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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	14
Form 3	1
Form 26	1
<hr/>	
TOTAL	19 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 1

(FOR OFFICE USE ONLY)

THE PATENT ACT 1970

(39 OF 1970)

And

The patent rules, 2003

Application number:

Filing date:

amount of fee paid:

CBR NO:

APPLICATION FOR GRANT OF PATENT

[See sec 7, 54,135 and rule20 (1)]

1 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

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

Fixed Vane Rotary Compressor

4. ADDRESS FOR CORRESPONDANCE OF AUTHORISED PATENT AGENT IN INDIA:-

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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 27th day September 2010

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 1000 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 27th day September 2010

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

Fixed Vane Rotary Compressor

2. APPLICANTS(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

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 gas and air compressor or vacuum pump having a fixed vane slidably mounted on cylinder and more particularly to such compressor having concentrically mounted roller having eccentric groove.

Prior art:

The conventional fixed vane rotary compressor has a fixed vane slidably mounted on a cylinder. The rotor having lesser diameter than the cylinder, is rotatably but eccentrically mounted within the cylinder such that the roller outside diameter touches the inside diameter of the cylinder at one point. The roller performs circular translational movement inside the cylinder surface. The volume between one side of fixed vane and roller forms suction chamber whereas on the remaining portion a compression chamber is formed. When the roller rotates the volume between the vane and the touching line of roller formed on one side of the vane goes on increasing so as to create suction whereas the volume of on remaining side goes on decreasing to form a compression chamber. The vane is generally of rectangular shape and touches both sides of the stationary cylinder and outer periphery of roller. Due to manufacturing tolerances it is difficult to have a leak proof assembly on the sides of vane causing leaks between compression and suction chambers. Furthermore the contact between the roller outer periphery and inside cylinder cavity is a line contact which is prone to leakages.

Problems to be solved:

The fixed vane compressor should have such features so as to circumvent and obviate the vital problem of leakages between compression and suction chambers formed by fixed vane, surfaces of the sides of cylinder & rotor and line contact between cylinder and eccentric rotor, to reduce unbalance of rotor. Hence there should an arrangement through which the manufacturing tolerances are taken care of to mitigate the leakages in air chambers and through the cylinder, rotor side faces and further an eccentric roller to be dispensed with a concentric rotor to simplify manufacturing.

Object:

The basic objective of the present invention is to circumvent and obviate the vital problem of leakages between compression and suction chambers formed by fixed vane, surfaces of the cylinder, rotor and line contact between cylinder and eccentric roller. Further object of the present invention to provide adequate surface contact between rotor and cylinder to mitigate leakage. Still further object of the present invention is to provide leak-proof contact between fixed vane and rotor groove and further providing a replaceable sealing arrangement on the fixed vane. Another object of the present invention is to provide less machining tolerance only on inner surface of cylinder and outer surface of the surface of the rotor and to have a concentric rotor to simplify manufacturing. With a novel construction solution there is achieved a substantial reduction in the leakages thereby improving the efficiency of the said compressor and simplified manufacturing.

These and other advantages will be more readily understood by referring to the following detailed description for a novel fixed vane rotary compressor disclosed hereinafter with reference to the accompanying drawings and which are generally applicable to other compressor and suction pump to fulfill particular application illustrated hereinafter.

Further objectives and advantages of the present invention will become apparent and readily understood by any person skilled in the art by referring to the detail description and appended claims of the invention.

STATEMENT:

Following specifications of the preferred embodiment of the invention comprises a stationary cylinder having a cavity and a compartment to house fixed round vane in a slot. The housing is further comprises a vane guide for the slidable vane and a compression spring to keep the vane in contact with the rotor. The vane comprises a profile to take up a replaceable metallic sprung ring. A cylindrical rotor having outside diameter similar to that of cylinder inside diameter is rotatably and concentrically mounted within the said cylinder cavity. The rotor comprises a groove on its periphery. The groove has a circular profile and its depth varies along the periphery of the rotor such that the bottom of the groove lies on an eccentric pitch circle diameter with respect to the centre of the rotor means the depth of the groove increases for first 180⁰ and decreases for next 180⁰ however, the radius of curvature of the groove is maintained constant. The profile of the free end of the vane has the same radius of curvature to that of the groove hence it fits snugly inside groove during the rotation of the rotor. Another novelty of the present invention where the

outer peripheral surface of rotor comprises sealing rings on either sides of the groove to minimize leakages. Still another novelty of the preferred embodiment where there is adequate surface contact between cylinder and rotor.

