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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
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Documents attached with the application:-

	Number of Pages
Form 1	3
Form 2	14
Form 3	1
Form 26	1
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
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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
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2. TITLE OF INVENTION

Vane Pump with Calibration

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 of May 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 in Cash/Cheque/bank draft bearing no

Date on Bank.

We hereby declare that to the best 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 of May 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

Vane Pump with Calibration

2 APPLICANTS

Name	Nationality	Address
Ingole Vijay Tulshiram	Indian	104 Ganediwal layout, camp, Amravati-444602
Ingole Ashutosh Vijay	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 pumps, and more particularly to positive displacement vane pump with calibration for fluids and more particularly for incompressible fluids like water and having a comparable discharge per rotation as compared to other vane pumps and which is simple in construction and economic to manufacture with an optional novel finely adjustable metered volumetric discharge and delivers fixed quantity for every single rotation as required in solar pumps, bottling plant, pouch filling plant, pharmaceutical industries etc. Further it can be used as a measuring meter for gas, liquid as it is self rotating due to incoming fluid pressure.

Prior art:

Various types of rotary pumps have been available from many years, being used as a positive displacement pump replacing cumbersome reciprocating pumps which suffer from the disadvantages of inlet, outlet valve, crank and crank shaft for converting rotary motion of prime mover to reciprocating motion of the pump and higher number of wearable parts and associated maintenance. Generally a vane pump comprises a stator means pump outer housing having a cylindrical chamber, a cylindrical drive rotor arranged eccentrically in the pump chamber and adopted to rotate such that it is disposed in close proximity to a portion of the inner wall surface of the pump chamber and the plurality of vanes rotably supported by a cam, centre shaft or such arrangement to hold the vanes in position. The plurality of vane project in the cavity so formed by the pump housing and eccentric rotor so as to form plurality of fluid chambers of which volume changes when the vanes rotate in the said cavity thus performing suction and discharge actions simultaneously. Most of the vane pumps suffer from the disadvantage of vane wear and the suggested modifications manifested in increasing the complexity of construction of vane pumps. Further arrangement for the adjustable or calibration of discharge of the vane pump not provided. Inherently vane pump is dynamically unbalance due to varying rotating mass causing vibration during operation however, no suitable modifications have been incorporated in the present designs.

Problems to be solved:

Accordingly, there was a long felt need in the art to simplify the design of vane pump to have a cost effective manufacturing process, to design a multipurpose vane pump which can cater for gas as well as incompressible fluids equally effectively without modification, which would increase the discharge with comparable vane pump, to minimize the wear and tear of vane, to minimize vibration of vane pump during operation, where the output discharge is adjustable, where preferably an extended single vane is used.

Object:

1. Primary objective of the present invention is to provide a vane pump incorporating preferably a single extended vane instead of multiple vanes, simple housing profile for the vane to be contact with diametrically surface of the housing, to increase the discharge of the pump,
2. further object of present invention is to provide an adjustable means calibrated output discharge, and to provide a single design for gas as well as incompressible liquids like water, to minimize wear and tear, to minimize vibration, to have a simple design requiring minimum parts and easy to manufacture to make it cost effective.
3. Another object of present invention is to provide positive displacement vane which is simple in construction and economic to manufacture with a novel finely adjustable volumetric discharge and delivers fixed quantity for every one rotation as required in bottling plant, pouch filling plant, pharmaceutical industries etc.
4. Yet further object of present invention is to be used as a measuring meter for gas, liquid as it is self rotating means motoring due to incoming fluid pressure.
5. Yet another object of present invention is to have an inbuilt arrangement to provide a dynamically balanced rotor in association with pluralities of vane for operation under higher speeds.

