July 13, 1965 H. L. WOROSZ 3,195,119

MAGNETIC TRANSDUCER HEAD ASSEMBLY

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Fig. 1.

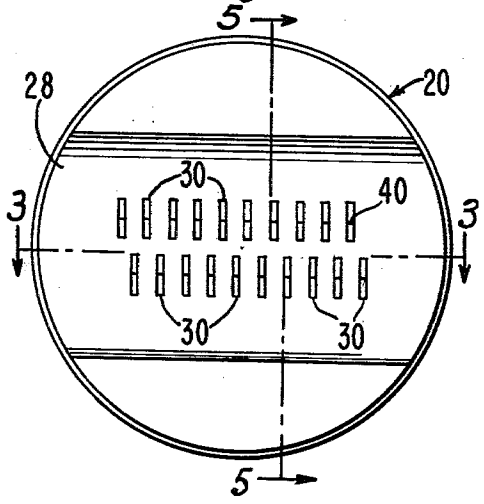


Fig. 2.

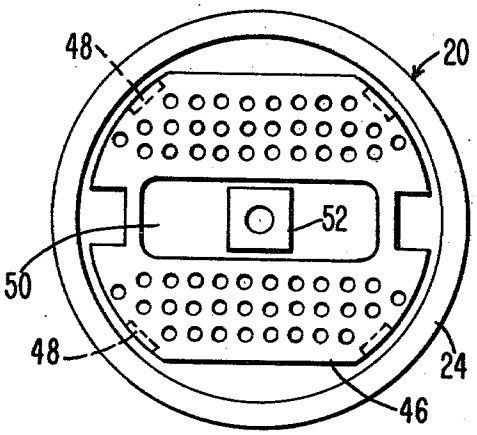


Fig. 3.

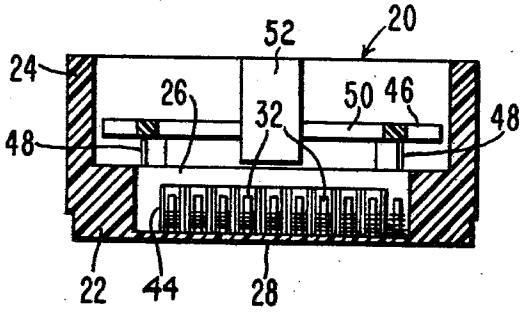
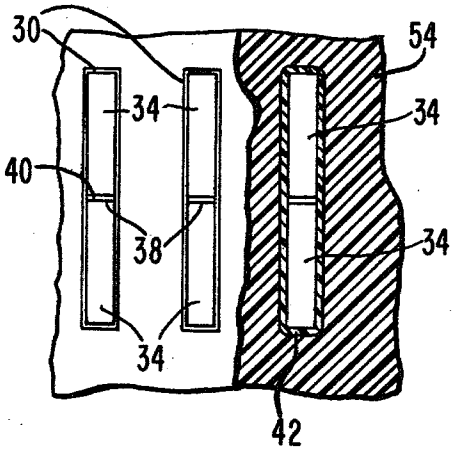


Fig. 4.



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Fig. 6.

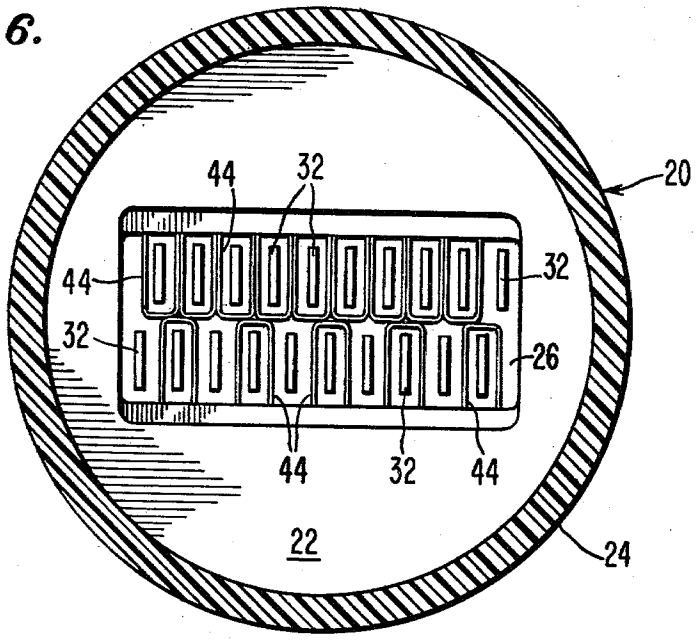


Fig. 5.

