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To
The controller of patents,
The patent office,
At Mumbai

APPLICATION FOR PATENT ALONG WITH COMPLETE SPECIFICATION

APPLICANT(S)

Name	Nationality	Address
Ingole Vijay Tulshiram	Indian	104 Ganediwal layout, camp, Amravati-444602
Ingole Ashutosh Vijay	Indian	104 Ganediwal layout, camp, Amravati-444602
Ingole Paritosh Vijay	Indian	104 Ganediwal layout, camp, Amravati-444602

Documents attached with the application:-

Number of Pages

Form 1	3
Form 2	
Form 3	1
Form 26	1

TOTAL pages

Fee paid along with the application:-

1. Form 1 Rupees 1000(one thousand only)

TOTAL AMOUNT RUPEES 1000(ONE THOUSAND ONLY)
Mode of payment in Cash/Cheque/bank draft bearing no

FORM 1THE PATENT ACT 1970
(39 OF 1970)

And

The patent rules, 2003

(FOR OFFICE USE ONLY)

Application number:

Filing date:

amount of fee paid:

CBR NO:

APPLICATION FOR GRANT OF PATENT

[See sec 7, 54, 135 and rule 20 (1)]

1 APPLICANT(S)

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Ingole Ashutosh Vijay	Indian	104 Ganediwal layout, camp, Amravati-444602
Ingole Paritosh Vijay	Indian	104 Ganediwal layout, camp, Amravati-444602

2 Inventor(s)

Name	Nationality	Address
Ingole Vijay Tulshiram	Indian	104 Ganediwal layout, camp, Amravati-444602
Ingole Ashutosh Vijay	Indian	104 Ganediwal layout, camp, Amravati-444602
Ingole Paritosh Vijay	Indian	104 Ganediwal layout, camp, Amravati-444602

2. TITLE OF INVENTION

Windmill Power Generation Device

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5. DECLARATION:

(i) Declaration by the inventors

We the above named inventors are the true and first inventors for this invention

Dated this 15th day August 2011

Signature of the inventors

Name: (1) Ingole Vijay Tulshiram

(2) Ingole Ashutosh Vijay

(3) Ingole Paritosh Vijay

(ii) Declaration by the applicants

We the applicants hereby declare that:-

We are in possession of above mentioned invention.

The complete specification relating to the invention is filed with the application

There is no lawful ground of objection to the grant of patent to us.

Signature of the applicants

Name: (1) Ingole Vijay Tulshiram

(2) Ingole Ashutosh Vijay

(3) Ingole Paritosh Vijay

6. FOLLOWING ARE THE ATTACHMENTS WITH THE APPLICATION

- (a) Complete specification in duplicate
- (b) Drawings in duplicate
- (c) Statement and undertaking on form 3 in duplicate
- (d) Abstract in duplicate
- (e) Form number 26 Power of authorization to patent agent.
- (f) Form number 9.
- (g) Form number 18.

Fee Rs in Cash/Cheque/bank draft bearing no

Date on Bank.

We hereby declare that to the best of our knowledge, information and belief the facts and the matter stated herein are correct and we request that the patent may be granted to us for the said invention.

Dated this 4th day August 2011

Signature:

Name : (1) Ingole Vijay Tulshiram

(2) Ingole Ashutosh Vijay

(3) Ingole Paritosh Vijay

FORM 2

THE PATENT ACT 1970
(39 OF 1970)
AND
The patent rules, 2003

COMPLETE SPECIFICATION
(See section 10: rule 13)

1. TITLE OF INVENTION

Windmill Power Generation Device

2 APPLICANTS(S)

Name	Nationality	Address
Ingole Vijay Tulshiram	Indian	104 Ganediwal layout, camp, Amravati-444602
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3. PREAMBLE TO THE DESCRIPTION

COMPLETE

Following specification particularly describes the invention and the manner in which it is to be performed.

4. DESCRIPTION.

Technical field of invention:

The present invention relates to windmill power generation device, particularly it relates to horizontal axis windmill with rudder and rotatably mounted on the vertical axis wherein the generator, gear box being fixed to stationery strut structure or tower or foundation.

