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(71) Applicant(s)
Outokumpu Oyj

(72) Inventor(s)
Henri Virtanen; Ismo Virtanen; Tuomo Kivisto; Tom Marttila

(74) Agent/Attorney
DAVIES COLLISON CAVE, 1 Little Collins Street, MELBOURNE VIC 3000

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(71) Applicant (for all designated States except US): OUTOKUMPU OYJ [FI/FI]; Riihitontuntie 7, FIN-02200 Espoo (FI).			
(72) Inventors; and			
(75) Inventors/Applicants (for US only): VIRTANEN, Henri [FI/FI]; Liikastentie 23, FIN-28610 Pori (FI). VIRTANEN, Ismo [FI/FI]; Viipuritie 23, FIN-28600 Pori (FI). KIVISTÖ, Tuomo [FI/FI]; Hirsalantie 259, FIN-02420 Kirkkonummi (FI). MARTTILA, Tom [FI/FI]; Humaljärventie 5, FIN-02400 Kirkkonummi (FI).			
(74) Agent: OUTOKUMPU OYJ; Patent Services, P.O. Box 27, FIN-02201 Espoo (FI).			
(54) Title: ANODE FOR ELECTROLYTIC REFINING			
(57) Abstract The invention relates to an anode used in the electrolytic refining of copper, said anode (1) comprising two support parts (2), whereby the anode (1) is suspended during the electrolytic process against the electrolytic tank walls. According to the invention, in the anode support parts (2) there are formed brackets (3) for gripping the anode (1) and for supporting the anode (1) when it is being transferred from one position to another.			

ANODE FOR ELECTROLYTIC REFINING

The present invention relates to a soluble copper anode for electrolytic refining, which anode is immersed in a tank used in electrolytic refining and lifted up from
5 said tank, so that gripping members provided in a charging member are protected from contacting the tank walls.

The cathodes and anodes serving as electrodes in the electrolytic refining of copper are placed in an alternating fashion in a tank containing the electrolytic
10 solution. In order to advantageously perform electrolytic refining, the electrodes are positioned as near to each other as possible, and the mutual positioning of the electrodes must be carried out as precisely as possible in order to avoid short circuits. Although the anodes and cathodes are subjected to completely different operations both before their immersion in the electrolytic tank and after
15 being lifted up therefrom, it is advantageous for the operation of the charging member that the charging member, while being positioned above the electrolytic tank, can handle both anodes and cathodes at the same time. Therefore the charging member is advantageously provided with separate gripping members designed for anodes and cathodes respectively.

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When using an anode that is soluble in the electrolytic solution, the anode lugs that support the anode both during loading and during the electrolytic treatment are made of the same soluble material, and therefore the anode lugs are made as short as possible. Thus the anode gripping members in connection with
25 loading extend essentially near to the tank walls and to the conductor rails with insulation suspended from the tank walls, in which case even slight erroneous movements of the gripping member could result in the damaging of the tanks, conductor rails or insulation.



When using copper anodes of the conventional shape, where the grip point between the lugs and the charging member is located in between the

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electrolytic tank wall and the plate-like part of the anode, the surface of the electrolytic solution contained in the electrolytic tank must be essentially low with respect to the conductor rails suspended from the tank walls, so that the anode lug designs required by the anode treatment are prevented from entering the electrolytic solution and thus from interfering the electrolytic process itself. When the surface of the electrolytic solution is kept low, the investment and running expenses of the electrolytic plant are increased – owing to an increased amount of anode scrap, among other reasons.

10 Advantageously, the present invention alleviates some of the drawbacks of the prior art and realizes a more feasible soluble anode design for the electrolytic refining of copper, in which anode the grip point in between the anode lug and the charging member is adjusted in order to be able to load both the anodes and the cathodes used in electrolytic refining in an essentially simultaneous fashion.

15 According to the present invention there is provided an anode for the electrolytic refining of copper, said anode including two support parts, by which the anode can be suspended during the electrolytic process against the electrolytic tank walls, wherein when casting the anode, in the anode support parts, there are formed
20 brackets for facilitating gripping of the anode and for supporting the anode when transferring it from one position to another, so that ends of the brackets that point away from the support parts are located essentially at the same height as ends of the support parts that point away from the anode.

25 In the soluble anode meant for the electrolytic refining of copper, in the suspension part of the anode which suspends the anode in the electrolytic tank during the electrolytic process, there is formed, advantageously when casting the anode, a bracket, so that the end of said bracket that points away from the anode suspension part is directed towards the center line of the anode or towards an imaginary continuation of said center line. Thus the suspension part of an anode that is provided with a bracket can be thoroughly gripped above the liquid surface



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of the electrolytic solution contained in the electrolytic tank – and by using a motion of the gripping member that takes place essentially far from the electrolytic tank walls. The bracket formed in the anode suspension part supports the anode during transportation to the electrolytic tank, during the immersion into and lifting
5 up from the electrolytic tank, and during further transportation away from the electrolytic tank. Thus the

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Support part properly supports the anode only while the anode is being immersed in the electrolytic tank.

