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CORE ASSEMBLY

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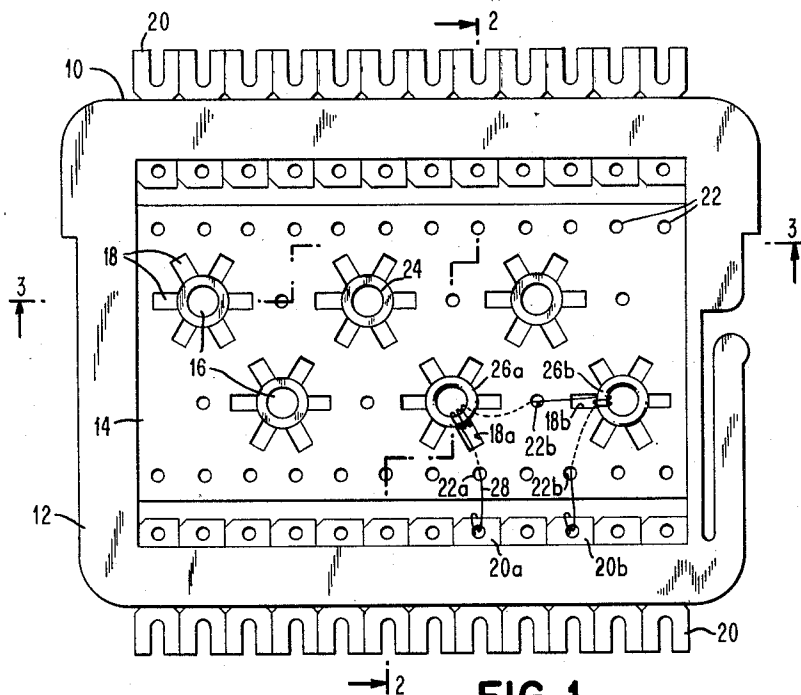


FIG. 1

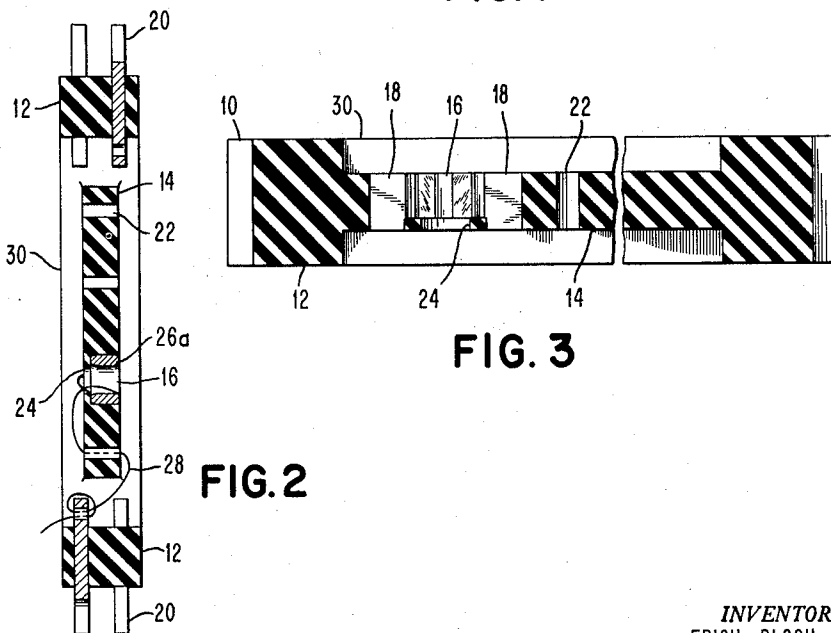


FIG. 3

FIG. 2

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CORE ASSEMBLY

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7 Claims. (Cl. 340—174)

This invention relates to circuit cards and more particularly to the packaging of a plurality of magnetic cores on a circuit card.