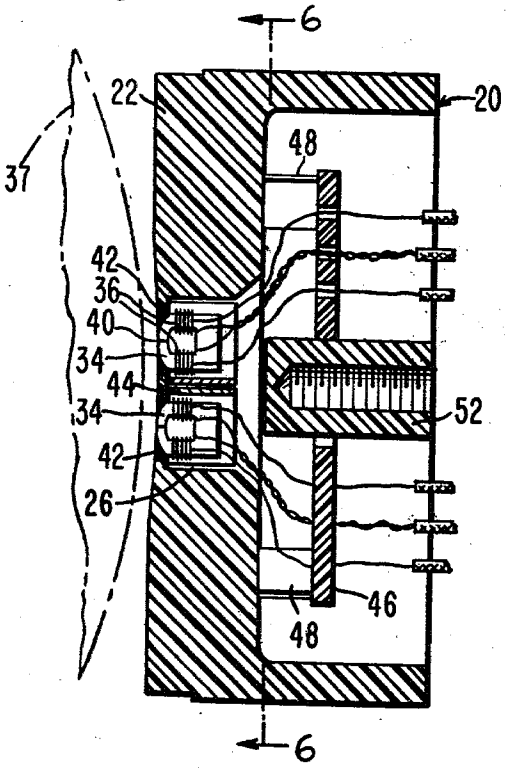
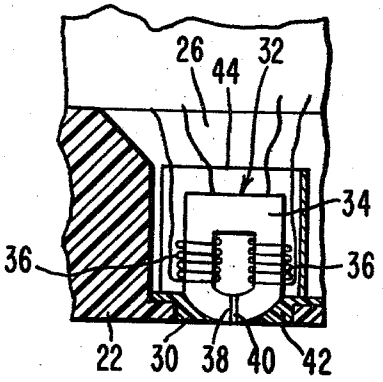


Fig. 7.



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MAGNETIC TRANSDUCER HEAD ASSEMBLY

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4 Claims. (Cl. 340—174.1)

This invention relates generally to multiple read-write transducer assemblies, and particularly to the insulating of the transducers electrically from each other.

One of the objects of the invention is to provide an improved multiple read-write transducer unit.

Another object of the invention is to provide a multiple read-write transducer unit in which the transducers are compactly arranged without danger of adjacent transducers magnetically affecting each other.

A further object of the invention is to provide for the compactly arranged transducers, an improved arrangement of individual shield members therefor by means of which the transducers may be magnetically insulated from each other efficiently and by a lesser number of shields than the number of transducers.

More specifically, it is an object of the invention to provide a multiple read-write transducer unit in which compactness is achieved by the provision of two rows of transducers with the transducers of one row in staggered relationship to those of the other row and magnetically insulated from each other by a particular arrangement, or pattern of individual U-shaped shield members of a lesser number than the number of transducers.

Other objects of the invention will become apparent from the following detail description, taken in connection with the accompanying drawings in which:

FIG. 1 is a front view of a multiple read-write transducer assembly embodying features of the invention;

FIG. 2 is a rear view;

FIG. 3 is a horizontal sectional view, taken along the line 3—3 of FIG. 1;

FIG. 4 is an enlarged fragmentary detail view, partly broken away and in section;

FIG. 5 is a vertical sectional view, taken along the line 5—5 of FIG. 1;

FIG. 6 is a vertical sectional view, taken along the line 6—6 of FIG. 5, and

FIG. 7 is an enlarged fragmentary sectional view showing one of the transducers of the assembly.

Referring to the drawings by characters of reference, the multiple read-write transducer unit includes a body or head 20 which is preferably cylindrical in general contour having an end wall 22 and a skirt 24. The head 20 may be molded or be otherwise formed of a suitable nonmagnetic material such as a resin plastic material. In the forming of the head, the end wall 22 is internally recessed to provide a transducer receiving compartment 26 having a relatively thin wall portion 28 in which is provided two rows of slit-like openings or apertures 30. In the present head 20 there are ten of the apertures 30 in each row, equally spaced apart with the apertures of one row in offset or staggered relationship to the apertures in the other row, as shown in FIG. 1. Preferably the apertures are rectangular in outline.

Within the head compartment 26 there are two rows of magnetic read-write transducers 32 which may be of any sutiable well known type. In the present unit, each of the transducers 32 may comprise a magnetic core 34 and a pair of coils 36 wound about opposite portions of the core 34 in opposite directions, as is illustrated in FIG. 7. As is well known, one of the coils 36 is energized to effect a magnetic reading operation and the other is energized to effect a magnetic writing operation with respect to a magnetizable surface of a record or memory drum 37. Each of the cores 34 is provided with the usual

slit 38 in the vicinity of which a magnetic field is generated by the energization of one or the other of the coils 36, and the transducers are arranged such that the core slits are respectively at the apertures 30, as shown. Preferably in the slits 38 of each of the cores 34, a silver shim 40 is provided for the well known purpose of diverting the magnetic flux outwardly around the outer edge of the shim and thus outwardly of the head 20 or toward the memory drum 37. When assembling the unit, the transducers 32 are held in proper positions by fixtures, and a suitable cement such as resin cement, as at 42, is introduced into the compartment 26 to cement the transducers to the head and to fill in the apertures 30 except in the flux generating areas of the transducers, or areas about the shims 40.