Prior art:

One of the non-conventional energy sources operates by harnessing wind energy by using wind velocity operated impeller to minimize green gas effect and to decrease the consumption of exhausting fossil fuel. Conversion of wind energy in to mechanical or electrical energy has been widely used since the plant equipment for such conversion is relatively low and durable however; the associated generator and gear box also rotate with the impeller with respect to a steady strut during the shift in wind direction daily and/or seasonally which being a serious disadvantage of the present windmills.

The windmill electric power generation plant comprises an electric generator coupled to the rotating windmill impeller means blade assembly directly or through gear box, wherein the blades means impeller may be installed on horizontal axis or vertical axis windmill. The horizontal axis windmill has to change its axis in the direction of wind to optimize the energy conversion which is accomplished by a rudder or other sophisticated position control system whereas the vertical axis windmill operation is not affected by the shift in wind direction. Despite the said advantage of vertical axis windmill it suffers from a difficulty in self starting, poor efficiency, complex assembly and cost as compared to horizontal axis windmill hence horizontal axis windmill are popular in said applications.

A conventional horizontal axis windmill electric power generation plant comprises an electric generator coupled to the rotating windmill impeller through a gear box and the generator power is carried by power cables and mounted on a rotary structure thus forming a rotary assembly. The wind energy rotates the spinning mass having angular momentum on the rotary assembly comprising impeller, gears and generator rotor. While the direction of wind shifts the said assembly turned means rotated by the rudder to get aligned with the new wind direction however; during the said turning the said angular momentum offers gyration forces opposing the said rotation results in to poor time response of the rotating assembly which is not

desirable means the angular momentum of the said rotary assembly should be as low as possible. Further one end of the power cables being fixed to the rotary assembly and other end being laid on stationary strut due to which the power cables are subjected fatigue and if rotation of rotary assembly exceeds one orbit then the cables are likely to get entangled thus limiting the operation of the said windmill. The maintenance of the gear box and generator being fixed to the rotary assembly their maintenance becomes hard.

Problems to be solved:

- Therefore there is a need of a simple solution to the existing windmill
1. to enhance the limit of rotation of windmill more than one orbit means rotation so that the windmill rotating on vertical axis while windmill rotating on horizontal axis and can have as many revolutions as the situation may demand due to shift in wind direction,
 2. to prevent the rotation of generator, power cables and gear box while the blade assembly of windmill rotates to eliminate the entanglement of power cable and to avoid their breakage due to fatigue,
 3. to minimize the inertia of the rotating blade assembly by installing the generator and main gear box (optional) on stationery grounded foundation,
 4. to have easy installation maintenance of generator and gearbox (optional).
 5. to provide increase in speed by means of crown means bevel gear and pinion means another bevel gear assembly being connected to generator thereby reducing the weight and size of generator.
 6. to minimize the magnitude of angular momentum so the gyration forces of the rotating mass on the rotary structure to improve the time response of the windmill during the shift in wind direction.

These and other advantages will be more readily understood by referring to the following detailed description for a novel windmill power generation device disclosed hereinafter with reference to the accompanying drawings and which are generally applicable to other windmill applications to fulfill particular application illustrated hereinafter.

Object:

Primary object of this novel invention is to incorporate a solution to enhance the limit of bidirectional rotation of windmill more than one orbit means rotations

due to shift in wind direction and can have as many orbits as the situation may demand and to mount generator, power cables and gear box on a stationery strut means foundation to eliminate the entanglement of power cable and further to prevent subsequent break down due to fatigue and to minimize the angular momentum of the rotary component having mounted only rotating impeller whereas generator and gear box are mounted on stationary strut thereby reducing the angular momentum and further having easy installation, maintenance thereof and by using suitable crown gear and pinion bevel gear having higher speed ratio combination thereby reducing weight and size of generator offered in a novel embodiment of the present invention.

Further objects and features can be readily understood by any person skilled in the art by referring to the detail description and appended claims of the invention.