These and other features and advantages will be more readily understood by referring to the following detailed illustrations for a novel fixed vane rotary compressor disclosed hereinafter with reference to the accompanying drawings and which are generally applicable to other compressor to fulfill particular application illustrated hereinafter.

BRIEF DESCRIPTION OF DRAWING:

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

Sheet 1 of 4 illustrates cross-sectional view of rotor elevation cylinder on line M-N in Figure-1A, partial cross sectional side elevation on line K-L in Figure-1B of the present invention.

Sheet 2 of 4 illustrates the cross section elevation of end-cover in Figure-1C, Figure-2A showing partial cross sectional elevation and Figure-2B showing partial cross section of side elevation of vane with retaining spring of the preferred embodiment of present invention.

Sheet 3 of 4 illustrates the partial cross section of elevation on line Q-R in Figure-3A and partial side elevation on line O-P in Figure-3B of the rotor ,

Sheet 4 of 4 is the cross sectional elevation in Figure-4A and cross sectional side elevation Figure-4B of the compressor as per the preferred embodiment of present invention.

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 of 4 illustrates cross-section of cylinder of the preferred embodiments of fixed vane rotary compressor. Figure-1A is a cross section of elevation on line M-N of cylinder 100 showing a bearing housing 104, vane housing 105, spring housing 102, vane guide hole 101, and cylinder inner surface 105. Figure-1B showing cross sectional side elevation on line K-L of cylinder 100 having shaft opening 106, bearing housing 104, spigot for fixing end-cover 200 (not shown), cylinder inner surface 105, cylinder inner diameter 112, inlet 107, direction of inlet gas flow by arrow 108, compressed gas outlet 109, direction of gas outlet flow by arrow 110, vane housing 103, spring housing 102, vane guide 101, and Spigot 111.

Sheet 2 of 4 illustrates partial cross sectional elevation of end-cover 200 in Figure-1C having a spigot 211 for fitting on cylinder 100, internal face 205, and bearing housing 204. Figure-2A and Figure-2B show partial crossed section elevation on line R-Q and side elevation on line O-H of vane 150 which slides in the vane housing 103 having a groove to take up sprung sealing ring 153 on 151, direction of movement of vane 150 by an arrow 152, a guide pin 155 which slide in the guide 101, a retaining compression spring 154 placed in the spring housing 102 (Ref. to Figure-1A).

Sheet 3 of 4 illustrates cross-section of rotor of the preferred embodiments of fixed vane rotary compressor. Figure-1A and Figure-3B show a partial cross section of elevation on line W-X and side elevation on line U-J of rotor 300 having a center 307 showing a hole 304 to take up a shaft (not shown), circular grooves 303 for taking up sprung rings (not shown) on periphery 302 of the rotor 300 having outer diameter 303, a circular profile of groove 301 matching the profile of vane 150 on the periphery 302 eccentrically provided on center 308 of the rotor 300, on the periphery 303 of the rotor 300 the depth of the groove is maximum at point T and goes on decreasing (305) and at point S diametrically opposite to point T there is no groove between point A and B. The direction of rotation of rotor 300 is shown by arrow 310.

Sheet 4 of 4 illustrates various subassemblies described in sheets 1 of 4 to 3 of 4 in the manner in which they are to be assembled to form the preferred embodiment of fixed vane rotary compressor Figure-4A and Figure-4B show partial sectional elevation on line G-H and sectional side elevation on line E-F where rotor 300 is rotatably and concentrically mounted in cylinder 100 cavity 105 and end-cover 200 is shown. Figures also show shaft 201 fixed to rotor 300, bearings 202, end-