Due to the economy and inherent reliability of magnetic logical components, their use is highly desirable in data handling systems, and accordingly logical circuits utilizing such components have been conceived which perform substantially all of the basic, or standard, logic utilized in the present-day electronic computer. In many instances the magnetic components utilized have a number of windings encircling its structure which may comprise one or more turns depending upon their function. Since the components are of small size, these windings, as a practical matter, could not be wound by machine so that costly and time consuming hand winding has been resorted to. Structures adapted for the automatic assembly of magnetic core logical circuits has therefore become desirable to decrease costs and increase production rates.

The prior art is exemplified by a Patent No. 2,823,371 which describes a magnetic core mounting structure in which a substantially flat insulating member, or panel, is provided with a series of cut outs, or notches, along one of its sides, with each magnetic core associated with a particular notch and in line therewith transversely with the panel. A counter-sunk hole is provided for each magnetic core and is conveniently placed near the edge of the panel and the cores are preferentially placed in an upright manner. A winding is then provided encircling the panel and the core located within the notch to a terminal point. It is noted that the windings are introduced through the core and panel and wound about the edge of the panel for re-entry through the core. In the foregoing package, however, when several separate windings are to be wound about the core, undesirable electrical interaction between different circuits is evidenced since the windings are wound one over the other. In another Patent No. 2,823,373, the edges of the support member, or panel are provided with scallops or tongues extending along one or more edges thereof. By this configuration it is possible to mount the cores on the tongues or scallops to allow for as much as 180° or more exposure of the toroidal core for the separate windings, so that several windings may be wound through the core, through the registering holes of the core and the scallop, and, at the same time, occupy separate individual sections of the core.

In each of the aforementioned patents, the core must be placed along the edge of the panel to allow automatic winding to take place. In the latter patent, whenever more than one winding is to be positioned in a core, the panel must be rotated to expose a further sector of the core for automatic assembly so that the windings are not wound one on another. Further, there is no positive way of retaining separate windings on the cores, and in some instances when a large number of separate windings are to be provided on a single component

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or if any of the windings becomes loose, interaction still prevails between windings due to their close proximity.

Accordingly, it is an object of this invention to provide an improved magnetic core assembly or package.

It is a more specific object of this invention to provide an improved package for mounting toroidal magnetic cores on a panel to receive a plurality of windings separately dispersed and held in different sectors of the core.

In accordance with the foregoing objects, a flat insulating member, or panel, is provided with a series of counter-bored holes or cavities adapted to retain a magnetic core. A plurality of apertures are further provided surrounding each of the cavities, the configuration of which resembles a wheel, with the core as the hub and the material between apertures the spokes. The core is then divided into sectors each of which is adapted to contain a single winding separated from other windings by an insulating material, and the mounting of the cores in such a manner presents them in a convenient position for applying the windings to the cores by reciprocating winding machines, and the like. Moreover, since each winding is physically separated and contained within a specific sector, not only is electrical interaction between windings due to overlapping positively eliminated, but reduced air inductance between windings is positively provided.

Other objects of this invention will be pointed out in the following description and claims and illustrated in the accompanying drawings which disclose, by way of example, the principle of the invention and the best mode which has been contemplated of applying that principle.

In the drawings:

Fig. 1 is a plan view of a core assembly panel in accordance with this invention.

Fig. 2 is a sectional view of the assembly of Fig. 1, taken through the section 2—2.

Fig. 3 is a further sectional view of the assembly of Fig. 1, taken through the section 3—3.

Referring to the Figs. 1, 2 and 3, a support member 10 is provided made up of a frame 12 and a central portion 14 which is fabricated with a suitable insulating material. The central portion 14 is provided with a number of holes 16 having a configuration similar to the magnetic component to be employed such as toroidal or rectangular shaped cores and the like. For clarity, a component of toroidal structure is assumed to be utilized and the holes 16 are shown annular in shape to accommodate such a component. A series of apertures 18 surround each of the holes 16 which preferentially terminate in the hole 16 but could be removed therefrom. A number of terminal posts 20, in the frame 12, are provided for termination of the circuitry which is to be constructed. A plurality of holes 22 are shown in the portion 14 which are utilized as guides for the wires to facilitate winding of the components and may be of any usable shape or number.

