

**PATENT SPECIFICATION**

**639,111**



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SPECIFICATION NO. 639,111

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By a direction given under Section 17(1) of the Patents Act 1949 this application proceeded in the name of Technograph Printed Circuits Limited, a British Corporation, of 32, Shaftesbury Avenue, London, W.1.

THE PATENT OFFICE,  
10th February, 1951

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ence in its usual form, or a development of that form upon a plane or other surface, instead of being first produced as a linear conductor and afterwards given its three-dimensional form.

A typical instance of the invention comprises the steps of making a drawing of the electric or magnetic circuit, or of a development of it if it is of three dimensions; preparing from that drawing, by any of the well-known methods of the printing art, a printing surface; making an imprint by the aid of the printing surface; and from that imprint producing the conductor.

A description of the mass production of a resistance will illustrate a widely applicable specific example of the method of the invention. The pattern of the resistant conductor is first drawn out, for instance a grid, or a succession of grids, in line or, for a variable resistance, grouped in a semi-circle. From this a printing block is prepared. Foil of resistant metal is backed by a layer of insulating material, which may be applied in a liquid or plastic form, for instance as a varnish, or may be a preformed sheet of fabric, plastic or impregnated paper made to adhere thoroughly to the foil. Upon the metal surface of a band of this composite material the resistant pattern may

other vessel, as for keeping food warm, the metal foil may be printed and then attached direct to the vessel which then constitutes its insulating backing; though even in this case the metal may first be coated on the vessel and subsequently printed by the offset method.

There are other ways of converting a printed pattern into a conductor. Where leaf metal will suffice to give a conductor of the requisite cross-section, the print may be made with adhesive ink upon an insulating backing, and metal leaf, for instance copper leaf, applied after printing; it will adhere to the ink throughout the printed pattern and elsewhere may be removed by dabbing with a duster.

Where, as in the resistance under consideration, the desired conductor is continuous, or is not too much broken up, the print may be made upon an insulating backing in a conductive ink, or in an adhesive ink upon which graphite can be dusted and a conductor may be subsequently built up in an electrolytic bath. A modification of this method is to spray the metal directly upon the printed pattern or through a patterned mask. For some purposes a print in conductive ink may need no building up, in which case the method is not restricted to continuous patterns.

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