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 first preferred embodiment of the invention comprises a pump housing including a nearly cylindrical housing chamber, an end-cover, a cylindrical rotor arranged eccentrically inside the pump housing adopted to rotate such that it is disposed in close proximity to the portion of the inner wall surface of the pump housing having attached to a shaft to be driven by a prime mover and has a through slit or slot passing through the central of the rotor to take up a vane which so adopted to move to and fro in side the said slit means slot and driven when rotor rotates and preferably rectangular vane having certain thickness to sustain the fluid pressure and other forces and width equal to the width of the pump chamber and length equal to the distance between the curved surface of the pump chamber taken through the centre of the eccentrically mounted rotor and the curvature of the housing chamber is made in such a manner that distance always remain constant at any angle of rotation of the vane which slide simultaneously inside the slot provided in the rotor so that plurality of space is formed with three distinct closed spaces within the space means cavities formed among the pump chamber, rotor outer surface and vane end extensions on either sides of the rotor and due to typical arrangement of the stator housing chamber, rotor, contact surface of chamber hereinafter referred to as contact and rotor and vane and further on rotation of the rotor means vanes the volume of the said cavities varies such that suction is formed between the said contact and one end of the vane, a mid cavity is formed between the space between two projected portions of vane and delivery cavity is formed between remaining end of the vane and suction means inlet port is connected to said suction cavity and delivery means outlet port is connected to delivery cavity and two hallow spaces means escape channels, hereinafter referred to as channels and further each is referred to as delivery channel and suction channel formed in delivery cavity and suction cavity respectively, which are symmetrically arranged about the said contact are formed on the end-cover of the vane pump to bypass the fluid under typical vane positions during its rotation and such channels which are formed on the end cover can be partially rotated in either direction so that their angular position can be changed with respect to the said contact so as to increase or decrease the discharge quantity to the desired level and further the channels further provides suction and discharge action in the mid cavity thereby increasing the discharge quantity and pressure unlike conventional single-vane vane pump and further the annular contact in regular vane pump is line contact leading to leakage between suction means inlet

port and delivery means outlet port which is circumvented by providing annular space in the form of surface contact. .

Second preferred embodiment described herein where other description remaining same as in the first embodiment comprises an additional cam attached to the pump housing placed within the rotor cavity and the vane is guided to rotate inside the pump housing without rubbing so as to minimize wear and tear of the vane and the profile of the said cam is formed in such a way that the distance of the vane is always constant with respect to the pump housing profile so as to adopt to sealed chambers without rubbing contacts.

Third preferred embodiment herein where other description remaining same as in the first embodiment comprises an additional cam attached to the pump housing placed within the housing having a profile in which counter balancing weights are rotably placed and driven by the rotor to minimize the unbalance and so the vibrations in the pump.

These and other features and advantages will be more readily understood by referring to the following detailed illustrations for a novel vane pump with calibration disclosed hereinafter with reference to the accompanying drawings and which are generally applicable to other pumps 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 1/8 comprising Figure-1 and Figure-2 illustrate cross-sectional views of the first embodiment of the present invention.

Sheet 2/8 comprising Figure-3, Figure-4, Sheet 3/8 comprising Figure-5, Figure-6, illustrate the functioning of the first embodiment of the present invention.

Sheet 4/8 comprising Figure-7, Figure-8, Sheet 5/8 comprising Figure-9, Figure-10, Sheet 6/11 comprising Figure-11, Figure-12 illustrate the functioning of the channels of the first embodiment of the present invention.

Sheet 7/8 comprising Figure-13 and Figure-14 illustrate cross-sectional views of the second embodiment of the present invention.

Sheet 8/8 comprising Figure-15 and Figure-16 illustrate cross-sectional views of the third embodiment of the present invention.

Detail description of the invention:

In order of 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.

Sheet 1/8 comprising Figure-1 and Figure-2 illustrates cross-sectional views of the first preferred embodiment of vane pump designated as 100 of the present invention comprises a pump housing 1 defines therein a nearly cylindrical pump chamber profile 3 with a centre 2 and further comprises inlet port 4 and outlet port 5 formed near the pump housing centre line C. Rotor 6 having a shaft 7 mounted at rotor centre 8 disposed eccentrically within the pump housing chamber 3 such a way that part of the curved surface between contact line 9 and contact line 10 disposed close to the housing inner profile surface 3 where the angle K/2 of line 9 and line 10 are symmetrically disposed transversely with respect to centre line C so as to form a surface contact between housing 1 and rotor 6 to minimize leakage across inlet port 4 and outlet 5. The rotor 6 comprises a shaft 7 driven by prime mover (not shown). A radial slot 13 is formed on rotor 2 across the its diameter including shaft 7 passing through the centre 8 to accommodate a single piece vane 11 comprising opposite end 12. Vane 11 slides through the slot 13 while being in contact with pump housing 1 pump chamber profile 3 when driven by the rotor 2 in direction 20 and forming plurality of fluid chambers 21, 22, and 23 namely suction, mid and discharge chamber respectively. The volume of plurality of chambers 21, 22, and 23 keeps on varying during the rotor rotation which may not any pose a problem with compressible fluids like gas however, may present serious problems with liquids like water etc as it may be subjected to cavitations in the mid chamber as its volume is more than suction and discharge chamber. To overcome such serious problems with liquids a novel channels configuration named as inlet channel 14 and outlet channel 17 are provided in the present embodiment. Each channel is engraved in the form of a groove having suitable profile and depth and located preferably on the end cover 24. The working will be made clear in the forthcoming description. Hitherto all the denoted angles are from the rotor centre 8 with respect to centre line C. The inlet channel 14 ingress end 15 starts from the inlet port 4 and egress end 16 terminates at

