

Coil, New Application of Electroforming

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1. Purpose

For an advanced accelerator system being constructed in Japan, small size electromagnets of high field are required.

So, we've developed the production process of the hollow coil used for such an electromagnet, applying copper-electroforming.

2. Produced Coil

- (1) A coil for a four-pole electromagnet
- (2) Joined with terminals by brazing.
- (3) Consists of four sections connected in series.
- (4) Each section has a space to put in a ferrous core.

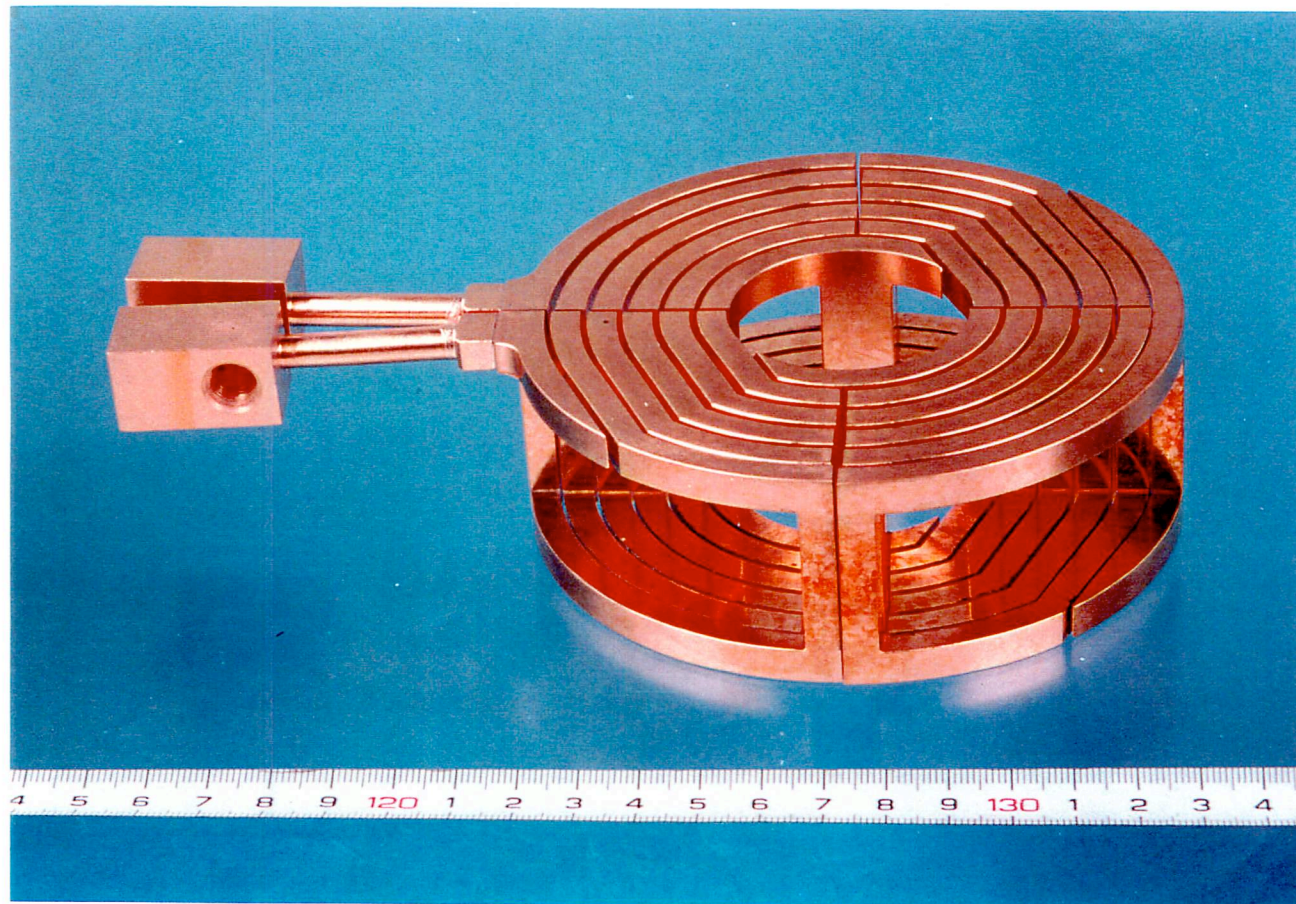
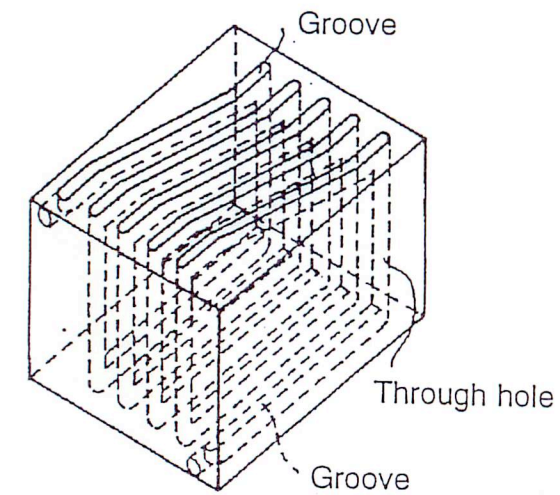


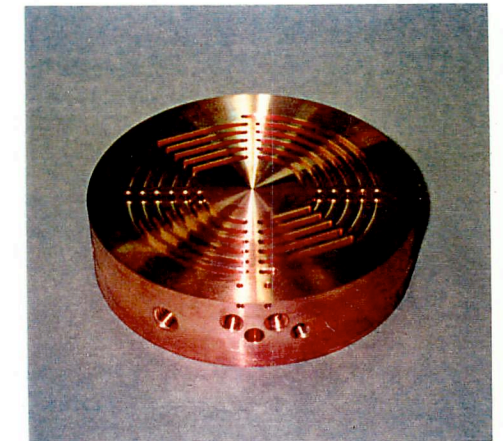
Fig.1 Appearance of the produced coil

3. Production Process

- (1) Starts with a copper block.
- (2) Grooves and through holes are dug.



(a) model



(b) Copper block

Fig.2 Grooves and through holes

- (3) Grooves are covered with electrodeposited-copper.
 - i) Fill the grooves with wax. (Fig. 3)
 - ii) Coat the surfaces of the filled wax with silver powder. (Fig. 4)
 - iii) Apply copper-electroforming and finish the surfaces by machining. (Fig. 5)
- (4) Surplus copper of the block are mechanically removed.



Fig. 3

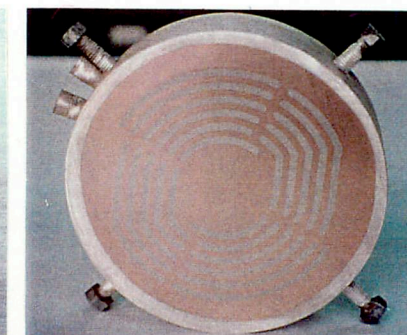


Fig. 4

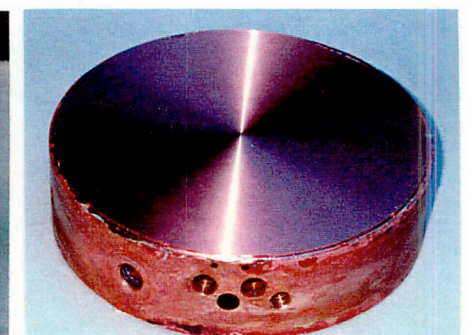


Fig. 5