

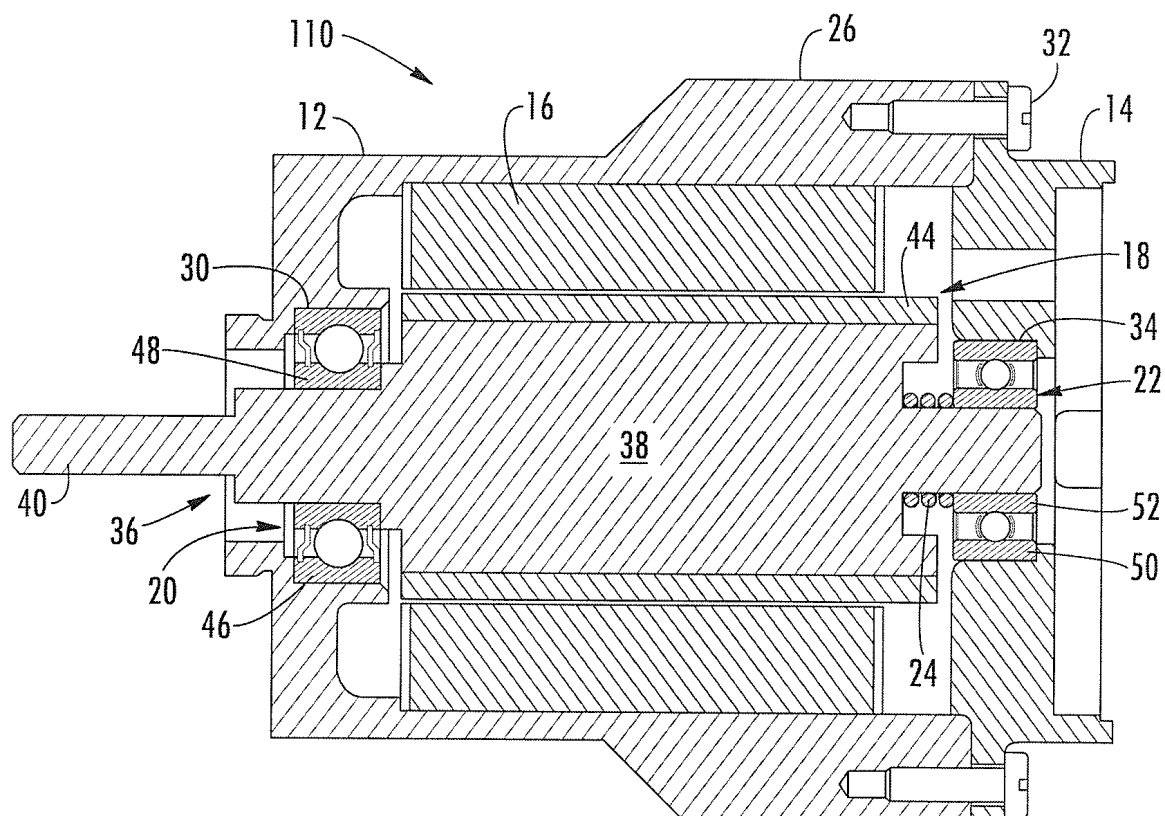
Search strategy

Query

..SEMSEARCH "ALTERNATING CURRENT SOURCE" 50 "AXIAL POSITION" 21 "BEARING" 58 "BEARING RACE" 25 "CIRCULAR CONFIGURATION" 23 "COIL" 29 "COIL ARRANGEMENT" 19 "COIL CORE" 45 "CORE" 39 "DIRECT CURRENT SOURCE" 23 "DISC" 47 "FIXATION" 17 "FIXED SUPPORT" 21 "HOUSING" 17 "LEVER" 53 "MACHINE" 19 "MOTOR" 100 "MOTOR ELABORATION" 100 "ONE WAY BEARING" 64 "OUTER RACE" 20 "POWER" 18 "PROGRAMMABLE SPEED" 22 "PROGRAMMABLE TORQUE" 100 "PROGRAMMING TORQUE" 22 "PROTECTION ELEMENT" 22 "ROTOR" 15 "SECURITY ENCLOSURE" 22 "SHAFT" 100 "STATOR" 15 "TORQUE" 31 "VERTICAL POSITION" 22

20 Documents

Publication numbers	Title	Current assignees
EP1631743 A2	Pump motor with bearing preload	HARGRAVES TECHNOLOGY
EP3436221 A1	Brushless motor for a power tool	MILWAUKEE ELECTRIC TOOL
US4607182 A	Motor spindle with integrated bearing races	GMN GEORG MULLER NURNBERG
US20050253480 A1	Apparatus and method for reducing shaft charge	RELIANCE ELECTRIC TECHNOLOGIES
EP1810910 A1	Motor and power steering apparatus	JTEKT
US20040080236 A1	Armature support structure of starter for automotive engine	DENSO
US4438542 A	Disk storage drive	PAPST LICENSING
US20020070614 A1	Spindle motor for hard disk drives with improved running accuracy	MINEBEA
US20020084708 A1	Spindle motor with sleeve for hard disc drives	MINEBEA
EP-655824 A2	Outer rotor type brushless DC motor	SANYO ELECTRIC
US5761002 A	Disk clamp with clamp load carrying beams	SEAGATE TECHNOLOGY, ...
EP1497903 A1	Drive arrangement with a fixed bearing	SCHAEFFLER TECHNOLOGIES, ...
FR2350721 A1	Electric motor has the outer rotor	SKF KUGELLAGERFABRIKEN
US6897595 B1	Axial flux motor with active flux shaping	CHIARENZA KEVIN J.
EP1258015 A1	Rotary device with matched expansion ceramic bearings	MES INTERNATIONAL, ...
US5945751 A	Disk storage device having a spindle driving motor	EBM PAPST
EP1247108 A2	Galvanometer with axial symmetry and improved bearing design	GSI, ...
WO2005119885 A1	A frameless switched reluctance motor and application as a top drive for a rotary pump	MSI MACHINEERING SOLUTIONS
US20190379249 A1	Electric motor for a power tool	MILWAUKEE ELECTRIC TOOL
US5705866 A	Spindle motor	NIHON DENSAN

Images**Publication numbers**

US8096043

JP4699348

US20100132186

CN100499316

EP1631743

CN1856925

JP2006524480

US20060181168

WO2004/092582

EP1631743

WO2004/092582

Publication kind codes

B2

B2

A1

C

A4

A

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A1

A3

A2

A2

Publication dates

2012-01-17

2011-03-11

2010-06-03

2009-06-10

2006-12-20

2006-11-01

2006-10-26

2006-08-17

2006-04-20

2006-03-08

2004-10-28

Earliest priority date

2003-04-14

Title

(EP1631743)

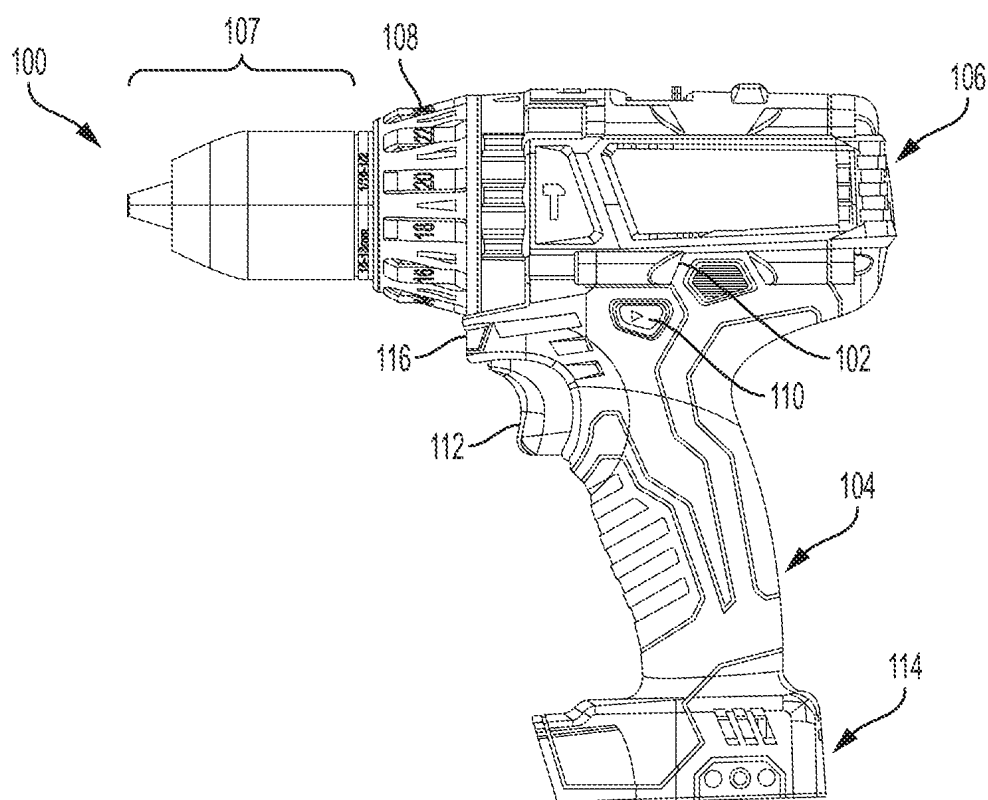
Pump motor with bearing preload

Abstract

(EP1631743)

A electrical machine includes a housing assembly, first and second bearings mounted in the housing assembly, and a rotor assembly mounted in the bearings such that it has a predetermined amount of axial and radial play relative to the housing. A biasing element is disposed between one of the rotor assembly or the housing and one of the bearings. The biasing element urges the rotor assembly to a preloaded position which eliminates the axial and radial play. Each of the first inner and outer races and the second inner and outer races are secured to one of the rotor assembly or to the housing, such that the rotor assembly is retained in the preloaded position. The components of the electrical machine are chosen such that this preload is maintained over the operating temperature range of the machine.