angle B (preferably at 90^0) from centre line C. Similarly the outlet channel 17 egress end 19 starts from the outlet port 5 and ingress end 18 terminates at B (preferably at 90^0) in opposite direction from centre line C means channels end 15 and 18 are located at an angle of 180^0 means aligned to horizontal axis H. The shape of channel 14 and 17 are suitably made as per the inlet and outlet chambers of pump chamber 3 and the cross sections of channel 14 and 17 are suitably made as per the maximum volume of mid chambers 22 of pump chamber 3. For the working of the embodiment refer to sheet 2/8 comprising Figure-3 and Figure-4, sheet 3/8 comprising Figure-5 and figure-6. The vane angles A are denoted from the rotor centre 8 with respect to centre C. In Figure-3 the vane 9 is aligned to the centre C means at 0^0 position and volumes of suction chamber 21 and discharge chamber 23 are equal and channels 14 and 17 are not utilized. In Figure-4 when the vane 9 is at angle A $<90^0$ fluid is sucked in suction chamber 21 and fluid Fc is also sucked in mid chamber 22 routed through the passage of inlet channel 14 since the volume of mid chamber 22 is also increasing simultaneously and discharged chamber 23 volume decreases whereas channel 17 is not utilized. In Figure-5 when the vane 9 is at angle A $=90^0$ fluid is sucked in suction chamber 21, channel 14 and 17 are no more in the mid chamber 22 means direct passage from suction chamber 21 to discharge chamber 23 is circumvented so channels 14 and 17 are not utilized. In Figure-6 when the vane 9 is at angle A $>90^0$ fluid is sucked in suction chamber 21 and discharged through discharge chamber 23 and extra fluid Fc from mid chamber 22 is also routed from the passage of outlet channel 17 since the volume of mid chamber 22 is also decreasing simultaneously whereas channel 14 is not utilized. In this manner channel 14 and 17 helps in eliminating cavitations and compression in the mid chamber 22 as expected in liquid vane pumps. Sheet 4/8 comprising Figure-7 and Figure-8, Sheet 5/8 comprising Figure-9 and Figure-10 and Sheet 5/8 comprising Figure-11 and Figure-12 illustrate the functioning and procedure for calibration of the preferred embodiment of vane pump with calibration designated as 100 of the present invention. The pump housing 1 is closed by end cover 24 to enclose the pump 100. The end cover 24 is fitted on the housing 1 concentric with rotor centre 8 so that the relative angular position can be changed by rotating the end cover 24 centre axis C' with respect to rotor 6 centre C. It is of a general knowledge that the output of a pump varies due to various reasons encountered in manufacturing such as tolerances etc. form piece to piece or batch to batch and it becomes imperative to alter or adjust the discharge to get fixed guaranteed metered quantity required for various purposes. Figure-7 and Figure-8 show the relative position of pump housing 1 and end cover 24 where the angle

between axis C of pump housing 1 and centre axis C' of end cover 24 having channels 14 and 17.is zero means B= 90^0 and the pump delivers its normal quantity of discharge output per rotation means sum of volumes of mid chamber 22 and discharge chamber 23. Figure-9 and. Figure-10 show the relative position of pump housing 1 and end cover 24 where the angle between axis C of pump housing 1 and centre axis C' of end cover 24 having channels 14 and 17.is B1 in CCW direction which makes B<90^0 and the pump delivers more quantity of discharge output per rotation as the sum of volumes of mid chamber 22 and discharge chamber 23 becomes more means Fc flow through inlet channel 14 stops at a lower angle of rotation of vane 11, 12. Figure-11 and Figure-12 show the relative position of pump housing 1 and end cover 24 where the angle between axis C of pump housing 1 and centre axis C' of end cover 24 having channels 14 and 17.is B2 in CW direction which makes B>90^0. In such situation the pump delivers less quantity per rotation as the sum of volumes of mid chamber 22 and discharge chamber 23 becomes less means Fc flow through inlet channel 14 stops at higher angle of rotation of vane 11, 12.

Sheet 7/8 comprising Figure-13 and Figure-14 illustrates cross-sectional views of the second preferred embodiment of vane pump designated as 110. The basic hitch associated with vane pump is the wear and tear of vanes happening while moving inside the housing chamber leading to frequent maintenance and replacement. In order to circumvent such problem a vane guiding cam is added while other features as described in the first preferred embodiment remaining same. A cam 24 is fixed to the pump housing 1 in which rotor 7 is rotably mounted. Rotor 7 is having a cylindrical cavity to have room for the cam 24. Vane 11 is having cut such that the inner parts of the cut 36, 37 are guided on the cam while vane 11 and 12 are just touching the pump chamber profile 3.

