PTO/AIA/15 (03-13)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No.	PAT AP-00723-203
First Named Inventor	Tewari Paramahamsa
Title	Reduced Reaction Rotary Alternating Current Generator
Express Mail Label No.	

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

1. [✓] **Fee Transmittal Form** (PTO/SB/17 or equivalent)
2. [ ] **Applicant asserts small entity status.** See 37 CFR 1.27
3. [✓] **Applicant certifies micro entity status.** See 37 CFR 1.29. Applicant must attach form PTO/SB/15A or B or equivalent.
4. [✓] **Specification** [*Total Pages* 16] Both the claims and abstract must start on a new page. *(See MPEP § 608.01(a) for information on the preferred arrangement)*
5. [✓] **Drawing(s)** (35 U.S.C. 113) [*Total Sheets* 9]
6. **Inventor's Oath or Declaration** [*Total Pages* 1] *(including substitute statements under 37 CFR 1.64 and assignments serving as an oath or declaration under 37 CFR 1.63(e))*
   a. [✓] Newly executed (original or copy)
   b. [ ] A copy from a prior application (37 CFR 1.63(d))
7. [✓] **Application Data Sheet** ** See note below.* See 37 CFR 1.76 (PTO/AIA/14 or equivalent)
8. **CD-ROM or CD-R** in duplicate, large table, or Computer Program (*Appendix*)
   [ ] Landscape Table on CD
9. **Nucleotide and/or Amino Acid Sequence Submission** (*if applicable, items a. – c. are required*)
   a. [ ] Computer Readable Form (CRF)
   b. [ ] Specification Sequence Listing on:
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      ii. [ ] Paper
   c. [ ] Statements verifying identity of above copies

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ACCOMPANYING APPLICATION PAPERS

10. [ ] **Assignment Papers** (cover sheet & document(s))
    Name of Assignee _____
11. [ ] **37 CFR 3.73(c) Statement** (*when there is an assignee*) [✓] **Power of Attorney**
12. [ ] **English Translation Document** (*if applicable*)
13. [ ] **Information Disclosure Statement** (PTO/SB/08 or PTO-1449)
    [ ] Copies of citations attached
14. [ ] **Preliminary Amendment**
15. [ ] **Return Receipt Postcard** (*MPEP § 503*) (*Should be specifically itemized*)
16. [ ] **Certified Copy of Priority Document(s)** (*if foreign priority is claimed*)
17. [ ] **Nonpublication Request** Under 35 U.S.C. 122(b)(2)(B)(i). Applicant must attach form PTO/SB/35 or equivalent.
18. [ ] **Other:** _____

*__Note__: (1) Benefit claims under 37 CFR 1.78 and foreign priority claims under 1.55 **must** be included in an Application Data Sheet (ADS).
(2) For applications filed under 35 U.S.C. 111, the application must contain an ADS specifying the applicant if the applicant is an assignee, person to whom the inventor is under an obligation to assign, or person who otherwise shows sufficient proprietary interest in the matter. See 37 CFR 1.46(b).

19. CORRESPONDENCE ADDRESS

[✓] The address associated with Customer Number: 114215 **OR** [ ] Correspondence address below

Name					
Address					
City		State		Zip Code	
Country		Telephone		Email	

Signature	/John Laurence/	Date	2014-04-14
Name (Print/Type)	John Laurence	Registration No. (Attorney/Agent)	63383

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FEE TRANSMITTAL

Complete if known	
Application Number	
Filing Date	2014-04-14
First Named Inventor	Tewari Paramahamsa
Examiner Name	TBD
Art Unit	
Practitioner Docket No.	PAT AP-00723-203

☐ Applicant asserts small entity status. See 37 CFR 1.27.

☑ Applicant certifies micro entity status. See 37 CFR 1.29. Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously.

TOTAL AMOUNT OF PAYMENT ($) 400.00

METHOD OF PAYMENT (check all that apply)

☐ Check ☑ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): _____

☐ Deposit Account Deposit Account Number: _____ Deposit Account Name: _____

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FEE CALCULATION

1. BASIC FILING, SEARCH, AND EXAMINATION FEES (U = undiscounted fee; S = small entity fee; M = micro entity fee)

	FILING FEES			SEARCH FEES			EXAMINATION FEES			
Application Type	**U ($)**	**S ($)**	**M ($)**	**U ($)**	**S ($)**	**M ($)**	**U ($)**	**S ($)**	**M ($)**	**Fees Paid ($)**
Utility	280	140*	70	600	300	150	720	360	180	400.00
Design	180	90	45	120	60	30	460	230	115	
Plant	180	90	45	380	190	95	580	290	145	
Reissue	280	140	70	600	300	150	2,160	1,080	540	
Provisional	260	130	65	0	0	0	0	0	0	

* The $140 small entity status filing fee for a utility application is further reduced to $70 for a small entity status applicant who files the application via EFS-Web.

2. EXCESS CLAIM FEES

Fee Description	**Undiscounted Fee ($)**	**Small Entity Fee ($)**	**Micro Entity Fee ($)**
Each claim over 20 (including Reissues)	80	40	20
Each independent claim over 3 (including Reissues)	420	210	105
Multiple dependent claims	780	390	195

Total Claims		**Extra Claims**	**Fee ($)**		**Fee Paid ($)**
9	-20 or HP =	_____	x _____	=	_____

HP = highest number of total claims paid for, if greater than 20.

Indep. Claims		**Extra Claims**	**Fee ($)**		**Fee Paid ($)**
1	-3 or HP =	_____	x _____	=	_____

HP = highest number of independent claims paid for, if greater than 3.

Multiple Dependent Claims	
Fee ($)	**Fee Paid ($)**
_____	_____

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is $400 ($200 for small entity) ($100 for micro entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets	**Extra Sheets**	**Number of each additional 50 or fraction thereof**	**Fee ($)**	**Fee Paid ($)**
16 - 100 =	_____ / 50 =	_____ (round **up** to a whole number) x	_____ =	_____

4. OTHER FEE(S)

	Fees Paid ($)
Non-English specification, $130 fee (no small or micro entity discount)	_____
Non-electronic filing fee under 37 CFR 1.16(t) for a utility application, $400 fee ($200 small or micro entity)	_____
Other (e.g., late filing surcharge): _____	_____

SUBMITTED BY

Signature	/John Laurence/	Registration No. (Attorney/Agent) 63383	Telephone 9176121059
Name (Print/Type)	John Laurence		Date 2014-04-14

This collection of information is required by 37 CFR 1.136. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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Doc Code: MES.GIB
Document Description: Certification of Micro Entity Status (Gross Income Basis)

PTO/SB/15A (03-13)

CERTIFICATION OF MICRO ENTITY STATUS
(GROSS INCOME BASIS)

Application Number or Control Number (if applicable):	Patent Number (if applicable):
First Named Inventor: Tewari Paramahamsa	Title of Invention: Reduced Reaction Rotary Alternating Current Generator

The applicant hereby certifies the following—

(1) **SMALL ENTITY REQUIREMENT** - The applicant qualifies as a small entity as defined in 37 CFR 1.27.

(2) **APPLICATION FILING LIMIT** - Neither the applicant nor the inventor nor a joint inventor has been named as the inventor or a joint inventor on more than four previously filed U.S. patent applications, excluding provisional applications and international applications under the Patent Cooperation Treaty (PCT) for which the basic national fee under 37 CFR 1.492(a) was not paid, and also excluding patent applications for which the applicant has assigned all ownership rights or is obligated to assign all ownership rights as a result of the applicant's previous employment.

(3) **GROSS INCOME LIMIT ON APPLICANTS AND INVENTORS** - Neither the applicant nor the inventor nor a joint inventor, in the calendar year preceding the calendar year in which the applicable fee is being paid, had a gross income, as defined in section 61(a) of the Internal Revenue Code of 1986 (26 U.S.C. 61(a)), exceeding the "Maximum Qualifying Gross Income" reported on the USPTO website at http://www.uspto.gov/patents/law/micro_entity.jsp which is equal to three times the median household income for that preceding calendar year, as most recently reported by the Bureau of the Census.

(4) **GROSS INCOME LIMIT ON PARTIES WITH AN "OWNERSHIP INTEREST"** - Neither the applicant nor the inventor nor a joint inventor has assigned, granted, or conveyed, nor is under an obligation by contract or law to assign, grant, or convey, a license or other ownership interest in the application concerned to an entity that, in the calendar year preceding the calendar year in which the applicable fee is being paid, had a gross income, as defined in section 61(a) of the Internal Revenue Code of 1986, exceeding the "Maximum Qualifying Gross Income" reported on the USPTO website at http://www.uspto.gov/patents/law/micro_entity.jsp which is equal to three times the median household income for that preceding calendar year, as most recently reported by the Bureau of the Census.

SIGNATURE by a party set forth in 37 CFR 1.33(b)

Signature	/John Laurence/				
Name	John Laurence				
Date	2014-04-14	Telephone	9176121059	Registration No.	63383

☐ There is more than one inventor and I am one of the inventors who are jointly identified as the applicant. Additional certification form(s) signed by the other joint inventor(s) are included with this form.

