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PATENT SPECIFICATION

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(54) IMPROVEMENTS IN OR RELATING TO CONDENSERS FOR VERY HIGH VOLTAGES

(71) We, PIRELLI SOCIETA PER AZIONI, a Company incorporated under the laws of Italy, of Centro Pirelli, Piazza Duca d'Aosta No. 3, Milan, Italy, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be described in and by the following statement:—

The present invention relates to condensers for very high voltages (up to some hundreds of kilovolts) and to power factor correction plant including such condensers able to supply large reaction powers (of the order of some tens or even hundreds of MVAR).

Power factor correction plant utilising condensers having flat plates, and insulated with impregnated paper, are already known. Said plant of known type are unsuitable for use at the above-mentioned very high voltages, as their electrical characterics are such that permanent damage to the condensers can be caused in operation of the plant.

The present invention aims at providing condensers and power factor correction plant incorporating said condensers, which are able to work satisfactorily at said very high voltages.

According to the present invention a condenser for very high voltages for power factor correction plant comprises coaxial inner and outer tubular plates, a dielectric filling the space between the plates, said dielectric being impregnated with an insulating fluid, and the inner plate being perforated whereby insulating fluid present within the inner plate may communicate with the insulating fluid impregnating the dielectric.

Preferably the insulating fluid impregnating the dielectric is at a pressure higher than atmospheric pressure.

The invention further provides a power factor correction plant including at least one condenser of the above-described type.

The condensers according to the invention, by virtue of their structural features, are able to withstand very high voltages. In particular, the insulating fluid under pressure impregnates the dielectric in such a way as to exclude the smallest interstices containing air or other gases which are likely to be subjected to ionization.

Moreover, as it will be better explained herebelow, the condenser can be constructed, according to methods already known (in connection with the manufacture of oil-filled cables) in very long lengths and this enables any desired capacity to be obtained easily. As the condenser generally has a considerable length compared with its diameter, it is also relatively flexible and therefore can be wound up in any appropriate manner, in order to occupy a small space.

In a preferred embodiment, the dielectric is constituted by stratified paper tapes; the impregnating fluid can advantageously be an oil of the type used in oil-filled power cables and can have a kinematic viscosity ranging between 4 and 100 cSt at 20°C. An appropriate screen comprising layers of semi-conductive paper (for example, paper loaded with carbon black or metallized paper) can be interposed between the dielectric and the two plates.

The inner tubular plate of the condenser can be advantageously constituted by an extruded aluminium tube, the wall of which has a thickness of the order of 1 or a few millimetres; also the outer tubular plate can advantageously comprise an aluminium tube, having a small thickness (of the order of 1 or a few millimetres). Said plates are of sufficient size from the electric point of view that, even in the presence of very large reaction powers, the currents involved are relatively low on account of the very high voltage values.

The tubular inner plate is advantageous as regards weight and cost as compared with a solid plate, without giving rise to appreciable

[Price 5s. 0d. (25p)]

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