to improve the torque and the efficiency.

PRIOR ART DOCUMENTS

PATENT DOCUMENTS

[0009]

Patent Document 1: Japanese Patent Application Laid-Open Publication No. 2006-121821

Patent Document 2: Japanese Patent Application Laid-Open Publication No. 2009-194945

SUMMARY OF THE INVENTION

PROBLEMS TO BE SOLVED BY THE INVENTION

[0010]

However, according to the configuration of the rotor of the SynRM, layers of flux barriers that are large in magnetic resistance need to be disposed to increase a salient pole ratio (Lq / Ld) in order to increase the torque and the power factor.

[0011]

According to the configuration of the conventional SynRM, in its structure, the width of a magnetic path on the side of an upper layer (or in a radial-direction outer-side portion perpendicular to the axis of the rotor) of multi-layered magnetic paths is relatively narrow. Accordingly, the problem is that a large magnetic resistance occurs locally, leading to a decrease in the q-axis inductance (Lq) of the entire rotor and resulting in a drop in the torque and the power factor.

[0012]

~~The~~Embodiments of the present invention ~~has~~have been made to solve the above problems. ~~The object~~ Embodiments of the present invention ~~is to~~ raise the

salient pole ratio (Lq / Ld) of the synchronous reluctance motor and increase the torque and power factor.

MEANS FOR SOLVING THE PROBLEM

[0013]

According to a first aspect of the present invention, there is provided a synchronous reluctance motor comprising: a rotor shaft which is supported in a rotatable manner and axially extends at a rotation axis; a rotor core on which a plurality of flux barriers are formed and which is fixed to the rotor shaft and extends in the direction of the rotation axis; a stator core which is disposed on an outer periphery of the rotor core in such a way as to form a gap between the rotor core and the stator core and on which a plurality of protruding stator teeth are formed in such a way as to be spaced out in a circumferential direction each other and extend in the direction of the rotation-axis; and multiphase armature windings of a plurality of poles which are wound around the plurality of stator teeth, wherein the flux barriers include a plurality of first flux barriers which are formed in such a way as to be spaced out in the circumferential direction each other and extend in a radial direction, and a plurality of second flux barriers which are formed in each of circumferential angular regions sandwiched between the first flux barriers in such a way as to form a curved surface protruding toward the center of the rotation-axis and to spread and be mutually spaced out in the circumferential direction.

[0014]

According to a second aspect of the present invention, there is provided a rotor of a synchronous reluctance motor equipped with a stator core including an armature winding, comprising: a rotor shaft which is

supported in a rotatable manner and axially extends at a rotation axis; and a rotor core on which a plurality of flux barriers are formed and which is fixed to the rotor shaft and extends in the direction of the rotation axis, wherein the flux barriers include a plurality of first flux barriers which are formed in such a way as to be spaced out in the circumferential direction each other and extend in a radial direction, and a plurality of second flux barriers which are formed in each of circumferential angular regions sandwiched between the first flux barriers in such a way as to form a curved surface convex toward the rotation-axis center and to spread and be spaced out in the circumferential direction each other.

ADVANTAGE OF THE INVENTION

[0015]

According to embodiments of the present invention, it is possible to raise the salient pole ratio (Lq / Ld) of the synchronous reluctance motor and increase the torque and power factor.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016]

FIG. 1 is a cross-sectional view of a synchronous reluctance motor, which is perpendicular to the direction of a rotation axis, according to a first embodiment.

FIG. 2 is a detailed, partial cross-sectional view of the synchronous reluctance motor, which is perpendicular to the direction of the rotation axis, according to the first embodiment.

FIG. 3 is a wiring diagram of armature windings of the synchronous reluctance motor according to the first embodiment.