REDUCED REACTION ROTARY ALTERNATING CURRENT GENERATOR

RELATED APPLICATION

[0001] This application claims the benefit of U.S. provisional patent application No. 61/960,752, filed September 26, 2013, in the name of Paramahamsa Tewari, the disclosure of which is incorporated herein by reference.

FIELD OF THE INVENTION

[0002] The present invention relates to a rotating alternating current generator whose structural characteristic provide for a reduction in the amount force running counter to the rotation of the machine as a reaction to the induced alternating current.

BACKGROUND OF THE INVENTION

[0003] Michael Faraday discovered the principles of electromagnetic induction and invented the rotating electrical generator in 1832. The generator was known as the Unipolar Generator, Acyclic Generator and Disk Generator. This generator operated on the principle that voltage is induced in a conductor in relative motion to an external magnetic field. Moreover, when the conductor is configured as a closed circuit and is in relative motion with an external magnetic field, a current will be induced to flow through that circuit. The induced current itself will generate an induced magnetic field surrounding the conductor. The direction of the induced current is determined by Fleming's right hand rule which states that the magnetic field produced by the current induced in the conductor will repel the external magnetic field which induced the current in the conductor. As such, the induced magnetic field surrounding the conductor and the external magnetic field repel each other so as to create a torque on the conductor which counters that conductor's movement relative to the external magnetic field. Faraday's generator and all subsequent generators have in common the production of this counter or back torque.

[0004] The efficiency of an electrical generator is governed by mechanical and electrical limitations. The mechanical limitations include windage and friction of the generator's rotor and bearings. The electrical limitations include electrical impedance within the windings of the generator as well as the above-described counter or back torque.

[0005] A prime mover is attached to a generator so as to cause the rotation of the generator's rotor resulting in the production of either a direct or an alternating current within the generator's conductor and a back torque which counters the rotation caused by the prime mover. The prime mover may be powered by steam, wind or water.

[0006] Therefore, the problem with standard generators is that their efficiency is limited due to back torque generated as a result of current induced within the generator's conductor windings.

DEFINITIONS

[0007] The following definitions are provided for convenience and are not to be taken as a limitation of the present invention.

[0008] Fleming's Left Hand Rule refers to the effect that when a current flows in a conductor and an external magnetic field is applied across that current flow, the conductor will experience a force perpendicular to both the external magnetic field and the direction of the current flow. The Left Hand Rule can be used to represent three mutually orthogonal axes using the thumb to represent a mechanical force, the first finger to represent a magnetic field and the middle finger to represent the current, each finger positioned at right angles to each other.

[0009] Synchronous generator refers to an electrical generator which turns at the same speed as the drive mechanism, also known as the synchronous speed. A synchronous generator produces an alternating current and voltage at a frequency proportional to the rotation speed and to the number of excitation poles internal to the generator.

[0010] Asynchronous generator refers to an alternating current generator that uses the principles of induction to produce power. Asynchronous generators operate by mechanically turning their rotor faster than the synchronous speed, giving negative slip.

[0011] Low carbon steel refers to steel containing less carbon than other steels. This steel is inherently easier to cold-form due to its soft and ductile nature.

[0012] Grain oriented electrical steel refers to sheet steel used for laminations in power transformers having a silicon level of 3% or less.

SUMMARY OF THE INVENTION

[0013] It is the primary purpose of the present invention to obviate the above problems by providing a reduced reaction rotating alternating current generator providing improvement in efficiency characteristics not currently available in standard alternating current generators.

[0014] To accomplish this objective, according to one embodiment of the present invention a reduced reaction alternating current generator is disclosed comprising a hollow stator core having an axis comprised of longitudinally positioned sheets laminated with a high permeability magnetic material, the laminated sheets including longitudinally embedded slots in which a conductor winding is laid parallel to the axis, a cylindrical rotor concentric with and positioned inside the hollow stator core comprised of a high permeability magnetic material and a shaft coupled to the rotor and driven by an external source so as to freely rotate the rotor relative to the hollow stator core. The generator furthermore comprising a first set of magnets in which the south pole of each magnet is coupled to the surface to the rotor and the north pole of each magnet is facing the inner surface of the hollow stator core, a second set of magnets in which the north pole of each magnet is coupled to the surface of the rotor and the south pole of each magnet is facing the inner surface of the hollow stator core and a set of silicon steel pieces coupled to the outer surface of the rotor comprised of individual silicon steel pieces positioned adjacent to and longitudinally in line with each individual magnet within the first set of magnets and each individual magnet within the second set of magnets.

[0015] In addition to the foregoing, other features, objects and advantages of the present invention will become apparent from the following description.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] The following detailed description, given by way of example and not intended to limit the present invention solely thereto, will best be appreciated in conjunction with the accompanying drawings in which:

[0017] Figure 1 depicts a longitudinal cross sectional view of a reduced reaction alternating current generator according to an exemplary embodiment of the present invention;

[0018] Figure 2 depicts an end cross sectional view of a reduced reaction alternating current generator according to an exemplary embodiment of the present invention;

[0019] Figure 3 depicts a center cross sectional view of a reduced reaction alternating current generator according to an exemplary embodiment of the present invention;

[0020] Figure 4 depicts a longitudinal cross sectional view of the flow of magnetic fields emanating from the first set of magnets within a reduced reaction generator according to an exemplary embodiment of the present invention;

[0021] Figures 5 and 6 depict the interaction between the magnetic flux originating from the north poles of the first set of magnets and the magnetic flux resulting from an induced current in the conductor winding according to an exemplary embodiment of the present invention;

[0022] Figure 7 depicts a longitudinal cross sectional view of the flow of magnetic fields emanating from the second set of magnets within a reduced reaction generator accordance to an exemplary embodiment of the present invention; and

[0023] Figures 8 and 9 depict the interaction between the magnetic flux originating from the south poles of the second set of magnets and the magnetic flux resulting from an induced current in the conductor winding according to an exemplary embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0024] The present invention relates to a reduced reaction rotating alternating current generator providing improvement in efficiency characteristics not currently available in standard alternating current generators.

[0025] Figure 1 depicts a longitudinal cross sectional view of a reduced reaction alternating current generator according to an exemplary embodiment of the present invention. As shown by Figure 1, the induction machine 100 comprises a shaft 101, a rotor 102, a stator 103, a first set of magnets 104, a second set of magnets 105 (not shown), a conductor winding 106 and silicon steel pieces 107.

[0026] The rotor 102 is a cylinder of high permeability magnetic material attached directly to the shaft 101 using any conventional known method that provides for a secure and permanent bonding under normal operating conditions. The rotor 102 is sized to be fully encompassed within the stator 103 while the shaft 101 is sized to extend beyond at least one end of the stator 103.

[0027] The shaft 101 is mounted within the stator 103 so as to allow the shaft 101 and the attached rotor 102 to rotate freely within the stator 103 when the shaft 101 is driven by an external drive source. The external drive source is coupled to one end of the shaft 101 that extends beyond the stator 103. The external drive source may be driven either at a variable speed or at a synchronous speed. As such the drive source may be an alternating current (AC) based source or a direct current (DC) based source. The drive source may also be a non-electric based drive source such as a hydro, wind or an internal combustion based source. The means of coupling the drive source to the shaft 101 will be dependent on the type drive source and any conventional know means appropriate to the drive source type may be implemented.

[0028] In an exemplary embodiment, the shaft is two 30 mm diameter 1018 steel, the rotor is 370 mm diameter 1018 steel and the stator has a 570 mm diameter.

[0029] Provisions are made on the cylindrical surface of the rotor 102 for the mounting of the first set magnets 104 and for the mounting of the second set of magnets 105 near each of the ends of the rotor 102. Provisions are also made for the mounting of the silicon steel pieces 107 on the rotor at positions near the center of the rotor.

[0030] The first set of magnets 104 and the second set of magnets 105 (not shown) are attached to the ends of the rotor 102 cylinder using any conventionally method known to provide for a secure and permanent bonding under normal operating conditions. Each end of the rotor 102 contains one of the first set of magnets 104 and one of the second set of magnets 105, for a total of four magnets. The first set of magnets 104 are oriented with their north poles facing the stator 103 and their south poles coupled to the rotor 102. The second set of magnets 105 (not shown) are oriented with their south poles facing the stator 103 and their north poles coupled to the rotor 102. The magnets may be permanent magnets or electromagnets.

[0031] In an exemplary embodiment, the permanent magnets are Neodymium magnets with a maximum energy product (BH_{max}) of 48 to 50 MGOe. Moreover, in another exemplary embodiment the electromagnets are radial pole and are attached to the rotor in a manner generally known in the industry.

[0032] The silicon steel pieces 107 are also attached to the rotor 102 using any conventionally method known to provide for a secure and permanent bonding under normal operating conditions. There is a single silicon steel piece 107 corresponding to each magnet of the first and second sets of magnets 104 attached to the rotor 102. Each silicon steel piece 107 is positioned in line with its corresponding magnet leaving a predefined distance 109 between silicon steel piece and its corresponding magnet. Each silicon steel piece 107 is comprised of silicon steel which is a specialty steel tailored to have a small magnetic hysteresis area and high magnetic permeability. A high magnetic permeability is defined as having a magnetic saturation level above 1.8 Teslas.

