United States Patent [19]

Burkin et al.

[11] **3,833,994**

[45] **Sept. 10, 1974**

[54] **DEVICE FOR MAKING DIGIT WINDING LOOPS IN MEMORY STORAGE MATRICES**

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[22] Filed: **June 20, 1973**

[21] Appl. No.: **371,699**

[30] **Foreign Application Priority Data**

Dec. 7, 1972 U.S.S.R. 1856391

[52] **U.S. Cl.** ..... **29/203 MM**

[51] **Int. Cl.** **H05k 13/04**

[58] **Field of Search**.. 29/203 MM, 203 MW, 203 R, 29/203 P

[56] **References Cited**

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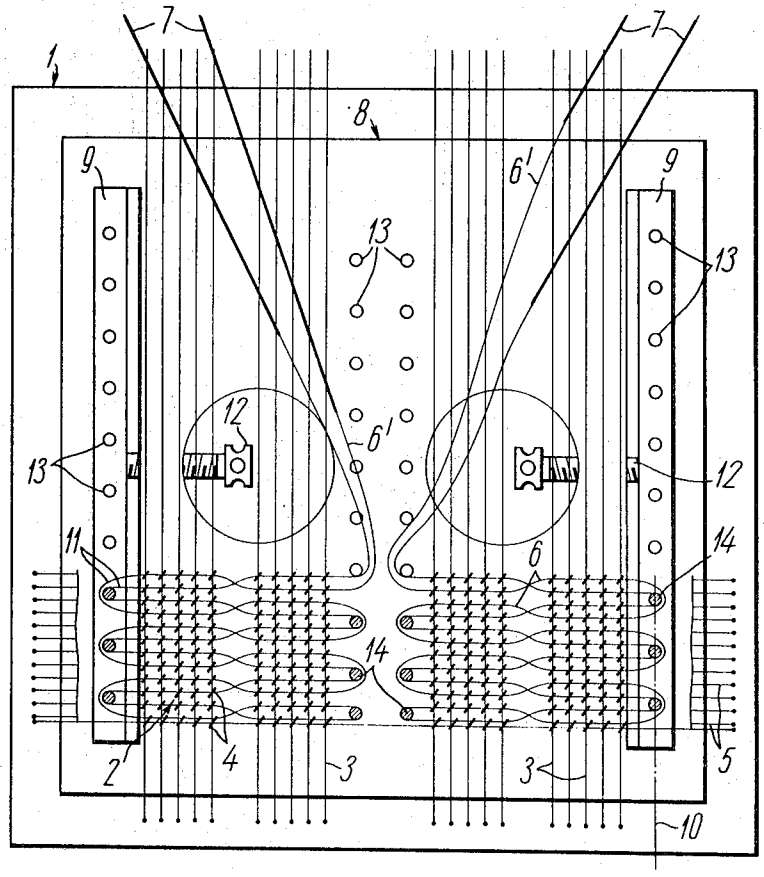
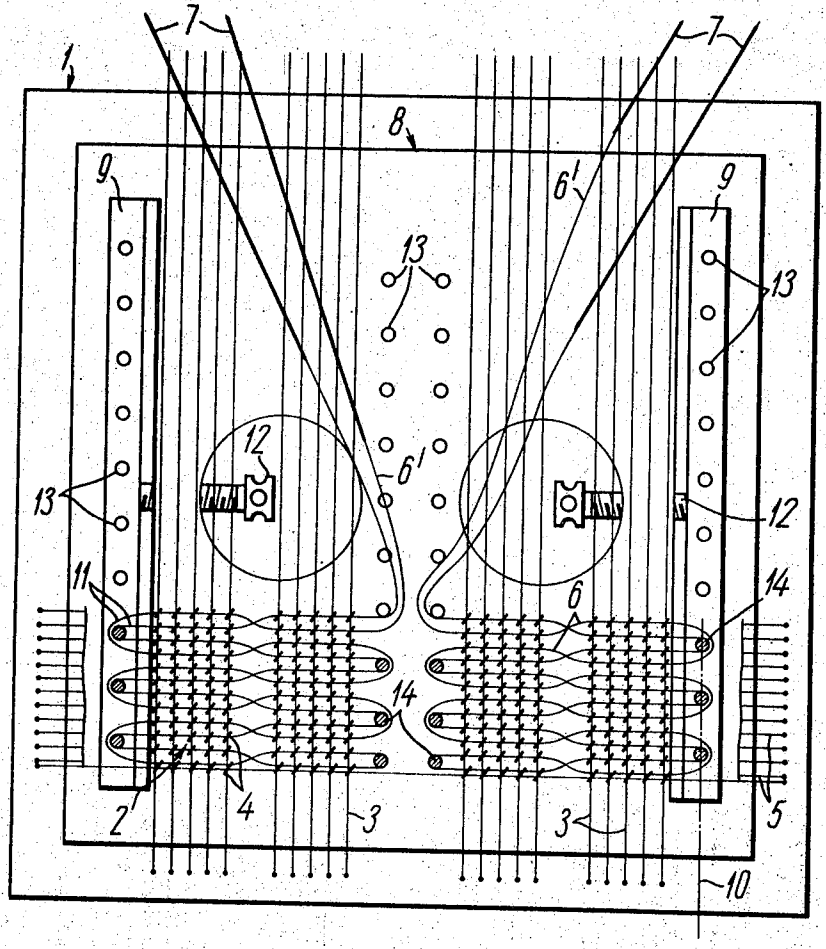
[57] **ABSTRACT**

