2513904_A1

**Family:**

Publication number	Publication date	Application number	Application date
AU198288789 A1	19830414	AU19820088789	19820928
AU560474 B2	19870409	AU19820088789	19820928
CA1210735 A1	19860902	CA19820411937	19820922
FR2513904 A1	19830408	FR19820016560	19821001
FR2513904 B1	19900608	FR19820016560	19821001

Priority:

Probable Assignee: GNB BATTERIES INC**Assignee(s):** (std): GNB BATTERIES INC ; GOULD INC**Assignee(s):** REAMS EDWARD J ; LARSON ANDREW H ; CLARK KENNETH G ; CORDES WILLIAM A ; DOUGHERTY JOHN E ; GNB BATTERY TECHNOLOGIES INC ; GNB INC ; GNB TECHNOLOGIES INC**Inventor(s):** (std): CLARK KENNETH G ; CLARK KENNETH GALE ; CORDES WILLIAM A ; CORDES WILLIAM ADOLPH ; DOUGHERTY JOHN E ; DOUGHERTY JOHN EDWARD ; LARSON ANDREW H ; LARSON ANDREW HESSLER ; REAMS EDWARD J ; REAMS EDWARD JOSEPH**Inventor(s):** WILLIAM ADOLPH CORDES ; KENNETH GALE CLARK ANDREW HESSLER LARSON... ; ANDREW HESSLER LARSON ; EDWARD JOSEPH REAMS ; JOHN EDWARD DOUGHERTY ; KENNETH GALE CLARK ; KENNETH GALE CLARK ANDREW HESSLER LARSON EDWARD JO ; KENNETH GALE CLARK ANDREW HESSLER LARSON EDWARD JOSEPH REAMS WILLIAM ADOLPH CORDES ET JOHN EDWARD DOUGHERTY**Agent(s):** PHILLIPS ORMONDE FITZPATRICK; MCFADDEN FINCHAM; OSLER HOSKIN AND HARCOURT LLP**7) Family number: 57414072 (US2016030856A)**

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Title: DISTILLATION REACTOR MODULE

Abstract: The distillation reactor consists of a reactor apparatus with corresponding method of upstream distilling and purification of carbon based liquid or liquidized streams for use as fuels, lubricating oils and or gaseous energy and electricity production. The distillation reactor consolidates the atmospheric and vacuum distillation processes along with desalting, defueling, deasphalting, fractionation, thin/wiped film evaporation and Hydro finishing into an advanced high velocity, high volume single reactor system. Carbon based feed streams include either a single stream or preferably, a combined stream of liquefied coal slurries, crude oils, spent oils, Pyrolytic oils and or peat or other plant carbon derived liquids, vapors, mists or gases. The method further consists of controlling the mix ratio, flow velocity, sequential fractionation and filtration technology and processing atmospheres of the carbon feeds with the reactor apparatus. The combined apparatus and method allows for a refinery to consistently produce a finished barrel of oil well below traditional costs and at a higher efficiency than current art and prior art.

Classifications:

International (IPC 8-9): B01D3/00 B01D3/06 B01D3/10 B01D3/26 B01D3/32 B01D39/20 B01D53/48 B01D53/62 B01D59/04 B01J B01J19/24 B01J19/26 B01J2/00 B01J6/00 B01J8/24 B02C23/00 B03C1/00 B22F3/10 B22F9/00 B29B17/00 C01B17/027 C01B17/74 C02F1/00 C10B49/12 C10G1/00 C10G11/18 C10G33/00 C10G45/00 C10G57/00 C10G7/00 C10G7/06 C10G9/04 C10J3/72 C10L9/10 C22B13/00 C22B15/00 C22B21/00 C22B7/00 C22B9/00 F03G7/00 F27B17/00 G21C1/02 G21D5/00 H01M10/54 H01M8/00 H02K55/02 H02K7/09 (Advanced/Invention)

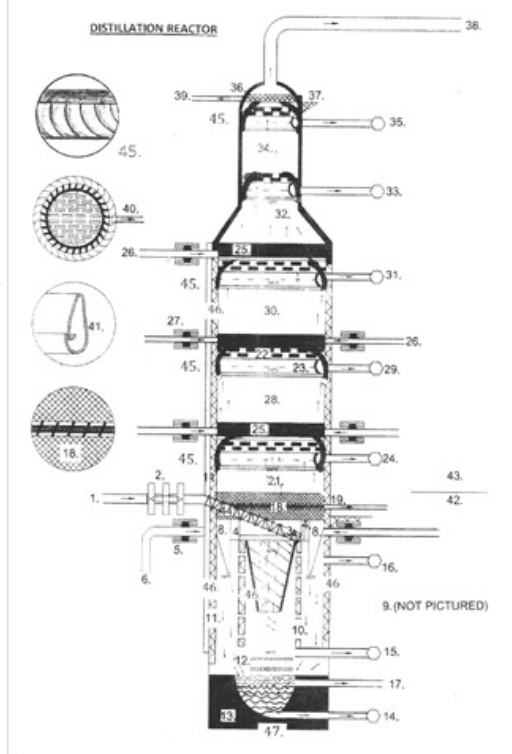
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US: 196/46 202/232 209/213 210/251 241/301 241/65 266/160 310/90.5 422/129 422/170 422/187 422/198 422/255 423/522 423/567.1 429/49 505/163 505/166 60/698

JP F-Term: 4D036 4D076 4D076/AA22 4D076/AA23 4D076/AA24 4D076/BB03 4D076/BB18 4D076/CA11 4D076/CA19 4D076/CD21 4D076/DA02 4D076/DA10 4D076/DA35 4D076/EA04 4D076/EA12 4D076/EA15 4D076/FA03 4D076/FA12 4D076/FA18 4D076/FA20 4D076/FA33 4D076/HA13 4D076/HA20 4D076/JA06

JP F-Index: B01D3/26/Z B01D59/04

PatBase - US2016030856_AA

**Family:**

Publication number	Publication date	Application number	Application date
CA2907677 AA	20150921	CA20142907677	20140318
EP2969180 A2	20160120	EP20140762668	20140318
EP2969180 A4	20161005	EP20140762668	20140318
IL242590 A0	20160131	IL20140242590	20140318
JP2016512165 T2	20160425	JP20160502609T	20140318
US2016030856 AA	20160204	US20140776734	20140318
US2016032904 AA	20160204	US20140776736	20140318
US2016045841 AA	20160218	US20140776732	20140515
WO14146129 A2	20140918	WO2014US31118	20140318
WO14146129 A3	20150129	WO2014US31118	20140318
WO14153570 A2	20140925	WO2014US38290	20140515
WO14153570 A3	20150219	WO2014US38290	20140515
WO14153570 A9	20150806	WO2014US38290	20140515
WO14200605 A2	20141218	WO2014US31116	20140318
WO14200605 A3	20150326	WO2014US31116	20140318
WO14200605 A4	20150430	WO2014US31116	20140318
WO14200605 A9	20150205	WO2014US31116	20140318

Priority:

US20130800209P 20130315 US20130801170P 20130315 US20130801491P 20130315
US20140776734 20140318 US20140776736 20140318 WO2014US31118 20140318
WO2014US31116 20140318 US20140776732 20140515 WO2014US38290 20140515

Probable Assignee: TRANSTAR GROUP LLC

Assignee(s): (std): BRADLEY RANDALL ; KALPAN ALLEN ; KAPLAN ALLEN ; TRANSTAR GROUP LTD

Assignee(s): TRANSTAR GROUP LLC

Inventor(s): (std): BRADLEY RANDALL ; KALPAN ALLEN ; KAPLAN ALLEN

Agent(s): ADE AND CO INC; NELLIGAN OBRIEN PAYNE LLP; PERRONACE ANDREA; HERSHKOVITZ ABRAHAM ET AL; HERSHKOTIZ ABRAHAM ET AL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

8) Family number: 57781073 (US2017271725A)

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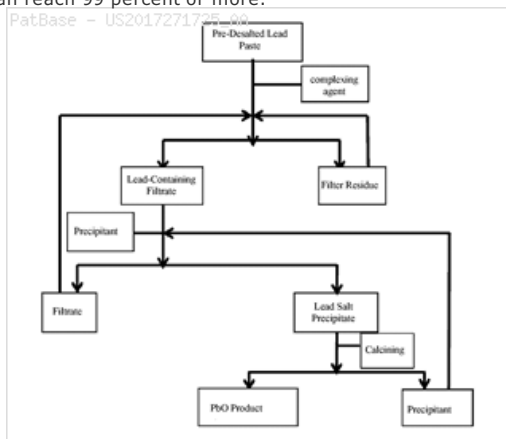
Title: METHOD FOR RECOVERING LEAD OXIDE FROM WASTE LEAD PASTE

Abstract: A method for recovering lead oxide from a pre-desalted lead paste, comprising the following steps: a. dissolving the pre-desalted lead plaster by using a complexing agent solution, and making all of PbO therein react with the complexing agent to generate lead complexing ions, obtaining a lead-containing solution and a filter residue; b. adding a precipitant to the lead-containing solution, and then the precipitant reacting with the lead complexing ions to generate a lead salt precipitate and the regenerated complexing agent; c. calcining the lead salt precipitate to obtain lead oxide and regenerate the precipitant. The final recovery rate of lead oxide of the method can reach 99 percent or more.

Classifications:

International (IPC 8-9): C01G21/06 C01G21/14 C22B13/00 C22B3/00 C22B7/00 H01M10/00 H01M10/06 H01M10/54 H01M4/56 (Advanced/Invention)

CPC: C22B7/006 C22B13/045 H01M10/06 C01G21/06 H01M10/54 C01G21/14 C01P2006/80 H01M4/56 Y02P10/234 Y02W30/84



Family:

Publication number	Publication date	Application number	Application date
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CN104141045 B	20170412	CN201410410675	20140820
US2017271725 AA	20170921	US20150505608	20150610
US10135100 BB	20181120	US20150505608	20150610
WO16026344 A1	20160225	WO2015CN081203	20150610

Priority:

CN201410410675 20140820 WO2015CN081203 20150610

Probable Assignee: BEIJING UNIV OF CHEMICAL TECHNOLOGY

Assignee(s): (std): BEIJING UNIV OF CHEMICAL TECHNOLOGY ; UNIV BEIJING CHEM TECH ; UNIV BEIJING CHEMICAL ; UNIV BEIJING CHEMICAL TECH

Inventor(s): (std): BIAN YARU ; NIU YINJIAN ; PAN JUNQING ; SUN YANZHI

Agent(s): HAUPTMAN HAM LLP; BEIJING PANTECH INTELLECTUAL PROPERTY LAW FIRM

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

9) Family number: 59238103 (US2016160315A)

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Title: METHOD FOR RECYCLING LEAD OXIDE-CONTAINING WASTE MATERIAL

Abstract: Provided is a method for recycling a lead oxide-containing waste material, comprising: (1) contacting the lead oxide-containing waste material with a desulphurizer under desulphurization reaction conditions, and performing a solid-liquid separation on the mixture after contacting to obtain a filtrate and a filtration residue; (2) performing a conversion reaction on the above-mentioned filtration residue at a temperature of 350-750 degrees centigrade so as to convert the lead-containing components in the filtration residue into lead oxide; (3) contacting the product obtained from step (2) with an alkaline solution so as to dissolve the PbO therein, and then performing a solid-liquid separation to obtain a PbO-alkaline solution; and (4) crystallizing the PbO-alkaline solution from step (3) to obtain PbO crystals and an alkaline filtrate. The method can reduce the energy consumption.

Classifications:

International (IPC 8-9): B09B3/00 C01D5/00 C01G21/06 C22B1/00 C22B1/02 C22B1/11 C22B13/00 C22B3/00 C22B3/22 C22B3/44 C22B7/00 H01M10/54 (Advanced/Invention)

CPC: C22B1/005 H01M10/54 Y02W30/84 C22B13/045 C01G21/06 C01D5/00 C01P2006/80 C22B7/006 Y02P10/234

US: 423/92

JP F-Term: 4D004 4D004/AA23 4D004/AB03 4D004/BA05 4D004/CA15 4D004/CA22 4D004/CA34 4D004/CA41 4D004/CA50 4D004/CB09 4D004/CC11 4D004/CC12 4D004/DA03 4D004/DA06 4D004/DA10 4K001 4K001/AA20 4K001/BA22 4K001/CA11 4K001/DB22

JP F-Index: B09B3/00/303/A B09B3/00/304/J B09B3/00/ZAB C22B1/02 C22B3/44/101/Z C22B7/00/C C22B7/00/G

Family:

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AU2014383726 AA	20160128	AU20140383726	20140527
AU2014383726 BB	20161110	AU20140383726	20140527
CA2918348 AA	20160114	CA20142918348	20140527
CA2918348 C	20170912	CA20142918348	20140527
CN104619645 A	20150513	CN201480001973	20140527
CN104619645 B	20170301	CN201480001973	20140527
CN104862481 A	20150826	CN201410060146	20140221
EP3012334 A1	20160427	EP20140883017	20140527
EP3012334 A4	20160907	EP20140883017	20140527
IN201637001759 A	20160701	IN201637001759	20160118
JP2017503088 T2	20170126	JP20160562053T	20140527
JP6314248 B2	20180418	JP20160562053T	20140527
KR101718000 B1	20170320	KR20167001880	20140527
KR20160044461 A	20160425	KR20167001880	20140527
US2016160315 AA	20160609	US20140906366	20140527
US9828653 BB	20171128	US20140906366	20140527
WO15123931 A1	20150827	WO2014CN078491	20140527

Priority:

CN201410060146 20140221 CN201480001973 20140527 WO2014CN078491 20140527
WO2014CN78491 20140527

Probable Assignee: BEIJING UNIV OF CHEMICAL TECHNOLOGY

Assignee(s): (std): BEIJING UNIV OF CHEMICAL TECHNOLOGY ; CHAOWEI POWER CO LTD ; CHILWEE POWER CO LTD ; CHILWEE POWER CO LTD AND BEIJING UNIV OF CHEMICAL TECHNOLOGY ; UNIV BEIJING CHEMICAL ; UNIV BEIJING CHEMICAL TECH ; UNIV BEIJING CHEM TECH

Assignee(s): ZHOU MINGMING ; YANG XINXIN ; ZHANG XUAN ; ZHOU LONGRUI ; WU XIN ; SONG SHUANG ; PAN JUNQING ; WANG JIANGLIN ; SUN YANZHI ; NIU YINJIAN ; LIU XIAOWEI ; CHEN TIXIAN ; MA YONGQUAN ; CHILWEE POWER CO ; CAI XIAOXIANG ; CAO GUOQING ; CHAOWEI POWER CO

Inventor(s): (std): CHEN TIXIAN ; LIU XIAOWEI ; MA YONGQUAN ; NIU YINJIAN ; PAN JUNQING ; SONG SHUANG ; SUN YANZHI ; WANG JIANGLIN ; WU XIN ; YANG XINXIN ; ZHANG XUAN ; ZHOU LONGRUI ; ZHOU MINGMING ; CAI XIAOXIANG ; CAO GUOQING

Inventor(s): CHE N TIXIAN

Agent(s): DAVIES COLLISON CAVE; DAVIES COLLISON CAVE PTY LTD; BORDEN LADNER GERRAIS LLP; NEDERLANDSCH OCTROOIBUREAU; NOGAWA SHINTARO; MAINE CERNOTA AND RARDIN; RUNPING AND PARTNERS

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

10) Family number: 11204121 (US5827347A)

© PatBase

Title: PROCESS FOR THE RECOVERY OF LEAD FROM SPENT BATTERIES

Abstract: A process for the recovery of lead from spent battery paste and lead containing materials. The process includes the steps of calcination of a spent paste treated with an alkali carbonate or hydroxide or any mixture thereof, and elemental sulphur at a temperature of up to 600 DEG C., followed by washing with water. The calcined and washed paste is dissolved in an alkali molten electrolyte, and lead is electrowinned from the alkali molten electrolyte. The spent electrolyte is reused in the process.

Classifications:

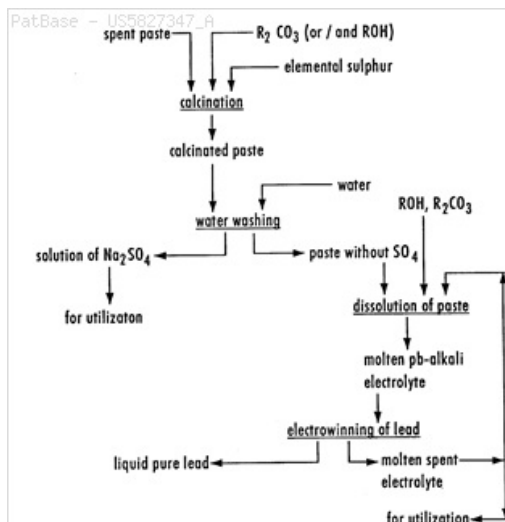
International (ipc 8-9): C22B13/02 C25C3/34 (Advanced/Invention); C22B13/00 C25C3/00 (Core/Invention)

International (ipc 1-7): C22B C25C3/34 H01M10/54

CPC: C22B13/025 C25C3/34 Y02P10/214

European: C22B13/02R C25C3/34

US: 205/369 423/621 429/49 75/419



Family:

Publication number	Publication date	Application number	Application date
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AU199877868 A1	20000105	AU19980077868	19980616
AU199877868 A5	20000105	AU19980077868	19980616
IL118397 A0	19960912	IL19960118397	19960523
KR19970077808 A	19971212	KR19970020103	19970522
US5827347 A	19981027	US19960686623	19960724
WO9966105 A1	19991223	WO1998IL00284	19980616

Priority:

IL19960118397 19960523 WO1998IL00284 19980616

Probable Assignee: MARGULEAD LTD

Assignee(s): (std): EFIM MARGULIS ; MARGULEAD LTD ; MARGULIS EFIM

Inventor(s): (std): MARGULIS EFIM

Inventor(s): EFIM MARGULIS

Designated states: AL AM AT AU AZ BA BB BE BG BR BY CA CH CN CU CY CZ DE DK EE ES FI FR GB GE GH GM GR GW HU ID IE IL IS IT JP KE KG KP KZ LC LK LR LS LT LU LV MC MD MG MK MN MW MX NL NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG UZ VN YU ZW

11) Family number: 56437122 (US2014131220A)

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Title: RECOVERING LEAD FROM A LEAD MATERIAL INCLUDING LEAD SULFIDE

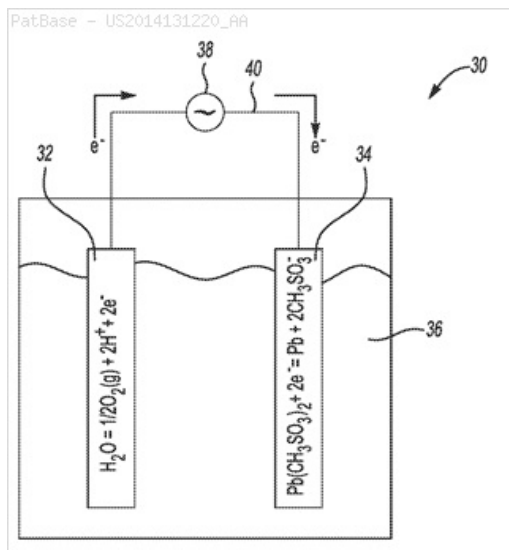
Abstract: In an example of a method for recovering lead from a lead material including lead sulfide, methane sulfonic acid is selected as a leaching acid for the lead material. The lead material is exposed to a solution including the methane sulfonic acid and i) ferric methane sulfonate or ii) oxygen, which leaches lead from the lead sulfide in the lead material, and generates a liquid leachate including a lead-methane sulfonate salt. The liquid leachate is purified, and lead is recovered from the purified liquid leachate using electrolysis.

Classifications:

International (IPC 8-9): C22B13/00 C22B3/00 C22B3/16 C25C1/18 E03D1/00 E03D1/14 E03D1/30 (Advanced/Invention)

CPC: C25C1/18 C22B3/165 C22B13/04

US: 1/1 205/599



Family:

Publication number	Publication date	Application number	Application date
BR112015010834 A2	20170711	BR20151110834	20131113
US2014131220 AA	20140515	US20130076662	20131111
US9322105 BB	20160426	US20130076662	20131111
WO14076544 A1	20140522	WO20131B02535	20131113

Priority:

US20120725835P 20121113 US20130810664P 20130410 US20130076662 20131111
WO2013US69961 20131113

Probable Assignee: OF BRITISH COLUMBIA UNIV

Assignee(s): (std): BASF SE ; IP HOLDCO L L C AS ; UNIV BRITISH COLUMBIA

Assignee(s): IP HOLDCO LLC AS ; OF BRITISH COLUMBIA UNIV

Inventor(s): (std): CHRISTOPHE BUCHER ; DAVID GROVER ; FASSBENDER STEFAN ; WU ZHENGHUI ; DREISINGER DAVID ; JAMES MCHALE

Agent(s): DIERKER AND KAVANAUGH PC

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

12) Family number: 56437123 (US2014131219A)

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Title: RECOVERING LEAD FROM A MIXED OXIDIZED MATERIAL

Abstract: In an example of a method for recovering lead from a mixed oxidized lead material, methane sulfonic acid is selected as a leaching acid for the mixed oxidized lead material. The mixed oxidized lead material is exposed to a solution including the methane sulfonic acid, which leaches lead from any of a lead oxide or a lead carbonate in the mixed oxidized lead material, and generates a liquid leachate including a lead-methane sulfonate salt. The liquid leachate is purified, and

lead is recovered from the purified liquid leachate using electrolysis.

Classifications:

International (IPC 8-9): C22B13/00 C22B3/00 C22B3/16 C22B3/22 C22B3/26 C22B3/42 C22B3/44 C25C1/18 (Advanced/Invention)

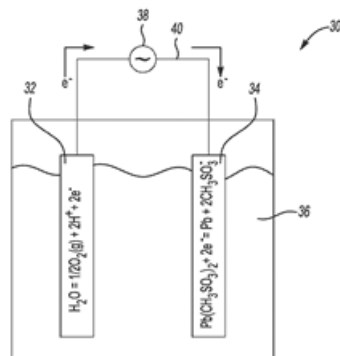
CPC: C25C1/18 C22B13/045 C22B13/04

US: 1/1 205/599

JP F-Term: 4K001 4K001/AA20 4K001/BA02 4K001/CA01 4K001/DB11 4K001/DB21 4K001/DB22 4K001/DB23 4K001/DB24 4K001/DB28 4K001/DB30 4K001/DB31 4K001/DB36 4K001/EA06 4K058 4K058/AA25 4K058/BA27 4K058/BB04 4K058/CA03 4K058/CA17 4K058/CA22 4K058/EB13 4K058/ED04 4K058/FC02 4K058/FC14

JP F-Index: C22B13/00/101 C22B3/16 C22B3/22 C22B3/26 C22B3/42 C22B3/44/101/A C22B3/44/101/Z C25C1/18

PatBase - US2014131219_AA



Family:

Publication number	Publication date	Application number	Application date
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AU2013346480 BB	20170831	AU20130346480	20131113
CA2860614 AA	20140704	CA20132860614	20131113
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EP2920330 A1	20150923	EP20130812067	20131113
EP2920330 B1	20171101	EP20130812067	20131113
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PL2920330 T3	20180530	PL20130812067T	20131113
PT2920330 T	20180129	PT20130812067T	20131113
RS56991 B1	20180531	RS20180000089	20131113
TR201801145 T4	20180221	TR20180001145T	20131113
US2014131219 AA	20140515	US20130076564	20131111
US9322104 BB	20160426	US20130076564	20131111
WO14076547 A1	20140522	WO20131B02540	20131113

Priority:

US20120725824P 20121113
WO20131B02540 20131113

US20130076564 20131111

EP20130812067 20131113

Probable Assignee: OF BRITISH COLUMBIA UNIV

Assignee(s): (std): BASF SE ; UNIV BRITISH COLUMBIA ; UNIV OF BRITISH COLUMBIA

Assignee(s): OF BRITISH COLUMBIA VANCOUVER UNIV ; OF BRITISH COLUMBIA UNIV103-6190 AGRONOMY ROADVANCOUVERB1V6T 1Z3CA ; FASSBENDER STEFAN ; WU ZHENGHUIBOX 537-6335 THUNDERBIRD CRESCENTVANCOUVERB1V6T 2G9CA ; WU ZHENGHUI ; BASF SE67056LUDWIGSHAFENDE ; DREISINGER DAVID ; DREISINGER DAVID5233 BENTLEY CRESDELTA1V4K 4K2CA ; OF BRITISH COLUMBIA UNIV

Inventor(s): (std): DAVID DREISINGER ; DREISINGER DAVID ; STEFAN FASSBENDER ; WU ZHENGHUI ; FASSBENDER STEFAN ; Z WU ; ZHENGHUI WU

Inventor(s): FASSBENDER STEFANDE ; WU ZHENGHUI VANCOUVER ; WU ZHENGHUIBOX 537-6335 THUNDERBIRD CRESCENTVANCOUVERB1V6T 2G9CA ; DREISINGER DAVID DELTA ; DREISINGER DAVID5233 BENTLEY CRESDELTA1V4K 4K2CA

Agent(s): WATERMARK PATENT AND TRADE MARKS ATTORNEYS; WATERMARK INTELLECTUAL PROPERTY PTY LTD; SIM AND MCBURNEY; ROBIC; ZUMSTEIN ANGELA; CARVAJAL Y ISABEL; YESIM METIN; LOWENSTEIN SANDLER LLP

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT HW HN HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

13) Family number: 2269141 (US4650553A)

© PatBase

Title: ELECTROLYTIC RECOVERY OF LEAD FROM SCRAP

Abstract: Lead is recovered from lead-containing scrap metal in an electrolytic process employing an aqueous solution of C1-4 alkanesulfonic acid as the electrolyte at a high concentration, scrap lead as the anode, and an electroconductive cathode, impressing an electromotive force across the solution between the electrodes to provide a specified steady-state concentration of lead salt in the electrolyte, and continuing the process to deplete the anode and collect lead at the cathode.

Classifications:

International (IPC 8-9): C22B13/00 C25C1/18

H01M10/54 (Advanced/Invention);

C25C1/00 H01M10/54 (Core/Invention)

International (IPC 1-7): C22B13/00 C25C1/00 C25C1/14 C25C1/18

H01M10/54

CPC: C25C1/18 H01M10/54 Y02W30/84 Y02P10/212

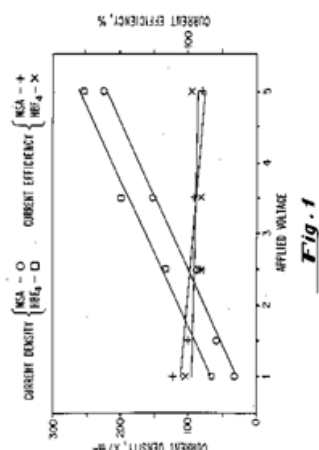
European: C25C1/18 H01M10/54 Y02E60/12

US: 204/114 205/601

JP F-Term: 4K058 4K058/AA17 4K058/AA23 4K058/BA27
 4K058/BB03 4K058/CA03 4K058/CA11 4K058/CA20 4K058/EB12
 4K058/EB13 4K058/EC04
JP F-Index: C25C1/18

PatBase - US4650553_R

U.S. Patent Mar. 17, 1987 Sheet 1 of 2 4,650,553



Family:

Publication number	Publication date	Application number	Application date
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AU586045 B2	19890629	AU19860064461	19861028
BRPI8701266 A	19871229	BR1987PI01266	19870320
CA1292203 A1	19911119	CA19860521698	19861029
DE3674194 D1	19901018	DE19863674194	19861031
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DK564386 A0	19861125	DK19860005643	19861125
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IN166444 A	19900512	IN1986CA00766	19861021
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MX168069 B	19930503	MX19860004715	19861218
US4650553 A	19870317	US19860842578	19860321

Priority:

US19860842578 19860321 CA19860521698 19861029

Probable Assignee: ATOFINA CHEMICALS INC A CORP OF PENNSYLVANIA

Assignee(s): (std): ATOCHEM NORTH AMERICA ; FELGENDREGER ALFRED F ; PENNWALT CORP

Assignee(s): PENNWALT A CORP OF PA CORP ; PENNWALT CORP PHILADELPHIA PA US ; FELGENDREGER ALFRED FRANK ; TUSZYNSKI WILLIAM JOSEPH ; NEVERS ASHLEY DWIGHT ; ATOCHEM NORTH AMERICA INC ; ATOCHEM NORTH AMERICA INC A PA CORP ; ATOFINA CHEMICALS INC ; ATOFINA CHEMICALS INC A CORP OF PENNSYLVANIA ; ELF ATOCHEM NORTH AMERICA INC

Inventor(s): (std): ARUFURETSUDO EFU FUERUGENDOREG ; ASHIYURII DEII NEBERUSU ; NEVERS ASHLEY D ; NEVERS ASHLEY DWIGHT ; TUSZYNSKI WILLIAM JOSEPH ; TUSZYNSKI WILLIAM JOSEPH ; UIRIAMU JIEI TEYUSHINSUKI ; FELGENDREGER ALFRED F ; FELGENDREGER ALFRED FRANK

Inventor(s): FELGENDREGER ALFRED FRANK WYNCOTE PA 19095 US ; ALFRED F FELGENDREGER ; WILLIAM J TUSZYNSKI ; ASHLEY D NEVERS ; ARUFURETSUDO EFU FUERUGENDOREGAA

Agent(s): PHILLIPS ORMONDE FITZPATRICK; BORDEN LADNER GERVAIS LLP

Designated states: BE DE ES FR GB IT NL SE

14) Family number: 31122144 (EP0247023A1)

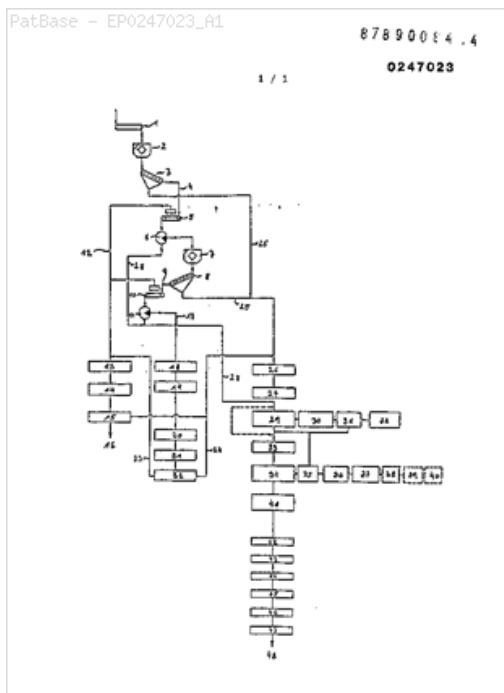
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Title: PROCESS FOR RECOVERING SPENT PRIMARY CELLS.

Abstract: 1. A process for reprocessing spent primary cells, in particular appliance batteries, such as carbon-zinc, batteries and alkali-manganese batteries, in which the batteries are previously sorted to separate accumulators, and button cells and mechanically broken up, characterised in that the mechanical breaking-up is effected using impact mills (2, 7) and subsequent screening (3, 8), in that after an initial mill passage and after an initial screening the screen overflow (4) undergoes a magnetic separation (5) so as to separate a scrap function, in that the portion of the screen overflow not separated after an initial magnetic separation (5) undergoes a second mill passage through an impact mill (7), optionally via a second magnetic separation (6), whereupon screening is again carried out and magnetic constituents are separated, in that the material (25) which has passed through both screening operations (3, 8) is filtered and washed to separate alkaline and ammonium salts and then subjected to a thermal treatment (29), in that the non-magnetic fraction from the screen overflow (9) of the two screening operations (3, 8), which fraction cannot be comminuted with the respective impact mill used, is fed to the thermal treatment (29), and in that the magnetic fraction (12, 17) of the screen overflow (9) of the second screening operation (8) is treated separately.

Classifications:

International (IPC 8-9): A43B5/00 C22B7/00
H01M6/52 (Advanced/Invention);
H01M6/00 (Core/Invention)
International (IPC 1-7): A43B5/04 C22B7/00 H01M10/54 H01M6/52
CPC: A43B5/00 H01M6/52 Y02W30/84
European: A43B5/00 H01M6/52 Y02E60/12
JP F-Term: 4K001 4K001/AA09 4K001/AA10 4K001/AA14
4K001/AA16 4K001/AA30 4K001/BA22 4K001/CA01 4K001/CA02
4K001/CA04 4K001/CA23 4K001/DA07 4K001/GA07
JP F-Index: C22B7/00/C



Family:

Publication number	Publication date	Application number	Application date
AT1386 A	19880215	AT19860000013	19860108
AT138686 A	19880115	AT19860001386	19860523
AT386491 B	19880825	AT19860001386	19860523
AT386512 B	19880912	AT19860000013	19860108
DE3764026 D1	19900906	DE19873764026	19870423
EP0247023 A1	19871125	EP19870890084	19870423
EP0247023 B1	19900801	EP19870890084	19870423
ES2017764 B3	19910301	ES19870890084T	19870423
FI872274 A	19871124	FI19870002274	19870522
FI872274 A0	19870522	FI19870002274	19870522
GR3000687 T3	19910927	GR19900400532T	19900802
JP63024560 A2	19880201	JP19870126844	19870523
NO872156 A	19871124	NO19870002156	19870522
NO872156 A0	19870522	NO19870002156	19870522

Priority:

AT19860000013 19860108 AT19860001386 19860523

Probable Assignee: HARTJES RUDOLF

Assignee(s): (std): HARTJES RUDOLF ; VOEST ALPINE AG

Assignee(s): VOEST ALPINE AG WIEN AT ; VOEST ALPINE AKTIENGESSELLSCHAFT ; VOEST ALPINE WIEN AT AG

Inventor(s): (std): BUARUTAA OODARU ; BUARUTAA RUUKUSHIYADERU ; FUERIKUSU BUARUNERU ; LUGSCHEIDER WALTER ; LUGSCHEIDER WALTER DIPL ING DR ; ODAR WALTER ; ODAR WALTER DIPL ING ; WALLNER FELIX ; WALLNER FELIX DIPL ING DR

Inventor(s): WALLNER FELIX DIPLING DR ; ODAR WALTER DIPLING ; WALLNER DIPL ING DR ; LUGSCHEIDER WALTER DIPLING DR ; ODAR DIPL ING ; LUGSCHEIDER DIPL ING DR

Designated states: BE CH DE ES FR GB GR IT LI LU NL SE

15) Family number: 59634156 (US2017005374A)

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Title: PROCESS FOR RECYCLING LI-ION BATTERIES

Abstract: The present invention concerns a process for the recovery of metals and of heat from spent rechargeable batteries, in particular from spent Li-ion batteries containing relatively low amounts of cobalt. It has in particular been found that such cobalt-depleted Li-ion batteries can be processed on a copper smelter by: feeding a useful charge and slag formers to the smelter; adding heating and reducing agents; whereby at least part of the heating and/or reducing agents is replaced by Li-ion batteries containing one or more of metallic Fe, metallic Al, and carbon. Using spent LFP or LMO batteries as a feed on the Cu smelter, the production rate of Cu blister is increased, while the energy consumption from fossil sources is decreased.

Classifications:

International (IPC 8-9): B09B3/00 C21B15/00 C22B C22B15/00 C22B15/06 C22B21/00 C22B21/04 C22B26/12 C22B7/00 C22B7/04 H01M10/0525 H01M10/54 (Advanced/Invention);
C22B7/00 (Core/Invention)

CPC: H01M10/54 H01M10/0525 C22B26/12 C22B21/04 C22B21/0069 C22B15/0052 C22B15/0056 C22B7/003 C21B15/00 C22B7/001 C22B7/04 Y02P10/214 Y02W30/84

US: 75/433

JP F-Term: 4D004 4D004/AA23 4D004/BA05 4D004/CA29 4D004/CB02 4D004/CB31 4D004/CC11 4D004/DA03 4D004/DA10 4K001 4K001/AA09 4K001/BA22 4K001/DA05 4K001/GA06

JP F-Index: B09B3/00/303/A C22B15/06 C22B7/00/ZAB/C

Family:

Publication number	Publication date	Application number	Application date
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PatBase PDF Export - Page: 12 14/03/2019

Publication number	Publication date	Application number	Application date
AT146705 E	19970115	AT19930915650T	19930719
CA2140862 AA	19950123	CA19932140862	19930719
CZ283263 B6	19980218	CZ19950000206	19930719
CZ9500206 A3	19951213	CZ19950000206	19930719
DE4224884 A1	19940203	DE19924224884	19920728
DE59304910 D1	19970206	DE19935004910	19930719
DK0652811 T3	19970623	DK19930915650T	19930719
EP0652811 A1	19950517	EP19930915650	19930719
EP0652811 B1	19961227	EP19930915650	19930719
ES2098760 T3	19970501	ES19930915650T	19930719
GR3022926 T3	19970630	GR19970400613T	19970326
HU215754 B	19990201	HU19950000235	19930719
HU75883 A2	19970528	HU19950000235	19930719
HU9500235 A0	19950328	HU19950000235	19930719
JP3014452 B2	20000228	JP19940504079T	19930719
JP7508927 T2	19951005	JP19940504079T	19930719
KR19950702457 A	19950729	KR19950700333	19930719
PL176546 B1	19990630	PL19930307299	19930719
PL307299 A1	19950515	PL19930307299	19930719
SK10595 A3	19950711	SK19950000105	19930719
SK280608 B6	20000516	SK19950000105	19930719
US5575907 A	19961119	US19950374780	19950126
WO9402265 A1	19940203	WO1993DE00644	19930719

Priority:

DE19924224884 19920728 DE19935004910 19930719 WO1993DE00644 19930719
WO1993DE00644 19930719

Probable Assignee: BATENUS UMWELT U RECYCLINGTECHNOLOGIE GMBH AND CO KG

Assignee(s): (std): BATENUS UMWELT U RECYCLINGTECHNOLOGIE GMBH AND ; BATENUS UMWELT U RECYCLINGTECHNOLOGIE GMBH AND C ; BATENUS UMWELT UND RECYCLINGTE ; BATENUS UMWELT UND RECYCLINGTECHNOLOGIE GMBH AND C ; BATENUS GMBH U CO KG ; BATENUS GMBH UND CO KG ; BATENUS UMWELT U RECYCLINGTE ; BATENUS GMBH AND CO KG ; LINDERMANN WALTER

Assignee(s): BATENUS GMBH ; BATENUS GMBH AND CO KG O 8010 DRESDEN DE ; BATENUS GMBH AND CO O 8010 DRESDEN DE KG ; BATENUS UMWELT U ; BATENUS UMWELT U RECYCLINGTECHNOLOGIE GMBH AND CO ; BATENUS UMWELT UND RECYCLINGTECHNOLOGIE GMBH AND CO KG ; BATENUS UMWELT UND RECYCLINGTECHNOLOGIE GMBH AND CO KG 79780 STUEHLINGEN DE ; BATENUS UMWELT UND RECYCLINGTECHNOLOGIE GMBH AND CO ; BATENUS UMWELT U RECYCLINGTECHNOLOGIE GMBH AND CO KG ; BATENUS UMWELT U RECYCLINGTECHNOLOGIE GMBH AND COKG ; LINDERMANN WALTER SCHOOPACKER

Inventor(s): (std): LINDERMANN WALTER

Inventor(s): LINDERMANN WALTER SIBLINGEN CH ; LINDERMANN WALTER CH 8225 SIBLIGEN CH

Agent(s): RIDOUT AND MAYBEE LLP

Designated states: AT BE CA CH CZ DE DK ES FR GB GR HU IE IT JP KR LI LU MC NL PL PT RO SE SK US

17) Family number: 1408166 (US4030916A)

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Title: PROCESS FOR RECOVERING LEAD FROM THE ACTIVE MATERIAL OF USED BATTERIES

Abstract: Lead is recovered from the lead-containing sludge from used batteries by first heating the sludge at 100 DEG - 150 DEG C to drive off the water. The sludge is subsequently reacted at about 1,000 DEG C with carbon powder in a closed electric furnace. The relatively small volume of water-free waste gas produced leads to a marked saving in energy. Not only dust but also the SO2 can be removed simply from the waste gases.

Classifications:

International (IPC 8-9): C22B13/02 C22B5/10 C22B7/00 H01M10/54 (Advanced/Invention);

C22B13/00 C22B5/00 C22B7/00 H01M10/54 (Core/Invention)

International (IPC 1-7): C22B13/00 C22B13/02 C22B13/06 C22B5/10 C22B7/00 H01M10/54

CPC: C22B7/001 C22B5/10 C22B13/02 H01M10/54 Y02W30/84 Y02P10/214

European: C22B13/02 C22B5/10 C22B7/00B H01M10/54 Y02E60/12

US: 75/10.59 75/696 75/77

Family:

Publication number	Publication date	Application number	Application date
CH597351 A	19780331	CH19750000153	19750108
DE2600384 A1	19760715	DE19762600384	19760107
FR2297254 A1	19760806	FR19760000277	19760107
GB1471640 A	19770427	GB19750053203	19751230
IT1052044 A	19810620	IT19750030874	19751230
JP51095925 A2	19760823	JP19760002015	19760108
US4030916 A	19770621	US19760646767	19760106

Priority:

CH19750000153 19750108

Probable Assignee: LINIGER A

Assignee(s): (std): LINIGER A ; LINIGER ANDREAS M ; LINIGER ANDRES ; LINIGER ANDRES M

Inventor(s): (std): GEORGES FRANCOIS ; KNOCH HUBERT ; LINIGER ANDRES M ; LINIGER MAX

Inventor(s): ANDRES M LINIGER ; FRANCOIS GEORGES ET HUBERT KNOCH

Title: ENERGY-SAVING AND ENVIRONMENT-FRIENDLY METHOD FOR RECYCLING WASTE ACID STORAGE BATTERIES

Abstract: The invention discloses an energy-saving and environment-friendly method for recycling waste acid storage batteries. The energy-saving and environment-friendly method comprises the following specific steps of: cutting waste lead-acid storage batteries by utilizing a cutting machine, and then putting the cut waste lead-acid storage batteries into a breaking hammer for breaking; adding water into broken materials, and removing floating plastic particles; adding into a stirring device for stirring and simultaneously adding reducing agents such as ferric sulfate and dilute sulphuric acid; filtering reacted materials, and recycling a filtrate; then adding a desulfurizing agent such as sodium carbonate, and carrying out solid-liquid separation after the reaction is finished; generating sodium sulfate for recycling after carrying out crystallization and impurity removal treatment on the filtrate; and putting dried solid metal carbonate in a smelting furnace, adding a reducing agent (iron powder) and a reducing agent (carbon), reducing lead carbonate in the solid metal carbonate into lead liquid, introducing generated carbon dioxide gas into sodium hydroxide liquid, and generating sodium carbonate for recycling. The energy-saving and environment-friendly method disclosed by the invention has the advantages that the energy consumption is reduced, the waste and the discharging of waste liquid are also reduced, and regeneration of pollution is avoided.

Classifications:

International (IPC 8-9): C22B7/00 H01M10/54 (Advanced/Invention)

CPC: Y02E60/12 Y02W30/84

Family:

Publication number	Publication date	Application number	Application date
CN103280612 A	20130904	CN201310193049	20130523

Priority:

CN201310193049 20130523

Probable Assignee:

CAI YIZHONG

Assignee(s): (std):

CAI YIZHONG

Inventor(s): (std):

CAI YIZHONG

19) Family number: 32840179 (BRPI0403364A)

Title: PROCESSO DE PREPARACAO DE CHUMBO METALICO A PARTIR DE CONCENTRADOS DE CHUMBO PARCIALMENTE DESSULFURADOS E DE SUCATAS DE BATERIAS DE CHUMBO-ACIDO E CHUMBO METALICO ASSIM OBTIDO PROCESS FOR PREPARATION OF METALLIC LEAD FROM LEAD CONCENTRATE AND PARTIALLY DESSULFURADOS SCRAP LEAD-ACID BATTERIES AND LEAD METALICO THUS OBTAINED (Machine translation)

Abstract: "PROCESSO DE PREPARAÇÃO DE CHUMBO METÁLICO A PARTIR DE CONCENTRADOS DE CHUMBO PARCIALMENTE DESSULFURADOS E DE SUCATAS DE BATERIAS DE CHUMBO-ÁCIDO E CHUMBO METÁLICO ASSIM OBTIDO". A presente invenção refere-se a um processo de preparação de chumbo metálico a partir de concentrados de chumbo parcialmente dessulfurados e de baterias de chumbo-ácido usadas. Este processo permite que se utilize indistintamente fontes diversas de chumbo a fim de produzir chumbo refinado e suas ligas apresentando vantagens econômicas. A presente invenção refere-se ainda a chumbo metálico e suas ligas obtíveis pelo referido processo.

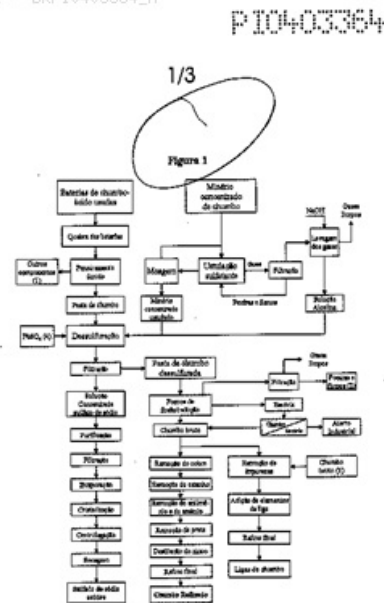
Classifications:

International (IPC 8-9): C22B13/00 C22B3/00 (Advanced/Invention);
C22B13/00 C22B3/00 (Core/Invention)

International (IPC 1-7): C22B13/00 C22B3/00

CPC: Y02P10/234

PatBase - BRPI0403364 A



Family:

Publication number	Publication date	Application number	Application date
BRPI0403364 A	20060404	BR2004PI03364	20040820

Priority:

BR2004PI03364 20040820

Probable Assignee:

ROTAVI IND LTDA

Assignee(s): (std):

ROTAVI IND LTDA

Assignee(s):

ROTAVI INDUSTRIAL LTDA

Inventor(s): (std):

TRINCANATO GIUSEPPE

20) Family number: 32840181 (BRPI0403369A)

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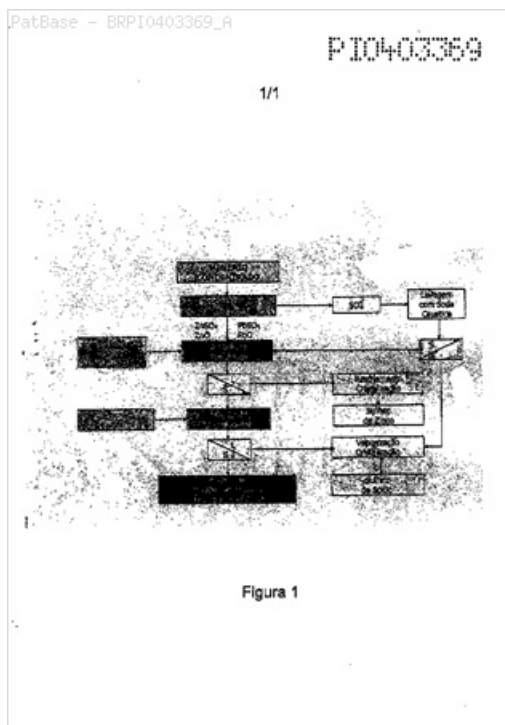
Title: PROCESSO PARA PREPARACAO DE MATERIAL CONCENTRADO DE CHUMBO TRATADO PARA OBTENCAO DE CHUMBO METALICO E CONCENTRADO PARCIALMENTE DESSULFURADO ASSIM OBTIDO PROCESS FOR PREPARATION OF MATERIAL LEAD CONCENTRATE FOR OBTAINING THE TREATY OF LEAD CONCENTRATE AND PARTIALLY METALICO desulfurized THUS OBTAINED (Machine translation)

Abstract: Source: BRPI0403369A [PT] # # # #
 # # # # ss e # RESUMO Patente de Invencao: "PROCESSO PARA PREPARACAO DE MATERIAL CONCENTRADO DE CHUMBO TRATADO PARA OBTENCAO DE CHUMBO METALICO E CONCENTRADO PARCIALMENTE DESSULFU- 5 RADO ASSIM OBTIDO". A presente invencao refere-se a um processo para a preparacao de concentrado de chumbo parcialmente dessulfurado a partir de concentra- dos de chumbo compreendendo etapas de oxidacao e dessulfuracao parcial das materias-primas. Os concentrados de chumbo podem ser minerios con- 10 centrados de chumbo como a galena. A presente invencao refere-se ainda a concentrados dessulfura- dos obteniveis pelo referido processo.
Machine translation: # # # #
 ss and # Patent Invention SUMMARY: "PROCESS FOR PREPARATION OF LEAD CONCENTRATE MATERIAL TREATY FOR LEAD obtaining METALICO AND CONCENTRATED PARTIALLY DESSULFU- 5 RADO SO OBTAINED. " The present invention relates to a process for the preparation of lead concentrate starting from partially desulfurized lead concentration comprising the steps of partial oxidation and desulfurization of raw materials. Lead concentrates can be con- 10 centered ores of lead and galena. The present invention further relates to dessulfura- concentrates obtainable by said process.

