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TYPE HC-E *Winding Machine for Small Toroidal Cores*

The machine is designed for winding of multilayer coils of enamel or enamel plus silk insulated wires of 0.05 to 0.11 mm in diameter on toroidal cores of 2 to 3 mm inside diameter.

The winding is done by two rocking needles and two sliders drawing the free end of the wire around the core in successive steps.

The other parts of the machine serve for core rotation, winding direction change and winding pitch control.

The feeding of cores into roller bed is done by a magazine feeder.

The machine is equipped with a counter switching off the machine on completion of the preset number of turns.

The machine design permits to modify it for simultaneous winding of two toroidal cores by one end of wire. In that case two operating and two feeding systems are mounted on one machine.

Main Technical Data

1. Speed of winding from 120 to 200 turns per minute
2. Maximum length of free end of wire 350 mm
3. Magazine capacity 50—70 cores
4. Production rate (for cores with two 50 turn windings) 40 cores per hour
5. Motor 10 W, 2,000 r.p.m.
6. Power supply 110V d.c. or 127V, 50 c.p.s.
7. Dimensions 360×290×355 mm
8. Weight 12 kg

*Printed in
Soviet Union*

All Electrical Connections are IMPORTANT!

Too often electrical connections are taken for granted. Too often we do not realize that no electrically operated or electrically controlled device is any better than its poorest electrical connection.

Failure analysis of any component or any electronic system can be reduced to four fundamental points:

1. Defective or improper material;
2. Improper processing;
3. Improper design; or
4. Faulty workmanship.

It is suggested you set up a *Reliable Electrical Connection Program* and follow it all the way through by critically analyzing the functions of all electrical connections in terms of:

1. The materials which are to be joined together;
2. The method and equipment to be used to prepare them for joining;
3. The method and equipment used to join them;
4. The materials and methods which must be used to protect the points;
5. The usage or the environment of the finished part or system; and
6. The servicing and maintenance of the part or system.

Whether or not the connection is in plain sight or concealed within a component part, such as in a relay, tube or diode, is immaterial.

The foregoing is an abstract of an article originally published in the *Syracuse Scanner (I.R.E.)* and reprinted in *The Eraser Company's Bulletin No. 14*. Copies may be had on request, no charge.

Needles Wind Russian Cores

Size of demonstration toroids ($\frac{1}{8}$ in. o.d.) indicates USSR's miniaturization progress.

Miniature Toroidal Core Winder shown at the International Automation Exhibition in New York recently did not require the wire to be prewound on ring bobbins.

The machine was part of the USSR Chamber of Commerce exhibit. Several electronics firms employees who saw it remarked that the size of the demonstration cores ($\frac{1}{8}$ in. o.d.) and the machines existence testified to Russian miniaturization progress.

The machine winds insulated wires of 0.05 to 0.11 mm diameter on cores with inside diameters of 2 to 3 mm (0.08" to 0.12"). It occupied little more than a square foot of bench space, winds at 120 to 200

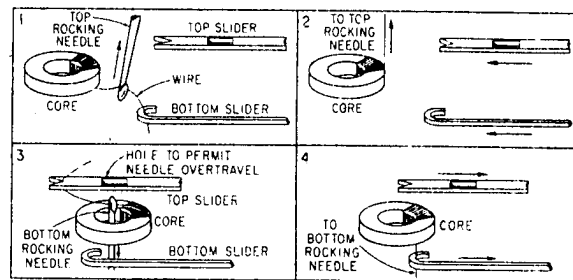


Fig 1

Sliders working in unison with "crocheting needles" pull free end of fine magnet wire around and through miniature cores of 120 to 200 turns a minute.

turns a minute and will turn out 40 cores with two 50-turn windings in one hour.

Winding is done with two rocking needles, similar to crochet needles, and two sliders. The top slider has a notch to push the wire over the top of the core. The bottom slider has a semicircular end to pull the wire under the bottom of the core.

The basic motion of the machine is shown in figures 1, 2, 3 and 4. The free end of the wire is drawn around the core in discrete steps during each cycle of the machine.

The rocking needles ride almost a full circle in the drum of the machine case. The drum is 6 or 7 inches in diameter in the model shown. Full circle, rather than reciprocating, action apparently gives enough travel to the free end of the wire. Maximum length of wire is 350 mm (14 inches).

The toroids lay on a roller bed consisting of 3 rotating pins with formed rubber heads. The rollers rotate the cores during the winding. A lever system will spread the pins to accept several sizes of cores.

Cores are fed to the roller bed by a tube in which 50 to 70 cores are loaded on a center post. Finger pressure on top of the tube extends the post to the roller bed. The rollers grasp the bottom core and it slips over springs on the post as the post retracts.

After loading a core, the operator strips sufficient wire off a supply spool in the machine. He turns the winding mechanism with a hand wheel until the rocking needles engage the wire, then turns on the 10, 2,000 rpm drive motor. A counter switches off the machine on completion of a preset number of turns. By doubling up the mechanism, 2 cores may be wound with one end of wire.

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