STATEMENT:

Following specifications provide the general description of novel embodiment of the present invention comprising a windmill having blades means impeller fixed on a horizontal mill-shaft and while facing the wind direction rotate the said mill-shaft and the said mill-shaft is rotably mounted on antifriction bearings located in bearing housings provided on a rotary component and a crown gear means a bevel gear means a spiral bevel gear is mounted concentrically on the said mill-shaft and an engaging a pinion gear means bevel gear preferably smaller in size means having fewer gear teeth than the said crown gear and is further fixed to another pinion-shaft preferably at right angle to the said mill-shaft and so as to mechanically engage with the said crown gear means when the crown gear rotates through certain revolutions on horizontal shaft the said pinion gear with the said pinion-shaft rotates preferably at higher revolutions at right angle and the said pinion-shaft is rotably mounted on antifriction bearing located in the bearing housings provided on the rotary component and the said rotary component is rotably mounted concentrically with respect to the said pinion shaft on antifriction bearings in the bearing housings provided on a stationary component and the said stationary component is further rigidly fixed to a strut or a tower supporting the said windmill and further the said pinion shaft extension coupled through a gear box to the generator and the said gear box and generator further mounted means fixed means grouted on the stationery strut means the angular momentum on the rotary

component comprises only of windmill impeller and when the windmill blade means impeller rotates the mill-shaft the said crown gear rotates which further rotates the engaged pinion at preferably at higher revolutions depending on their gear ratio and when the wind direction shifts the rudder or similar mechanism turns and aligns the said impeller and the said rotary component to the wind direction and in doing so it rotates concentrically with the geometrical axis of said pinion shaft thus irrespective of the angular position of the rotary component the vertical geometrical axis of the said pinion shaft always remains unchanged means remains always coaxial with the rigidly mounted gear box and generator on the strut and so the power cables remains secured and thus windmill power obtained from a generator and power cables which are not rotating with the windmill however; a dead weight counter balancing the impeller may be attached to the rotating component to opposite side of impeller.

The above and other objects, apparent from the drawings, and following description, may be attained, the above described difficulties overcome, and the advantages and results obtained, by the embodiments, construction, arrangement and combinations, subcombinations and parts which comprise the present invention of windmill power generation device, a preferred embodiment of which, illustrated of the best mode in which the applicants have contemplated applying the principle, being set fourth in details in the following description and illustrated in the accompanying drawings and which are generally applicable to other windmill to fulfill particular application illustrated hereinafter.

BRIEF DESCRIPTION OF DRAWING:

The invention is described by way of example with reference to the accompanying drawings

Sheet 1/2:

Figure-1 is a sectional view of through A-AA of the windmill power generation device embodying the invention;

Figure-2 is a sectional top view of the same components through C-CC and showing section lines A-AA and B-BB for the purpose of illustration.

Sheet 2/2

Figure-3 is a sectional side view of through B-BB of the same components embodying the invention;

Referring now more particularly to the embodiment of the invention illustrated in which similar reference character refers to similar components throughout as the machine being symmetrical and further the illustrations does not

show lubricating system, mechanical hardware, gear box, generator mounting arrangements, electrical installation, switch-gear and other all being conventional.

In order that the manner in which the above-cited and other advantages and objects of the invention are obtained, a more particular description of the invention briefly described above will be rendered by reference to specific embodiments thereof which are illustrated in the appended drawings. Understanding that these drawings depict only typical embodiments of the invention and therefore not to be considered limiting on its scope, the invention will be described with additional specificity and details through the use of the accompanying drawings.

Detailed description:

