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Note

The Honeycomb spool: a modified method for winding capillary columns

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Rapid heating and cooling of a 150 m × 0.75 mm I.D. stainless-steel capillary column is impossible when the column is wound on a cylinder without leaving space between the layers. During temperature programming of such a column, the temperature of the outside layers will be different from that of the inside layers. Therefore, these columns are often wound on a cylinder with vertical spacers so that air can circulate through the windings[1]. A disadvantage of this system is that a separate cylinder is needed for every column. A modified method of winding capillary columns has been developed and is described in this paper.

The stainless-steel column is wound on an apparatus (Fig. 1) which consists of two metal discs, A and B, and a wooden cylinder, C. All three parts are provided

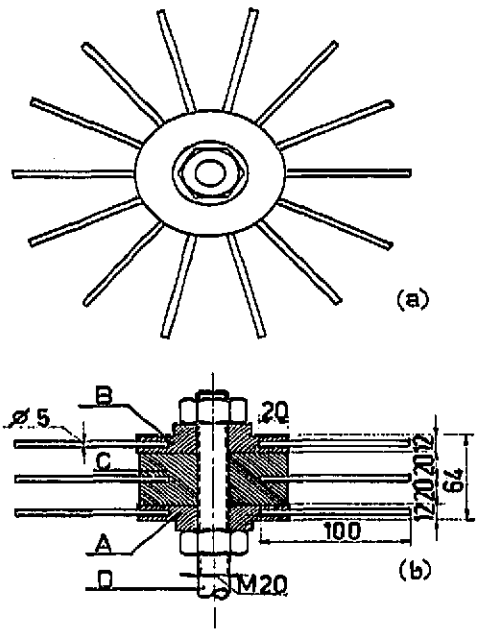

Fig. 1. (a) Top view of the winding apparatus. (b) Cross-section of the winding apparatus (dimensions in millimetres).

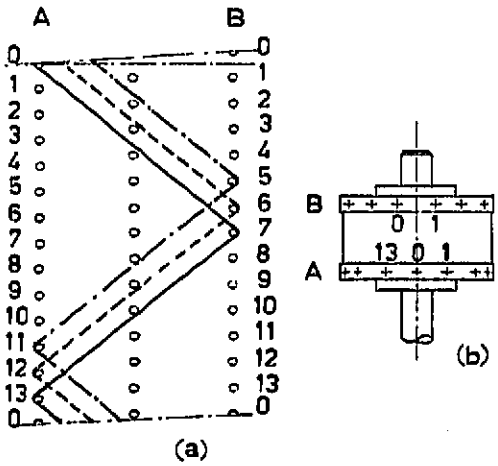

Fig. 2. (a) Developments of the winding apparatus; indicated are the windings A0→ B7→ A13→ A12→ B5→ A11, etc. (b) Side view of the winding apparatus. The positions of the pins on A and B are indicated; for the sake of clarity, the pins on C are omitted.

with 14 pins made of silver-steel to prevent bending. A, B and C are fixed together on a threaded rod, D, with two nuts. The pins fit exactly in the holes which are drilled in parts A, B and C.

The middle row of pins serves as guide for the capillary tubing and their position is adjusted during the winding of the first layer by slightly turning C. The position of the pins on A and B is shown in Fig. 2. The easiest way to wind the column on the cylinder is to fix D in the claw of a lathe and to turn it manually. First a layer of string is wound; this facilitates the later removal of the column from the cylinder. The column is then wound on the cylinder according to the scheme given in Table I, *i.e.*, the winding is started at A0 and continues by way of B7 to A13, etc. (Fig. 2a).

TABLE I

WINDING SCHEME FOR ONE LAYER OF THE HONEYCOMB SPOOL

Pin No., disc A	*Pin No., disc B*
0	7
13	6
12	5
11	4
10	3
9	2
8	1
7	0
6	13
5	12
4	11
3	10
2	9
1	8

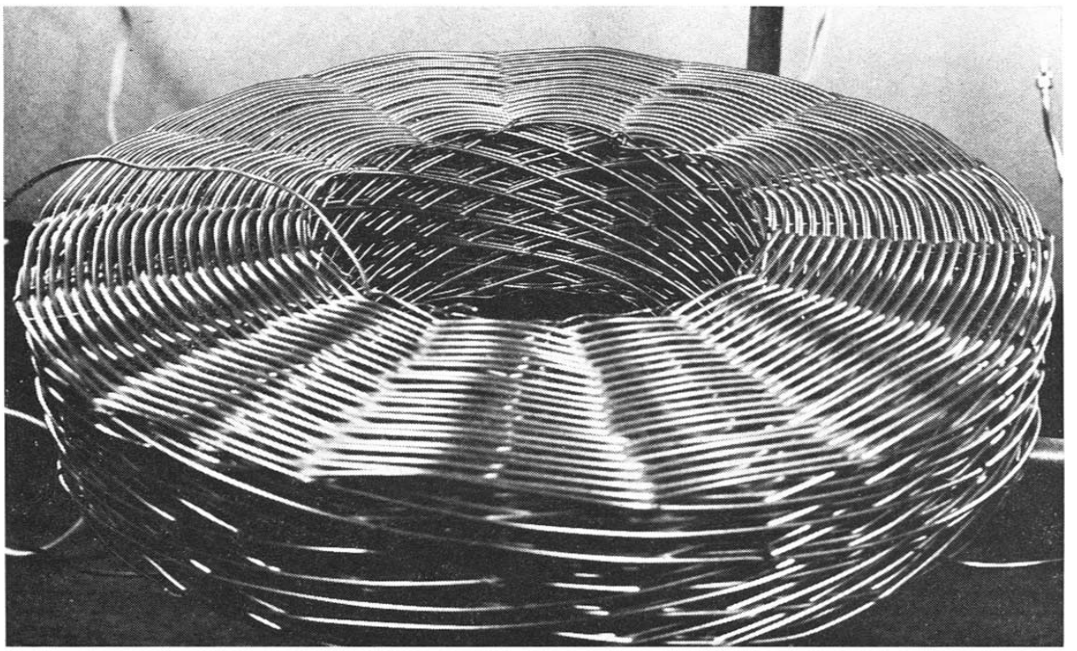

Fig. 3. Honeycomb spool (150 m × 0.75 mm I.D.).

At the end of the winding procedure, bar D and the pins of disc B are removed and then B is removed.

A stainless-steel wire is strung through the openings left by the removal of the pins but the string layer is kept separated from the column.

The same procedure is now carried out with A and finally the pins of C are removed. The string layer is removed and the column can easily be taken from the cylinder. To strengthen the wound column which is obtained in this way, a stainless-steel wire is also strung through the holes left by these pins.

The dimensions indicated in Fig. 1a are sufficient to wind a column of 150 m × 0.75 mm I.D., which will fit in an oven of 30 × 30 × 6 cm. The size can, of course, be adjusted to make a spool which will fit in an oven of other dimensions. A completed honeycomb spool is shown in Fig. 3.

The honeycomb spool has been used in this Institute to our entire satisfaction for the past 5 years.

REFERENCE

1 T. R. Mon, *Res. Develop.*, 22, No. 12 (1971) 14.