Family 2/20 - FAMPAT - ©Questel

Images**Publication numbers**

US10673305
CN110912341
CN109070328
US20190356197
US10432065
JP6574318
AU2017240597
US20190140516
KR10-1970453
JP2019510456
EP3436221
US10205365
EP3436221
CN109070328
KR20180118240
AU2017240597
TWM550510
US20170288499
WO2017/173075

Publication kind codes

B2

A
B
A1
B2
B2
B2
A1
B1
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A4
B2
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A
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A1
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A1
A1

Publication dates

2020-06-02
2020-03-24
2019-12-03
2019-11-21
2019-10-01
2019-09-11
2019-07-25
2019-05-09
2019-04-18
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2019-02-12
2019-02-06
2018-12-21
2018-10-30
2018-10-04
2017-10-11
2017-10-05
2017-10-05

Earliest priority date

2016-03-30

Title

(EP3436221)

Brushless motor for a power tool

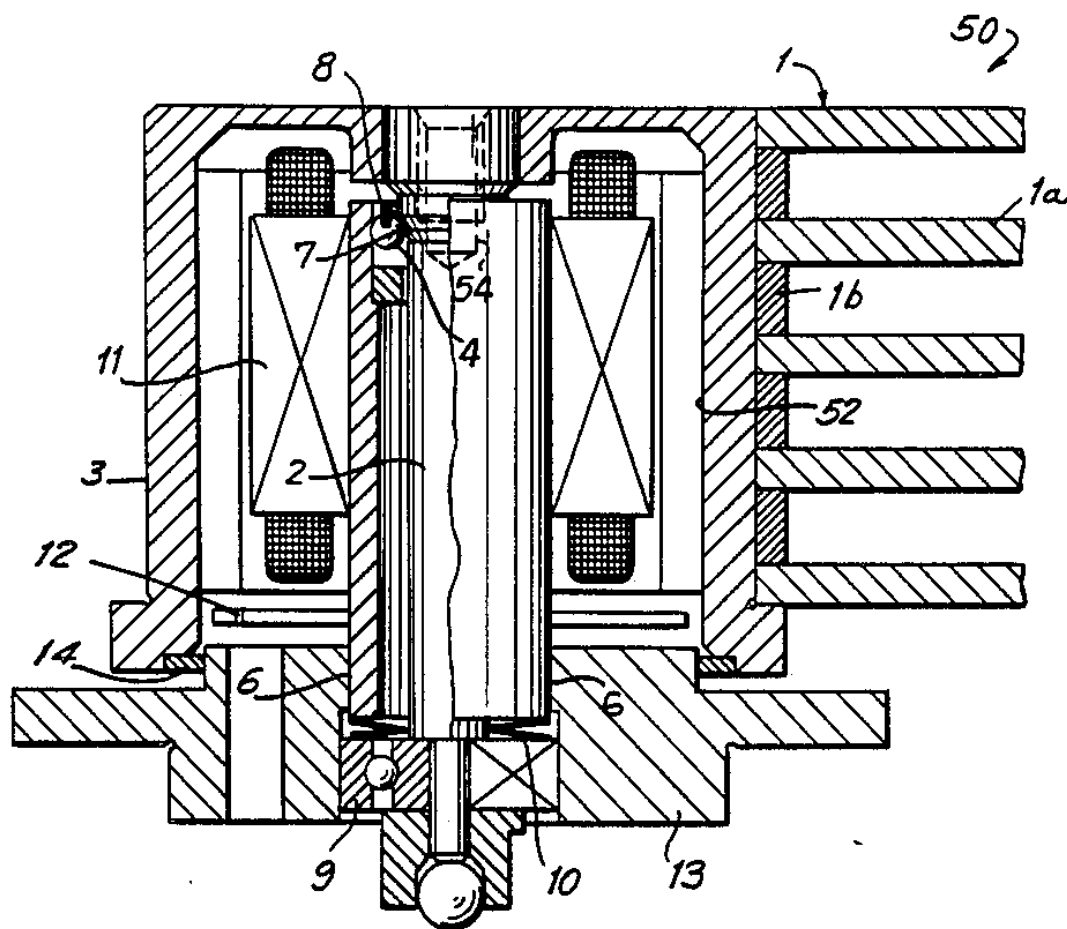
Abstract

(EP3436221)

A brushless direct current motor for a power tool. The motor includes a stator assembly including a stator core having stator laminations with an annular portion and inwardly extending stator teeth. The motor also includes a rotor assembly including a rotor core having rotor laminations and defining a central aperture that receives an output shaft. The rotor assembly also includes a rotor end cap on a first side of the rotor core having a bearing holder and defining a channel,

wherein the channel is open on a side of the rotor end cap facing the rotor core. The motor further includes a bearing provided in the bearing holder that couples the rotor end cap to the output shaft and a position sensor board assembly provided in the channel of the rotor end cap and configured to provide position information of the rotor core to a motor controller.

Images



Publication numbers

GB2162376

US4607182

GB2162376

JPS60257732

FR2565017

DE3419814

GB8513230

Publication kind codes

B

A

A

A

A1

C1

D0

Publication dates

1988-05-05

1986-08-19

1986-01-29

1985-12-19

1985-11-29

1985-11-28

1985-06-26

Earliest priority date

1984-05-26

Title

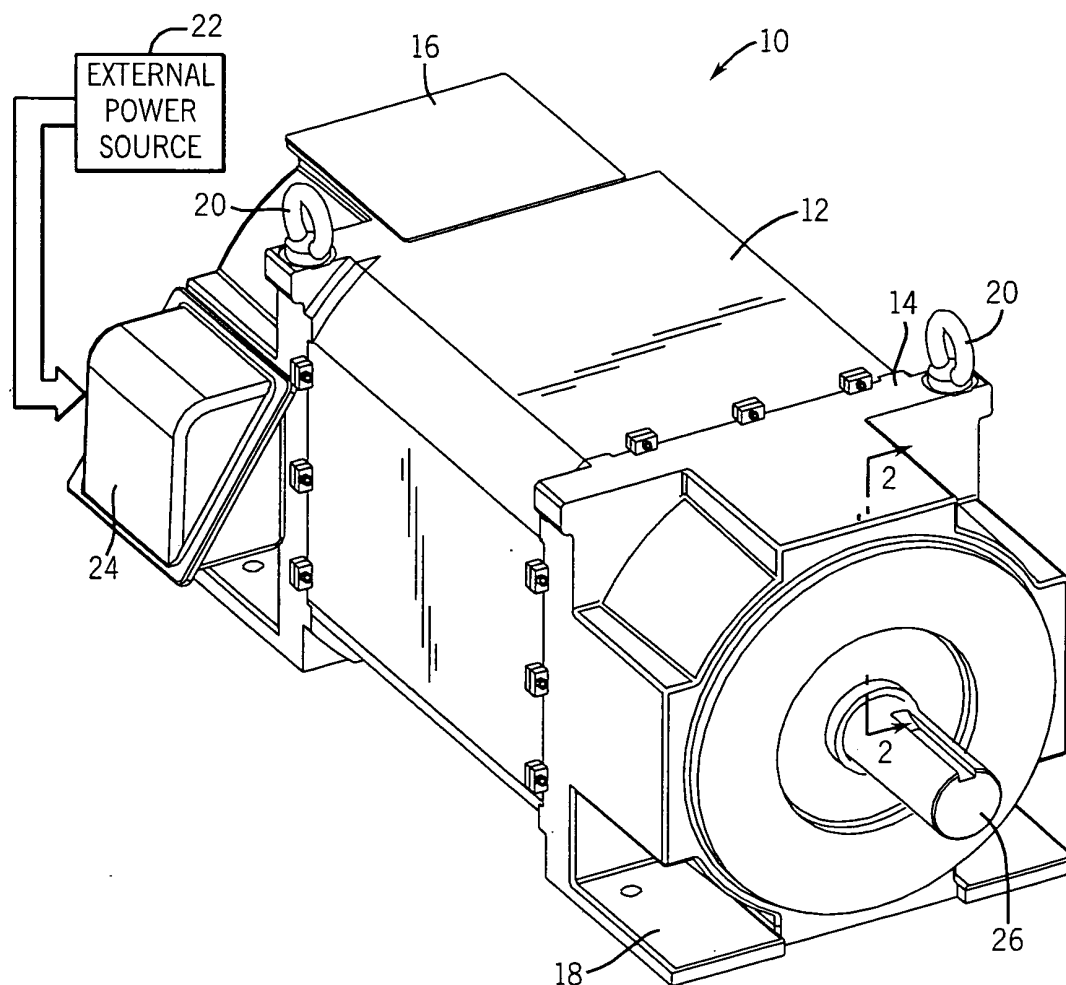
(US4607182)

Motor spindle with integrated bearing races

Abstract

(US4607182)

A motor spindle for magnetic disc storage drives includes an outer rotor connected to an inner shaft which is rotatably mounted by an integrated bearing including rolling elements, such as balls, which run in inner and outer races, the outer race being formed in the stator bushing and the inner race being formed in the shaft.

Images**Publication numbers**

US20050253480

Publication kind codes

A1

Publication dates

2005-11-17

Earliest priority date

2004-05-14

Title

(US20050253480)

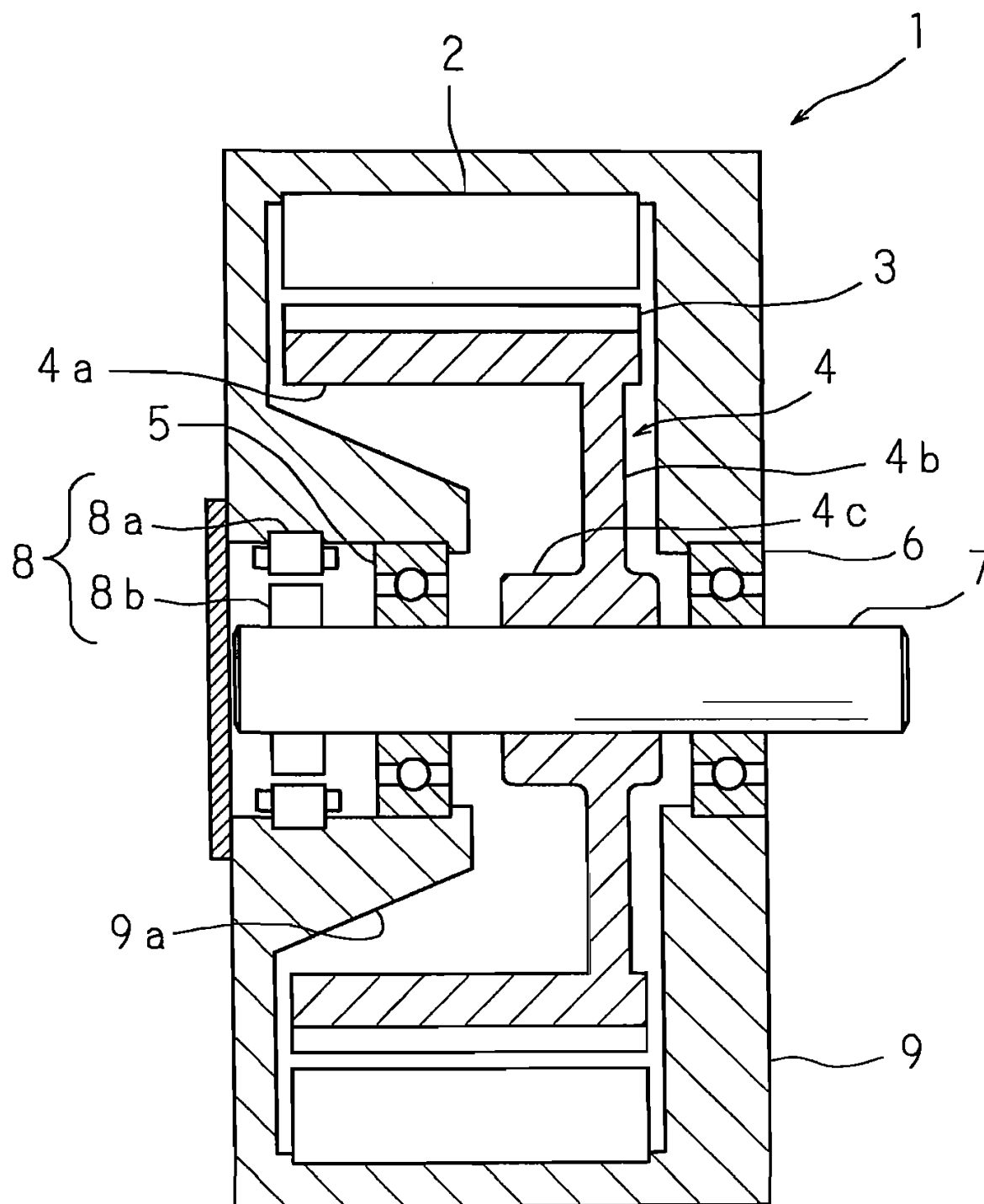
Apparatus and method for reducing shaft charge