Because the electrodes, the cathodes and anodes, used in the electrolytic refining of copper carried out in an electrolytic tank, are during the electrolytic process suspended from the electrolytic tank walls by means of two separate support parts that are located on opposite sides of the center line of the electrodes, in the anode according to the present invention the grip bracket is likewise formed separately for both support parts, advantageously so that the bracket ends directed away from the support part are pointed towards each other.

According to the invention, the bracket formed in the anode support part is advantageously positioned so that the bracket end directed away from the support part is located essentially at the same height as that end of the support part that points away from the center line of the anode. Now the bracket is advantageously essentially parallel with the support part along the whole length thereof. That end of the bracket that points away from the support part may also be located at a different height, either higher or lower, than the end that is directed away from the anode center line. In that case at least part of the bracket forms a sharp angle in relation to the support part. The length of the bracket is advantageously such that a sufficient support is obtained by means of the gripping member provided in the charging member in order to transfer the anode from one position to another. Moreover, the brackets provided in the support parts of an anode according to the invention are located so that the brackets are positioned essentially symmetrically with respect to the anode center line.

When employing a soluble anode meant for electrolytic refining according to the invention, where the support part of said anode is provided with a bracket for suspending the anode in connection with transportation, it is essentially easy to handle mixed anode and cathode loads with a charging member, because the



gripping members provided in the charging member and matching the bracket do not need to penetrate in between the anodes and cathodes, where there is usually no room for the anode gripping member. In addition, a bracketed anode according to the invention can be gripped so that the location of the anode with
5 respect to the gripping member can be adjusted in an essentially precise fashion. Moreover, the gripping member gripping the bracket is placed essentially far from the electrolytic tank walls and from the conductor rails with insulation provided on the walls, so that the gripping member does not hit the walls or rails, at least not due to slight erroneous movements.

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Advantageously the bracket formed in the anode grip part according to the invention and the gripping member that grips said bracket are always positioned above the electrolytic solution contained in the electrolytic tank, so that the treatment of the anode according to the invention does not in any way
15 restrict a possible raising of the surface of the electrolytic solution. By raising the surface of the electrolytic solution, the investment and running costs of an electrolytic refining plant can be advantageously cut. Thus for instance the amount of anode scrap is reduced, irrespective of separate grip brackets. Moreover, when a grip bracket is used in the anode grip part according to the
20 invention, the gripping of the anode need not be taken into account while defining the respective dimensions of the electrolytic tank and the cathodes and anodes serving as electrodes.

The invention is explained in more detail below, with reference to the appended
25 drawing, which is a front-view illustration of a preferred embodiment of the invention.

According to the drawing, in a cast copper anode 1, there are formed, in connection with the casting, support parts 2 in order to suspend the anode
30 during the dissolution process taking place in the electrolytic tank. Moreover, in connection with the casting, the support parts 2 are provided with grip brackets

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3 in order to support the anode while the anode is being moved by means of gripping members (not illustrated) that are connected to the charging member and are known as such. In addition to this, the reference number 4 refers to that end of the grip bracket 3 that points away from the support part, and the reference
5 number 5 refers to that end of the support part 2 that points away from the anode.

The reference to any prior art in this specification is not, and should not be taken as, an acknowledgment or any form of suggestion that that prior art forms part of the common general knowledge in Australia.

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Those skilled in the art will appreciate that the invention described herein is susceptible to variations and modifications other than those specifically described. It is to be understood that the invention includes all such variations and modifications which fall within its spirit and scope. The invention also includes all
15 the steps, features, compositions and compounds referred to or indicated in this specification, individually or collectively, and any and all combinations of any two or more of said steps or features.

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THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. An anode for the electrolytic refining of copper, said anode including two support parts, by which the anode can be suspended during the electrolytic process against the electrolytic tank walls, wherein when casting the anode, in the anode support parts, there are formed brackets for facilitating gripping of the anode and for supporting the anode when transferring it from one position to another, so that ends of the brackets that point away from the support parts are located essentially at the same height as ends of the support parts that point away from the anode.
2. An anode according to claim 1, wherein the brackets are formed so that the ends of the brackets that point away from the support parts are directed towards each other.
3. An anode according to claim 1 or 2, wherein the brackets are essentially parallel to the support parts along the whole length thereof.
4. An anode according to any one of the preceding claims, wherein the brackets formed in the support parts are in an essentially symmetrical position with respect to the center line of the anode.
5. An anode substantially as hereinbefore described with reference to the accompanying drawing.

DATED this 18th day of JULY, 2000

Outokumpu Oyj

by DAVIES COLLISON CAVE
Patent Attorneys for the Applicant(s)



