GOVERNMENT OF INDIA : THE PATENT OFFICE, 214, LOWER CIRCULAR ROAD, CALCUTTA-17.

Specification No. 95419. Application No. 9541[illegible], dated 31st August 1964. Complete Specification left on 30th June 1965. (Application Accepted 12th May 1966.)

PROVISIONAL SPECIFICATION

Index at acceptance:—70C5[LVIII(5)] —153[XLIII(3)].

IMPROVEMENTS IN OR RELATING TO THE SHARPENING OF RAZOR BLADES.

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).

The following specification describes the nature of this invention.

This is an invention by Dr. MICHAEL ANGELO VINCENT DEVANATHAN, Scientist, Central Electrochemical Research Institute, Karaikudi-3 (S. Rly.), Madras State, Ceylon Citizen, VANNIYUR KRISHNASWAMY VENKATESAN, Scientist, Central Electrochemical Research Institute, Karaikudi-3 (S. Rly.), Madras State, Indian Citizen, and SRINIVASAN SARANGAPANI, Senior Laboratory Assistant, Central Electrochemical Research Institute, Karaikudi-3 (S. Rly.), Madras State, Indian Citizen.

This invention relates to improvements in or relating to the sharpening of razor blades.

Hitherto it has been proposed to sharpen the razor blades by mechanical means.

This is open to the objection that mechanical polishing introduces stress in the metal which may lead to stress corrosion and makes the cutting surface, which comes into contact with the skin, rough thereby causing irritation.

The object of this invention is to obviate these disadvantages by electrolytically polishing the blade edges.

To these ends, the invention broadly consists in anodically polishing the blade edges in a polishing solution containing a suitable inhibitor.

The following examples illustrate the invention:

EXAMPLE 1.

Electropolishing at low current densities using a solution containing phosphoric acid, sulphuric acid and a suitable inhibitor like "Manoxol OT" (trade name).

EXAMPLE 2.

Electropolishing at low current densities using an aqueous solution of citric acid and sulphuric acid containing an inhibitor.

The following are among the main advantages of the invention:

1. Gives a sharper edge with a smooth cutting surface.
2. No stress in the metal.

R. BHASKAR PAI,

PATENTS OFFICER,

Council of Scientific and Industrial Research.

Dated this 24th day of August 1964.

COMPLETE SPECIFICATION.

IMPROVEMENTS IN OR RELATING TO THE SHARPENING OF RAZOR BLADES.

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).

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

This is an invention by Dr. MICHAEL ANGELO VINCENT DEVANATHAN, Scientist, Central Electrochemical Research Institute, Karaikudi-3 (S. Rly.), Madras State, Ceylon Citizen, VANNIYUR KRISHNASWAMY VENKATESAN, Scientist, Central Electrochemical Research Institute, Karaikudi-3 (S. Rly.), Madras State, Indian Citizen, and SRINIVASAN SARANGAPANI, Senior Laboratory Assistant, Central Electrochemical Research Institute, Karaikudi-3 (S Rly.), Madras State, Indian Citizen.

This invention relates to improvements in or relating to sharpening of razor blades in the large scale production of blades.

The existing method consists in mechanically honing the blades with emery stones and polishing with leather wheels using suitable polishing materials. Honing with grinding stones leaves burrs or microprojections which are not completely removed by polishing with leather wheels. The burrs cause irritation to the skin while shaving. Moreover, the sharpness of the edge is to some extent limited by the skill of the workers in aligning the grinding and polishing equipments.

The object of this invention is to get a sharp and smooth edge free from burrs.

We have evolved a simple electrochemical method for improving the edge.

According to this invention, the method of sharpening consists in anodically polishing the blade using a sharpening solution consisting of chromic acid, phosphoric acid, and water of about 15 per cent., 70 per cent. and 15 per cent. by weight respectively and making the blade an anode. The cathode in this process can be a metal such as stainless steel, lead or graphite. The current density can be varied, depending upon the time within which it is required to polish the blades. A direct current source, operating on the mains with a constant voltage of about 2.8 volts when lead or stainless steel cathode is used, serves as the current source for this process.

The device for carrying out the invention broadly consists of an automatic feeding unit and a conveyor belt of conventional type; two identical sharpening units operating on the above principle are situated on either side of the conveyer belt. The blades then pass through the conventional washing, drying and collecting units.

Thus, in the invented method, the blade is anodically dissolved in the sharpening solution. Till now controlled anodic dissolution has not been applied to improve the edges of razor blades. By employing the invented process, the microprojections and defects caused by the grinding process in the blade edges can be easily removed by controlled anodic dissolution. By introducing this process in the final stage, it is possible to obtain consistently sharp edges. Therefore the percentage of rejects in a process where this new method is used in the final stage will be negligible.