Abstract

(US20050253480)

According to an exemplary embodiment, the present invention provides a rotatable element, such as a rotor for an electric motor. The exemplary rotatable element has a core with a generally circular cross-section and a channel that extends through the core along an axial centerline of the core. The element also includes a shaft that is secured to the core and that is disposed in the channel. Additionally, the element includes a dielectric layer disposed between the shaft and the core that electrically insulates the core and shaft with respect to one another. Accordingly, the dielectric layer prevents current from flowing between the core and the shaft. In turn, the dielectric layer reduces the development of charge in the shaft.

Images

**Publication numbers**

DE602007005521

EP1810910

JP2007195344

US20070176507

CN101005231

EP1810910

Publication kind codes

D1

B1

A

A1

A

A1

Publication dates

2010-05-12

2010-03-31

2007-08-02

2007-08-02

2007-07-25

2007-07-25

Earliest priority date

2006-01-19

Title

(EP1810910)

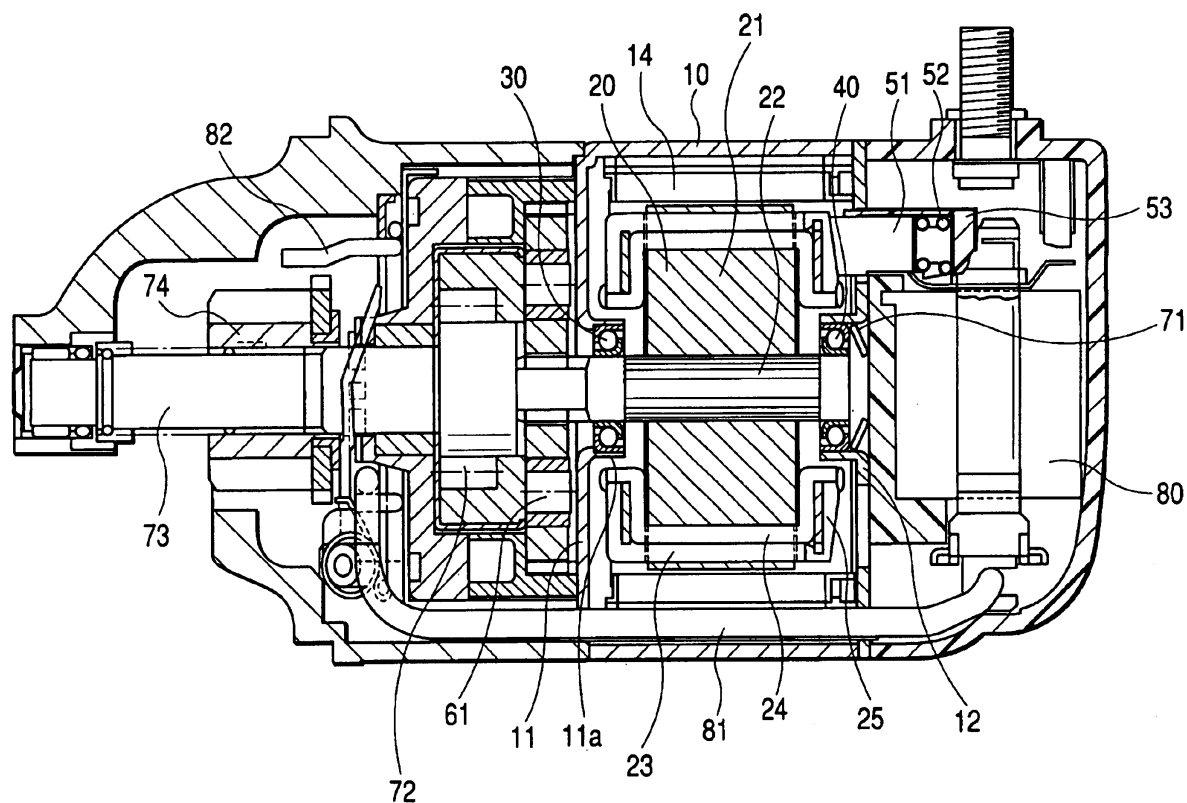
Motor and power steering apparatus

Abstract

(EP1810910)

A motor with a rearranged bearing configuration for reducing an axial length, hence dimensions thereof, is to be provided. In a motor (1) including a stator (2) fixed to an inner circumferential wall of a housing (9), a rotating shaft (7) rotatably supported by the housing (9) via bearings (5, 6), and a rotor (4) fixed to the rotating shaft (7), the rotor (4) includes a disk-shaped portion (4b) disposed coaxially with the rotating shaft (7) and a cylindrical portion (4a) extending parallel to the rotating shaft (7) from a circumferential edge of the disk-shaped portion (4b), such that the rotor (4) constitutes a cylindrical shape with the disk-shaped portion (4b) closing an end portion thereof. Locating a portion of the bearing (5) and of a rotation detector (8) inside the cylindrical portion (4a) of the rotor (4) allows reducing the axial length of the motor (1),

Family 6/20 - FAMPAT - ©Questel

Images**Publication numbers**

JP4039208

US6930430

JP2004144017

DE10349064

US20040080236

Publication kind codes

B2

B2

A

A1

A1

Publication dates

2007-11-16

2005-08-16

2004-05-20

2004-05-13

2004-04-29

Earliest priority date

2002-10-24

Title

(US6930430)

Armature support structure of starter for automotive engine

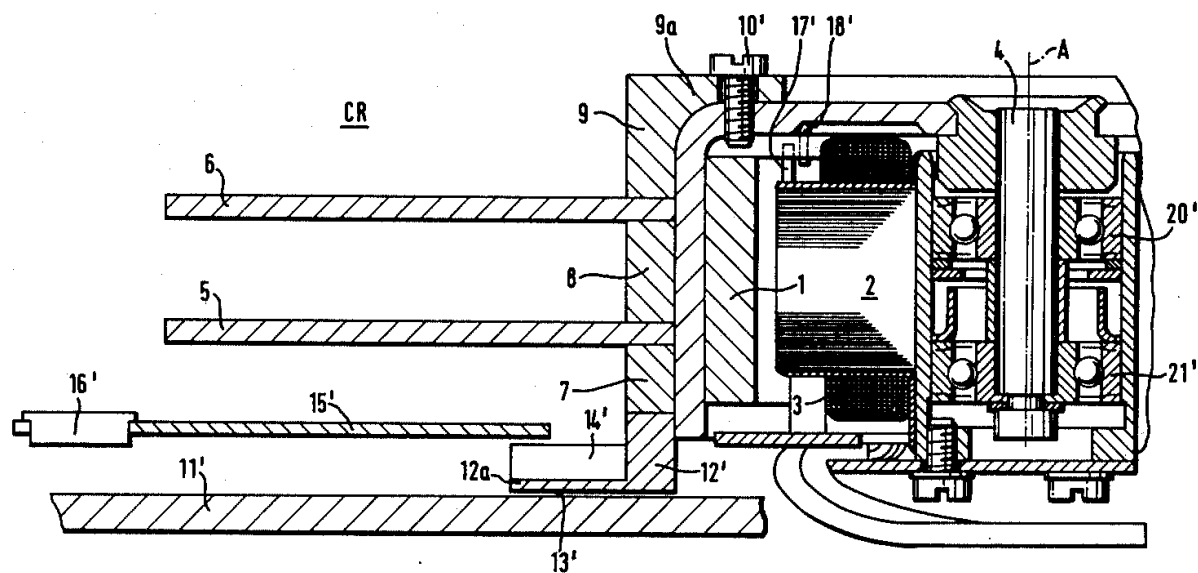
Abstract

(US20040080236)

A starter for an internal combustion engine is provided which includes a pair of angular contact ball bearings used to

support an armature shaft. The bearings are disposed close to opposed ends of a core of an armature. The core has disposed thereon coils which define a commutator on one of the ends of the core. One of the bearings is disposed within an inner periphery of the commutator. This structure results in a decreased interval between the bearings, thus ensuring stability in supporting the armature shaft during rotation, which results in decreased mechanical vibrations, magnetic noises, and wear of the bearings.

Family 7/20 - FAMPAT - ©Questel

Images**Publication numbers**

DE3049334

DE3049334

DE3108204

US4438542

DE3135385

JPS5753876

DE3108204

JPS56166760

DE3049334

Publication kind codes

C2

C3

C2

A

A1

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A1

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A1

Publication dates

1993-09-30

1993-09-30

1992-05-14

1984-03-27

1983-03-17

1982-03-31

1981-12-24

1981-12-22

1981-10-29

Earliest priority date

1980-03-05

Title

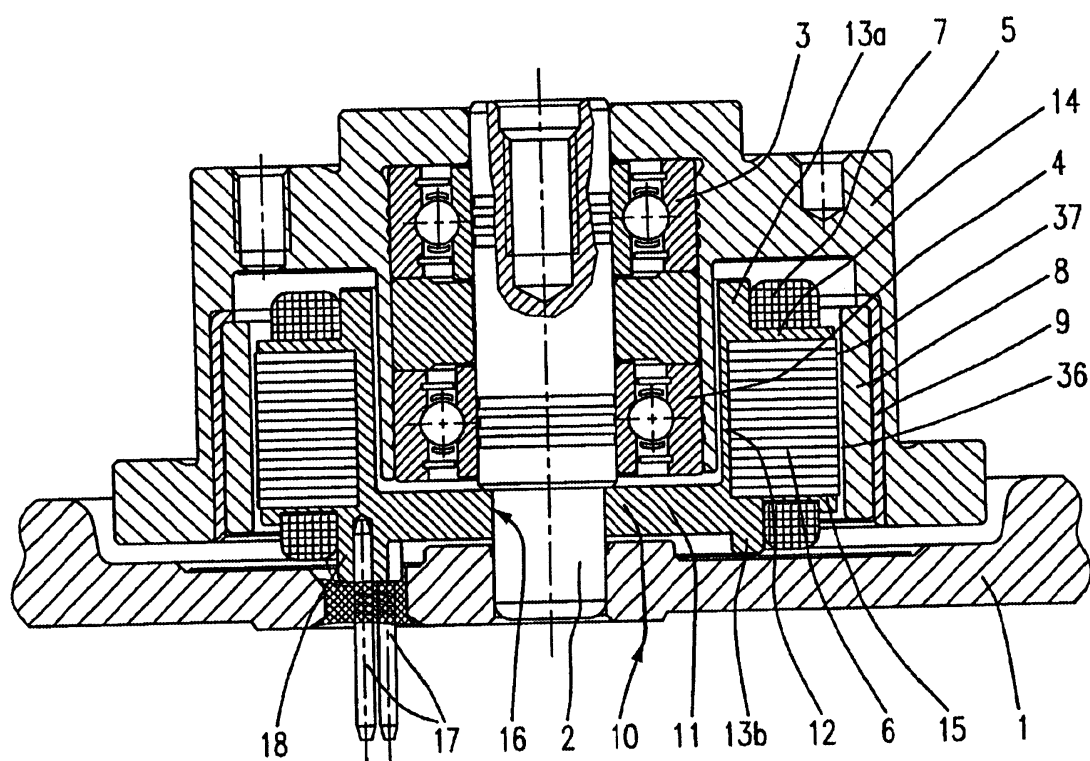
(US4438542)

