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**"IMPROVEMENTS IN OR RELATING TO ELECTRODE HOLDER FOR THE ELECTROCHEMICAL
MARKING OF METALS"**

**COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH, RAFI MARG, NEW DELHI-1, INDIA,
AN INDIAN REGISTERED BODY INCORPORATED UNDER THE REGISTRATION OF
SOCIETIES ACT (ACT XXI OF 1860).**

**This is an invention by DR. SHANKARAN GURUSWAMY, Scientist, Central Electrochemical Research Institute,
Karaikudi-3 (Madras State), India, an Indian citizen.**

*The following Specification particularly describes and ascertains the nature of this invention and the manner
in which it is to be performed.*

This invention relates to improvements in the electrode holder for the electrochemical marking of metals.

The method of electrochemical marking of metals is at present employed for transferring letter, designs and numbers on metals so that metal articles of industry and commerce are marked for the purpose of identification, certificate of quality and for advertisement. The method has the advantages of speed, clarity, permanence, ease of production and minimum damage to the underlying metal.

Full details of the method, however, are not available. The necessary equipment and know-how for the work will have to be imported involving foreign exchange and dependence on foreign firms.

The main object of this invention is to develop indigenous know-how on the subject and to design suitable equipment for the electrochemical marking of metals. Reference is made to prior Indian Patent Specification No. 111691.

This invention is concerned specifically with improvements in or relating to electrode holder for the electrochemical marking on metals and has for its principal object to propose such a construction that alternating or direct current of suitable amperage and voltage is made to flow through an absorbent pad containing solutions of suitable mixture chemicals.

It is further the object of the invention that it should be possible to conveniently adopt the electrode holder in industrial installations to the requirements of continuous marking of metal articles of industry and commerce.

According to this invention, the electrode holder comprises a metal electrode in electrical contact with a metal plate and an absorbent pad which, when soaked with a solution of mixture of chemicals, allows the passage of current between the metal electrode and the metal article that has to be marked through a stencil.

Thus in accordance with one embodiment, the electrode holder comprises a holding piece for the metal electrode, a metal plate of suitable size, an absorbent pad and an arrangement to keep the pad secure to the electrode holder.

The electrode holder which may be circular, rectangular or square in cross-section according to requirements is closed at one end and is fully open at the other. The holding piece is held secure to the electrode holder at the centre of its closed end by means of a screw arrangement. The screw arrangement also controls the movement and position of the metal electrode within the electrode holder.

The metal electrode is secured to one end of the holding piece by a screw and the electrical lead is taken out through a hole running along the length of the holding piece.

The metal plate, which is separate from the metal electrode, is contained in the electrode holder and is of such a size that it easily moves along the length of the electrode holder when the metal electrode is moved. The metal plate which is in direct electrical contact with the metal electrode has several holes drilled on it to allow for the free escape of gases formed during electrochemical reaction.

The electrode holder has one end fully open to enable placing of an absorbent pad over the metal plate. The absorbent pad is held secure to the electrode holder by means of a piece of absorbent cloth and ring. The latter is fixed over a recess cut along the edge of the electrode holder.

The electrode holder, the holding piece and the ring are made of electrically insulating material such as ebonite. The metal electrode and the metal plate are made of stainless steel, aluminium or other metals depending on requirements. The absorbent pad is made of cotton, nylon, felt or others depending on requirements.

It is obvious that other modifications can be made within the ambit and scope of this invention.

The invention will now be described more fully with reference to the accompanying drawing. Sheet 1 shows a sectional elevation of the electrode holder which is circular in cross-section.

The metal electrode (1) is secured to the holding piece (5) by means of screw arrangement (2). The electrical lead (4) is taken through a hole (3) running along the length of the holding piece (5). The holding piece is secured by screw arrangement (6) at the centre of the closed end of the electrode holder (7). The movement of the metal electrode (1) inside the electrode holder (7) is controlled and fixed by screw arrangement (6). The metal plate (9) has several holes drilled on it to allow for the escape of gases formed during electrochemical reactions. The gases escape through holes (8) drilled on the electrode holder (7). The absorbent pad (10) is secured to the electrode holder (7) by a piece of absorbent cloth (11) and ring (12). The ring fits tightly over the recess (13) cut along the edge of the electrode holder (7).

The electrode holder is assembled and operated in the following manner :

The ring (12) is removed and the electrode holder inverted so that the open end faces the observer. The holding piece (5) along with metal electrode (1) is screwed down so that it reaches its lowest position towards the closed end of the electrode holder (7). Metal plate (9) is now put into the electrode holder (7) so that it touches the metal electrode (1). The absorbent pad (10) is prepared over the metal plate (9). Suitable quantities of solution of mixture of chemicals are added over the absorbent pad (10) so as to soak it. A piece of absorbent cloth (11) is spread

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over the absorbent pad (10) and fixed over the recess (13) by means of ring (12). The electrode holder is now inverted and rotated so that the absorbent pad is compressed and the solution slowly comes out through the cloth layer (11). The electrode is now ready for marking.