[0033] In an exemplary embodiment, the first and second sets of magnets 104, 105 and the silicon steel pieces 107 are each sized to have approximately the same surface area and the distance 109 between silicon steel piece and a corresponding magnet is no more than the length of the magnet in the axial plane.

[0034] The rotor 102 and the attached magnets 104, 105 and steel pieces 107 are each sized as to provide for an air-gap 108 of a predefined size between the outer surfaces of the attached magnets 104, 105 and silicon steel pieces 107 and the inner surface of the stator 103. The air gap is sized to provide for the free rotation of the rotor 102 and the attached first and

second sets of magnets 104, 105 within the stator 103 as well as the efficient flow of magnetic flux into and out of the stator 103 across the air-gap 108.

[0035] In an exemplary embodiment, the air-gap 108 is within a range of 3 mm to 10 mm.

[0036] The stator 103 is composed of longitudinally placed silicon steel laminates having grains oriented along the path of the magnetic flux that enters and exits the stator 103. The stator 103 also includes longitudinally oriented slots in which the conductor winding 106 is laid, the conductor winding 106 positioned such as to be cut through by the rotating magnetic flux originating from the first and second sets of magnets 104 attached to the rotating motor 102.

[0037] In an exemplary embodiment, the stator is comprised of a magnetically inert material, such as PVC piping, of suitable strength to support grain oriented steel lamination sheets.

[0038] In an exemplary embodiment, the magnetic flux emanating from the first and second magnets is approximately 10,000 Gauss.

[0039] Figure 2 depicts an end cross sectional view of a reduced reaction alternating current generator according to an exemplary embodiment of the present invention. As shown by Figure 2, the first set of magnets 104 with their north poles facing the stator 103 and their south poles coupled to the rotor 102 are positioned at opposing in-line positions on one end of the rotor 102.

[0040] Similarly, the second set of magnets 105 with their south poles facing the stator 103 and their north poles coupled to the rotor 102 are positioned at opposing in-line positions on the same end of the rotor 102 at a ninety degree offset from the first set of magnets 104. An identical first set of magnets 104 and second set of magnets 105 are coupled to the other end of the rotor 102 at similar positions.

[0041] Figure 3 depicts a center cross sectional view of a reduced reaction alternating current generator according to an exemplary embodiment of the present invention. As shown by Figure 3, a single silicon steel piece 107 is positioned longitudinally in line with each magnet of the first and second sets of magnets 104, 105 (not shown). The position of each silicon steel

piece 107 provides for a predefined distance 108 between a silicon steel piece 107 and its corresponding magnet.

[0042] In an exemplary embodiment, the distance between a silicon steel piece 107 and its corresponding magnet is equal to the longitudinal length of the magnet.

[0043] Referring again to Figure 1, an electromagnetic force (EMF) is created across the conductor winding 106 embedded within the stator 103 when the magnetic flux emanating from the first set of magnets 104 and from the second set of magnets 105 cut through the conductor winding 106 as the rotor 102 rotates. Looking in the direction of arrow C in Figure 1, with the rotor 102 turning in a clockwise direction and the magnetic flux emanating in a vertically upward direction from the north poles of the first set of magnets 104, the current generated as a result of the induced electromagnetic force will travel from left to right 110 within the conductor winding 106.

[0044] The current direction is as per Lenz's Law which states when an electric current is induced in a conductor, the direction of the induced current is such that its magnetic effect will oppose the action that gives rise to the induced current. As such, the direction of the induced current 110 results in a torque such as to oppose the clockwise rotation of the rotor 102. Specifically, looking in the direction of the arrow C in Figure 1, the interaction between the counter-clockwise magnetic field surrounding the conductor as a result of the induced electromagnetic force and the upward magnetic flux emanating from the north poles first pair of magnets 104 will create a counter-clockwise torque opposing the clockwise rotation of the rotor 102.

[0045] Figure 4 depicts a longitudinal cross sectional view of the flow of magnetic fields emanating from the first set of magnets within a reduced reaction generator according to an exemplary embodiment of the present invention. As shown by Figure 4, the magnetic flux 401 emanating from the north poles of the first set of magnets 104 travels vertically upward, across the air gap 108 and into the stator 103 as the magnetic flux 401 rotates with the rotor 102 relative to the stator 103. As this rotating magnetic flux 401 enters the static stator 103, it cuts sideways across the conductor winding 106 embedded within the stator 103 and induces a current within the conductor winding 106.

[0046] Within the stator 103, a portion of magnetic flux 402 is now trapped within the grain stampings within the stator 103 and flows longitudinally in an effort to return to a corresponding south pole of the first set of magnets 104. This portion of the magnetic flux 402 is now static relative to the stator 103 and the embedded conductor winding 106. As such, this portion of the magnetic flux 402 flows through and exits the stator 103 without any sideways movement relative to the embedded conductor winding 106 and therefore without inducing a current within the conductor winding 106.

[0047] Outside of the stator 103, a portion of the magnetic flux 403 crosses the air gap 108 and reaches the surface of a corresponding steel piece 107. The steel piece 107 focuses the magnetic flux 403 within the air gap 108 providing a more efficient and specifically designed path for the magnetic flux 403 to return to a corresponding first set of magnets 104. The magnetic flux 403 passes through the steel piece 107 and returns to a corresponding south pole of the first set of magnets 104 thereby closing the magnetic flux loop between north and south poles of each magnet of the first set of magnets 104.

[0048] Figures 5 and 6 depict the interaction between the magnetic flux originating from the north poles of the first set of magnets and the magnetic flux resulting from an induced current in the conductor winding according to an exemplary embodiment of the present invention. In both Figures 5 and 6, the current 110 induced in the conductor winding 106 by the clockwise rotation of the rotor 102 is shown coming out of the page. Moreover, in accordance with the application of the right hand rule, the magnetic flux 501 surrounding the conductor winding 106 as a result of the induced current 110 is shown as having a counter-clockwise rotation.

[0049] In Figure 5, the magnetic flux originating from the first set of magnets is shown traversing the air gap in an upward direction and interacting with the magnetic flux surrounding the conductor winding. As shown by Figure 5, the magnetic field 401 originating from the first set of magnets 104 is strengthened on the right side of the conductor winding 106 due to the superimposition of the magnetic field 501 induced in the conductor winding 106 in the same direction. However, the magnetic field 401 origination from the first set of magnets 104 is weakened on the left side of the conductor winding 106 due to the superimposition of the magnetic field 501 induced in the conductor winding 106 in the opposite direction. As a result of

this interaction, the net magnetic field in the air-gap 108 over the surfaces of the first set of magnets 104 results in the application of a counter-clockwise torque 502 to the rotor 102 which opposes the clockwise rotation of the rotor 102. This is in accordance with Lenz's Law and is confirmed by the right hand rule which shows that a conductor within an upward directed magnetic field and carrying a current in the induced direction (coming out of the page) will experience a counter-clockwise force.

[0050] In Figure 6, the portion of the magnetic flux that is routed back from the stator, downward across the air gap and through a silicon steel piece is shown interacting with the induced magnetic flux surrounding the conductor winding. As shown by Figure 6, the magnetic field 403 routed down through the silicon steel piece 107 is strengthened on the left side of the conductor winding 106 due to the superimposition of the magnetic field 501 induced in the conductor winding 106 in the same direction. However, the magnetic field 403 is weakened on the right side of the conductor winding 106 due to the superimposition of the magnetic field 501 induced in the conductor winding 106 in the opposite direction. As a result, on the surface of the silicon steel piece 107, the magnetic field 403 develops a gradient from left to right thus creating a clockwise torque 602 which supports the clockwise rotation of the rotor 102. This is in accordance with Lenz's Law and is confirmed by the right hand rule which shows that a conductor winding 106 within a downward directed magnetic field 403 and carrying a current 110 in the induced direction (coming out of the page) will experience a clockwise force.

[0051] Therefore, as a result of this configuration, the conductor winding 106 embedded within the stator 103 is cut at two places by each magnetic flux originating from the north pole of the first set of magnets 104. Specifically, a first time when the magnetic field 401 enters the stator 103 in an upward direction and a second time when the magnetic field 403 exits the stator 103 in a downward direction through a silicon steel piece 107. The net effect is that the clockwise torque generated by the magnetic field 403 rerouted through the silicon steel pieces 107 partially cancels the counter-clockwise torque generated by the magnetic field 401 originating from the north poles of the first set of magnets 104. This results in a partial nullification of the back torque reaction caused by the effect of Lenz's Law reaction and results in a corresponding increase in the efficiency of the machine because the external drive source has to supply less torque to overcome the reduced reaction of the machine.

[0052] Figure 7 depicts a longitudinal cross sectional view of the flow of magnetic fields emanating from the second set of magnets within a reduced reaction generator according to an exemplary embodiment of the present invention. As shown by Figure 7, the magnetic flux 701 flowing into the south pole of the second set of the magnets 105 travels vertically downward from within the stator 103 and across the air gap 108 as the magnetic flux 701 rotates with the rotor 102 relative to the stator 103. As this rotating magnetic flux 701 exits the static stator 103, it cuts sideways across the conductor winding 106 embedded within the stator 103 and induces a current within that conductor winding 106.