Disk storage drive

Abstract

(US4438542)

A motor for direct or coaxial drive of a disc storage, mounted in a center hole formed in a storage disc includes a rotor and a stator which form together with an air gap separating the rotor from the stator a magnetic circuit. The stator has a single-phase winding. The motor produces an auxiliary reluctance moment complementing the electromagnetic torque produced by the winding and being offset in time relative to the electromagnetic torque. Due to the positioning of the motor within the center hole of the disc a very compact construction is obtained.

Images**Publication numbers**

US6753636

US20020070614

JP2002027721

DE10026467

Publication kind codes

B2

A1

A

A1

Publication dates

2004-06-22

2002-06-13

2002-01-25

2001-12-13

Earliest priority date

2000-05-27

Title

(US6753636)

Spindle motor for hard disk drives with improved running accuracy

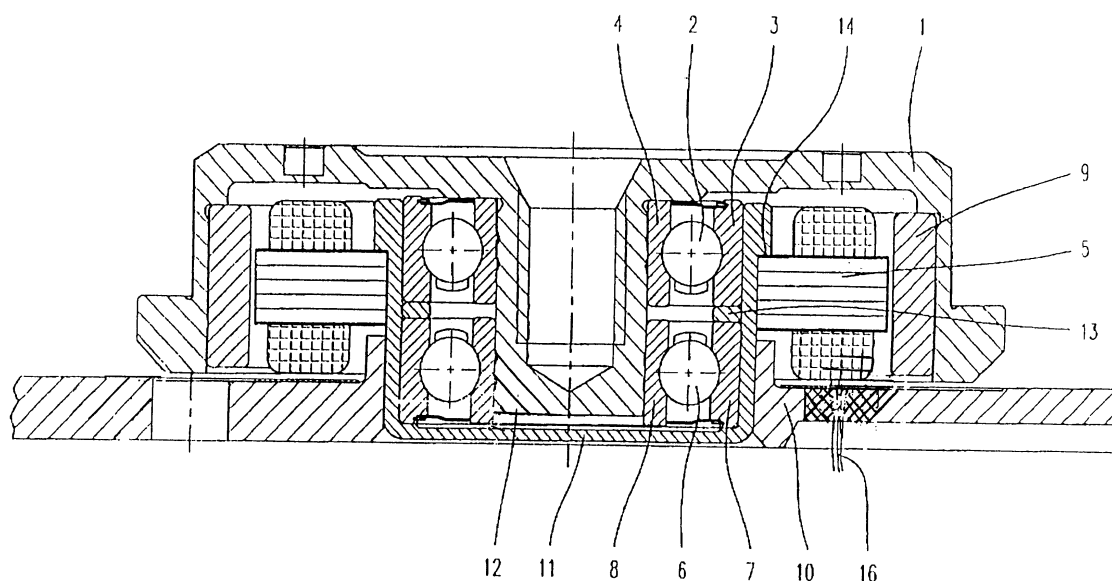
Abstract

(US20020070614)

The invention relates to a spindle motor for hard disk drives with improved running accuracy where the sheet metal package or the complete stator consisting of sheet metal package and windings is encompassed by a centering casing of plastic, which is preferably applied by means of an injection molding operation. Depending on the design of the spindle motor the centering casing can be centered on the stationary shaft and/or on the outer rings/inner raceways pertaining to the sets of rolling bodies. Furthermore, a stator without centering casing is described whose sheet metal package is

centered directly on the outer rings/inner raceways.

Family 9/20 - FAMPAT - ©Questel

Images**Publication numbers**

US6586856

US20020084708

JP2002119012

DE10043808

Publication kind codes

B2

A1

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A1

Publication dates

2003-07-01

2002-07-04

2002-04-19

2002-03-14

Earliest priority date

2000-09-06

Title

(US6586856)

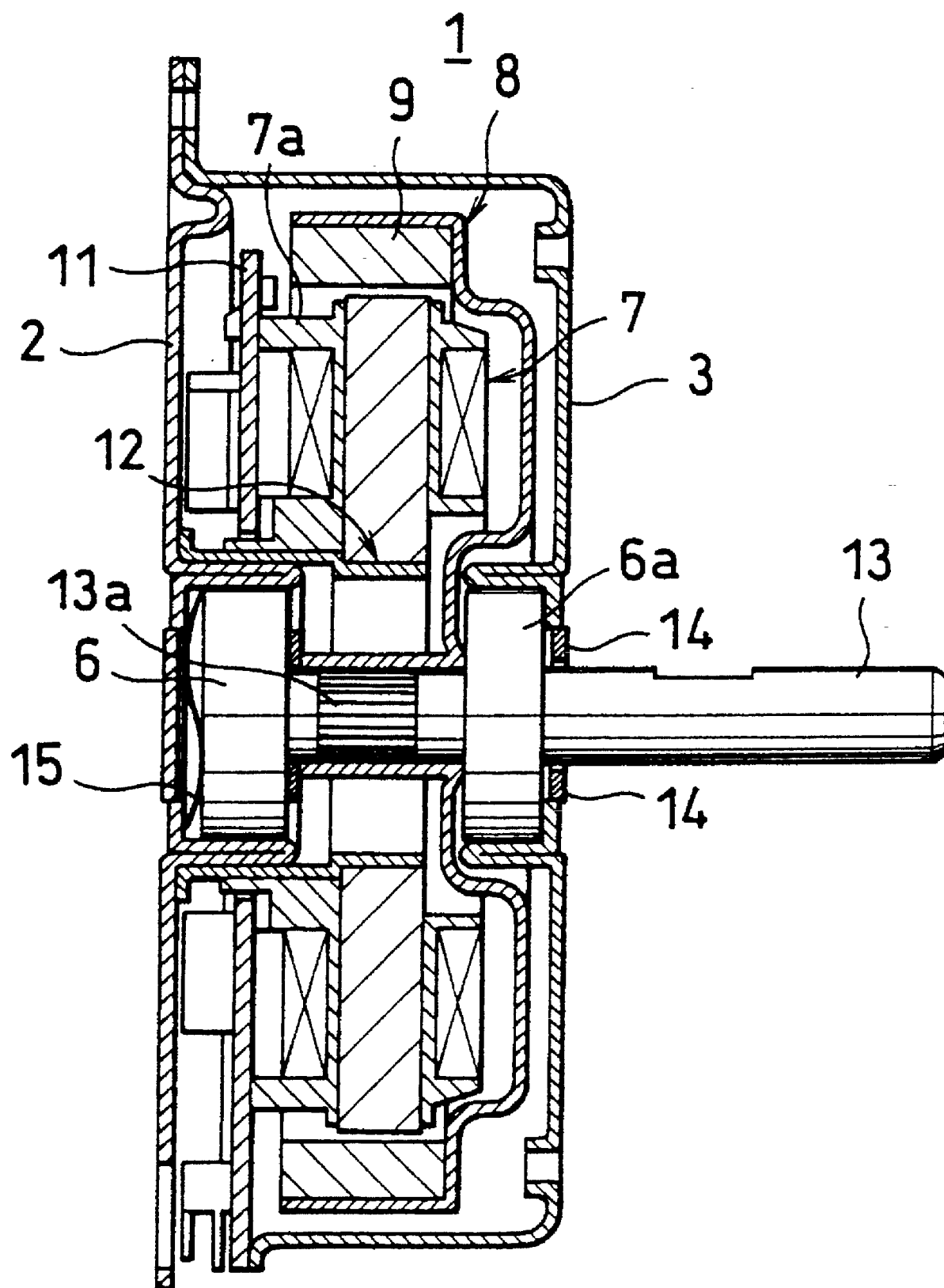
Spindle motor with sleeve for hard disc drives

Abstract

(US20020084708)

The invention relates to a spindle motor for solid-plate running gears with a stator, a rotor, the shaft of which is turnably borne with the aid of rolling bearings with respect to the stator, and a shell, in which the shell is constructed as a separate pot-shaped part closed on one side, on the outer circumference of which the stator is held and on the inner circumference of which the outer rings of the rolling bearings are held.

FIG. 1



Publication numbers

CN1059520

JP3015644

JP3011597

DE69416269

JP2896058
JP2896059
KR100178419
CA2117719
DE69416269
EP0655824
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US5497040
TW268161
CN1111412
JP07222420
BR9404785
JP07163115
JP07163116
JP07163117
KR950015917
CA2117719
EP0655824
BRPI9404785

Publication kind codes

C
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Publication dates

2000-12-13
2000-03-06
2000-02-21
1999-09-02
1999-05-31

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1995-06-23
1995-06-23
1995-06-23
1995-06-17
1995-05-31
1995-05-31
1995-02-14

Earliest priority date

1993-11-30

Title

(EP-655824)

Outer rotor type brushless DC motor

Abstract

(EP0655824)

An outer rotor type brushless DC motor has: a first housing member formed of a sheet metal by press-working and having a first central bearing receiver also formed by press-working in the form of generally hollow cylinder; a second housing member formed from a sheet metal by press-working and having a second central bearing receiver also pressed in the form of generally hollow cylinder; a hollow cylindrical stator support formed of a sheet metal by press-working and having one end mounted on the first bearing receiver of the first housing member and another end for receiving the stator on the outer surface of the stator support; a magnets support press-worked from a electrical steel sheet metal for supporting magnets around the stator and inside the second housing member; a first bearing mounted in the first bearing receiver; a second bearing mounted in the second bearing receiver coaxially with the first bearing; and a freely rotatable shaft mounted on the first and second bearings, for firmly supporting thereon the stator support. The motor may be assembled in simple steps without any molding to suppress vibrations and noises. The motor has a suitable design for mass production.