A stencil (14) which may be made of paper, cloth or plastic film is placed over the metal to be marked (15). The electrode holder is, in turn, placed over the stencil. The metal to be marked (15) and the metal electrode (1) are now connected to the electric supply and current passed for a suitable time to complete the marking on the metal.

The following are among the main advantages of the invention :

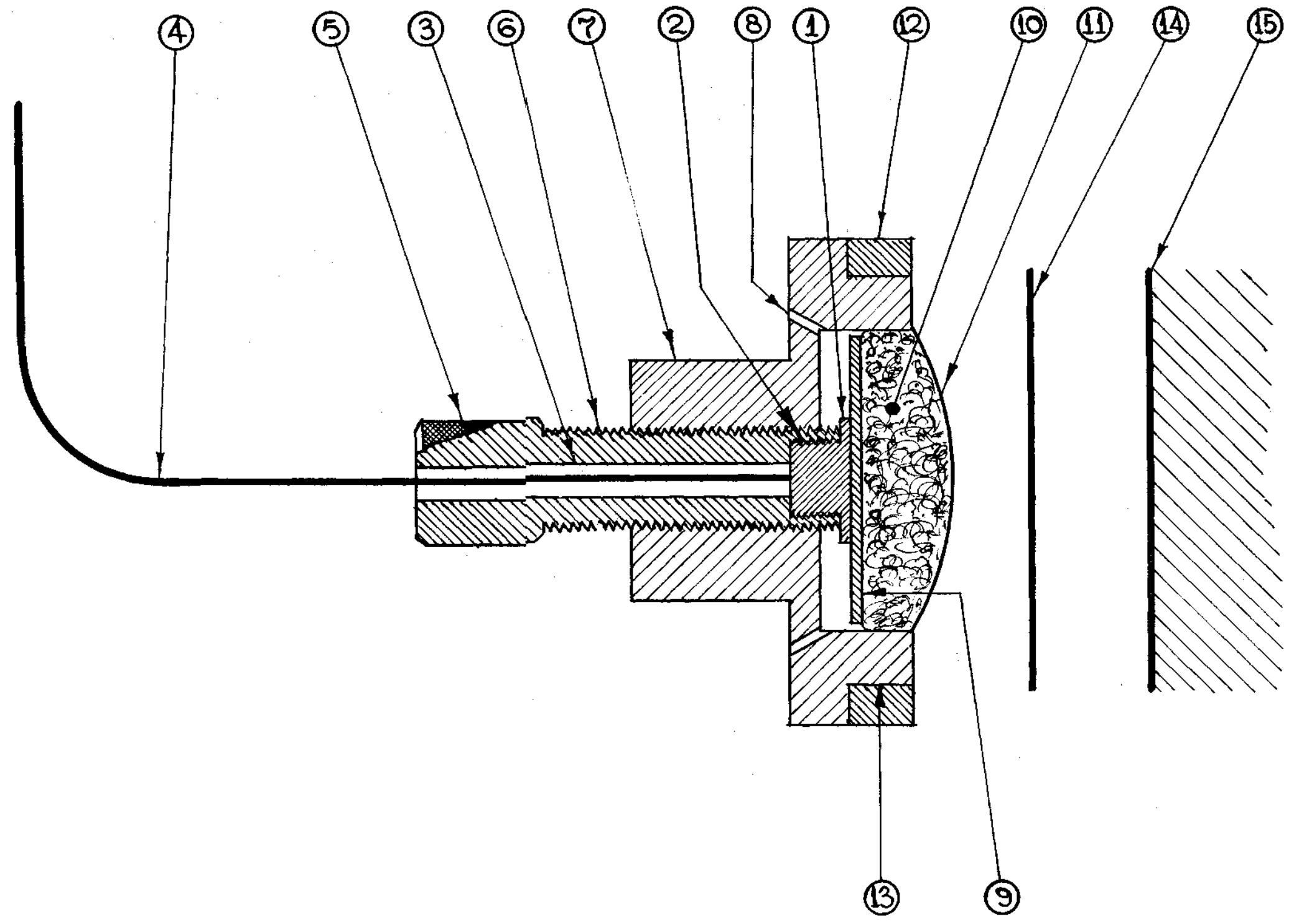
1. The electrode holder is simple to use and easy to maintain.
2. It is capable of being adopted in industrial installations to the requirements of continuous marking of metal articles of industry and commerce.

We claim :

1. An electrode holder for the electrochemical marking of metals comprising a holding piece for metal electrode, a metal electrode in electrical contact with a metal plate of suitable size, an absorbent pad to hold a solution of mixture of electrolytes and an arrangement to keep the pad secure to the electrode holder whereby passage of current is allowed between the metal electrode and the metal article that has to be marked, through a stencil.
2. An electrode holder substantially as herein described and illustrated.

Dated this 23rd day of September 1968.

PATENTS OFFICER,
Council of Scientific and Industrial Research



R. B. Haskarbai
(R.B. PAI),
PATENTS OFFICER,
C.S.I.R.