Sheet 1/2 and Sheet 2/2 comprises Figure-1, Figure-2 and Figure-3 showing the sections of the embodiment of present invention. The blade means impeller 102 is mounted on an impeller hub 101 which is concentrically mounted on mill-shaft 105 and the said shaft 105 is rotatably mounted on antifriction bearings 104 located in bearing housing provided on both sides of rotary component 103 and opposite side of impeller 102 a rudder 121 is preferably mounted to align the impeller 102 in the direction of wind velocity. A crown gear means bevel gear means spiral gear 106 facing and engaging a fitting pinion gear 107 and concentrically mounted on shaft 105 whereas the geometrical axis of said pinion gear 107 is placed at right angle to the geometrical axis of shaft 105. The said pinion gear 107 is rotatably mounted on antifriction bearings 108 and 112 located in the bearing housing provided in the said rotary component 103. The said rotary component 103 rotatably mounted on stationary component 111 aligned to geometrical centre 125 which also being the geometrical centre of said pinion gear 107, and the said rotary component 103 is rotatably mounted on antifriction bearings 109, 113 on a stationary component 111 so that when the rotary component 103 rotates in either direction as shown by the arrows 122 in the said stationary component 111 the pinion gear shaft 110 always remains concentric with the said stationary component 111. To said concentric pinion shaft 110 a generator 120 associated power cables (not shown) is coupled by suitable means through a gear box and mounted on the stationary component 111 at 119. When the wind rotates the said blade means impeller 102 the wind power is transferred to generator 120 through generator shaft 124 it starts generating power wherein the speed of the generator is preferably higher than the speed of the impeller

102 for obvious reasons. The said stationary component 111 further fixed to the strut 118 grouted to ground.

In the ongoing description, certain terms have been used for brevity, clearness and understanding, but no unnecessary limitations are to be implied therefrom beyond the requirement of prior art, because such words are used for descriptive purposes herein and are intended to be broadly construed.

Moreover, the embodiments of the improved construction illustrated and described herein are by way of example, and the scope of the present invention is not limited to the exact details of construction.

Having now described the invention the construction, the operation, and use of preferred embodiments thereof, and the advantageous new and useful results obtained thereby; the new and useful construction and reasonable mechanical equivalents thereof obvious to those skilled in the art, are set fourth in the appended claims.

CLAIMS

We claim:-

1. A windmill power generation device comprising a novel embodiment of the present invention comprising a windmill having blades means impeller fixed on a horizontal mill-shaft and while facing the wind direction rotate the said mill-shaft and the said mill-shaft is rotably mounted on antifriction bearings located in bearing housings provided on a rotary component and a crown gear means a bevel gear means a spiral bevel gear is mounted concentrically on the said mill-shaft and an engaging a pinion gear means bevel gear preferably smaller in size means having fewer gear teeth than the said crown gear and is further fixed to another pinion-shaft preferably at right angle to the said mill-shaft and so as to mechanically engage with the said crown gear means when the crown gear rotates through certain revolutions on horizontal shaft the said pinion gear with the said pinion-shaft rotates preferably at higher revolutions at right angle and the said pinion-shaft is rotatably mounted on antifriction bearing located in the bearing housings provided on the rotary component and the said rotary component is rotably mounted concentrically with respect to the said pinion shaft on antifriction bearings in the bearing housings provided on a stationary component and the said stationary component is further rigidly fixed to a strut or a tower supporting the said windmill and further the said pinion shaft extension coupled through a gear box to the generator and the said gear box and generator further mounted means fixed means grouted on the stationery strut means the angular momentum on the rotary component comprises only of windmill impeller and when the windmill blade means impeller rotates the mill-shaft the said crown gear rotates which further rotates the engaged pinion at preferably at higher revolutions depending on their gear ratio and when the wind direction shifts the rudder or similar mechanism turns and aligns the said impeller and the said rotary component to the wind direction and in doing so it rotates concentrically with the geometrical axis of said pinion shaft thus irrespective of the angular position of the rotary component the vertical geometrical axis of the said pinion shaft always remains unchanged means remains always coaxial with the rigidly mounted gear box and generator on the strut and so the power cables remains secured and thus windmill power obtained from a generator and power cables which are not rotating with the windmill however; a dead weight counter balancing the impeller may be attached to the rotating component to opposite side of impeller.