<IMAGE>

Images

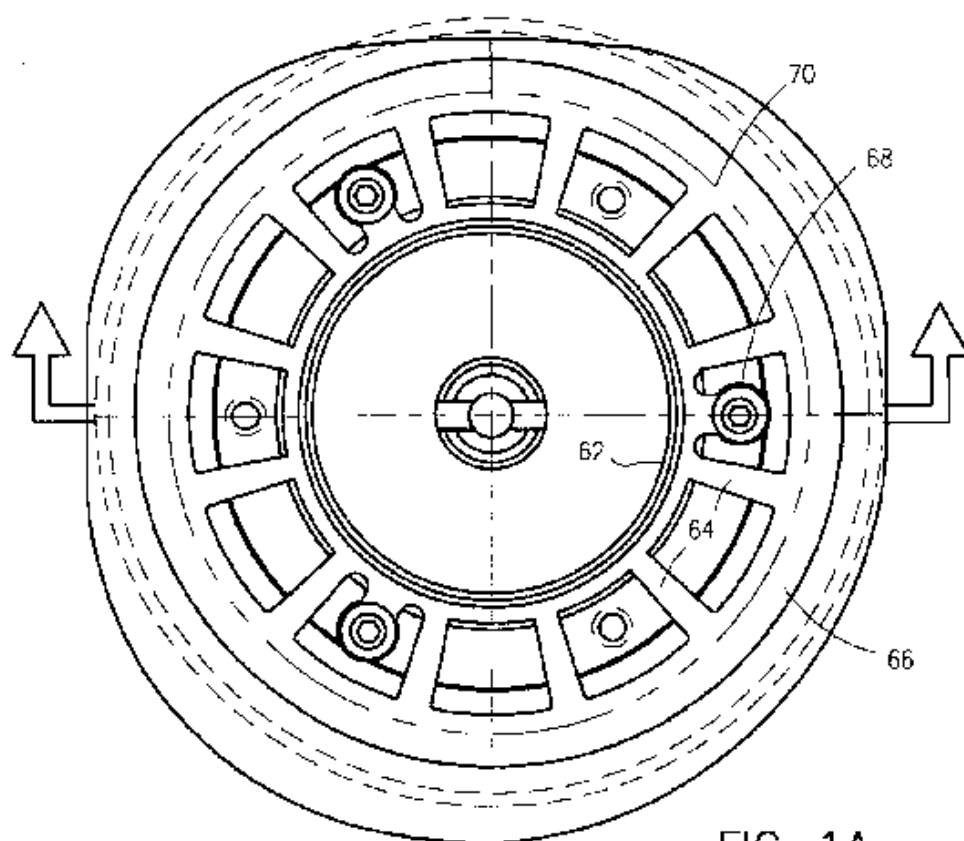


FIG. 1A

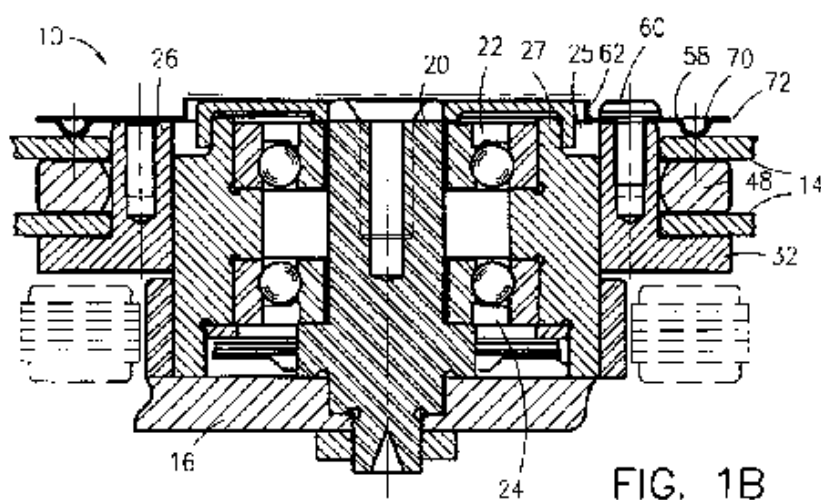


FIG. 1B

Publication numbers

US5949613

US5923498

US5917677

US5828518

US5781374

US5761002

Publication kind codes

A

A

A

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A

Publication dates

1999-09-07

1999-07-13

1999-06-29

1998-10-27

1998-07-14

1998-06-02

Earliest priority date

1995-12-18

Title

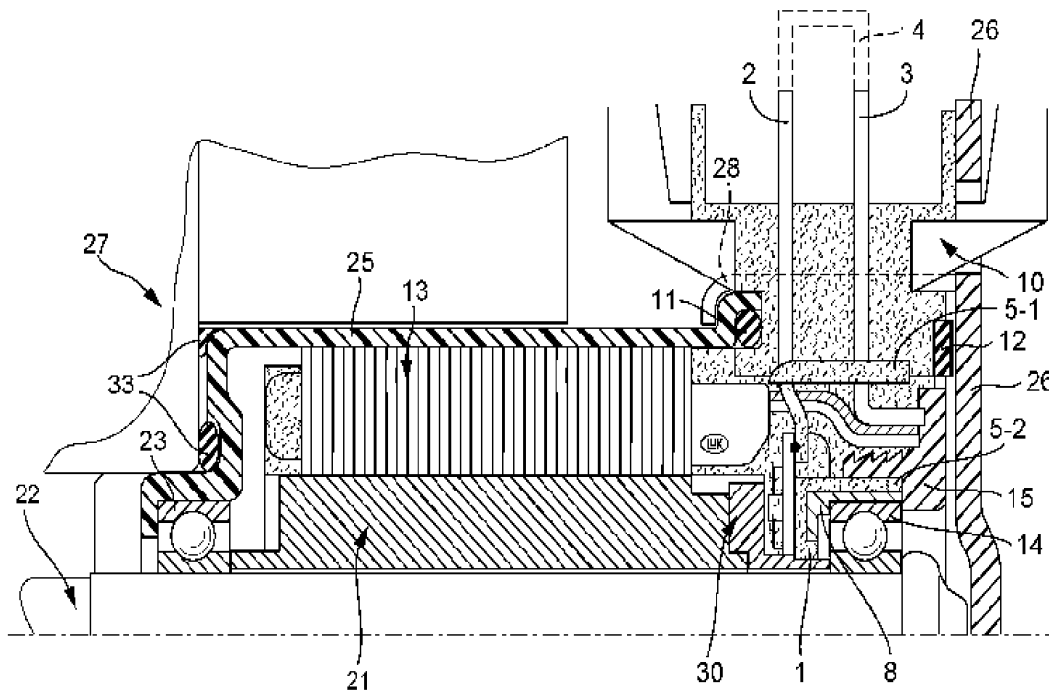
(US5761002)

Disk clamp with clamp load carrying beams

Abstract

(US5761002)

A disc clamp for securing a plurality of information storage discs to a spindle hub on a disc drive motor assembly comprising an annular inner wall portion, an annular outer ring portion, a plurality of clamp load beams extending radially from the annular inner wall portion to the annular outer ring portion and a plurality of eyelets extending radially from the annular inner wall portion for receiving screws that couple the disc clamp to the spindle hub.

Images**Publication numbers**

DE10316444
DE10316423
DE10391581
DE10391584
DE10391586
DE10391628
KR100977644
JP4241396
DE50310575
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EP1499820
US7398706
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AT305575
EP1499821
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FR2841624
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AU2003238343
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WO03/087630
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FR2838494
FR2838495
FR2838498
FR2838575
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ITMI20030730

Publication kind codes

B4
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A5
A5
A5
B1
B2

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Publication dates

2015-10-01

2015-02-26

2013-09-19

2013-09-19

2013-09-19

2013-09-19

2010-08-24

2009-01-09

2008-11-13

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2008-05-28

2007-08-08

2006-12-28

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2005-01-26

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2003-10-11

Earliest priority date

2002-04-10

Title

(EP1497903)

Drive arrangement with a fixed bearing

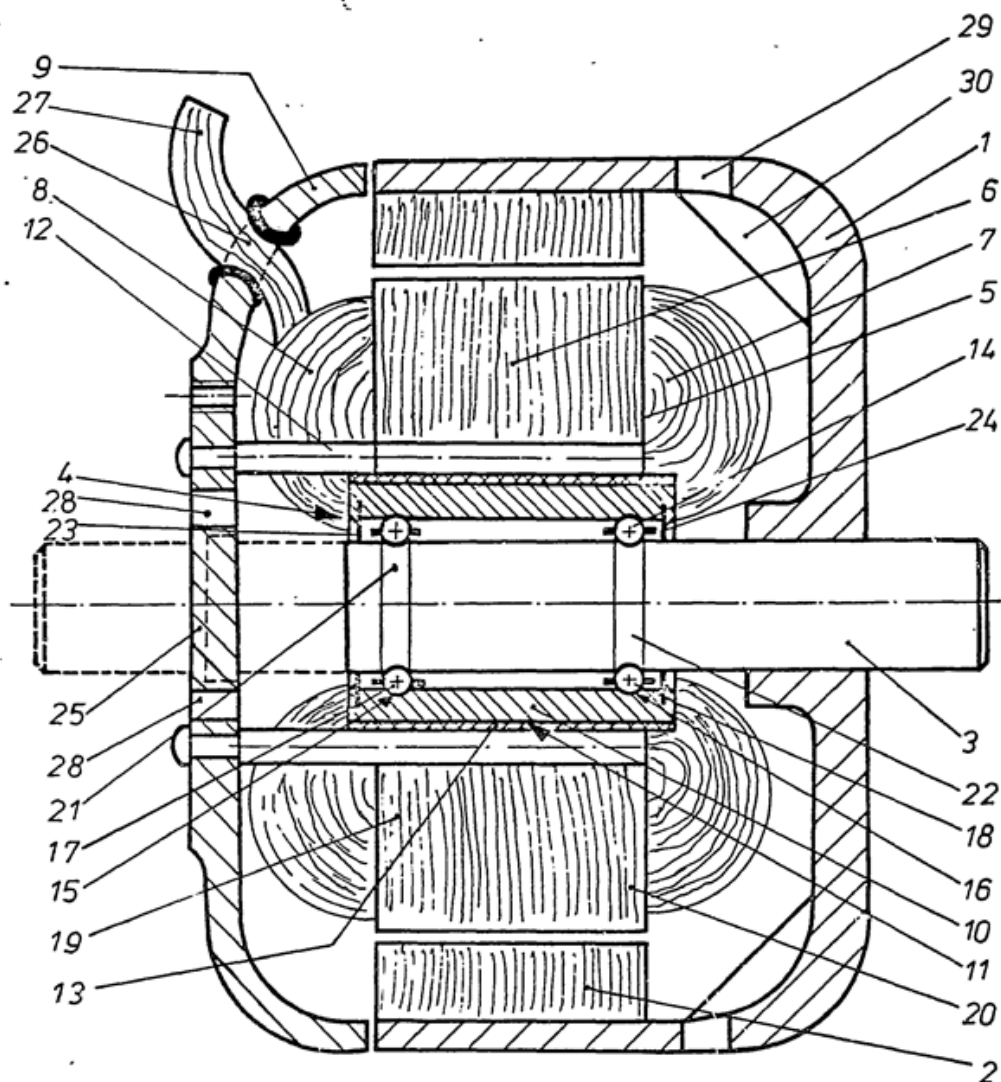
Abstract

(EP1497903)

The invention relates to a drive arrangement with a unit comprising stator, rotor and fixed bearing in which a shaft of the motor is mounted, housed in a motor housing. An injection moulded piece comprises a plug piece on an external annular piece, which comprises a branch supply line, connected to the coil of the stator and a sensor line connected to a sensor circuit board, whereby said sensor circuit board comprises at least one sensor. The injection moulded piece further comprises an inner annular piece in which the fixed bearing is arranged on the side axially opposed to the shaft output of the drive arrangement.