Classifications:

International (IPC 8-9): C22B13/02 (Advanced/Invention);
 C22B13/00 (Core/Invention)

International (IPC 1-7): C22B13/02

**Family:**

Publication number	Publication date	Application number	Application date
BRPI0403369 A	20060404	BR2004PI03369	20040820

Priority:

BR2004PI03369 20040820

Probable Assignee: ROTAVI IND LTDA

Assignee(s): (std): ROTAVI IND LTDA

Assignee(s): ROTAVI INDUSTRIAL LTDA

Inventor(s): (std): MARCHETTO RUI INACIO ; SERINET FRANCOIS XAVIER

Inventor(s): FRANCOIS XAVIER SERINET ; RUI INACIO MARCHETTO

21) Family number: 32571204 (US2006018819A)

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Title: DESULFURIZATION PROCESS OF PASTEL AND GRIDS OF LEAD ACCUMULATORS

Abstract: The present invention relates to a desulfurization process of pastel and grids of lead accumulators comprising a carbonation in two steps, a granulometric separation between the two steps followed by specific desulfurization of the large part, a desodification obtaining the conversion of the PbSO_4 contained in the pastel into PbCO_3 which can be easily converted into metallic Pb in an oven by the addition of coal. The system used for the desodification of the large part of the pastel can also be used for the desulfurization of the fine part of the grids.

Classifications:

International (IPC 8-9): C01B31/24 C01B32/60 C01G21/14

C22B13/00 C22B7/00 H01M10/54 (Advanced/Invention);

C01B31/00 C01G21/00 C22B13/00 C22B7/00

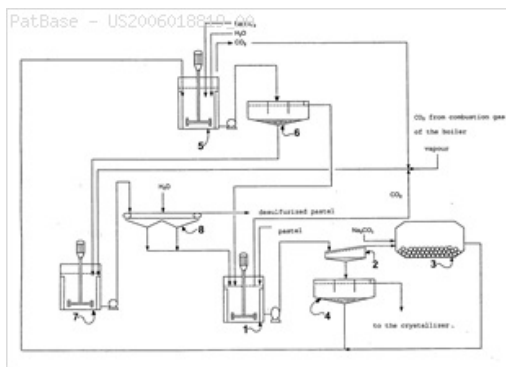
H01M10/54 (Core/Invention)

CPC: H01M10/54 C22B3/44 C22B7/008 C22B13/045 H01M4/73

H01M10/06 Y02W30/84 Y02P10/234

European: C22B13/04R C22B3/44 C22B7/00D2 H01M10/54

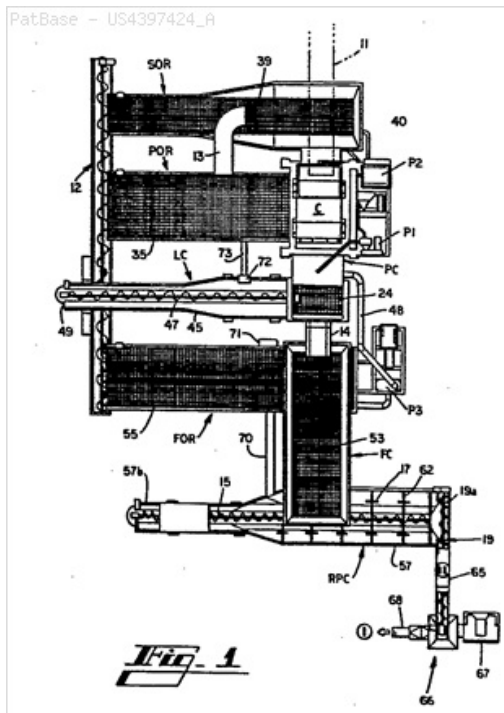
US: 423/414 423/415.1 423/419.1 423/433 423/434 423/434P
423/89 423/92



Publication number	Publication date	Application number	Application date
AT388248 E	20080315	AT20050106436T	20050714
CN100590930 C	20100217	CN200510092400	20050720
CN1728445 A	20060201	CN200510092400	20050720
DE602005005112 D1	20080417	DE200560005112T	20050714
DE602005005112 T2	20090326	DE200560005112T	20050714
EP1619261 A1	20060125	EP20050106436	20050714
EP1619261 B1	20080305	EP20050106436	20050714
ES2303189 T3	20080801	ES20050106436T	20050714
ITMI20041456 A1	20041020	IT2004MI01456	20040720
RU2005123404 A	20070220	RU20050123404	20050719
RU2379364 C2	20100120	RU20050123404	20050719
US2006018819 AA	20060126	US20050035001	20050112
US7498012 BB	20090303	US20050035001	20050112

Designated states: AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI SK TR

US: 209/158 209/17 209/3 241/20 241/24 241/24.13 241/79.1

**Family:**

Publication number	Publication date	Application number	Application date
AT26364 E	19870415	AT19810303765T	19810819
DE3176076 D1	19870507	DE19813176076	19810819
DK161612 B	19910722	DK19810003729	19810824
DK161612 C	19920127	DK19810003729	19810824
DK372981 A	19820226	DK19810003729	19810824
EP0046654 A1	19820303	EP19810303765	19810819
EP0046654 B1	19870401	EP19810303765	19810819
ES504946 A0	19821101	ES19810504946	19810825
ES8301066 A1	19821101	ES19810504946	19810825
JP57168480 A2	19821016	JP19810132209	19810825
NO152770 B	19850805	NO19810002806	19810820
NO152770 C	19851113	NO19810002806	19810820
NO812806 A	19820226	NO19810002806	19810820
PT73565 A	19810901	PT19810073565	19810824
PT73565 B	19821105	PT19810073565	19810824
US4397424 A	19830809	US19800181267	19800825

Priority:

US19800181267 19800825 EP19810303765 19810819

Probable Assignee: MA IND INC**Assignee(s):** (std): EMU EI IND INC ; MA IND INC**Assignee(s):** WACHOVIA BANK OF GEORGIA NATIONAL ASSOCIATION ; MA IND INC A CORP OF GA ; MAIN INDUSTRIES INC ; M A IND INC ; M A INDUSTRIES INC ; MA IND**Inventor(s):** (std): BOBIII PIIKOTSUKU ; PEACOCK B ; PEACOCK BOBBIE ; PEACOCK ROBBIE ; ROBAATO JEI ZAATSUPA ; ROBAATO JIEI ZAATSUPA ; ROBBIE PEACOCK ; ROBERT J ZAPPA ; ZAPPA R J ; ZAPPA ROBERT J**Designated states:** AT BE CH DE FR GB IT LI LU NL SE**23) Family number: 32120249 (US2005169823A)**

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Title: PROCEDURE TO LEACH COPPER CONCENTRATES, UNDER PRESSURE AND AT AMBIENT TEMPERATURE, BY FORMING A REACTIVE GEL IN A SULFATE-CHLORIDE MEDIUM

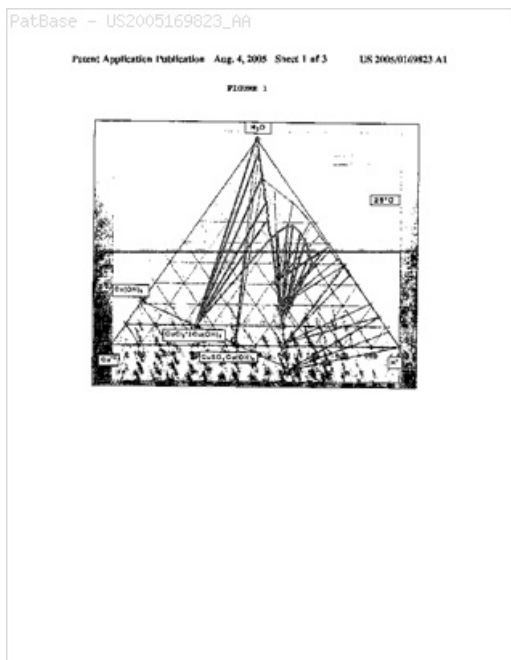
Abstract: A chemical process to leach copper concentrates in the presence of a concentrated solution of sulfates and chlorides. The process includes forming a high reactivity chemical paste containing a high concentration of ions in the liquid phase of the paste which react with copper ores and forms a series of soluble salts. The salts are extracted by a simple wash. Mixing equipment for handling high viscosity liquids is used. The total mixing time is about 5 minutes, after which the paste is poured into a rectangular mold, of several hundred meters per side, and is left to settle and breathe. During settling, water and sulfuric acid are added at intervals to replace that consumed by the reactions taking place during the aeration, until the reactions have virtually end. This treatment results in a dry, very resistant mass, containing the copper extracted in form of chlorine salts, and sulfate.

Classifications:

International (IPC 8-9): C22B15/00 C22B15/14 C22B3/00 C22B3/04 C22B3/06 C22B3/08 C22B3/10 C22B7/00 C23C16/44 C23C16/452 C23C16/455 C23C16/52 C23C26/00 H01J37/32 H01L21/205 H01L21/285 H01L21/3065 (Advanced/Invention); C23C16/455 (Advanced/Non-invention); C22B15/00 C22B3/00 C23C16/44 C23C16/448 C23C16/455 C23C16/52 H01J37/32 H01L21/02 (Core/Invention)

International (IPC 1-7): C22B1/243 C22B15/00 C22B15/14 C22B3/00 C22B3/04 C22B3/08 C22B3/10 C23C16/44 C23C16/452 C23C16/455 C23C26/00 H01J37/32 H01L21/285

H01L21/3065 H01L21/44
CPC: Y02P10/236 C22B15/0008 C22B15/0067 C22B15/0069
C22B15/0071 Y02P70/605 H01J37/3244 C23C16/4405 C23C16/4412
H01J37/32844 Y02C20/30
European: C22B15/00B2D C22B15/00L2A C22B15/00L2A2
C22B15/00L2A4 C23C16/44A6 C23C16/44H H01J37/32O18D4B
H01J37/32O2
US: 118/715 118/715S 423/26 423/27 423/28 423/38 423/39 423/40
423/41 423/42 423/45 423/46 423/47 438/785 438/785P
JP F-Term: 4K030 4K030/BA01 4K030/BA12 4K030/BA18
4K030/CA04 4K030/CA12 4K030/DA06 4K030/EA01 4K030/EA03
4K030/FA01 4K030/FA10 4K030/LA15 4M104 4M104/BB04
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5F004/DA02 5F004/DA17 5F004/DA18 5F004/DB08 5F045
5F045/AB40 5F045/AC00 5F045/AC12 5F045/BB08 5F045/EB06
5F045/EE02 5F045/EG04 5F045/EG07 5F045/EG08 5F045/EG09
5F045/EH18
JP F-Index: C23C16/44/E C23C16/44/J C23C16/452 H01L21/205
H01L21/285/C H01L21/302/101/H



Family:

Publication number	Publication date	Application number	Application date
AU2004240193 AA	20050818	AU20040240193	20041216
AU2004240193 BB	20081106	AU20040240193	20041216
BRPI0403895 A	20050920	BR2004PI03895	20040813
BRPI0403895 B1	20150616	BR2004PI03895	20040813
CA2475833 AA	20050729	CA20042475833	20040728
CA2475833 C	20110201	CA20042475833	20040728
CL2004000143 A1	20050729	CL20040000143	20040129
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CN100537844 C	20090909	CN200410081886	20041231
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EP1559799 A2	20050803	EP20040106019	20041123
EP1559799 A3	20050831	EP20040106019	20041123
EP1559799 B1	20070912	EP20040106019	20041123
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EP1560252 B1	20160309	EP20040258095	20041223
ES2291820 T3	20080301	ES20040106019T	20041123
JP2005194630 A2	20050721	JP20040378477	20041228
JP5031189 B2	20120919	JP20040378477	20041228
KR101216927 B1	20121231	KR20040118147	20041231
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MXPA04012931 A1	20050908	MX2004PA12931	20041217
PE07462005 A1	20051114	PE20040000857	20040906
SG113032 A1	20050728	SG20040007914	20041229
TW200535276 A	20051101	TW20040141584	20041231
TWI386513 B	20130221	TW20040141584	20041231
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US2005250347 AA	20051110	US20040018641	20041221
US7491372 BB	20090217	US20040018614	20041221
ZA200500362 A	20060222	ZA20050000362	20051201

Priority:

US20030533615P 20031231 CL20040000143 20040129 US20040018641 20041221
EP20040258095 20041223

Probable Assignee: MINERA MICHILLA SA

Assignee(s): (std): EDWARDS VACUUM INC ; EDWARDS VACUUM LLC ; PURDON SIMON J ; PRADHAN KASMALKAR REVATI ; MA CE ; WANG QING M ; HOGLE RICHARD ; SULLIVAN AARON D ; BAILEY CHRISTOPHER M ; BOC GROUP INC ; MINERA MICHILLA S A

Assignee(s): BOC GROUP INC THE ; MINERA MICHILLA SA ; EDWARDS VACUUM LLC SANBORN ; THE BOC GROUP INC

Inventor(s): (std): WANG QING MIN ; WANG QING M ; SULLIVAN AARON D ; SULLIVAN AARON ; SIMON PURDON ; RICHARD HOGLE ; RICHARD A HOGLE ; REVATI PRADHAN KASMALKAR ; RAULD FAINE JAIME ROBERTO ; RAULD FAINE JAIME ; PURDON SIMON J ; PURDON SIMON ; PRADHAN KASMALKAR REVATI ; MONTEALEGRE JULLIAN RAUL JAIME ENRIQUE ; MONTEALEGRE JULLIAN RAUL ; MA CE ; KIN MIN WAN ; KASMALKAR REVATI PRADHAN ; JULLIAN RAUL MONTEALEGRE ; JULLIAN RAUL M ; FAINE JAMIE RAULD ; FAINE JAMIE R ; FAINE JAIME RAULD ; CHRISTOPHER M BAILEY ; CE MA ; BAYLEY CHRISTOPHER MARK ; BAYLEY CHRISTOPHER M ; BAILEY CHRISTOPHER MARK ; BAILEY CHRISTOPHER M ; BACKIT GUTIERREZ ABRAHAM LEOPOLDO ; BACKIT GUTIERREZ ABRAHAM ; HOGLE RICHARD A ; HOGLE RICHARD ; GUTIERREZ ABRAHAM BACKIT ; GUTIERREZ ABRAHAM B ; ALFARO FREDDY AROCA ; ALFARO FREDDY A ; ABRAHAM BACKIT GUTIERREZ ; AARON SULLIVAN ; AROCA ALFARO FREDDY ARNULFO ; AROCA ALFARO FREDDY

Inventor(s): AROCA ALFARO ; JAIME RAULD FAINE FREDDY AROCA ALFARO ABRAHAM BACKIT GUTIERREZ RAUL MONTEALEGRE JULLIAN ; WANG QING ; BAILEY CHRISTOPHER ; FREDDY AROCA ALFARO ; BACKIT

Agent(s): GUTIERREZ ; JAIME RAUL D FAINE ; MONTEALEGRE JULLIAN ; RAUL MONTEALEGRE JULLIAN
DAVIES COLLISON CAVE PTY LTD; DAVIES COLLISON CAVE; JACQUELINE ABARZA; CLARK CHARLES
ROBERT; CHIBA AKIO; ONO SHINJIRO; TOMITA HIROYUKI; SHAMOTO ICHIO; HIRAYAMA KOJI;
KOBAYASHI YASUSHI; D PETER HOCHBERG D PETER HOCHBERG CO LPA; BOC GROUP INC;
HOCHBERG D PETER; MELLINO SEAN F; SMOLA DANIEL J; D PETER; DANIEL J; SEAN F

Designated states: AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU MC NL PL PT RO SE SI SK TR

24) Family number: 2743254 (EP0038366A1)

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Title: METHODS OF RECOVERING LEAD VALUES FROM BATTERY SLUDGE.

Abstract: A process for recovery of substantially all lead values in battery sludge as metallic lead is disclosed. By means of the process, lead is substantially completely and efficiently recovered as metallic lead in an environmentally acceptable manner. The process comprises (a) subjecting the sludge to low temperature reducing conditions; (b) converting lead sulfates to insoluble nonsulfur containing compounds while solubilizing all sulfur materials and thereafter separating the solid residue by solid-liquid separation techniques; (c) dissolving the solid products resulting from steps (a) and (b) in an acid selected from the group consisting of fluoboric and fluosilicic acid); (d) collecting the supernatant from step (c) by means of solid-liquid separation techniques; and (e) electrowinning the lead from the collected supernatant. The lead peroxide reduction of step (a) may be effected by low temperature reducing roasts or by contacting the lead peroxide with sulfur dioxide gas or sulfites.

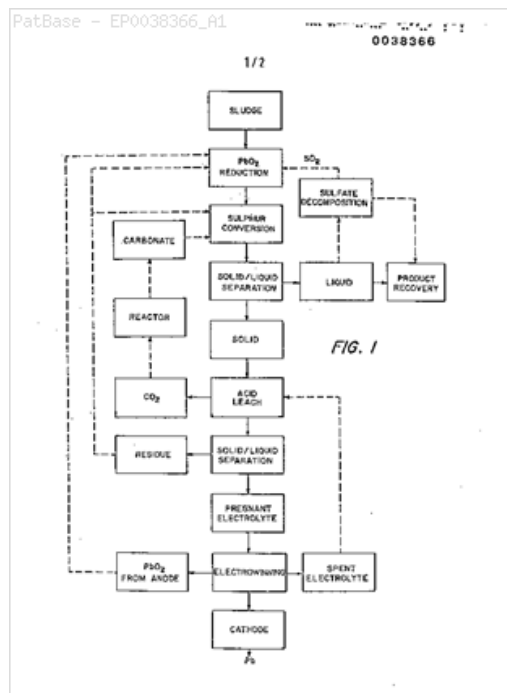
Classifications:

International (IPC 8-9): H01M10/54 (Advanced/Invention);
H01M10/54 (Core/Invention)

International (IPC 1-7): C22B13/04 H01M10/54

CPC: C22B13/045 H01M10/54 Y02W30/84 Y02P10/212

European: C22B13/04R H01M10/54 Y02E60/12



Family:

Publication number	Publication date	Application number	Application date
AT7747 E	19840615	AT19800101994T	19800414
DE3068005 D1	19840705	DE19803068005	19800414
EP0038366 A1	19811028	EP19800101994	19800414
EP0038366 B1	19840530	EP19800101994	19800414

Priority:

EP19800101994 19800414

Probable Assignee: RSR CORP

Assignee(s): (std): RSR CORP

Inventor(s): (std): PRENGAMAN RAYMOND DAVID ; MCDONALD HERSCHEL BENSON

Designated states: AT BE CH DE FR GB IT LI LU NL SE

25) Family number: 41021257 (WO08002114A1)

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Title: METHOD FOR REPROCESSING LEAD-CONTAINING MATERIALS

Abstract: The invention relates to non-ferrous metallurgy, in particular to methods for reprocessing lead-containing materials. The aim of the invention is to increase a lead extraction into a crude metal, to improve a specific performance and to simultaneously reduce the unit costs of energy vectors. The inventive method consists in preparing and drying a mix material, in carrying out roast melting in a suspended state in oxygen atmosphere in such a way that an oxide melt and mixtures of dusts with roast smelting gases are obtained, in reducing the melt during the filtration thereof through a layer of hot parts of a carbon reducing medium in such a way that a pure metal lead, a zinc-containing oxide melt and gases are obtained. The mix material is ground and classified and the separated fraction of dry mix material, 90 percent of the mass of which consists of particles having size of 0.01-0.10 mm, is supplied at the roast smelting stage. The moisture content of the mix material, during the preparation thereof, is equal to 8-16 percent and a coal, in the dry mass of which a total carbon content ranges from about 49 to about 80 percent and a volatile content from about 11 to about 27 percent, is used in the form of a ground carbon reducing medium.

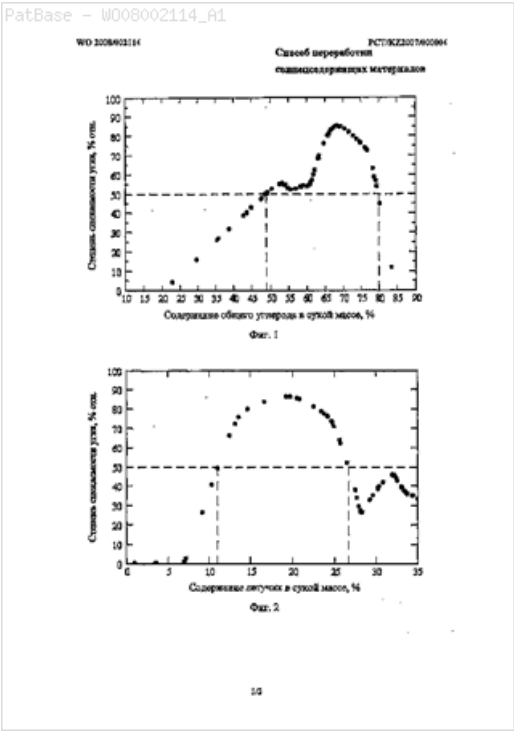
Classifications:

International (IPC 8-9): C22B13/00 C22B13/02 (Advanced/Invention);
C22B13/00 (Core/Invention)

International (IPC 1-7): C22C21/00 F16C33/06

CPC: C22B13/0 C22B19/2 C22B13/025 C22B4/08 C22B5/10

C22B9/02 C22B9/20 C22B19/28 Y02P10/214 Y02P10/234
European: C22B13/02R C22B19/28 C22B4/08 C22B5/10 M22B9/02
M22B9/20



Family:

Publication number	Publication date	Application number	Application date
BRPI0702908 A2	20110322	BR2007PI02908	20070327
BRPI0702908 B1	20131224	BR2007PI02908	20070327
CL2007003397 A1	20080704	CL20070003397	20071126
CN101321881 A	20081210	CN200780000437	20070327
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IN06450DN2007 A	20080711	IN2007DN06450	20070820
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RU2359045 C2	20090620	RU20070120273	20070530
WO08002114 A1	20080103	WO2007KZ00004	20070327

Priority:

KZ20060001401 20061220 WO2007KZ00004 20070327

Probable Assignee: STATE AFFILIATE EASTERN MI

Assignee(s): (std): DOCHERNEE GP VOS NI GORNO META ; RAGULIN BORIS ALEXANDROVICH ; POLYAKOV IVAN PETROVICH ; STARSEV IGOR VLADIMIROVCH ; SHUMSKIY VIKTOR ALEXANDROVICH ; EASTERN MINING AND METALLURG R ; STATE AFFILIATE EASTERN MI ; STATE AFFILIATE EASTERN MINING AND METALLURG RES INST FOR NON FERROUS METALS REPUBLIC STATE AFFI ; USHAKOV NIKOLAY NIKOLAYEVICH ; STATE AFFILIATE THE EASTERN MI ; STATE AFFILIATE THE EASTERN MINING AND METALLURG RES INST FOR NON FERROUS METALS REPUBLIC STATE AFFI ; CHALENKO VALENTINA VASILYEVNA ; STATE AFFILIATE MINING AND METALLURG INST

Assignee(s): STATE AFFILIATE EASTERN MINING AND METALLURGICAL RESEARCH INST FOR NON FERROUS METALS REPUBLIC STATE AFFILIATE NATIONAL ENTERPRISE OF COMPLEX PROCESSING FOR MINERAL AND RAW MATERIAL OF RE ; THE EASTERN MINING AND METALLURGICAL RESEARCH INST FOR NON FERROUS METALS REPUBLIC STATE AFFILIATE NATIONAL ENTE ; DOCHERNEE GOSUDARSTVENNOE PREDPRIJATIE VOSTOCHNYJ NAUCHNO ISSLEDOVATEL SKIJ GORNO METALLURGICHESKIJ INST TSVETNYKH METALLOV RESPUBLIKANSKOGO GOSUDARSTVENNOGO PREDPRIJATIJA NATSIONAL NYJ TSENTRPO KOMPLEKSNOJ PERERABOTKE MINERAL NOGO SYR JA RES ; DOCHERNEE GOSUDARSTVENNOE PREDPRIJATIE VOSTOCHNYJ NAUCHNO ISSLEDOVATEL SKIJ GORNO METALLURGICHESKIJ INSTITUT TSVETNYKH METALLOV RESPUBLIKANSKOGO GOSUDARSTVENNOGO PREDPRIJATIJA NATSIONAL NYJ TSENTRPO KOMPLEKSNOJ PERERABOTKE MINERAL NOGO SYR JA RES ; STATE AFFILIATE THE EASTERN MINING AND METALLURGICAL RESEARCH INSTITUTE FOR NON FERROUS METALS REPUBLIC STATE AFFILIATE NATIONAL ENTERPRISE OF COMPLEX PROCESSING FOR MINERAL AND RAW MATERIAL OF THE RE ; THE EASTERN MINING AND METALLURGICAL RESEARCH INSTITUTE FOR NON FERROUS METALS REPUBLIC STATE AFFILIATE NATIONAL ENTE ; STATE AFFILIATE THE EASTERN MINING AND METALLURGICAL RESEARCH INSTITUTE FOR NON FERROUS METALS REPUBLIC STATE AFFILIATE NATIONAL ENTERPRISE OF COMPLEX PROCESSING FO MINERAL AND RAW MATERIAL OF THE ; STATE AFFILIATE EASTERN MINING AND METALLURGICAL RESEARCH INST FOR NON FERROUS METALS REPUBLIC STATE AFFILIATE NATIONAL ENTERPRISE OF COMPLEX PROCESSING FO MINERAL AND RAW MATERIAL OF ; VNIITSVETMET SA ; STATE AFFILIATE EASTERN MINING AND METALLURGICAL RESEARCH INST FOR NON FERROUS METALS OF REPUBLIC STATE AFFILIATE NATIONAL ENTERPRISE OF COMPLEX PROCESSING FOR MINERAL AND RAW MATERIAL OF REPUBLIC OF KAZAKHSTAN

Inventor(s): (std): NIKOLAYEVICH USHAKOV NIKOLAY ; PETROVICH POLYAKOV IVAN ; POLJAKOV IVAN PETROVICH ; POLYAKOV IVAN PETROVICH ; RAGULIN BORIS ALEKSANDROVICH ; RAGULIN BORIS ALEXANDROVICH ; SHUMSKIY VIKTOR ALEKSANDROVICH ; SHUMSKIY VIKTOR ALEXANDROVICH ; CHALENKO VALENTINA VASIL EVNA ; CHALENKO VALENTINA VASILYEVNA ; STARSEV IGOR VLADIMIROVCH ; STARSEV IGOR VLADIMIROVICH ; STARTSEV IGOR VLADIMIROVICH ; USHAKOV NIKOLAJ NIKOLAEVICH ; USHAKOV NIKOLAY NIKOLAYEVICH ; ALEXANDROVICH RAGULIN BORIS ; ALEXANDROVICH SHUMSKIY VIKTOR ; VASILYEVNA CHALENKO VALENTINA ; VLADIMIROVCH STARSEV IGOR

Inventor(s): STARTSEV IGOR' VLADIMIROVICH ; CHALENKO VALENTINA VASIL'EVNA ; VIKTOR ALEXANDROVICH SHUMSKIY ; BORIS ALEXANDROVICH RAGULIN ; VALENTINA VASILYEVNA CHALENKO ; IGOR VLADIMIROVICH STARSEV ; IGOR VLADIMIROVICH STARTSEV ; IVAN PETROVICH POLYAKOV ; NIKOLAY NIKOLAYEVICH USHAKOV ; SHUMSKIY VIKTOR ALEXANDROVICH STARTSEV IGOR

VLADIMIROVICH RAGULIN BORIS ALEXANDROVICH USHAKOV NIKOLAY NIKOLAYEVICH P
CHALENKO VALENTINA VASILIEVNA

Agent(s):

Designated states: AE AG AL AM AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY
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IT JP KE KG KM KN KP KR KZ LA LC LK LR LS LT LU LV LY MA MC MD MG MK ML MN MR MT MW MX MY
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TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

26) Family number: 1479279 (US4269811A)

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Title: PRODUCTION OF LEAD MONOXIDE FROM LEAD SULFATE WITH ACETIC ACID

Abstract: An efficient and inexpensive method for producing lead monoxide from lead sulfate bearing materials such as recycled battery mud is provided comprising: (a) reacting said material with an ammonium carbonate solution to convert lead sulfate to lead carbonate; (b) decomposing the lead carbonate to form impure lead monoxide; (c) reacting the impure lead monoxide with acetic acid to form a lead acetate solution; (d) contacting the lead acetate solution with carbon dioxide to produce insoluble lead carbonate; and (e) decomposing the lead carbonate to form lead monoxide.

Classifications:

International (IPC 8-9): C01G21/06 H01M10/54

H01M4/56 (Advanced/Invention);

C01G21/00 H01M10/54 H01M4/48 (Core/Invention)

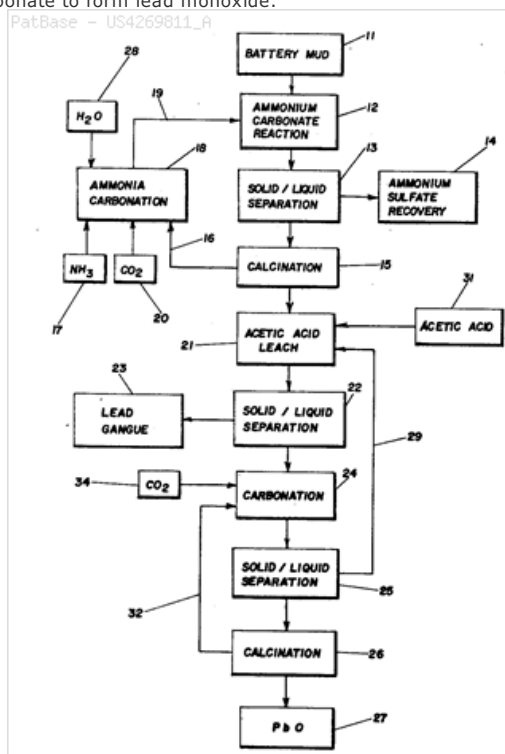
International (IPC 1-7): C01G21/02 C01G21/06 C22B13/04

CPC: H01M4/56 C01G21/06 C01P2002/72 C01P2006/60

C01P2006/80 H01M10/54 Y02W30/84

European: C01G21/06 H01M10/54 H01M4/56 M01P2/72 M01P6/60
M01P6/80 Y02E60/12

US: 423/435 423/619 423/92



Family:

Publication number	Publication date	Application number	Application date
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SE7908361 L	19800411	SE19790008361	19791009
US4269811 A	19810526	US19800126625	19800303

Priority:

US19780950078 19781010 CA19790337238 19791009 US19800126625 19800303

Probable Assignee: NL IND INC

Assignee(s): (std): NL IND INC ; NL INDUSTRIES INC

Assignee(s): NL INDUSTRIES INC INDUSTRIES INC ; NL INDUSTRIES INC TE NEW YORK ; STRIFFLER EUGENE JR ; NL IND INC IND INC ; NL IND INC TE NEW YORK ; KOLAKOWSKI MICHAEL A ; N L IND INC ; NL CHEMICALS INC ; NL CHEMICALS INC A CORP OF DE ; NL IND

Inventor(s): (std): KOLAKOWSKI M ; KOLAKOWSKI M A ; KOLAKOWSKI MICHAEL A ; STRIFFLER E ; STRIFFLER EUGENE JR ; STRIFFLER JR E ; STRIFFLER JR EUGENE ; STRIFFLER JUN EUGENE

Inventor(s): M A KOLAKOWSKI ; A KOLAKOWSKI MICHAEL ; E STRIFFLER JR ; JUN

Agent(s): KIRBY EADES GALE BAKER

27) Family number: 2210280 (US4769116A)

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Title: HYDROMETALLURGICAL PROCESS FOR AN OVERALL RECOVERY OF THE COMPONENTS OF EXHAUSTED LEAD-ACID

BATTERIES

Abstract: The invention relates to a hydrometallurgical process for the overall recovery of the components of exhausted lead-acid batteries, in a re-useable form, said components being mainly constituted by such materials as polypropylene, ebanite, PVC; by paste comprising lead sulphatized compounds; and by pure or alloyed metal lead, characterized in that it comprises the following steps: (a) battery crushing, (b) separation of paste by wet-screening, (c) separation of polypropylene by water floating, (d) separation of ebanite and PVC from pure or alloyed metal lead, by means of a first hydrodynamic separation, (e) separation of ebanite from PVC by a second hydrodynamic separation, (f) desulfurization of paste by carbonation by sodium carbonate, with pure sodium sulphate being obtained, (g) recovery of so-obtained pure sodium sulphate, (h) treatment of carbonated paste in order to recovery from it the lead, in pure metal form, by extraction by electrowinning.

Classifications:

International (IPC 8-9): C08J11/06 C22B13/00 C22B3/00 C22B7/00 C25C1/18 H01M10/54 (Advanced/Invention); C08J11/00 C22B13/00 C22B3/00 C22B7/00 C25C1/00 H01M10/54 (Core/Invention)

International (IPC 1-7): C01D5/00 C08J11/06 C08L21/00 C08L23/12 C22B13/00 C22B3/00 C22B7/00 C25C1/18 H01M10/54 H01M6/52

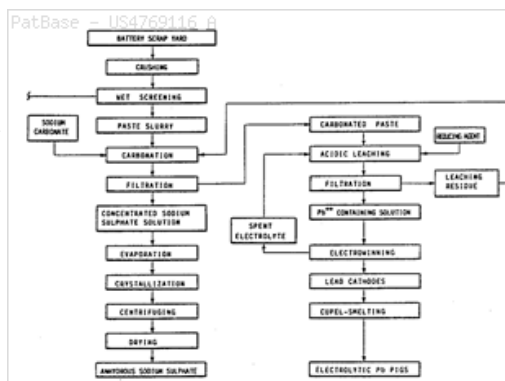
CPC: C22B13/045 H01M10/54 Y02W30/84 Y02P10/212

European: C22B13/04R H01M10/54 Y02E60/12

US: 204/114 204/115 205/599 209/10 423/209 423/551 423/98 429/49 75/120 75/432 75/78

JP F-Term: 4K001 4K001/AA20 4K001/BA22 4K001/CA01 4K001/CA03 4K001/DB02 4K001/DB17 4K001/DB21 4K001/JA03 5H031 5H031/AA01 5H031/BB02 5H031/BB04 5H031/BB07 5H031/BB09 5H031/EE01 5H031/EE03 5H031/EE04 5H031/HH06 5H031/HH08 5H031/RR01 5H031/RR02 5H031/RR07

JP F-Index: C22B13/06 C22B7/00/C H01M10/54



Family:

Publication number	Publication date	Application number	Application date
CA1333960 A1	19950117	CA19870526957	19870108
DE3700143 A1	19870723	DE19873700143	19870105
DE3700143 C2	19960605	DE19873700143	19870105
FR2592662 A1	19870710	FR19870000105	19870108
FR2592662 B1	19900601	FR19870000105	19870108
GB2185348 A1	19870715	GB19870000205	19870107
GB2185348 B2	19891115	GB19870000205	19870107
GB8700205 A0	19870211	GB19870000205	19870107
IT1191650 A	19880323	IT19860019031	19860109
IT8619031 A0	19860109	IT19860019031	19860109
JP62216179 A2	19870922	JP19870001949	19870109
US4769116 A	19880906	US19870001442	19870108

Priority:

IT19860019031 19860109 CA19870526957 19870108

Probable Assignee: ENGITEC IMPIANTI SPA

Assignee(s): (std): BUS ENGITEC SERV AMBIENTALI ; TECNECO SPA ; ENGITEC IMPIANTI ; TEKUNECO SRL ; ENGITEC IMPIANTI SPA

Assignee(s): TECNECO SRL ; OLPER MARCO ; FRACCHIA PIERLUIGI ; TECNECO S R L ; ENGITEC IMPIANTI S P A ; BUS ENGITEC SERVIZI AMBIENTALI SRL ; BUS ENGITEC SERVIZI AMBIENTALI SRL AN ITALIAN CO ; B U S ENGITEC SERVIZI AMBIENTALI S R L ; B U S ENGITEC SERVIZI AMBIENTALI S R L MAILAND MILANO IT

Inventor(s): (std): MAAKO ORUPAA ; FRACCHIA PIERLUIGI ; OLPER MARCO ; PIERLUIGI FURATSUCHIA

Inventor(s): PIERLUIGI FRACCHIA ; OLPER MARCO MONZA IT ; FRACCHIA PIERLUIGI MAILAND MILANO IT ; MARCO OLPER ; MARCO OLPER ET PIERLUIGI FRACCHIA

Agent(s): SWABEY OGILVY RENAULT

28) Family number: 15291301 (US7078122B)

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Title: HIGH EFFICIENCY PROCESS FOR TREATING MIXED METAL WASTE

Abstract: A process for rendering hazardous materials present in multi-element waste non-hazardous, and for recovering valuable components of said waste, particularly metals, comprising contacting the waste with an aqueous solution of HX, wherein X is halogen, thereby converting metals present in the waste to the corresponding halides, and subsequently separating said metal halides from other components of the reaction mixture and from each other.

Classifications:

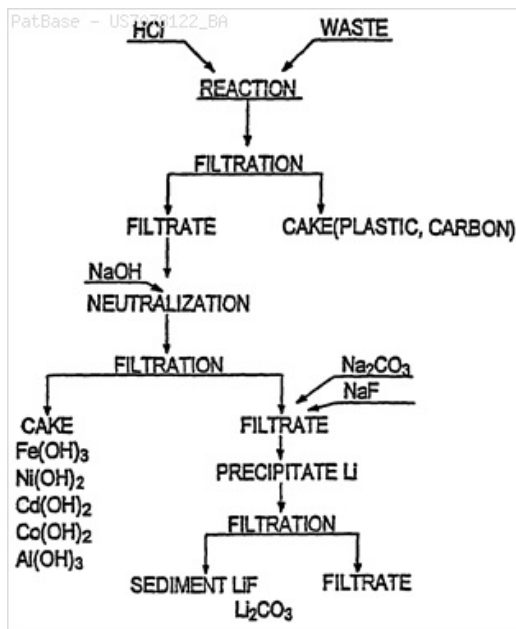
International (IPC 8-9): C22B26/00 C22B26/12 C22B7/00 H01M10/54 H01M6/52 (Advanced/Invention); C22B26/00 C22B7/00 H01M10/54 H01M6/00 (Core/Invention)

International (IPC 1-7): C02F11/14 C22B1/18 C22B26/12 C22B7/00 H01M10/54 H01M6/52

CPC: C22B26/12 C22B7/007 H01M6/52 H01M10/54 Y02W30/84 Y02P10/234

European: C22B26/12 C22B7/00D1 H01M10/54 H01M6/52 Y02E60/12

US: 429/49 75/711



Family:

Publication number	Publication date	Application number	Application date
AT283551 E	20041215	AT20000949866T	20000725
AU200063120 A1	20010213	AU20000063120	20000725
AU200063120 A5	20010213	AU20000063120D	20000725
DE60016236 D1	20041230	DE20006016236	20000725
DE60016236 D1	20041230	DE20006016236T	20000725
DE60016236 T2	20051208	DE20006016236T	20000725
EP1204998 A1	20020515	EP20000949866	20000725
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IL131110 A0	20010128	IL19990131110	19990726
IL131110 A1	20031031	IL19990131110	19990726
US7078122 BA	20060718	US20000048252	20000725
WO0108245 A1	20010201	WO2000IL00442	20000725

Priority:

IL19990131110 19990726 WO2000IL00442 20000725

Probable Assignee: METAL TECH LTD

Assignee(s): (std): ARIEL ROSENBERG ; ARIEL ROSENBERG OMER ; ROSENBERG ARIEL

Assignee(s): METAL TECH LTD

Inventor(s): (std): ROSENBERG ARIEL

Inventor(s): ARIEL ROSENBERG

Agent(s): ANDERSON KILL AND OLICK PC

Designated states: AE AG AL AM AT AU AZ BA BB BE BF BG BJ BR BY BZ CA CF CG CH CI CM CN CR CU CY CZ DE DK DM DZ EE ES FI FR GA GB GD GE GH GM GN GR GW HR HU ID IE IL IN IS IT JP KE KG KP KR KZ LC LI LK LR LS LT LU LV MA MC MD MG MK ML MN MR MW MX MZ NE NL NO NZ PL PT RO RU SD SE SG SI SK SL SN SZ TD TG TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW

29) Family number: 42001304 (US2010143219A)

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Title: PROCESS FOR THE PRODUCTION OF NANO LEAD OXIDES

Abstract: Provided is a process for producing fine particles of pure lead oxide from a waste lead oxide paste obtained from exhausted lead-acid batteries. The lead oxide particles so produced are substantially spherical and have a weight average particle size from about 13 nm to about 100 nm, which, are of nano-particle dimensions. The process according to the present invention is capable to produce pure lead oxide of PbO₂ and lead oxide of Pb₃O₄ or commonly known as red lead.

Classifications:

International (IPC 8-9): B82B3/00 C01G21/02 C01G21/08 C01G21/10 C22B13/08 H01M10/54 H01M4/57 (Advanced/Invention); B82B3/00 C01G21/00 C22B13/00 H01M10/54 H01M4/48 (Core/Invention)

International (IPC 1-7): B82B3/00

CPC: H01M10/54 B82Y30/00 H01M10/06 Y02W30/84

European: B82Y30/00 H01M10/54 T01M10/06 Y02E60/12

US: 423/89 423/89S 423/92 423/92P 977/773 977/773S

JP F-Term: 3C082 4G047 5H031 5H031/AA01 5H031/BB00 5H031/BB01 5H031/BB02 5H031/BB09 5H031/EE03 5H031/HH06 5H031/HH09 5H031/RR02 5H050 5H050/AA19 5H050/BA09 5H050/CA06 5H050/CB15 5H050/FA17 5H050/GA02 5H050/GA12 5H050/HA02 5H050/HA05 5H050/HA14 5H050/HA20

JP F-Index: B82Y30/00 B82Y99/00 C01G21/08 C01G21/10 H01M10/54 H01M4/57

Waste Lead Oxide Paste

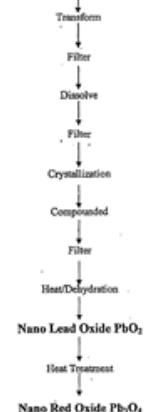


FIG. 1

Family:

Publication number	Publication date	Application number	Application date
AU2008203584 AA	20080710	AU20080203584	20080103
CN101605717 A	20091216	CN200880001666	20080103
EP2121517 A1	20091125	EP20080705035	20080103
IN04577DN2009 A	20100514	IN2009DN04577	20090714
JP2010515642 T2	20100513	JP20090544816T	20080103
KR20090096730 A	20090914	KR20097015477	20080103
MY143055 A	20110228	MY20070000012	20070105
US2010143219 AA	20100610	US20080448713	20080103
WO08082287 A1	20080710	WO2008MY00001	20080103

Priority:

MY20070000012 20070105 WO2008MY00001 20080103

Probable Assignee: TAI KWONG YOKOHAMA BATTERY IND SDN BHD

Assignee(s): (std): TAI KWONG YOKOHAMA BATTERY IND ; TAI KWONG YOKOHAMA BATTERY IND SDN BHD

Assignee(s): TAI KWONG YOKOHAMA BATTERY INDUSTRIES SDN BHD ; TAI KWONG YOKOHAMA BATTERY INDUSTRIES SDN BHD

Inventor(s): (std): CHOW SIEW HON ; HON CHOW SIEW

Inventor(s): SIEW HON CHOW ; CHOW SIEW

Agent(s): PIZZEYS; PIZZEYS PATENT AND TRADE MARK ATTORNEYS PTY LTD; MAURY RICHARD PHILIP; OHNO SEIJI; MORITA KOJI; TANAKA REIKO; MATSUTOYA YUKO; KITANO TAKESHI; WOLF GREENFIELD AND SACKS PC; LEE YUKE CHIN

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN SV SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

30) Family number: 11056315 (US5788739A)

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Title: PROCESS FOR RECOVERING METALLIC LEAD FROM EXHAUSTED BATTERIES

Abstract: The present invention relates to a process for the recovery of metallic lead from exhausted lead-acid batteries. According to the invention, the metallic scrap obtained thereof is treated by a smelting operation which is carried out under a layer of a molten flux. The flux comprises alkali hydroxide and optionally also carbonate(s) and sulfate(s) of said alkali. The temperature which is maintained during the smelting is between 350 DEG C. to 600 DEG C. and most preferably in the range of between 450 DEG C. to 550 DEG C. The preferred weight ratio between the metallic scrap and the flux is between 15 to 45. Generally, the alkali flux is selected from sodium hydroxide and potassium hydroxide and mixtures thereof. The process is characterized by a very extent of lead recovery compared with the known processes and absence of exhausted gases.

