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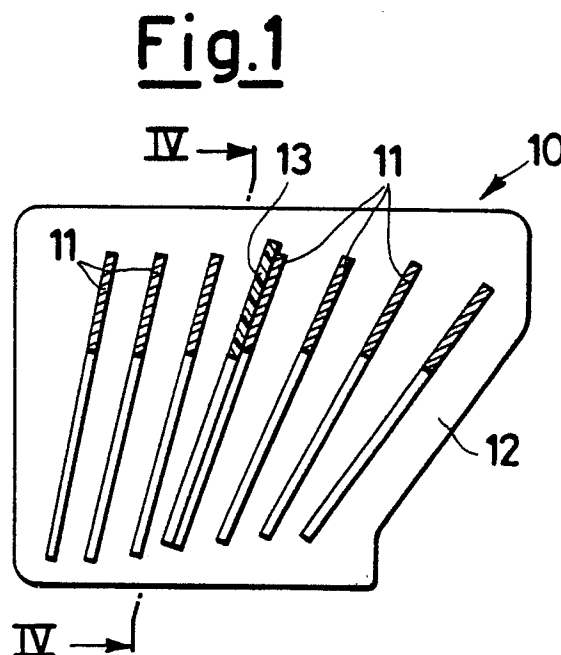
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Arc chamber, in particular for low-voltage circuit breakers.

This invention relates to an arc chamber (10) constituted by shaped blades (11) made of metal material. Such blades are positioned side by side to, in a sub parallel arrangement and are joined with one another by means (12) of a non-conductive material. One of said metal blades is in contact with an element made of an organic-based material, capable of releasing a gas when it is struck by the electric arc.



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"ARC CHAMBER, IN PARTICULAR FOR LOW-VOLTAGE CIRCUIT BREAKERS"

The object of the present invention is an arc chamber, in particular for low-voltage circuit breakers.

Arc chambers are known, for low-voltage circuit breakers, which are constituted by two shaped blades made of an electrically conductive material, placed side-by-side to each other in a parallel or sub-parallel arrangement, joined with each other by means of a non-conductive material. Such arc chambers suffer from the drawback of a not enough rapid dielectric restoration, in particular if large short-circuit currents have to be interrupted.

The purpose of the present invention is to obviate the disadvantages of the above cited prior art.

Aiming at such purpose, an arc chamber has been therefore provided, which is constituted by shaped blades made of a metal material, which are positioned side-by-side to, in a sub-parallel arrangement, and are joined with, one another, by means of side plates of a non-conductive material, characterized in that at least one of said metal blades is in contact with an element made of an organic-based material, capable of releasing a gas when it is struck by the electric arc.

Still according to the invention, said element made of an organic-based material capable of releasing gases is constituted by at least a blade essentially having the same shape as of one of said shaped metal blades.

Furthermore, at least said one blade is placed in contact with, and parallelly to, said shaped metal blade, thus resulting inserted between two blades made of a metal material.

In order to better understand the characteristics and further advantages of the instant invention, said invention is now disclosed by referring to the here-to attached drawing table, wherein:

Figure 1 shows a sectional view of an arc chamber according to the invention;

Figure 2 shows a sectional view of the elements of Figure 1, differently arranged.

Figure 3 shows a sectional view of another example of an arc chamber according to the invention; and

Figure 4 shows a sectional view taken along the path IV-IV of Figure 1.

Referring to the Figures, by the reference numeral 10 an arc chamber according to the present invention is shown, which is constituted by blades made of a metal material 11 fastened on side plates 12 made of an insulating material.

In Figure 1, a metal blade 11 is shown, which is in contact with a blade 13 made of an organic-based material, essentially having the same profile

as of the metal blade 11. The blade 13, inserted inside the arc chamber 10, is capable of releasing gases, when, during the interruption process, it is struck by the electrical arc, it being constituted by such materials as, e.g., teflon, and other synthetic materials. The gases released by the contact of the arc with the blade 13 are generally, but not necessarily, hydrogen or fluorine, which favour the dielectric restoration, generally improving the interrupting characteristics of the circuit breaker in which arc chambers of this type are inserted.