Family 13/20 - FAMPAT - ©Questel

Images



Publication numbers

IT1125775

FR2350721

GB1529153

FR2350721

JPS52135010

NL7704826

SE7705093

DE7614054

Publication kind codes

B
B1
A
A1
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L
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Publication dates

1986-05-14
1981-09-11
1978-10-18
1977-12-02
1977-11-11
1977-11-08
1977-11-05
1976-08-26

Earliest priority date

1976-05-04

Title

(FR2350721)

Electric motor has the outer rotor

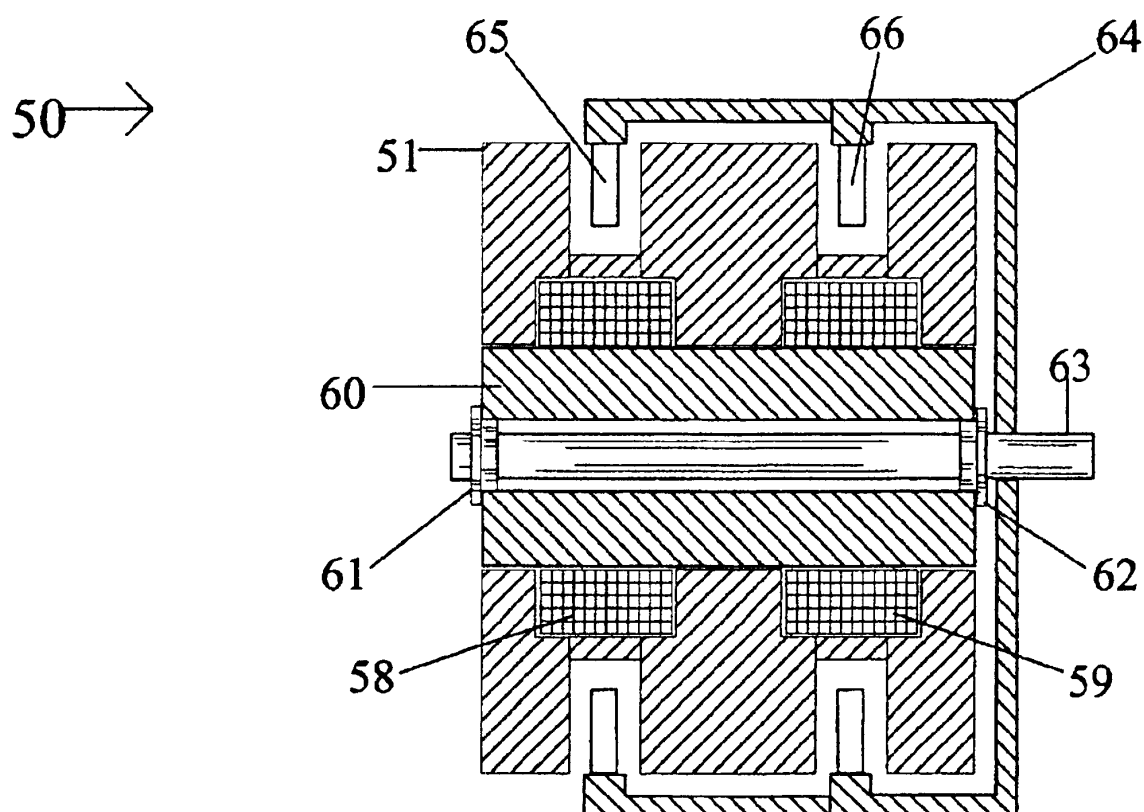
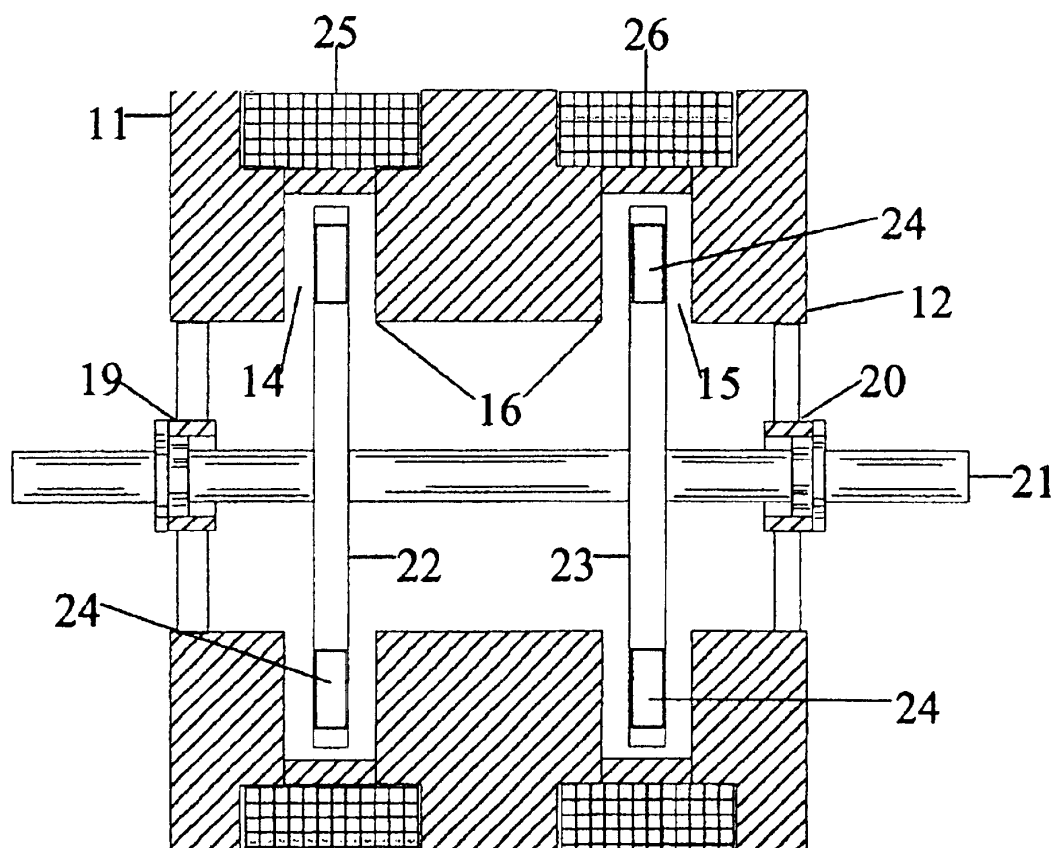
Abstract

(FR2350721)

1529153 Bearing arrangements in electric motors SKF KUGELLAGERFABRIKEN GmbH 28 April 1977 [4 May 1976]
17881/77 Heading H2A A motor shaft 3 carrying an external rotor 1 is journaled in the stator 5 by means of a two-row ball bearing 4 having a common outer race ring 10 and inner race-ways 21, 22 formed directly on the shaft. A resilient insulating sleeve 13 is interposed between the ring 10 and the shaft. Pins 12 secure a cover 9 to the stator.

(From GB1529153 A)

Images



Publication numbers

US6897595

Publication kind codes

B1

Publication dates

2005-05-24

Earliest priority date

2004-03-29

Title

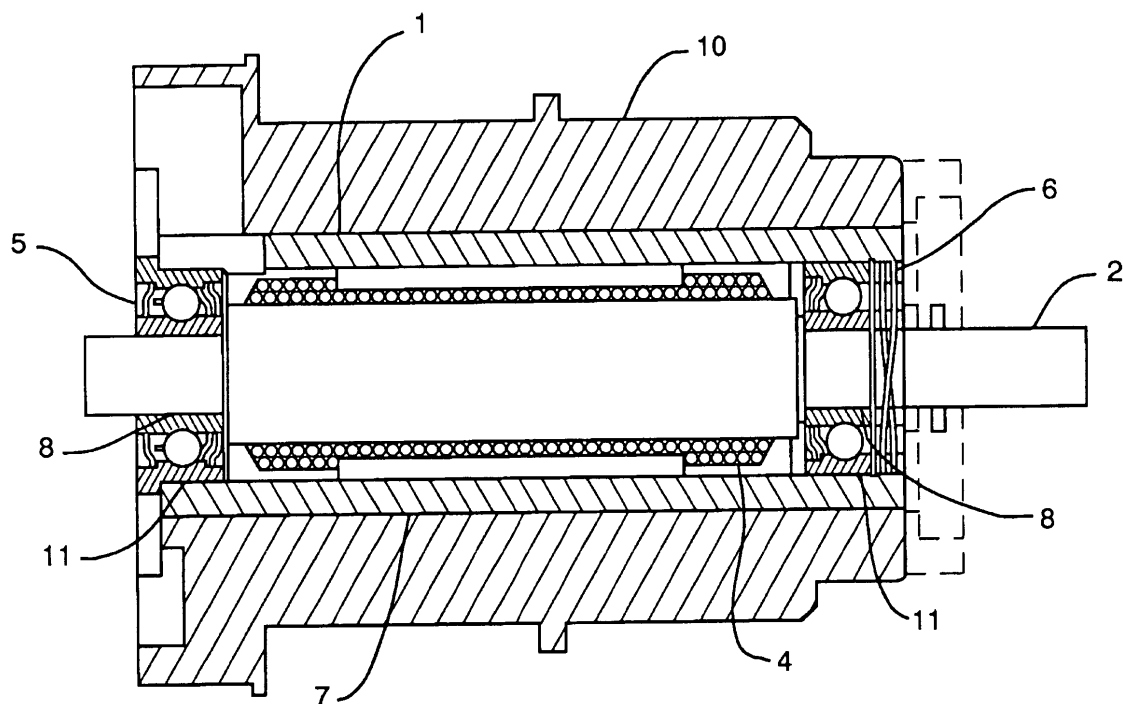
(US6897595)

Axial flux motor with active flux shaping

Abstract

(US6897595)

An improved electric motor design wherein the interior surface of the stator has a plurality of corrugations intersected by annular grooves formed therein and a corresponding number of rotor disks having permanent magnets secured to their outer surface, the permanent magnets being positioned to rotate within the grooves. The magnets alternate in polarity about each disk as well as being offset about the circumference from disk to disk so that one disk set will align with the pole face created by the intersection of the corrugations and the adjacent annular grooves and the other disk set will be offset from the corrugations and pole faces. Alternately energizing coils positioned within a plurality of notches formed in the outer surface of the stator with alternating current causes the magnets and their associated disks to reposition themselves in a manner that causes the motor shaft to rotate as well as shaping the core flux field for more efficient use, thereby increasing motor torque.