Sheet 8/8 comprising Figure-15 and Figure-16 illustrates cross-sectional views of the third preferred embodiment of vane pump designated as 120. The undesirable feature associated with vane pump is the vibration due inherent dynamic unbalance associated with eccentrically rotating vane In order to circumvent such problem a dynamic vane balancing weights are inserted to counter balance the eccentrically rotating vane while other features as described in the first preferred embodiment remaining same. In the pump housing 1 a circular groove 28 having a centre 31 formed off centre to rotor centre 29 but diametrically opposite to housing chamber centre 2. Balancing weights comprising segmented semicircular rings 30 and 31 of equal weight are rotably mounted inside the groove 28 such that they are free to

rotate inside independent of each other around the centre 31. Arrows 34 show the direction of rotation of rotor 6 with vane 11, 12 and balancing weights 30, 31. The arrow 35 shows the oscillating motion of the vane 11, 12 inside the balancing weight 30, 31 grooves 32. The rotor shaft 7 is located inside the groove 28 and weight 30 is placed on one side and weight 31 is placed on the other side driven by rotor 6 (not shown). Each weight 30 has projected notches 32 in which rotor 6 with vane 11 slides to drive the weight 30, 31 in such a way that the centre of combined mass of balancing weights 30, 31 is always opposite to the vane 11 and 12 for dynamically balancing.

There have thus been described certain preferred embodiments of vane pump with calibration 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 simple to construct and cost effective device and methodology for the construction of vane pump comprising plurality of vanes and more particularly a doubly extended single vane for pumping fluids and more particularly non-compressible liquids like water and having an adjustment for calibrated means metered discharge and comprising a cam to minimize the wear and tear of vanes and further an arrangement for dynamically balancing rotating parts means rotor, vane and the said vane pump also functions like a motor means to work as a dispenser means metered discharge means a flow meter;
2. The preferred embodiments of the vane pump with calibration as claimed in claim 1 comprising:

a. a housing having nearly cylindrical inner chamber means housing chamber having certain inner profile and a chamber centre and centre line means Y axis;
b. the said housing having an inlet port and outlet port for facilitating communication of fluid flow through the said chamber and disposed on either side of the said Y axis;
c. an eccentrically located opening on the said Y axis means hole means bearing to take up means support the rotably mounted shaft of the rotor means on the crossing of said Y axis and perpendicular X axis means centre of said vane pump;
d. on the open end of the said housing an arrangement to mount and locate the end cover means being concentric to the said opening means hole means to support the said hole for rotor shaft;
e. a rotably mounted cylindrical rotor having shaft extensions means one supported on the said housing eccentric located opening means hole means bearing on the Z axis and other shaft end supported on said end cover concentric opening means hole means bearing means on the said Z axis;
f. and the said rotor having a length to rotably fit snugly inside the chamber formed between said housing and said end cover;
g. and the said rotor rotably disposed inside the said inner chamber and further having a surface contact with the said inner chamber at one end means between inlet port and outlet port and a centre line means Y axis and further

the said chamber centre located on the said Y axis and further means the said inlet port and said outlet port located on either side of the said Y axis;

h. and said rotor having a slot along its diameter means passing through its centre means said vane pump centre also through the said shaft part within the said rotor and along its full length of the said rotor for mounting the vane;
i. a fluid chamber means the volume of the fluid enclosed in the space between the said housing chamber and said cylindrical rotor;
j. a vane means generally a single rectangular piece having certain thickness mounted inside the said slot means disposed so as to slide in the said rotor slot and extensible diametrically in either side of the said rotor curved surface and further touching the said housing chamber profile means dividing the said fluid chamber;
k. and the said vane having width equal to the length of said rotor means length of said housing chamber means along the said Z axis;
l. and the said vane having a length determined by the distance means gap between two points on the said housing chamber inner profile means while measured through the said vane pump centre and further means the inner profile having constant means same distance means equal to the length of the said vane all along the circular means through each rotation of said rotor path means while measured through the centre of the rotor and further means the both extensions of said vane while simultaneously remaining in touch with the said inner chamber means said inner profile of the said housing while rotating in the said housing means around the centre of said rotor means said shaft;
m. and the said vane while driven by the said rotor disposed to slide to and fro means oscillates inside the said rotor slot of the said rotor rotation means being determined by the said profile of the said inner profile of the said housing chamber;
n. and the said vane means its said vane extensions means one end of the vane extensions means closer to inlet port means suction end and remaining vane extension means extending out of the said rotor slot means closer to outlet port means discharge end means further extending on either sides of the said rotor means inside the said chamber and between the said rotor outer curved surface and the said surface contact between the said rotor and said housing chamber form a plurality of sealed chambers within the said fluid chamber comprising a suction chamber means formed between the said surface contact and said suction end of said vane means the said chamber communicating