Classifications:

International (IPC 8-9): C01G21/02 C22B13/02 H01M10/06 H01M10/54 (Advanced/Invention);
H01M10/06 (Advanced/Non-invention);
C22B13/00 H01M10/54 (Core/Invention);
H01M10/06 (Core/Non-invention)

International (IPC 1-7): B03B9/06 C01G21/02 C22B C22B13/00 C22B13/02 C22B7/00 H01M10/54

CPC: H01M10/54 C22B13/025 H01M10/06 Y02W30/84 Y02P10/214

European: C22B13/02R H01M10/54 T01M10/06 Y02E60/12

US: 423/621 429/49 75/419 75/693

Family:

Publication number	Publication date	Application number	Application date
AU199731884 A1	19990104	AU19970031884	19970625
DE19605242 A1	19970731	DE19961005242	19960213
GB2309464 A1	19970730	GB19960002402	19960207

GB9602402 A0	19960403	GB19960002402	19960207
IL116884 A0	19960514	IL19960116884	19960124
KR19970059287 A	19970812	KR19970001781	19970122
US5788739 A	19980804	US19960597748	19960206
WO9858879 A1	19981230	WO19971L00212	19970625

Priority:

IL19960116884 19960124 WO19971L00212 19970625

Probable Assignee: MARGULEAD LTD

Assignee(s): (std): MARGULEAD LTD ; MARGULIS EFIM

Assignee(s): EFIM MARGULIS ; MARGULEAD LTD KIRYAT YAM IL

Inventor(s): (std): MARGULIS EFIM ; MARGULIS EFIM PROF

Inventor(s): EFIM MARGULIS

Designated states: AL AM AT AU AZ BB BE BF BG BJ BR BY CA CF CG CH CI CM CN CZ DE DK EE ES FI FR GA GB GE GH GN GR HU IE IS IT JP KE KG KP KR KZ LK LR LS LT LU LV MC MD MG MK ML MN MR MW MX NE NL NO NZ PL PT RO RU SD SE SG SI SK SN SZ TD TG TJ TM TR TT UA UG US UZ VN ZW

31) Family number: 59135339 (US2015123030A)

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Title: PRESSURE OXIDATION OF ENARGITE CONCENTRATES CONTAINING GOLD AND SILVER

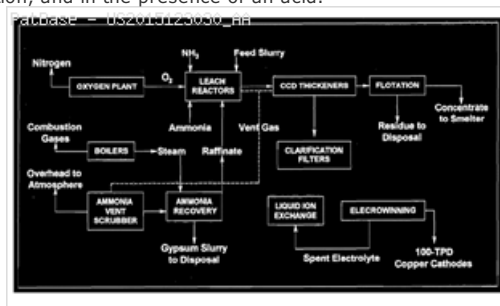
Abstract: Disclosed herein is a treated ore solid comprising a reduced amount of a contaminant, for example arsenic, compared to the ore solid prior to treatment. Also disclosed are temperature and pressure modifications, parameters, and methods for treating an ore solid by pressure oxidation leaching of enargite concentrates. The disclosed methods and processes may be applied to copper sulfide orebodies and concentrates containing arsenic. In some cases, the disclosed methods and systems extract, remove, or reduce contaminants, for example arsenic, from an ore containing solution at moderately increased temperature, pressure, and oxygen concentration, and in the presence of an acid.

Classifications:

International (IPC 8-9): B01J8/08 B01J8/10 C22B15/00
C22B7/00 (Advanced/Invention)

CPC: C22B15/0008 C22B1/11

US: 252/182.33 422/119 423/1



Family:

Publication number	Publication date	Application number	Application date
US2015123030 AA	20150507	US20140531770	20141103

Priority:

US20130898781P 20131101 US20140531770 20141103

Probable Assignee: COLORADO SCHOOL OF MINES

Assignee(s): (std): COLORADO SCHOOL OF MINES

Inventor(s): (std): ANDERSON CORBY G ; CONNER KIMBERLY D

32) Family number: 2121359 (US4655928A)

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Title: MEMBRANE PROCESSES FOR METAL RECOVERY AND POLLUTION CONTROL IN METAL PROCESS INDUSTRIES

Abstract: A process for the treatment of an aqueous stream containing an acid or base and typically a precipitable material such as a metal ion comprises: (a) subjecting the aqueous stream to (i) a treatment to produce a relatively pure stream of water and a concentrated aqueous stream, and (ii) water splitting to produce a stream of acid and a dilute aqueous stream of a concentration lower than the concentrated aqueous stream, the treatments (i) and (ii) being effected in either order, (b) recycling at least part of the pure water stream produced in (a)(i) to an earlier stream either in the production leading to said aqueous stream or to step (i) or (ii), (c) recycling at least part of the acid and/or base streams produced in (a)(ii) to an earlier stream either in the production leading to said aqueous stream or to an earlier step in the process, and (d) recycling at least part of the lower concentration stream produced in (a)(ii) to either (a)(i) or to another step in the process, whereby, when present, only the precipitable material is removed from the aqueous stream, thereby obviating toxic waste disposal problems.

Classifications:

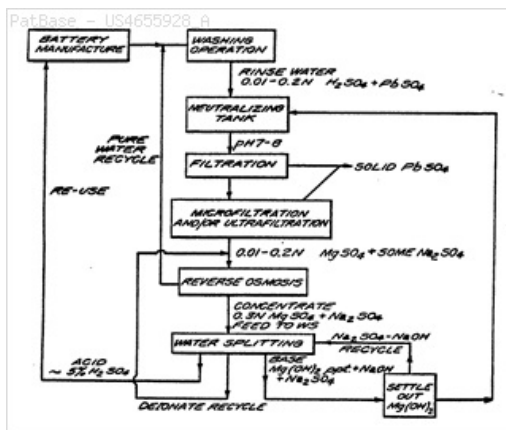
International (IPC 8-9): B01D61/44 C02F1/44 C02F1/469 C02F1/62 C02F9/00 C22B13/00 C22B15/00 C22B17/00 C22B23/00 C22B26/10 C22B7/00 C23F1/46 H01M10/54 (Advanced/Invention); C02F1/44 C02F1/469 C02F1/62 C22B13/00 C22B17/00 C22B23/00 C23F1/46 (Advanced/Non-invention); B01D61/42 C02F1/44 C02F1/469 C02F1/62 C02F9/00 C22B13/00 C22B15/00 C22B17/00 C22B23/00 C22B26/00 C22B7/00 C23F1/46 H01M10/54 (Core/Invention)

International (IPC 1-7): B01D13/00 B01D13/02 C02F1/44 C02F1/46 C02F1/62 C22B13/04 C22B15/12 C22B17/04 C22B23/04 C22B7/00

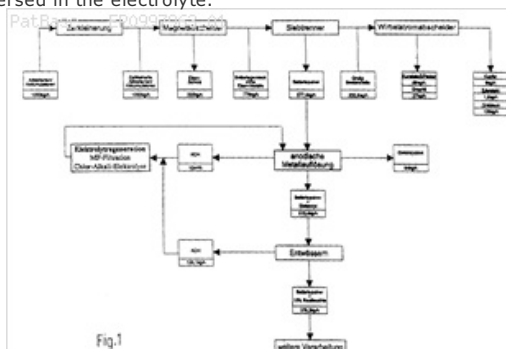
CPC: B01D61/145 B01D61/147 C02F1/4693 C02F2001/46128 H01M10/54 B01D61/025 B01D61/445 B01D61/58 B01D2311/2642 C02F9/00 C02F2101/20 C22B7/006 C22B13/04 C22B15/0086 C22B17/04 C22B23/0453 C22B26/10 Y02W30/84 Y02P10/234 Y02P10/236 C02F1/001 C02F1/441 C02F1/444 C02F1/66

European: B01D61/58 C02F1/469D C02F9/00 C22B13/04 C22B15/00L4B C22B17/04 C22B23/04B C22B26/10 C22B7/00D

JP F-Index: C02F1/44/E C02F1/46/103 C02F1/469 C02F1/62/Z
C22B13/00/101 C22B13/04 C22B15/00/107 C22B15/12 C22B17/00/101 C22B17/04 C22B23/00/102 C22B23/04 C22B7/00/A



Publication number	Publication date	Application number	Application date
AU198433833 A1	19850426	AU19840033833	19841004
AU575857 B2	19880811	AU19840033833	19841004
CA1249885 A1	19890207	CA19840464353	19840928
EP0159349 A1	19851030	EP19840903860	19841015
EP0159349 A4	19861106	EP19840903860	19841015
GR80528 B	19850107	GR19840180528	19841003
JP60106583 A2	19850612	JP19840219348	19841018
NZ209875 A	19880929	NZ19840209875	19841012
US4655928 A	19870407	US19830543191	19831018
US4775480 A	19881004	US19870008176	19870129
WO8501670 A1	19850425	WO1984US01645	19841015



Publication number	Publication date	Application number	Application date
DE19849385 A1	20000504	DE19981049385	19981027
EP0997963 A1	20000503	EP19990121142	19991022

DE19981049385 19981027

Probable Assignee: EISENMANN MASCHBAU KG
Assignee(s): (std): EISENMANN KG MASCHBAU ; EISENMANN MASCHBAU KG
Assignee(s): EISENMANN MASCHINENBAU KG
Inventor(s): (std): EBERHARD GUENTER
Designated states: DE ES FR GB IT SE

34) Family number: 55802363 (US2014050986A)

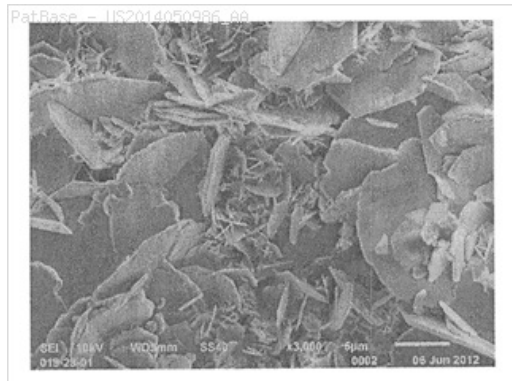
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Title: ACTIVE MATERIALS FOR LEAD ACID BATTERY

Abstract: The present disclosure describes a series of improvements to the positive active material and negative active material of electrochemical cells. In particular, the present disclosure describes improvements in the lead oxide powder, processing, and additives used to make the positive active material and negative active material for pastes used to make electrodes for lead acid batteries. The present disclosure describes materials and processing that enable the formation of positive active materials having density comparable to conventional material but with substantially higher porosity and improved mechanical properties and the formation of negative active materials using substantially shorter and less energy intensive processing.

Classifications:

International (IPC 8-9): C01G21/02 C01G21/06 C01G21/08 C01G21/10 C22B13/02 H01M4/04 H01M4/14 H01M4/21 H01M4/38 H01M4/56 H01M4/58 H01M4/62 H01M4/66 H01M4/68 (Advanced/Invention)
CPC: H01M4/14 H01M4/625 Y10T428/2982 H01M4/16 H01M4/20 H01M10/06 C01G21/02 C01G21/06 C01G21/10 C01G21/08 H01M2004/028 H01M4/0471 H01M4/21 C01P2004/53 C01P2004/61 H01M4/56 H01M4/5825 H01M2004/021 H01M2220/20 H01M4/62 H01M10/4235 H01M2300/0005
US: 252/182.1 252/503 423/619 428/402 429/225



Family:

Publication number	Publication date	Application number	Application date
US2014050986 AA	20140220	US20130768192	20130215
US2014186712 AA	20140703	US20130145640	20131231
US2015298987 AA	20151022	US20120588623	20120817
WO14028856 A2	20140220	WO2013US55382	20130816
WO14028856 A3	20140508	WO2013US55382	20130816
WO15103314 A2	20150709	WO2014US72846	20141230
WO15103314 A3	20151112	WO2014US72846	20141230

Priority:

US20120475484 20120518 US20120588623 20120817 US20130768192 20130215
US20130842777 20130315 US20130145640 20131231

Probable Assignee: TBP INVESTMENTS LLC

Assignee(s): (std): ALBANO FABIO ; ANDERSON ERIK W ; ENERGY POWER SYSTEMS LLC ; GOPU SUSMITHA ; DHAR SUBHASH ; DAHLBERG KEVIN ; HIGLEY LIN ; VENKATESAN SRINIVASAN ; KOETTING WILLIAM

Assignee(s): TBP INVESTMENTS LLC

Inventor(s): (std): ALBANO FABIO ; ANDERSON ERIK W ; HIGLEY LIN ; DHAR SUBHASH ; GOPU SUSMITHA ; DAHLBERG KEVIN ; VENKATESAN SRINIVASAN ; KOETTING WILLIAM

Agent(s): GARRETT ARTHUR S ET AL; VAN HORN CHARLES E ET AL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

35) Family number: 4680377 (DE3612491A1)

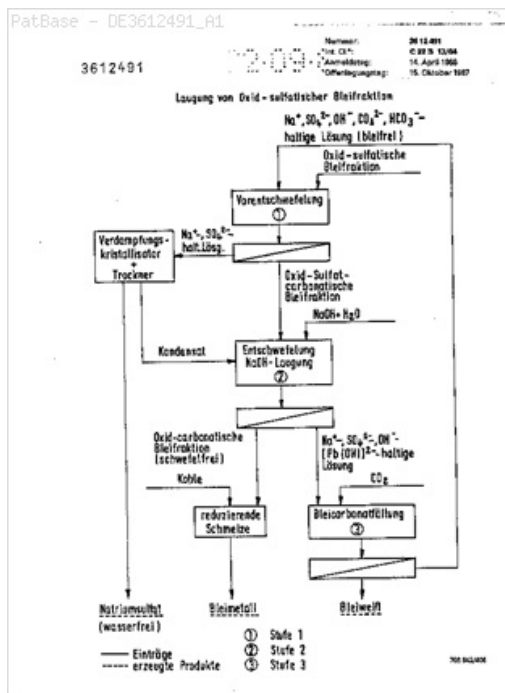
© PatBase

Title: PROCESS FOR RECOVERING LEAD FROM OXIDIC OR OXIDIC/SULPHATIC SECONDARY PRECURSOR MATERIALS

Abstract: A process is described for recovering lead from oxidic or oxidic/sulphatic secondary precursor materials, in particular from a corresponding fraction in the recirculation (recycling) and processing of accumulator (battery) scrap, whereby the precursor materials are subjected to preliminary desulphurisation with an alkaline solution of the last process stage, the complete desulphurisation is then carried out in a second stage with a NaOH solution and the oxide-containing, carbonate-containing sulphur-free lead fraction thus obtained is melted under reducing conditions to lead, while the residual lead contained in the alkaline solution is precipitated as carbonate, separated out and the remaining lead-free alkaline solution is recycled to the first stage for preliminary desulphurisation.

Classifications:

International (IPC 8-9): C22B13/00 H01M10/54 (Advanced/Invention); C22B13/00 H01M10/54 (Core/Invention)
International (IPC 1-7): C22B13/00 C22B13/04
CPC: C22B13/045 H01M10/54 Y02W30/84 Y02P10/214
European: C22B13/04R H01M10/54 Y02E60/12



Family:

Publication number	Publication date	Application number	Application date
DE3612491 A1	19871015	DE19863612491	19860414
DE3612491 C2	19910718	DE19863612491	19860414

Priority:

DE19863612491 19860414

Probable Assignee: PREUSSAG METALL AG

Assignee(s): (std): PREUSSAG AG METALL ; PREUSSAG METALL AG

Assignee(s): PREUSSAG AG METALL 3380 GOSLAR DE ; PREUSSAG METALL 3380 GOSLAR DE AG

Inventor(s): (std): HANUSCH KUNIBERT DR ING ; HERBST KARL ALBRECHT DIPL ING ; PRETZSCH KLAUS DR

36) Family number: 40748386 (WO07120026A1)

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Title: UNIT FOR PROCESSING PULVERIZED LEAD- AND ZINC-CONTAINING RAW MATERIAL

Abstract: The invention relates to non-ferrous metallurgy, mainly to devices for processing pulverized lead- and zinc-containing raw material which also could contain copper and precious metals. The aim of said invention is to increase the direct extraction of lead into impure metal and the unit specific performance. The inventive unit for processing pulverized lead- and zinc-containing raw material comprises a vertical melting chamber which has a rectangular cross-section and is provided with a burner device, a gas cooler shaft, a baffle provided with water-cooling copper elements, which separates the melting chamber from the gas cooler shaft, an electric furnace separated from the melting chamber by the baffle provided with water-cooling copper elements, a caisson ring, a device for tapping a melting product, a bottom, wherein the difference quotient of the lower edges of the baffles to a distance between the roof of the melting chamber and the lower edge of the baffle separating the electric furnace from the melting chamber ranges from 0.15 to 0.29, whilst the distance ratio between the lower edge of said baffle and the bottom to the difference of the levels of the lower edges of the baffles ranges from 1.25 to 2.10.

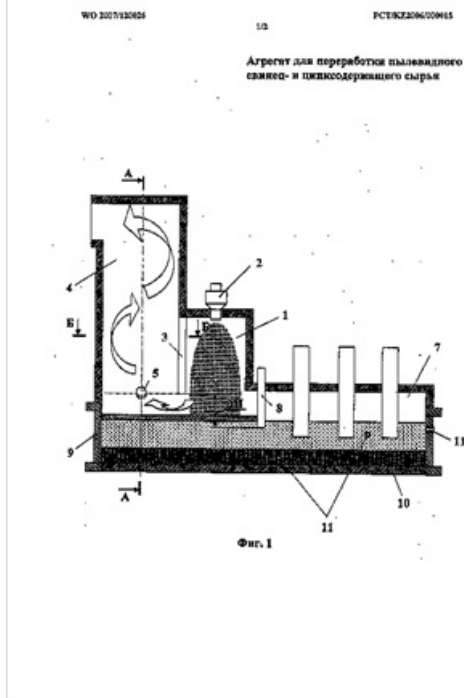
Classifications:

International (IPC 8-9): C22B13/00 C22B13/02 C22B19/00
C22B19/08 C22B7/00 F27B17/00 F27B19/02 (Advanced/Invention);
C22B13/00 F27B17/00 (Core/Invention)

International (IPC 1-7): C22B7/00

CPC: C22B4/08 C22B13/02 C22B19/20 F27B19/02 F27B19/04
F27B19/0 C22B13/0 C22B19/2

European: C22B13/02 C22B19/20 C22B4/08 F27B19/02 F27B19/04

**Family:**

Publication number	Publication date	Application number	Application date
BRPI0615489 A2	20110517	BR2006PI15489	20061128
BRPI0615489 B1	20150721	BR2006PI15489	20061128
CL2007002156 A1	20080418	CL20070002156	20070724
CN101317067 A	20081203	CN200680006156	20061128
CN101317067 B	20120321	CN200680006156	20061128
IN05775DN2007 A	20080201	IN2007DN05775	20070725
IN269391 B	20151030	IN2007DN05775	20070725
RU2006145142 A	20080627	RU20060145142	20061218
RU2359188 C2	20090620	RU20060145142	20061218
WO07120026 A1	20071025	WO2006KZ00015	20061128

Priority:

KZ20060000853 20060724

WO2006KZ00015 20061128

Probable Assignee: STATE AFFILIATE THE EASTERN MI

Assignee(s): (std): RAGULIN BORIS ALEXANDROVICH ; STARSEV IGOR VLADIMIROVICH ; STATE AFFILIATE THE EASTERN MI ; POLYAKOV IVAN PETROVICH ; SHUMSKIY VIKTOR ALEXANDROVICH ; STATE AFFILIATE THE EASTERN MINING AND METALLURG RES INST FOR NON FERROUS METALS REPUBLIC STATE AFFI ; DOCHERNEE GP VOS NI GORNO META ; EASTERN MINING AND METALLURG R ; CHALENKO VALENTINA VASILYEVNA ; STATE AFFILIATE EASTERN MINING AND METALLURG RES INST FOR NON FERROUS METALS REPUBLIC STATE AFFI ; USHAKOV NIKOLAY NIKOLAYEVICH

Assignee(s): STATE AFFILIATE THE EASTERN MINING AND METALLURGICAL RESEARCH INSTITUTE FOR NON FERROUS METALS REPUBLIC STATE AFFILIATE NATIONAL ENTERPRISE OF COMPLEX PROCESSING FOR MINERAL AND RAW MATERIAL OF THE ; THE EASTERN MINING AND METALLURGICAL RESEARCH INSTITUTE FOR NON FERROUS METALS ; VNIITSVETMET SA ; STATE AFFILIATE EASTERN MINING AND METALLURGICAL RESEARCH INST FOR NON FERROUS METALS REPUBLIC STATE AFFILIATE NATIONAL ENTERPRISE OF COMPLEX PROCESSING FOR MINERAL AND RAW MATERIAL OF ; DOCHERNEE GOSUDARSTVENNOE PREDPRIJATIE VOSTOCHNYJ NAUCHNO ISSLEDOVATEL SKIJ GORNO METALLURGICHESKIJ INST TSVETNYKH METALLOV RESPUBLIKANSKOGO GOSUDARSTVENNOGO PREDPRIJATIJA NATSIONAL NYJ TSENTRPO KOMPLEKSNOJ PERERABOTKE MINERAL NOGO SYR JA RES ; DOCHERNEE GOSUDARSTVENNOE PREDPRIJATIE VOSTOCHNYJ NAUCHNO ISSLEDOVATEL SKIJ GORNO METALLURGICHESKIJ INSTITUT TSVETNYKH METALLOV RESPUBLIKANSKOGO GOSUDARSTVENNOGO PREDPRIJATIJA NATSIONAL NYJ TSENTRPO KOMPLEKSNOJ PERERABOTKE MINERAL NOGO SYR JA RES ; EASTERN MINING AND METALLURGICAL RESEARCH INST FOR NON FERROUS METALS ; STATE AFFILIATE EASTERN MINING AND METALLURGICAL R ; STATE AFFILIATE THE EASTERN MINING AND METALLURGIC ; STATE AFFILIATE THE EASTERN MINING AND METALLURGICAL RESEARCH INSTITUT FOR NON FERROUS METALS REPUBLIC STATE AFFILIATE NATIONAL ENTERPRISE OF COMPLEX PROCESSING FOR MINERAL AND RAW MATERIAL OF TH ; STATE AFFILIATE EASTERN MINING AND METALLURGICAL RESEARCH INST FOR NON FERROUS METALS REPUBLIC STATE AFFILIATE NATIONAL ENTERPRISE OF COMPLEX PROCESSING FOR MINERAL AND RAW MATERIAL OF TH

Inventor(s): (std): CHALENKO VALENTINA VASILYEVNA ; POLYAKOV IVAN PETROVICH ; RAGULIN BORIS ALEXANDROVICH ; SHUMSKIY VIKTOR ALEXANDROVICH ; STARSEV IGOR VLADIMIROVICH ; USHAKOV NIKOLAY NIKOLAYEVICH ; SHUMSKIY VIKTOR ALEKSANDROVICH ; RAGULIN BORIS ALEKSANDROVICH ; POLJAKOV IVAN PETROVICH ; PETROVICH POLYAKOV IVAN ; NIKOLAYEVICH USHAKOV NIKOLAY ; CHALENKO VALENTINA VASIL'EVNA ; ALEXANDROVICH SHUMSKIY VIKTOR ; ALEXANDROVICH RAGULIN BORIS ; VLADIMIROVICH STARSEV IGOR ; VASILYEVNA CHALENKO VALENTINA ; USHAKOV NIKOLAJ NIKOLAEVICH ; STARTSEV IGOR VLADIMIROVICH

Inventor(s): SHUMSKIY VIKTOR ALEXANDROVICH STARTSEV IGOR VLADIMIROVICH RAGULIN BORIS ALEXANDROVICH USHAKOV NIKOLAY NIKOLAYEVICH P ; BORIS ALEXANDROVICH RAGULIN ; STARTSEV IGOR' VLADIMIROVICH ; CHALENKO VALENTINA VASIL'EVNA ; VALENTINA VASILYEVNA CHALENKO ; VIKTOR ALEXANDROVICH SHUMSKIY ; IGOR VLADIMIROVICH STARSEV ; IVAN PETROVICH POLYAKOV ; NIKOLAY NIKOLAYEVICH USHAKOV

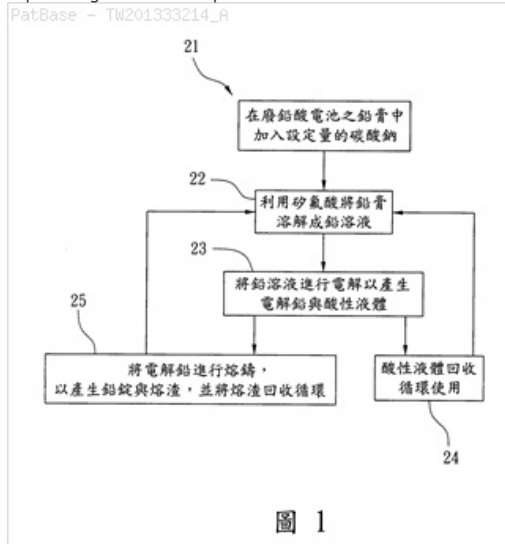
Designated states: AE AG AL AM AT AU AZ BA BB BE BF BG BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LK LR LS LT LU LV LY MA MC MD MG MK ML MN MR MW MX MY MZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN SV SY SZ TD TG TJ TM

37) Family number: 54599387 (TW201333214A)

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Title: ONE METHOD OF RECYCLING LEAD FROM THE PASTE CONTAINED IN WASTE LEAD BATTERY

Abstract: One method of recycling lead from the paste contained in waste lead battery including the following procedures: (A) Sodium carbonate is utilized to transform lead sulfate to lead carbonate. (B) dissolve in H₂SiF₆ solution. (C) The lead-contained solution was utilized to electrolyze and produce lead metal in cathode. (D) The used electrolysis acid solution were recycled to decrease the operating cost and impact on environment. Lead sulfate transform to lead carbonate used by sodium carbonate can increase solubility of H₂SiF₆ for lead paste contained in waste battery and increasing the concentration of lead in the solution. And increase the speed and quality of lead metal when electrolysis process produced. The used electrolysis acid solution can be recycled to use again to decrease the operating cost and impact on environment.

Classifications:**International (IPC 8-9):** C22B13/00 C22B7/00 (Advanced/Invention)**CPC:** Y02P10/234**Family:**

Publication number	Publication date	Application number	Application date
TW201333214 A	20130816	TW20120104347	20120210

Priority:

TW20120104347 20120210

Probable Assignee:

LOGOS TECHNOLOGY DEV CO LTD

Assignee(s): (std):

LOGOS TECHNOLOGY DEV CO LTD

Assignee(s):

LOGOS TECHNOLOGY DEVELOPMENT CO

Inventor(s): (std):

HUANG MING FA

38) Family number: 12951391 (EP1009058A1)

© PatBase

Title: METHOD OF TREATING LITHIUM BATTERY TO RECYCLE ITS MATERIALS

Abstract: Spent lithium battery processing involves alcohol treatment to form lithium alcoholate which is reacted with cathode active material to form a lithiated transition metal oxide. Spent lithium batteries having a cathode active material of transition metal oxide are processed by: (a) removing the external casing; (b) immersing the battery, with stirring and under an inert gas atmosphere, in a linear or branched greater than or equal to 3C alkanol to disperse the battery constituents and form a lithium alcoholate; (c) separating the solid materials; (d) reacting the transition metal oxide with the lithium alcoholate to obtain a lithiated or super-lithiated transition metal oxide of defined stoichiometry; (e) separating insoluble elements (mainly lithiated or super-lithiated transition metal oxide and carbon) from the soluble elements (mainly lithium salts and electrolyte); (f) recovering the lithiated or super-lithiated transition metal oxide and carbon in powder form; and (g) subjecting the powder to evaporation of residual alcohol, rinsing and drying. Independent claims are also included for the following: (i) lithiated or super-lithiated transition metal oxide obtained by the above process; (ii) an electrode having an active material which, before any charging or discharging, comprises the above lithiated or super-lithiated transition metal oxide; and (iii) a battery containing the above electrode.

Classifications:**International (IPC 8-9):** B09B5/00 C22B7/00 H01M10/54

H01M6/52 (Advanced/Invention);

B09B5/00 C22B7/00 H01M10/54 H01M6/00 (Core/Invention)

International (IPC 1-7): B09B5/00 C01B31/02 C22B26/12 C22B7/00

H01M H01M10/54 H01M6/52

CPC: H01M6/52 H01M10/54 Y02W30/84**European:** H01M10/54 H01M6/52 Y02E60/12**JP F-Term:** 4D004 4D004/AA23 4D004/AB03 4D004/AC05

4D004/BA06 4D004/CA02 4D004/CA22 4D004/CA29 4D004/CA34

4D004/CA41 4D004/CC15 4D004/DA02 4D004/DA03 4D004/DA06

4G146 4K001 4K001/AA34 4K001/BA22 4K001/CA00 5H031

5H031/BB00 5H031/BB02 5H031/HH00 5H031/HH06 5H031/RR02

JP F-Index: B09B5/00/A C22B7/00/C H01M10/54**JP Facet:** ZAB

PatBase - JP2000173677_表1

構成	Li-イオン 4ボルト	Li-金属/固体 ポリマー電解質	Li-金属/液体 ポリマー電解質	Li-イオン 3ボルト
アノード	カーボン	金属リチウム	金属リチウム	カーボン
電解質	ゲル化された電 解質または有機 液体	固体乾燥ポリマ ー	特定の液体電解 質	特定の液体電解 質
カソード 活物質	コバルト酸化物 、ニッケル酸化 物、および、マ ンガン酸化物	V ₂ O ₅	マンガン酸化物	マンガン酸化物
コレクタ	アルミニウムグ リッド	アルミニウムフ ィルムまたはニ ッケルフィロム	アルミニウムグ リッドまたはニ ッケルグリッド	アルミニウムグ リッド

Family:

Publication number	Publication date	Application number	Application date
CA2290879 AA	20000607	CA19992290879	19991201

EP1009058 A1	20000614	EP19990403005	19991202
FR2786927 A1	20000609	FR19980015412	19981207
FR2786927 B1	20010112	FR19980015412	19981207
IL133156 A0	20010319	IL19990133156	19991125
JP2000173677 A2	20000623	JP19990345505	19991203

Priority:

FR19980015412 19981207 CA19992290879 19991201

Probable Assignee: COMMISSARIAT A LENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES

Assignee(s): (std): COMMISSARIAT ENERGIE ATOMIQUE ; COMMISSARIAT A LENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES

Assignee(s): LE CRAS FREDERIC ; VANDELLE PIERRE ; COMMISSARIAT A LENERGIE ATOMIQUE ; BLOCH DIDIER ; BOURBON CAROLE ; COMMISS ENERG ATOM ; COMMISSARIAT A L ENERGIE ATOMIQUE

Inventor(s): (std): BLOCH DIDIER ; BOURBON CAROLE ; LE CRAS FREDERIC ; VANDELLE PIERRE

Agent(s): GOUDREAU GAGE DUBUC

Designated states: AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE

39) Family number: 43043394 (US7507496B)

© PatBase

Title: PROCESS FOR RECOVERING LEAD OXIDES FROM EXHAUSTED BATTERIES

Abstract: A process for recovering lead oxides from the spent paste of exhausted lead acid batteries. The process provides heating the spent paste with an alkali hydroxide solution at elevated temperatures prior to calcinations. Calcination is at various temperatures so that either lead mono-oxide, lead dioxide or red lead is obtained as the principal product. There is also provided the use of the lead oxide to prepare the paste for positive and negative electrodes or other lead compounds.

Classifications:

International (IPC 8-9): C01G21/02 C01G21/10 C22B13/00 C22B13/02 C22B13/06 C22B13/08 H01M4/82 H01M6/50 (Advanced/Invention);

C01G21/04 C01G21/06 C01G21/08 (Advanced/Non-invention); C01G21/00 C22B13/00 H01M4/64 H01M6/00 (Core/Invention)

CPC: C22B7/008 C01G21/06 C01G21/08 C01G21/10 C01P2006/80 C22B1/02 C22B13/025 C22B13/045 H01M4/20 H01M10/06 Y10T29/10 Y02P10/214 Y02P10/234

European: C01G21/06 C01G21/08 C01G21/10 C22B1/02 C22B13/02R C22B13/04R C22B7/00D2 H01M4/20 M01P6/80 T01M10/06 Y02E60/12F

US: 29/2 423/619 423/92 423/98 429/49

Family:

Publication number	Publication date	Application number	Application date
US7507496 BA	20090324	US20040006279	20041207

Priority:

US20040006279 20041207

Probable Assignee: RETRIEV TECHNOLOGIES INC

Assignee(s): (std): KINSBURSKY BROTHERS INC ; TOXCO INC

Assignee(s): RETRIEV TECHNOLOGIES INC

Inventor(s): (std): KINSBURSKY STEVEN A ; SCHUTTE RICHARD ; SMITH W NOVIS

Agent(s): JOHN LEZDEY AND ASSOC

40) Family number: 1273406 (US4118219A)

© PatBase

Title: PROCESS FOR RECYCLING JUNK LEAD-ACID BATTERIES

Abstract: A hydrometallurgical process for recycling the paste and electrolyte of junk lead-acid batteries begins by separating the paste and electrolyte from the junk batteries. The paste and electrolyte are then reacted to increase the lead sulfate content of the paste and reduce the acid content of the electrolyte. Excess liquid is then removed from the mixture of paste and electrolyte, after which the paste is mixed with an aqueous ammoniacal ammonium sulfate solution to dissolve a substantial portion of the lead sulfate from the paste. The remaining solid materials are then separated from the resulting pregnant lead solution, after which lead carbonate is precipitated from the pregnant lead solution by the addition of ammonium carbonate, ammonium bicarbonate or carbon dioxide. The precipitated lead carbonate is removed from the spent liquid and either converted to lead oxide by calcining, or mixed with sulfuric acid and then calcined or reacted with a chemical reducing agent to convert lead dioxide therein to lead oxide, and the lead oxide-containing material is then mixed with sulfuric acid in a second sulfating reaction to increase the lead sulfate content thereof. The resulting product is mixed with an aqueous ammoniacal ammonium sulfate solution to dissolve further lead sulfate therefrom. The resulting pregnant lead solution is separated from any solid materials remaining therein, after which lead carbonate is precipitated from the solution.

Classifications:

International (IPC 8-9): C22B7/00 H01M10/54 (Advanced/Invention); H01M10/54 (Core/Invention)

International (IPC 1-7): C01G21/02 C01G21/06 C01G21/20 C22B13/04 C22B7/00 C25C1/18 H01M10/54

CPC: H01M10/54 Y02W30/84

European: H01M10/54 Y02E60/12

US: 423/433 423/559 423/619 423/92 423/98 75/103 75/432

Publication number	Publication date	Application number	Application date
AU197722153 A1	19780727	AU19770022153	19770210
BE851511 A	19770816	BE19770175003	19770216
CA1094816 A1	19810203	CA19770271209	19770209
DE2706056 A1	19770901	DE19772706056	19770212
DE2706056 B1	19771215	DE19772706056	19770212
DE2706056 C3	19780817	DE19772706056	19770212
FR2341523 A1	19770916	FR19770004754	19770218
FR2341523 B1	19800208	FR19770004754	19770218
GB1573024 A	19800813	GB19770005380	19770209
IT1075569 A	19850422	IT19770020269	19770214
JP52128529 A2	19771028	JP19770017650	19770219
LU76800 A	19770912	LU19770076800	19770218
MX4225 U	19820216	MX19770100647U	19770214
NL7701499 A	19770823	NL19770001499	19770211
NZ183268 A	19780920	NZ19770183268	19770207
US4118219 A	19781003	US19770812437	19770701

US19760659277 19760219 CA19770271209 19770209

Assignee(s): (std): GOULD INC

Inventor(s): (std): ELMORE M; ELMORE MARION E; ELMORE MARION EDWARD; KLANG J; KLANG JAMES K; KLANG JAMES KENNETH; MARION EDOWAADO ERUMOA; JIEIMUZU KENESU KURANGU

Agent(s): BARRIGAR AND MOSS

Abstract: The invention relates to a method of isolating the constituent materials of a lead-acid battery including the steps of dismantling the battery and substantially separating the metallic and non-metallic constituents of the battery.

International (IPC 8-9): B02C23/08 B02C23/18 B09B3/00

B29B17/02 C22B13/02 C22B7/00 H01M10/54
H01M6/52 (Advanced/Invention);

B02C23/00 B02C23/18 B09B3/00 B29B17/02 C22B13/00 C22B7/00

H01M10/54 H01M6/00 (Core/Invention)

CPC: Y02W30/524 Y02W30/622 Y02W30/84 B03B9/061

B03B2009/066 B29B17/02 B29B2017/0244 B29K2705/04

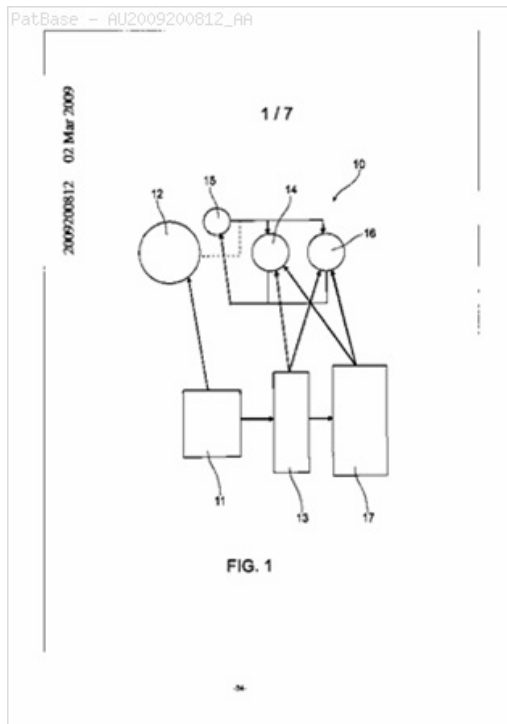
B29L2031/7146 C22B7/005 C22B7/008 C22B13/045 H01M10/06

H01M10/54 Y02P10/234

European: B03B9/06D B29B17/02 C22B13/04R C22B7/00C

C22B7/00D2 H01M10/06 H01M10/54 L03B9/06E L29B17/02Z1F2
L29K79F/04 L29L31/3146 Y02E60/125

L29K705/04 L29L31/7146 Y02E60/12F

**Family:**

Publication number	Publication date	Application number	Application date
AU2009200812 AA	20090917	AU20090200812	20090302
AU2009200812 BB	20100325	AU20090200812	20090302

Priority:

AU20080900987 20080228 AU20090200812 20090302

Probable Assignee: HUANG VINCENT

Assignee(s): (std): HUANG VINCENT

Assignee(s): VINCENT HUANG

Inventor(s): (std): HUANG VINCENT

Inventor(s): VINCENT HUANG

Agent(s): FISHER ADAMS KELLY PTY LTD; FISHER ADAMS KELLY CALLINANS; SPRUSON AND FERGUSON; FISHER ADAMS KELLY

42) Family number: 59353416 (US2016294024A)

© PatBase

Title: DEVICES AND METHOD FOR SMELTERLESS RECYCLING OF LEAD ACID BATTERIES

Abstract: Lead from lead acid battery scrap is recovered in two separate production streams as clean grid lead and as high-purity lead without smelting. In preferred aspects, lead recovery is performed in a continuous process that uses an aqueous electroprocessing solvent and electro-refining and spent electroprocessing solvent can be recycled to the recovery process.

Classifications:

International (IPC 8-9): C22B13/00 C22B3/16 C22B3/44 C22B7/00 C25C C25C1/18 C25C5/02 C25C7/00 C25C7/02 C25C7/06 C25C7/08 H01M H01M10/06 H01M10/54

H01M4/14 (Advanced/Invention);

C25C7/00 (Core/Invention)

International (IPC 1-7): H01M10/06 H01M10/54

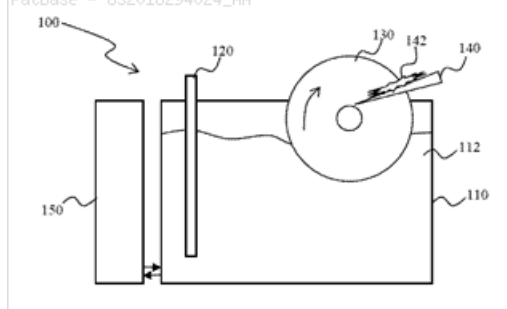
CPC: H01M4/14 Y02E60/126 C25C7/005 H01M10/54 C25C1/18 C25C5/02 C25C7/00 C25C7/007 C25C7/08 H01M10/06 Y02P10/212 Y02W30/84

US: 205/771

JP F-Term: 4K001 4K001/AA20 4K001/BA22 4K001/DB02 4K001/DB21 4K058 4K058/AA23 4K058/BA27 4K058/BB04 4K058/CA02 4K058/CA09 4K058/CA11 4K058/EB04 4K058/EB15 4K058/ED04 4K058/FC07 4K058/FC14 5H031 5H031/AA01 5H031/BB02 5H031/BB09 5H031/EE01 5H031/RR02 4K001/CA06 4K001/DB22 4K001/DB35 4K001/DB36 4K058/BA37 4K058/BB03 4K058/CA03 4K058/CA13 4K058/CA22 4K058/DD27 4K058/EB02 4K058/EB18 4K058/ED03 4K058/FA04 4K058/FA06 4K058/FA23 5H031/AA00 5H031/HH03

JP F-Index: C22B13/00/101 C22B3/16 C22B3/44 C22B7/00/C C25C1/18 C25C7/02/303 C25C7/02/306 C25C7/06/301/A H01M10/54 C22B3/44/101/Z C25C5/02 C25C7/08/A

PatBase - US2016294024_AA

**Family:**

Publication number	Publication date	Application number	Application date
AP201609279 A0	20160630	AP20160009279	20141118
AU2014353227 AA	20160602	AU20140353227	20141118
AU2014353227 BB	20170525	AU20140353227	20141118
AU2015350562 AA	20170629	AU20150350562	20150513
AU2015350562 BB	20180726	AU20150350562	20150513
AU2017213449 AA	20170824	AU20170213449	20170808
BR112016011396 A2	20170808	BR20161111396	20141118

BR112017010505 A2	20171226	BR20171110505	20150513
CA2930945 AA	20160517	CA20142930945	20141118
CA2930945 C	20180320	CA20142930945	20141118
CA2968064 AA	20170516	CA20152968064	20150513
CL2016001182 A1	20161230	CL20160001182	20160517
CL2017001279 A1	20180105	CL20170001279	20170518
CN105981212 A	20160928	CN201480071929	20141118
CN105981212 B	20180807	CN201480071929	20141118
CN107112606 A	20170829	CN201580062811	20150513
CN109183069 A	20190111	CN201810717006	20141118
EA201691047 A1	20170228	EA20160091047	20141118
EA201791004 A1	20171229	EA20170091004	20150513
EP3072180 A1	20160928	EP20140863903	20141118
EP3072180 A4	20171011	EP20140863903	20141118
EP3072180 B1	20190102	EP20140863903	20141118
EP3221918 A1	20170927	EP20150861829	20150513
EP3221918 A4	20181205	EP20150861829	20150513
ID201707000 A	20170707	ID2016P0004020	20141118
ID201800318 A	20180112	ID2017PID03808	20150513
IN201627020496 A	20160826	IN201627020496	20160615
IN201727020519 A	20171103	IN201727020519	20170612
JP2017504930 T2	20170209	JP20160533660T	20141118
JP2018500459 T2	20180111	JP20170526837T	20150513
JP6173595 B2	20170802	JP20160533660T	20141118
KR101739414 B1	20170524	KR20167016496	20141118
KR101882932 B1	20180727	KR20177016853	20150513
KR101926033 B1	20181206	KR20187021210	20150513
KR20160077227 A	20160701	KR20167016496	20141118
KR20170083634 A	20170718	KR20177016853	20150513
KR20180086520 A	20180731	KR20187021210	20150513
MX2016006435 A1	20170202	MX20160006435	20141118
MX2017006289 A1	20170821	MX20170006289	20150513
MX357027 B	20180625	MX20160006435	20141118
PE08352017 A1	20170704	PE20170000869	20150513
PE11032016 A1	20161119	PE20160000649	20141118
UA118037 C2	20181112	UA20160006667	20141118
US2016294024 AA	20161006	US20140037318	20141118
US2017352927 AA	20171207	US20150527749	20150513
US2018069276 AA	20180308	US20170810808	20171113
US9837689 BB	20171205	US20140037318	20141118
WO15077227 A1	20150528	WO2014US66142	20141118
WO15077227 A4	20150716	WO2014US66142	20141118
WO16081030 A1	20160526	WO2015US30626	20150513
ZA201604083 A	20171025	ZA20160004083	20160615
ZA201704123 A	20180627	ZA20170004123	20170615

Priority:

US20130905941P 20131119	AU20140353227 20141118	US20140037318 20141118
CN201480071929 20141118	WO2014US66142 20141118	US20150527749 20150513
WO2015US30626 20150513	US20160037318 20160517	AU20170213449 20170808
US20170810808 20171113		

Probable Assignee: AQUA METALS INC

Assignee(s): (std): AQUA METALS INC

Assignee(s): CLARKE ROBERT LEWIS ; CLARKE STEPHEN R ; DOUGHERTY BRIAN ; KING MICHAEL JOHN ; HURWITZ MICHAEL DAVID ; MOULD SELWYN JOHN

Inventor(s): (std): BRIAN DOUGHERTY ; CLARKE ROBERT LEWIS ; CLARKE STEPHEN R ; DOUGHERTY BRIAN ; HURWITZ MICHAEL DAVID ; KING MICHAEL JOHN ; MICHAEL DAVID HURWITZ ; MICHAEL JOHN KING ; MOULD SELWYN ; MOULD SELWYN JOHN ; ROBERT LEWIS CLARKE ; SELWYN JOHN MOULD ; STEPHEN R CLARKE

Inventor(s): MICHAEL DAVID WITZ

Agent(s): SPRUSON AND FERGUSON; SHAPIRO COHEN LLP; AVENTUM IP LAW LLP; VERAMARK Y O FERNANDO FERNANDEZ TELLERIA SA; FERNANDO FERNANDEZ TELLERIA Y O VERAMARK SA; KADOR AND PARTNER; KADOR AND PARTNER PARTG MBB; ADOLF MARTUA PANGGABEAN; MAROLITA SETIATI; UMBERG ZIPSER LLP; FESSENMAIER MARTIN ET AL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

43) Family number: 55131447 (US2013302226A)

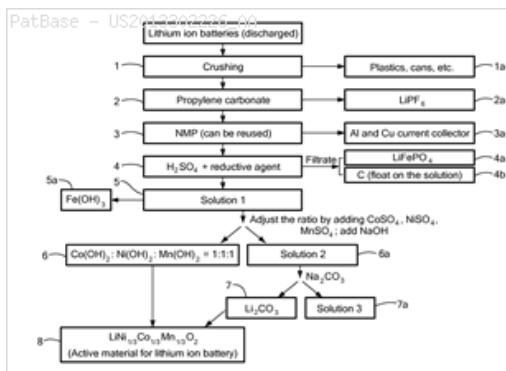
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Title: METHOD AND APPARATUS FOR RECYCLING LITHIUM-ION BATTERIES

Abstract: Cathode material from exhausted lithium ion batteries are dissolved in a solution for extracting the useful elements Co (cobalt), Ni (nickel), Mn (manganese), Li (lithium), and Fe (iron) to produce active cathode materials for new batteries. The solution includes compounds of desirable materials such as cobalt, nickel and manganese dissolved as compounds from the exhausted cathode material of spent cells. Depending on a desired proportion, or ratio, of the desired materials, raw materials are added to the solution to achieve the desired ratio of the commingled compounds for the recycled cathode material for new cells. The desired materials precipitate out of solution without extensive heating or separation of the desired materials into individual compounds or elements. The resulting active cathode material has the predetermined ratio for use in new cells, and avoids high heat typically required to separate the useful elements because the desired materials remain commingled in solution.