Images**Publication numbers**

US6710487

JP2003520553

EP1258015

CN1394346

EP1258015

KR20020076252

US20010030476

AU3276501

CA2397062

WO01/52279

Publication kind codes

B2

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A4

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A1

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A1

A

A1

A1

Publication dates

2004-03-23

2003-07-02

2003-04-23

2003-01-29

2002-11-20

2002-10-09

2001-10-18

2001-07-24

2001-07-19

2001-07-19

Earliest priority date

2000-01-11

Title

(EP1258015)

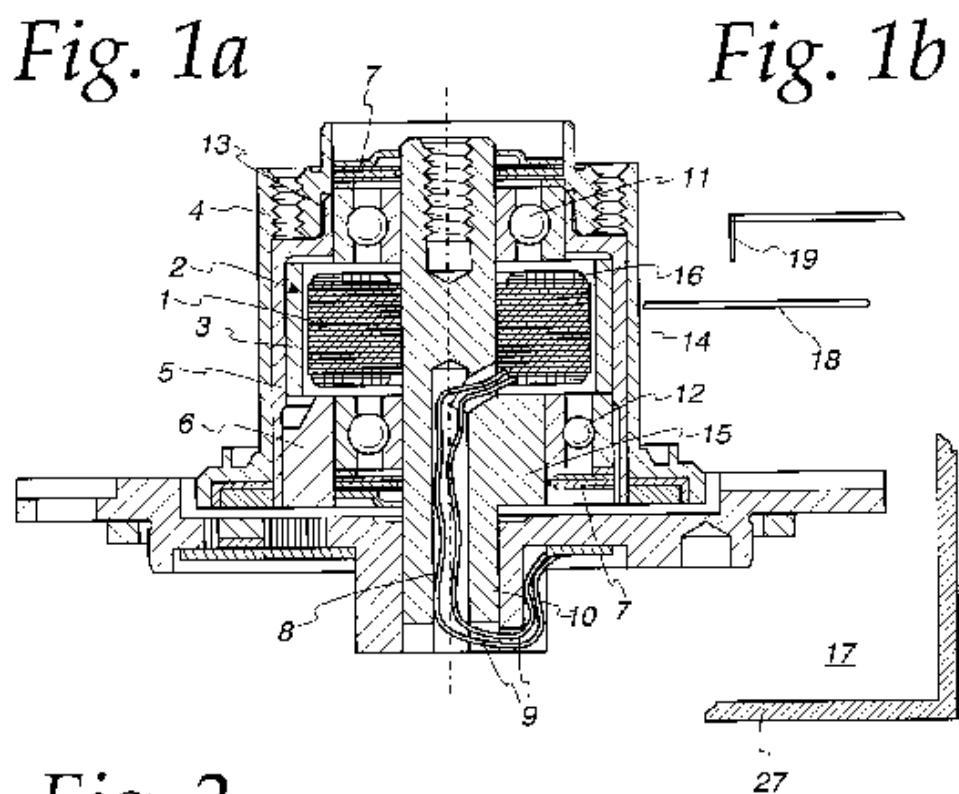
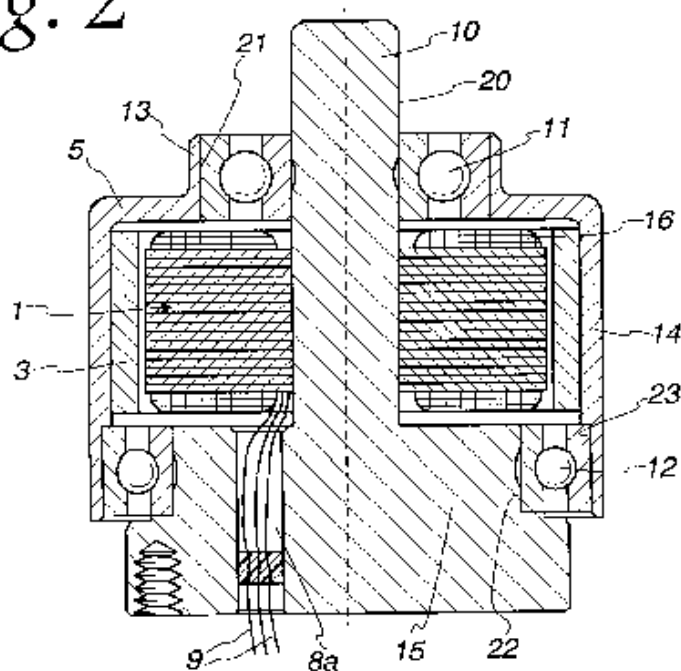
Rotary device with matched expansion ceramic bearings

Abstract

(EP1258015)

A high precision torque motor, including a partial rotation drive suitable for use in a galvanometer scanner, where the rotor (2) is supported within the stator (1) and housing assembly on all ceramic ball bearings (5, 6), including inner and outer races and bearing balls. The ceramic ball bearing assemblies and all structural support elements have substantially equal coefficients of expansion through the use of matched expansion, nickel-iron alloy for the rotor shaft, stator, housing and other structural components which contact, locate, and support the inner and outer bearing races. The non-conductive bearings permit exclusion of any grounding conductor strap as between the rotor shaft and the housing.

Images

*Fig. 2*

Publication numbers

US5945751

Publication kind codes

A

Publication dates

1999-08-31

Earliest priority date

1991-06-28

Title

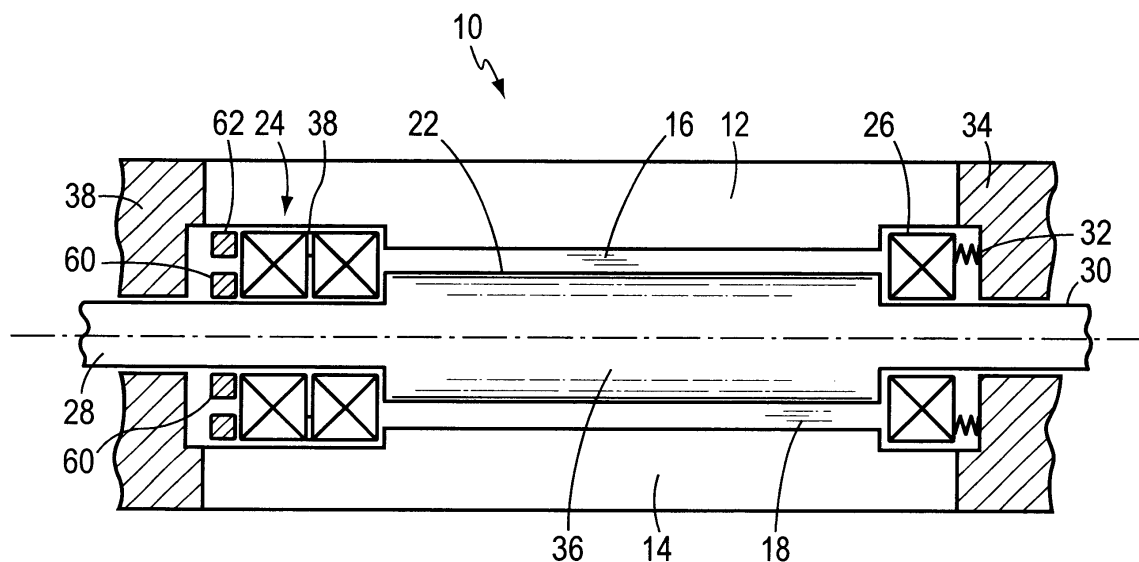
(US5945751)

Disk storage device having a spindle driving motor

Abstract

(US5945751)

The invention relates to a spindle driving motor, in particular an external rotor motor, the main components of which are accommodated in the interior of a driving hub (4) or the back iron (5). According to the invention, in order to minimize the number of joints, both ball bearings (11, 12) are arranged directly, yet correctly as far as assembly is concerned, between the fixed shaft (10) and the back iron (5), a collar (15) having a larger diameter serving in particular to this end.

Images**Publication numbers**

JP2003533671

US6612015

EP1247108

US20020059715

WO01/50139

US6307292

WO01/50139

Publication kind codes

A

B2

A2

A1

A3

B1

A2

Publication dates

2003-11-11

2003-09-02

2002-10-09

2002-05-23

2002-01-31

2001-10-23

2001-07-12

Earliest priority date

1999-12-30

Title

(EP1247108)