with said suction port and a mid chamber means between said suction end of the said vane extension and said discharge end of the said vane extension and discharge chamber formed between the said discharge end of the said vane extension and said surface contact means communicating with said output port;

o. an end cover disposed means mounted on the said housing means on the open end of the said housing means concentric to the said rotor and having a concentric opening means a hole means bearing means on the said Z axis to support the other end of the rotably mounted rotor comprising the said shaft;

p. and the said end cover having an arrangement for fixing on the said housing such that the said end cover rotably disposed to swivel means rotate in either direction means through some degrees means with respect to said X axis and said Y axis means around said Z axis;

q. and the said end cover further comprises two channels some profile and some depth means an inlet channel disposed on the suction port side of the said vane pump having one end aligned to the said X axis and having other end opening in inlet port and further an outlet channel disposed on the discharge port side of the said vane pump having one end aligned to the said X axis and having other end opening in outlet port means specific ends of the inlet channel and said outlet channel are aligned to said X axis means 180^0 apart means diametrically opposite and further the said inlet channel and said outlet channel generally disposed symmetrically across the said Y axis and further the profile of the said channels disposed such that the said inlet channel envelops the said suction chamber and said outlet channel envelops the said discharge chamber and the said chambers having certain cross section means suitable for the easy flow of fluid;

r. and when said vane is aligned to said X axis means at right angle to the said Y axis the said vane extensions are just intersecting the said ends of the said inlet channel means the centre line of the said end cover means X' axis are aligned means the angle is 90^0 means normal intersection angle and said outlet channel means the communication between said suction chamber as well as said discharge section is discontinued and further when the said vane extensions disposed lesser than right angle to the said Y axis the said inlet channel provides communication passage to the flow of fluid from said suction chamber to said mid chamber but the said outlet channel not having communication passage to the flow of fluid from said mid chamber to said discharge chamber means the angle between the said channels and said Y axis

is and when said vane extensions disposed more than right angle to the said Y axis the said outlet channel provides communication passage to the flow of fluid from said mid chamber to said discharge chamber but the said inlet channel not having communication passage to the flow of fluid from said suction chamber to said mid chamber means the only volume of fluid in the said mid chamber and said discharge chamber discharge through the said outlet port;

s. and when the said X' axis of the said end cover is rotated with respect to said Y axis around the said Z axis such that the angle between the said Y axis and said X' axis is less than 90^0 the said vane extension and suction channel intersection occurs at less angle means less than the said normal intersection angle and the volume of said mid chamber and discharge chamber increase and so the said discharge through the outlet port;.

t. and when the said X' axis of the said end cover is rotated with respect to said Y axis around the said Z axis such that the angle between the said Y axis and said X' axis is more than 90^0 the said vane extension and suction channel intersection occurs at higher angle means more than the said normal intersection angle and the volume of said mid chamber and discharge chamber decrease and so the said discharge through the outlet port;.

3. The second preferred embodiments of the vane pump with calibration as claimed in claim 2 comprising;

a. a cam fixed to the closed end of said housing means housing centre and having certain cam outer profile means aligned with the said housing chamber inner profile means the distance between the said cam outer profile and said chamber inner profile is constant mean while measured through the said rotor centre;

b. and the said cam comprises a hole to dispose the said rotor shaft and disposed inside the cylindrical cavity formed inside the said rotor;

c. and the said vane disposed inside the said rotor slot and having a cut comprising axial edges to ride on the sides of said cam means the said extensions of the said vane simultaneously touch the inner profile of the said housing chamber means during the rotation of said rotor means the said vane means to form the said sealed chambers.

4. The third preferred embodiments of the vane pump with calibration as claimed in claim 2 comprising;

a. a circular groove disposed preferably on the said housing closed end means formed eccentric with reference to the said rotor centre means opposite to the

said housing chamber centre means eccentric to the said housing chamber centre means the said shaft hole disposed within the said groove;

b. and in the said circular groove two rings of equal mass rotably disposed means in the form of segment of a cylinder means having certain included angle less than 180^0 and the said rings provided with notches at the centre of the segment of the said ring and the said notches disposed in the said rotor means said vane means preferably on either side of the said rotor centre to be driven by said vane means preferably by said rotor means when the rotor rotates said rings rotate independently means to counter the unbalance of the said vane.

5. The device and methodology as claimed in claim 3 and claim 4 can also be performed by making certain additions or removal or variations in the overall assembly according to the manufacturing requirement and specified conditions and can be easily construed by the person skilled in the art as the part and parcel of the preferred embodiment without varying from the basic conscience of the invention
6. The said vane pump as recited in claim 1, claim 2 and claim 3 can function as a motor for metered discharge means flow meter.