Classifications:

International (IPC 8-9): B09B3/00 C01B25/45 C01G53/00 C22B3/02 C22B47/00 C22B7/00 H01M10/0525 H01M10/54 H01M4/485 H01M4/505 H01M4/52 H01M4/525 H01M4/58 (Advanced/Invention)
CPC: C22B47/00 H01M4/52 C22B26/12 H01M10/0525 B09B3/00 C01G53/006 C01G53/42 C22B3/02 C22B7/006 H01M4/505 H01M4/525 H01M10/54 Y02P10/234 Y02W30/84 H01M4/485 C01B25/45 H01M2004/028 H01M4/5825 C01P2006/40 C01G53/50
US: 252/182.1 422/187 423/1 423/50

**Family:**

Publication number	Publication date	Application number	Application date
CA2979077 AA	20170907	CA20162979077	20161122
CN107431256 A	20171201	CN201680004496	20161122
EP3381080 A1	20181003	EP20160869162	20161122
KR20180080992 A	20180713	KR20177017116	20161122
US2013302226 AA	20131114	US20130855994	20130403
US2017077564 AA	20170316	US20160358862	20161122
US2018261894 AA	20180913	US20180976981	20180511
US9834827 BB	20171205	US20130855994	20130403
WO17091562 A1	20170601	WO2016US63294	20161122
WO18209164 A1	20181115	WO2018US32186	20180511

Priority:

US20120620051P	20120404	US20130855994	20130403	US20150259161P	20151124
US20160358862	20161122	WO2016US63294	20161122	US20170504699P	20170511
US20180976981	20180511				

Probable Assignee: WORCESTER POLYTECHNIC INST

Assignee(s): (std): APELIAN DIRAN ; WANG YAN ; ZOU HAIYANG ; WORCESTER POLYTECH INST

Assignee(s): ZHENG ZHANGFENG ; WORCESTER POLYTECHNIC INST ; GRATZ ERIC ; HEELAN JOSEPH ; QINA SA

Inventor(s): (std): APELIAN DIRAN ; MA XIAOTU ; WANG YAN ; ZOU HAIYANG ; ZHENG ZHANGFENG ; QINA SA ; HEELAN JOSEPH ; GRATZ ERIC ; MU XIAOTU

Agent(s): RIDOUT AND MAYBEE LLP; NOACK ANDREAS; CHAPIN IP LAW LLC; LUTZ CHRISTOPHER J ET AL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DJ DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JO JP KE KG KH KM KN KP KR KW KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

44) Family number: 60611463 (MX2014014287A)

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Title: PROCESS FOR OBTAINING METALLIC LEAD FROM THE PASTE OF THE RECYCLED ACID-LEAD BATTERIES.

Abstract: The acid-lead batteries have metallic components directly re-melted for obtaining secondary lead, this latter element being used again in the batteries production; however, the pastes require different treatments for obtaining metallic lead that are implemented only by large companies. Small and medium companies recycling lead, generally work only with the metallic part, confining at best the pastes to sanitary landfills. The invention refers to a novel process for reducing the pastes of acid-lead batteries for directly obtaining metallic lead in a single step, which consists in mixing the pastes with sodium carbonate and melting the same in a silicon carbide melting pot at 850 degrees centigrade

Classifications:

International (IPC 8-9): C22B13/02 H01M10/54 (Advanced/Invention)

CPC: Y02W30/84 Y02P10/212

**Family:**

Publication number	Publication date	Application number	Application date
MX2014014287 A1	20150625	MX20140014287	20141124

Priority:

MX20140014287 20141124

Probable Assignee: INST POLITECNICO NAC**Assignee(s):** (std): INST POLITECNICO NAC**Assignee(s):** INSTITUTO POLITECNICO NACIONAL**Inventor(s):** (std): MARTINEZ ANGELICA SANCHEZ ; PEREZ VICTOR HUGO GUTIERREZ ; RAMIREZ ALEJANDRO CRUZ ; ALVARADO RICARDO GERARDO SANCHEZ**Inventor(s):** ANGELICA SANCHEZ MARTINEZ ; ALEJANDRO CRUZ RAMIREZ ; RICARDO GERARDO SANCHEZ ALVARADO ; VICTOR HUGO GUTIERREZ PEREZ**45) Family number: 11265473** (US5840262A)

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Title: PROCESS FOR THE MANUFACTURE OF PURE LEAD OXIDE FROM EXHAUSTED BATTERIES

Abstract: The present invention relates to an improved process for producing lead oxide in a pure state from a spent paste resulting from exhausted acid batteries. The spent paste is first calcined and desulfurized, then leached by a concentrated solution comprising an alkali hydroxide at a temperature above 100 DEG C. The separated solution is contacted with a ketone resulting in a suspension from which the alpha -lead oxide constituent is recovered. The solutions of alkali and ketone are recycled in the process. The preferred alkali constituents are selected from sodium hydroxide or potassium hydroxide, preferably containing also a small amount of sulfate of the respective alkali metal of the hydroxide used.

Classifications:**International (IPC 8-9):** C01G21/02 C01G21/06 C22B13/00

C22B13/02 H01M10/06 H01M10/54 (Advanced/Invention);

C22B13/00 H01M10/06 (Advanced/Non-invention);

C01G21/00 C22B13/00 H01M10/54 (Core/Invention);

H01M10/06 (Core/Non-invention)

International (IPC 1-7): B03B9/06 C01G21/00 C01G21/06 C22B

C22B13/00 C22B13/08 H01M10/54

CPC: C22B13/025 C01G21/06 C01P2002/76 C01P2006/80

C22B13/045 H01M10/06 H01M10/54 Y02W30/84 Y02P10/214

European: C01G21/06 C22B13/02R C22B13/04R H01M10/54

M01P2/76 M01P6/80 T01M10/06 Y02E60/12

US: 423/619 423/92 423/98

U.S. Patent

Nov. 24, 1998

5,840,262

**Family:**

Publication number	Publication date	Application number	Application date
AU199731885 A1	19990104	AU19970031885	19970625
DE19605243 A1	19970717	DE19961005243	19960213
GB2309030 A1	19970716	GB19960002464	19960207
GB9602464 A0	19960403	GB19960002464	19960207
IL116753 A0	19960514	IL19960116753	19960114
US5840262 A	19981124	US19960597821	19960207
WO9858878 A1	19981230	WO1997IL00213	19970625

Priority:

IL19960116753 19960114 WO1997IL00213 19970625

Probable Assignee: MARGULEAD LTD**Assignee(s):** (std): MARGULEAD LTD ; MARGULIS EFIM**Assignee(s):** EFIM MARGULIS ; MARGULEAD LTD KIRYAT YAM IL**Inventor(s):** (std): MARGULIS EFIM ; MARGULIS EFIM PROF**Inventor(s):** EFIM MARGULIS

Designated states: AL AM AT AU AZ BB BE BF BG BJ BR BY CA CF CG CH CI CM CN CZ DE DK EE ES FI FR GA GB GE GH GN GR HU IE IS IT JP KE KG KP KR KZ LK LR LS LT LU LV MC MD MG MK ML MN MR MW MX NE NL NO NZ PL PT RO RU SD SE SG SI SK SN SZ TD TG TJ TM TR TT UA UG US UZ VN WZ

46) Family number: 53060477 (CN102925698A)

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Title: METHOD FOR DESULFURIZING WASTE LEAD-ACID BATTERY DIACHYLON

Abstract: The invention relates to a method for desulfurizing waste lead-acid battery diachylon. The technical scheme is that the diachylon of broken waste lead-acid batteries is added into a reaction tank at first, 1-25wt percent of ammonia water or 1-25wt percent of amino substance-containing solution is added, and the molar weight of ammonia in the ammonia water or the molar weight of amino in the amino substance-containing solution is 1-10 times of the molar weight of lead sulfate in the diachylon; continuous stirring is carried out at room temperature to separate solid from liquid, so that the desulfurized diachylon and filtrate are obtained; then, the filtrate is added into a evaporative crystallization tank, a single effect vacuum evaporation, concentration and crystallation technology is adopted so as to produce an ammonium sulfate by-product, and evaporation liquid of the crystallation process is cooled to the room temperature and is added into the reaction tank to be recycled; and finally, the desulfurized diachylon is calcined and reduced for 1-10 times at 315-400 DEG C, and carbon dioxide gas which is recovered from the calcination and reduction process is filled into the reaction tank to be recycled. The method has the characteristics of simplicity in technology, high desulfurizing rate, environmental friendliness and low cost.

Classifications:**International (IPC 8-9):** C22B13/00 C22B7/00 H01M10/54 (Advanced/Invention)**CPC:** Y02E60/12 Y02W30/84**Family:**

Publication number	Publication date	Application number	Application date
CN102925698 A	20130213	CN201210422631	20121030
CN102925698 B	20140903	CN201210422631	20121030

Priority:

CN201210422631 20121030

Probable Assignee: UNIV WUHAN SCIENCE AND ENG

Assignee(s): (std): HUBEI CHUKAI CO LTD ; UNIV WUHAN SCIENCE AND ENG ; WUHAN UNIV OF SCIENCE AND TECHNOLOGY

Assignee(s): HUBEI CHUKAI CO
Inventor(s): (std): ZHANG LIYU ; YANG ZHENGQUN ; WANG ZHENZHONG ; WANG XI ; LI HUAICHENG ; KE CHANGMEI ; CHEN SHAN

47) Family number: 1598495 (EP0030345A2)

© PatBase

Title: PROCESS FOR SMELTING ANTIMONIAL PRELIMINARY MATERIALS OF HIGH LEAD CONTENT.

Abstract: In a process for smelting storage battery scrap in particular, the lead is reduced and the antimony oxidised in a first stage, initially under weakly reducing conditions. The primary antimony-rich slag produced in this process is separated from the low-antimony lead melt and then processed in a second stage under strongly reducing conditions to produce an antimony-rich crude lead. The final slag of the second process stage can be dumped without problems.

Classifications:

International (IPC 8-9): C22B13/02 C22B7/00 C22B7/04

H01M10/54 (Advanced/Invention);

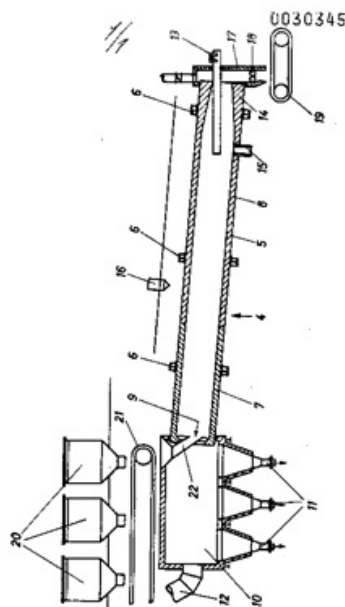
C22B13/00 C22B7/00 C22B7/04 H01M10/54 (Core/Invention)

International (IPC 1-7): C22B13/02 C22B13/06 C22B7/00

CPC: C22B7/04 C22B7/001 C22B13/02 H01M10/54 Y02W30/84 Y02P10/214

European: C22B13/02 C22B7/00B C22B7/04 H01M10/54 Y02E60/12

PatBase - EP0030345_A2



Family:

Publication number	Publication date	Application number	Application date
DD156002 A5	19820721	DD19800225815	19801206
DE2949033 A1	19810611	DE19792949033	19791206
EP0030345 A2	19810617	EP19800107508	19801202
EP0030345 A3	19811230	EP19800107508	19801202

Priority:

DE19792949033 19791206

Probable Assignee: PREUSSAG METALL AG

Assignee(s): (std): PREUSSAG AG ; PREUSSAG AG METALL ; PREUSSAG METALL AG

Assignee(s): PREUSSAG METALL DE AG ; PREUSSAG AG METALL DE ; PREUSSAG AKTIENGESellschaft METALL

Inventor(s): (std): DUMONT HERBERT ; KOHLER ANDREAS DR ; KOHLER ANDREAS DR ING DR ; DUMONT HERBERT DIPL ING ; KOHLER ANDREAS ; MARKWART BERND ; MARKWART BERND DIPL ING ; MUELLER ERICH A ; MUELLER ERICH A DR ; MUELLER ERICH A DR ING DR ; MULLER ERICH A DR

Inventor(s): MULLER ERICH A ; MARKWART BERND DE ; KOHLER ANDREAS DE ; KOHLER DR ING DR ; KOHLER DR INGDR ; DUMONT HERBERT DE ; A MUELLER DR ING DR ; A MUELLER DR INGDR

Designated states: BE FR GB IT NL SE

48) Family number: 49949496 (US2013064756A)

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Title: SYSTEM FOR CONTROLLED ON DEMAND IN SITU HYDROGEN GENERATION USING A RECYCLABLE LIQUID METAL REAGENT, AND METHOD USED IN THE SYSTEM

Abstract: A hydrogen generating system and a method of in situ hydrogen generation controlled on demand capable of reacting an aluminum-free metal reagent composed of at least one of alkali metals, alkaline earth metals, alkali metal alloys and blends including alkali metals, alkaline earth metal alloys and blends including alkaline earth metals and metal alloys including at least one alkali metal and at least one alkaline earth metal, with water to obtain hydrogen and a residual reaction product including metal hydroxide composed of at least one of alkali hydroxides and alkaline earth hydroxide; and separating hydrogen from the residual reaction product; liquefying the metal reagent by heating to obtain liquid metal reagent under vacuum conditions; injecting the liquid metal reagent into a reactor by metal reagent injecting means and simultaneously injecting, by water injection system, a stoichiometric amount of water with respect to the amount of the liquid metal reagent being injected into the reactor such that a controlled metal reagent/water ratio is maintained in the reactor; transferring hydrogen and the residual reaction product from the reactor to separation means; separating hydrogen from the residual reaction product; transferring separated hydrogen to hydrogen receiving means and transferring the residual reaction product to metal hydroxide receiving means, keeping the metal reagent injecting means water injection system, the reactor, the separating means and the hydrogen receiving means free of oxygen by selectively providing a vacuum in the system.

Classifications:

International (IPC 8-9): B01J4/02 B01J7/00 C01B3/08 C01B3/10 C01B3/24 C01B3/38 C01B3/50 C22B26/10 C22B5/16

C22B7/00 (Advanced/Invention)

CPC: Y02T90/32 B01J4/008 B01J10/005 C01B2203/0465
C01B2203/169 H01M8/04208 H01M2250/20 Y02E60/36 C01B3/08
C01B3/10 C01B3/50

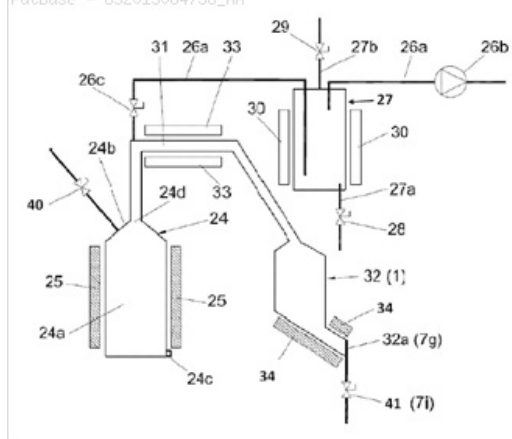
European: B01J10/00L B01J4/00D C01B3/08 C01B3/10 C01B3/50
H01M8/04C6B M01B203/04P M01B203/16L T01M250/20 Y02E60/36

US: 252/373 422/162 423/650 423/657 48/61

JP F-Term: 4G140 4G140/FA02 4G140/FB01 4G140/FB02
4G140/FC08 4G140/FC09 4G140/FE01 4K001 4K001/AA34
4K001/BA24 4K001/CA09 4K001/DA07 4K001/HA12

JP F-Index: C01B3/08/A C01B3/08/B C01B3/50 C22B26/10
C22B5/16 C22B7/00/E

PatBase - US2013064756_AA



Family:

Publication number	Publication date	Application number	Application date
AU2011252133 AA	20111117	AU20110252133	20110509
AU2011252133 BB	20141030	AU20110252133	20110509
BR112012029030 A2	20160802	BR20121129030	20110509
CA2799124 AA	20111117	CA20112799124	20110509
CN102933488 A	20130213	CN201180023912	20110509
CN102933488 B	20150408	CN201180023912	20110509
CO6640273 A2	20130322	CO20120226032	20121213
DE602010002395 D1	20121018	DE201060002395T	20100513
EP2394953 A1	20111214	EP20100162771	20100513
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RU2555022 C2	20150710	RU20120153784	20110509
US2013064756 AA	20130314	US20110697378	20110509
US8696936 BB	20140415	US20110697378	20110509
WO11141413 A1	20111117	WO2011EP57399	20110509

Priority:

EP20100162771 20100513 WO2011EP57399 20110509

Probable Assignee: GARRIDO ESCUDERO GABRIEL

Assignee(s): (std): ESCUDERO AMALIO GARRIDO ; GARRIDO EHSKUDERO AMALIO ; GARRIDO ESCUDERO AMALIO ;
GARRIDO ESCUDERO GABRIEL

Assignee(s): AMALIO GARRIDO ESCUDERO

Inventor(s): (std): GARRIDO ESCUDERO AMALIO ; ESCUDERO AMALIO GARRIDO ; GARRIDO EHSKUDERO AMALIO

Inventor(s): AMALIO GARRIDO ESCUDERO

Agent(s): CALLINANS; SPRUSON AND FERGUSON; FISHER ADAMS KELLY CALLINANS; GOWLING LAFLEUR
ENDERSON LLP; JAIME EDUARDO DELGADO VILLEGAS; COHAUSZ AND FLORACK PATENT U
RECHTSANWALTE PARTNERSCHAFTSGESELLSCHAFT MBB; CARPINTERO LOPEZ FRANCISCO;
CARPINTERO MARIO; CANTOR COLBURN LLP

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU
CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL
IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT
MW MX MY MZ NA NE NG NI NL NO NZ OM PE PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN ST
SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

49) Family number: 41457500 (WO08014538A1)

© PatBase

Title: LEAD SLAG REDUCTION

Abstract: A process for lead slag reduction subjects the slag to top-submerged lance injection of oxygen containing gas and fuel, via a vertically suspended lance having its lower tip end submerged in the slag. The injection generates a combustion zone in the slag in which fuel is combusted and generates turbulent conditions forming a slag coating on the lower extent of the lance which is solidified by the cooling effect of the injected gas. The injection is conducted under reducing conditions, using a sulphidic material as a reductant, to reduce lead in the slag to metallic lead and thereby form a molten lead phase which is able to be tapped as lead bullion.

Classifications:

International (ipc 8-9): C22B13/00 C22B13/02 C22B5/00 C22B5/08

C22B5/12 C22B7/04 (Advanced/Invention);

C22B13/00 C22B5/00 C22B7/04 (Core/Invention)

International (ipc 1-7): C22B7/04

CPC: C22B5/08 C22B7/04 C22B13/02 C22B13/025 Y02P10/214

European: C22B13/02 C22B13/02R C22B5/08 C22B7/04

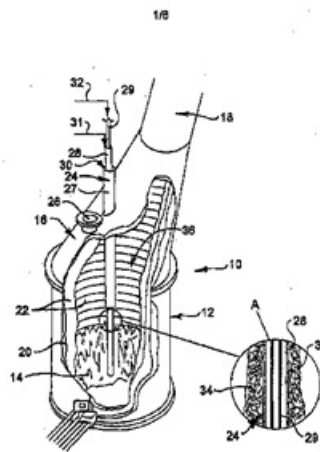


FIG 1

Family:

Publication number	Publication date	Application number	Application date
AU2007281012 AA	20080207	AU20070281012	20070730
AU2007281012 BB	20101216	AU20070281012	20070730
CA2658674 AA	20090122	CA20072658674	20070730
CA2658674 C	20141202	CA20072658674	20070730
CN101512024 A	20090819	CN200780032643	20070730
CN101512024 B	20120125	CN200780032643	20070730
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DE112007001820 T5	20090520	DE200711001820T	20070730
EA014399 B1	20101029	EA20090070169	20070730
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MX2009001285 A1	20090211	MX20090001285	20070730
PE04112008 A1	20080428	PE20070001001	20070801
TW200813234 A	20080316	TW20070127920	20070731
TWI448557 B	20140811	TW20070127920	20070731
WO08014538 A1	20080207	WO2007AU01053	20070730

Priority:

AU20060904221 20060801 AU20070281012 20070730 WO2007AU01053 20070730

Probable Assignee: AUSMELT LTD

Assignee(s): (std): LIGHTFOOT BRIAN WILLIAM ; MATUSEWICZ ROBERT WALTER ; OUTOTEC OYJ ; AUSMELT LTD

Assignee(s): AUSMELT LTD12 KITCHEN ROADVICTORIA3175DANDENONGAU ; AUSMELT PTY LTD12 KITCHEN ROADDANDENONG SOUTHAU ; AUSMELT LIMITED ; OUTOTEC OYJIPR MANAGEMENTRIIHTONTUNTIE 7EP.O. BOX 8602201ESPOOFI ; OUTOTEC AUSMELT PTY LTD28 RODBOROUGH /ROADNSW2086FRENCHS FORESTAU

Inventor(s): (std): LIGHTFOOT BRIAN WILLIAM ; MATUSEWICZ ROBERT WALTER ; WALTER MATUSEWICZ ROBERT ; WILLIAM LIGHTFOOT BRIAN

Inventor(s): ROBERT WALTER MATUSEWICZ ; BRIAN WILLIAM LIGHTFOOT ; MATUSEWICZ ROBERT WALTERAU ; LIGHTFOOT BRIAN WILLIAMAU ; MATUSEWICZ ROBERT ; LIGHTFOOT BRIAN

Agent(s): PHILLIPS ORMONDE FITZPATRICK; SIM AND MCBURNEY

Designated states: AE AG AL AM AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN SV SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

50) Family number: 57941515 (RS53799B)

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Title: THE PROCEDURE OF PROCESSING THE WASTE LEAD-ACID ALKALINE SLAG INTO USEFUL PRODUCTS

Abstract: Invention herewith described refers to the procedure of processing the waste lead-acid alkaline slag into useful products, which primarily obtains the fraction + 1 mm which contains useful components (metal sulphides, compact and insoluble part) and that, as such, returns into the melting process in order to valorise the useful components. With this procedure, there is also obtained the fraction -1 mm (waste oxide-sulphate part) of the optimal composition and structure, and which is suitable for further stabilization and solidification procedure in a cement matrix of the concrete for the application in the construction industry. The procedure of processing the waste lead-acid alkaline slag comprises the flushing (leaching) in the cylindrical rotating flusher - the separator at a temperature of from 22 to 43 degrees C, at the stirring velocity of 6-25 min⁻¹ and the ratio of the compact to the liquid is 10-28 percent of compact, whereat the water-soluble components are removed from the slag, and thus more stable slag with finer granulation (fraction - 1 mm) is obtained, and

there are extracted the return metal and furstone (fraction +1 mm) with the content of useful components that are valorised by bringing back to the melting process. Another useful product, which is obtained by this procedure, is the solution upon the treatment of the sodium carbonate content, and which is used in the production process of sodium (1) - sulphate, together with the solution from the phase of lead paste desulphurisation during the processing of the waste lead batteries, and all this in order to obtain the commercial product Na2SO4.

Classifications:

International (IPC 8-9): B09B3/00 C04B18/14 C04B5/00 C22B13/06 C22B7/04 (Advanced/Invention)

CPC: Y02W30/94



Family:

Publication number	Publication date	Application number	Application date
RS20130151 A1	20141031	RS20130000151	20130418
RS53799 B1	20150630	RS20130000151	20130418

Priority:

RS20130000151 20130418

Probable Assignee: TEHNOLOSKO METALURSKI FAKULTET UNIVERZITET U BEOGRADU

Assignee(s): (std): TEHNOLOSKO METALURSKI FAKULTET UNIVERZITET U BEOGRADU ; TEHNOLOŠKO METALURŠKI FAKULTET UNIVERZITET U BEOGRADU

Inventor(s): (std): KORAC MARIJA DR ; KAMBEROVICZELJKO PROF DR ; KAMBEROVIC ZELJKO PROF DR

51) Family number: 3453521 (US4927510A) © PatBase

Title: HYDROMETALLURGICAL PROCESS FOR RECOVERING IN PURE METAL FORM ALL THE LEAD CONTAINED IN THE ACTIVE MASS OF EXHAUSTED BATTERIES

Abstract: A process for recovering in pure metal form substantially all lead from battery sludge is disclosed. The battery sludge is desulfurized, leached with acid, and separated by filtration. Lead is recovered from the filtrate by electrowinning. The residue from the leaching and filtration is treated with concentrated sulfuric acid to cause the simultaneous occurring of the following reactions: C n (H 2 O) m +H 2 SO 4.fwdarw.nC+H 2 SO 4...mH 2 O (1) C+2PbO 2 +2H 2 SO 4.fwdarw.2PbSO 4 +CO 2 +2H 2 O (2) up to the quantitative reduction of substantially all of the lead dioxide PbO 2 and elimination of substantially all the organic substances C n (H 2 O) m contained in the insoluble residue. Lead sulfate from the above reaction is recycled to the desulfurization step.

Classifications:

International (IPC 8-9): C25C1/18 H01M10/54 (Advanced/Invention); C25C1/00 H01M10/54 (Core/Invention)

International (IPC 1-7): C22B13/04 C22B3/00 C25C1/18 H01M10/54

CPC: H01M10/54 C22B13/045 Y02W30/84 Y02P10/212

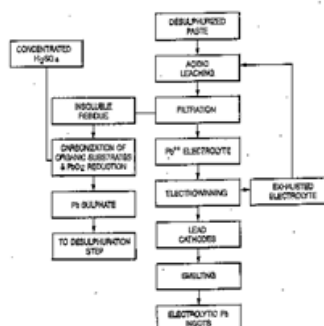
European: C22B13/04R H01M10/54 Y02E60/12

US: 204/114 204/115 204/117 205/600 205/601 423/559 423/95 429/49 75/120

U.S. Patent

May 22, 1990

4,927,510

**Family:**

Publication number	Publication date	Application number	Application date
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DE3877504 D1	19930225	DE19883877504	19881013
EP0313153 A1	19890426	EP19880202285	19881013
EP0313153 B1	19930113	EP19880202285	19881013
IT1223314 A	19900919	IT19870022348	19871020
IT8722348 A0	19871020	IT19870022348	19871020
US4927510 A	19900522	US19880258596	19881017

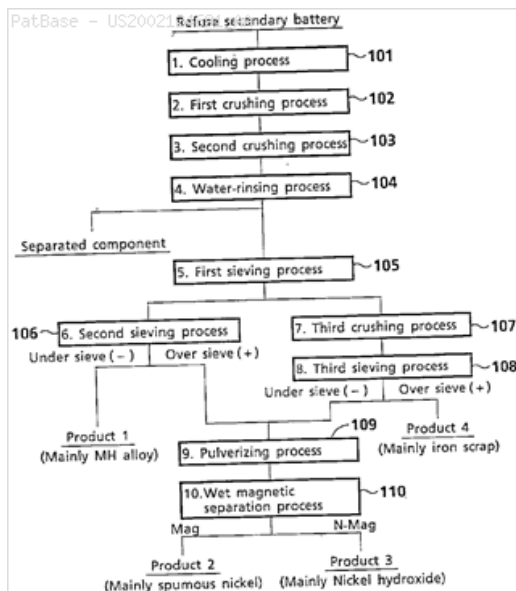
Priority:

IT19870022348 19871020 CA19880580622 19881019

Probable Assignee: ENGITEC IMPIANTI SPA**Assignee(s):** (std): B U S ENGITEC SERVIZI AMBIENTALI ; BUS ENGITEC SERV AMBIENTALI ; ENGITEC IMPIANTI SPA ; ENGITEC IMPIANTI**Assignee(s):** BUS ENGITEC SERVIZI AMBIENTALI SRL A ITALIAN CO ; OLPER MARCO ; FRACCHIA PIERLUIGI ; BUS ENGITEC SERVIZI AMBIENTALI SRL ; ENGITEC IMPIANTI S P A ; B U S ENGITEC SERVIZI AMBIENTALI S R L ; B U S ENGITEC SERVIZI AMBIENTALI S R L MAILAND MILANO IT**Inventor(s):** (std): OLPER MARCO ; FRACCHIA PIERLUIGI**Inventor(s):** MARCO OLPER ; FRACCHIA PIERLUIGI I 20124 MILAN IT ; OLPER MARCO I 20052 MONZA MILAN IT ; PIERLUIGI FRACCHIA**Agent(s):** MARKS AND CLERK**Designated states:** DE ES FR GB**52) Family number: 28304522 (US2002124691A)**

© PatBase

Title: PROCESS AND SYSTEM FOR RECOVERING VALENT METALS FROM REFUSE SECONDARY BATTERIES**Abstract:** A process comprises a separating process to mechanically separate refuse secondary batteries and to separate them into a separated cathode material and a separated anode material, and a process to recover valent metals from the separated anode and the separated cathode material separated in the separating process is disclosed.**Classifications:****International (IPC 8-9):** B03B9/06 C22B1/00 C22B23/02 C22B59/00 C22B7/00 C22B9/00 H01M10/54 H01M6/52 (Advanced/Invention); H01M10/34 H01M10/50 (Advanced/Non-invention)**International (IPC 1-7):** B03B9/00 C22B1/00 C22B23/00 C22B7/00 C22B9/00 H01M10/54**CPC:** C22B7/007 C22B23/02 C22B59/00 H01M10/345 H01M10/54 H01M10/613 H01M10/6569 Y02W30/84 C22B7/005 Y02P10/234 Y02P10/212 Y02E60/124**European:** C22B23/02 C22B59/00 C22B7/00C C22B7/00D1 H01M10/54 H01M6/52 T01M10/34D T01M10/50C2 T01M10/50K12F Y02E60/12**US:** 266/137 266/137S 75/401 75/401P 75/714 75/714P**JP F-Term:** 4K001 4K001/AA07 4K001/AA19 4K001/BA24 4K001/CA00 4K001/CA01 4K001/CA02 4K001/CA04 4K001/FA00 5H031 5H031/AA02 5H031/AA09 5H031/BB00 5H031/EE01 5H031/RR02**JP F-Index:** C22B7/00/C H01M10/54



Family:

Publication number	Publication date	Application number	Application date
EP1049190 A1	20001102	EP19990949359	19991022
EP1049190 A4	20050525	EP19990949359	19991022
JP2000025382 A1	20020129	JP20000578868T	19991022
US2002124691 AA	20020912	US20020090276	20020304
US2003121366 AA	20030703	US20020241085	20020911
WO0025382 A1	20000504	WO1999JP05830	19991022

Priority:

JP19980305301	19981027	JP19980313337	19981104	JP19980352582	19981211
JP19980352675	19981211	WO1999JP05830	19991022	WO1999JP05830	19991022
US20000581696	20000615	US20020090276	20020304	US20020241085	20020911

Probable Assignee: MITSUI MINING AND SMELTING CO LTD

Assignee(s): (std): KAHATA MINORU ; MITSUI MINING AND SMELTING CO ; MIYAGAWA HIROSHI ; SHIRAI RYOICHI ; TATEIWA HIRONORI

Assignee(s): MITSUI MINING AND SMELTING CO LTD

Inventor(s): (std): KAHATA MINORU ; MIYAGAWA HIROSHI ; SHIRAI RYOICHI ; TATEIWA HIRONORI ; TEIWA HIRONORI ; EIWA HIRONORI

Designated states: AT BE CH CY DE DK ES FI FR GB GR IE IT JP LI LU MC NL PT SE US

53) Family number: 52446528 (US8323595B)

© PatBase

Title: RECOVERY OF HIGH PURITY LEAD OXIDE FROM LEAD ACID BATTERY PASTE

Abstract: There is provided a process for recovering high purity litharge PbO from spent lead acid battery paste at low temperatures and the further preparation of highly pure lead oxides and Pb(OH)₂.

Classifications:

International (IPC 8-9): C22B13/00 (Advanced/Invention)

CPC: H01M10/54 C01B11/062 H01M4/20 H01M4/56 C22B13/045 C01G21/06 C01G21/10 C01G21/12 C01G21/14 C01P2006/80 Y02W30/84 Y02P10/212

US: 423/473 423/500 423/89

Family:

Publication number	Publication date	Application number	Application date
US8323595 BA	20121204	US20110199580	20110903

Priority:

US20110199580 20110903

Probable Assignee: RETRIEV TECHNOLOGIES INC

Assignee(s): (std): KINSBURY STEVEN A ; SMITH W NOVIS ; TOXCO INC

Assignee(s): RETRIEV TECHNOLOGIES INC

Inventor(s): (std): SMITH W NOVIS ; KINSBURY STEVEN A

Agent(s): JOHN

54) Family number: 58975541 (US2016160316A)

© PatBase

Title: METHOD FOR DIRECTLY RECOVERING LEAD OXIDE USED FOR A LEAD-ACID BATTERY CATHODE FROM WASTE LEAD PASTE

Abstract: Provided is a method for directly recovering lead oxide used for a lead-acid battery negative electrode from waste lead paste. The method comprises: (1) contacting waste lead paste with a barium-containing desulphurizer under desulphurization reaction conditions, and performing a solid-liquid separation on the mixture after contacting to obtain a filtrate and a filtration residue; and (2) performing a conversion reaction on the above-mentioned filtration residue at a

temperature of 350-750 degrees centigrade so as to convert the lead-containing components in the filtration residue into lead oxide. In the method, the direct recovery of a lead oxide raw material applicable to a lead-acid battery negative electrode from waste lead paste is achieved by quantitatively replenishing a barium sulphate additive in the process of desulphuration thereby substantially decreasing the recovery cost and energy consumption, and improving the comprehensive utilization of waste lead paste.

Classifications:

International (IPC 8-9): B09B3/00 C01G21/06 C22B1/00 C22B1/02 C22B13/00 C22B3/00 C22B3/44 C22B7/00 H01M10/54 (Advanced/Invention)

CPC: C22B1/005 C22B13/045 C22B7/006 H01M10/54 Y02P10/234 Y02W30/84

US: 423/92

JP F-Term: 4D004 4D004/AA23 4D004/AB05 4D004/AC05 4D004/BA10 4D004/CA04 4D004/CA08 4D004/CA13 4D004/CA15 4D004/CA22 4D004/CA32 4D004/CA34 4D004/CC11 4D004/CC12 4K001 4K001/AA20 4K001/BA22 4K001/CA11 4K001/DB22

JP F-Index: B09B3/00/303/A B09B3/00/304/J B09B3/00/ZAB C22B1/02 C22B13/00 C22B3/44/101/Z C22B7/00/C

Family:

Publication number	Publication date	Application number	Application date
AU2014383725 AA	20160128	AU20140383725	20140527
AU2014383725 BB	20161103	AU20140383725	20140527
CA2918335 AA	20160114	CA20142918335	20140527
CA2918335 C	20171212	CA20142918335	20140527
CN104520240 A	20150415	CN201480001984	20140527
CN104520240 B	20160525	CN201480001984	20140527
CN104868187 A	20150826	CN201410060387	20140221
CN104868187 B	20170606	CN201410060387	20140221
DE602014023953 D1	20180509	DE201460023953T	20140527
EP3012335 A1	20160427	EP20140883113	20140527
EP3012335 A4	20160907	EP20140883113	20140527
EP3012335 B1	20180411	EP20140883113	20140527
IN201637001758 A	20160701	IN201637001758	20160118
JP2017503087 T2	20170126	JP20160562052T	20140527
JP6363733 B2	20180725	JP20160562052T	20140527
KR101717998 B1	20170320	KR20167001878	20140527
KR20160044460 A	20160425	KR20167001878	20140527
US2016160316 AA	20160609	US20140906452	20140527
US9828654 BB	20171128	US20140906452	20140527
WO15123930 A1	20150827	WO2014CN078489	20140527

Priority:

CN201410060387 20140221 CN201480001984 20140527 WO2014CN078489 20140527
EP20140883113 20140527

Probable Assignee: BEIJING UNIV OF CHEMICAL TECHNOLOGY

Assignee(s): (std): BEIJING UNIV OF CHEMICAL TECH ; BEIJING UNIV OF CHEMICAL TECHNOLOGY ; CHAOWEI POWER CO LTD ; CHILWEE POWER CO LTD ; UNIV BEIJING CHEMICAL ; CHILWEE POWER CO LTD AND BEIJING UNIV OF CHEMICAL TECHNOLOGY ; UNIV BEIJING CHEMICAL TECH ; UNIV BEIJING CHEM TECH

Assignee(s): CHILWEE POWER CO LTD CHANGXING ; ZHOU MINGMING ; YANG XINXIN ; NIU YINJIAN ; ZHOU LONGRUI ; PAN JUNQING ; SONG SHUANG ; YANG YUNFEI ; SUN YANZHI ; MA YONGQUAN ; CHAOWEI POWER CO ; LIU XIAOWEI ; CHEN TIXIAN ; CHILWEE POWER CO ; CAI XIAOXIANG ; CAO GUOQING

Inventor(s): (std): CAI XIAOXIANG ; CAO GUOQING ; CHEN TIXIAN ; LIU XIAOWEI ; MA YONGQUAN ; NIU YINJIAN ; PAN JUNQING ; SONG SHUANG ; SUN YANZHI ; YANG XINXIN ; YANG YUNFEI ; ZHOU LONGRUI ; ZHOU MINGMING

Inventor(s): ZHOU MINGMING CHANGXING ; ZHOU LONGRUI CHANGXING ; YANG YUNFEI CHANGXING ; YANG XINXIN CHANGXING ; SUN YANZHI CHANGXING ; SONG SHUANG CHANGXING ; PAN JUNQING CHANGXING ; NIU YINJIAN CHANGXING ; MA YONGQUAN CHANGXING ; LIU XIAOWEI CHANGXING ; CHEN TIXIAN CHANGXING ; CAO GUOQING CHANGXING ; CAI XIAOXIANG CHANGXING

Agent(s): DAVIES COLLISON CAVE; DAVIES COLLISON CAVE PTY LTD; BORDEN LADNER GERVAIS LLP; NEDERLANDSCH OCTROOIBUREAU; NOGAWA SHINTARO; MAINE CERNOTA AND RARDIN; RUNPING AND PARTNERS

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

55) Family number: 23353545 (US6129779A)

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Title: RECLAIMING METALLIC MATERIAL FROM AN ARTICLE COMPRISING A NON-METALLIC FRIABLE SUBSTRATE

Abstract: A method for reclaiming a metallic material from a article including a non-metallic friable substrate. The method comprising crushing the article into a plurality of pieces. An acidic solution capable of dissolving the metallic material is provided dissolving the metallic material in the acidic material to form an etchant effluent. The etchant effluent is separated from the friable substrate. A precipitation agent, capable of precipitating the metallic material, is added to the etchant effluent to precipitate out the metallic material from the etchant effluent. The metallic material is then recovered.

Classifications:

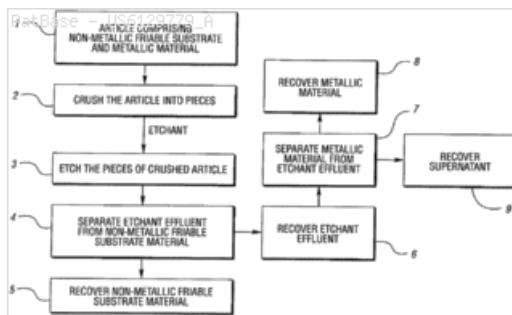
International (IPC 8-9): C22B11/00 C22B7/00 (Advanced/Invention); C22B11/00 C22B7/00 (Core/Invention)

International (IPC 1-7): B01D24/00 B02C13/00 C22B1/00 C22B11/00 C22B3/00 C25D17/00

CPC: Y10S241/38 C22B17/04 C22B7/006 Y02P10/234 Y02W30/827

European: C22B17/04 C22B7/00D

US: 204/198 204/227 204/240 209/12.1 209/121 210/295 241/24.22 241/79 241/DIG.38 266/101 266/137 266/170 423/1 423/109 423/34 75/714 75/743 75/744



Family:

Publication number	Publication date	Application number	Application date
US6129779 A	20001010	US19980076191	19980512
US6391165 BA	20020521	US20000573100	20000517

Priority:

US19970046290P 19970513 US19980076191 19980512 US20000573100 20000517

Probable Assignee: FIRST SOLAR INC

Assignee(s): (std): FIRST SOLAR LLC

Assignee(s): FIRST SOLAR US MFG ; SOLAR CELLS INC ; FIRST SOLAR US MFG LLC ; JPMORGAN CHASE BANK NA ; JPMORGAN CHASE BANK NA ADMINISTRATIVE AGENT AS ; ENERGY UNITED STATES DEPARTMENT ; ENERGY UNITED STATES DEPARTMENT OF ; FIRST SOLAR INC

Inventor(s): (std): ANISIMOV IGOR IVANOVICH ; BOHLAND JOHN RAPHAEL ; DAPKUS TODD JAMES ; KAMM KRISTIN DANIELLE ; SASALA RICHARD ANTHONY ; SMIGIELSKI KEN ALAN

56) Family number: 53273551 (US2013071306A)

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Title: BATTERY DISPOSAL SYSTEM

Abstract: Embodiments described herein comprise a system and method for the recycling and recovery of components and metals found within lithium ion batteries. The process includes the safe and effective means of disposing of batteries, including lithium thynel chloride, lithium ion, conventional designs, in a manner that utilizes a process of alloying to chemically capture the by product.

Classifications:

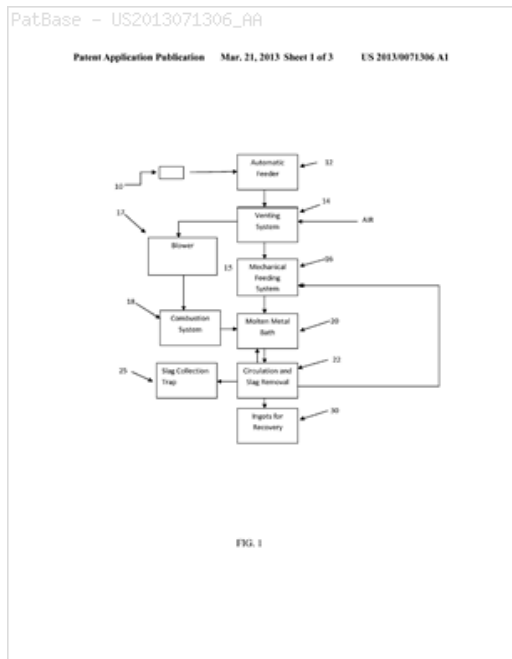
International (IPC 8-9): A62D3/32 C22B26/12

C22B7/00 (Advanced/Invention)

CPC: A62D3/32 C22B7/00 C22B7/003 C22B26/12 A62D2101/24

A62D2101/43 Y02P10/212

US: 423/1 423/179.5 588/314 75/10.14 75/414 75/708



Family:

Publication number	Publication date	Application number	Application date
US2013071306 AA	20130321	US20120587815	20120816

Priority:

US20110523963P 20110816 US20120587815 20120816

Probable Assignee: CAMP DAVID M

Assignee(s): (std): CAMP DAVID M ; CAMP JOHN

Inventor(s): (std): CAMP DAVID M ; CAMP JOHN

57) Family number: 30951557 (US2004177721A)

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Title: RECOVERY OF METAL VALUES FROM CERMET

Abstract: Cermet material obtained from unused inert anodes, used inert anodes and cermet used in the production of inert anodes is beneficiated into a nonferrous metal concentrate composition from which metal values contained in the composition may be readily recovered by using a conventional smelting process. The invention also relates to the use of the composition in a smelting process for the recovery of metal values from the cermet composition of the invention.

Classifications:

International (ipc 8-9): C22B1/24 C22B1/242 C22B1/248 C22B11/02 C22B15/00 C22B23/00 C22B23/02

C22B7/00 (Advanced/Invention);

B09B3/00 C22B1/14 C22B11/00 C22B15/00 C22B23/00

C22B7/00 (Core/Invention);

C22B (Subclass/Invention);

C22B (Subclass/Non-invention)

International (ipc 1-7): C22B C22B1/24 C22B1/248

CPC: C22B1/2406 C22B7/003 C22B11/025 C22B15/0058

C22B23/026 Y02P10/214 Y02P10/22 Y02P10/224

European: C22B1/24B C22B11/02R8 C22B15/00H6K C22B23/02K

C22B7/00B4

US: 204/291 75/300 75/303 75/414

JP F-Term: 4K001 4K001/AA01 4K001/AA04 4K001/AA07

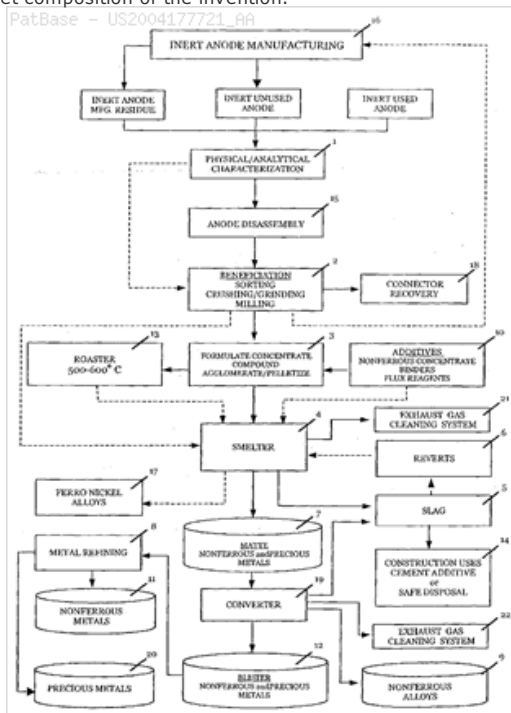
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4K001/BA06 4K001/BA22 4K001/CA01 4K001/CA25 4K001/DA03

4K001/GA03 4K001/GA04 4K001/KA01 4K001/KA02 4K001/KA06

4K001/KA07 4K001/KA13

JP F-Index: C22B1/242 C22B15/00/102 C22B23/02 C22B7/00/F



Family:

Publication number	Publication date	Application number	Application date
AP2120 A	20100428	AP20050003401	20040312
AT532885 E	20111115	AT20040720319T	20040312
AU2004221471 AA	20040930	AU20040221471	20040312
AU2004221471 BB	20100610	AU20040221471	20040312
BRPI0408361 A	20060321	BR2004PI08361	20040312
CA2519054 AA	20050913	CA20042519054	20040312
CA2519054 C	20120814	CA20042519054	20040312
CN1788094 A	20060614	CN200480013010	20040312
CN1788094 B	20100421	CN200480013010	20040312
DE602004035220 D1	20120209	DE200460035220T	20040312
EA009107 B1	20071026	EA20050001459	20040312
EA200501459 A1	20060224	EA20050001459	20040312
EP1618219 A2	20060125	EP20040720319	20040312
EP1618219 A4	20080521	EP20040720319	20040312
EP1618219 B1	20111109	EP20040720319	20040312
IL170715 A0	20090211	IL20040170715	20040312
IL170715 A1	20150630	IL20040170715	20040312
IN02259CN2005 A	20070914	IN2005CN02259	20050914
IN228196 B	20090306	IN2005CN02259	20050914
IS2852 B	20131015	IS20050008065	20051010
IS8065 A	20051010	IS20050008065	20051010
JP2006520432 T2	20060907	JP20060508797T	20040312
JP5265112 B2	20130814	JP20060508797T	20040312
KR101110650 B1	20120227	KR20057017234	20040312
KR20050118188 A	20051215	KR20057017234	20040312
MXPA05009728 A1	20060217	MX2005PA09728	20040312
NO20054696 A	20051214	NO20050004696	20051012
NO20054696 A0	20051012	NO20050004696	20051012
UA87105 C2	20090625	UA20050009641	20040312
US2004177721 AA	20040916	US20030387505	20030314
US2004177722 AA	20040916	US20040787085	20040227
US6830605 BB	20041214	US20030387505	20030314
US7048774 BB	20060523	US20040787085	20040227
WO04083467 A2	20040930	WO2004US05236	20040312
WO04083467 A3	20050113	WO2004US05236	20040312
ZA200507173 A	20060531	ZA20050007173	20050907

Priority:

US20030387505 20030314 US20040787085 20040227 EP20040720319 20040312
WO2004US05236 20040312

Probable Assignee: WORLD RESOURCES CO

Assignee(s): (std): WORLD RESOURCES CO ; WORLD RESOURCES COMPANY

Assignee(s): WORLD RESOURCES CO MCLEAN ; HALPIN PETER T ; RIEGEL KENNETH E ; SCHLEGEL ULRICH R

Inventor(s): (std): HALPIN PETER T SCHLEGEL ULRICH ; RIEGEL KENNETH E ; HALPIN PETER T ; SCHLEGEL ULRICH R ; ULRICH R SCHLEGEL ; SCHLEGEL ULRICH ; PETER T HALPIN ; KENNETH E RIEGEL ; HALPIN PETER ; RIEGEL KENNETH

Inventor(s): HALPIN PETER T ; SCHLEGEL ULRICH R WARRENTON ; HALPIN PETER T GREAT FALLS ; RIEGEL

KENNETH E ORWIGSBURG ; SCHEGEL ULRICH R

Agent(s):

DAVIES COLLISON CAVE; DAVIES COLLISON CAVE PTY LTD; RIDOUT AND MAYBEE LLP; KSNH
PATENTANWALTE KLUNKER SCHMITT NILSON HIRSCH; THOMSON JAMES B; SELIGSOHN GABRIELI
AND CO; BACON AND THOMAS PLLC

Designated states:

AE AG AL AM AT AU AZ BA BB BE BF BG BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ
DE DK DM DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GW HR HU ID IE IL IN IS IT JP KE
KG KP KR KZ LC LI LK LR LS LT LU LV MA MC MD MG MK ML MN MR MW MX MZ NA NE NI NL NO NZ OM
PG PH PL PT RO RU SC SD SE SG SI SK SL SN SY SZ TD TG TJ TM TN TR TT TZ UA UG UZ VC VN YU ZA
ZM ZW

58) Family number: 50777565 (WO12032256A1)

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Title: METHOD FOR RECYCLING DUST FROM ELECTRIC STEEL PLANTS

Abstract: The invention relates to a method for recycling dust from electric steel plants, originating from the furnaces of secondary-smelting electric steel plants, in which a portion of the dust collected after smelting in the electric furnace is agglomerated in the presence of a sodium oxide source and a carbon source so as to form pellets, and the resulting pellets are subsequently fed into the electric furnace with the scrap.

