Fig. 9 Gauze fabrication on the looms in the Johnson Matthey Metals gauze shop. Rhodium-platinum gauzes up to 140 in (3.56 metres) wide are woven from 0.003 in diameter wire

The development of these inactive surfaces is the subject of further research work and in a later article it is hoped that an explanation will be given of the fundamental causes that lie behind these observations.

Acknowledgements

The author is much indebted to Dr G. J. K. Acres for helpful discussions and to Mr J. G. Day, who obtained the scanning electron microscope and electron microprobe analyser photographs.

References

1 H. Connor, *Platinum Metals Rev.*, 1967, **11**, (1), 2–9 *Ibid.*; (2), 60–69
2 T. H. Chilton, *Chem. Engng. Prog. Mon. Ser. 3*
3 A. W. Holmes, *Platinum Metals Rev.*, 1959, **3**, (1), 2–8

The Electrodeposition of Rhodium on Titanium

The protection of titanium by a thin coating of platinum is well known in chemical technology but, although platinised titanium anodes are commonly used for industrial electrochemical purposes, little attention has been given to titanium coated with other platinum group metals.

A recent paper by K. P. Batashev and V. P. Zverev (*Tr. Leningrad. Politekh. Inst.*, 1970, (304), 130–134) now reports on studies by the polarisation curve method of the electrodeposition of rhodium on titanium and indicates the feasibility of such plating. It can produce both protective and decorative coatings and also insoluble rhodium/titanium anodes. The features of rhodium for these purposes are its lesser density and greater hardness than platinum.

Titanium alloys were degreased chemically and then were etched in sulphuric acid solution at 60 to 90°C before plating in a bath containing 1.2 to 2.0 g/l rhodium and 40 to 50 g/l sulphuric acid at current densities between 0.1 and 1.5 A/dm^2 and at temperatures between 20 and 75°C. Insoluble anodes of platinum and rhodium-plated titanium were used and efficiency increased with lower current density and higher bath temperature.

The rhodium coatings obtained at low current density adhered well and were satisfactory as regards hardness, reflectivity (brightness) and corrosion resistance. Tests were carried out to determine the properties, strength and optimum thickness of rhodium coatings on insoluble titanium anodes.