ABSTRACT

The present invention relates to pumps, and more particularly to positive displacement vane pump with calibration for fluids and more particularly for incompressible fluids like water and having a comparable discharge per rotation as compared to other vane pumps and which is simple in construction and economic to manufacture with an optional novel finely adjustable metered volumetric discharge and delivers fixed quantity for every single rotation as required in solar pumps, bottling plant, pouch filling plant, pharmaceutical industries etc. Further it can be used as a measuring meter for gas, liquid as it is self rotating due to incoming fluid pressure. It comprises a nearly cylindrical pump chamber having inlet and outlet ports, a single double ended vane rotably mounted within the pump chamber and also slidebly mounted in a slot provided in a cylindrical rotor whereas the rotor is eccentrically mounted in the pump chamber and driven by a prime mover and an arrangement to calibrate the discharge volume of fluid like water or liquid medicine or similar fluid from the pump is provided. Further a central cam is provided to guide single or pluralities of vane to minimize the wear and tear of vane thereof. And further an intrinsic arrangement is provided to dynamically balance the rotor in association with pluralities of vane for operation under higher speeds.

Following invention can be better understood by the person skilled in the art with the help of Sheet 1/8 comprising Figure-1 and Figure-2 illustrate cross-sectional views of the first embodiment of the present invention.

Sheet 2/8 comprising Figure-3, Figure-4, Sheet 3/8 comprising Figure-5, Figure-6, illustrate the functioning of the first embodiment of the present invention.

Sheet 4/8 comprising Figure-7, Figure-8, Sheet 5/8 comprising Figure-9, Figure-10, Sheet 6/11 comprising Figure-11, Figure-12 illustrate the functioning of the channels of the first embodiment of the present invention.

Sheet 7/8 comprising Figure-13 and Figure-14 illustrate cross-sectional views of the second embodiment of the present invention.

Sheet 8/8 comprising Figure-15 and Figure-16 illustrate cross-sectional views of the third embodiment of the present invention.