[0053] Within the stator 103, a portion of the magnetic flux 702 flows longitudinally along the grain stampings within the stator 103 from a position where the magnetic flux 702 enters the stator 103. This portion of the magnetic flux 702 is static relative to the stator 103 and to the conductor winding 106 embedded within the stator 103. As such, this portion of the magnetic flux 702 enters and flows through the stator 103 without any sideways movement relative to the embedded conductor winding 106 and, therefore, without inducing a current within the conductor winding 106.

[0054] Outside of the stator 103, a portion of the magnetic flux 703 flows from a north pole of the second set of magnets 105, through a corresponding silicon steel piece 107, upward across the air gap 108 and into the stator 103. The silicon steel piece 107 focuses the magnetic flux 703 within the air gap 108 providing a more efficient and specifically designed path for the magnetic flux 703 originating from a corresponding second set of magnets 105. The magnetic flux 703 exists the steel piece 107 and enters the stator 103 thereby closing the magnetic flux loop between the south and north poles of each magnet of the second set of magnets 105.

[0055] Figures 8 and 9 depict the interaction between the magnetic flux originating from the south poles of the second set of magnets and the magnetic flux resulting from an induced current in the conductor winding according to an exemplary embodiment of the present invention. In both Figures 8 and 9, the current 110 induced in the conductor winding 106 by the clockwise rotation of the rotor 102 is shown as going into the page. Moreover, in accordance with the application of the right hand rule, the magnetic flux 801 surrounding the conductor winding 106 as a result of the induced current 110 is shown as having a clockwise rotation.

[0056] In Figure 8, the magnetic flux originating from the second set of magnets is shown traversing the air gap in a downward direction and interacting the magnetic flux surrounding the conductor winding. As shown by Figure 8, the magnetic field 701 originating from the second set of magnets 105 is strengthened on the right side of the conductor winding 106 due to the superimposition of the magnetic field 801 induced in the conductor winding 106 in the same direction. However, the magnetic field 701 originating from the second set of magnets 105 is weakened on the left side of the conductor winding 106 due to the superimposition of the magnetic fields 801 induced in the conductor winding 106 in the opposite direction. As a result of this interaction, the net magnetic field in the air-gap over the surfaces of the second set of magnets 105 results in the application of a counter-clockwise torque 802 to the rotor 102 which opposes the clockwise rotation of the rotor 102. This is in accordance with Lenz's Law and is confirmed by the right hand rule which shows that a conductor within a downward directed magnetic field and carrying a current in the induced direction (going into the page) will experience a counter-clockwise force.

[0057] In Figure 9, the portion of the magnetic flux originally routed through the steel pieces 107, across the air gap 108 and into the stator is shown interacting with the induced magnetic flux surrounding the conductor winding. As shown by Figure 9, the magnetic field 703 routed upwardly through a steel piece 107 and across the air gap 108 is strengthened on the left side of the conductor winding 106 due to the superimposition of the magnetic field 801 induced in the conductor winding 106 in the same direction. However, the magnetic field 703 is weakened on the right side of the conductor winding 106 due to the superimposition of the magnetic field 801 induced in the conductor winding 106 in the opposite direction. As a result, on the surface of the silicon steel piece 107, the magnetic field 703 develops a gradient from left to right thus creating a clockwise torque 902 which supports the clockwise rotation of the rotor 102. This is in accordance with Lenz's law and is confirmed by the right hand rule which shows that a conductor winding 106 within an upward directed magnetic field 703 and carrying a current 110 in the induced direction (going into the page) will experience a clockwise force.

[0058] Therefore, as a result of this configuration and as described above for the first set of magnets, the conductor embedded within the stator is cut at two places by each magnetic field terminating at the south pole of the second set of magnets. Specifically, a first time when

the magnetic field 701 exits the stator 103 in a downward direction and a second time when the magnetic field 703 enters the stator 103 in an upward direction through a silicon steel piece 107. The net effect is that the clockwise torque generated by the magnetic field 703 rerouted through the silicon steel pieces 107 partially cancels the counter-clockwise torque generated by the magnetic field 701 terminating at the south pole of the second set of magnets 105. This results in a partial nullification of the back torque reaction caused by the effect of Lenz's Law reaction and results in a corresponding increase in the efficiency of the machine because the external drive source has to supply less torque to overcome the reduced reaction of the machine.

CLAIMS

What is claimed:

1. A reduced reaction alternating current generator, comprising:

a hollow stator core having an axis comprised of longitudinally positioned sheets laminated with a high permeability magnetic material, the laminated sheets including longitudinally embedded slots in which a conductor winding is laid parallel to the axis;

a cylindrical rotor concentric with and positioned inside the hollow stator core comprised of a high permeability magnetic material;

a shaft coupled to the rotor and driven by an external source so as to freely rotate the rotor relative to the hollow stator core;

a first set of magnets in which the south pole of each magnet is coupled to the surface to the rotor and the north pole of each magnet is facing the inner surface of the hollow stator core;

a second set of magnets in which the north pole of each magnet is coupled to the surface of the rotor and the south pole of each magnet is facing the inner surface of the hollow stator core; and

a set of silicon steel pieces coupled to the outer surface of the rotor comprised of individual silicon steel pieces positioned adjacent to and longitudinally in line with each individual magnet within the first set of magnets and each individual magnet within the second set of magnets.

2. The reduced reaction alternating current generator of claim 1, wherein each silicon steel piece is positioned relative to a corresponding magnet to create magnetic circuit through the silicon steel piece and the corresponding magnet such that the magnetic flux

emanating from each magnet is guided in one direction into the stator and then guided in an opposite direction out of the stator.

3. The reduced reaction alternating current generator of claim 1, wherein the silicon steel pieces are sized to have approximately the same surface area as the corresponding magnets.

4. The reduced reaction alternating current generator of claim 1, wherein the silicon steel pieces are positioned to provide for a gap between a silicon steel piece and a corresponding magnet, the gap being approximately equal to the longitudinal length of the corresponding magnet.

5. The reduced reaction alternating current generator of claim 1, wherein the first set of magnets and the second set of magnets are permanent magnets.

6. The reduced reaction alternating current generator of claim 5, wherein the permanent magnets can be Neodymium, Samarian Cobalt or Ceramic.

7. The reduced reaction alternating current generator of claim 1, wherein the first set of magnets and the second set of magnets are electromagnets.

8. The reduced reaction alternating current generator of claim 1, wherein the electromagnets are comprised of steel alloy having a high flux density of saturation.

9. The reduced reaction alternating current generator of claim 1, wherein the high permeability magnetic laminations which make up the stator are made from grain oriented electrical steel, the grains oriented as to facilitate the flow of magnetic flux between a magnet and a corresponding silicon steel piece.

ABSTRACT OF THE DISCLOSURE

[0059] A reduced reaction alternating current generator including a hollow stator core, a cylindrical rotor within the stator, a freely rotating shaft coupled to the rotor, a first set of magnets in which the south pole of each magnet is coupled to the surface to the rotor and the north pole of each magnet is facing the inner surface of the hollow stator core, a second set of magnets in which the north pole of each magnet is coupled to the surface of the rotor and the south pole of each magnet is facing the inner surface of the hollow stator core and a set of silicon steel pieces coupled to the outer surface of the rotor comprised of individual silicon steel pieces positioned adjacent to and longitudinally in line with each individual magnet within the first set of magnets and each individual magnet within the second set of magnets.

