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DISK TYPE ROTOR FOR AXIAL POLE INDUCTION MOTORS

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FIG. 1

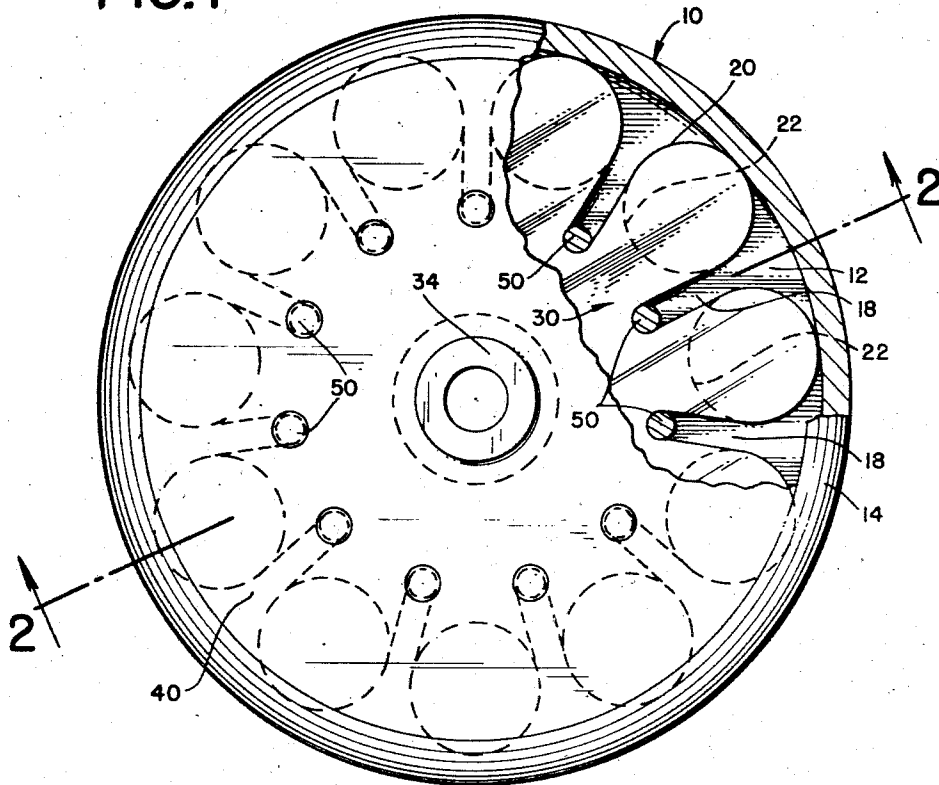
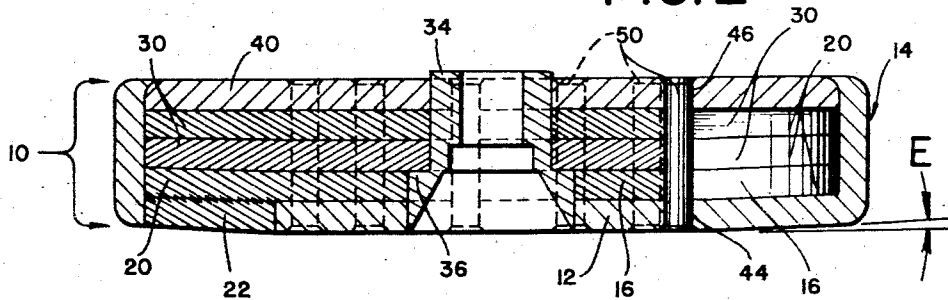


FIG. 2



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UNITED STATES PATENT OFFICE

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DISK TYPE ROTOR FOR AXIAL POLE
INDUCTION MOTORSLeonard E. Aske, Minneapolis, Minn., assignor to
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Application June 25, 1946, Serial No. 679,073

9 Claims. (Cl. 172-120)

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This invention relates to rotors for shaded pole induction motors.

An object of the invention is to improve and simplify the rotors for shaded pole induction motors disclosed in my patent application, Serial No. 659,217, filed April 3, 1946, entitled Shaded pole induction motor.

This and other objects, as will hereinafter appear, are accomplished by this invention which is fully described in the following specification and shown in the accompanying drawing, in which

Figure 1 is a top plan view of a rotor embodying my invention; and

Fig. 2 is a transverse section on the line 2-2 of Fig. 1.

The embodiment illustrated comprises a flat cup-like member 10 of non-magnetic material, preferably copper, having a nearly flat bottom 12 and an upstanding cylindrical ring 14.

Within this member is housed a spider 16 of magnetic material, preferably sheet steel, having a series of notches 18 forming lobes 20, the outer portions of which are circular. The notches 18 are preferably one-half the peripheral diameter of the spider.

Steel buttons 22 having a radius equal to that of the outer portion of the lobes 22 are secured thereto in any suitable manner, as disclosed in my co-pending patent application mentioned above. In the present instance they are preferably spot welded thereto.

Above the spider member 20 lie other spider members 30 which are identical in periphery with the spider 20 but which do not have any buttons secured thereto. A stepped bushing 34, preferably of stainless steel, is inserted through central openings in the bottom 12 and in the spider member 20, which openings are of the same size but are larger in diameter than the openings in the spider members 30 so that a shoulder 36 on the steel bushing has a bearing on the lowermost member 30.