A device for making digit winding loops in memory storage matrices comprises a memory plane frame having cores threaded with coordinate wires lying in both directions, needles at the leading ends of the wire for wiring a digit winding, and a surface plate temporarily fastened to the frame and having also attached thereto at least one movable strip disposed along the row of oppositely lying loops, the surface plate and the movable strips having openings arranged so as to correspond to the position of the digit winding loops in the matrix; the device is also provided with clamps fixing the movable strips in place, and detachable connectors the number of which is equal to that of the loops in the matrix.

1 Claim, 1 Drawing Figure

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DEVICE FOR MAKING DIGIT WINDING LOOPS IN MEMORY STORAGE MATRICES

BACKGROUND OF THE INVENTION

The present invention relates generally to the art of making ferrite core stores for electronic computers, logic switching units control, communication and monitoring circuits and more particularly, it relates to devices for making digit winding loops in memory storage matrices.

The invention can be used for manufacturing ferrite core matrices with any arrangement of cores at the intersections of the X and Y wires in the matrix and ferrite cubes made in the form of mats, strands and frameless storage units of practically unlimited capacity assembled from cores of any dimensions, including superminiature cores, and employing any topological pattern of digit winding arrangement, including diagonal arrangement.

A device for making digit winding loops in memory storage matrices is known which comprises a memory plane frame with cores threaded with X and Y coordinate wires, and a needle at the leading end of the wire intended for threading the digit winding. Loops of the digit winding are made by hand, the size of the loop, its position and curvature radius depending on the accuracy of the eye and skill of the operator.

This device has the disadvantage of not being provided with any means for arranging and forming the digit winding and, especially, its loops in the matrix. This results in a low quality of matrices, makes the threading operation depend on operator's individual abilities, reduces the efficiency of the laborer, calls for high operator's skill and exerts considerable strain on his eyes.

Another known device for threading ferrite core matrices with X, Y and digit wires employs manual formation of digit winding loops. This device comprises a vibrator and a special jig which is an apertured plate, the size and the shape of the apertures repeating those of the core. The apertures are disposed against the matrix cores at an angle of 45° with respect to the axes of the rows of cores. The jig has an adhesive-coated side so that each aperture becomes a socket with an adhesive-coated bottom for retaining a core. The jig is placed over the cores with its adhesive-coated bottom outside and the cores, when shaken by the vibrator, adhere to the bottoms of the sockets.

This device permits of stringing a digit wire through the cores adhesively attached to the plate before threading X and Y coordinate windings, which facilitates the preparation of loops of digit windings. Further, the cores fixed in the sockets along the edges of the matrix allow for visually monitoring the size of the digit winding loops.

This known device, however, has also several disadvantages. First, it has no attachments for forming digit winding loops which would guarantee an identical shape and size of the loops in both halves of the digit winding, which gives rise to additional noise when the matrix is in operation and the quality of the matrix deteriorates. Second, the jigs employed in the device are expensive and difficult to manufacture. For superminiature cores, fabrication of such jigs becomes absolutely unfeasible. Third, threading of the cores rigidly fixed in the jig sockets creates considerable stresses on the cores, which tends to break the cores and increase the amount of discarded matrix planes. Finally, removal of the adhesive layer and detachment of the jig from the threaded matrix also involve core damage.

SUMMARY OF THE INVENTION

It is an object of the present invention is to provide a device for making digit winding loops in memory storage matrices which will be simple and convenient, enable identical loops to be made in the digit winding halves regardless of the operator's skill, and permit of minimizing the strain on the operator's eyes.

The essence of the invention resides in that the device for making digit winding loops in memory storage matrices, comprising a frame having cores threaded with X and Y coordinate wires and needles at the leading ends of the wire for threading a digit winding. According to the invention, the device further comprises a surface plate disposed parallel to the matrix plane and temporarily fastened to the frame which has at least one movable strip attached to the frame along a row of opposite lying loops, the surface plate and the strips having a plurality of openings against the digit winding loops in the matrix circuitry, the device being also provided with strip clamps and detachable connectors the number of which equals to that of loops in the matrix, the diameter of the loops corresponding to the inner diameter of the loop curvatures and to the diameter of openings in the surface plate and the movable strips.