If the toroidal component is to be inserted by hand, the hole 16 has its boundaries approximately equal to the outside diameter of the core, however, it is preferred that this boundary be larger to allow the cores to be vibrated into the holes 16, in which case, a seat 24 is provided for seating the cores.

Once the components are seated in the holes 16, herein shown as toroidal cores 26a and 26b the structure may then be automatically wired with each winding on the core retained in the aperture 18, with insulation provided between adjacent windings to reduce inductance. A typical winding configuration embracing two of the cores 26 is shown by a wire 28 describing a circuit from a terminal post 20a through a hole 22a, an aperture 18a, wound about the core 26a, through a hole 22b, an

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aperture 18b, thence winding about the core 26b, through a hole 22b, terminating in the post 20b. It should be understood that this is only a typical wiring configuration and the wire 28 could inductively couple any and all of the components inserted in a desired assembly and depicts only one of a plurality of wires which may interlink the cores. Also, a wire, such as 28, may be tightly wound to secure the cores 26a and 26b to the portion 14.

It should be noted, that the central portion 14 may be centered about the frame 12, in such a manner so as to form a mold for potting or hermetically sealing an appropriate oil within the seal 30 as shown in the Figs. 2 and 3.

While there have been shown and described and pointed out the fundamental novel features of the invention as applied to a preferred embodiment, it will be understood that various omissions and substitutions and changes in the form and details of the device illustrated and its operation may be made by those skilled in the art without departing from the spirit of the invention. It is the intention therefore, to be limited only as indicated by the scope of the following claims.

What is claimed is:

1. A magnetic core assembly comprising, in combination, an electrical insulating support member having at least one portion which has an aperture the boundaries of which define a plurality of secondary apertures surrounding a central aperture, a magnetic core having at least one aperture, said core positioned on said portion so that the axis of said central aperture coincides with the axis of the aperture of said core, and a plurality of separate windings wound about said core with each winding linking said core and extending through said central aperture and one of said secondary apertures whereby the windings are dispersed in different sectors of the core and magnetically isolated one from the other.

2. A magnetic core assembly comprising, in combination, an electrical insulating non-magnetizable supporting member having a number of portions each of which has an aperture the boundaries of which define a plurality of secondary apertures surrounding a central aperture, a toroidal magnetic core positioned on said portion so that the axis of said central aperture coincides with the axis of the aperture of said core, and a plurality of separate windings wound about said core with each winding extending through said coinciding apertures and one of said secondary apertures whereby the windings are dispersed in different sectors of the core and magnetically isolated one from the other.

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3. An assembly as set forth in claim 2 including a frame about said supporting member so constructed and arranged as to form a mold for hermetically sealing said supporting member, and a plurality of feed thru terminals secured in said frame each of which protrude on at least one side thereof in an axis with said supporting member.

4. A magnetic core assembly comprising, in combination, an electrical insulating supporting member having at least one portion which has a central aperture and a plurality of secondary apertures surrounding said central aperture, a magnetic core having at least one aperture, said core positioned on said portion so that the axis of said central aperture coincides with the axis of the aperture of said core, and a plurality of separate windings wound about said core with each winding linking said core and extending through said central aperture and one of said secondary apertures so that the windings are dispersed in different sectors of said core and magnetically isolated one from the other.

5. A magnetic core assembly comprising, in combination, an electrical insulating supporting member having a number of portions each having a central aperture and a plurality of secondary apertures surrounding said central aperture, a toroidal magnetic core positioned on each of said portions so that the axis of said central aperture coincides with the axis of the aperture of said core, and a plurality of separate windings wound about said core with each winding extending through said coinciding apertures and one of said secondary apertures whereby the windings are dispersed in different sectors of said core and magnetically isolated one from the other.

6. An assembly as set forth in claim 5 including a frame about said supporting member so constructed and arranged as to form a mold for hermetically sealing said supporting member, and a plurality of feed thru terminals secured in said frame each of which protrude on at least one side thereof in an axis with said supporting member.

7. An assembly as set forth in claim 6 wherein at least one of said windings tightly encircle said core so as to secure said core to said supporting member.

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