Classifications:

International (ipc 8-9): B09B3/00 C01D1/04 C22B1/243 C22B1/245
C22B1/248 C22B7/02 (Advanced/Invention);
C22B19/30 (Advanced/Non-invention)

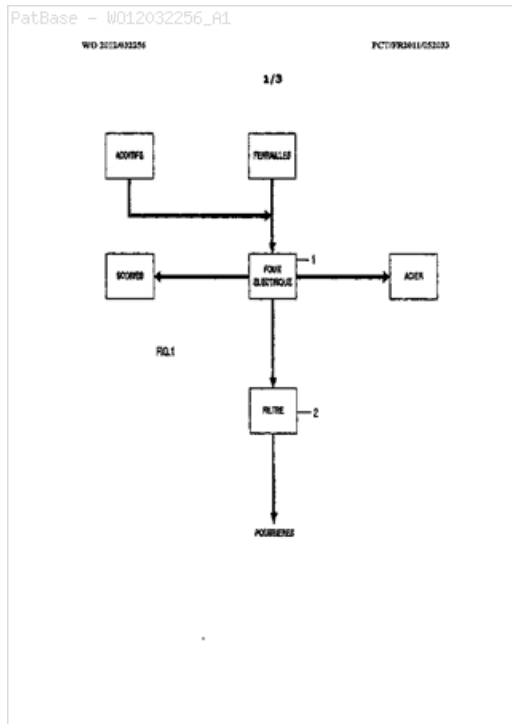
CPC: C22B19/30 Y02P10/214 Y02P10/216 C22B7/02 C22B1/245
C22B1/248

European: C22B1/245 C22B1/248 C22B7/02 M22B19/30

JP F-Term: 4D004 4D004/AA37 4D004/AB06 4D004/AB08
4D004/BA05 4D004/CA12 4D004/CA13 4D004/CA15 4D004/CA40
4D004/CA42 4D004/CA45 4D004/CB21 4D004/CC11 4D004/CC12
4D004/CC15 4D004/CC16 4D004/DA03 4D004/DA09 4D004/DA11
4G074 4K001 4K001/AA10 4K001/AA20 4K001/AA30 4K001/BA14
4K001/CA06 4K001/CA25 4K001/CA26 4K001/CA29 4K001/FA10
4K001/GA13 4K001/HA01 4K001/HA10 4K001/HA12

JP F-Index: B09B3/00/301/N B09B3/00/301/R B09B3/00/304/G
C01D1/04/Z C22B1/243 C22B19/30 C22B7/02/Z

JP Facet: ZAB



Family:

Publication number	Publication date	Application number	Application date
EP2614165 A1	20130717	EP20110773034	20110906
FR2964392 A1	20120309	FR20100057055	20100906
FR2964392 B1	20130329	FR20100057055	20100906
JP2013543052 T2	20131128	JP20130526542T	20110906
KR20130105844 A	20130926	KR20137007662	20110906
WO12032256 A1	20120315	WO2011FR52033	20110906

Priority:

FR20100057055 20100906 WO2011FR52033 20110906

Probable Assignee: ASSOCIATES RES ERS AND ENGINEERS

Assignee(s): (std): ASSOCIATES RES ERS AND ENGINEERS ; SCHMICKRATH GEORGES

Assignee(s): ASSOCIATES RESEARCHERS AND ENGINEERS

Inventor(s): (std): SCHMICKRATH GEORGES

Inventor(s): GEORGES SCHMICKRATH

Agent(s): NEVANT MARC; CABINET BEAU DE LOMENIE; NEVANT MARC ET AL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU
CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL
IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT
MW MX MY MZ NA NE NG NI NL NO NZ OM PE PG PH PL PT QA RO RS RU RW SC SD SE SG SI SK SL SM
SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

59) Family number: 6971580 (US4115109A)

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Title: SECONDARY LEAD SMELTING PROCESS

Abstract: A process for producing metallic lead from lead battery plates and other types of lead scrap in a secondary lead smelting operation has been developed which comprises adding from 1 percent to 8 percent moisture and 0.5 percent to 5 percent oxygen to the air which is used to react with carbonaceous material such as coke to maintain the temperature in the melting region from about 1100 DEG C. to about 1300 DEG C. The moisture is added to the air to react with the coke to form

carbon monoxide and hydrogen, and the oxygen is added to maintain the temperature in the melting zone. Increased amounts of lead are produced using smaller quantities of coke and iron when the moisture and the oxygen are added to the air.

Classifications:

International (IPC 8-9): C22B13/02 C22B5/10

H01M10/54 (Advanced/Invention);

C22B13/00 C22B5/00 H01M10/54 (Core/Invention)

International (IPC 1-7): C22B13/00 C22B13/02

CPC: H01M10/54 Y02W30/84 C22B5/10 C22B13/02 Y02P10/214 Y02P10/224

European: C22B13/02 C22B5/10 H01M10/54 Y02E60/12

US: 75/696 75/77

PatBase - CA1092834_A1

SUBSTITUTE

REMPLACEMENT

SECTION is not Present

Cette Section est Absente

Family:

Publication number	Publication date	Application number	Application date
CA1092834 A1	19810106	CA19780301790	19780424
DE2819476 A1	19791108	DE19782819476	19780503
NL7804914 A	19791112	NL19780004914	19780508
US4115109 A	19780919	US19770842983	19771017

Priority:

US19760678954 19760421 US19770842983 19771017 CA19780301790 19780424
DE19782819476 19780503 NL19780004914 19780508

Probable Assignee: NL IND INC

Assignee(s): (std): NL IND INC ; NL INDUSTRIES INC

Assignee(s): NL IND INC TE NEW YORK ; NL INDUSTRIES INC TE NEW YORK ; RAO MANNIGE V ; N L INDUSTRIES INC ; LIBSCH KARL D ; N L IND INC

Inventor(s): (std): LIBSCH KARL D ; LIBSCH KARL DAVID ; RAO MANNIGE V ; RAO MANNIGE VIKRAM

Inventor(s): VIKRAM RAO MANNIGE ; DAVID LIBSCH KARL

Agent(s): KIRBY EADES GALE BAKER

60) Family number: 5141590 (GB2073725A)

© PatBase

Title: A METHOD OF RECOVERING LEAD VALUES FROM SCRAP BATTERIES

Abstract: Lead is recovered from the paste fraction of scrap lead batteries as a solution of lead nitrate by a wet process which involves a preliminary desulphation of the paste fraction by treatment with a carbonate or hydroxide of an alkali metal or of ammonium. The solid phase of the reaction product is then treated with nitric acid, to convert into lead nitrate the lead present as metal, as lead monoxide and as lead dioxide, in the presence of hydrogen peroxide or of added lead.

Classifications:

International (IPC 8-9): C01G21/18 C22B13/00 H01M10/54 (Advanced/Invention);

C01G21/00 C22B13/00 H01M10/54 (Core/Invention)

International (IPC 1-7): C01G21/18 C22B13/04

CPC: C22B13/045 C01G21/18 H01M10/54 Y02W30/84 Y02P10/212

European: C01G21/18 C22B13/04R H01M10/54 Y02E60/12

Family:

Publication number	Publication date	Application number	Application date
GB2073725 A1	19811021	GB19810010998	19810408

Priority:

GB19800012128 19800411 GB19810010998 19810408

Probable Assignee: ASS LEAD MFG LTD

Assignee(s): (std): ASS LEAD MFG LTD

Assignee(s): ASSOCIATED LEAD MFRS LTD

Abstract: The present invention relates to a method for disposing electrical and electronic equipment comprising plastic and metal components, the method comprising: melt processing the equipment and/or comminuted parts thereof to form a melt processed product; transferring the melt processed product into a vessel and heating the product using far infrared radiation such that it liberates volatile hydrocarbons and leaves behind non-volatile residue comprising metal; and collecting one or both of the volatile hydrocarbons and the non-volatile residue for subsequent use.

Classifications:

International (IPC 8-9): B09B B09B3/00 B09B5/00 B29B B29B17/00 B29B17/02 B29B17/04 B29K B29K705/00 B29L B29L31/30 C07C7/00 C08J C08J11/00 C08J11/12 C10B C10B53/07 C10G C10G1/10 C22B C22B11/02 C22B13/02 C22B15/02 C22B15/04 C22B19/08 C22B19/10 C22B19/30 C22B25/02 C22B25/06 C22B3/00 C22B61/00 C22B7/00 C25C1/00 C25C3/00 (Advanced/Invention); B09B3/00 B09B5/00 B29B17/04 B29K705/00 B29L31/30 C08J11/00 C22B7/00 (Advanced/Non-invention); B09B3/00 B09B5/00 B29B17/00 C08J11/00 C10G1/00 C22B7/00 (Core/Invention); B09B B29B C08J C10B C10G C22B (Subclass/Invention); B29K B29L (Subclass/Non-invention)

CPC: B29B17/02 B29B2017/0496 B29K2705/00 B29L2031/3061 C10B53/07 C10G1/10 C10G2300/1003 C10G2300/205 C10G2400/02 C10G2400/04 C22B7/001 C22B7/003 C22B25/06 Y02W30/622 Y02W30/625 Y02P10/214 Y02P10/228

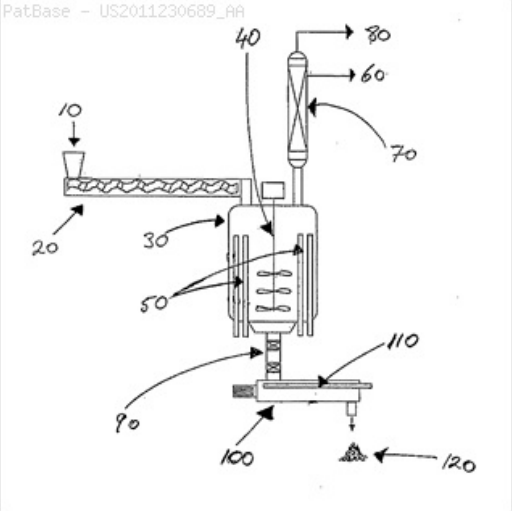
European: B29B17/02 C10G1/10 C22B25/06 C22B7/00B C22B7/00B4 L29B17/04Z16 L29K705/00 L29L31/30G4

US: 110/346 201/19 205/261 205/261S 585/240 585/240P 585/241 588/301 588/321 75/392 75/392S

JP F-Term: 4D004 4D004/AA07 4D004/AA08 4D004/AA16 4D004/AA22 4D004/AB03 4D004/AB05 4D004/AB06 4D004/AC05 4D004/BA03 4D004/BA05 4D004/CA04 4D004/CA08 4D004/CA09 4D004/CA15 4D004/CA22 4D004/CA24 4D004/CA29 4D004/CA47 4D004/CB04 4D004/CB16 4D004/CB27 4D004/CB31 4D004/CB32 4D004/CB44 4D004/CC11 4D004/DA02 4D004/DA03 4D004/DA06 4F401 4F401/AA08 4F401/AA11 4F401/AA13 4F401/AA21 4F401/AA22 4F401/AA23 4F401/AA24 4F401/AA25 4F401/AB02 4F401/AC05 4F401/BA02 4F401/BA03 4F401/BA10 4F401/BB09 4F401/CA14 4F401/CA23 4F401/CA25 4F401/CA58 4F401/CA70 4F401/CA89 4F401/CB02 4F401/CB03 4F401/CB15 4F401/CB18 4F401/CB40 4F401/DA05 4F401/DA08 4F401/EA48 4F401/FA01/Y 4F401/FA01/Z 4K001 4K001/AA01 4K001/AA02 4K001/AA04 4K001/AA06 4K001/AA09 4K001/AA10 4K001/AA19 4K001/AA20 4K001/AA24 4K001/AA41 4K001/BA17 4K001/BA22 4K001/CA01 4K001/CA02 4K001/CA04 4K001/CA49 4K001/DA05 4K001/DA06 4K001/GA02 4K001/GA03 4K001/GA19

JP F-Index: B09B3/00/Z B09B3/00/302/A B09B3/00/302/Z B09B3/00/303/A B09B3/00/303/E B09B3/00/303/G B09B5/00/Q B29B17/02 C08J11/12 C22B11/02 C22B13/02 C22B15/02 C22B15/04 C22B19/08 C22B19/10 C22B19/30 C22B25/02 C22B25/06 C22B61/00 C22B7/00/F

JP Facet: ZAB



Family:

Publication number	Publication date	Application number	Application date
AU2009284688 AA	20100225	AU20090284688	20090818
AU2009284688 BB	20150917	AU20090284688	20090818
BRPI0917398 A2	20151201	BR2009PI17398	20090818
BRPI0917398 B1	20170328	BR2009PI17398	20090818
CA2734737 AA	20100225	CA20092734737	20090818
CA2734737 C	20160419	CA20092734737	20090818
CN102159735 A	20110817	CN200980137105	20090818
DE602009033974 D1	20151112	DE200960033974T	20090818
DK2334833 T3	20160111	DK20090807744T	20090818
EP2334833 A1	20110622	EP20090807744	20090818
EP2334833 A4	20141119	EP20090807744	20090818
EP2334833 B1	20150930	EP20090807744	20090818
ES2557308 T3	20160125	ES20090807744T	20090818
HK1159193 A1	20160429	HK20110113329	20111209
HK1159193 A1	20120727	HK20110113329	20111209
HK1159193 A3	20120727	HK20110113329	20111209
HK1159193 B	20160429	HK20110113329	20111209
HU026383 T2	20160628	HU20090807744T	20090818
IN303644 B	20181130	IN2011DN01258	20110221
JP2012500110 T2	20120105	JP20110523264T	20090818
KR20110054019 A	20110524	KR20117006284	20090818
MX2011001878 A1	20110812	MX20110001878	20090818
MY152962 A	20141215	MY20110000748	20090818
PT2334833 T	20160127	PT20090807744T	20090818
RU2011110385 A	20120927	RU20110110385	20090818
UA101053 C2	20130225	UA20110003152	20090818
US2011230689 AA	20110922	US20090059878	20090818
US8864946 BB	20141021	US20090059878	20090818
WO10019993 A1	20100225	WO2009AU01055	20090818
ZA201101333 A	20120425	ZA20110001333	20090818

Priority:

AU20080904271 20080820 AU20090284688 20090818 WO2009AU01055 20090818
EP20090807744 20090818

Probable Assignee: P FUEL LTD

Assignee(s): (std): FUEL LTD P ; P FUEL LTD ; SCHEIRS JOHN

Inventor(s): (std): JOHN SCHEIRS ; SCHEIRS JOHN

Agent(s): DAVIES COLLISON CAVE; DAVIES COLLISON CAVE PTY LTD; BERESKIN AND PARR LLP SENCRL SRL; HALLYBONE HUW GEORGE; ISERN JORGE; CHINA PATENT AGENT HK LTD; OGAWA TOSHIHARU; SENMYO KENJI; YAMAMOTO RYOZO; BANNER AND WITCOFF LTD; TOZER RAMON DEAN ET AL

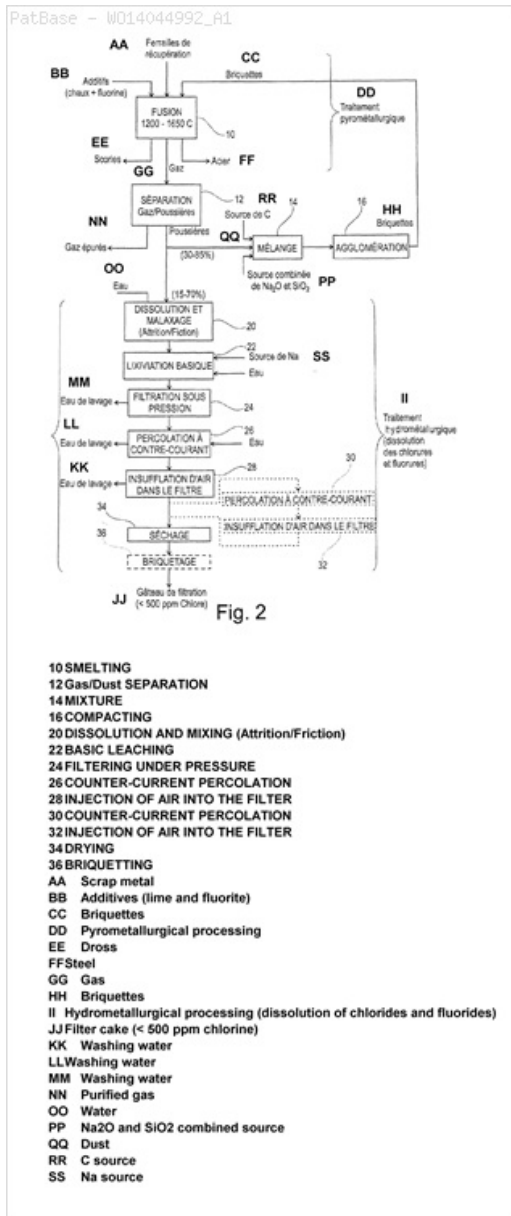
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Title: METHOD FOR THE PYROMETALLURGICAL PROCESSING OF STEEL PLANT DUST RESULTING FROM SCRAP METAL SMELTING

Abstract: The invention relates to a method comprising the steps of: a) collecting dust by filtering (12) the gases leaving a scrap smelting furnace; b) preparing (14) a mixture containing a first fraction of dust collected in step (a), a carbon source and a source of oxide of sodium and silicon, such as sodium metasilicate; c) preparing (16) briquettes by means of the pressure compacting of the mixture obtained in step (b); d) feeding the briquettes into the scrap furnace and pyrometallurgically processing (10) the briquettes with the scrap; and e) performing hydrometallurgical processing (20-34) for dissolution of the chlorides and fluorides of a second fraction of dust collected in step (a) but not used for the mixture in step (b).

Classifications:**International (IPC 8-9):** C22B1/243 C22B1/245 C22B1/248

C22B7/02 (Advanced/Invention)

CPC: C22B1/245 C22B1/243 C22B7/02 Y02P10/214 Y02P10/216 Y02P10/234**Family:**

Publication number	Publication date	Application number	Application date
FR2995910 A1	20140328	FR20120058954	20120924
WO14044992 A1	20140327	WO2013FR52245	20130924

Priority:

FR20120058954 20120924

Probable Assignee: MINE AND ORE**Assignee(s):** (std): MINE AND ORE ; SCHMICKRATH GEORGES**Inventor(s):** (std): SCHMICKRATH GEORGES**Inventor(s):** GEORGES SCHMICKRATH**Agent(s):** DOMINIQUE DUPUIS LATOUR; DUPUIS LATOUR DOMINIQUE

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UZ VC VN ZA ZM ZW

Title: METHOD FOR THE HYDROMETALLURGICAL PROCESSING OF STEEL PLANT DUST RESULTING FROM SCRAP METAL SMELTING

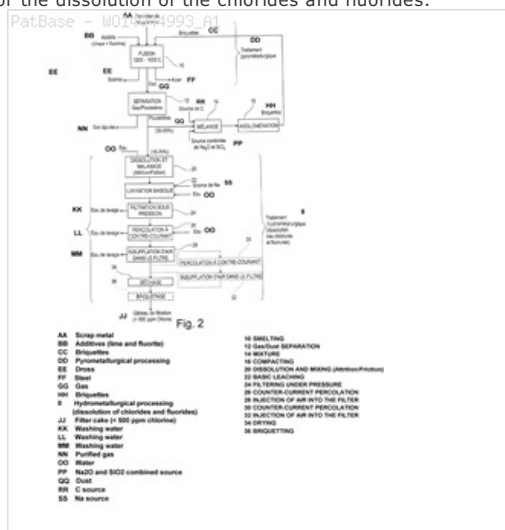
Abstract: The invention relates to a method comprising the steps of: a) collecting dust by filtering (12) the gases leaving a scrap smelting furnace; b) preparing (14) a mixture containing a first fraction of dust collected in step (a), a carbon source and a sodium oxide source; c) preparing (16) briquettes by means of the pressure compacting of the mixture obtained in step (b); d) feeding the briquettes into the scrap smelting furnace and pyrometallurgically processing (10) the briquettes with the scrap; and e) performing hydrometallurgical processing (20-36) for dissolution of the chlorides and fluorides of a second fraction of dust collected in step (a) but not used for the mixture in step (b), with the addition of a sodium source reagent to said second dust fraction for hydrometallurgical processing (20-36) for the dissolution of the chlorides and fluorides.

Classifications:

International (IPC 8-9): C22B1/245 C22B1/248

C22B7/02 (Advanced/Invention)

CPC: C22B7/02 Y02P10/212



Family:

Publication number	Publication date	Application number	Application date
FR2995911 A1	20140328	FR20120058955	20120924
WO14044993 A1	20140327	WO2013FR52246	20130924

Priority:

FR20120058955 20120924

Probable Assignee: MINE AND ORE

Assignee(s): (std): MINE AND ORE ; SCHMICKRATH GEORGES

Inventor(s): (std): SCHMICKRATH GEORGES

Inventor(s): GEORGES SCHMICKRATH

Agent(s): DOMINIQUE DUPUIS LATOUR; DUPUIS LATOUR DOMINIQUE

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

Title: PROCESS FOR THE RECYCLING OF WASTE BATTERIES AND WASTE PRINTED CIRCUIT BOARDS IN MOLTEN SALTS OR MOLTEN METALS

Abstract: Disclosed is a system and method for the recycling of waste composite feed materials such as printed circuit boards (PCBs), batteries, catalysts, plastic, plastic composites such as food packaging materials, for example Tetra Pak(R), mattresses, compact disks (CDs, DVDs), automobile shredder residue (ASR), electric cable wastes, liquid display panels, mobile phones of various sizes or combinations of the above using a new pyrolysis system and method.

Classifications:

International (IPC 8-9): A62D3/32 B03B5/28 B03B9/06 B09B3/00 B29B17/02 B29B17/04 C10B49/14 C10B53/00 C10B53/07 C22B1/00 C22B7/00 F23G5/00 F23G7/00 H01B15/00 H01M10/54 H01M6/52 H05K3/22 (Advanced/Invention)

CPC: B09B3/0083 B03B5/28 C10B49/14 C10B53/00 C10B53/07 C22B7/001 B03B5/36 B03B5/44 B03B9/061 B03B2009/066 B03B2009/068 H05K3/22 H05K2203/178 Y02W30/521 Y02W30/524 Y02W30/822 Y02W30/827 Y02W30/84 F23G7/003 F23G2900/7007 F23G2900/7011 F23G5/00 F23G7/00 B09B5/00 F23G7/005 F23G7/12 F23G2201/301 F23G2201/302 F23G2206/203 F23G2209/20 F23G2209/28 F23G2900/50205 F23G2900/7006 F23J1/08 F23J2700/001 H01B15/003 F23G7/006 B03B9/06 Y02P10/214 Y02P20/143 Y02P70/613 Y02E20/12 C22B7/00 C22B1/005 H01M6/52 H01M10/54 B09B3/00 Y02W30/622
US: 422/184.1 75/401

Publication number	Publication date	Application number	Application date
EP2984153 A2	20160217	EP20140725017	20140414
GB201401990 A0	20140319	GB20140001990	20140205
GB2522860 A1	20150812	GB20140001990	20140205
US2016030987 AA	20160204	US20140784075	20140414
WO14167139 A2	20141016	WO2014EP57536	20140414
WO14167139 A3	20150409	WO2014EP57536	20140414

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UB UG UZ VC VN ZA ZW ZW

JP F-Index: C22B13/00/101 C22B13/04 C22B7/00 C22B7/00/C

SUBSTITUTE
REMPLACEMENT

SECTION is not Present
Cette Section est Absente

Family:

Publication number	Publication date	Application number	Application date
CA1126963 A1	19820706	CA19790319204	19790105
DE2856330 A1	19790712	DE19782856330	19781227
JP54093626 A2	19790724	JP19780000257	19780106
US4222769 A	19800916	US19780971827	19781219

Priority:

JP19780000257 19780106

Probable Assignee: DIAMOND ENG CO LTD**Assignee(s):** (std): DIAMON ENGINEERING CO LTD ; DIAMOND ENG CO LTD ; DIAMOND ENGINEERING CO LTD**Assignee(s):** DIAMON ENGINEERING CO ; DIAMOND ENGINEERING CO**Inventor(s):** (std): TOMIZAKI KIYOTAKA ; TOMISAKI KIYOTAKA ; OKUDA MASAOKI**67) Family number: 11420678** (WO9944942A1)

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Title: THERMAL PROCESS FOR CONVERSION OF ACTIVE MATERIAL FROM SPENT LEAD ACID BATTERIES TO LEAD MONOXIDE

Abstract: There is disclosed a method for the conversion of active material from spent lead acid battery comprising, subjecting dry battery paste to a step of calcination in the temperature range of 400 degrees centigrade - 450 degrees centigrade using fluxing agent made of soda ash, sulphur and an organic reducer for conversion of lead sulphate and lead dioxide to lead monoxide, followed by a step of leaching with water. The organic reducer is preferably charcoal. The fluxing agent made of alkali carbonate, sulphur and charcoal can be used in the ratio of 20 to 22: 0.80 to 1.2: 1.8 to 2.5 parts per 100 parts of the active material.

Classifications:**International (IPC 8-9):** C01G21/06 C22B13/02 H01M10/54 (Advanced/Invention);

C01G21/00 C22B13/00 H01M10/54 (Core/Invention)

International (IPC 1-7): C01G21/06 C22B13/02 H01M10/54**CPC:** C22B13/025 C01G21/06 H01M10/54 Y02W30/84 Y02P10/214**European:** C01G21/06 C22B13/02R H01M10/54 Y02E60/12**Family:**

Publication number	Publication date	Application number	Application date
AU199931659 A1	19990920	AU19990031659	19990301
WO9944942 A1	19990910	WO1999IN00006	19990301

Priority:

IN1998MA00425 19980303

WO1999IN00006 19990301

Probable Assignee: NILE LTD**Assignee(s):** (std): NILE LIMITED ; NILE LTD**Inventor(s):** (std): ADHIKARI DURJOY**Inventor(s):** DURJOY ADHIKARI

Designated states: AL AM AT AU AZ BA BB BE BF BG BJ BR BY CA CF CG CH CI CM CN CU CY CZ DE DK EE ES FI FR GA GB GE GH GM GN GR GW HR HU ID IE IL IS IT JP KE KG KP KR KZ LC LK LR LS LT LU LV MC MD MG MK ML MN MR MW MX NE NL NO NZ PL PT RO RU SD SE SG SI SK SL SN SZ TD TG TJ TM TR TT UA UG UZ VN YU ZW

Title: PRODUCTION OF LEAD MONOXIDE FROM LEAD SULFATE WITH ACIDIC AMMONIUM ACETATE

Abstract: An efficient and inexpensive method for producing lead monoxide from impure lead sulfate bearing materials such as recycled battery mud is provided comprising: (a) reacting said material with an ammonium carbonate solution to convert lead sulfate to lead carbonate; (b) decomposing the lead carbonate to produce impure lead monoxide; (c) reacting said impure lead monoxide with an acidic ammonium acetate solution to form a lead acetate solution; (d) reacting ammonium hydroxide with the lead acetate solution to form lead hydroxide; and (e) dehydrating the lead hydroxide to produce lead monoxide.

Classifications:

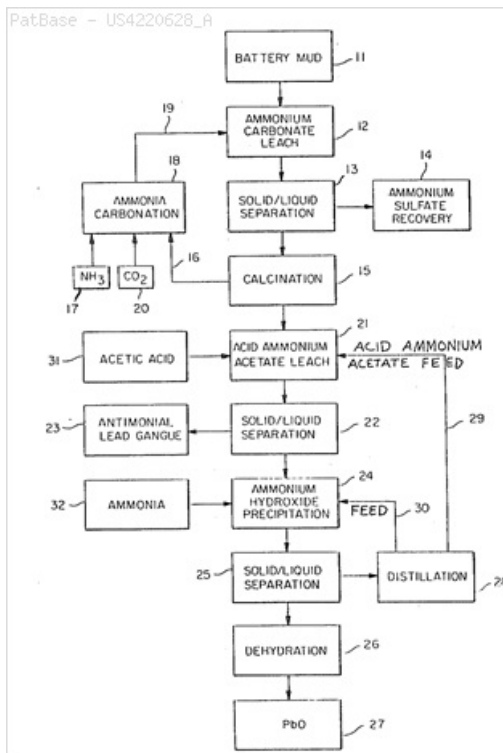
International (IPC 8-9): C01G21/06 H01M10/54 (Advanced/Invention); C01G21/00 H01M10/54 (Core/Invention)

International (IPC 1-7): C01G21/00 C01G21/02 C01G21/06 C22B13/04

CPC: C01G21/06 C01P2002/76 C01P2006/60 C01P2006/80 H01M10/54 Y02W30/84

European: C01G21/06 H01M10/54 M01P2/76 M01P6/60 M01P6/80 Y02E60/12

US: 423/619 423/92

**Family:**

Publication number	Publication date	Application number	Application date
BE879296 A	19800201	BE19790197555	19791009
CA1124035 A1	19820525	CA19790337226	19791009
DD147936 A5	19810429	DD19790216154	19791010
DD149055 A5	19810624	DD19790216153	19791010
DE2941136 A1	19800424	DE19792941136	19791010
DK424579 A	19800411	DK19790004245	19791009
FI793125 A	19800411	FI19790003125	19791009
GB2033883 A1	19800529	GB19790035025	19791009
GB2033883 B2	19821215	GB19790035025	19791009
NL7907513 A	19800414	NL19790007513	19791010
NO793219 A	19800411	NO19790003219	19791008
PH15390 A	19821223	PH19790023135	19791005
SE7908360 A	19800411	SE19790008360D	19791009
SE7908360 L	19800411	SE19790008360	19791009
US4220628 A	19800902	US19780950075	19781010

Priority:

US19780950075 19781010 CA19790337226 19791009

Probable Assignee: NL IND INC

Assignee(s): (std): NL INDUSTRIES INC ; NL IND INC

Assignee(s): NL IND INC TE NEW YORK ; NL INDUSTRIES INC US ; NL INDUSTRIES INC TE NEW YORK ; STRIFFLER EUGENE JR ; NL IND INC US ; KOLAKOWSKI MICHAEL A ; N L IND INC ; N L INDUSTRIES INC ; NL CHEMICALS INC ; NL CHEMICALS INC A CORP OF DE ; NL IND

Inventor(s): (std): KOLAKOWSKI M A ; KOLAKOWSKI MICHAEL A ; STRIFFLER E ; STRIFFLER EUGENE DR ; STRIFFLER EUGENE JR ; STRIFFLER JR E ; STRIFFLER JUN EUGENE ; STRIFFLER JUN EUGENE ; KOLAKOWSKI M

Inventor(s): STRIFFLER JUN EUGENE US ; M A KOLAKOWSKI ; A KOLAKOWSKI MICHAEL ; E STRIFFLER JR ; JUN

Agent(s): KIRBY EADES GALE BAKER

Title: PROCESS FOR SEPARATING HAZARDOUS METALS FROM WASTE MATERIALS DURING VITRIFICATION

Abstract: A process and system for separating metals from a waste composition and for producing a reusable glass product is disclosed. The process includes heating waste materials containing at least one glass forming substance to a temperature sufficient to volatilize any volatile metals contained within the waste material. The waste material is also heated to a temperature and for a time sufficient for substantially all of the glass forming substances contained within the material to melt and form a molten glass. In one embodiment, the waste materials are heated in a reducing atmosphere in a direct

contact radiant heating device, such as an electric arc furnace.

Classifications:

International (IPC 8-9): B01D53/75 B09B3/00 B09C1/06 C03B5/00 C03B5/02 C03B5/235 C22B7/00 (Advanced/Invention); B01D53/74 B09B3/00 B09C1/00 C03B5/00 C22B7/00 (Core/Invention)

International (IPC 1-7): C22B9/02

CPC: B09C1/067 B01D53/75 B09B3/005 B09B3/0083 B09C1/06 C03B5/005 C03B5/025 C03B5/235 C22B7/001 Y02P10/214 Y02P40/52

European: B01D53/75 B09B3/00D4M B09B3/00T B09C1/06 B09C1/06V C03B5/00B C03B5/02D C03B5/235 C22B7/00B

US: 588/252 75/10.32 75/10.36 75/10.65 75/407

Family:

Publication number	Publication date	Application number	Application date
US6136063 A	20001024	US19980033827	19980303

Priority:

US19980033827 19980303

Probable Assignee: AJT ENTERPRISES INC

Assignee(s): (std): AJT ENTERPRISES INC ; AJT ENTPR INC ; UNIV CLEMSON

Assignee(s): CLEMSON UNIV ; CLEMSON UNIVERSITY

Inventor(s): (std): BROSNAN DENIS A

70) Family number: 5113688 (GB2066798A)

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Title: PRODUCTION OF PURIFIED LEAD AND ANTIMONY OXIDE

Abstract: Purified lead and antimony oxide are produced from antimonial lead alloys by oxidation of the molten alloy to form purified metallic lead and a slag of lead oxides and antimony oxides, separation of the metal and slag, and subsequent partial reduction and fuming of the slag to produce pure antimony oxide.

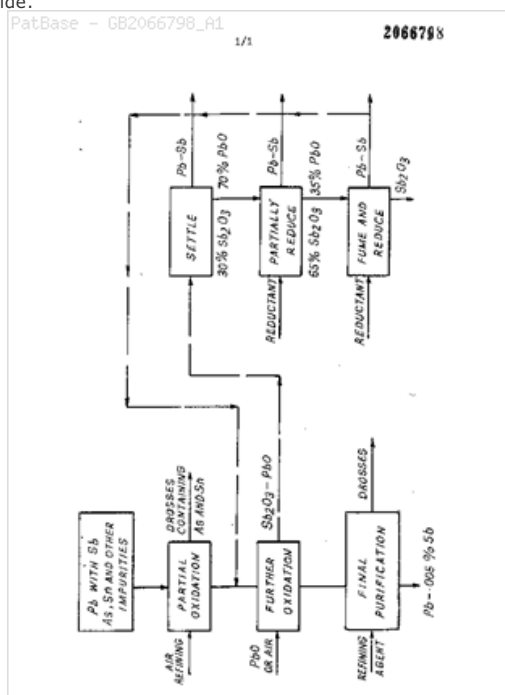
Classifications:

International (IPC 8-9): C01G30/00 C22B13/06 (Advanced/Invention); C01G30/00 C22B13/00 (Core/Invention)

International (IPC 1-7): C01G30/00 C22B13/06

CPC: C01G30/005 C01P2006/60 C01P2006/80 C22B13/06

European: C01G30/00F2 C22B13/06 M01P6/60 M01P6/80



Family:

Publication number	Publication date	Application number	Application date
GB2066798 A1	19810715	GB19800000049	19800102
GB2066798 B2	19830706	GB19800000049	19800102

Priority:

GB19800000049 19800102

Probable Assignee: NL INDUSTRIES INC

Assignee(s): (std): NL INDUSTRIES INC

Assignee(s): NL IND INC

71) Family number: 58413688 (UA97902C)

© PatBase

Title: METHOD FOR PROCESSING USED LEAD-ACID ACCUMULATORS AND STORAGE BATTERIES

Abstract: The invention relates to the field of metallurgy, in particular to a method for processing lead-acid accumulators and storage batteries. The method involves mechanical crushing of accumulators and storage batteries, separation by wet screening of the sand and slag fraction as a product for melting, hydros separation with output of metal fraction as a product for a fraction remelting, the output of polypropylene or propylene copolymer for processing, the withdrawal of heavy plastic materials for recycling, melting of the sand and slag fraction and the metal fraction in rotary drum furnaces and refining rough lead, which is produced in these furnaces. At that hydros separation is carried out in three hydros separators, at that in the first hydros separator the coarse products of grinding are separated - metal fraction from the bulk of the plastic material in the flow of rising water with the speed of 0.05-0.35 m/s with bubbling thereof with the compressed air with the speed of its

supplying of 90 - 200 m/hour per square meter of the flow cross-section, after which the metal fraction is sent to the second hydroseparator, where in the flow of rising water with the speed of 0.01-0.066 m/s with bubbling thereof with the compressed air with the speed of its supplying of 15-45 m/hour per square meter of the flow cross-section the metal fraction is separated from the plastic material residue, from the first and the second hydroseparators the plastic material is supplied to the third hydroseparator, in which in a stream of running water with a flow rate of 0.04-0.12 m/hour at the rate of plastic mass supplying of 300- / hour polypropylene or propylene copolymer is separated from heavy plastic material and residual sand and slag fraction, which before the melting is subjected to the desulfuration in a closed tank by chemical reaction with sodium carbonate and water: $2\text{PbSO}_4 + 3\text{Na}_2\text{CO}_3 + \text{H}_2\text{O} \rightarrow \text{Pb}(\text{CO}_3)(\text{OH}) + 2\text{Na}_2\text{SO}_4 + \text{CO}_2 + \text{heat}$, (1) with application of lead bicarbonate, sodium sulphate and carbon dioxide, at that the chemical reaction is carried out with mixing with blade stirrer and additional mixing by recirculation the reacting mixture in a closed tank with the intensity of recirculation flow of 12-60 m/hour, then the chemical reaction products are passed through a filter press for separation of solid particles from a solution of sodium sulfate, where they are subjected to blowing with the compressed air of the intensity of 6-18 m/hour per ton of solid particles blown, and then, as sediment from the filter press, solid particles in the form of a cake of desulfurated sand and slag fraction are supplied to the remelting as a product. The invention provides increased efficiency of hydroseparation, removal of sulfur compounds from the process technology with the obtain of sodium sulfate and increased removal of lead, polypropylene, reduction during the smelting process of harmful sulfur gasses emissions to the atmosphere.

Classifications:

International (IPC 8-9): C22B13/00 C22B7/00 (Core/Invention)

Family:

Publication number	Publication date	Application number	Application date
UA97902 C2	20120326	UA20100105787	20101227

Priority:

UA20100105787 20101227

Probable Assignee: BURYLOV SERHII VOLODYMYROVYCH

Assignee(s): (std): BURYLOV SERHII VOLODYMYROVYCH ; DZENZERSKYI DENIS VIKTOROVYCH ; DZENZERSKYI VIKTOR OLEKSANDROVYCH

Inventor(s): (std): BURYLOV SERHII VOLODYMYROVYCH ; DENYSENKO DMYTRO VOLODYMYROVYCH ; DZENZERSKYI DENIS VIKTOROVYCH ; DZENZERSKYI VIKTOR OLEKSANDROVYCH ; KAZACHA YURII IVANOVYCH ; SHNUROVYI SERHII VOLODYMYROVYCH ; SKOSAR VIACHESLAV YURIOVYCH

72) Family number: 3826690 (EP0185879A2)

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Title: SHAFT FURNACE FOR THE TREATMENT OF WASTE LEAD AND BATTERY SCRAP WITH A POST-COMBUSTION INSTALLATION FOR THE EXHAUST GASES.

Abstract: 1. Shaft furnace for smelting waste lead, in particular battery scrap, having charging holes for raw material and additives, blast nozzles for blowing in combustion air, tapping holes for the smelted crude lead and the slack, and an afterburning unit for the furnace gas produced in the smelting process, characterized in that the afterburning unit is a radiation recuperator (1) formed of two concentrically arranged, high temperature-resistant tubes, whose inner pipe (2) consists of a ceramic material of high thermal conductivity and whose outer pipe (3) consists of a heat-resistant, heat-insulating ceramic material, and which has means for feeding the furnace gas to the inner pipe (2) and for feeding combustion air in counter-current to the annular gap (4) between the inner pipe (2) and outer pipe (3), and that the inner pipe (2) is open towards the annular gap (4) in the region of the furnace gas inlet.

Classifications:

International (IPC 8-9): C22B13/02 C22B7/00 F27B1/22 F27D17/00 H01M10/54 (Advanced/Invention);

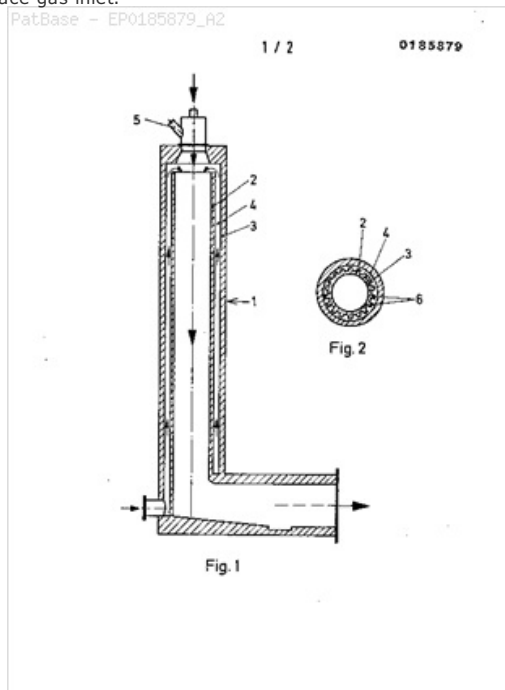
C22B13/00 C22B7/00 F27B1/00 F27D17/00

H01M10/54 (Core/Invention)

International (IPC 1-7): C22B13/02 C22B7/00 F27B1/08 F27B1/22 F27D17/00

CPC: F27B1/22 C22B7/003 C22B13/02 H01M10/54 Y02W30/84 Y02P10/214

European: C22B13/02 C22B7/00B4 F27B1/22 H01M10/54 Y02E60/12



Family:

Publication number	Publication date	Application number	Application date
AT48912 E	19900115	AT19850113496T	19851024
DE3443452 A1	19860528	DE19843443452	19841129
DE3574906 D1	19900125	DE19853574906	19851024
EP0185879 A2	19860702	EP19850113496	19851024
EP0185879 A3	19870506	EP19850113496	19851024
EP0185879 B1	19891220	EP19850113496	19851024

Priority:

DE19843443452 19841129

DE19853574906 19851024

EP19850113496 19851024

Probable Assignee: VARTA BATTERIE
Assignee(s): (std): VARTA BATTERIE
Assignee(s): VARTA BATTERIE AG ; VARTA BATTERIE AG 3000 HANNOVER DE ; VARTA BATTERIE AKTIENGESELLSCHAFT
Inventor(s): (std): NIKLAS HANS DR DIPL CHEM ; NIKLAS HANS DIPL CHEM DR
Inventor(s): NIKLAS DR DIPL CHEM HANS D 6239 EPPSTEIN DE ; NIKLAS HANS DIPL CHEMDR
Designated states: AT CH DE FR GB IT LI SE

73) Family number: 48459691 (AU2010206110A)

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Title: A PROCESS OF SMELTING LEAD BEARING MATERIALS

Abstract: The present invention relates to a process for smelting lead containing materials such as used plates of lead-acid 5 batteries. The process produces a matte/slag emulsion that is relatively rich in lead and that is suitable for use in feed stock to a primary lead smelter. The present invention also relates a matte/slag and a furnace for producing the matte/slag.

