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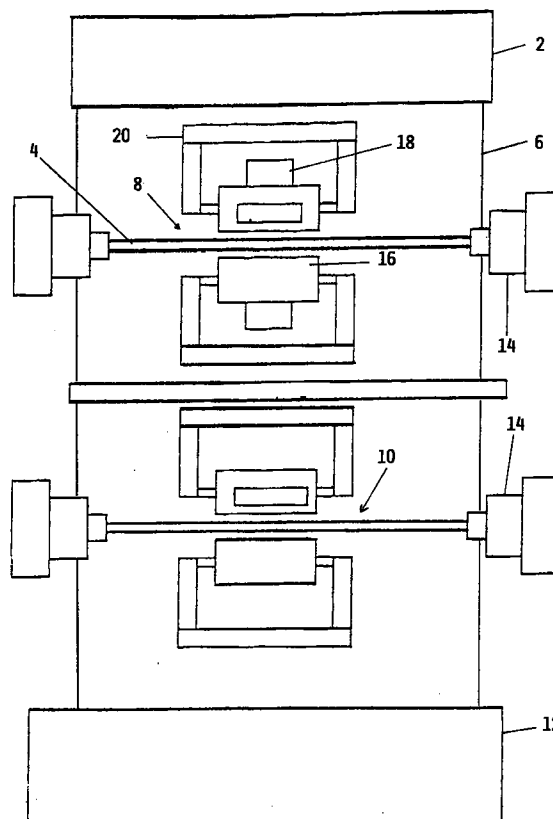
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(54) **Method for cleaning water heating elements, in particular armoured resistance elements**

(57) A method for cleaning water heating elements, in particular armoured resistance elements (4), characterised in that the cleaning is carried out by mechanical abrasion.



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## Description

[0001] This invention relates to a method for cleaning water heating elements, in particular armoured resistance elements.

[0002] Water heating elements are known consisting substantially of a steel sheath internally housing a resistive wire separated from the sheath by a dielectric substance, in particular magnesium oxide.

[0003] In order to free the surface of the sheath from oxidation and irregularities which could allow the detergent and lime to accumulate with resultant corrosion, the sheath is subjected to finishing treatment generally consisting of polishing in an electrolytic bath.

[0004] After the electrolytic bath the resistance element is washed with hot water, possibly slightly alkaline, to neutralize the residual bath acids.

[0005] This cleaning method has however certain drawbacks, namely:

- high cost due to the provision of the electrolytic plant itself and the need to provide a wash water purification plant and a bath liquid disposal plant,
- low productivity,
- laborious preparation of the resistance element for the electrocleaning, requiring precleaning and degreasing of any fingerprints which, following electrocleaning, would be highlighted and indelibly impressed on the resistance element,
- incomplete cleaning as the sheath requires protection of its ends, which hence remain uncleared.

[0006] An object of the invention is to eliminate these drawbacks by providing a method which enables the resistance element to be cleaned in a completely automated manner, is of high productivity and low cost, requires little maintenance, and suffers from no ecological problems.

[0007] This and further objects which will be apparent from the ensuing description are attained by a cleaning method for water heating elements, in particular armoured resistance elements as described in claim 1.

[0008] The invention is further clarified hereinafter with reference to the accompanying drawing showing a schematic plan view of a plant for implementing the method of the invention.

[0009] As can be seen from the figure the plant for implementing the method of the invention comprises substantially a loading hopper 2 housing the individual resistance elements 4 already assembled, ie with the resistive wire inserted into the sheath and separated therefrom by dielectric material, for example magnesium oxide. Starting from the loading hopper there is a conveyor 6 for conveying the individual resistance elements to a cleaning station 8 and a polishing station 10. The conveyor exit is connected to a discharge hopper 12.

[0010] The cleaning station 8 and polishing station 10

comprise two chucks 14 for locking the resistance element and two vegetable fibre brushes 16 of horizontal axis, each of which is faced by a cake of abrasive paste.

[0011] The brushes are mounted on a traversable frame 20.

[0012] According to the method of the invention, an individual resistance element 4 is discharged by the loading hopper 2 onto the conveyor 6 to be fed to the cleaning station 8, where it is locked by the locking chucks 14. At the same time the brushes 16 are operated so that as a result of their rotation the fibres pick up abrasive paste while at the same time mechanically cleaning the resistance element. During this stage the brushes are made to traverse along their axis so as to clean the entire resistance element. The resistance element is then conveyed to the polishing station where the aforescribed operations are effected. After cleaning, the resistance element is fed to the discharge hopper 12.

[0013] From the foregoing it is apparent that the cleaning method of the invention presents numerous advantages, and in particular:

- it is lower cost than the electrocleaning plant,
- there are no environmental pollution problems, as the solid residues are discharged as solid urban refuse,
- it enables reliable finishing to be achieved by the use of synthetic fibres and abrasive material which is continuously replaced,
- it is suitable for automation, with consequent high productivity.

[0014] The described example relates to a plant operating automatically on a straight resistance element. The method can however also be carried out manually, ie by subjecting the individual resistance elements to a manual mechanical cleaning operation. It can also be used manually or automatically on an already completed resistance element.

## Claims

1. A method for cleaning water heating elements, in particular armoured resistance elements, characterised in that the cleaning is carried out by mechanical abrasion.
2. A method as claimed in claim 1, characterised in that the cleaning is carried out with rotating brushes of vegetable fibre.
3. A method as claimed in claim 1, characterised in that the rotating brushes are faced by a cake of abrasive paste.