In order to insure against the magnetic influencing of adjacent ones of the two rows of compactly arranged transducers 32, I provide individual U-shaped shield members 44 to efficiently shield the transducers and at the same time facilitate assembly, the shields being arranged in a particular pattern that makes it possible to insulate the transducers from each other with a lesser number of shields than the number of transducers. As shown, the shields are channel-shaped and arranged such that they extend around three sides of the transducers with the shield webs in back-to-back relation to shield the rows of transducers from each other. With reference to FIG. 6, each of the transducers 32 of one row thereof is provided with an individual shield therefor with the exception of the shield at the right hand end of the row, FIG. 6. Of the other row of transducers, alternate ones of the transducers 32, starting with the right hand transducer, are provided with shields and it will be seen by this arrangement that each and all of the transducers are shielded from each other although there is a lesser number of shields than transducers.

As shown in FIG. 5, leads from the transducer coils 36 extend rearwardly out of the head through apertures in a lead separator 46 in the form of a board of suitable dielectric material. The board 46 is mounted within the head 20, and is spaced from the end wall 22 by spacer members 48. An elongated opening 50 in the board 46 receives an anchor member 52 which is internally threaded for attachment to a mounting screw (not shown). The board 46 and anchor member 52 are held in place by suitable fixtures while the cavity of the head 20 is filled with a suitable potting compound 54, FIG. 4, such as polyurethane foam. This potting compound flows into the spaces between the transducers and the shields and cements the transducers and their shields 44 to the head 20. Also, the transducer leads, board 46 and the anchor member 52 are embedded in the polyurethane potting compound.

While I have shown and described the transducer assembly in considerable detail, it will be understood that many changes and variations may be made without departing from the spirit and scope of the invention.

What is claimed is:

1. A magnetic transducer assembly comprising a body having a wall provided wih two spaced apart parallel rows of openings therethrough with the openings of one row in staggered relationship to the openings of the other row, two spaced apart parallel rows of magnetic transducers positioned within said body with the transducer magnetic flux areas respectively positioned within and facing outwardly of said openings, and a plurality of separate channel-shaped shield members arranged in two groups respectively associated with said two rows of transducers within said body with the webs of the shield members of the two groups in back-to-back relationship between said rows of transducers and with the sides of said shield members extending between adjacent ones of said transducers, said shield members being less in number

than said transducers and the shield members of one group being positioned in side-by-side relationship and the shield members of the other group being positioned about alternate ones of its corresponding row of transducers.

2. A magnetic transducer assembly comprising a body having a wall provided with two laterally positioned parallel rows of openings therethrough with the openings of one row in staggered relationship to the openings of the other row, two rows of magnetic transducers positioned within said body respectively in alignment with said openings, and a plurality of separate channel-shaped shield members within said body with the webs of the shield members in back-to-back relationship between said rows of transducers and with the sides of the shield members extending between adjacent ones of said transducers, said shield members being less in number than said transducers with the shield members respectively receiving successive ones of the transducers of said one row of transducers except an end one of the row of transducers and receiving alternate ones of said transducers of said other row of transducers including the end transducer of said other row corresponding to the said end one of the transducers of said one row.

3. A magnetic transducer assembly comprising a body having an inner recess in a wall thereof forming a transducer compartment having oppositely disposed inner wall surfaces, said recessed wall having two rows of apertures therethrough in parallel relative to said wall surfaces with the apertures of one row in staggered relationship to the apertures of the other row and each row having the same and even number of apertures, a plurality of transducers mounted within said compartment having flux areas respectively positioned at said apertures, a first plurality of individual channel-shaped flux shields shielding said transducers from each other, said shields individually receiving

all but one of the end ones of the transducers of one of the rows thereof with the webs of the shields between said rows of transducers and the sides of adjacent shields in broadside contact with each other and extending to one of said wall surfaces, and a second plurality of shields less in number than the first plurality of shields and respectively receiving alternate ones of the other row of transducers with the webs of the second plurality of transducers in back-to-back broadside contact with the webs of the first plurality of shields and with the sides of said channel-shaped shields extending to the other of said wall surfaces.

4. A magnetic transducer assembly comprising a body portion having a pair of elongated parallel walls, two laterally spaced rows of equal numbers of transducers, each adjacent one of said walls, said transducers in each row being substantially equally spaced one from the other, the transducers of one row being substantially on the center lines between the transducers of the other row, and open-ended shielding means enclosing on three sides each transducer of one row, except an end one thereof, and alternate ones of the other row, the end transducer of said other row offset from said un-enclosed transducer being enclosed, said shielding means including partitions substantially along said center lines and extending to said adjacent walls and said shielding means for both rows extending in combination from wall to wall.

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