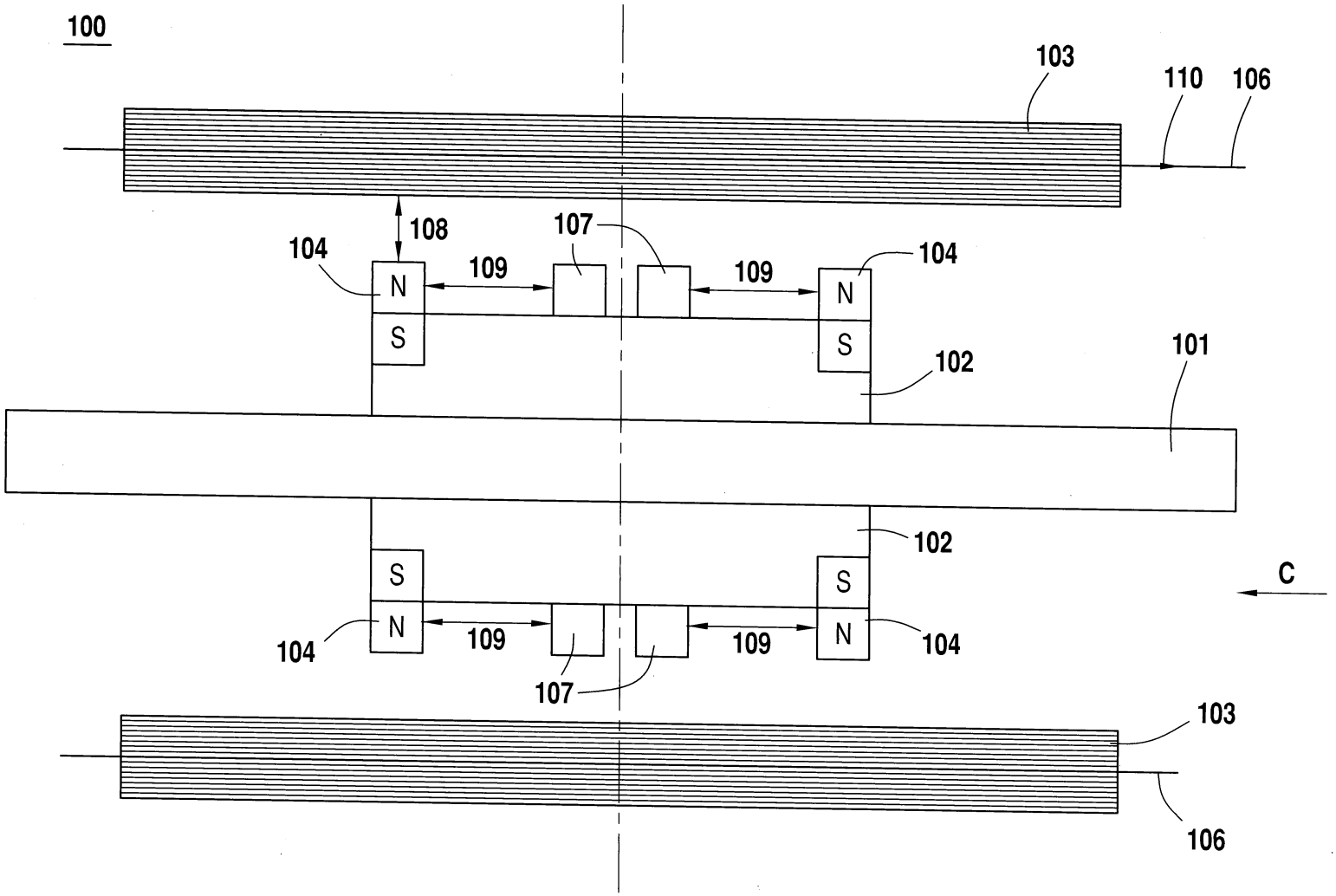
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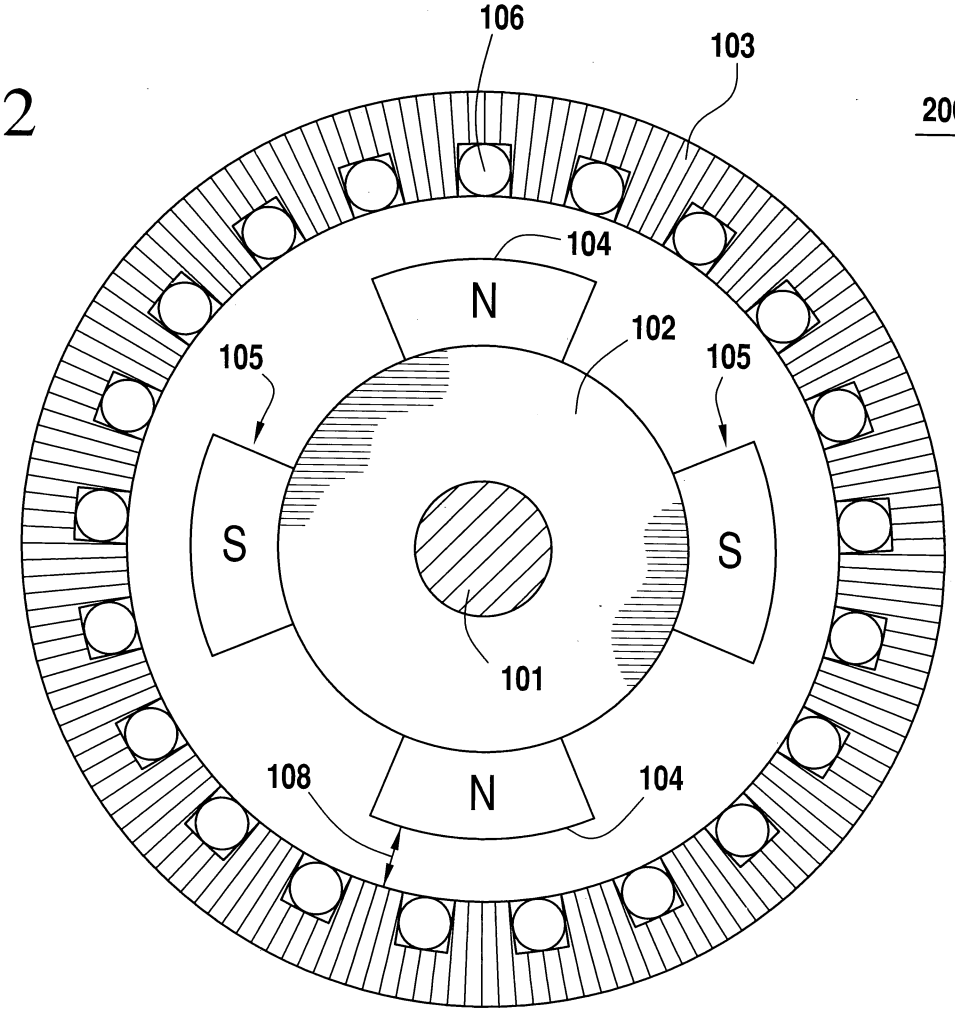
FIG. 1