2 the preferred embodiments of the device as claimed in claim 1 comprising:

- a. a rotary component means part having bearing housing and antifriction bearings and one side a rudder mounted and said component having provision for rotatably mounting on other stationary component and further having bearing housings and antifriction bearings for rotatably mounting a bevel pinion gear;
 - b. a mill-shaft means a preferably horizontally oriented shaft journaling in the said bearings of said rotary component and one end of the said shaft blade means impeller of the said windmill fixed and preferably a counter balancing dead weight fixed to opposite side to maintain centre of gravity and further a provision for locating and fixing of a crown gear means bevel gear means a spiral bevel gear;
 - c. a crown gear means bevel gear means a spiral bevel gear having certain pitch and number of teeth concentrically mounted and fixed to the said mill-shaft;
 - d. a pinion bevel gear means a pinion spiral bevel gear having same pitch and preferably lesser number of teeth than that of said crown gear and concentrically mounted and fixed to a pinion shaft being preferably at right angle to the said mill-shaft and rotatably and concentrically mounted for journaling in the said bearings of the said rotary component means part;
 - e. a stationary component means stationary part having bearing housing and antifriction bearings on certain geometrical axis wherein the said rotary component means part is concentrically and rotatably mounted with the said pinion bevel gear while geometrical axes being aligned for journaling and the said stationary component is rigidly fixed to the strut means tower of the said windmill;
 - f. a generator being coupled to the said pinion shaft through a gear box and rigidly fixed to the stationary component means strut means tower and further connected to load means power system through stationery laid power cables;
 - g. the said generator being directly coupled to said pinion shaft;
 - h. a strut means tower rigidly grouted to foundation on ground;
3. The device as claimed in claim 1 and 2 wherein said crown bevel gear and said bevel pinion gear being engaged means a gear assembly formed mean transmit power between two shafts whose geometrical axes interests at certain angle and preferably at right angle;

4. the geometrical axis of rotation of said rotary component, geometrical axis of said bearings of stationary component and the geometrical axis of said pinion bevel gear being same;
5. The said generator as claimed in claim 1,2,3,4 directly coupled to said pinion shaft;
6. The said generator as claimed in claim 1,2,3,4 directly coupled to said pinion shaft through a gear box;
7. the said generator and said gear box as claimed in claim 1,2,3,4 mounted on a stationary strut means component preferably on a vertical axis;
8. In the invention as claimed in claim 1,2,3,4 a counter balancing weight added to opposite side of said impeller on said rotary component to align the centre of gravity with respect to said pinion gear geometrical axis;
9. the said device as claimed in claim 8 being protected against rain, dust with suitable enclosure;

ABSTRACT

A windmill power generation device comprising a novel embodiment of the present invention comprising a windmill run by impeller due to wind velocity fixed on a horizontal impeller shaft turned in direction of the wind by a rudder mounted on a rotary component having a crown gear engaging a pinion bevel gear mounted on another shaft preferably at right angle to the impeller shaft and so as to mechanically engaged with the said crown gear rotates the pinion gear preferably at higher revolution and the said pinion-shaft further rotably mounted concentrically on a stationary component rigidly fixed to a strut or a tower and further the said pinion shaft extension coupled through a gear box (optional) to a generator and the said pinion shaft always remains aligned with respect to the shaft of generator irrespective of the angular position windmill impeller so the generator and associated power cables always remain secured to grounded strut which is not achievable with the existing windmills and further for smaller windmill the crown and pinion bevel gear ratio being higher a separate gear box can be dispensed with to cut down the size and cost of the generator.