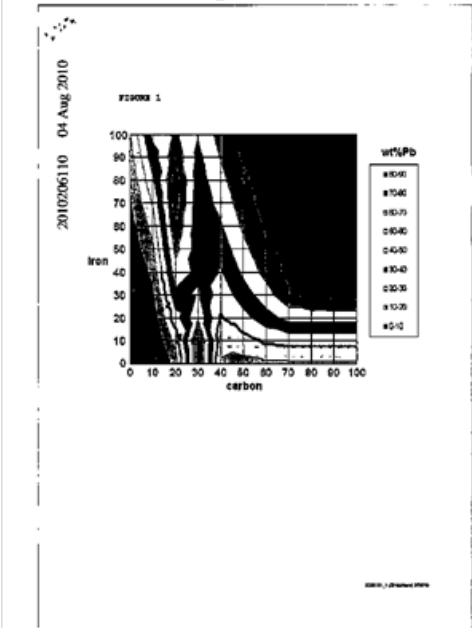
Classifications:

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CPC: C22B7/003 C22B5/10 C22B13/02 C22B13/06 Y02P10/212

European: C22B13/02 C22B13/06 C22B5/10 C22B7/00B4

PatBase - AU2010206110_AA



Family:

Publication number	Publication date	Application number	Application date
AU2010206110 AA	20110303	AU20100206110	20100804

Priority:

AU20090903845 20090814 AU20100206110 20100804

Probable Assignee: AUSTRALIAN REFINED ALLOYS PTY LTD

Assignee(s): (std): AUSTRALIAN REFINED ALLOYS PTY LTD

Inventor(s): (std): NELSON DARREN ; STEVENSON MARK

Inventor(s): DARREN NELSON ; MARK STEVENSON

Agent(s): GRIFFITH HACK

74) Family number: 8594712 (US4340421A)

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Title: METHOD OF RECOVERING LEAD FROM LEAD-ACID BATTERIES

Abstract: A process for recovering lead from scrap lead-acid batteries comprises smelting whole unbroken batteries in a blast furnace having a configuration which minimizes the amounts of flue dust produced. The volatile organic material produced by the combustion of the battery cases and separators and entrained in the furnace exhaust gases are ducted to an after-burner and burned to carbon dioxide while any sulfur dioxide gas combines with metal oxides to form solid metal sulphate including lead sulphate particles which can be collected and recycled into the furnace for further lead recovery. The blast furnace utilized in the lead recovery process is characterized by its wide shaft causing gases to rise at a low velocity, thus enabling a longer time for hot reducing gases generated in the smelting zone to contact and give up heat to the descending charge of scrap batteries, resulting in the maintenance of a cold furnace top. Most of the volatilized lead recondenses on the cold charge, reducing significantly the amount of lead-containing flue dust. Flue dust which is formed during smelting may be collected, and melted, to form an agglomerated product which can be introduced back into the blast furnace.

Classifications:

International (IPC 8-9): C22B13/02 C22B7/00

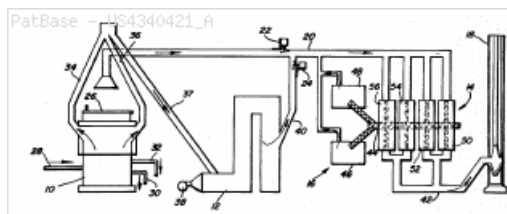
H01M10/54 (Advanced/Invention);

C22B13/00 C22B7/00 H01M10/54 (Core/Invention)

International (IPC 1-7): C22B13/00 C22B7/02

CPC: Y10S75/961 H01M10/54 C22B7/003 C22B13/02 Y02W30/84 Y02P10/214

European: C22B13/02 C22B7/00B4 H01M10/54 Y02E60/12

**Family:**

Publication number	Publication date	Application number	Application date
US4340421 A	19820720	US19800195435	19801009

Priority:

US19800195435 19801009

Probable Assignee: PAUL BERGSOE AND SON A S**Assignee(s):** (std): BERGSOE AND SON AS P ; BERGSOE AND SON P AS ; PAUL BERGSOE AND SON A S**Assignee(s):** PAUL BERGSOE AND SON A S A CORP**Inventor(s):** (std): BERGSOE SVEND**75) Family number: 54980729 (US8562923B)**

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Title: PROCESS FOR OBTAINING PURE LITHARGE FROM LEAD ACID BATTERY PASTE**Abstract:** The present invention relates to the recovery of high purity litharge from spent lead acid battery paste at a low temperature which does not produce sulfur dioxide. In the process lead acetate is produced which is converted to pure litharge.**Classifications:****International (IPC 8-9):** B09B3/00 C01G21/06 C22B13/00 C22B3/00 (Advanced/Invention)**CPC:** C22B13/045 C01G21/06 Y02P10/212**US:** 423/619 423/92 423/93 429/49**Family:**

Publication number	Publication date	Application number	Application date
US8562923 BA	20131022	US20120660548	20121025
US8980203 BA	20150317	US20130902187	20130524
WO14065888 A1	20140501	WO2013US42612	20130524

Priority:

US20120660548 20121025 US20130902187 20130524

Probable Assignee: RETRIEV TECHNOLOGIES INC**Assignee(s):** (std): RETRIEV TECHNOLOGIES INC ; TOXCO INC**Inventor(s):** (std): KINSBURSKY STEVEN ; KINSBURSKY STEVEN A ; SMITH W NOVIS**Inventor(s):** SMITH W**Agent(s):** RATNERPRESTIA; LEWIS CHRISTOPHER R ET AL**Designated states:** AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW**76) Family number: 31485757 (US2007028720A)**

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Title: PROCESS FOR THE HIGH YIELD RECOVERY OF LEAD FROM SPENT LEAD-ACID BATTERIES WITH REDUCED ASSOCIATED PRODUCTION OF SLAG AND GASEOUS EMISSIONS**Abstract:** Process for desulphating a solid mixture and/or aggregate resulting from the breaking up of lead-acid batteries, comprising electrode slime containing lead compounds belonging to the group comprising oxides, oxidated compounds and sulphates, through contact with an aqueous solution of sodium carbonate and a substance dissolving lanarkite in which the said solid residues containing lead compounds are suspended, in which the solid phase of the suspension is subjected to a chemical reaction whose action is assisted by brushing, shear and compression forces exerted by brushing or scraping and compressing mechanical means, thus achieving almost total desulphatation.**Classifications:****International (IPC 8-9):** C22B13/00 C22B3/00 C22B3/12 C22B3/22 C22B7/00 H01M10/54 (Advanced/Invention);

H01M10/06 (Advanced/Non-invention);

C22B13/00 C22B3/00 C22B7/00 H01M10/54 (Core/Invention);

H01M10/06 (Core/Non-invention)

International (IPC 1-7): C22B13/00 C22B13/04 H01M10/54**CPC:** H01M10/54 C22B7/008 C22B13/045 H01M10/06 Y02W30/84 Y02P10/234**European:** C22B13/04R C22B7/00D2 H01M10/54 T01M10/06 Y02E60/12**US:** 75/714 75/714P**Family:**

Publication number	Publication date	Application number	Application date
CN1846005 A	20061011	CN200480025066	20040712
EP1656463 A1	20060517	EP20040743947	20040712
US2007028720 AA	20070208	US20040564989	20040712
WO05007904 A1	20050127	WO2004IB02285	20040712

Priority:

CH20030001257 20030718 WO2004IB02285 20040712

Probable Assignee: KANDY SA**Assignee(s):** (std): KANDY S A ; MODICA GIOVANNI ; SOMMARIVA ANTONIO**Assignee(s):** KANDY SA**Inventor(s):** (std): GIOVANNI SOMMARIVA ANTONIO MOD ; MODICA GIOVANNI ; SOMMARIVA ANTONIO**Inventor(s):** SOMMARIVA ANTONIO MODICA GIOVANNI**Agent(s):** CONNOLLY BOVE LODGE AND HUTZ LLP**Designated states:** AE AG AL AM AT AU AZ BA BB BE BF BG BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GW HR HU ID IE IL IN IS IT JP KE KG KP KR KZ LC LI LK LR LS LT LU LV MA MC MD MG MK ML MN MR MW MX MZ NA NE NI NL NO NZ OM PG PH PL PT RO RU SC SD SE SG SI SK SL SN SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW**77) Family number: 56411763 (CN103794834A)**

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Title: METHOD FOR RECYCLING USED LEAD-ACID BATTERIES IN FULL CIRCULATION MODE

Abstract: The invention relates to a method for recycling used lead-acid batteries in a full circulation mode. According to the technical scheme, a band sawing machine for cutting the used lead-acid batteries is used for sawing and cutting a used lead-acid battery into an upper cover, a groove body, an electrode set and acid liquid, and the upper cover, the groove body, the electrode set and the acid liquid are respectively processed to obtain lead-antimony alloy, plastic, lead plaster, lead-calcium alloy and dilute sulphuric acid. Then, the lead plaster is added into a reaction tank, amidogen-contained substances are added to the lead plaster, stirring is conducted, desulfurization is conducted after carbon-contained substances are added, solid-liquid separation is conducted, and therefore desulfurated lead plaster and filter liquid are obtained. Then, the filter liquid is evaporated and crystallized to obtain ammonium sulfate, and liquid evaporated in the evaporation and crystallization process is cooled to the room temperature and recycled. The washed desulfurated lead plaster is dried, and the dried desulfurated lead plaster is roasted at the temperature larger than 400 degrees centigrade and smaller than or equal to 500 degrees centigrade or at the temperature larger than 500 degrees centigrade and smaller than or equal to 650 degrees centigrade to obtain lead tetroxide or lead oxide. The method has the advantages of being simple in process, low in recycling cost, high in recycling rate, high in product purity and environmentally friendly.

Classifications:**International (IPC 8-9):** B23D55/00 B23D55/02 B23D55/04

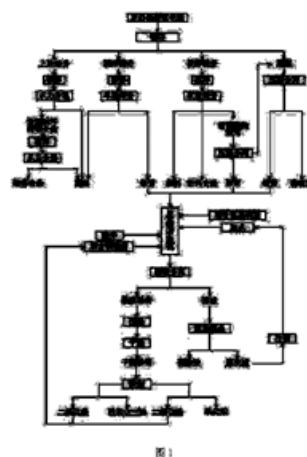
B23Q7/00 C22B7/00 H01M10/54 (Advanced/Invention)

CPC: Y02W30/84 Y02P10/234 H01M10/54 B23D55/02 B23D55/04

B23D55/043 B23D55/046 B23D55/065 B23D55/08 C22B7/00

PatBase - CN103794834_A

CN 103794834 A 说明书附图 1/6页



34

Family:

Publication number	Publication date	Application number	Application date
CN103794834 A	20140514	CN201410076147	20140304

Priority:

CN201410076147 20140304

Probable Assignee: UNIV WUHAN SCIENCE AND ENG**Assignee(s):** (std): UNIV WUHAN SCIENCE AND ENG ; WUHAN UNIV OF SCIENCE AND TECHNOLOGY ; XIANGYANG YUANRUI RESOURCE ENGINEERING TECHNOLOGY CO LTD**Assignee(s):** XIANGYANG YUANRUI RESOURCE ENGINEERING TECHNOLOGYCO**Inventor(s):** (std): KE CHANGMEI ; MENG DAN ; TIAN XIAOBO ; WANG PUFA ; XIAO XIAO ; YANG JINTANG ; YANG ZHENGQUN**78) Family number: 15021789 (US5284503A)**

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Title: PROCESS FOR REMEDIATION OF LEAD-CONTAMINATED SOIL AND WASTE BATTERY

Abstract: Lead-contaminated soil and battery casings are remediated using a plasma arc furnace which pyrolyzes the soil

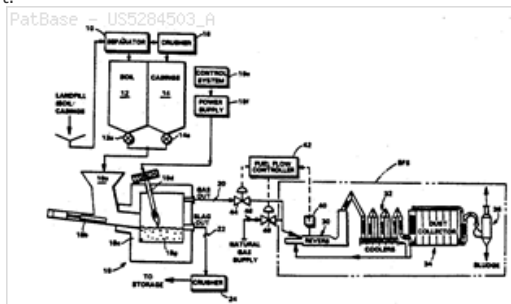
Classifications:

CPC: A62D2101/02 A62D2101/22 A62D2101/26 A62D2101/28

US: 110/346 266/172 266/87 405/128.65 405/128.85 405/129 405/129.28 429/49 588/200 588/237 588/256 588/311

588/314 588/316 588/319 588/401 588/406 588/407 588/408 588/409 588/412 75/10.19 75/693

JF F-Index: B09B3/00/303/P B09B3/00/7AB B09B5/00/7AB/A B09C1/06 C22B13/02 C22B4/04



Publication number	Publication date	Application number	Application date
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AT161442 E	19980115	AT19940304876T	19940704
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AU199670756 A1	19970409	AU19960070756	19960918
AU663227 B2	19950928	AU19930048539	19930913
BRPI9305719 A	19961231	BR1993PI05719	19930913
CA2124005 AA	19940526	CA19932124005	19930913
DE19681571 T	19981029	DE19961081571T	19960918
DE19681571 T1	19981029	DE19961081571T	19960918
DE69315562 D1	19980115	DE19936015562	19930913
DE69315562 T2	19980507	DE19936015562T	19930913
DE69407546 D1	19980205	DE19946007546	19940704
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GB2320713 A1	19980701	GB19980004847	19960918
GB2320713 B2	19991020	GB19980004847	19960918
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JP7503659 T2	19950420	JP19940512062T	19930913
KR19940703930 A	19941212	KR19940702361	19940708
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NO304585 B1	19990118	NO19940002583	19940708
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US19950478617	19950607	US19950003956	19950919	US19950003956P	19950919
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US19960715486	19960918				

Assignee(s): DEUTSCHE BANK NEW YORK AG ; EXIDE TECHNOLOGIES F K A EXIDE CORP ; EXIDE CORP READING PA US ; EXIDE CORP PHILADELPHIA PA US ; EXIDE TECHNOLOGIES (F K A EXIDE CORPORATION) ; EXIDE TECHNOLOGIES F K A EXIDE CORPORATION ; BANKERS TRUST CO ; BARANSKI JOHN P ; CREDIT SUISSE FIRST BOSTON ADMINISTRATIVE AGENT ; CREDIT SUISSE FIRST BOSTON ADMINISTRATIVE AGENT AS : BITLER JOHN A : CREDIT SUISSE FIRST BOSTON AS ADMINISTRATIVE

Inventor(s): (std): JOHN A BITLER ; JOHN P BARANSKI ; BARANSKI JOHN P ; BITLER JOHN A ; BARANSKI JONH P ; LARSON HAROLD R

Inventor(s): BARANSKI JOHN P SINKING SPRING PA US ; HAROLD R LARSON ; LARSON HAROLD R SPRING TEX US ; JONH P BARANSKI ; BITLER JOHN A DENVER PA US

Agent(s): CULLENS PATENT AND TRADE MARK ATTORNEYS; CULLENS PTY LTD; SPRUSON AND FERGUSON; BORDEN LADNER GERVAIS LLP

Designated states: AL AM AT AU AZ BB BE BF BG BJ BR BY CA CF CG CH CI CM CN CZ DE DK EE ES FI FR GA GB GE GN GR HU IE IL IS IT JP KE KG KP KR KZ LI LK LR LS LT LU LV MC MD MG MK ML MN MR MW MX NE NL NO NZ PL PT RO RU SD SE SG SI SK SN SZ TD TG TJ TM TR TT UA UG UZ VN

79) Family number: 10334793 (US5762683A)

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Title: FERRIC FLUOBORATE/ORGANIC EXTRACTANT HYDROMETALLURGICAL PROCESS FOR RECOVERING METALS

Abstract: A method is provided for the hydrometallurgical recovery of metal values from sources containing more than one metal of antimony, lead, copper, zinc, bismuth, tin, cadmium and other metals by leaching the metal containing source with a ferric fluoborate/fluoroboric acid solution to provide a leachant metal containing solution. The leachant solution is contacted with specific organic extractants such as an organophosphoric acid ester, an alkyl salicylaldoxime and an amidobis(thiophosphoryl) compound in a series of extraction steps to separate metals based on the extractant used. The organic extractant solution is stripped of the extracted metal(s) and the metal(s) recovered. The remaining leach solution after extraction being either further treated to extract other metals or processed to provide metal values contained therein.

Classifications:

International (ipc 8-9): B01D11/04 C09K3/00 C22B/00 C22B13/00 C22B13/06 C22B15/ C22B15/00 C22B15/14 C22B19/00 C22B19/32 C22B25/00 C22B3/04 C22B3/06 C22B3/10 C22B3/16 C22B3/20 C22B3/30 C22B3/38 C22B30/00 C22B30/02 C22B30/06 C22B7/00 C25C1/12 C25C1/18 (Advanced/Invention); B01D11/04 C09K3/00 C22B25/00 C22B3/16 C25C1/12 C25C1/18 (Advanced/Non-invention)

International (ipc 1-7): B01D11/04 C09K3/00 C22B13/00 C22B13/06 C22B15/00 C22B15/14 C22B19/00 C22B19/32 C22B25/00 C22B3/04 C22B3/06 C22B3/16 C22B3/20 C22B3/30 C22B3/38 C22B30/00 C22B30/02 C22B30/06 C25C1/12 C25C1/18

CPC: C22B3/0017 C22B3/0043 C22B3/0063 C22B3/10 C22B7/006 C22B13/045 C22B15/0063 C22B25/04 C22B30/00 Y02P10/234 Y02P10/236 C25C1/18 C25C1/12

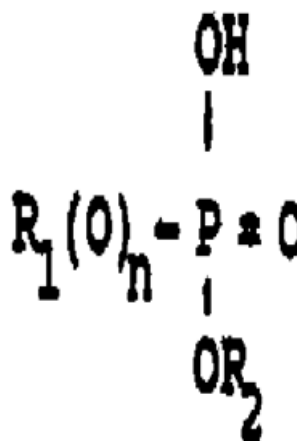
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US: 205/580 205/599 210/638 75/743

JP F-Term: 4D056/AB03 4D056/AB04 4D056/AB08 4D056/AC15 4D056/AC25 4D056/CA17 4D056/CA25 4D056/CA27 4D056/CA31 4D056/CA39 4D056/DA05 4H016 4K001 4K001/AA01 4K001/AA03 4K001/AA04 4K001/AA05 4K001/AA09 4K001/AA20 4K001/AA21 4K001/AA24 4K001/AA30 4K001/AA41 4K001/BA03 4K001/BA12 4K001/BA14 4K001/BA19 4K001/BA23 4K001/DB02 4K001/DB21 4K001/DB31 4K001/DB34 4K058 4K058/AA21 4K058/BA21 4K058/BA25 4K058/BA27 4K058/BA28 4K058/BA29 4K058/BA30 4K058/BB04 4K058/CA03 4K058/FC02 4K058/FC03 4K058/FC07 4K058/FC13

JP F-Index: B01D11/04/B C09K3/00/108/E C22B25/00/101 C22B25/04 C22B3/00/A C22B3/00/H C22B3/06 C22B3/34 C22B3/38 C22B30/02 C22B30/06 C25C1/12 C25C1/18

PatBase - KR20000015779_H

**Family:**

Publication number	Publication date	Application number	Application date
AU199731209 A1	19971209	AU19970031209	19970512
AU711913 B2	19991021	AU19970031209	19970512
CA2252849 AA	19981021	CA19972252849	19970512
CL1997000946 A1	19980303	CL19970000946	19970520
EP0963451 A1	19991215	EP19970926439	19970512
EP0963451 A4	19991215	EP19970926439	19970512
JP2000511234 T2	20000829	JP19970542455T	19970512
KR20000015779 A	20000315	KR19980709327	19970512
US5762683 A	19980609	US19960651923	19960521
WO9744499 A1	19971127	WO1997US07918	19970512
ZA9704214 A	19980204	ZA19970004214	19970515

Priority:

US19940353056 19941209 US19960651923 19960521 WO1997US07918 19970512

Probable Assignee: ASARCO INC**Assignee(s):** (std): ASARCO INC

Assignee(s): ASARCO INCORPORATED SOC ORGANIZADA BAJO LAS LEYES DEL ESTADO DE NEW JERSEY ; JACKSON JONATHAN S ; KING MICHAEL G

Inventor(s): (std): JACKSON JONATHAN S ; KING MICHAEL G ; KING MICHAEL G DR

Inventor(s): MICHAEL G KING ; JONATHAN S JACKSON ; JONATHAN S JACKSON ; DR MICHAEL G KING

Agent(s): CULLENS PATENT AND TRADE MARK ATTORNEYS; CULLENS PTY LTD; SPRUSON AND FERGUSON; RIDOUT AND MAYBEE LLP; VILLASECA

Designated states: AT AU BE CA CH DE DK ES FI FR GB GR IE IT JP KR LU MC MX NL PT SE

Title: INTEGRATED FIXATION SYSTEMS

Abstract: The invention provides polymeric matrices and films comprising fixation reagents that are capable of reacting with solubilized metals to form less soluble metal compounds. The fixation reagent may include inorganic sulfides and phosphates, as well as adsorbents. The polymeric matrices may be comprised of polyvinyl alcohols and polyvinyl acetates. In some embodiments, the polymeric matrix is selected to be at least as soluble as the selected fixation reagent, particularly under the conditions in which the matrix is expected to come into contact with the solubilized metal.

Classifications:

International (IPC 8-9): A62D A62D3/00 A62D3/33 A62D3/37 A62D3/38 B01J20/00 B01J20/28 B09B3/00 B65D85/84 C02F C02F1/62 C08K3/32 C22B17/00 C22B43/00 C22B7/00 H01H1/02 H01J61/02 H01J61/72 H01J9/52 H01M H01M10/06 H01M10/30 H01M10/42 H01M10/54 H01M2/02 H01M6/50 (Advanced/Invention); A62D101/24 A62D101/43 H01H11/02 H01L21/00 H01M10/06 H01M10/30 (Advanced/Non-invention); A62D3/00 B01J20/00 C02F1/62 C22B17/00 C22B43/00 C22B7/00 H01J61/00 H01J61/02 H01M10/42 H01M10/54 H01M6/00 (Core/Invention); H01M10/06 H01M10/24 (Core/Non-invention)

International (IPC 1-7): A62D3/00 B01J20/00 B09B3/00 B65D85/84 C02F1/62 C08K3/32 C22B43/00 H01H1/02 H01J9/00 H01M10/42 H01M10/54 H01M2/02 H01M6/50

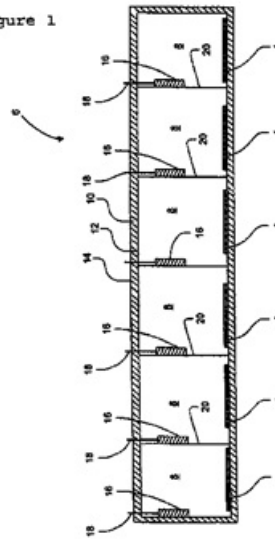
CPC: A62D3/37 A62D3/38 A62D2101/24 A62D2203/04 A62D3/33 A62D2101/43 A62D2203/10 C22B7/00 C22B17/00 C22B43/00 H01J61/02 H01J61/72 H01M10/06 H01M10/30 H01M10/4235 H01M10/54 H01M2200/00 H01M2200/10 Y02W30/84 Y02W30/828 C22B3/24 Y02P10/234 Y02P10/212

European: A62D3/00E4 A62D3/00K12 A62D3/00K14 A62D3/00K4 A62D3/00M10D A62D3/00M12D A62D3/33 A62D3/37 A62D3/38 C22B17/00 C22B3/00D4 C22B43/00 C22B7/00 H01J61/02 H01J61/72 H01M10/42M H01M10/54 K62D101/24 K62D101/43 K62D203/04 K62D203/10 T01M10/06 T01M10/30 T01M200/00 T01M200/10 Y02E60/12

US: 429/49 524/414 524/417 524/420 524/436

PatBase - US6838504_BA

U.S. Patent Jan. 4, 2005 Sheet 1 of 2 US 6,838,504 B1

Figure 1**Family:**

Publication number	Publication date	Application number	Application date
AU199916569 A1	19990712	AU19990016569	19981221
AU199936954 A1	19991123	AU19990036954	19990506
CA2225367 AA	19990619	CA19972225367	19971219
CA2372985 AA	20011101	CA19992372985	19990506
CA2372985 C	20101012	CA19992372985	19990506
EP1062035 A1	20001227	EP19990918998	19990506
EP1435674 A1	20040707	EP20030078630	19990506
HK1069920 A1	20050603	HK20050100164	20050107
HK1069920 A3	20050603	HK20050100164	20050107
US6838504 BA	20050104	US20010646544	20010913
WO9933137 A1	19990701	WO1998CA01156	19981221
WO9956867 A2	19991111	WO1999CA00383	19990506
WO9956867 A3	19991223	WO1999CA00383	19990506

Priority:

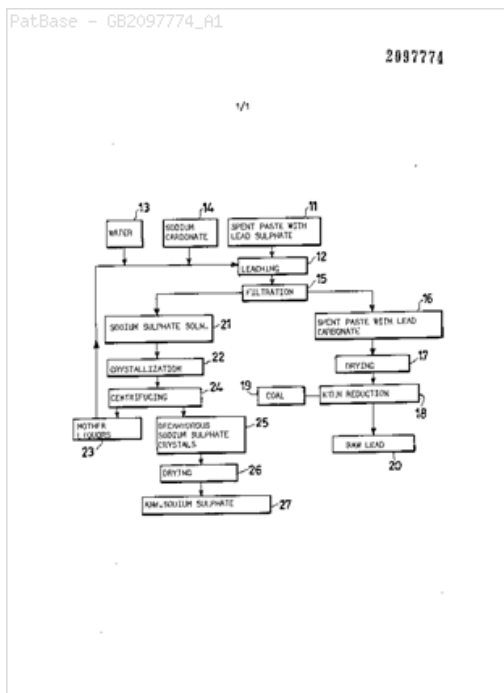
CA19972225367 19971219	US19980072771 19980506	WO1998CA01156 19981221
CA19992372985 19990506	EP19990918998 19990506	WO1999CA00383 19990506
US20010646544 20010913		

Probable Assignee: EAST MORGAN HOLDINGS INC**Assignee(s):** (std): HURLEY PETER ; SOLUCORP IND LTD ; SOLUCORP INDUSTRIES LTD ; WEBSTER WILLIAM C ; SPINDLER NOEL EVAN**Assignee(s):** SOLUCORP IND LTD 250 WEST NYACK ROAD WEST NYACK NY ; SOLUCORP INDUSTRIES ; REVENUE SERVICE INT ; SOLUCORP IND ; EAST MORGAN HOLDINGS INC ; GEMINI MASTER FUND LTD ; GEMINI STRATEGIES LLC**Inventor(s):** (std): PETER HURLEY ; SPINDLER NOEL EVAN ; WEBSTER WILLIAM ; WEBSTER WILLIAM C ; WILLIAM C WEBSTER ; HURLEY PETER**Inventor(s):** NOEL EVAN SPINDLER**Agent(s):** FETHERSTONHAUGH AND CO; HONG KONG PATENT AGENCY ROOM NO1 7 F LAP FAI BUILDING POTTINGER STREET**Designated states:** AE AL AM AT AU AZ BA BB BE BF BG BJ BR BY CA CF CG CH CI CM CN CU CY CZ DE DK EE ES FI FR GA GB GD GE GH GM GN GR GW HR HU ID IE IL IN IS IT JP KE KG KP KR KZ LC LI LK LR LS LT LU LV MC MD MG MK ML MN MR MW MX NE NL NO NZ PL PT RO RU SD SE SG SI SK SL SN SZ TD TG TJ TM TR TT UA UG US UZ VN YU ZA ZW**Title:** PROCESS FOR TREATING SULPHATED LEAD COMPOUNDS FOR RECOVERING METALLIC LEAD AND A HIGH-PURITY SULPHATE

Abstract: The process for treating sulphated lead compounds, more particularly those coming from exhausted storage batteries, comprises the steps of subjecting said sulphated compounds to leaching (12) with sodium carbonate in aqueous solution, collecting on a filter (15) the lead carbonate thus obtained from the sodium sulphate which is left dissolved, subjecting the lead carbonate to reduction (18) to metallic lead, separating the sodium sulphate by crystallization (22) from the filtrates (21) and recycling the mother liquors (23) of crystallization to the leaching stage (12).

Classifications:

European: C22B13/04R



Family:

Publication number	Publication date	Application number	Application date
BR8202453 A	19830412	BR19820002453	19820428
CA1190401 A1	19850716	CA19820401814	19820428
DE3215592 A1	19821118	DE19823215592	19820427
ES511763 A0	19830201	ES19820511763	19820428
ES8302111 A1	19830201	ES19820511763	19820428
FR2504940 A1	19821105	FR19820007423	19820429
GB2097774 A1	19821110	GB19820011634	19820422
GB2097774 B2	19850306	GB19820011634	19820422
IT1136589 A	19860903	IT19810021447	19810429
IT8121447 A0	19810429	IT19810021447	19810429
YU88682 A	19850320	YU19820000886	19820423

Priority:

IT19810021447 19810429 CA19820401814 19820428

Probable Assignee: TONOLLI COSTRUZIONI SPA

Assignee(s): (std): TONOLLI COSTRUZIONI S P A ; TONOLLI COSTRUZIONI SPA

Assignee(s): FRACCHIA PIERLUIGI

Inventor(s): (std): FRACCHIA P ; FRACCHIA PIERLUIGI

Inventor(s): PIERLUIGI FRACCHIA : VERZICHT DES ERFINDERS AUF NENNUNG

Agent(s): MARKS AND CLERK

82) Family number: 2544847 (US4096045A)

Title: PROCESS FOR THE RECOVERY OF LEAD FROM LEAD SCRAPS

Abstract: A process for the recovery of lead from battery scraps by mixing the lead scraps at elevated temperature with an aqueous solution of an alkali metal chloride and hydrochloric acid in order to dissolve, in the form of lead chloride, the lead compounds present in the lead scraps, separating an aqueous solution of this lead chloride from insoluble hard lead, which is recovered, crystallizing lead chloride from the cooling aqueous solution, which is separated from the lead chloride crystals, and finally subjecting the obtained lead chloride to electrolysis for the recovery of metallic lead.

Classifications:

International (IPC 8-9): C22B13/00 C25C1/00 C25C1/18

C25C3/34 (Advanced/Invention);

C22B13/00 C25C1/00 C25C3/00

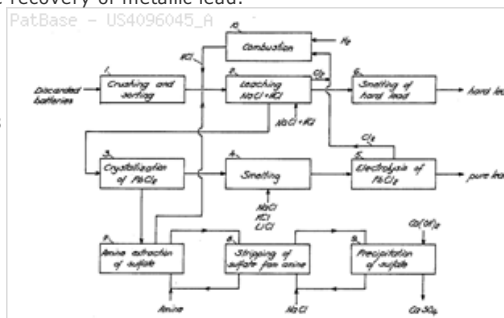
C22B (Subclass/Invention)

Internati
62562/24

CDC: G22B12/04E Y02B10/312

CPC: C22B13/045 Y02P1
European: C22B13/04B

European: C22B13/04R
US: 304/117 305/600 433/94

US: 204/117 205/600 423/94

Family:

Publication number	Publication date	Application number	Application date
DE2712898 A1	19771006	DE19772712898	19770324
DK130377 A	19770926	DK19770001303	19770324
FI61721 B	19820531	FI19760000814	19760325

FI61721 C	19820910	FI19760000814	19760325
FI760814 A	19770926	FI19760000814	19760325
GB1520224 A	19780802	GB19770012422	19770324
SE7703366 A	19770926	SE19770003366D	19770324
SE7703366 L	19770926	SE19770003366	19770324
US4096045 A	19780620	US19770780824	19770324

Priority:

FI19760000814 19760325

Probable Assignee: LYIJYVALKOISTEHD GROENBERG BLY

Assignee(s): (std): GROENBERG BLYVITTFAB ; LYIJYVALKOISTEHD GROENBERG BLY ; LYIJYVALKOISTEHDAS GROENBERG B ; LYIJYVALKOISTEHDAS GROENBERG ; LYIJYVALKOISTEHDAS GROENBERG BL ; LYIJYVALKOISTEHDAS GROENBERG OY ; LYIJYVALKOISTEHDAS O

Assignee(s): OY LYIJYVALKOISTEHDAS GROENBERG BLYVITTFABRIKEN GROENBERG AB ; OY LYIJYVALKOISTEHD GROENBERG BLYVITTFABR GROENBERG AB ; LYIJYVALKOISTEHDAS GROENBERG BLYVITTFABRIKEN GROENBERG AB ; OY ; LYIJYVALKOISTEHDAS GROENBERG OY BLYVITTFABRIKEN GROENBERG AB ; BLYVITTFABRIKEN GROENBERG AB OY

Inventor(s): (std): AHONEN H ; AHONEN HEIKKI ; AHONEN HEIKKI DIPL ING ; LINDROOS J ; LINDROOS JARI ; LINDROOS JARL ; SARKKINEN V ; SARKKINEN VELI ; SEPPEANEN R ; SEPPEANEN REIJO ; SEPPEANEN REIJO DIPL ING ; SEPPEANEN R

Inventor(s): V SARKKINEN ; R SEPPEANEN ; H AHONEN ; J LINDROOS

83) Family number: 32401873 (WO9426941A1)

© PatBase

Title: METHOD AND EQUIPMENT FOR THERMOLYTIC VACUUM PROCESSING OF SOLID PRODUCTS, WITH CONTINUOUS SEPARATION AND RECOVERY OF A LIQUID FRACTION OF THESE PRODUCTS

Abstract: Method for processing solid products containing a low melting point metal, comprising heating these products in a first zone, thermolyzing (2) them in a second zone at subatmospheric pressure while collecting, by means of an externally communicating siphon (7), the liquid metal flowing from the products, after which said products are reduced in a third zone. These zones are isolated from each other and from the outside by doors forming airlocks.

Classifications:

International (ipc 8-9): B09B3/00 C10B53/00 C10B53/07 C10B7/14 C22B1/00 C22B13/02 C22B5/02 C22B7/00 F27B9/02 F27B9/26 F27D3/14 H01M10/54 (Advanced/Invention); F27D3/00 (Advanced/Non-invention); B09B3/00 C10B53/00 C10B53/07 C10B7/00 C22B1/00 C22B13/00 C22B5/00 C22B7/00 F27B9/00 F27D3/14 H01M10/54 (Core/Invention); F27D3/00 (Core/Non-invention)

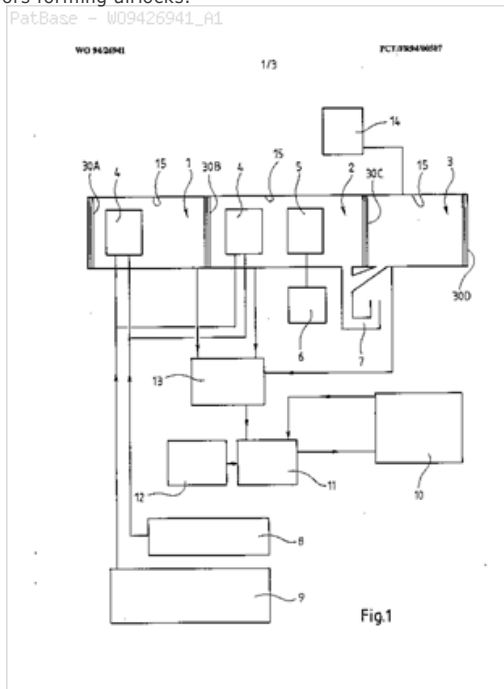
International (ipc 1-7): B09B3/00 C22B1/00 C22B7/00 C22B9/02 F27B9/02 F27B9/04

CPC: Y02W30/84 C22B5/02 C10B7/14 C10B53/00 C10B53/07 C22B7/003 C22B13/025 F27B9/028 F27B9/262 F27D3/14 F27D2003/0056 F27D2003/0072 H01M10/54 Y02P10/214 Y02P20/143

European: C10B53/00 C10B53/07 C10B7/14 C22B13/02R C22B5/02 C22B7/00B4 F27B9/02D F27B9/26B F27D3/14 H01M10/54 R27D3/00R10C R27D3/00R23 Y02E60/12

JP F-Term: 4D004 4D004/AA11 4D004/AA23 4D004/AA26 4D004/AB05 4D004/BA03 4D004/BA05 4D004/CA14 4D004/CA22 4D004/CA24 4D004/CA26 4D004/CA28 4D004/CA29 4D004/CA32 4D004/CA35 4D004/CA40 4D004/CB05 4D004/CB32 4D004/CB43 4D004/CB45 4D004/CC01 4D004/CC02 4D004/DA02 4D004/DA03 4D004/DA06 4D004/DA07 4D004/DA12 4K001 4K001/AA06 4K001/AA19 4K001/AA20 4K001/BA22 4K001/CA02 4K001/CA09 4K001/DA06 4K001/EA02 4K001/EA05 4K001/GA13 4K001/GA19 4K001/GB01 4K001/GB02 4K001/GB08 4K001/GB09 4K001/HA01 4K001/HA10

JP F-Index: B09B3/00/303/A C22B1/00 C22B7/00/F



Family:

Publication number	Publication date	Application number	Application date
DE0624656 T1	19950803	DE19940400958T	19940503
EP0624656 A1	19941117	EP19940400958	19940503
ES2071597 T1	19950701	ES19940400958T	19940503
FR2705103 A1	19941118	FR19930005645	19930511
FR2705103 B1	19950804	FR19930005645	19930511
GR950300001 T1	19950228	GR19950300001T	19950228
JP8510011 T2	19961022	JP19940525038T	19940503
WO9426941 A1	19941124	WO1994FR00507	19940503

Priority:

FR19930005645 19930511 WO1994FR00507 19940503

Probable Assignee: THERMOLYSE STE FRANCAISE

Assignee(s): (std): CHAUSSONNET PIERRE ; THERMOLYSE SOC FR DE ; THERMOLYSE SOC FRANCE ; THERMOLYSE STE FRANCAISE

Assignee(s): FRANCAISE DE THERMOLYSE AIX EN PROVENCE FR SOC ; FRANCAISE DE THERMOLYSE SOC ; SOCIETE FRANCAISE DE THERMOLYSE ; SOCIETE FRANCAISE DE THERMOLYSE AIX EN PROVENCE FR

Inventor(s): (std): CHAUSSONNET PIERRE ; PIERRE CHAUSSONNET

Inventor(s): CHAUSSONNET PIERRE F 13100 AIX EN PROVENCE FR

Designated states: AT BE CA CH DE DK ES FR GB GR IT JP LI LU MC NL PT RU SE US

Title: BATTERY PASTE RECYCLING PROCESS

Abstract: A method of recovering fine lead-containing particles (battery paste) from expended lead-acid batteries in a form which can be used as battery paste in the manufacturing of new batteries without smelting is disclosed. A method of heating lead carbonate particles to about 315 DEG C. to convert them to lead monoxide particles for use in battery manufacturing is also disclosed.

Classifications:

International (IPC 8-9): C01G21/06 C22B13/00 C22B3/04

H01M10/06 H01M10/54 (Advanced/Invention);

C22B13/00 H01M10/06 (Advanced/Non-invention);

C01G21/00 C22B13/00 C22B3/00 H01M10/54 (Core/Invention);

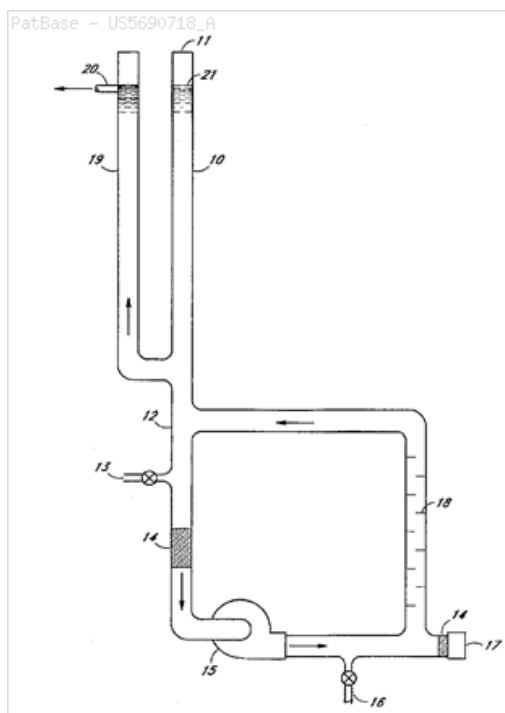
H01M10/06 (Core/Non-invention)

International (IPC 1-7): C01G21/02 C01G21/14 C22B13/00 C22B3/04

CPC: H01M10/54 C01G21/06 C01P2006/60 C22B13/045 H01M10/06 Y02W30/84 Y02P10/212

European: C01G21/06 C22B13/04R H01M10/54 M01P6/60 T01M10/06 Y02E60/12

US: 209/172.5 209/175 423/434 75/711 75/743

**Family:**

Publication number	Publication date	Application number	Application date
AU199671642 A1	19970428	AU19960071642	19960923
US5690718 A	19971125	US19950539993	19951006
WO9712998 A1	19970410	WO1996US15161	19960923

Priority:

US19950539993 19951006 WO1996US15161 19960923

Probable Assignee: GLOBAL AENER COLOGY CORP

Assignee(s): (std): GLOBAL AENER COLOGY CORP

Inventor(s): (std): SABIN CULLEN M

Inventor(s): CULLEN M SABIN

Designated states: AL AM AT AU AZ BB BE BF BG BJ BR BY CA CF CG CH CI CM CN CZ DE DK EE ES FI FR GA GB GE GN GR HU IE IL IS IT JP KE KG KP KR KZ LK LR LS LT LU LV MC MD MG MK MN MW MX NL NO NZ PL PT RO RU SD SE SG SI SK SZ TJ TM TR TT UA UG UZ VN

Title: PROCESS FOR THE HYDROMETALLURGICAL AND ELECTROCHEMICAL TREATMENT OF THE ACTIVE MASS OF EXHAUSTED LEAD BATTERIES, TO OBTAIN ELECTROLYTIC LEAD AND ELEMENTAL SULPHUR

Abstract: A hydrometallurgical and electrochemical process for treating exhausted lead batteries, in particular the active mass and the electrolyte, is described having as products electrolytically obtained lead and elemental sulphur. The active mass (paste) obtained from the mechanical processing of the exhausted batteries, consisting mainly of lead sulphate and dioxide, is dispersed in a dilute H₂SO₄ solution and then reacted with an Na₂S solution to convert all the lead compounds present into insoluble lead sulphide and sodium sulphate. After filtration, the sodium sulphate solution is evaporated to obtain the anhydrous salt. From this, by thermal reduction with carbon, the Na₂S is reformed for use in treating further paste. The lead sulphide obtained in this manner is leached with an electrolyte based on ferric fluoborate, which oxidizes the sulphide to elemental sulphur and solubilizes the lead in the form of fluoborate. After filtering the residue containing the elemental sulphur, the lead fluoborate solution is electrolyzed in a diaphragm cell to obtain electrolytic lead in the cathodic compartment and regenerate the ferric fluoborate in the anodic compartment for use in leaching further sulphide.

Classifications:

International (IPC 8-9): B09B3/00 C01B17/02 C01B17/06

C01B17/24 C01B17/26 C22B13/00 C22B3/04 C22B3/22 C22B7/00

C25C1/18 H01M10/54 (Advanced/Invention);

B09B3/00 C01B17/00 C22B13/00 C22B7/00 C25C1/00

H01M10/54 (Core/Invention)

International (IPC 1-7): B09B3/00 C01B17/02 C01B17/06

C01B17/24 C01B17/26 C22B13/00 C22B3/04 C22B3/22 C22B7/00

C25C1/18 C25D5/06 H01M10/54

CPC: C25C1/18 C22B13/045 H01M10/54 Y02W30/84 Y02P10/212

European: C22B13/04R C25C1/18 H01M10/54 Y02E60/12

US: 205/600 423/578.1 423/98

JP F-Term: 4D004 4D004/AA23 4D004/AC05 4D004/BA05

JP F-Index: B09B3/00/304/Z C01B17/06/A C01B17/24 C01B17/26
C22B7/00/C H01M10/54

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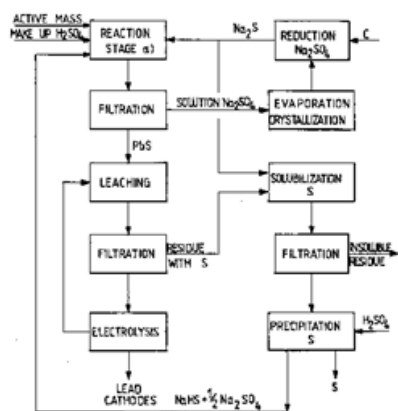


Fig.1

Publication number	Publication date	Application number	Application date
CA2141099 AA	19960726	CA19952141099	19950125
DE69601814 D1	19990429	DE19966001814	19960116
DE69601814 T2	19991104	DE19966001814T	19960116
EP0724306 A1	19960731	EP19960200096	19960116
EP0724306 B1	19990324	EP19960200096	19960116
JP8260063 A2	19961008	JP19960011212	19960125
US5630931 A	19970520	US19960591717	19960125

CA19952141099 19950125

Assignee(s): (std): ECOWIN SRL ; ECOCHEM VADUZ AG ; AMARNA SA ; ECOCHEM AG ; ECOCHEM AG VADUZ

Assignee(s): ECOCHEM AG VADUZ LI ; AMARNA S A ; ECOWIN SRL VIALE E JENNER ; ENGITEC SPA ; ECOWIN S R L ; EKOIUN SARL ; ECOCHEM AKTIENGESELLSCHAFT ; MANEQUINI ADILSON C ; SEMICONDUCTOR BV ; ECOCHEM VADUZ LI AG

Inventor(s): (std): MANEQUINI ADILSON C ; CASADEI MANEQUINI ADILSON

Inventor(s): ADEIRUSON KIYASADEI MANEKIINI ; CASADEI MANEQUINI ADILSON TORONTO ONTARIO CA

Agent(s): OGILVY RENAULT LLP SENCRL SRL

Designated states: DE FR GB IT

86) Family number: 9521920 (EP0581995A1)

Title: RECOVERY OF VALUABLE MATERIALS.

Abstract: The process enables wastes which are difficult to dispose of, such as dry batteries, fluorescent tubes, electronic scrap etc., to be reprocessed with recovery of valuable materials. For this purpose, a guide element, preferably zinc, is employed in sulphuric acid solution.

Classifications:

International (IPC 8-9): C22B7/00 H01M6/52 (Advanced/Invention);
C22B7/00 H01M6/00 (Core/Invention)

International (IPC 1-7): C22B7/00

CPC: H01M6/52 C22B7/007 Y02W30/84 Y02P10/234

European: C22B7/00D1 H01M6/52 Y02E60/12

Publication number	Publication date	Application number	Application date
AT147797 E	19970215	AT19920113522T	19920807
DE59207905 D1	19970227	DE19925007905	19920807
EP0581995 A1	19940209	EP19920113522	19920807
EP0581995 B1	19970115	EP19920113522	19920807
ES2098399 T3	19970501	ES19920113522T	19920807

EP19920113522 19920807

Assignee(s): (std): ARNOTECH CONSULTING AG

Inventor(s): (std): SCHWEIGER HERIBERT

Inventor(s): SCHWEIGER HERIBERT A 9601 ARNOLDSTEIN 206 AT

Designated states: AT BE CH DE DK ES FR GB GR IE IT LI LU MC NL PT SE

Abstract: A method for recovering a valuable material from a lithium-ion secondary battery, the method contains: roasting a lithium-ion secondary battery containing a valuable material in a metal battery case thereof to obtain a roasted material; stirring the roasted material with liquid to separate contents containing the valuable material from the inside of the metal battery case; and sorting the contents separated by the separation and the metal battery case to obtain a recovered material containing the valuable material.