The invented process and device for improving the edges of razor blades in the blade industry will now be described in detail. The process consists in the

controlled anodic dissolution of blade edges in a sharpening solution, using lead, stainless steel or other cathodes at ordinary temperatures. Depending on the rate of feed of the blades, the current is adjusted.

In Figure 1 of the accompanying drawings, the cross section of the sharpening unit is shown. In Figure 2 oblique view is shown. Blades (6) carried by the conveyer belt (5) pass through the grooves (1). The sharpening solution is passed through the main compartment (2) of the sharpening unit form a tank and the flow rate suitably adjusted. The solution flows from the main compartment through the holes (4) into the grooves (1) and fills them. The holes are situated at regular intervals of about 1 to 5 mm. The edges of the blades (6) carried by the conveyer belt (5) pass through the grooves. The overflowing solution along with the solution coming out of the main compartment is collected and sent back to the main tank. The blade is made anodic with respect to the cathode (3). The stainless steel or lead cathode is of the same length as that of the sharpening unit and is fixed in the main compartment (2). Electrical connections to the blade are made through the conveyer belt. The current is obtained from a suitable d.c. power source. The negative terminal of the d.c. power source is connected to the cathode through a current measuring instrument. The length of the sharpening unit depends on the rate of feeding of the blades. The alignment of the sharpening units can be controlled by adjusting the screw (7).

Example 1.

Two identical sharpening units made of perspex or P. V. C. described above are mounted on either side of the conveyer belt in such a way that the two edges of the blades pass through the solution in the grooves, without touching the sides. The sharpening solution which consists of a mixture of 15 per cent. chromic acid, 70 per cent. phosphoric acid and 15 per cent. water by weight, is allowed to pass through the main compartment and fill the grooves. For a feeding rate of 2 blades per second and sharpening unit length of 60 cms., a current of about 800 mA is applied. As the blade edges pass through the solution in the grooves, in the above conditions, the edges are improved. Afterwards, the blades pass through a conventional washing unit where the sharpening solution is completely washed. The blades are then dried in the conventional way now used in blade industries (i.e., in a stream of hot air). The blades are then collected in the usual way.

Example 2.

When the feeding rate of the blades is 3/sec. and the length of the column 120 cm., the current applied is about 1.5A. Washing, drying and collecting are done as above.

The following are the main advantages of the invention:

(a) The process removes the burrs caused by the mechanical grinding;

(b) This process gives a superior sharp edge;

(c) The process is very simple to operate and does not require highly skilled personnel;

(d) No mechanical strain in the cutting edge is introduced in this process;

(e) This process removes the tendency for stress corrosion of the edges thereby increasing the useful life of the blade.

We claim:

1. A process for sharpening razor blades which consists in electrolytically polishing the blade edges using a sharpening solution consisting of chromic acid, phosphoric acid and water of about 15 per cent., 70 per cent. and 15 per cent. by weight respectively and making the blade an anode.

2. A process as claimed in Claim 1 wherein the cathode consists of a metal such as stainless steel, lead, or graphite.

3. A process as claimed in Claim 1 or 2 wherein the current density is varied depending upon the time within which it is required to sharpen the blades.

4. An electro polishing unit for use in the process substantially as hereinbefore described.

5. Razor blades whenever sharpened according to a process substantially as hereinbefore described.

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Dated this 28th day of June 1965.

MG IC—30—33 Patent/6C—20 1-68 —100.

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No 95419

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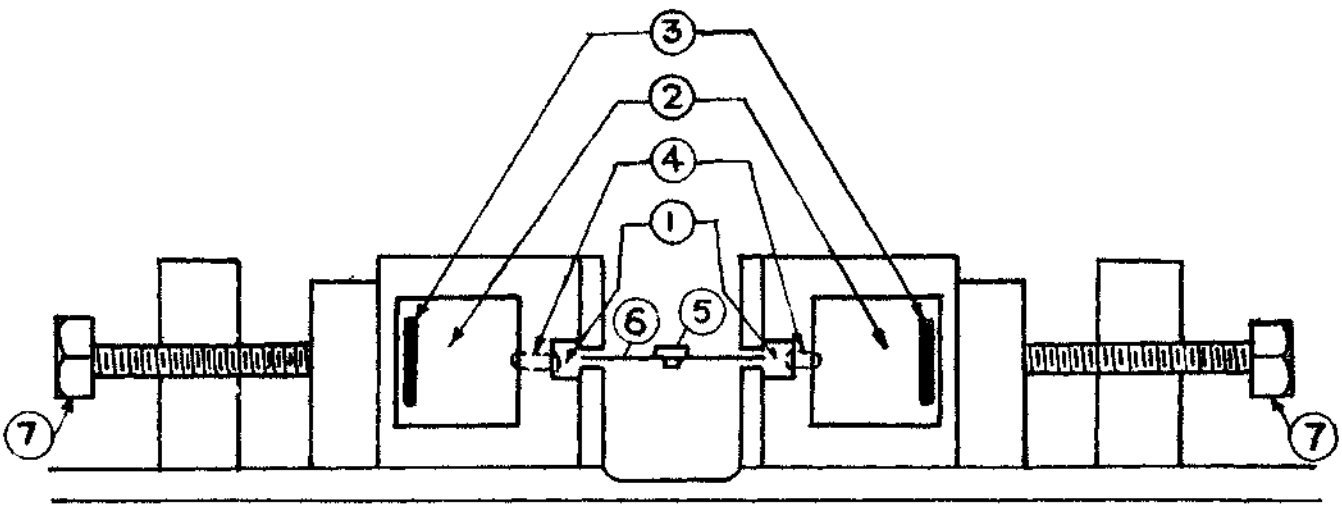