The cup-like member 10 is closed at the top by means of a copper disk 40 which fits snugly over the top of the bushing 34. A series of openings 44, 46 are formed in the bottom 12 and in the top disk 40 in alignment with the inner ends of the notches 18 for the reception of copper pins or rivets 50 which may be fed through these holes and through these notches in any suitable manner. This may be done by passing a series of copper rods through these openings, which rods are then cut to suitable lengths in any desired manner or the rods or rivets 50 may be preformed and passed down through these openings, after

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which the ends are riveted over in any well known manner.

The rotor may now be placed in a suitable press which pushes all the elements together and causes copper to flow so as to get an intimate bond, for example, between the rivets or rods 50 on the one hand and the copper members 12 and 40 on the other. Also, the upper edge of the cup 14 is forced into intimate contact with the periphery of the disk 40. At the same time the lower outer edge of the bottom 12 may be inclined upwardly somewhat, as indicated by the letter "E," which is preferably set at an angle of 2° to the bottom.

Thus an intimate bond is formed between the ends of the rivets 50 and the metal plates 12 and 40 which insures a path of low resistance for electric current which is induced in these rivets as they are caused to cut through lines of force in the field of the shaded pole induction motor in which this rotor is being used. Thus a heavy starting and running torque is provided in this rotor which may be employed in the type of shaded pole induction motor illustrated in the patent application above referred to.

To insure a more permanent electrical connection between ends of the rivets 50 and the sheath members consisting of the bottom 12 and disk 40, I have sometimes dipped the rotor in melted solder. This also adds a protective coating to the rotor.

It will thus be seen I have provided a very simple and efficient type of rotor for an induction motor and one which can be produced at low cost.

While I have shown and described but a few embodiments of my invention, it is to be understood that it is capable of many modifications. Changes, therefore, may be made which do not depart from the spirit and scope of my invention as disclosed in the appended claims.

I claim as my invention:

1. A disk type rotor for an axial pole induction motor comprising a plurality of rotor sections of magnetic material each made up of a series of radiating lobes separated by deep indentations, a copper sheath substantially enclosing the rotor sections, and a rivet extending through the sheath at the bottom of each indentation electrically connecting the two faces of the sheath and firmly securing the sheath to the rotor sections, the magnetic material extending through openings in one of said faces of the sheath.

2. A disk type rotor for an axial pole induction

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motor comprising a plurality of rotor sections of magnetic material each made up of a series of radiating lobes separated by deep indentations, a copper sheath substantially enclosing the rotor sections, and a rivet extending through the sheath at the bottom of each indentation electrically connecting the two faces of the sheath and firmly securing the sheath to the rotor sections, the lowermost rotor section having a steel button secured to the outermost surface of each lobe and extending substantially through an opening in the sheath.

3. A disk type rotor for an axial pole induction motor comprising a plurality of rotor sections of magnetic material each made up of a series of radiating lobes separated by deep indentations, a copper sheath substantially enclosing the rotor sections, a rivet extending through the sheath at the bottom of each indentation electrically connecting the two faces of the sheath and firmly securing the sheath to the rotor sections, the lowermost rotor section having a steel button secured to the outermost surface of each lobe and extending substantially through an opening in the sheath, and a steel bushing extending centrally through the rotor.

4. A disk type rotor for an axial pole induction motor comprising a plurality of rotor sections of magnetic material each made up of a series of radiating lobes separated by deep indentations, a copper sheath substantially enclosing the rotor sections, a rivet extending through the sheath at the bottom of each indentation electrically connecting the two faces of the sheath and firmly securing the sheath to the rotor sections, the lowermost rotor section having a steel button secured to the outermost surface of each lobe and extending substantially through an opening in the sheath, and a stepped steel bushing extending centrally through the rotor.

5. A disk type rotor for an axial pole induction motor comprising a plurality of rotor sections of magnetic material each made up of a series of radiating lobes separated by deep indentations, a non-magnetic current-carrying metal sheath sub-

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stantially enclosing the rotor sections, and a rivet extending through the sheath at the bottom of each indentation electrically connecting the two faces of the sheath and firmly securing the sheath to the rotor sections, the magnetic material extending through openings in one of said faces of the sheath.

6. A disk type rotor for an axial pole induction motor comprising a cup-shaped member of non-magnetic electrically conducting material, having a bottom plate and a cylindrical side wall section, a plurality of laminations of magnetic material in said member having radial lobes separated by notches, a cover plate of electrically conducting material overlying said laminations at the opposite end of said member from said bottom plate, and an electrically conducting retaining member extending axially through the inner end of each notch and fastened to said bottom and cover plates.

7. A rotor according to claim 6 in which one of said plates has an opening aligned with each lobe.

8. A rotor according to claim 6 in which one of said plates has an opening aligned with each lobe, and one lamination carries a button of magnetic material on each lobe, said buttons extending through said openings.

9. A rotor according to claim 6 in which said cover plate is electrically connected to said cylindrical side wall.

LEONARD E. ASKE.

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