International (IPC 8-9): B09B3/00 B09B5/00 C22B23/00 C22B3/00 C22B7/00 C22C19/07 H01M10/54 (Advanced/Invention); H01M10/0525 (Advanced/Non-invention); B09B3/00 C22B23/00 (Core/Invention)

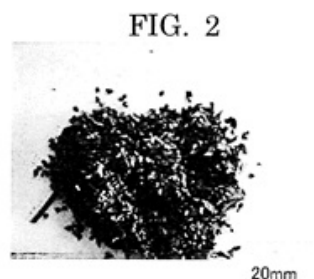
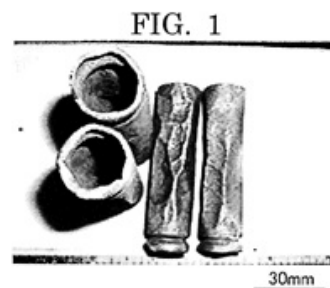
CPC: C22C19/07 C22B23/005 C22B23/04 C22B7/007 C22B23/0407
H01M10/0525 H01M10/54 Y02P10/234 Y02T10/7011 Y02W30/84

European: C22B23/04A C22B7/00D1 H01M10/54 T01M10/0525 Y02T10/70B2

US: 1/1 420/435 75/401

JP F-Term: 4D004 4D004/AA23 4D004/BA05 4D004/CA02
4D004/CA08 4D004/CA10 4D004/CA12 4D004/CA13 4D004/CA15
4D004/CA22 4D004/CA42 4D004/CB09 4D004/CB21 4D004/CC03
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5H031/BB02 5H031/BB04 5H031/HH03 5H031/HH09 5H031/RR02

JP F-Index: B09B3/00/Z B09B3/00/303/Z B09B5/00/A H01M10/54
JP Facet: ZAB

**Family:**

Publication number	Publication date	Application number	Application date
CN103270644 A	20130828	CN201180062915	20111206
EP2650961 A1	20131016	EP20110854212	20111206
JP2012138301 A2	20120719	JP20100291012	20101227
JP5651462 B2	20150114	JP20100291012	20101227
SG191357 A1	20130830	SG20130049135	20111206
TH130104 A	20131211	TH20131003635	20111206
US2013287621 AA	20131031	US20130927428	20130626
US9359659 BB	20160607	US20130927428	20130626
WO12090654 A1	20120705	WO2011JP78153	20111206

Priority:

JP20100291012 20101227 WO2011JP78153 20111206

Probable Assignee: DOWA ECO SYSTEM CO LTD**Assignee(s):** (std): DOWA ECO SYSTEM CO LTD ; FUJITA KOJI ; HONMA YOSHIHIRO ; KAWAKAMI SATOSHI ; WATANABE RYOEI**Assignee(s):** DOWA ECO SYSTEM CO**Inventor(s):** (std): FUJITA KOJI ; FUJITA KOUJI ; HONMA YOSHIHIRO ; KAWAKAMI SATOSHI ; WATANABE AKISHIGE ; WATANABE RYOEI**Agent(s):** HILL CHRISTOPHER MICHAEL; CARMODY TORRANCE SANDAK AND HENNESSEY LLP; HIROTA KOICHI ET AL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PE PG PH PL PT QA RO RS RU RW SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

88) Family number: 42044949 (US2010034715A)

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Title: RECOVERY OF LEAD IN FORM OF HIGH PURITY LEAD CARBONATES FROM SPENT LEAD BATTERIES INCL. ELECTRODE PASTE

Abstract: Wet process of low environmental impact recovers the lead content of an electrode slime and/or of lead minerals in the valuable form of high purity-lead carbonates that are convertible to highly pure lead oxide by heat treatment in oven at relatively low temperature, perfectly suited for making active electrode pastes of new batteries or other uses. The process basically comprises the following steps: a) adding sulphuric acid to a different acid leach suspension of the starting impure material for converting all dissolved lead compounds to insoluble lead sulphate; b) separating the solid phase constituted by lead sulphate and undissolved impurities from the acid leach solution; c) selectively dissolving lead sulphate contained in said separated solid phase in an aqueous solution of a lead solubilizing compound comprising preferably sodium acetate; d) separating the solution containing dissolved lead sulphate from the solid phase residue including undissolved impurities; e) adding to the separated solution of lead sulphate a carbonate of the same cation of said dissolving compound for forming insoluble lead carbonate and/or and lead oxycarbonate and a dissolved sulphate of the same cation; f) separating the

precipitated carbonate and/or oxycarbonate of lead from the dissolving solution now containing also sulphate of the cation of said solubilizing compound.

Classifications:

International (IPC 8-9): B01J19/18 B01J8/00 B09B3/00 C01G C01G1/14 C01G21/00 C01G21/06 C01G21/12 C01G21/14 C22B C22B13/00 C22B3/02 C22B3/04 C22B3/08 C22B3/16 C22B3/20 C22B3/44 C22B7/00 H01M H01M10/04 H01M10/54 (Advanced/Invention); B01J8/00 B09B3/00 C01G1/00 C01G1/14 C01G21/00 C22B13/00 C22B3/00 C22B7/00 H01M10/00 H01M10/54 (Core/Invention); B01J19/18 C01G21/06 C01G21/12 C01G21/14 (Core/Non-invention)

International (IPC 1-7): C22B13/00

CPC: C22B13/045 C01G21/02 C01G21/14 C22B3/165 C22B7/007 H01M6/52 H01M10/06 H01M10/54 C22B3/08 Y02W30/84 Y02P10/234

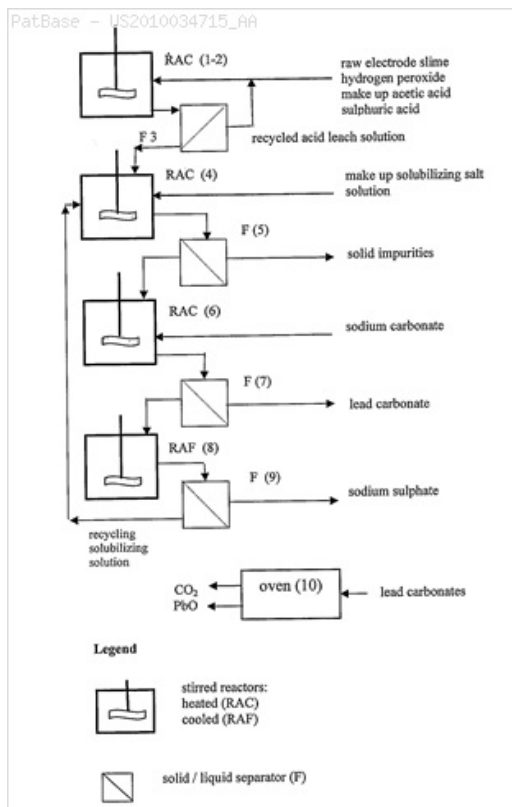
European: C01G21/02 C01G21/14 C22B13/04R C22B3/08 C22B3/16B2G C22B7/00D1 H01M10/54 T01M10/06 T01M6/52 Y02E60/12

US: 266/101 266/101S 266/186 266/186S 422/187 422/187S 422/224 422/225 423/435 423/559 423/619 423/92 423/92P 423/93 423/95 423/98 75/711 75/711S 75/739 75/739P 75/743 75/743P

JP F-Term: 4D004 4D004/AA23 4D004/AB03 4D004/BA05 4D004/CA37 4D004/CA40 4D004/CC12 4D004/DA03 4D004/DA06 4D004/DA10 4K001 4K001/AA20 4K001/BA22 4K001/DB02 4K001/DB05 4K001/DB08 4K001/DB09 4K001/DB11 4K001/DB14 4K001/DB22 5H031 5H031/AA01 5H031/BB01 5H031/BB02 5H031/BB09 5H031/EE03 5H031/EE04 5H031/HH03 5H031/HH06 5H031/RR02 5H031/RR07 4D004/AC05 4D004/CA13 4D004/CA15 4D004/CA22 4D004/CC11 4K001/BA03 4K001/BA17 4K001/DB03 4K001/DB23 4K001/DB24 4K001/EA06 4K001/JA03 5H028 5H028/BB02 5H028/BB05 5H028/BB06 5H028/BB10 5H028/BB15 5H028/BB18 5H028/EE02 5H028/EE04 5H028/EE06 5H028/HH03 5H028/HH08 5H031/BB04 5H031/HH00

JP F-Index: B09B3/00/304/Z C22B13/00/101 C22B3/00/A C22B3/00/P C22B3/06 C22B3/12 C22B3/14 C22B3/16 C22B3/44/101/Z C22B7/00/C C22B7/00/G H01M10/54 C22B3/00/B C22B3/00/Q C22B3/00/R C22B3/08 C22B3/44/101/A C22B3/44/101/B H01M10/04/Z

JP Facet: ZAB



Family:

Publication number	Publication date	Application number	Application date
AU2008206662 AA	20080724	AU20080206662	20080115
AU2008206662 BB	20120823	AU20080206662	20080115
AU2009350377 AA	20110203	AU20090350377	20090730
BR112012002125 A2	20170905	BR20121102125	20090730
BRPI0806947 A2	20140506	BR2008PI06947	20080115
CA2675403 AA	20090714	CA20082675403	20080115
CA2769175 AA	20110203	CA20092769175	20090730
CN101636512 A	20100127	CN200880005365	20080115
CN101636512 B	20130102	CN200880005365	20080115
CN102576918 A	20120711	CN200980161170	20090730
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EP2460220 A1	20120606	EP20090787811	20090730
HK1139187 A1	20100910	HK20100104714	20100514
IN01754DN2012 A	20150605	IN2012DN01754	20120227
IN04799DN2009 A	20100305	IN2009DN04799	20090722
ITVA20070007 A1	20080718	IT2007VA00007	20070117
JP2010516891 T2	20100520	JP20090546070T	20080115
JP2013500566 T2	20130107	JP20120522342T	20090730
MX2009007675 A1	20091214	MX20090007675	20080115
MX2012001350 A1	20120222	MX20120001350	20090730
RU2009131073 A	20110227	RU20090131073	20080115
RU2012107523 A	20130910	RU20120107523	20090730
RU2457264 C2	20120727	RU20090131073	20080115
TW201119946 A	20110616	TW20100124261	20100723
UA100651 C2	20130110	UA20120002394	20090730
UA98949 C2	20120710	UA20090008600	20080115
US2010034715 AA	20100211	US20080523096	20080115
US2010043600 AA	20100225	US20090611630	20091103
US2012186397 AA	20120726	US20090388012	20090730
US7998440 BB	20110816	US20090611630	20091103
US8147780 BB	20120403	US20080523096	20080115
WO08087684 A1	20080724	WO2008IT00022	20080115
WO11013149 A1	20110203	WO2009IT00344	20090730

Priority:

IT2007VA00007 20070117 US20080523096 20080115 WO2008IT00022 20080115
WO2009IT00344 20090730 US20090523096 20091002 US20090611630 20091103

Probable Assignee: MILLBROOK LEAD RECYCLING TECHNOLOGIES LTD

Assignee(s): (std): MARTINI FEDERICA ; MILLBROOK LEAD RECYCLING TECH ; MILLBROOK LEAD RECYCLING TECHN ; MILLBROOK LEAD RECYCLING TECHNOLOGIES LTD ; MILLBRUK LID RESAJKLING TEKNOLODZHIZ LTD ; MILLBROOK LEAD RECYCLING TECHN IE

Assignee(s): MILLBRUK LID RESAJKLING TEKNOLODZHIZ LIMITED ; MILLBROOK LEAD RECYCLING TECHNOLOGIES LIMITED ; MILBROOK LEAD RECYCLING TECHNOLOGIES LTD ; MILLBROOK LEAD RECYCLING TECHNOLOGI ES LIMITED ; MILLBROOK LEAD RECYCLING TECHNOLOGI ES LTD

Inventor(s): (std): FEDERICA MARTINI ; MARTINI FEDERICA ; MARTINI FEDERIKA

Agent(s): DAVIES COLLISON CAVE; DAVIES COLLISON CAVE PTY LTD; BROUILLETTE AND ASSOCIES PARTNERS; PELLEGGRI ALBERTO; CLT PATENT AND TRADEMARK HK LTD; CONNOLLY BOVE LODGE AND HUTZ LLP; PELLEGGRI ALBERTO ET AL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PE PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

89) Family number: 32481952 (US5858061A) © PatBase

Title: PROCESS FOR THE RECOVERY OF METALS FROM USED NICKEL/METAL HYDRIDE STORAGE BATTERIES

Abstract: In the recycling of used nickel/metal hydride storage batteries, the battery scrap is dissolved in sulphuric acid after mechanical separation of the coarse constituents by magnetic and air separation. A solvent extraction is performed with the digestion solution, from which the rare earths (from the hydrogen-storage alloys in the negative electrodes) and iron and aluminum have been selected by precipitation, under conditions pH, choice of solvent, volumetric ratio of the phases) which are such that the aqueous phase contains nickel and cobalt in the same atomic ratio as that in which they were present in the scrap. This makes possible a joint recovery by simultaneous electrolysis, in which process the deposition product forms a master alloy which can be used, together with the precipitated rare earths which have been electrometallurgically reprocessed as misch metal, for the production of fresh hydrogen-storage alloys.

Classifications:

International (IPC 8-9): B03B9/06 C22B23/00 C22B3/00 C22B3/04 C22B3/20 C22B3/26 C22B3/38 C22B3/40 C22B3/44 C22B7/00 H01M10/54 H01M6/52 (Advanced/Invention); H01M10/34 (Advanced/Non-invention); B03B9/00 C22B3/00 C22B7/00 H01M10/54 H01M6/00 (Core/Invention)

International (IPC 1-7): B03B9/06 C22B3/00 C22B3/04 C22B3/20 C22B3/26 C22B3/38 C22B3/44 C22B7/00 H01M10/54 H01M6/52

CPC: C22B3/0068 C22B3/0005 C22B3/0095 C22B3/44 C22B7/007 C22B23/04 H01M10/345 H01M10/54 Y02W30/84 Y02P10/234 Y02E60/124

European: C22B23/04 C22B3/00D2 C22B3/00D2M2P2B12R C22B3/00D2M4 C22B3/00D6 C22B3/44 C22B7/00D1 H01M10/54 H01M6/52 T01M10/34D Y02E60/12

US: 429/49 75/711

JP F-Term: 4K001 4K001/AA02 4K001/AA06 4K001/AA07 4K001/AA10 4K001/AA16 4K001/AA19 4K001/AA30 4K001/AA39 4K001/BA22 4K001/CA01 4K001/CA04 4K001/DB02 4K001/DB03 4K001/DB04 4K001/DB21 4K001/DB23 4K001/DB26 4K001/DB31 4K001/EA02 4K001/EA04 4K001/EA06 4K001/GA16 4K001/HA01 4K001/HA03 4K001/JA03 5H031 5H031/AA02 5H031/BB00 5H031/BB09 5H031/EE01 5H031/HH03 5H031/HH06 5H031/RR02

JP F-Index: C22B23/00/102 C22B3/00/A C22B3/00/H C22B3/00/J C22B3/00/Q C22B3/06 C22B3/08 C22B3/10 C22B3/38 C22B3/44/101/A C22B7/00/C H01M10/54

Family:

Publication number	Publication date	Application number	Application date
AT171568 E	19981015	AT19950940265T	19951201
CA2207575 AA	19970611	CA19952207575	19951201
CA2207575 C	20061010	CA19952207575	19951201
CN1090827 C	20020911	CN19951096964	19951201
CN1171170 A	19980121	CN19951096964	19951201
DE4445496 A1	19960627	DE19944445496	19941220
DE59503738 D1	19981029	DE19955003738	19951201
DK0800710 T3	19990614	DK19950940265T	19951201
EP0800710 A1	19971015	EP19950940265	19951201
EP0800710 B1	19980923	EP19950940265	19951201
ES2122701 T3	19981216	ES19950940265T	19951201
HK1005965 A1	20030328	HK19980105127	19980610
JP10510878 T2	19981020	JP19960519456T	19951201
JP3918041 B2	20070523	JP19960519456T	19951201
US5858061 A	19990112	US19970896512	19970616
WO9619840 A1	19960627	WO1995EP04735	19951201

Priority:

DE19944445496 19941220 DE19955003738 19951201 WO1995EP04735 19951201

Probable Assignee: VARTA AUTOMOTIVE SYSTEMS GMBH

Assignee(s): (std): BOUVIER ALEXANDER ; FOELZER ANDREAS ; KLEINSORGEN KLAUS ; KOEHLER UWE ; NBT GMBH ; TREIBACHER AUERMET ; VARTA BATTERIE ; TREIBACHER AUERMET PROD GMBH ; TREIBACHER AUERMET PRODUKTIONSGES M B H ; VARTA BATTERIE ATKIENGESELLSCH ; VARTA BATTERIE AG

Assignee(s): VARTA BATTERIE 30419 HANNOVER DE AG ; VARTA BATTERIE ATKIENGESELLSCHAFT ; VARTA BATTERIE AG 30419 HANNOVER DE ; VARTA BATTERIE AKTIENGESELLSCHAFT ; TREIBACHER AUERMET PRODUKTIONSGES M B H TREIBACH ALTHOFEN AT ; TREIBACHER INDUSTRIE AG ; KOHLER UWE ; VARTA AUTOMOTIVE GMBH ; VARTA AUTOMOTIVE SYSTEMS GMBH ; TREIBACHER AUERMET PRODUKTIONSGESMBH ; TREIBACHER AUERMET PRODUKTIONSGES MBH ; FOLZER ANDREAS

Inventor(s): (std): KOEHLER UWE ; KOHLER UWE ; U KERLER ; KOEHLER UWE DR ; KLEINSORGEN K ; KERLER U ; K HLER UWE ; F LZER ANDREAS ; BOUVIER ALEXANDER DR ; BOUVIER A ; A BOUVIER ; BOUVIER ALEXANDER ; FOELZER ANDREAS ; FOLZER ANDREAS ; K KLEINSORGEN ; KLEINSORGEN KLAUS

Inventor(s): KLEINSORGEN KLAUS 65779 KELKHEIM DE ; FOELZER ANDREAS A 9330 TREIBACH ALTHOFEN AT ; BOUVIER ALEXANDER A 9021 KRUMPENDORF AT ; KIHLE UWE ; FILZER ANDREAS ; FOELZER ANDREAS TREIBACH ALTHOFEN AT ; KOEHLER UWE D 65779 KELKHEIM DE ; KLEINSORGEN KLAUS D 65779 KELKHEIM DE

Agent(s): FETHERSTONHAUGH AND CO

Designated states: AT BE CA CH CN DE DK ES FR GB GR IE IT JP LI LU MC NL PT SE SG US

90) Family number: 12727952 (JP11097076A) © PatBase

Title: METHOD FOR PROCESSING BATTERY

Abstract: PROBLEM TO BE SOLVED: To safely and efficiently recover and recycle various kinds of metals from wastes of battery packs of a primary battery and a secondary battery by immersing electrodes in acid liquid, eroding binder, and separating a collector and an active material from each other. SOLUTION: After discharging, a battery and a battery pack are disassembled and washed, an electrolyte in the battery is recovered, and ferrous components for constituting a housing are removed by selection with magnetic force. After that, recovering of various kinds of metallic compounds for constituting a collector of an electrode and the active material is performed by wet processing. The collector and an active material layer are impregnated in sulfuric acid or nitric acid. Therefore, acid enters between the collector and the active material, the collector is a little dissolved, and the active material is separated. The positive electrode active material is dissolved in acid, adjusted in pH, separated into Co and Li, and recovered. The collector is adjusted in pH with sulfuric acid used in the before process, and Al is recovered. Copper is recovered by electrolysis. Moreover, the pH adjustment is performed, and Co and Li are recovered.

Classifications:

International (IPC 8-9): B09B5/00 C22B7/00 H01M10/54

H01M6/52 (Advanced/Invention);

B09B5/00 C22B7/00 H01M10/54 H01M6/00 (Core/Invention)

International (IPC 1-7): B09B5/00 C22B7/00 H01M10/54 H01M6/52

CPC: C22B7/007 C22B26/12 H01M6/52 H01M10/54 Y02W30/84

Y02P10/234 Y02P10/236

European: C22B26/12 C22B7/00D1 H01M10/54 H01M6/52

Y02E60/12

JP F-Term: 4D004 4D004/AA23 4D004/BA05 4D004/CA04

4D004/CA09 4D004/CA10 4D004/CA12 4D004/CA22 4D004/CA35

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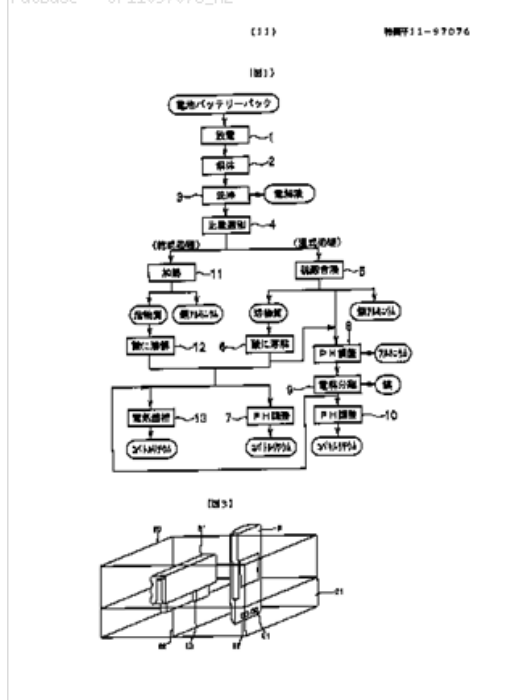
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5H031 5H031/BB00 5H031/EE01 5H031/HH03 5H031/RR02

JP F-Index: B09B5/00A C22B7/00C H01M10/54

JP Facet: ZAB

PatBase - JP11097076_A2



Family:

Publication number	Publication date	Application number	Application date
DE19842658 A1	19990401	DE19981042658	19980917
DE19842658 B4	20040805	DE19981042658	19980917
JP11097076 A2	19990409	JP19970253910	19970918
JP3452769 B2	20030929	JP19970253910	19970918

Priority:

JP19970253910 19970918

Probable Assignee: TOSHIBA CORP

Assignee(s): (std): TOSHIBA CORP ; TOSHIBA KAWASAKI KK

Assignee(s): TOSHIBA KK ; TOSHIBA KAWASAKI KANAGAWA JP KK ; KABUSHIKI KAISHA TOSHIBA ; KABUSHIKI KAISHA TOSHIBA KAWASAKI ; KABUSHIKI KAISHA TOSHIBA KAWASAKI KANAGAWA JP

Inventor(s): (std): FURUYA TOMIAKI ; HAYASHI MASARU ; KONUMA MASATAKA ; ONUMA MASAYUKI ; TADAUCHI KIMIHIRO ; TADAUCHI MASAHIRO ; TEZUKA FUMINOBU ; TOMIOKA YOSHIKI ; TOMIOKA YUKI ; YABUKI MOTONAKA ; YABUKI MOTOO

Inventor(s): YABUKI MOTONAKA KANAGAWA JP ; TOMIOKA YUKI SAYAMA SAITAMA JP ; TEZUKA FUMINOBU YOKOHAMA KANAGAWA JP ; TADAUCHI MASAHIRO TOKIO TOKYO JP ; ONUMA MASAYUKI YOKOHAMA KANAGAWA JP ; HAYASHI MASARU YOKOHAMA KANAGAWA JP ; FURUYA TOMIAKI YOKOHAMA KANAGAWA JP

Agent(s): MIYOSHI HIDEKAZU

91) Family number: 13225958 (US5538532A)

© PatBase

Title: METHODS FOR RECYCLING ELECTRIC ARC FURNACE DUST

Abstract: A method for the separation and recovery of metals selected from the group consisting of iron, cadmium, zinc, and lead, from raw material comprising a mixture of metals, which comprises the steps of heating the raw material to a temperature sufficient to substantially vaporize cadmium, zinc, and lead, and insufficient to substantially vaporize iron; separating secondary dust and vapors produced during the first step from the residual sinter mass, which mass comprises iron; slurrying the secondary dust in an aqueous solution of ammonia ammonium carbonate to dissolve zinc and cadmium; separating a zinc/cadmium bearing leach liquor from substantially insoluble lead containing particles by filtration; treating the zinc/cadmium bearing leach liquor to recover cadmium by adding metallic zinc to the leachate to produce a cadmium containing cement; separating the cement from the leach liquor; and removing ammonia from the leach liquor to precipitate basic zinc carbonate. The methods of the invention are especially suitable for treating electric arc furnace dusts.

Classifications:

International (IPC 8-9): C21B3/04 C22B17/00 C22B19/30 C22B5/16

C22B7/02 (Advanced/Invention);

C21B3/00 C22B17/00 C22B19/00 C22B5/00

C22B7/02 (Core/Invention)

International (IPC 1-7): C21B11/10 C22B7/02

CPC: Y10S75/961 Y02W30/542 C21B3/04 C22B5/16 C22B7/02

C22B17/00 C22B19/24 C22B19/30 Y02P10/216 Y02P10/234

European: C21B3/04 C22B17/00 C22B19/24 C22B19/30 C22B5/16



Priority:

US19950397409 19950302 US19960644836 19960510

Probable Assignee: COMPLETE RECOVERY PROCESS LLC

Assignee(s): (std): COMPLETE RECOVERY PROCESS ; COMPLETE RECOVERY PROCESS LLC

Inventor(s): (std): KEEGEL JR JOSEPH F

92) Family number: 11040982 (US5785923A)

Title: APPARATUS FOR CONTINUOUS FEED MATERIAL MELTING

Abstract: The apparatus of the present invention is a melter housing having a pretreat chamber heated with a feed material heater that is partially isolated from a melter chamber. The method of the present invention has the steps of introducing feed material into a pretreat chamber and heating the feed material to a softening temperature of the feed material, and passing the pretreated feed material to a melter chamber.

Classifications:

International (IPC 8-9): C03B3/02 C03B5/027 C03B5/03 C03B5/235 C22B7/00 C22B9/00 C22B9/21 F27B3/04 F27B3/18

F27D17/00 (Advanced/Invention):

C03B3/00 C03B5/00 C22B7/00 C22B9/00 C22B9/16 F27B3/00

F27B3/10 F27D17/00 (Core/Invention)

International (IPC 1-7): C22B9/21

CPIC: Y10S266/90 C03B3/02 C03B3/026 F27B3/045 C03B5/0272
C03B5/031 C03B5/235 C22B7/003 C22B9/00 F27B3/18 F27D17/008
Y02P40/57 Y02P10/212

European: C03B3/02 C03B5/027C C03B5/03B C03B5/235

C22B7/00B4 C22B9/00 F27B3/04B F27B3/18 F27D17/00E

US: 110/211 266/144 266/900 373/21 373/22 373/34 65/335



Priority:

US19960612692 19960308

Probable Assignee: BATTELLE MEMORIAL INST

Assignee(s): (std): BATTELLE MEMORIAL INST ; BATTELLE MEMORIAL INSTITUTE

Inventor(s): (std): PEREZ JR JOSEPH M ; SURMA JEFFREY E

Search history

- Search 1: SFT=((Lead battery w5 recycle*) and PD<20150729 and IC=(C22B13/06 or C22B7/00) (Results 0)
- Search 2: SFT=((Lead battery w5 recyl*) and PD<20150729 and IC=(C22B13/06 or C22B7/00) (Results 3)
- Search 3: SFT=((Lead w5 recyl*) and PD<20150729 and IC=(C22B13/06 or C22B7/00) (Results 177)
- Search 4: SFT=((Lead w5 recyl*) and PD<20150729 and IC=(C22B13/06 or C22B7/00) (Results 177)
- Search 5: SFT=((Lead and battery) w5 recyl*) and PD<20150729 and IC=(C22B13/06 or C22B7/00) (Results 14)

1) Family number: 34114026 (US2010040938A)

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Title: LEAD RECYCLING

Abstract: The present invention describes a method of recycling lead from lead containing waste, the method comprising the steps of mixing the battery paste with aqueous citric acid solution so as to generate lead citrate; isolating lead citrate from the aqueous solution; and converting the lead citrate to lead and/or lead oxide.

Classifications:

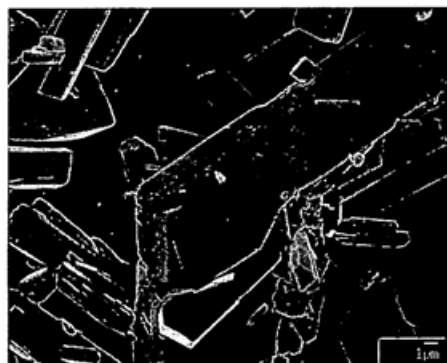
International (IPC 8-9): C01G21/00 C01G21/06 C22B13/00 C22B3/04 C22B7/00 H01M10/54 H01M6/52 (Advanced/Invention); C22B13/00 C22B7/00 H01M10/54 H01M6/00 (Core/Invention)

CPC: C22B13/045 C22B3/165 C22B7/007 H01M4/56 H01M6/52 H01M10/06 H01M10/54 Y02W30/84 Y02P10/234

European: C22B13/04R C22B3/16B2G C22B7/00D1 H01M10/54 H01M6/52 T01M10/06 T01M4/56 Y02E60/12

US: 423/92 423/98 429/49 429/49P 562/400 75/432 75/432S 75/711 75/711S 75/714 75/743

PatBase - US2010040938_AA



Family:

Publication number	Publication date	Application number	Application date
CN101573461 A	20091104	CN200780041628	20071106
CN101573461 B	20120808	CN200780041628	20071106
EP2089553 A1	20090819	EP20070824458	20071106
GB200622249 A0	20061220	GB20060022249	20061108
IN02216KN2009 A	20090703	IN2009KN02216	20090615
RU2009117620 A	20101220	RU20090117620	20071106
RU2486266 C2	20130627	RU20090117620	20071106
US2010040938 AA	20100218	US20070513707	20071106
US8323376 BB	20121204	US20070513707	20071106
WO08056125 A1	20080515	WO2007GB04222	20071106

Priority:

GB20060022249 20061108 WO2007GB04222 20071106

Probable Assignee: CAMBRIDGE ENTERPRISE LTD

Assignee(s): (std): CAMBRIDGE ENTPR LTD ; UNIV CAMBRIDGE TECH ; SONMEZ SEREF ; KOTZEVA VEGA PETROVA ; KUMAR RAMACHANDRAN VASANT ; KEMBRIDZH EHNTERPRAJZ LTD

Assignee(s): CHANCELLOR MASTERS AND SCHOLARS OF UNIV OF CAMBRIDGE ; CHANCELLOR MASTERS AND SCHOLARS OF UNIV OF CAMBRID ; CAMBRIDGE UNIV TECHNICAL SERVICES LTD ; CAMBRIDGE UNIVERSITY TECHNICAL SERVICES LIMITED ; CAMBRIDGE ENTERPRISE LIMITED ; CAMBRIDGE ENTERPRISE LTD

Inventor(s): (std): KUMAR RAMACHANDRAN VASANT ; PETROVA KOTZEVA VEGA ; SEREF SONMEZ ; SONMEZ SEREF ; VASANT KUMAR RAMACHANDRAN ; KOTZEVA VEGA PETROVA

Inventor(s): KUMAR RAMACHANDRAN ; KOTZEVA VEGA

Agent(s): WILLS ANDREW JONATHAN; MICHAEL BEST AND FRIEDRICH LLP; WATSON ROBERT ET AL

Designated states: AE AG AL AM AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN SV SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

2) Family number: 54323058 (WO14154160A1)

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Title: HYDROMETALLURGICAL PROCESS FOR RECOVERING LEAD FROM LEAD SULFATE

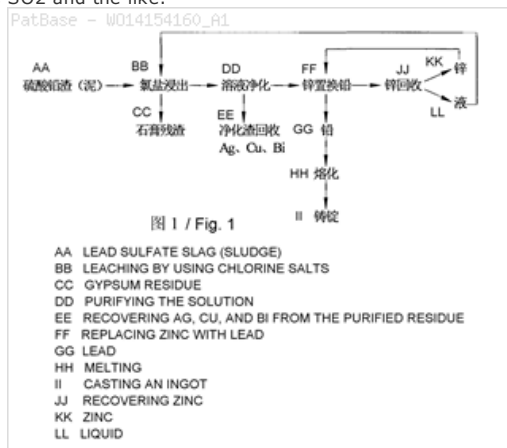
Abstract: A hydrometallurgical process for recovering lead from lead sulfate; the process uses $\text{CaCl}_2 + \text{NaCl}$ as a leach solution to leach the high leaching residue containing lead sulfate obtained from hydrometallurgy of zinc, the lead slag obtained by leaching zinc from lead-containing zinc oxide, or the lead sludge obtained by dismantling a lead-acid accumulator; replacing zinc with lead from the leached liquid; recovering zinc from the replaced liquid; the recovered zinc is returned to the lead replacement process, and the Cl-containing liquid after zinc recovery is circulated to the lead sulfate leaching process using chlorine salts. The process has low energy consumption and low cost, and is easy to apply, and can thoroughly eliminate flue gas pollution such as lead fumes, lead dust, SO_2 and the like.

Classifications:

International (IPC 8-9): C22B13/00 C22B13/06 C22B19/00

C22B3/10 C22B3/44 C22B3/46 C22B7/00 (Advanced/Invention)

CPC: C22B13/045 C22B19/30 Y02P10/214 C22B3/10 C22B3/46 Y02P10/234



Family:

Publication number	Publication date	Application number	Application date
AU2014201760 AA	20141016	AU20140201760	20140324
AU2014201760 BB	20160908	AU20140201760	20140324
CN103194615 A	20130710	CN201310100691	20130327
CN103194615 B	20140604	CN201310100691	20130327
EP2975141 A1	20160120	EP20140773683	20140327
EP2975141 A4	20160608	EP20140773683	20140327
EP2975141 B1	20181010	EP20140773683	20140327
WO14154160 A1	20141002	WO2014CN074192	20140327

Priority:

CN201310100691 20130327 WO2014CN074192 20140327

Probable Assignee: YUNNAN XIANGYUN FEILONG NON FERROUS METALS CO LTD

Assignee(s): (std): YUNNAN XIANGYUN FEILONG NON FERROUS METALS CO LTD ; YUNNAN XIANGYUN FEILONG RECYCLING TECHNOLOGY CO LTD ; YUNNAN XIANGYUNFEILONG RESOURCES RECYCLING TECH CO LTD ; YUNNAN XIANGYUNFEILONG RESOURCES RECYCLING TECHNOLOGY CO LTD

Assignee(s): YUNNAN XIANGYUNFEILONG RESOURCES RECYCLING TECHNOLOGY CO ; YUNNAN XIANGYUN FEILONG NON FERROUS METALS CO

Inventor(s): (std): SHU YUZHANG ; TIAN XILIN

Agent(s): GBIP LTD; SUN YIMING; BEIJING UTC LIANFENG INTELLECTUAL PROPERTY LAW OFFICE GENERAL PARTNERSHIP

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

3) Family number: 47786156 (CN101899576A)

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Title: METHOD FOR RECYCLING LEAD FROM LEAD-ACID BATTERY PASTE

Abstract: The invention relates to a method for recycling lead from lead-acid battery paste, which comprises the following steps of: firstly, desulfurizing paste with the reaction as follows: $\text{PbSO}_4 + \text{Na}_2\text{CO}_3 = \text{PbCO}_3 + \text{Na}_2\text{SO}_4$; secondly, carrying out filter pressing on the paste to obtain filter cakes; thirdly, treating the filter cakes with the reaction as follows: $\text{PbO}_2 + \text{H}_2 - 2 = \text{PbO} + \text{H}_2\text{O} + \text{O}_2$, $\text{PbO}_2 + \text{Pb} = 2\text{PbO}$, $\text{PbO} + \text{H}_2\text{SiF}_6 + \text{PbSiF}_6 + \text{H}_2\text{O}$, $\text{PbCO}_3 + \text{H}_2\text{SiF}_6 = \text{PbSiF}_6 + \text{H}_2\text{O} + \text{CO}_2$; fourthly, preparing lead by electrodeposition through the step of obtaining a PbSiF_6 solution in the third step, preparing electrolyte after the filter pressing treatment to the PbSiF_6 solution, then carrying out electrodeposition on the electrolyte, and controlling the density of current in $150\text{--}180\text{A/m}^2$ and the temperature between 35 degrees centigrade and 50 DEG C. The method has the advantages of high lead recovery rate, high purity of recovered lead and environmental protection. The invention belongs to the technical field of environment protection.

Classifications:

International (IPC 8-9): C22B13/00 C22B3/04 C22B7/00 C25C1/18 (Advanced/Invention);

C22B13/00 (Advanced/Non-invention)

CPC: Y02P10/234

Family:

Publication number	Publication date	Application number	Application date
CN101899576 A	20101201	CN201010258814	20100820

Priority:

CN201010160838 20100430 CN201010258814 20100820

Probable Assignee: ZHEJIANG HUITONG POWER SUPPLY CO LTD

Assignee(s): (std): ZHEJIANG HUITONG POWER SUPPLY CO LTD

Assignee(s): ZHEJIANG HUITONG POWER SUPPLY CO

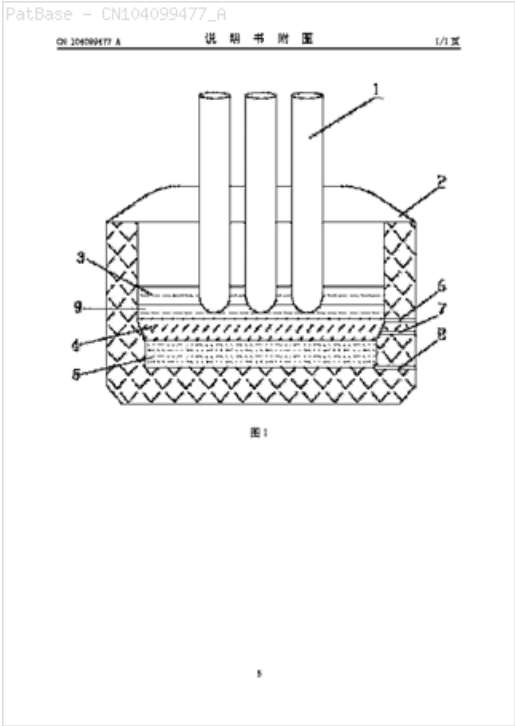
Inventor(s): (std): KUNYUAN JIAO ; XINGHU WEI
Inventor(s): WEI XINGHU ; JIAO KUNYUAN

4) Family number: 57575194 (CN104099477A) © PatBase

Title: METHOD FOR RECYCLING OF WASTE LEAD ACID BATTERY THROUGH HIGH-TEMPERATURE ARC MELTING

Abstract: The invention provides a method for the recycling of a waste lead acid battery through high-temperature arc melting. The method comprises the following steps: a high-temperature metal solution layer and a slag layer for protection are formed in a special electric-arc furnace; crushed sorted waste lead acid battery material is continuously added into a high-temperature solution layer molten pool in the electric-arc furnace through a special feeding device; pure lead is sunken to the bottom of the high-temperature solution layer after melting, the lead compound and other impurities in the material are subjected to reduction in reducing atmosphere with the temperature of 1200-1600 DEG C, and part slag charge in the material floats to the high-temperature molten liquid level to form a waste residue layer; heavy metals, which are not molten in the waste residue layer is subjected to smelting reduction in the waste residue layer and extracted out under the effect of high-temperature arc, and under the effect of density of the heavy metals, the heavy metals are sunken and mixed into a whole with a lead liquid layer; according to the weight of raw materials fed into the furnace and rate of finished products during melting, the height of the molten lead liquid layer is calculated or estimated, discharge is performed at proper time so as to ensure continuous melting process.

Classifications:
International (IPC 8-9): C22B13/02 C22B7/00
H01M10/54 (Advanced/Invention)
CPC: Y02W30/84 Y02P10/214



Family:

Publication number	Publication date	Application number	Application date
CN104099477 A	20141015	CN201410362662	20140728

Priority:
CN201410362662 20140728

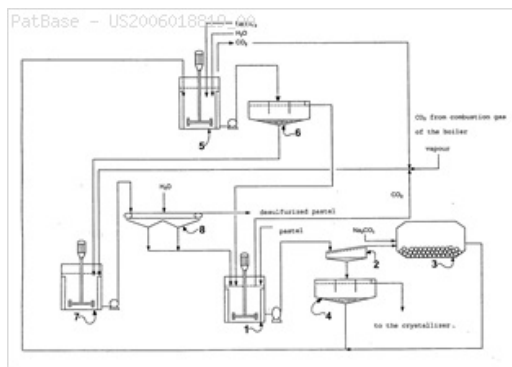
Probable Assignee: BAOJI JINWANGDA MACHINERY AND EQUIPMENT CO LTD
Assignee(s): (std): BAOJI JINWANGDA MACHINERY AND EQUIPMENT CO LTD
Assignee(s): BAOJI CITY SHANXI WANDA MACHINERY CO LTD ; BAOJI JINWANGDA MACHINERY AND EQUIPMENT CO
Inventor(s): (std): GUAN YUE ; GUAN ZHENWANG ; GUO YUNQI ; ZHANG GUOQING

5) Family number: 32571204 (US2006018819A) © PatBase

Title: DESULFURIZATION PROCESS OF PASTEL AND GRIDS OF LEAD ACCUMULATORS

Abstract: The present invention relates to a desulfurization process of pastel and grids of lead accumulators comprising a carbonation in two steps, a granulometric separation between the two steps followed by specific desulfurization of the large part, a desodification obtaining the conversion of the PbSO₄ contained in the pastel into PbCO₃ which can be easily converted into metallic Pb in an oven by the addition of coal. The system used for the desodification of the large part of the pastel can also be used for the desulfurization of the fine part of the grids.

Classifications:
International (IPC 8-9): C01B31/24 C01B32/60 C01G21/14
C22B13/00 C22B7/00 H01M10/54 (Advanced/Invention);
C01B31/00 C01G21/00 C22B13/00 C22B7/00
H01M10/54 (Core/Invention)
CPC: H01M10/54 C22B3/44 C22B7/008 C22B13/045 H01M4/73
H01M10/06 Y02W30/84 Y02P10/234
European: C22B13/04R C22B3/44 C22B7/00D2 H01M10/54
H01M4/73 T01M10/06 Y02E60/12
US: 423/414 423/415.1 423/419.1 423/433 423/434 423/434P
423/89 423/92



Family:

Publication number	Publication date	Application number	Application date
AT388248 E	20080315	AT20050106436T	20050714
CN100590930 C	20100217	CN200510092400	20050720
CN1728445 A	20060201	CN200510092400	20050720
DE602005005112 D1	20080417	DE200560005112T	20050714
DE602005005112 T2	20090326	DE200560005112T	20050714
EP1619261 A1	20060125	EP20050106436	20050714
EP1619261 B1	20080305	EP20050106436	20050714
ES2303189 T3	20080801	ES20050106436T	20050714
ITMI20041456 A1	20041020	IT2004MI01456	20040720
RU2005123404 A	20070220	RU20050123404	20050719
RU2379364 C2	20100120	RU20050123404	20050719
US2006018819 AA	20060126	US20050035001	20050112
US7498012 BB	20090303	US20050035001	20050112

Priority:

IT2004MI01456 20040720

Probable Assignee: ENGITEC SRL

Assignee(s): (std): EHNDZHITEK S R L ; ENGITEC S R L ; ENGITEC TECHNOLOGIES S P A ; ENGITECH S R I

Assignee(s): ENGITEC TECHNOLOGIES SPA ; ENGITECH SRI ; ENGITEC SRL ; EHNDZHITEK SRL

Inventor(s): (std): COSSALI SILVANO ; KOSSALI SIL VANO ; MACCAGNI MASSIMO ; MAKKAN I MASSIMO ; OL PER MARKO ; OLPER MARCO ; MASSIMO MACCAGNI ; MARCO OLPER ; SILVANO OLPER MARCO MACCAGNI M ; SILVANO COSSALI

Inventor(s): OL'PER MARKO ; MAKKAN'I MASSIMO ; KOSSALI SIL'VANO ; OLPER MARCO MACCAGNI MASSIMO COSSALI SILVANO

Agent(s): DE GREGORI ANTONELLA ET AL; HEDMAN AND COSTIGAN PC; COSTIGAN JAMES V; JAMES V

Designated states: AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI SK TR

6) Family number: 41612323 (IN00531DE2001A)

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Title: A PROCESS FOR RECOVERY OF LEAD BY DIRECT HIGH TEMPERATURE ELECTROLYTIC REDUCTION OF OXIDE-SULPHATE SLUDGE FROM SPENT LEAD ACID BATTERIES

Abstract: The present invention relates to a process of recovery of lead by direct high temperature electrolytic reduction of oxide-sulphate sludge from spent lead acid batteries. The utility of the invention is the direct recovery of lead from the oxide-sulphate sludge in spent lead acid batteries. It is a single stage high temperature electrolytic reduction process, which does not require to convert insoluble lead sulphate and lead oxides into leachable products used for recovery of lead by other electrolytic process. The electrolyte used for the recovery of lead can be reused. The reclaimed lead can be used for lead acid battery application.

Classifications:

International (IPC 1-7): C22B13/06

Family:

Publication number	Publication date	Application number	Application date
IN00531DE2001 A	20071012	IN2001DE00531	20010426
IN220126 B	20080711	IN2001DE00531	20010426

Probable Assignee: COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH

Assignee(s): COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH

Inventor(s): DR MEENAKSHISUNDARAM RAGHAVAN ; DR MOHAMED KAMALUDEEN ; ER AROCKIAM VISUVASAM ; ER MARIASUSAI DEVASAHAYAM ; ER PALAINIAPPAN SANKAR ; ER POOCHI MURUGESAN ; ER SOMASUNDARAM AMBALAVANAN ; SHRI KASIVISWANATHAN NAMBIAH

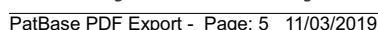
7) Family number: 57875375 (CN203967215U)

© PatBase

Title: DEVICE FOR RETREATING RECYCLED RESIDUE OF LEAD-ACID BATTERY

Abstract: The utility model provides a device for retreating recycled residue of a lead-acid battery. The device comprises a crushing cabin, a waste electrolyte treating cabin, a centrifugal separating device, a colloid electrolysis cabin, a shell crusher, a shell magnetic separation cabin, a plastic recycling cabin, a metal recycling cabin, a sediment cabin, a diluent cabin, a silicon dioxide drying device, a diachylon drying device, a diachylon smelting device and a sulfur dioxide treating device. The device is high in comprehensive recovery use ratio, easy to operate, and good in economic benefit and environmental

CPC: Y02P10/214 Y02W30/84



with water-cooling copper elements, a caisson ring, a device for tapping a melting product, a bottom, wherein the difference quotient of the lower edges of the baffles to a distance between the roof of the melting chamber and the lower edge of the baffle separating the electric furnace from the melting chamber ranges from 0.15 to 0.29, whilst the distance ratio between the lower edge of said baffle and the bottom to the difference of the levels of the lower edges of the baffles ranges from 1.25 to 2.10.