FIG. 2



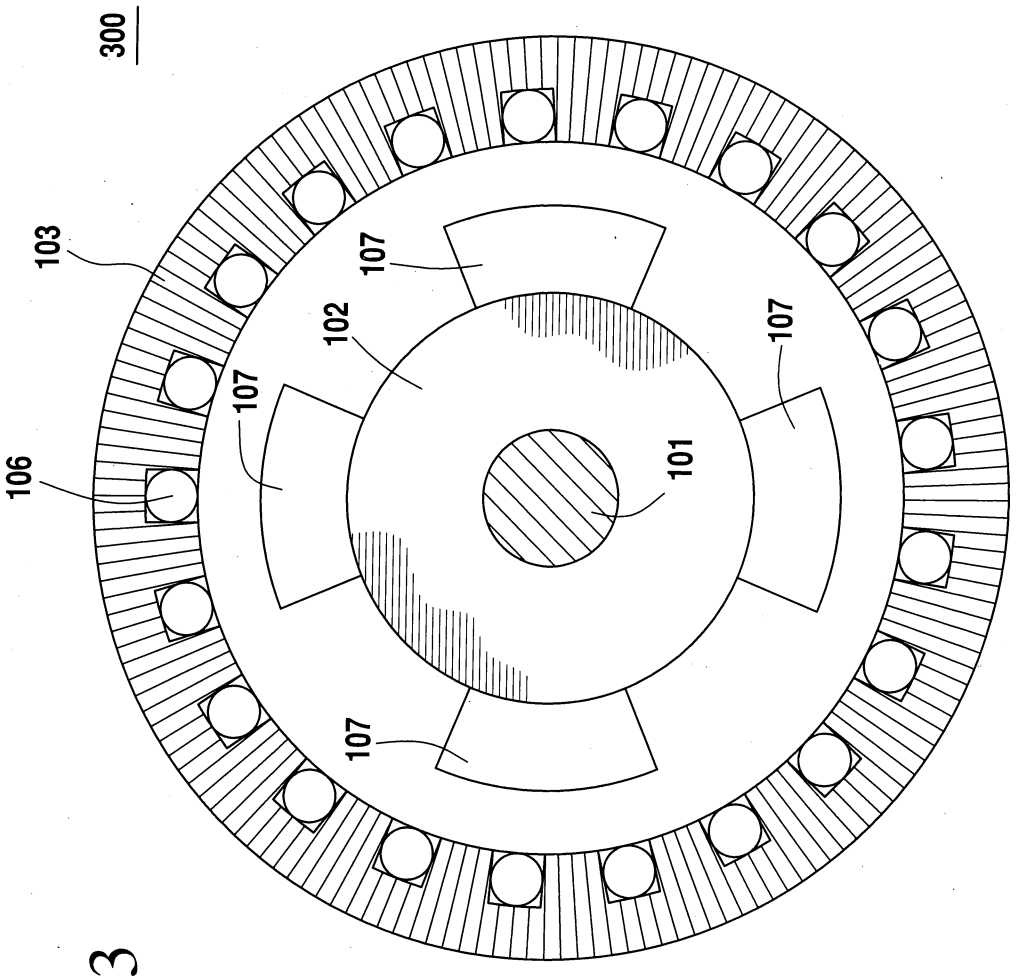


FIG. 3

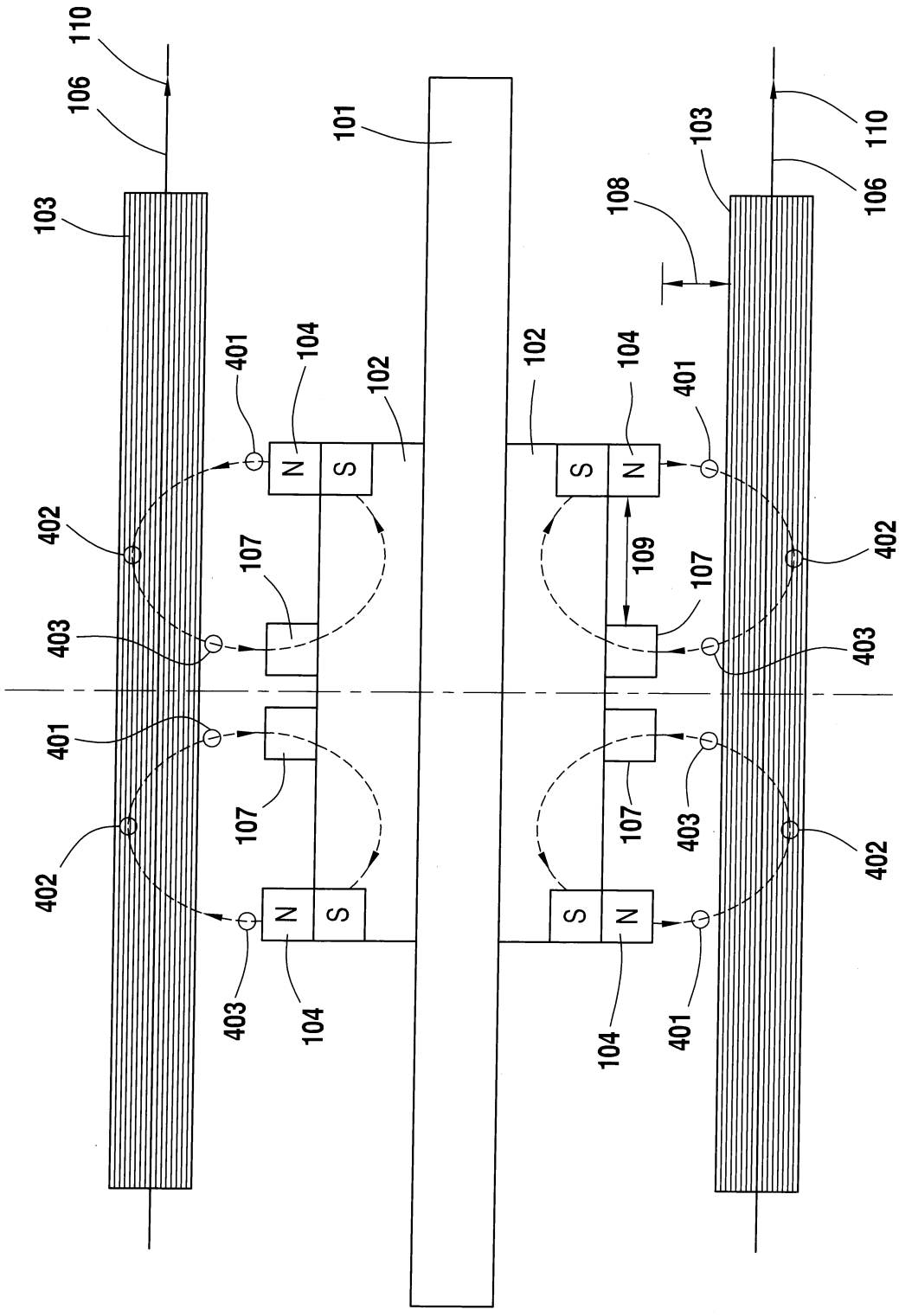


FIG. 4

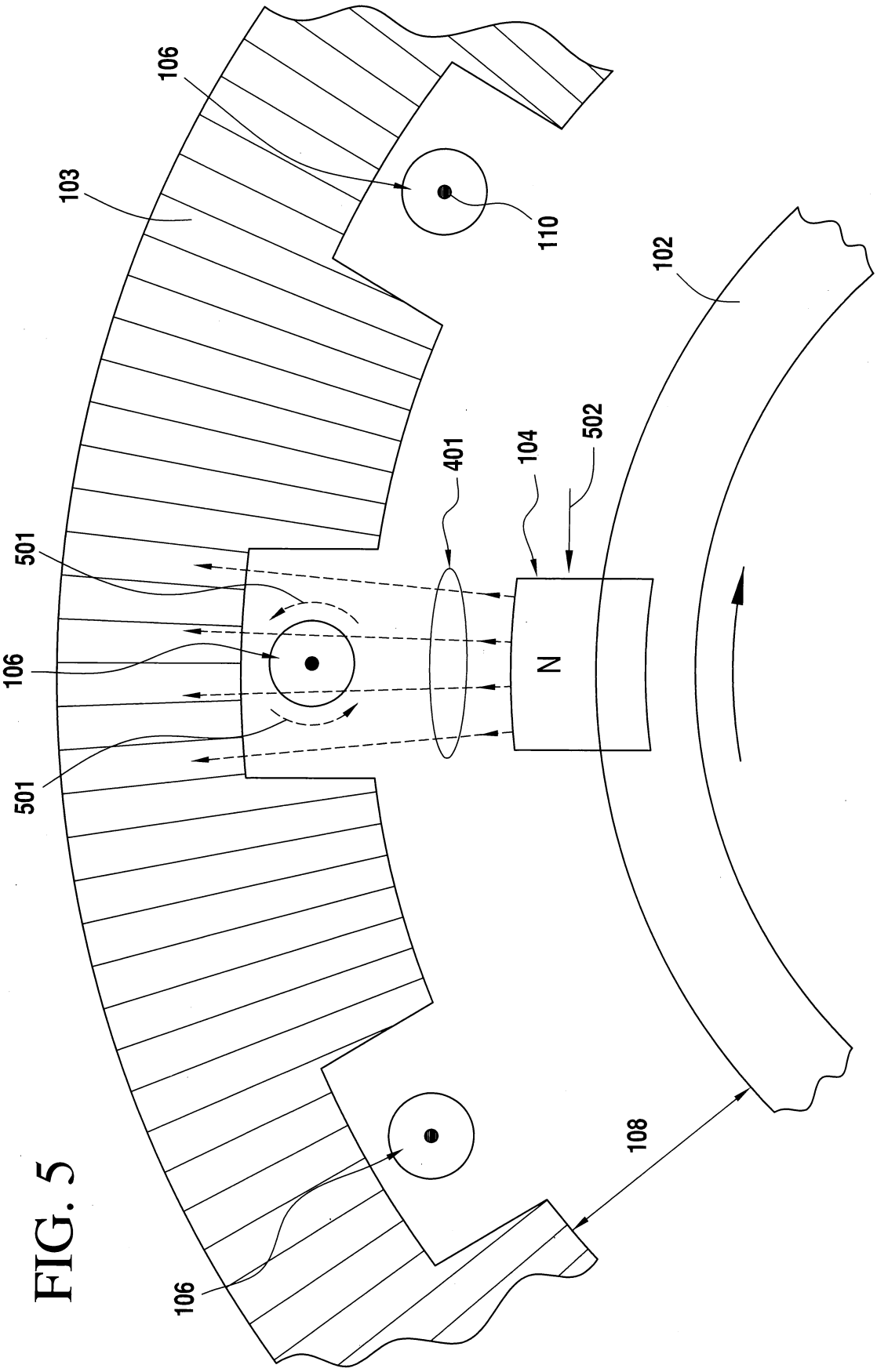


FIG. 5

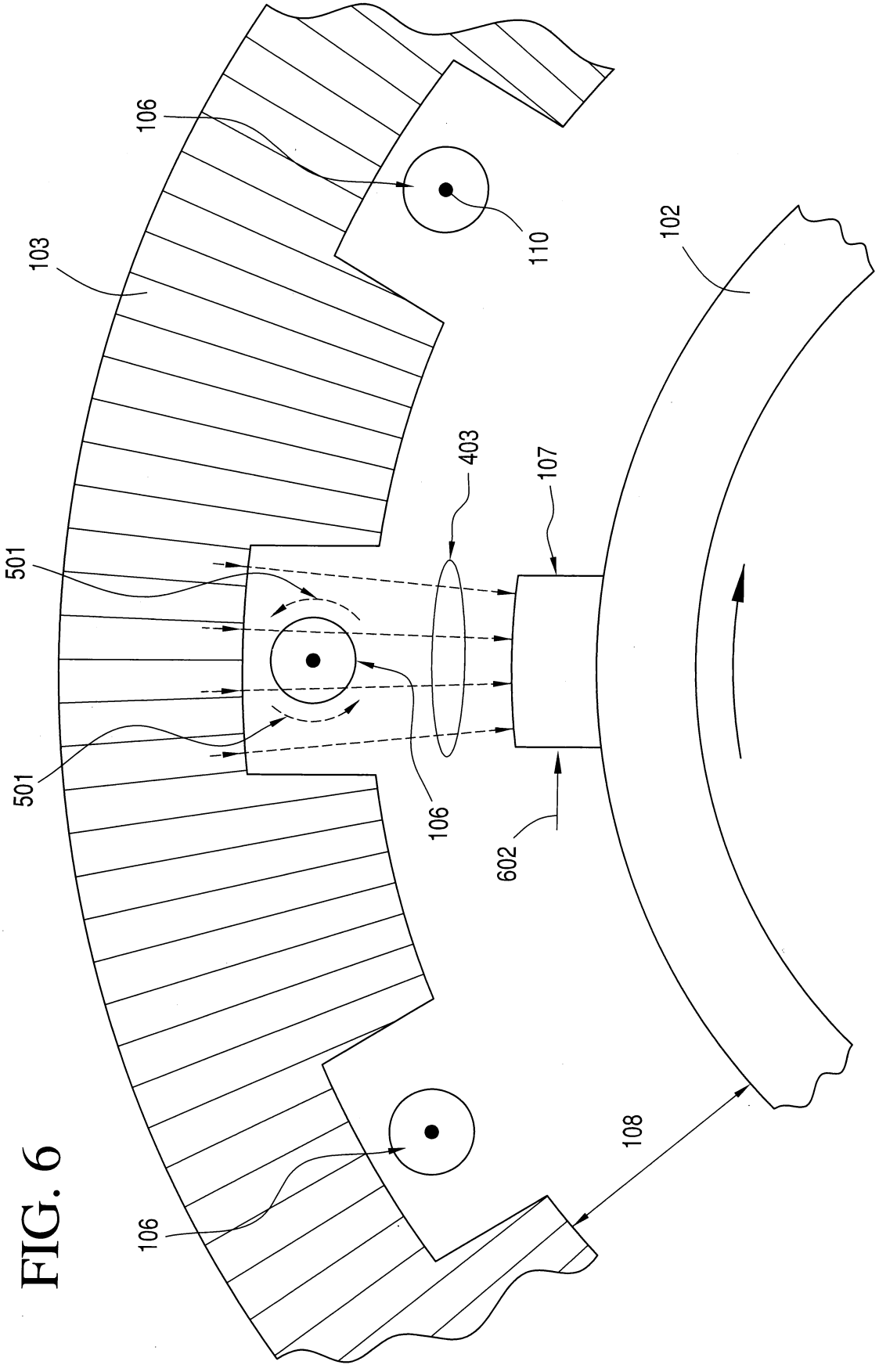


FIG. 6

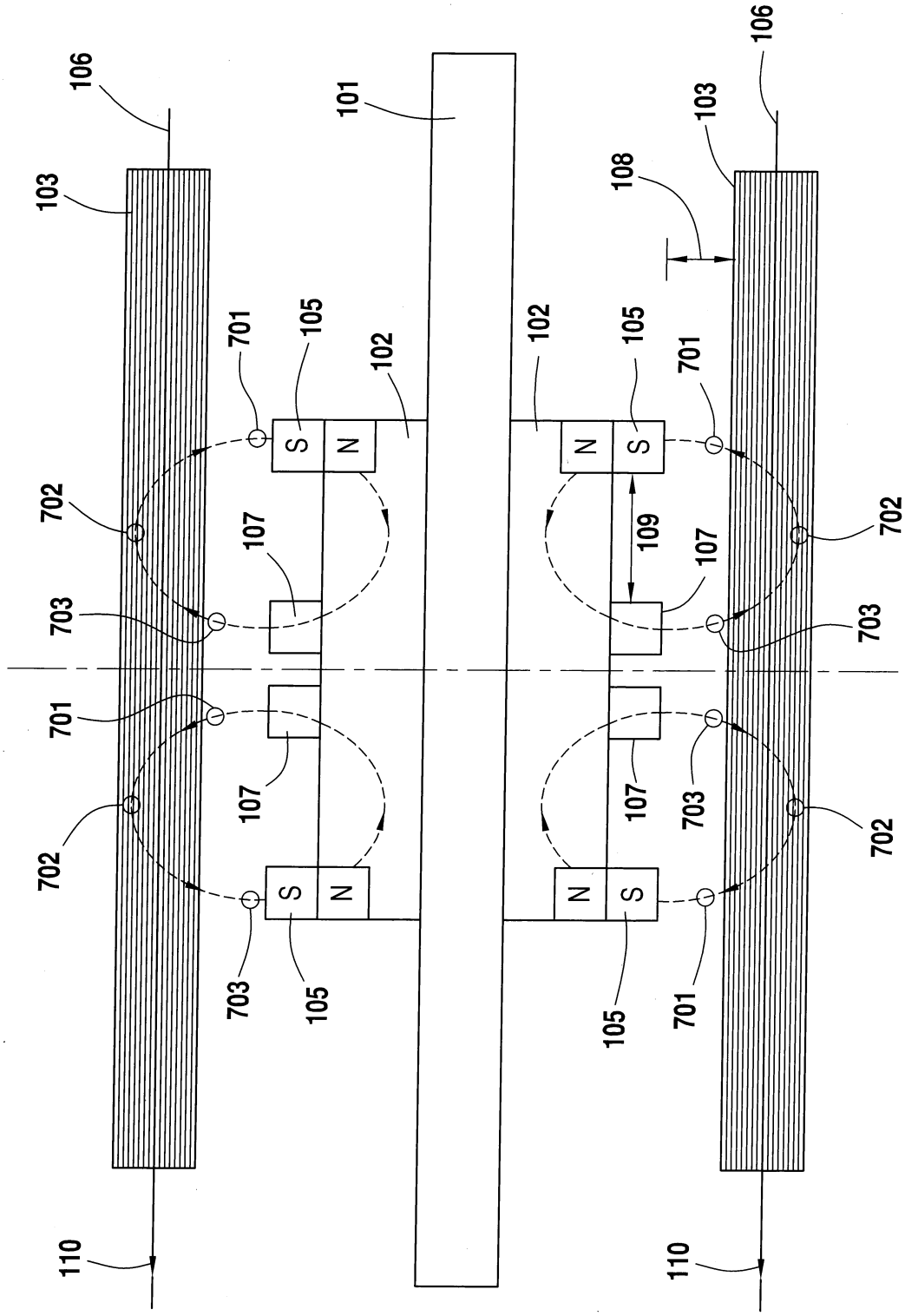

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FIG. 7

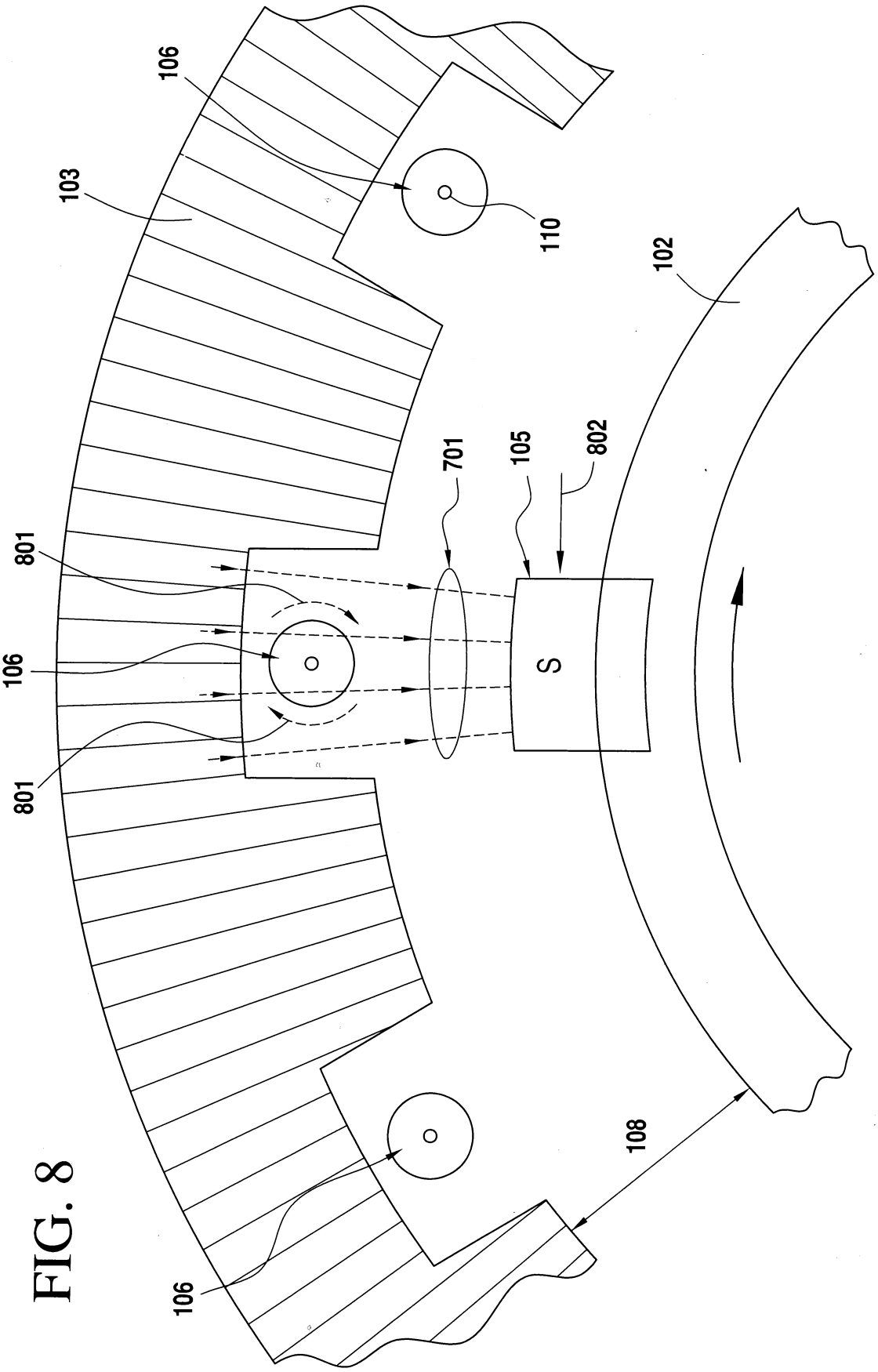

FIG. 8

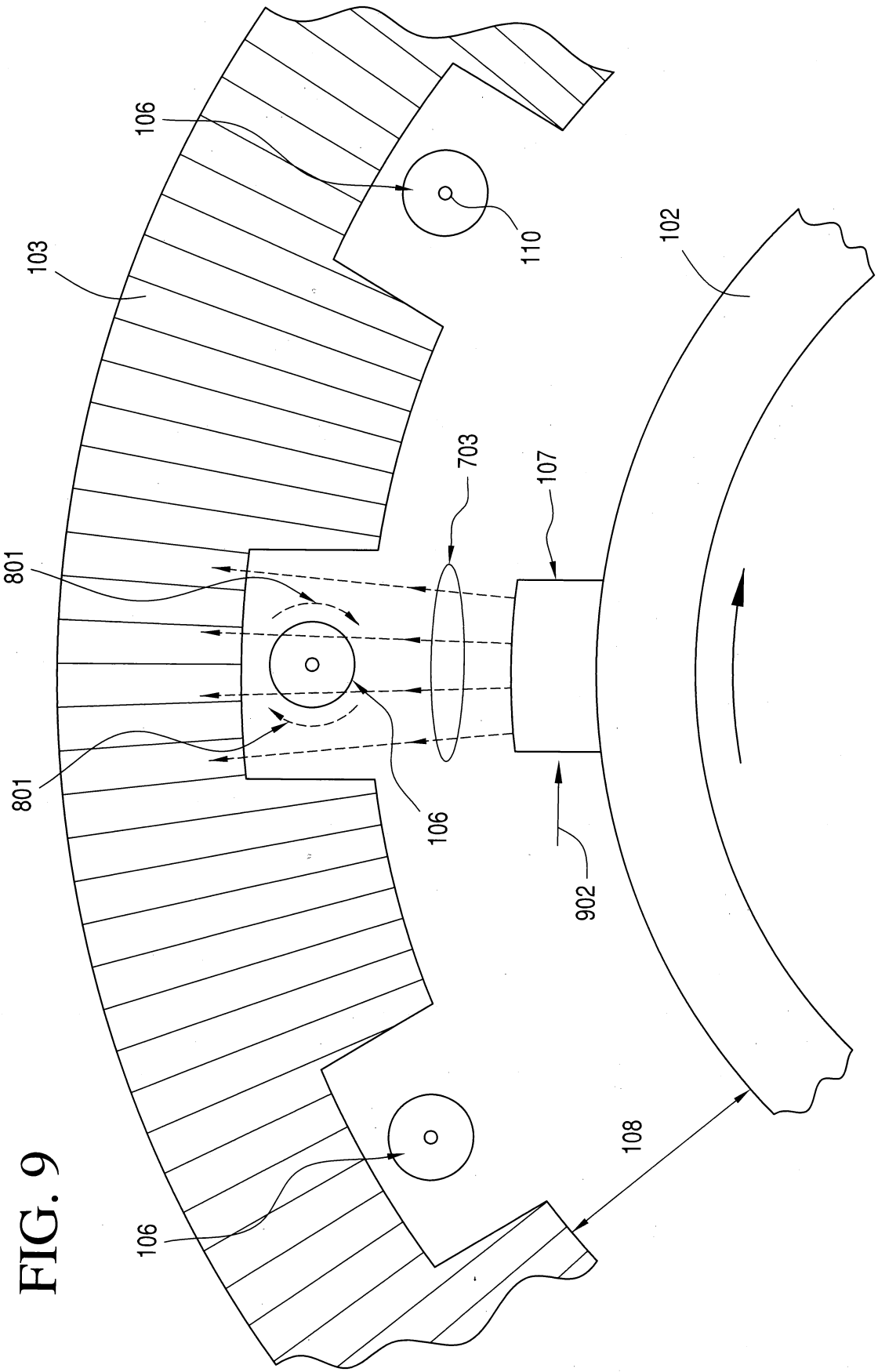

FIG. 9

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DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	Reduced Reaction Rotary Alternating Current Generator

As the below named inventor, I hereby declare that:

This declaration is directed to:

- [■] The attached application, or
- [ ] United States application or PCT international application number _____

  filed on _____.

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

LEGAL NAME OF INVENTOR

Inventor: Tewari Paramahamsa Date (Optional) : _____

Signature: _____

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

PTO/AIA/14 (12-13)
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	PAT AP-00723-203
	Application Number	
Title of Invention	Reduced Reaction Rotary Alternating Current Generator	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
Mr.	Tewari		Paramahamsa	

Residence Information (Select One) ○ US Residency ◉ Non US Residency ○ Active US Military Service

City	Gotegali	Country of Residence [i]	IN

Mailing Address of Inventor:

Address 1	Venodini Nivas		
Address 2	P.O. Gotegali - 581 317		
City	Karwar	**State/Province**	
Postal Code		**Country** [i]	IN

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	114215		
Email Address	john@wrsamuelslaw.com	Add Email	Remove Email

Application Information:

Title of the Invention	Reduced Reaction Rotary Alternating Current Generator		
Attorney Docket Number	PAT AP-00723-203	**Small Entity Status Claimed**	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	9	**Suggested Figure for Publication (if any)**	1

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	PAT AP-00723-203
	Application Number	
Title of Invention	Reduced Reaction Rotary Alternating Current Generator	

Filing By Reference :

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	◉ Customer Number	○ US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	114215		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.
When referring to the current application, please leave the application number blank.

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	Claims benefit of provisional	61/960752	2013-09-26

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button.

Foreign Priority Information:

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	PAT AP-00723-203
	Application Number	
Title of Invention	Reduced Reaction Rotary Alternating Current Generator	

