Dec. 19, 1961 R. JÖRGENSEN 3,014,119

PROCESS FOR ADJOINING CONTINUOUS ELECTRODES

Filed April 27, 1959

Fig. 1

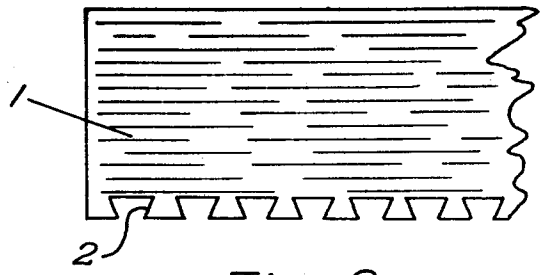


Fig. 2

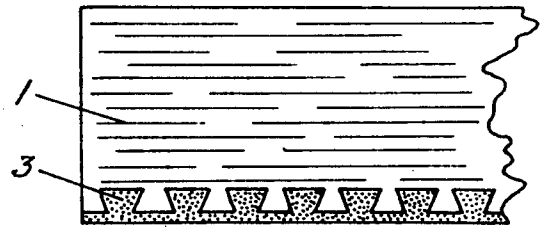
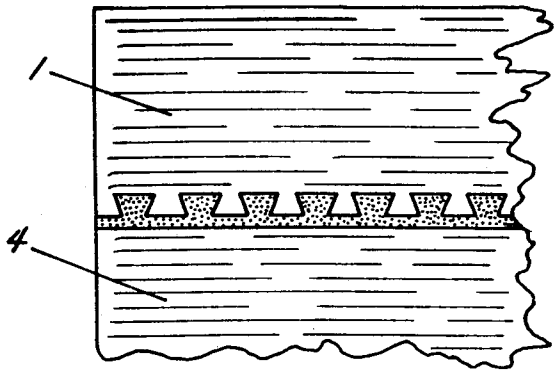


Fig. 3



INVENTOR

ROLF JÖRGENSEN

Wenderoth, Lind & Ponack

Attys.

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3,014,119
PROCESS FOR ADJOINING CONTINUOUS ELECTRODES

Rolf Jorgensen, Ardalstangen, Norway, assignor to A/S Ardal OG Sunndal Verk, Oslo, Norway

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1 Claim. (Cl. 219—85)

This invention relates to continuous electrodes for electrolysing furnaces for smelting bath electrolysis. More specially the invention relates to the adjoining of such electrodes. Because of the fact that the lower part of the electrode during the furnace operation is being consumed, the electrode must be gradually lowered and hence, the upper part must be elongated at a corresponding rate.

Regarded as a unity it is of principal importance that the electrode has good electrical conductivity, that it is mechanically strong and that it is resistant against attacks from the atmosphere surrounding the smelting bath. In order to accomplish these conditions it is of special importance that the connection between the separate sections of the electrode is adequate, since the quality of the electrode is determined by its poorest zone.

For connecting the blocks it has been attempted to impose between the electrode and the block to be adjoined a layer consisting of unbaked self-baking binder. This binder will then firmly bake to the faces of the blocks when the baking process takes place when heat is supplied from the electrode. As a result of the fact the new block, which is put on is cold or has substantially lower temperature than has the electrode underneath the binder, the adhesion and baking conditions on the upper and on the lower side of the intermediate layer will differ considerably.

Practice has shown that while in the above mentioned process the binder has good adherence to the underlaying electrode, it has not good adherence to the overlaying carbon block which is to be adjoined. Thus, in many instances fractures occur on the top face of the binder.

The object of the present invention is to relieve this drawback. The process according to the invention consists in that a suitable carbonizable binder is applied in such a quantity on the bottom face of a block being provided with dovetail shaped grooves in said bottom that the grooves are being filled, and that a continuous layer is formed underneath and between said grooves, placing said block face to face with the plane, continuous top surface of the electrode, said binder being carbonized on supply of heat from the electrode.

After the burning the binder will firmly adhere to and constitute a mechanical unity with the electrode or underlaying block, and the binder located in the grooves will form feather keys which fit into the grooves and serve to provide the required mechanical connection between the adjoined block and the underlaying electrode. Even if

the binder does not adhere to the underside of the superimposed block no fracture will occur.

The dovetail shaped grooves may be provided in various manners. In a manner known per se they can for instance be arranged in a row of parallel grooves, or they may extend in two directions intersecting each other thus leaving between the grooves merely a pattern of spigots having upwardly decreasing sectional areas.

It shall be understood that the profile of the grooves can be varied within wide limits, provided that the cross-sectional area increases in upward direction. The invention is schematically illustrated in the drawing, where—

FIG. 1 shows a broken section of a block which is to be adjoined to the upper end of an electrode.

FIG. 2 shows the block subsequent to the application of binder to its bottom, and

FIG. 3 shows a fragmentary section through the upper part of an electrode with a block shown in FIGS. 1 and 2 being placed on the top face of the electrode.

As shown in the drawing the block **1** is furnished on its lower face with parallel dovetail shaped grooves **2**. When the block shall be adjoined, it is on its lower face coated with a layer of binder **3**, which is applied in such a quantity that the grooves **2** are completely filled and further, that the binder forms a continuous layer below and between the grooves as it appears in FIG. 2. Thereafter the block is placed on the electrode as shown in FIG. 3, and the binder will become carbonized upon receiving heat from the electrode. A satisfactory carbonizable binder for use with the present invention is disclosed in German Patent No. 863,999, and another satisfactory binder is disclosed in Austrian Patent No. 196,135.

I claim:

A process for joining a block onto a continuous electrode having a plane, continuous top face, comprising the steps of forming in the bottom face of the block a plurality of dovetail shaped grooves, applying to said grooved face a suitable carbonizable binder for filling the grooves and simultaneously forming a continuous layer of binder over the entrance to and between said grooves, placing said block with the binder thereon in abutting relationship with the plane, continuous top face of the electrode, and carbonizing said binder by supplying heat thereto from the electrode.

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