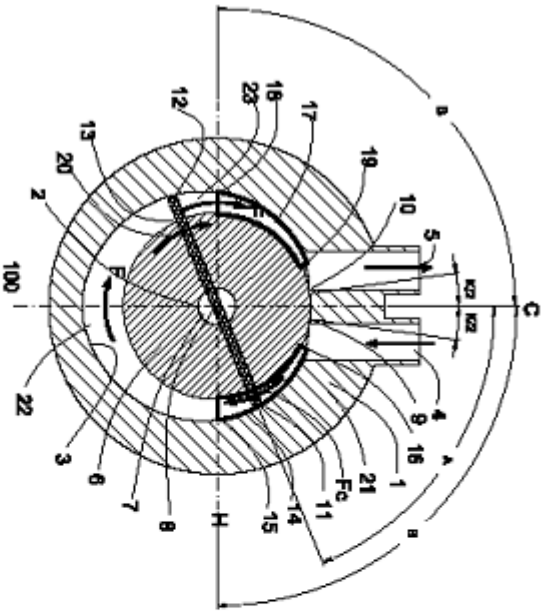

Figure-1

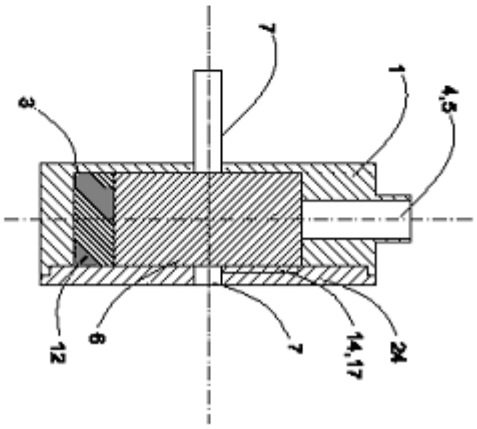

Figure-2

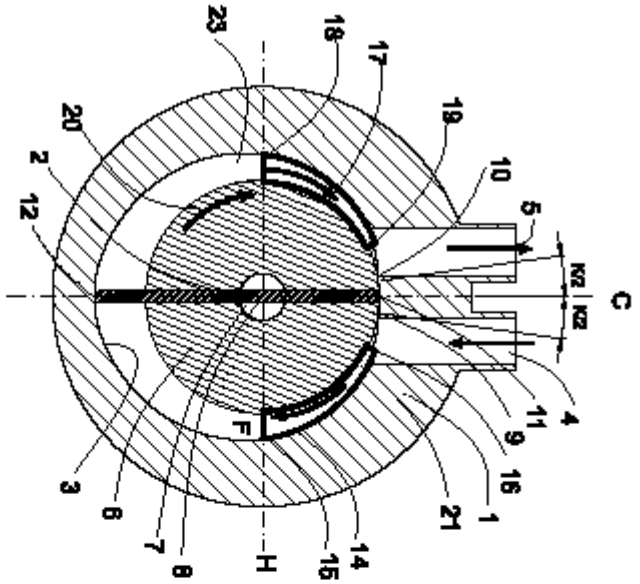

Figure-3

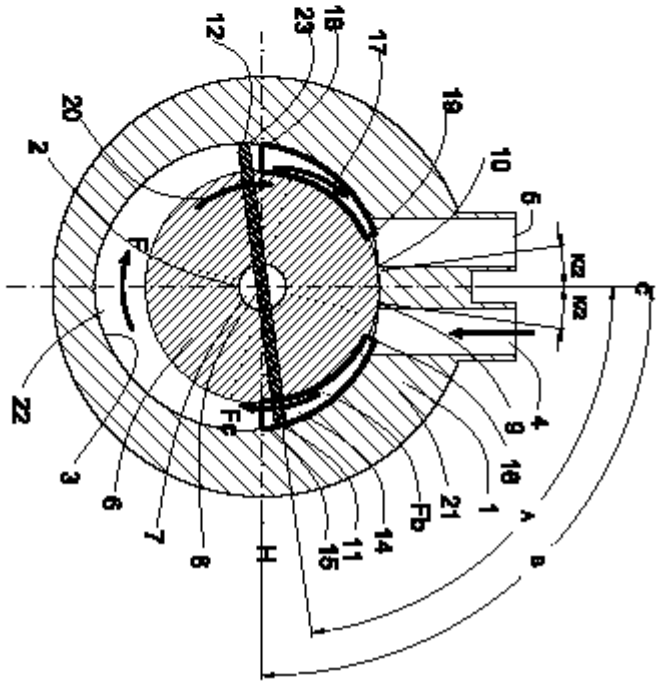

Figure-4