Galvanometer with axial symmetry and improved bearing design

Abstract

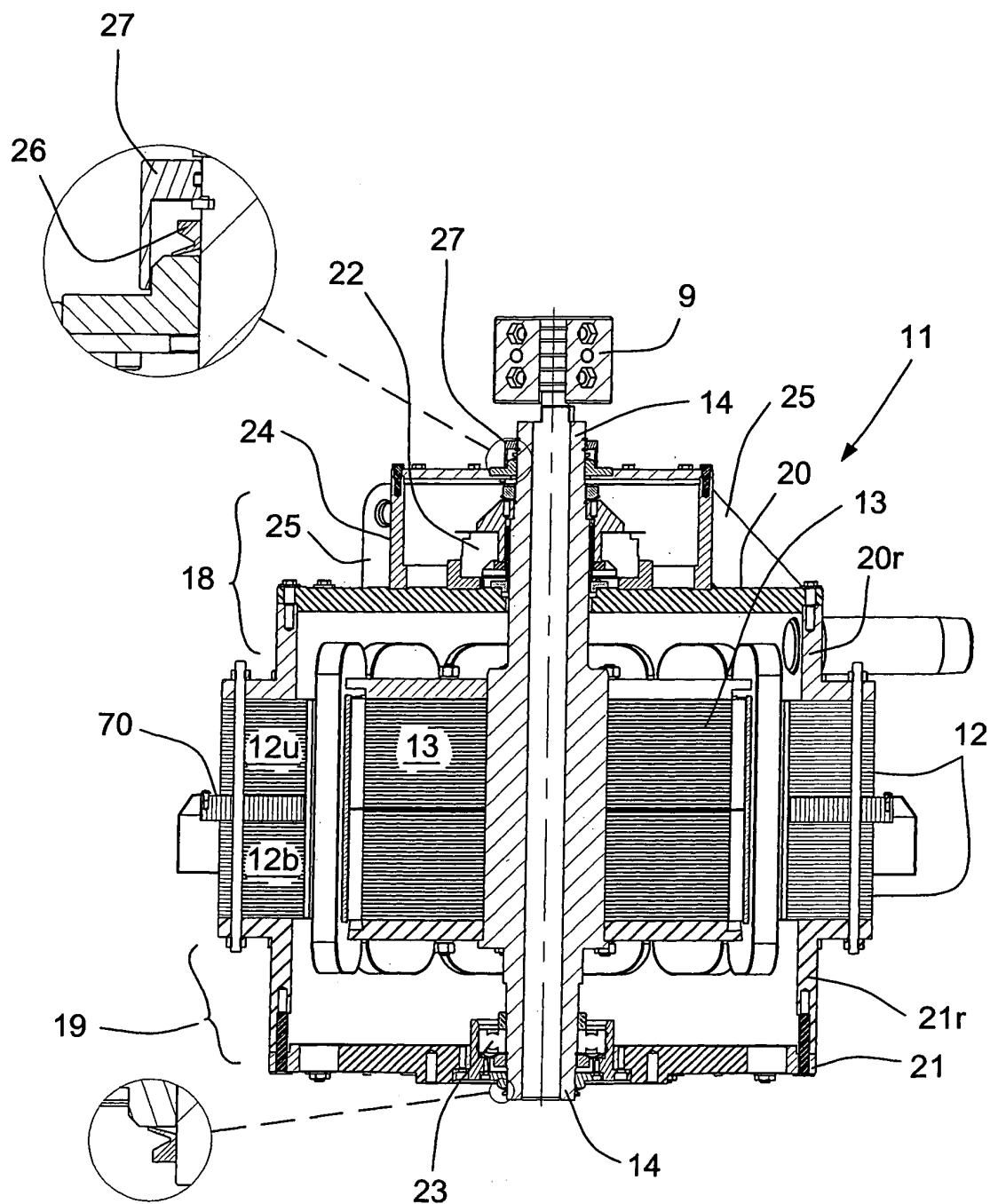
(EP1247108)

A galvanometer unit comprises a limited-rotation motor, which has axial symmetry of the major motor components including

axial placement of the bearings, stator drive coils, and stator back iron with respect to the magnetic center of the rotor, and which employs a cylindrical magnet having significantly uniform porperties along its length. The galvanometer employs independently "hard" and "soft" preloaded bearings, which simultaneously minimize axial displacement and account for thermal expansion of the rotor assembly and which improve the overall efficiency of the galvanometer and extend the service life of the bearings.

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Images



Publication numbers

CA2509180

EA200602209

US7199497

WO2005/119885

US20050269889

CA2509180

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A1

B2

A1

A1

A1

Publication dates

2008-09-09

2007-04-27

2007-04-03

2005-12-15

2005-12-08

2005-12-04

Earliest priority date

2004-06-04

Title

(WO2005119885)

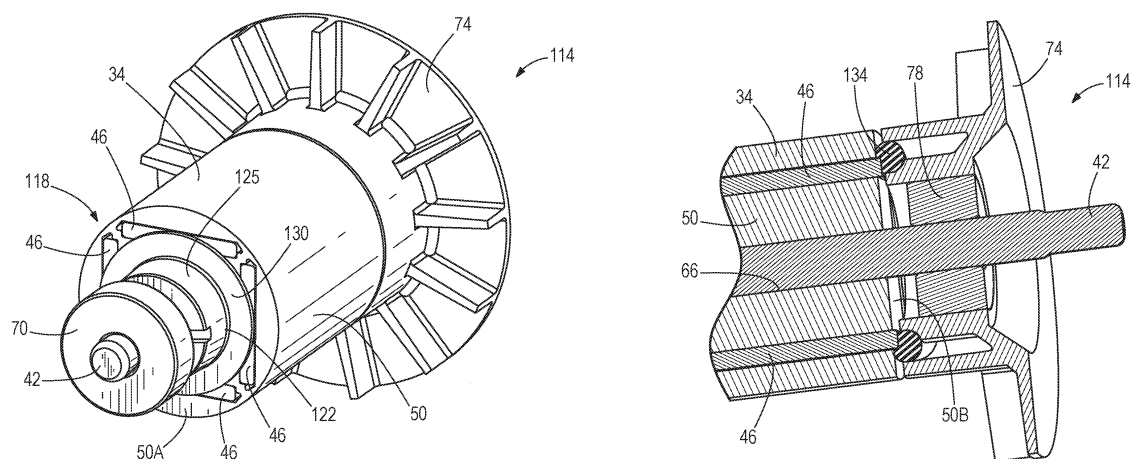
A frameless switched reluctance motor and application as a top drive for a rotary pump

Abstract

(WO2005/119885)

A frameless switched reluctance motor (SRM) has a stator sandwiched between two housings. Axial load on the rotor shaft is directed through a first bearing, through the first housing to the stator and through the second housing to a motor support. Heat is dissipated using low-loss electrical steel, one or more air movers and air passages through the motor. Preferably a stator profile enables the air passages to be formed through the stator's lamination stack. Optionally air is routed through passages between the coils and through air passages along the air gap and radially through passages between an upper and a lower stator. A first self aligning bearing adapts to misalignment between the first housing and the shaft and a second bearing is provided with transverse movement. Preferably, the frameless motor is adapted for support to a wellhead for driving a downhole rotary pump and a rotary rod string.

Family 19/20 - FAMPAT - ©Questel

Images**Publication numbers**

US20190379249

US10432045

CN103928997

CN103928997

US20140125158

Publication kind codes

A1

B2

B

A

A1

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2019-12-12

2019-10-01

2017-11-24

2014-07-16

2014-05-08

Earliest priority date

2012-11-06

Title

(US20190379249)

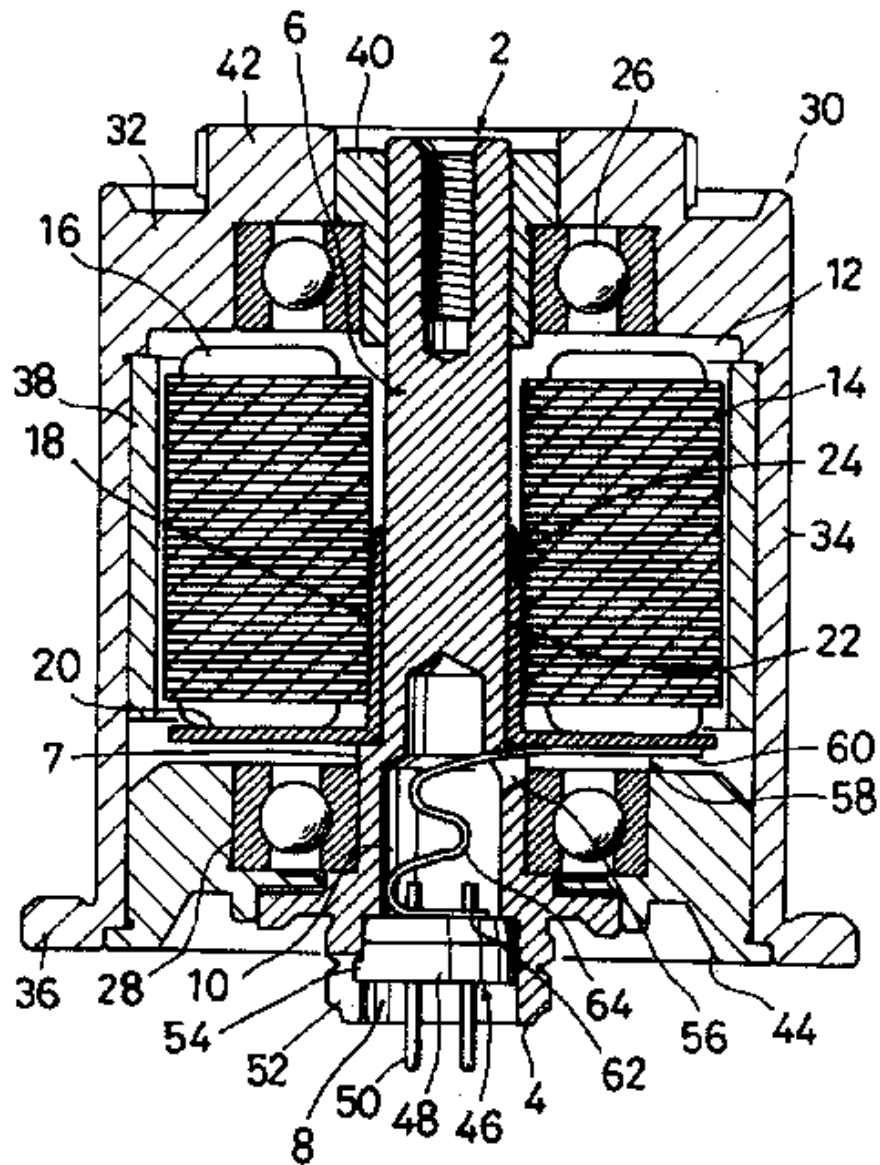
Electric motor for a power tool

Abstract

(US20190379249)

An electric motor for use with a power tool includes a rotor having a body, a stator having a plurality of electromagnetic coils surrounding the rotor, an output shaft coupled to the rotor for rotation with the rotor, and a plurality of magnets positioned within the body of the rotor. The motor also includes a mechanical magnet holder coupled to at least one of the rotor and the output shaft to engage each of the plurality of magnets. The mechanical magnet holder inhibits movement of the plurality of magnets out of the body of the rotor.

Fig.1

**Publication numbers**

US5705866

JP08019208

JP07336977

Publication kind codes

A

A

A

Publication dates

1998-01-06

1996-01-19

1995-12-22

Earliest priority date

1994-06-09

Title

(US5705866)

Spindle motor

Abstract

(US5705866)

A spindle motor comprises a stationary shaft, a rotor hub having an annular rotor magnet and rotatably mounted by bearings to the stationary shaft, a stator fixedly mounted to the stationary shaft so as to face the rotor magnet, a flexible printed circuit board connected to leads from the stator, and a reinforcement member composed of an annular plate portion and a tubular portion extending axially from the inner edge of the plate portion and disposed between the stationary shaft and the stator. For assembly, the stator is fitted onto the outer side of the tubular portion and then, the flexible printed circuit board is mounted to the plate portion of the reinforcement member. The tubular portion of the reinforcement member is joined to the outer side of the stationary shaft. Accordingly, the flexible printed circuit board is strengthened effectively and the assembly of the components will be eased.