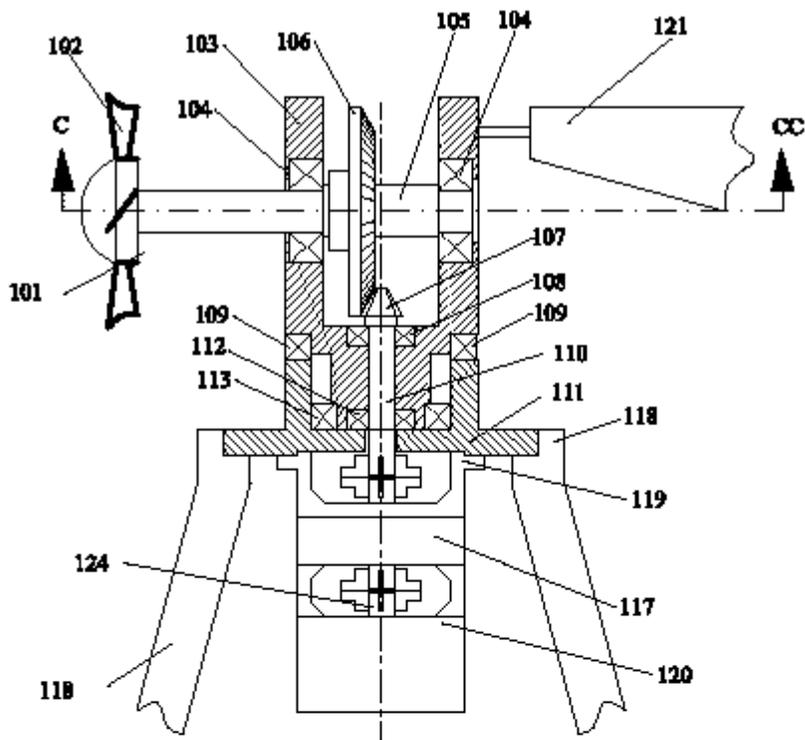


Figure-1

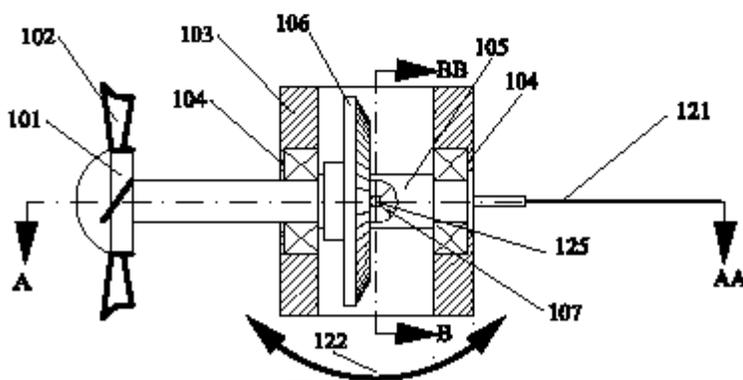


Figure-2

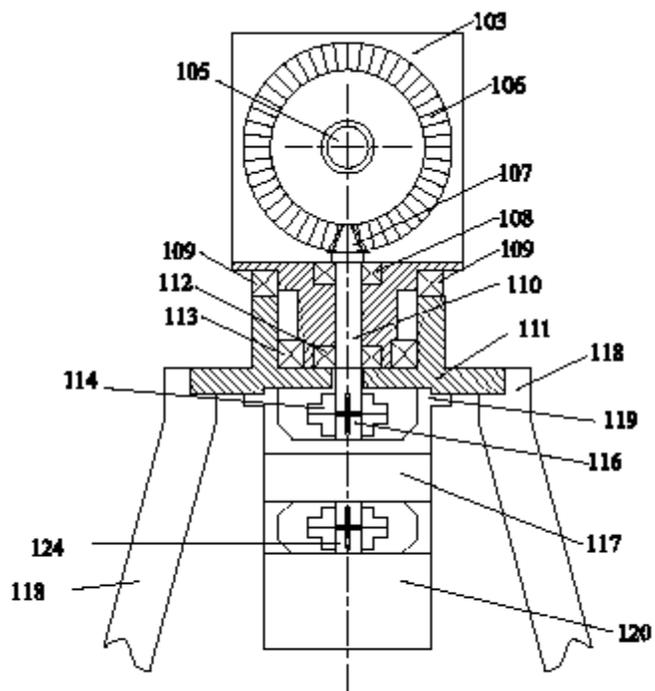


Figure-3

FORM 3
THE PATENT ACT 1970
(39 OF 1970)
AND
The patent rules, 2003
STATEMENT AND UNDERTAKING UNDER SECTION 8
(See section 8; rule 12)

We

Name	Nationality	Address
Ingole Vijay Tulshiram	Indian	104 Ganediwal layout, camp, Amravati-444602
Ingole Ashutosh Vijay	Indian	104 Ganediwal layout,camp,Amravati- 444602
Ingole Paritosh Vijay	Indian	104 Ganediwal layout,camp,Amravati- 444602

Hereby declare:-

(i) That we have not made any this application for the same /substantially the same invention outside India.

Dated this 15th day August 2011

Signature

Ingole Vijay Tulshiram

To
The controller of patents,
The patent office,
At Mumbai