For purely exemplifying purpose, in Figure 2 an example of arrangement of two blades 13 in contact with one metal blade 11 is shown, wherein said blades 13 are positioned in such a way that the metal blade 11 is positioned between the two blades 13 made of an organic-based material.

In Figure 3, still for exemplifying purpose, a blade of an organic-based material 14 of slightly larger dimensions is shown.

In general, in order to improve the dielectric strength after the interruption, the blades 13 and 14 contribute to such restoration by releasing positive ions which are characterized by a high mobility (e.g., protons), or releasing highly electronegative ions.

Advantageously, protons can be produced from organic-based and cellulose-based materials, which contain hydrogen in their chains, which is released at such high temperatures as developed by the arc.

As an alternative, electronegative ions can be produced from such materials as teflon, which releases fluorine.

Summing up, in both cases, the residual free ions of the arc column, by binding themselves to protons, or to the electronegative ions, decrease in mobility, and the probabilities are hence reduced that discharges of dielectric type may occur.

For illustrative purposes only, it is recommended to keep in mind that an element of an organic-based material can be installed in contact with the metal blades 11 also in positions different from those shown in Figures from 1 to 4, e.g., in a position perpendicular to the metal blades.

The present invention has been disclosed for illustrative and non-limitative purposes, but it should be understood that modifications and changes can be supplied by those skilled in the art, without anyway exiting the purview of protection of the present invention.

Claims

1. Arc chamber constituted by shaped blades made of a metal material, which are positioned side-by-side to, in a sub-parallel arrangement, and are joined with, one another, by means of side plates of a non-conductive material, characterized in that at least one of said metal blades is in contact with an element made of an organic-based material, or of celluloses, which is capable of releasing a gas when is struck by the electric arc.

2. Arc chamber according to claim 1, characterized in that said element made of an organic-based material, or of celluloses, capable of releasing gases, is constituted by at least one blade essentially having the same shape as of one of said shaped metal blades.

3. Arc chamber according to claims 1-2, characterized in that said at least one blade made of an organic-based material or of celluloses, is positioned in contact with, and parallelly to, said shaped metal blade.

4. Arc chamber according to claim 1, characterized in that said element made of an organic-based material, or of celluloses, is constituted by two blades in contact with one metal blade, said blades being positioned in such a way that said metal blade is positioned between two said blades.

5. Arc chamber according to claim 1, characterized in that said element made of an organic-based material is constituted by a material which, at a high temperature, is capable of releasing protons.

6. Arc chamber according to claim 1, characterized in that said element made of an organic-based material is constituted by a material which, at a high temperature, is capable of releasing electronegative ions.

7. Arc chamber according to claims 1 and 6, characterized in that said element made of an organic-based materials is made of teflon.