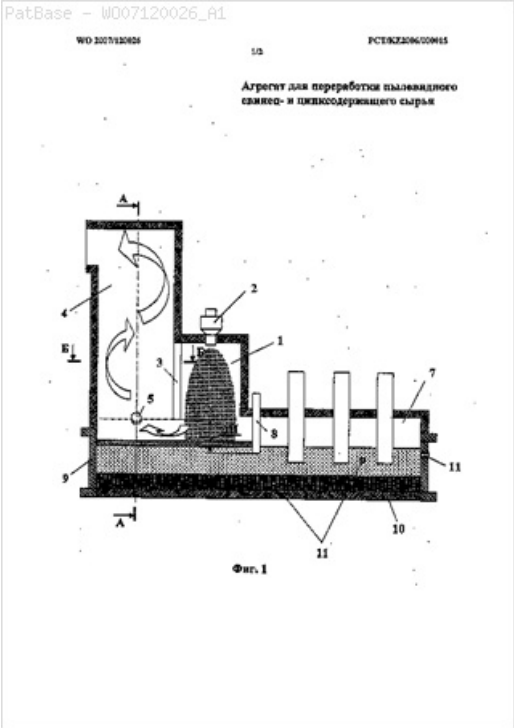
Classifications:

International (IPC 8-9): C22B13/00 C22B13/02 C22B19/00
C22B19/08 C22B7/00 F27B17/00 F27B19/02 (Advanced/Invention);
C22B13/00 F27B17/00 (Core/Invention)

International (IPC 1-7): C22B7/00

CPC: C22B4/08 C22B13/02 C22B19/20 F27B19/02 F27B19/04
F27B19/0 C22B13/0 C22B19/2

European: C22B13/02 C22B19/20 C22B4/08 F27B19/02 F27B19/04



Family:

Publication number	Publication date	Application number	Application date
BRPI0615489 A2	20110517	BR2006PI15489	20061128
BRPI0615489 B1	20150721	BR2006PI15489	20061128
CL2007002156 A1	20080418	CL20070002156	20070724
CN101317067 A	20081203	CN200680006156	20061128
CN101317067 B	20120321	CN200680006156	20061128
IN05775DN2007 A	20080201	IN2007DN05775	20070725
IN269391 B	20151030	IN2007DN05775	20070725
RU2006145142 A	20080627	RU20060145142	20061218
RU2359188 C2	20090620	RU20060145142	20061218
WO07120026 A1	20071025	WO2006KZ00015	20061128

Priority:

KZ20060000853 20060724 WO2006KZ00015 20061128

Probable Assignee: STATE AFFILIATE THE EASTERN MI

Assignee(s): (std): RAGULIN BORIS ALEXANDROVICH ; STARSEV IGOR VLADIMIROVICH ; STATE AFFILIATE THE EASTERN MI ; POLYAKOV IVAN PETROVICH ; SHUMSKIY VIKTOR ALEXANDROVICH ; STATE AFFILIATE THE EASTERN MINING AND METALLURG RES INST FOR NON FERROUS METALS REPUBLIC STATE AFFI ; DOCHERNEE GP VOS NI GORNO META ; EASTERN MINING AND METALLURG R ; CHALENKO VALENTINA VASILYEVNA ; STATE AFFILIATE EASTERN MINING AND METALLURG RES INST FOR NON FERROUS METALS REPUBLIC STATE AFFI ; USHAKOV NIKOLAY NIKOLAYEVICH

Assignee(s): STATE AFFILIATE THE EASTERN MINING AND METALLURGICAL RESEARCH INSTITUTE FOR NON FERROUS METALS REPUBLIC STATE AFFILIATE NATIONAL ENTERPRISE OF COMPLEX PROCESSING FOR MINERAL AND RAW MATERIAL OF THE ; THE EASTERN MINING AND METALLURGICAL RESEARCH INSTITUTE FOR NON FERROUS METALS ; VNIITSVETMET SA ; STATE AFFILIATE EASTERN MINING AND METALLURGICAL RESEARCH INST FOR NON FERROUS METALS REPUBLIC STATE AFFILIATE NATIONAL ENTERPRISE OF COMPLEX PROCESSING FOR MINERAL AND RAW MATERIAL OF ; DOCHERNEE GOSUDARSTVENNOE PREDPRIJATIE VOSTOCHNYJ NAUCHNO ISSLEDOVATEL SKIJ GORNO METALLURGICHESKIJ INST TSVETNYKH METALLOV RESPUBLIKANSKOGO GOSUDARSTVENNOGO PREDPRIJATIJA NATSIONAL NYJ TSENTRPO KOMPLEKSNOJ PERERABOTKE MINERAL NOGO SYR JA RES ; DOCHERNEE GOSUDARSTVENNOE PREDPRIJATIE VOSTOCHNYJ NAUCHNO ISSLEDOVATEL SKIJ GORNO METALLURGICHESKIJ INSTITUT TSVETNYKH METALLOV RESPUBLIKANSKOGO GOSUDARSTVENNOGO PREDPRIJATIJA NATSIONAL NYJ TSENTRPO KOMPLEKSNOJ PERERABOTKE MINERAL NOGO SYR JA RES ; EASTERN MINING AND METALLURGICAL RESEARCH INST FOR NON FERROUS METALS ; STATE AFFILIATE EASTERN MINING AND METALLURGICAL R ; STATE AFFILIATE THE EASTERN MINING AND METALLURGIC ; STATE AFFILIATE THE EASTERN MINING AND METALLURGICAL RESEARCH INSTITUT FOR NON FERROUS METALS REPUBLIC STATE AFFILIATE NATIONAL ENTERPRISE OF COMPLEX PROCESSING FOR MINERAL AND RAW MATERIAL OF TH ; STATE AFFILIATE EASTERN MINING AND METALLURGICAL RESEARCH INST FOR NON FERROUS METALS REPUBLIC STATE AFFILIATE NATIONAL ENTERPRISE OF COMPLEX PROCESSING FOR MINERAL AND RAW MATERIAL OF TH

Inventor(s): (std): CHALENKO VALENTINA VASILYEVNA ; POLYAKOV IVAN PETROVICH ; RAGULIN BORIS ALEXANDROVICH ; SHUMSKIY VIKTOR ALEXANDROVICH ; STARSEV IGOR VLADIMIROVICH ; USHAKOV NIKOLAY NIKOLAYEVICH ; SHUMSKIY VIKTOR ALEKSANDROVICH ; RAGULIN BORIS ALEKSANDROVICH ; POLJAKOV IVAN PETROVICH ; PETROVICH POLYAKOV IVAN ; NIKOLAYEVICH USHAKOV NIKOLAY ; CHALENKO VALENTINA VASIL EVNA ; ALEXANDROVICH SHUMSKIY VIKTOR ; ALEXANDROVICH RAGULIN BORIS ; VLADIMIROVICH STARSEV IGOR ; VASILYEVNA CHALENKO VALENTINA ; USHAKOV NIKOLAJ NIKOLAEVICH ; STARTSEV IGOR VLADIMIROVICH

Inventor(s): SHUMSKIY VIKTOR ALEXANDROVICH STARTSEV IGOR VLADIMIROVICH RAGULIN BORIS ALEXANDROVICH USHAKOV NIKOLAY NIKOLAYEVICH P ; BORIS ALEXANDROVICH RAGULIN ; STARTSEV IGOR VLADIMIROVICH ; CHALENKO VALENTINA VASIL'EVNA ; VALENTINA VASILYEVNA CHALENKO ; VIKTOR ALEXANDROVICH SHUMSKIY ; IGOR VLADIMIROVICH STARSEV ; IVAN PETROVICH POLYAKOV ; NIKOLAY NIKOLAYEVICH USHAKOV

Designated states: AE AG AL AM AT AU AZ BA BB BE BF BG BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LK LR LS LT LU LV LY MA MC MD MG MK ML MN MR MW MX MY MZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN SV SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

10) Family number: 59353416 (US2016294024A)

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Title: DEVICES AND METHOD FOR SMELTERLESS RECYCLING OF LEAD ACID BATTERIES

Abstract: Lead from lead acid battery scrap is recovered in two separate production streams as clean grid lead and as high-purity lead without smelting. In preferred aspects, lead recovery is performed in a continuous process that uses an aqueous electroprocessing solvent and electro-refining and spent electroprocessing solvent can be recycled to the recovery process.

Classifications:

International (IPC 8-9): C22B13/00 C22B3/16 C22B3/44 C22B7/00 C25C C25C1/18 C25C5/02 C25C7/00 C25C7/02 C25C7/06

C25C7/08 H01M H01M10/06 H01M10/54

H01M4/14 (Advanced/Invention);

C25C7/00 (Core/Invention)

International (IPC 1-7): H01M10/06 H01M10/54

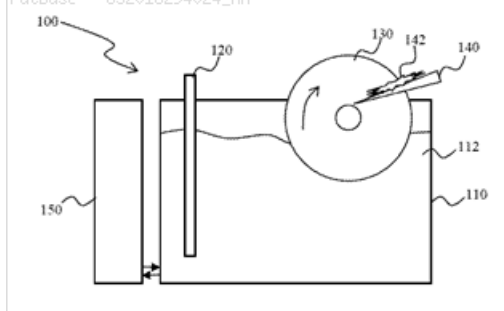
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US: 205/771

JP F-Term: 4K001 4K001/AA20 4K001/BA22 4K001/DB02 4K001/DB21 4K058 4K058/AA23 4K058/BA27 4K058/BB04 4K058/CA02 4K058/CA09 4K058/CA11 4K058/EB04 4K058/EB15 4K058/ED04 4K058/FC07 4K058/FC14 5H031 5H031/AA01 5H031/BB02 5H031/BB09 5H031/EE01 5H031/RR02 4K001/CA06 4K001/DB22 4K001/DB35 4K001/DB36 4K058/BA37 4K058/BB03 4K058/CA03 4K058/CA13 4K058/CA22 4K058/DD27 4K058/ED02 4K058/EB18 4K058/ED03 4K058/FA04 4K058/FA06 4K058/FA23 5H031/AA00 5H031/HH03

JP F-Index: C22B13/00/101 C22B3/16 C22B3/44 C22B7/00/C C25C1/18 C25C7/02/303 C25C7/02/306 C25C7/06/301/A H01M10/54 C22B3/44/101/Z C25C5/02 C25C7/08/A

PatBase - US2016294024_AH



Family:

Publication number	Publication date	Application number	Application date
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AU2014353227 AA	20160602	AU20140353227	20141118
AU2014353227 BB	20170525	AU20140353227	20141118
AU2015350562 AA	20170629	AU20150350562	20150513
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AU2017213449 AA	20170824	AU20170213449	20170808
BR112016011396 A2	20170808	BR20161111396	20141118
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CA2930945 C	20180320	CA20142930945	20141118
CA2968064 AA	20170516	CA20152968064	20150513
CL2016001182 A1	20161230	CL20160001182	20160517
CL2017001279 A1	20180105	CL20170001279	20170518
CN105981212 A	20160928	CN201480071929	20141118
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CN109183069 A	20190111	CN201810717006	20141118
EA201691047 A1	20170228	EA20160091047	20141118
EA201791004 A1	20171229	EA20170091004	20150513
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EP3221918 A1	20170927	EP20150861829	20150513
EP3221918 A4	20181205	EP20150861829	20150513
ID201707000 A	20170707	ID2016P0004020	20141118
ID201800318 A	20180112	ID2017PID03808	20150513
IN201627020496 A	20160826	IN201627020496	20160615
IN201727020519 A	20171103	IN201727020519	20170612
JP2017504930 T2	20170209	JP20160533660T	20141118
JP2018500459 T2	20180111	JP20170526837T	20150513
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KR101882932 B1	20180727	KR20177016853	20150513
KR101926033 B1	20181206	KR20187021210	20150513
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KR20170083634 A	20170718	KR20177016853	20150513
KR20180086520 A	20180731	KR20187021210	20150513
MX2016006435 A1	20170202	MX20160006435	20141118
MX2017006289 A1	20170821	MX20170006289	20150513
MX357027 B	20180625	MX20160006435	20141118
PE08352017 A1	20170704	PE20170000869	20150513
PE11032016 A1	20161119	PE20160000649	20141118
UA118037 C2	20181112	UA20160006667	20141118
US2016294024 AA	20161006	US20140037318	20141118
US2017352927 AA	20171207	US20150527749	20150513
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US9837689 BB	20171205	US20140037318	20141118

WO15077227 A1	20150528	WO2014US66142	20141118
WO15077227 A4	20150716	WO2014US66142	20141118
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ZA201604083 A	20171025	ZA20160004083	20160615
ZA201704123 A	20180627	ZA20170004123	20170615

Priority:

US20130905941P 20131119 AU20140353227 20141118 US20140037318 20141118
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US20170810808 20171113

Probable Assignee: AQUA METALS INC

Assignee(s): (std): AQUA METALS INC

Assignee(s): CLARKE ROBERT LEWIS ; CLARKE STEPHEN R ; DOUGHERTY BRIAN ; KING MICHAEL JOHN ; HURWITZ MICHAEL DAVID ; MOULD SELWYN JOHN

Inventor(s): (std): MICHAEL JOHN KING ; ROBERT LEWIS CLARKE ; SELWYN JOHN MOULD ; STEPHEN R CLARKE ; MOULD SELWYN JOHN ; MOULD SELWYN ; KING MICHAEL JOHN ; HURWITZ MICHAEL DAVID ; CLARKE STEPHEN R ; CLARKE ROBERT LEWIS ; BRIAN DOUGHERTY ; DOUGHERTY BRIAN ; MICHAEL DAVID HURWITZ

Inventor(s): MICHAEL DAVID WITZ

Agent(s): SPRUSON AND FERGUSON; SHAPIRO COHEN LLP; AVENTUM IP LAW LLP; VERAMARK Y O FERNANDO FERNANDEZ TELLERIA SA; FERNANDO FERNANDEZ TELLERIA Y O VERAMARK SA; KADOR AND PARTNER; KADOR AND PARTNER PARTG MBB; ADOLF MARTUA PANGGABEAN; MAROLITA SETIATI; UMBERG ZIPSER LLP; FESSENMAIER MARTIN ET AL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

11) Family number: 54780488 (CN103296336A)

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Title: METHOD FOR RECYCLING WASTE LEAD STORAGE BATTERY

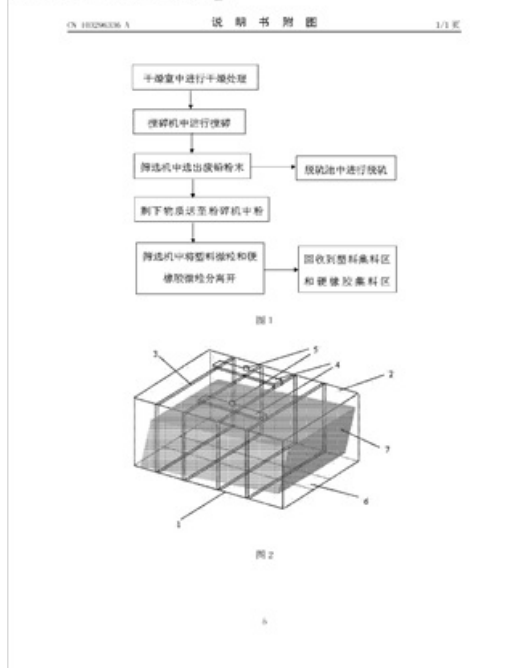
Abstract: The invention discloses a method for recycling a waste lead storage battery. The method comprises the following steps of 1, feeding the recovered waste storage battery into a drying chamber to be dried so as to evaporate the moisture inside the lead storage battery; 2, placing the dried waste lead storage battery into a smasher to be smashed, simultaneously sending the smashed articles into a screening machine to select the waste lead powder, and then placing the waste lead powder into a desulphurization pond to be desulphurized; and 3, sending the residual particles into the smasher to be smashed, sending the smashed articles into the screening machine, and recovering the selected plastic particles and the hard rubber particles respectively into a plastic collecting area and a hard rubber collecting area. The desulphurization agent used in the desulphurization pond is limestone-gypsum, a wet desulphurization method is used, the desulphurization product is gypsum which can be used as a building material, and the lead is also replaced. By adopting the method, the problem that the waste lead storage battery pollutes the environment can be solved, and the resource waste can be reduced.

Classifications:

International (IPC 8-9): C22B7/00 H01M10/54 (Advanced/Invention)

CPC: Y02E60/12 Y02W30/84 Y02P10/212

PatBase - CN103296336_A



Family:

Publication number	Publication date	Application number	Application date
CN103296336 A	20130911	CN201310234095	20130614

Priority:

CN201310234095 20130614

Probable Assignee: NINGXIA XINHANG ENERGY ENVIRONMENT TECHNOLOGY CO LTD

Assignee(s): (std): NINGXIA XINHANG ENERGY ENVIRONMENT TECHNOLOGY CO LTD

Assignee(s): NINGXIA XINHANG ENERGY ENVIRONMENT TECHNOLOGY CO

Inventor(s): (std): ZHANG FEI

Title: PROCESS FOR RECOVERING LEAD FROM EXHAUSTED ACCUMULATOR

Abstract: Source: CN1012909B **Machine translation:** The present invention is a method on battery recycling lead from waste, electrolysis equipment used in the cell containing dilute alkaline electrolyte and an anode in a tight-fitting structure arranged with waste separator and lead oxide reduction treatment after, water, and an ointment made of paste type cathode, by solid-phase reduction electrolysis, so that the paste type cathode formed to restore the lead. In addition to the advantages of the present invention is non-polluting, but also because of its low electrolysis voltage, high current density, high current efficiency, and therefore have a short electrolysis time, low energy consumption and low production cost.

Classifications:

International (IPC 8-9): C22B7/00 C25C1/18 C25C7/00 (Advanced/Invention);
C22B7/00 C25C1/00 C25C7/00 (Core/Invention)

International (IPC 1-7): C22B7/00 C25C1/18 C25C7/00

CPC: Y02P10/212

Family:

Publication number	Publication date	Application number	Application date
CN1012909 B	19910619	CN19881003531	19880608
CN1038315 A	19891227	CN19881003531	19880608

Priority:

CN19881003531 19880608

Probable Assignee: NO 712 RESEARCH INST OF NO 7 R

Assignee(s): (std): NO 712 RESEARCH INST OF NO 7 R

Assignee(s): NO 712 RESEARCH INST OF NO 7 RESEARCH INST ; NO 712 RESEARCH INST OF NO 7 RESEARCH INST GENERAL CORP OF CHINA SHIPPING IND ; NO 712 RESEARCH INST OF NO 7 RESEARCH INST GENERAL CORP OF CHINA SHIPPING INDUSTRY ; NO712 RESEARCH INST OF NO7 RESEARCH INST ; NO712 RESEARCH INST OF NO7 RESEARCH INST GENERAL ; NO712 RESEARCH INST OF NO7 RESEARCH INST GENERAL CORP OF CHINA SHIPPING IND

Inventor(s): (std): AL WANG RUSONG ET ; KEWEN ZHEN ; YINGWEN YI ; AL ET

Inventor(s): ZHEN KEWEN ; YI YINGWEN ; WANG RUSONG ET AL ; ET AL

Title: PROCESS FOR REMEDIATION OF LEAD-CONTAMINATED SOIL AND WASTE BATTERY

Abstract: Lead-contaminated soil and battery casings are remediated using a plasma arc furnace which pyrolyzes the soil and waste battery casings so as to form a vitrified slag and a combustible gas, respectively. The combustible gas along with volatilized lead (and other heavy metals which may be present) are transferred to, and used as a primary fuel by, a conventional smelting furnace. The volatilized lead that is entrained in the combustible gas is thus transferred to the recovery and environmental protection/control equipment associated with the smelting furnace. The soil, on the other hand, is converted into a non-toxic (i.e., according to the Toxicity Characteristic Leaching Procedure) vitrified slag by the plasma arc which may be crushed and used as a commercial material (e.g., roadway aggregate, asphalt filler material and the like) or simply transferred to a landfill where it poses no environmental threat.

Classifications:

International (IPC 8-9): A61D3/00 A62D3/00 A62D3/19 A62D3/32 A62D3/34 A62D3/37 A62D3/40 B09B3/00 B09B5/00 B09C1/06 C03B5/00 C03B5/02 C03C1/00 C10B53/00 C22B13/02 C22B4/00 C22B4/04 C22B7/00 F23G7/14 H01M10/54 (Advanced/Invention); A62D101/02 A62D101/22 A62D101/24 A62D101/26 A62D101/28 A62D101/43 A62D3/19 A62D3/37 B09B3/00 B09B5/00 C22B4/00 (Advanced/Non-invention); A62D3/00 B09C1/00 C03B5/00 C03C1/00 C10B53/00 C22B13/00 C22B4/00 C22B7/00 H01M10/54 (Core/Invention)

International (IPC 1-7): A61D3/00 A62D3/00 B01J19/08 B09B3/00 B09B5/00 B09C1/06 C10B53/00 C22B13/00 C22B13/02 C22B4/00 C22B4/04 C22B7/00 C22B7/04 F23G7/00 F23G7/14 H01M10/54 H01M2/00

CPC: A62D2101/02 A62D2101/22 A62D2101/26 A62D2101/28

A62D2101/24 A62D2101/43 C22B7/001 A62D3/40 A62D3/19 A62D2203/10 B09C1/065 B09C1/067 C03B5/005 C03B5/025 C03C1/002 C10B53/00 C22B4/005 C22B7/003 C22B13/025 H01M10/54 Y02W30/84 Y02P10/214 Y02P40/52 Y02P40/58

European: A62D3/00E5 A62D3/00G10 A62D3/00L A62D3/00M10B A62D3/00M10D A62D3/00M10F A62D3/00M10H A62D3/00M12D A62D3/00M2 A62D3/19 A62D3/40 B09C1/06P B09C1/06V C03B5/00B C03B5/02D C03C1/00B C10B53/00 C22B13/02R C22B4/00B C22B7/00B C22B7/00B4 H01M10/54 K62D101/02 K62D101/22 K62D101/24 K62D101/26 K62D101/28 K62D101/43 K62D203/10 Y02E20/12 Y02E60/12

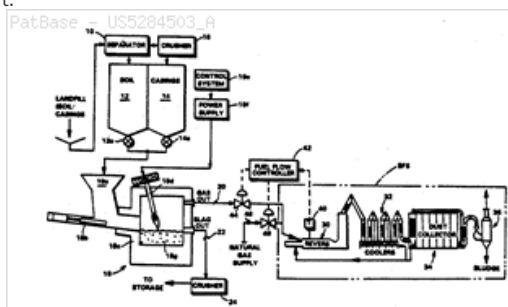
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JP F-Term: 4D004 4D004/AA07 4D004/AA23 4D004/AA41 4D004/AA43 4D004/AB03 4D004/AC04 4D004/BA02 4D004/BA03 4D004/BB03 4D004/CA04 4D004/CA29 4D004/CA32 4D004/CA43 4D004/CA45 4D004/CA50 4D004/CB11 4D004/CB21 4D004/CB42 4D004/CB50 4D004/CC11 4K001 4K001/AA20 4K001/BA12 4K001/BA22 4K001/BA24 4K001/BA24 4K001/CA01 4K001/CA02 4K001/DA07 4K001/FA12 4K001/GA03 4K001/GA16 4K001/GB05 4K001/GB09 4K001/GB11

JP F-Index: B09B3/00/303/P B09B3/00/ZAB B09B5/00/ZAB/A B09C1/06 C22B13/02 C22B4/04

Family:

Publication number	Publication date	Application number	Application date
AT160825 E	19971215	AT19930921453T	19930913
AT161442 E	19980115	AT19940304876T	19940704
AU199348539 A1	19940608	AU19930048539	19930913
AU199670756 A1	19970409	AU19960070756	19960918
AU663227 B2	19950928	AU19930048539	19930913
BRP19305719 A	19961231	BR1993PI05719	19930913
CA2124005 AA	19940526	CA19932124005	19930913



DE19681571 T	19981029	DE19961081571T	19960918
DE19681571 T1	19981029	DE19961081571T	19960918
DE69315562 D1	19980115	DE19936015562	19930913
DE69315562 T2	19980507	DE19936015562T	19930913
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DE69407546 T2	19980702	DE19946007546T	19940704
EP0625216 A1	19941123	EP19930921453	19930913
EP0625216 A4	19950503	EP19930921453	19930913
EP0625216 B1	19971203	EP19930921453	19930913
EP0653252 A1	19950517	EP19940304876	19940704
EP0653252 B1	19971229	EP19940304876	19940704
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GB2320713 A1	19980701	GB19980004847	19960918
GB2320713 B2	19991020	GB19980004847	19960918
GB9804847 A0	19980429	GB19980004847	19960918
JP7503659 T2	19950420	JP19940512062T	19930913
KR19940703930 A	19941212	KR19940702361	19940708
KR19947003930 A	19941212	KR19947002361	19930913
MX9306560 A1	19940630	MX19930006560	19931022
NO304585 B1	19990118	NO19940002583	19940708
NO942583 A	19940708	NO19940002583	19940708
NO942583 A0	19940708	NO19940002583	19940708
US5284503 A	19940208	US19920973236	19921110
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Priority:

US19920973236 19921110 WO1993US08508 19930913 WO1993US00085 19930913
US19930149340 19931109 US19930149343 19931109 US19940274829 19940714
US19950478617 19950607 US19950003956 19950919 US19950003956P 19950919
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Probable Assignee: EXIDE CORP

Assignee(s): (std): EXIDE CORP

Assignee(s): DEUTSCHE BANK NEW YORK AG ; EXIDE TECHNOLOGIES F K A EXIDE CORP ; EXIDE CORP READING PA US ; EXIDE CORP PHILADELPHIA PA US ; EXIDE TECHNOLOGIES (F K A EXIDE CORPORATION) ; EXIDE TECHNOLOGIES F K A EXIDE CORPORATION ; BANKERS TRUST CO ; BARANSKI JOHN P ; CREDIT SUISSE FIRST BOSTON ADMINISTRATIVE AGENT ; CREDIT SUISSE FIRST BOSTON ADMINISTRATIVE AGENT AS ; BITLER JOHN A ; CREDIT SUISSE FIRST BOSTON AS ADMINISTRATIVE AGENT ; EXIDE TECHNOLOGIES ; DEUTSCHE BANK AG

Inventor(s): (std): JOHN A BITLER ; JOHN P BARANSKI ; BARANSKI JOHN P ; BITLER JOHN A ; BARANSKI JONH P ; LARSON HAROLD R

Inventor(s): BARANSKI JOHN P SINKING SPRING PA US ; HAROLD R LARSON ; LARSON HAROLD R SPRING TEX US ; JONH P BARANSKI ; BITLER JOHN A DENVER PA US

Agent(s): CULLENS PATENT AND TRADE MARK ATTORNEYS; CULLENS PTY LTD; SPRUSON AND FERGUSON; BORDEN LADNER GERVAIS LLP

Designated states: AL AM AT AU AZ BB BE BF BG BJ BR BY CA CF CG CH CI CM CN CZ DE DK EE ES FI FR GA GB GE GN GR HU IE IL IS IT JP KE KG KP KR KZ LI LK LR LS LT LU LV MC MD MG MK ML MN MR MW MX NE NL NO NZ PL PT RO RU SD SE SG SI SK SN SZ TD TG TJ TM TR TT UA UG UZ VN

14) Family number: 53480926 (CN103014354A)

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Title: PROCESS FOR RECYCLING LEAD FROM LEAD-ACID BATTERY PASTE

Abstract: The invention relates to a lead recycling process, and mainly relates to a process for recycling lead from lead-acid battery paste. The process for recycling the lead from the lead-acid battery paste is characterized by comprising the following steps in sequence: ball milling for preliminary desulphurization, secondary desulphurization, treatment of desulphurized solution, leaching of filter cake and electrolytic deposition, wherein the treatment of the desulphurized solution comprises the following steps: performing filter pressing on the paste after the secondary desulphurization to obtain the desulphurized solution, adding Ba₂CO₃ and BaCl₂ into the desulphurized solution to treat the desulphurized solution, controlling the temperature of the desulphurized solution at 35-40 degrees centigrade and the pH value to be 13-14 when treating the desulphurized solution, and controlling the treatment time to be 30-50 minutes. The invention aims at overcoming defects of the prior art and providing the process for recycling the lead from waste lead-acid batteries; and the process has the advantages of low desulphurization cost, high desulphurization efficiency and high lead recycling rate, and is suitable for industrial production.

Classifications:

International (IPC 8-9): C22B13/00 C22B3/04 C22B7/00 C25C1/18 (Advanced/Invention)

CPC: Y02P10/234

Family:

Publication number	Publication date	Application number	Application date
CN103014354 A	20130403	CN201310013315	20130115
CN103014354 B	20140730	CN201310013315	20130115

Priority:

CN201310013315 20130115

Probable Assignee: ZHEJIANG HUITONG POWER CO LTD

Assignee(s): (std): ZHEJIANG HUITONG POWER CO LTD

Assignee(s): ZHEJIANG HUITONG POWER CO
Inventor(s): (std): XU SHUKUI ; MA XIUZHONG ; MA GUOFENG ; LAN DAWEI ; JIAO KUNYUAN

Search history

Search 1: SFT=((lead w5 batter*) w5 (treatment) and (sodium carbonate or soda ash) and smashing) (Results 1)

Search 2: SFT=((lead w5 batter*) w5 (treatment) and (sodium carbonate or soda ash) and smashing) and PD<20150729 (Results 1)

1) Family number: 42844147 (US2011265969A)

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Title: METHOD FOR IMPLEMENTING FULL CYCLE REGENERATION OF WASTE LEAD ACID BATTERIES

Abstract: A method for implementing full cycle regeneration of a waste lead acid battery is provided. The method includes the following steps. Step (1): the waste lead acid battery is smashed and separated so as to obtain grid lead, diachylon, plastic and waste electrolyte. Step (2): the obtained diachylon after being dried is positioned into an airtight reactor for desulphurization and deoxidation, wherein lead sulfate and the lead dioxide both in the diachylon react to obtain lead monoxide (PbO) and sulfur trioxide (SO₃). Step (3): the obtained lead monoxide is reduced by solid phase electrolysis in a wet way so that the lead monoxide is reduced into sponge lead.

Classifications:

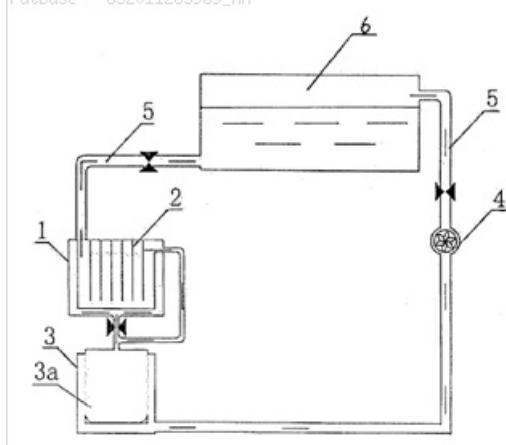
International (IPC 8-9): B22D23/00 C08J11/00 C25C1/18
H01M10/06 H01M10/42 H01M10/54 H01M6/52 (Advanced/Invention);
H01M10/06 H01M6/52 (Advanced/Non-invention);
H01M10/54 (Core/Invention)

CPC: H01M10/54 H01M6/52 H01M10/06 Y02W30/84 C25C1/18
C25C5/02

European: H01M10/54 T01M10/06 T01M6/52 Y02E60/12

US: 1/1 164/76.1 164/76.100P

PatBase - US2011265969_AA

**Family:**

Publication number	Publication date	Application number	Application date
CN100576626 C	20091230	CN200810029416	20080711
CN101335370 A	20081231	CN200810029416	20080711
DE602009027883 D1	20150108	DE200960027883T	20090710
EP2312686 A1	20110420	EP20090793857	20090710
EP2312686 A4	20131023	EP20090793857	20090710
EP2312686 B1	20141119	EP20090793857	20090710
US2011265969 AA	20111103	US20090003576	20090710
US9257731 BB	20160209	US20090003576	20090710
WO10003382 A1	20100114	WO2009CN072714	20090710

Priority:

CN200810029416 20080711 EP20090793857 20090710 WO2009CN072714 20090710

Probable Assignee: DONGGUAN SONGSHAN TECHNOLOGY GROUP CO

Assignee(s): (std): DONGGUAN SONGSHAN TECHNOLOGY G ; DONGGUAN SONGSHAN TECHNOLOGY GROUP CO LTD ; LIANG LIXIANG ; LIU ZHIQIANG ; SHANDONG SONGSHAN TECHNOLOGY G ; SHANDONG SONGSHAN TECHNOLOGY GROUP CO LTD ; ZHIQIANG LIANG

Assignee(s): SHANDONG SONGSHAN TECHNOLOGY GROUP CO ; DONGGUAN SONGSHAN TECHNOLOGY GROUP CO LTD DONGGUAN ; DONGGUAN SONGSHAN TECHNOLOGY GROUP CO

Inventor(s): (std): LIANG LIXIANG ; LIU ZHIQIANG ; ZHIQIANG LIANG ; ZHIQIANG LIU ; LIXIANG LIANG

Agent(s): BOEHMERT AND BOEHMERT ANWALTSPARTNERSCHAFT MBB PATENTANWALTE RECHTSANWALTE; LARCHER DOMINIQUE; BEI AND OCEAN; GEORGE G; GUANGZHOU ZHIYOU PATENT AND TRADEMARK AGENCY CO LTD

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PE PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

Legal status (INPADOC)

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Patent	Date recorded	Event group	Code	Event	Details
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CN100576626 C	20091230	LSGT	+	granted / extensions (spc, cpc, pte)	
CN100576626 C	20081231	LSPB	+C06	PUBLICATION	
CN100576626 C	20091230	LSGT	+C14	GRANT OF PATENT OR UTILITY MODEL	
CN100576626 C	20170825	LSLE	-CF01	TERMINATION OF PATENT RIGHT DUE TO NON-PAYMENT OF ANNUAL FEE	
CN100576626 C	20280711	PEXP		Calculated Patent Term Expiry	
CN101335370 A	20081231	LSPB	+	published / reissued	
EP2312686 A1	20110420	LSPB	+	published / reissued	
EP2312686 A1	20110420	LSSES	+17P	REQUEST FOR EXAMINATION FILED	EFFECTIVE DATE : 20110209
EP2312686 A1	20110713	LSAS	RAP1	RIGHTS OF AN APPLICATION TRANSFERRED	PARTYTYPE : OWNER OWNER : DONGGUAN SONGSHAN TECHNOLOGY GROUP CO., LTD.
EP2312686 A4	20131023	LSSES	+A4	SUPPLEMENTARY SEARCH REPORT DRAWN UP AND DESPATCHED	EFFECTIVE DATE : 20130925
EP2312686 A4	20131023	LSRE	RIC1	INFORMATION PROVIDED ON IPC CODE ASSIGNED BEFORE GRANT	CLASSIFICATIONSCHEME : IPC CLASSIFICATIONSYMBOL : H01M 6/52 20060101ALN20130919BHEP
EP2312686 A4	20131023	LSRE	RIC1	INFORMATION PROVIDED ON IPC CODE ASSIGNED BEFORE GRANT	CLASSIFICATIONSCHEME : IPC CLASSIFICATIONSYMBOL : H01M 10/06 20060101ALN20130919BHEP
EP2312686 A4	20131023	LSRE	RIC1	INFORMATION PROVIDED ON IPC CODE ASSIGNED BEFORE GRANT	CLASSIFICATIONSCHEME : IPC CLASSIFICATIONSYMBOL : H01M 10/54 20060101AFI20130919BHEP
EP2312686 A4	20140709	LSRE	RIC1	INFORMATION PROVIDED ON IPC CODE ASSIGNED BEFORE GRANT	CLASSIFICATIONSCHEME : IPC CLASSIFICATIONSYMBOL : H01M 10/54 20060101AFI20140605BHEP
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EP2312686 A4	20140716	LSRE	RIC1	INFORMATION PROVIDED ON IPC CODE ASSIGNED BEFORE GRANT	CLASSIFICATIONSCHEME : IPC CLASSIFICATIONSYMBOL : H01M 10/54 20060101AFI20140612BHEP
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EP2312686 A4	20140730	LSRE	RIC1	INFORMATION PROVIDED ON IPC CODE ASSIGNED BEFORE GRANT	CLASSIFICATIONSCHEME : IPC CLASSIFICATIONSYMBOL : H01M 10/06 20060101ALN20140623BHEP
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EP2312686 B1	20141119	LSGT	REG	REFERENCE TO A NATIONAL CODE	REF COUNTRY CODE : GB REF LEGAL EVENT CODE : FG4D
EP2312686 B1	20141128	LSNP	REG	REFERENCE TO A NATIONAL CODE	REF COUNTRY CODE : CH REF LEGAL EVENT CODE : EP
EP2312686 B1	20141215	LSNP	REG	REFERENCE TO A NATIONAL CODE	REF COUNTRY CODE : AT REF LEGAL EVENT CODE : REF REF DOCUMENT NUMBER : 697494 COUNTRY OF REF DOCUMENT : AT KIND CODE OF REF DOCUMENT : T DESIGNATED STATE(S) : EFFECTIVE DATE : 20141215
EP2312686 B1	20141217	LSGT	REG	REFERENCE TO A NATIONAL CODE	REF COUNTRY CODE : IE REF LEGAL EVENT CODE : FG4D
EP2312686 B1	20150108	LSPB	REG	REFERENCE TO A NATIONAL CODE	REF COUNTRY CODE : DE REF LEGAL EVENT CODE : R096 REF DOCUMENT NUMBER : 602009027883 COUNTRY OF REF DOCUMENT : DE EFFECTIVE DATE : 20150108
EP2312686 B1	20150325	LSRV	REG	REFERENCE TO A NATIONAL CODE	REF COUNTRY CODE : NL REF LEGAL EVENT CODE : VDEP EFFECTIVE DATE : 20141119
EP2312686 B1	20150415	LSRV	REG	REFERENCE TO A NATIONAL CODE	REF COUNTRY CODE : AT REF LEGAL EVENT CODE : MK05 REF DOCUMENT NUMBER : 697494 COUNTRY OF REF DOCUMENT : AT KIND CODE OF REF DOCUMENT : T DESIGNATED STATE(S) : EFFECTIVE DATE : 20141119
EP2312686 B1	20150427	LSRV	REG	REFERENCE TO A NATIONAL CODE	REF COUNTRY CODE : LT REF LEGAL EVENT CODE : MG4D
EP2312686 B1	20150430	LSLE	-PG25	LAPSED IN A CONTRACTING STATE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]	COUNTRY OF REF DOCUMENT : PT NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT LAPSED DATE : 20150319
EP2312686 B1	20150430	LSLE	-PG25	LAPSED IN A CONTRACTING STATE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]	COUNTRY OF REF DOCUMENT : FI NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT LAPSED DATE : 20141119
EP2312686 B1	20150430	LSLE	-PG25	LAPSED IN A CONTRACTING STATE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]	COUNTRY OF REF DOCUMENT : ES NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT LAPSED DATE : 20141119
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				FROM NATIONAL OFFICE TO EPO]	OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT LAPSED DATE : 20150219
EP2312686 B1	20150430	LSLE	-PG25	LAPSED IN A CONTRACTING STATE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]	COUNTRY OF REF DOCUMENT : NL NOTIFICATIONOF LAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT LAPSED DATE : 20141119
EP2312686 B1	20150529	LSLE	-PG25	LAPSED IN A CONTRACTING STATE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]	COUNTRY OF REF DOCUMENT : AT NOTIFICATIONOF LAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT LAPSED DATE : 20141119
EP2312686 B1	20150529	LSLE	-PG25	LAPSED IN A CONTRACTING STATE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]	COUNTRY OF REF DOCUMENT : LV NOTIFICATIONOF LAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT LAPSED DATE : 20141119
EP2312686 B1	20150529	LSLE	-PG25	LAPSED IN A CONTRACTING STATE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]	COUNTRY OF REF DOCUMENT : SE NOTIFICATIONOF LAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT LAPSED DATE : 20141119
EP2312686 B1	20150529	LSLE	-PG25	LAPSED IN A CONTRACTING STATE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]	COUNTRY OF REF DOCUMENT : CY NOTIFICATIONOF LAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT LAPSED DATE : 20141119
EP2312686 B1	20150529	LSLE	-PG25	LAPSED IN A CONTRACTING STATE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]	COUNTRY OF REF DOCUMENT : PL NOTIFICATIONOF LAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT LAPSED DATE : 20141119
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EP2312686 B1	20150731	LSLE	-PG25	LAPSED IN A CONTRACTING STATE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]	COUNTRY OF REF DOCUMENT : EE NOTIFICATIONOF LAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT LAPSED DATE : 20141119
EP2312686 B1	20150731	LSLE	-PG25	LAPSED IN A CONTRACTING STATE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]	COUNTRY OF REF DOCUMENT : SK NOTIFICATIONOF LAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT LAPSED DATE : 20141119
EP2312686 B1	20150731	LSLE	-PG25	LAPSED IN A CONTRACTING STATE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]	COUNTRY OF REF DOCUMENT : RO NOTIFICATIONOF LAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT LAPSED DATE : 20141119
EP2312686 B1	20150731	LSLE	-PG25	LAPSED IN A CONTRACTING STATE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]	COUNTRY OF REF DOCUMENT : DK NOTIFICATIONOF LAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT LAPSED DATE : 20141119
EP2312686 B1	20150731	LSLE	-PG25	LAPSED IN A CONTRACTING STATE [ANNOUNCED	COUNTRY OF REF DOCUMENT : CZ NOTIFICATIONOF LAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION

				FROM NATIONAL OFFICE TO EPO]	OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT LAPSED DATE : 20141119
EP2312686 B1	20150731	LSFE	+PGFP	ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]	COUNTRY OF REF DOCUMENT : GB PAYMENT DATE : 20150623 YEAR OF FEE PAYMENT : 7
EP2312686 B1	20150820	LSRE	REG	REFERENCE TO A NATIONAL CODE	REF COUNTRY CODE : DE REF LEGAL EVENT CODE : R097 REF DOCUMENT NUMBER : 602009027883 COUNTRY OF REF DOCUMENT : DE
EP2312686 B1	20151028	LSGT	+26N	NO OPPOSITION FILED	EFFECTIVE DATE : 20150820
EP2312686 B1	20151030	LSFE	+PGFP	ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]	COUNTRY OF REF DOCUMENT : DE PAYMENT DATE : 20150709 YEAR OF FEE PAYMENT : 7
EP2312686 B1	20151231	LSLE	-PG25	LAPSED IN A CONTRACTING STATE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]	COUNTRY OF REF DOCUMENT : IT NOTIFICATION OF LAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT LAPSED DATE : 20141119
EP2312686 B1	20160229	LSLE	-PG25	LAPSED IN A CONTRACTING STATE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]	COUNTRY OF REF DOCUMENT : MC NOTIFICATION OF LAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT LAPSED DATE : 20141119
EP2312686 B1	20160229	LSLE	-PG25	LAPSED IN A CONTRACTING STATE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]	COUNTRY OF REF DOCUMENT : SI NOTIFICATION OF LAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT LAPSED DATE : 20141119
EP2312686 B1	20160229	LSLE	REG	REFERENCE TO A NATIONAL CODE	REF COUNTRY CODE : CH REF LEGAL EVENT CODE : PL
EP2312686 B1	20160331	LSLE	-PG25	LAPSED IN A CONTRACTING STATE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]	COUNTRY OF REF DOCUMENT : LU NOTIFICATION OF LAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT LAPSED DATE : 20150710
EP2312686 B1	20160420	LSLE	REG	REFERENCE TO A NATIONAL CODE	REF COUNTRY CODE : IE REF LEGAL EVENT CODE : MM4A
EP2312686 B1	20160429	LSLE	-PG25	LAPSED IN A CONTRACTING STATE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]	COUNTRY OF REF DOCUMENT : CH NOTIFICATION OF LAPSE : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES LAPSED DATE : 20150731
EP2312686 B1	20160429	LSLE	-PG25	LAPSED IN A CONTRACTING STATE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]	COUNTRY OF REF DOCUMENT : LI NOTIFICATION OF LAPSE : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES LAPSED DATE : 20150731
EP2312686 B1	20160429	LSLE	REG	REFERENCE TO A NATIONAL CODE	REF COUNTRY CODE : FR REF LEGAL EVENT CODE : ST EFFECTIVE DATE : 20160331
EP2312686 B1	20160531	LSLE	-PG25	LAPSED IN A CONTRACTING STATE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]	COUNTRY OF REF DOCUMENT : FR NOTIFICATION OF LAPSE : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES LAPSED DATE : 20150731
EP2312686 B1	20160729	LSLE	-PG25	LAPSED IN A CONTRACTING	COUNTRY OF REF DOCUMENT : IE NOTIFICATION OF LAPSE : LAPSE

				STATE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]	BECAUSE OF NON-PAYMENT OF DUE FEES LAPSED DATE : 20150710
EP2312686 B1	20170201	LSDW	REG	REFERENCE TO A NATIONAL CODE	REF COUNTRY CODE : DE REF LEGAL EVENT CODE : R119 REF DOCUMENT NUMBER : 602009027883 COUNTRY OF REF DOCUMENT : DE
EP2312686 B1	20170322	LSLE	-GBPC	GB: EUROPEAN PATENT CEASED THROUGH NON- PAYMENT OF RENEWAL FEE	REF COUNTRY CODE : EP EFFECTIVE DATE : 20160710
EP2312686 B1	20170331	LSLE	-PG25	LAPSED IN A CONTRACTING STATE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]	COUNTRY OF REF DOCUMENT : MT NOTIFICATIONOF LAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT LAPSED DATE : 20141119
EP2312686 B1	20170428	LSLE	-PG25	LAPSED IN A CONTRACTING STATE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]	COUNTRY OF REF DOCUMENT : DE NOTIFICATIONOF LAPSE : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES LAPSED DATE : 20170201
EP2312686 B1	20170531	LSLE	-PG25	LAPSED IN A CONTRACTING STATE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]	COUNTRY OF REF DOCUMENT : GB NOTIFICATIONOF LAPSE : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES LAPSED DATE : 20160710
EP2312686 B1	20170531	LSLE	-PG25	LAPSED IN A CONTRACTING STATE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]	COUNTRY OF REF DOCUMENT : BG NOTIFICATIONOF LAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT LAPSED DATE : 20141119
EP2312686 B1	20170531	LSLE	-PG25	LAPSED IN A CONTRACTING STATE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]	COUNTRY OF REF DOCUMENT : SM NOTIFICATIONOF LAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT LAPSED DATE : 20141119
EP2312686 B1	20170531	LSLE	-PG25	LAPSED IN A CONTRACTING STATE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]	COUNTRY OF REF DOCUMENT : HU NOTIFICATIONOF LAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT; INVALID AB INITIO LAPSED DATE : 20090710
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EP2312686 B1	20180629	LSLE	-PG25	LAPSED IN A CONTRACTING STATE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]	COUNTRY OF REF DOCUMENT : MK NOTIFICATIONOF LAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT LAPSED DATE : 20141119

EP2312686 B1	20290710	PEXP		Calculated Patent Term Expiry	
US2011265969 AA	20111103	LSPB	+	published / reissued	
US9257731 BB	20160209	LSGT	+	granted / extensions (spc, cpc, pte)	
US9257731 BB	20151008	LSES	+NAM1	Notice of Allowance Mailed -- Application Received in Office of Publications	
US9257731 BB	20151222	LSFE	+PPR1	Publications -- Issue Fee Payment Received	
US9257731 BB	20160120	LSGT	PAT1	Patented Case	
US9257731 BB	20290710	PEXP		Calculated Patent Term Expiry	
WO10003382 A1	20100114	LSPB	+	published / reissued	
WO10003382 A1	20110112	LSNE	NENP	NON-ENTRY INTO THE NATIONAL PHASE IN:	REF COUNTRY CODE : DE
WO10003382 A1	20110209	LSNP	+WWE	WIPO INFORMATION: ENTRY INTO NATIONAL PHASE	REF DOCUMENT NUMBER : 2009793857 COUNTRY OF REF DOCUMENT : EP
WO10003382 A1	20110331	LSNP	+WWE	WIPO INFORMATION: ENTRY INTO NATIONAL PHASE	REF DOCUMENT NUMBER : 13003576 COUNTRY OF REF DOCUMENT : US