The proposed device makes it possible to simplify the labor-consuming operation of making digit winding loops and can be used for threading matrices composed of toroidal ferrite cores of any size arranged in any topological pattern and for wiring high-quality digit windings of practically any known topology.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will now be described in greater detail, by way of an example, with reference being had to the accompanying drawing which is a schematic representation of a device for making digit winding loops, according to the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

A device for making digit winding loops in memory storage matrices comprises a frame **1** of a matrix **2** carrying coordinate wires **3** lying in one direction with cores **4** threaded with coordinate wires **5**, lying in another direction, and with a digit winding **6**. A wire **6'** for making the digit winding **6** terminates in a needle **7** to facilitate threading.

A surface slate **8** is rigidly attached temporarily to the frame **1** of the matrix **2** for a period of time required to thread the digit winding **6**. At least one movable strip **9** is mounted on the surface plate **8** for a row **10** of oppositely lying loops **11** of the digit winding **6**, or a plurality of movable strips **9** is disposed thereon, depending on the number of the rows **10** of the loops **11**. The surface plate **8** and the movable strips **9** fastened thereto by means of clamps **12** have openings **13** for detachable connectors **14** which are arranged strictly against each loop **11** in the matrix **2**. The diameter of the detachable connectors **14** corresponds to the inner diameter of the curvature of the loops **11** of the digit winding **6** and to the openings **13** in the surface plate

8 and the movable strips 9. The connectors 14 freely enter the openings 13 so that a minimum gap is left.

The operation of the device for making the loops 11 of the digit windings 6 in the memory storage matrices 2 will now be considered.

Prior to starting the operation, the surface plate 8 with the movable strips 9 fastened thereto is fixed, with the aid of the clamps 9, to the frame 1 of the matrix 2. The ends of the wires 3 in one direction, preliminarily strung through the cores 4, are attached to the frame 1.

The extreme cores 4 on each wire 3 are threaded with the wire 5 lying in another direction, whereupon this wire is fixed in place on the frame 1. The next extreme cores 4 are threaded with the second wire 5 which is also fixed on the frame 1. Then, using the needles 7 at the leading ends of the wires, the wire 6' of the digit winding 6 is passed through the cores 4 strung on these two wires 5 in accordance with the topology of the matrix 2, and before pulling these wires tight, two detachable connectors 14 are inserted into the openings 13 of the surface plate 8 corresponding to the loops 11 in the center of the matrix 2, and the first pair of the loops 11 of the digit windings 6 is made around these connectors.

Then the next pair of the drive wires 5 is passed through the cores 5 threaded with the drive wires 3, whereupon the matrix 2 is threaded by means of the needles 7 with the wire 6' of the digit winding 6 in a direction from the edges towards the center of the matrix 2.

The next detachable connectors 14 are inserted into the openings 13 on the attached strips 9 in places where the loops 11 are formed at the edges of the matrix 2. By pulling the wires 6' of the digit windings 6, the next pair of the loops 11 is arranged on each winding 6 around the connectors 14. Further, as each section of the matrix 2 is threaded with the digit winding 6 forming the loops 11, the connectors 14 are inserted alternately into the openings 13 of the surface plate 8 and into the openings 13 of the movable strip 9, after which the wires are pulled tight. In the same way, the digit

windings 6 are threaded in the entire matrix 2.

When the threading operation is over, the movable strips 9 are drawn towards the oppositely lying loops 11 with the help of the clamps 12. As a result, the tension of the wires 6' of the digit windings 6 on the connectors 14 is reduced, and the connectors 14 can be detached by either turning the frame 1 upside down, or by carefully taking the connectors 14 out of the openings 13.

Finally, the surface plate 8 is detached from the ready matrix 2.

The proposed device reduces considerably the strain on the operator's eyes and permits of wiring high-quality matrixes by operators of lower skill.

The device is reliable in operation and simple in manufacture.

What is claimed is:

1. A device for making digit winding loops in memory storage matrices, said device comprising: a frame of said memory storage matrix of a particular topology; a plurality of cores; Y coordinate wires being attached to said frame; X coordinate wires, said X coordinate wires and said cores being threaded with said Y coordinate wires attached to said frame; a wire having leading ends; needles being attached to said leading ends of said wire for threading the digit winding; a surface plate being disposed parallel to said frame of said matrix and temporarily fixed to said frame; a row of oppositely lying loops; at least one movable strip being fastened to said surface plate along said row of oppositely lying loops having a curvature of a required inner diameter; said surface plate and said movable strips having openings against said loops of said digit windings in said matrix of said topology; clamps being adapted for fixing said movable strips in place; and detachable connectors of a required diameter equal in number to said loops in said matrix; said diameter of said connectors corresponding to said inner diameter of said loop curvatures and to the diameters of said openings in said surface plate and movable strips.

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