cover 200 fixed to cylinder 100, vane 150 positioned in the rotor groove 301, location of vane 150 having a fixed location on the cylinder 100 and slidably mounted in cylinder vane housing 103, spring 154, vane guide pin 155 guided in guide hole 101. It shows the varying profile of the groove 301 and sealing rings 309 on rotor periphery 303. A very close machining tolerance is to be maintained between rotor 300 peripheral surface 302 means outer diameter 312 and inside surface 105 means inner diameter 112 of cylinder 100 to minimize gas leakages from the chambers while maintaining rotatability of rotor 300 in cylinder 100. Figure-4B shows the center 307, the contact T and surface contact S between vane 150 and groove 301 forming two chambers namely P between S to T and V between T to S. When rotor 300 rotates in the direction of arrow 310 the volume of chamber P decreases as contact S approaches vane contact 306 thereby increasing the pressure in the chamber where an outlet 109 is provided. Simultaneously in opposite manner the volume of chamber V increases thereby creating a vacuum in chamber V where an inlet 107 is provided. The rotor is provided with a surface without groove from A to B as shown to minimize leakages between the said chambers. During all such rotation the vane profile is in contact with the groove.

There have thus been described certain preferred embodiments of fixed vane rotary compressor provided in accordance with the present invention. While preferred embodiments have been described and disclosed, it will be recognized by those with skill in the art that modifications are within the true spirit and scope of the invention. The claims are intended to cover all such modifications.

CLAIMS

We claim:-

1 A fixed vane rotary compressor functioning also as vacuum pump, gas motor, gas turbine comprising a slidably mounted vane at a fixed location on a cylinder and inside surface means cavity of cylinder a rotor having an eccentric groove on its periphery is concentrically and rotatably mounted to achieves unique feature of fixed vane rotary compressor to minimize leakages, ease of manufacturing and higher efficiency in the preferred embodiment of the present invention.

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

- a. having an internal diameter and depth thus forming a cavity;
- b. having a center;
- c. having certain thickness;
- d. having a vane housing at fixed location to guide a vane;
- e. having a housing for a spring;
- f. having a cavity to further guide the vane guiding component;
- g. having an outlet located at a certain location;
- h. having an inlet located at a certain location;
- i. to take up an end-cover to close the cavity;

3 the cylinder as claimed in claim 2 comprises of a vane located in the cylinder

- a. having a profile;
- b. slidably located in the vane housing of cylinder;
- c. whose outer profile matches with inner groove profile on the rotor during entire rotation;
- d. having a thickness;
- e. having a groove to take up replaceable sealing arrangement;
- f. having a guiding component;
- g. A spring put on the guiding component of the vane while pressing the vane on the cylinder groove;
- h. The guiding component slidable in the guiding cavity on the cylinder;

4 the device as claimed in claim 3 comprises of a rotor

- a. which is concentrically and rotatably mounted in the cylinder cavity;
- b. having thickness and a central hole to take up driving shaft;
- c. having outer diameter matching the inner diameter of the cylinder;
- d. Width of the rotor being less than the gap between cylinder and end-cover;
- e. having grooves for sealing arrangement on either the side of groove on rotor's circular surface;
- f. having a groove on its circular surface;
- g. the depth of the groove profile varies from maximum to minimum;
- h. the center of groove is eccentric with respect to rotor center;
- i. on certain part of the surface near the minimum groove depth of rotor having no groove;

5 the shape of vane and matching rotor groove as claimed in claim 4 be of different geometrical profile in accordance with the manufacturing requirement ;

6 The device as claimed in claim 5 wherein the formation of groove in rotor being of special metal liner for higher temperature operation.

7 The device as recited in claim 6 wherein the rotor circular surface in contact with cylinder being of certain metal liner for higher temperature operation.

8 The device as recited in claim 7 be provided with lubricating system;

9 The device as recited in claim 9 and as described and illustrated in preferred embodiments and ascertain the nature of this invention and the manner in which it is to be performed and revealed in diagrams of Sheet 1 of 4 comprising Figure-1A, Figure-1B; sheet 2 of 4 comprising and Figure-1C , Figure-2A, Figure-2B; sheet 3 of 4 comprising Figure-3A, Figure-3B; sheet 4 of 4 comprising Figure-4A, Figure-4B.

ABSTRACT

A fixed vane rotary compressor having a cylinder in which a concentric rotor is rotatably mounted. The rotor has an eccentric groove having preferably a circular profile of varying depth in which a fixed vane of matching profile is mounted. The fixed vane located in housing of the cylinder is pressed down on the groove by a spring and other free end of the vane fits snugly. The rotor is so designed to make a reasonable surface area contact with the cylinder. The fixed vane and said rotor contact form a compression chamber on its one side and suction chamber on its other side so that when the rotor rotates the suction chamber sucks air or gas from one side through suction inlet and delivers compressed gas from compressor chamber through the delivery outlet. The fixed vane, rotating groove and rotor are so designed to make leak proof compartments for optimum efficiency.