FIG. 1.

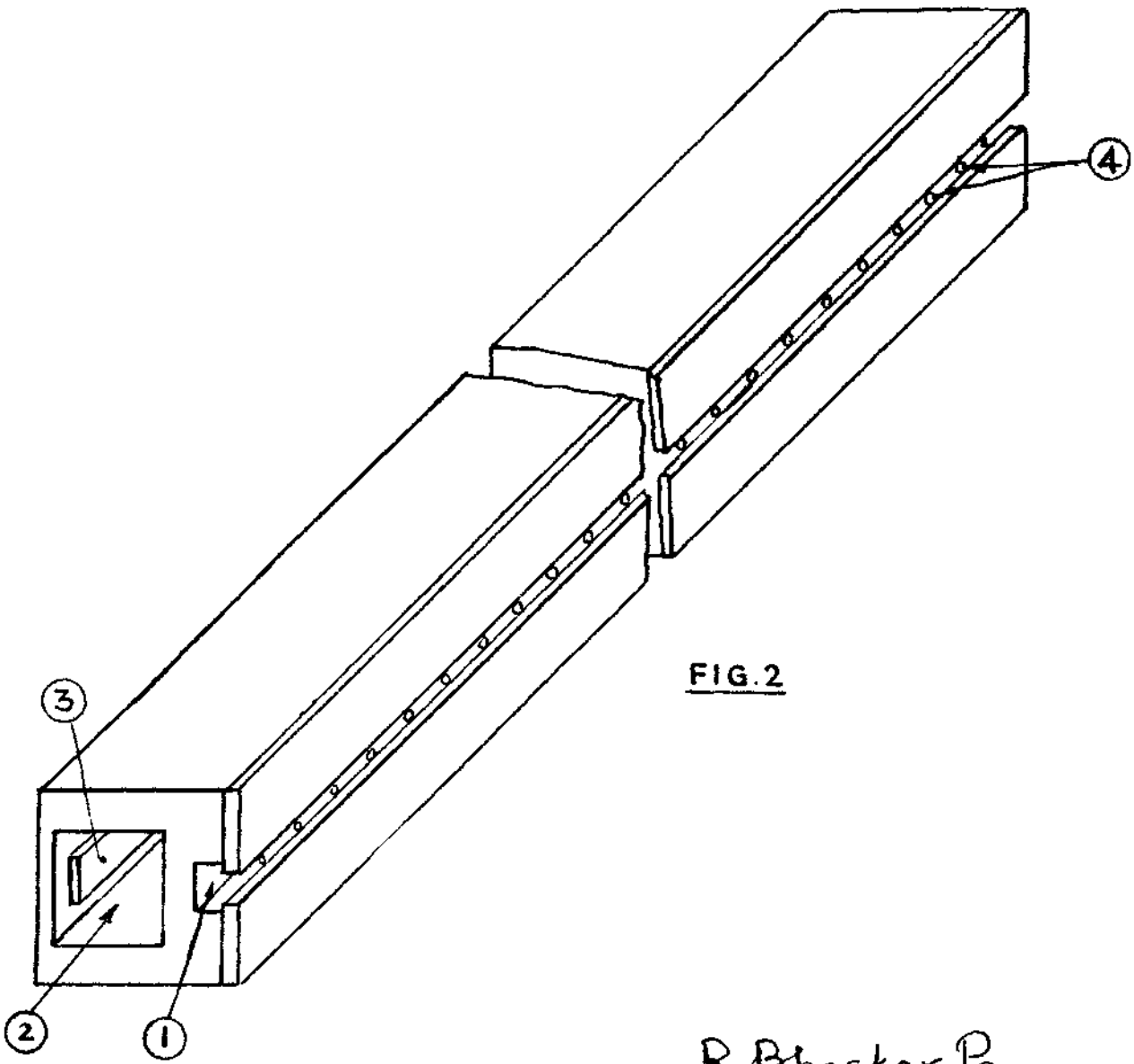

FIG. 2

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