8. Arc chamber according to any of the preceding claims, substantially as herein disclosed and illustrated.

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Fig.1

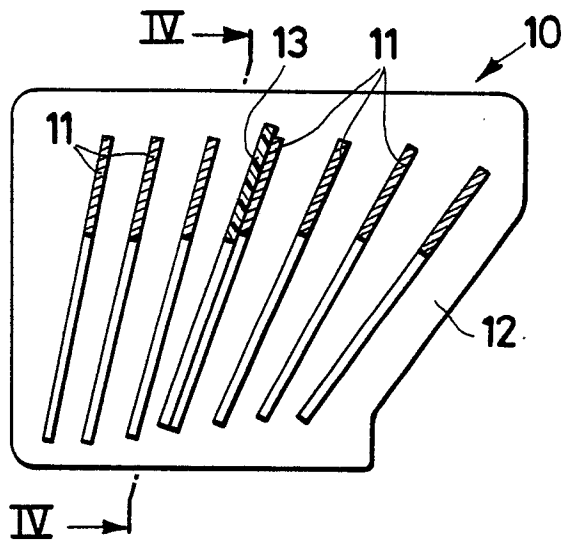


Fig.4

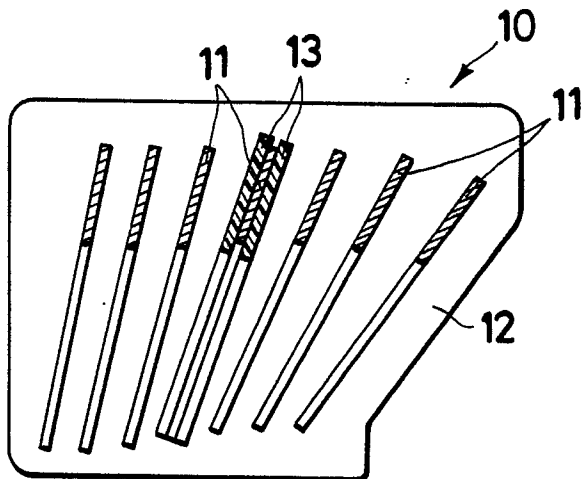
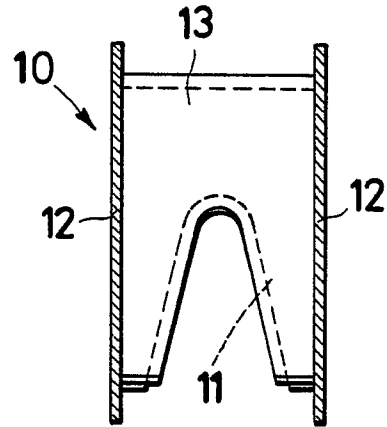


Fig.2

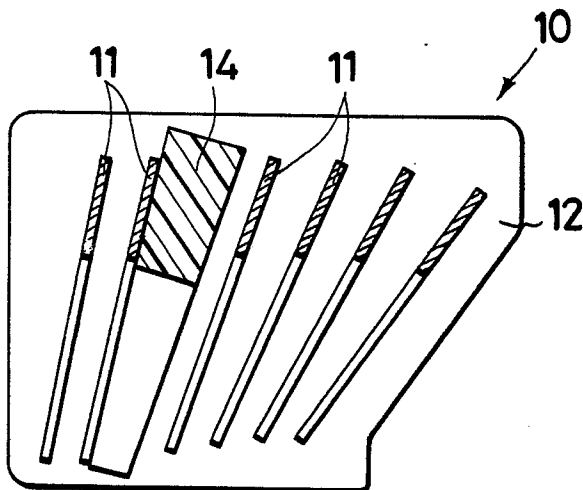


Fig.3



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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.3)
X	DE-A-3 247 681 (BBC) * claims 1,5; page 4, lines 31-34; page 9, lines 7-17; figures 1, 2, 4 * ---	1,3-4	H 01 H 33/76 H 01 H 73/18 H 01 H 9/30
X,P	FR-A-2 584 230 (MERLIN GERIN) * claims 1, 5-6, figure 4 * ---	1-2	
X	DE-U-1 707 783 (VOIGT & HAEFFNER) * complete document * ---	1-4	
Y	FR-A-1 040 798 (WESTINGHOUSE) * page 2, left-hand column; paragraphs 2-3; figure 1 * ---	1,5-7	
Y	FR-A-2 232 058 (SQUARE) * page 1, lines 1-8, 35-39; page 2, lines 37-39 * ---	1,5-6	
Y	FR-A-2 227 618 (BBC) * page 1, lines 1-13 * -----	7	
			TECHNICAL FIELDS SEARCHED (Int. Cl.3)
			H 01 H 33/00 H 01 H 73/00 H 01 H 9/00
The present search report has been drawn up for all claims			
Place of search BERLIN		Date of completion of the search 09-03-1988	Examiner DIOU J.M.
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	