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(d). When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)[i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(h)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Remove

Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Authorization to Permit Access:

☒ Authorization to Permit Access to the Instant Application by the Participating Offices

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	PAT AP-00723-203
	Application Number	
Title of Invention	Reduced Reaction Rotary Alternating Current Generator	

If checked, the undersigned hereby grants the USPTO authority to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the World Intellectual Property Office (WIPO), and any other intellectual property offices in which a foreign application claiming priority to the instant patent application is filed access to the instant patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO, KIPO, WIPO, or other intellectual property office in which a foreign application claiming priority to the instant patent application is filed to have access to the instant patent application.

In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the instant patent application with respect to: 1) the instant patent application-as-filed; 2) any foreign application to which the instant patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the instant patent application; and 3) any U.S. application-as-filed from which benefit is sought in the instant patent application.

In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date o f filing this Authorization.

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

◯ Assignee	◯ Legal Representative under 35 U.S.C. 117	◯ Joint Inventor
◯ Person to whom the inventor is obligated to assign.	◯ Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor :

If the Applicant is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	PAT AP-00723-203
	Application Number	
Title of Invention	Reduced Reaction Rotary Alternating Current Generator	

Mailing Address Information For Applicant:			
Address 1			
Address 2			
City		**State/Province**	
Country		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button.

Assignee Information including Non-Applicant Assignee Information:

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Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication . An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

If the Assignee or Non-Applicant Assignee is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information For Assignee including Non-Applicant Assignee:			
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Address 2			
City		**State/Province**	
Country		Postal Code	
Phone Number		Fax Number	
Email Address			

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	PAT AP-00723-203
	Application Number	
Title of Invention	Reduced Reaction Rotary Alternating Current Generator	