Following invention is described in detail with the help of Figure-1A showing partial cross sectional side elevation on line K-L in Figure-1B of the present invention.

Sheet 2 of 4 illustrates the cross section elevation of end-cover in Figure-1C, Figure-2A showing partial cross sectional elevation and Figure-2B showing partial cross section of side elevation of vane with retaining spring of the preferred embodiment of present invention.

Sheet 3 of 4 illustrates the partial cross section of elevation on line Q-R in Figure-3A and partial side elevation on line O-P in Figure-3B of the rotor ,

Sheet 4 of 4 is the cross sectional elevation in Figure-4A and cross sectional side elevation Figure-4B of the compressor as per the preferred embodiment of present invention.

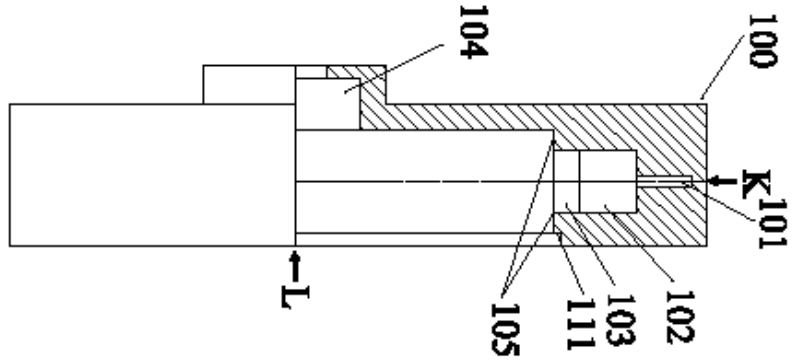