Signature:

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Signature	/John Laurence/			Date (YYYY-MM-DD)	2014-04-14
First Name	John	Last Name	Laurence	Registration Number	63383

Additional Signature may be generated within this form by selecting the Add button.

Doc Code: PA..
Document Description: Power of Attorney

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NOTE: This form is to be submitted with the Power of Attorney by Applicant form (PTO/AIA/82B) to identify the application to which the Power of Attorney is directed, in accordance with 37 CFR 1.5, unless the application number and filing date are identified in the Power of Attorney by Applicant form. If neither form PTO/AIA/82A nor form PTO/AIA82B identifies the application to which the Power of Attorney is directed, the Power of Attorney will not be recognized in the application.

Application Number	
Filing Date	2014-04-14
First Named Inventor	Tewari Paramahamsa
Title	Reduced Reaction Rotary Alternating Current Generator
Art Unit	
Examiner Name	
Attorney Docket Number	

SIGNATURE of Applicant or Patent Practitioner

Signature		Date (Optional)	
Name	Tewari Paramahamsa	Registration Number	
Title (if Applicant is a juristic entity)			
Applicant Name (if Applicant is a juristic entity)			

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. If more than one applicant, use multiple forms.

☐ *Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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Doc Code: PA..
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POWER OF ATTORNEY BY APPLICANT

I hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

Application Number	Filing Date
	2014-04-14

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OR

☐ I hereby appoint Practitioner(s) named in the attached list (form PTO/AIA/82C) as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the patent application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above. (Note: Complete form PTO/AIA/82C.)

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☑ The address associated with the above-mentioned Customer Number

OR

☐ The address associated with Customer Number:

OR

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Address					
City		State		Zip	
Country					
Telephone		Email			

I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

☑ Inventor or Joint Inventor (title not required below)

☐ Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)

☐ Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)

☐ Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature	/Tewari Paramahamsa/	Date (Optional)	
Name	Tewari Paramahamsa		
Title			

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.

☐ Total of forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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