Figure-1A

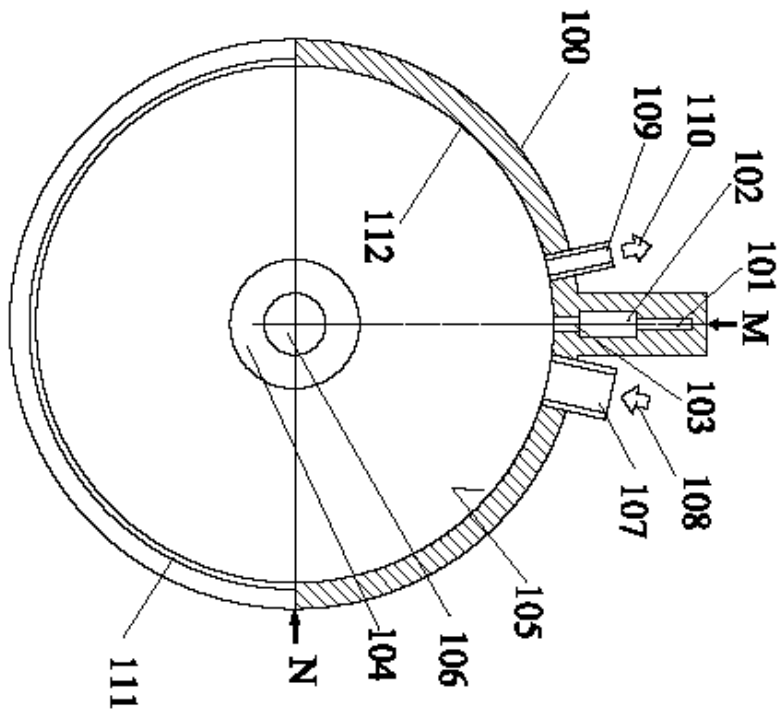


Figure-1B

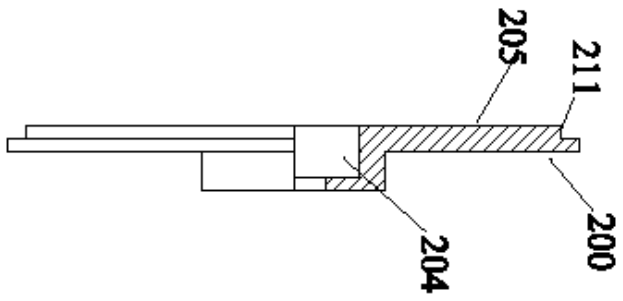


Figure-1C

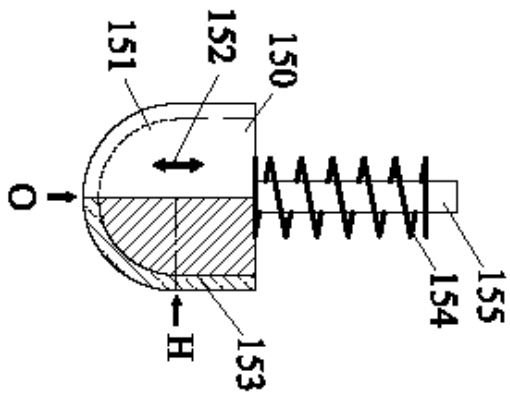


Figure-2A

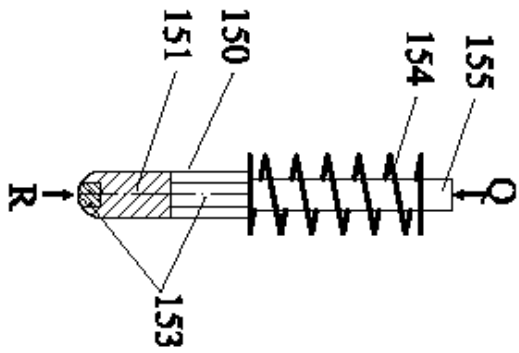


Figure-2B

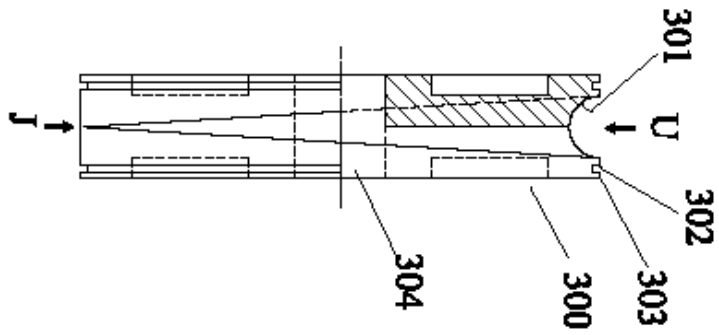


Figure-3A

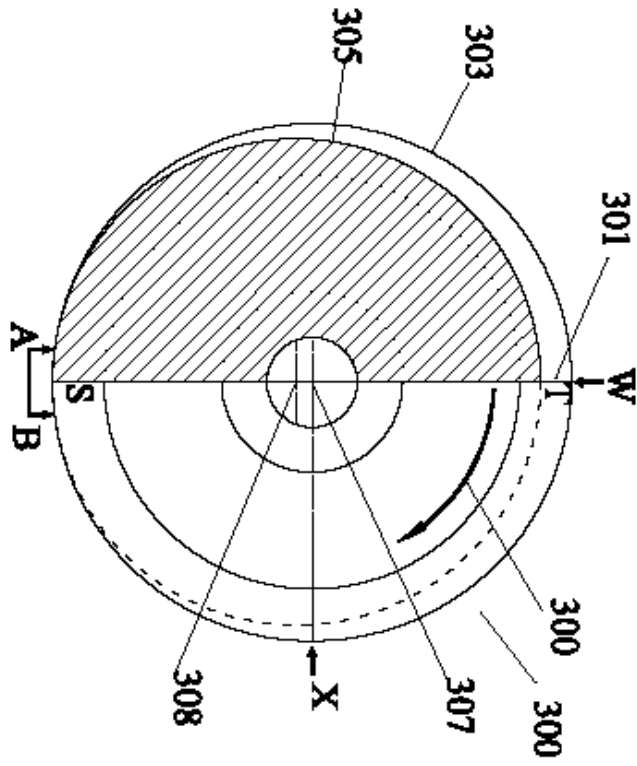


Figure-3B

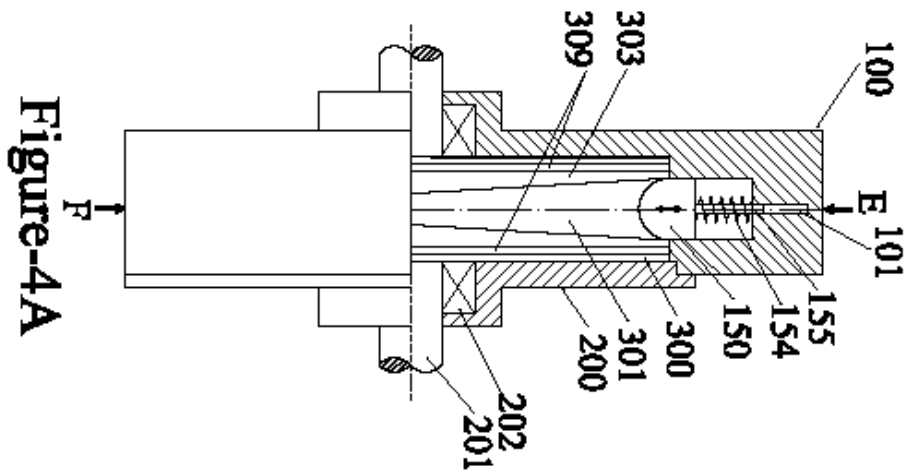


Figure-4A

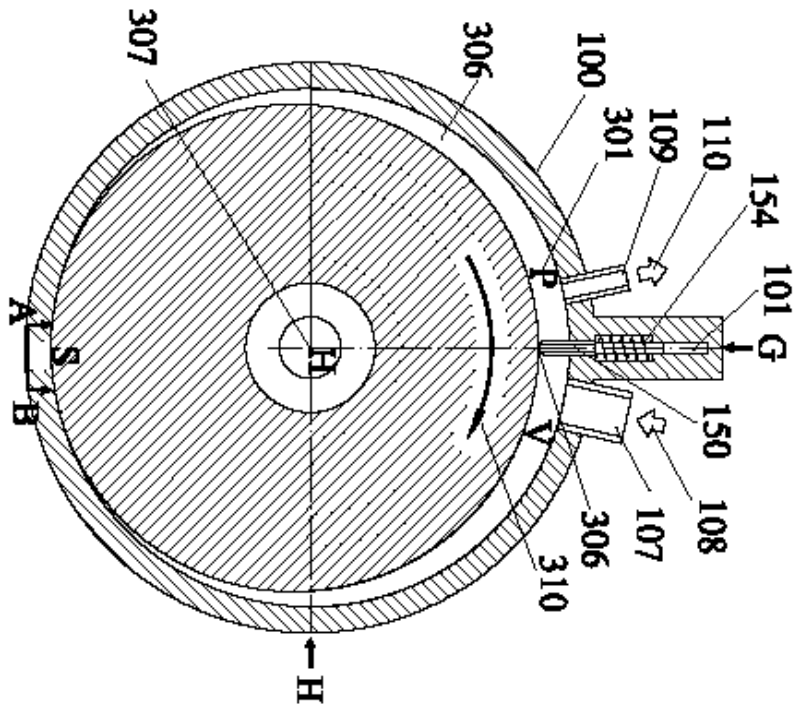


Figure-4B

(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 27th day September 2010

Signature

Ingole Vijay Tulshiram

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

FORM 26
THE PATENTS ACT, 1970
(39 OF 1970)
&
THE PATENTS RULES, 2003

FORM OF AUTHORISATION OF A PATENT AGENT/ OR ANY PERSON IN A
MATTER OR PROCEEDING UNDER THE ACT

[Section 127 and 132 and Rule 135]

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 authorize Swapnil J Gawande, Advocate and Patent Agent No. IN/PA 1587.of R-9 Harshnil,Eknath puram, nr yogakshem colony Amravati-444607,India to act on my behalf in connection with our patents, assignments, oppositions, rectifications, renewals and request that all notices, requisition and communication relating thereto may be sent to such person unless otherwise specified.

I hereby revoke all previous authorization, if any made, in respect of same matter or proceeding.

I hereby assent to the action already taken by the said person in the above matter.

Dated this 27th day September 2010

Name: Ingole Vijay Tulshiram

Ingole Ashutosh Vijay

Ingole Paritosh Vijay

To,
The Controller of Patents
The Patent Office
At Mumbai