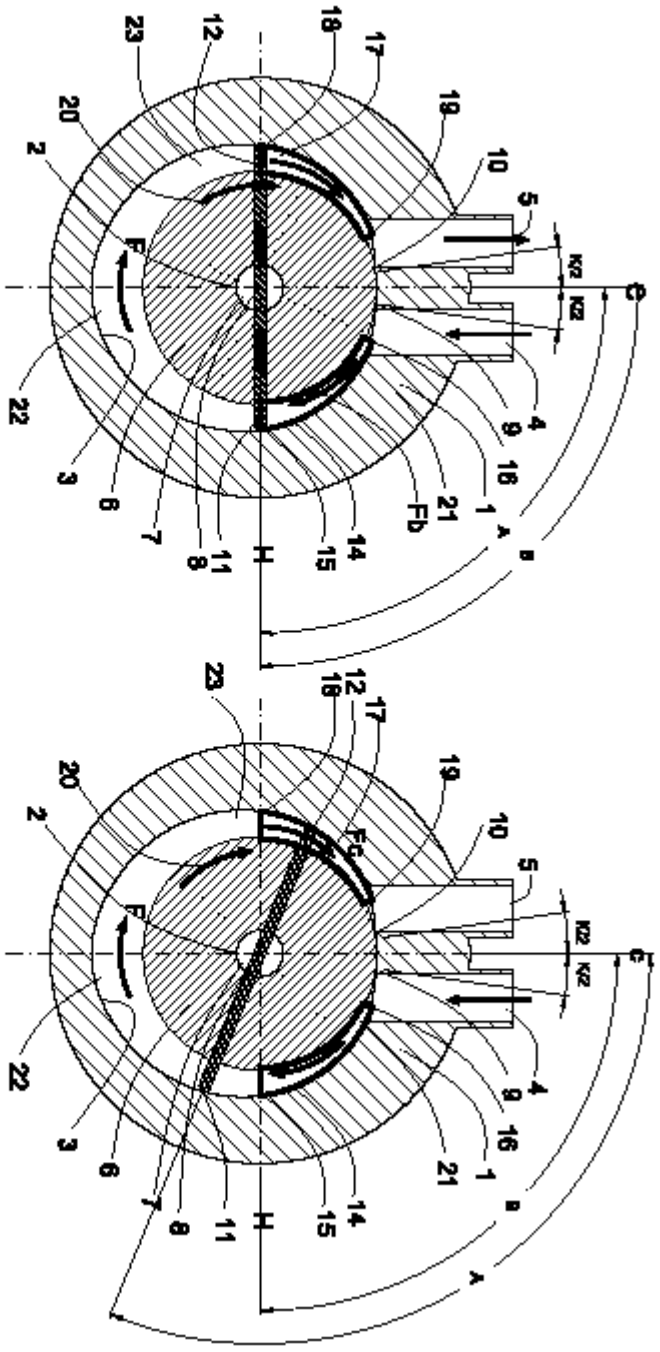

Figure-5

Figure-6

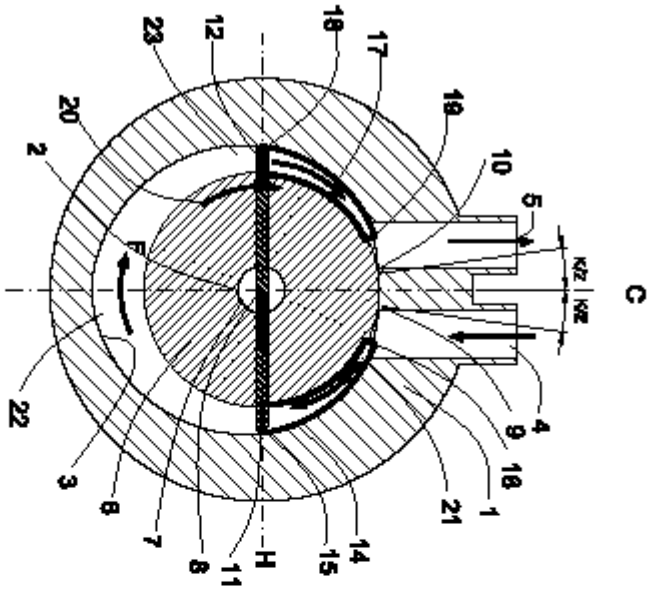

Figure-7

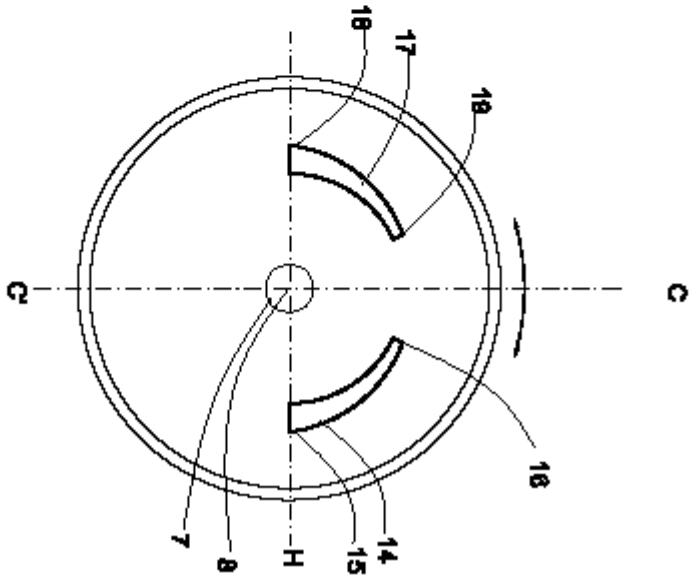

Figure-8

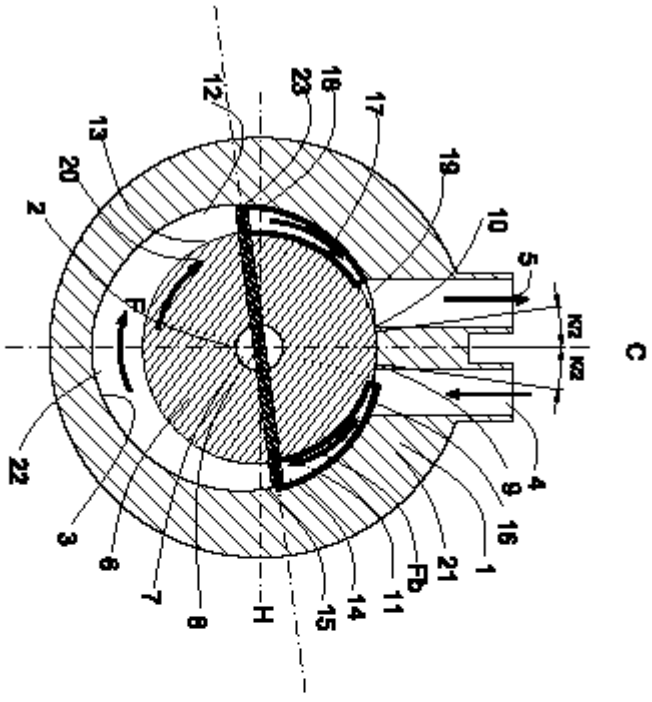

Figure-9

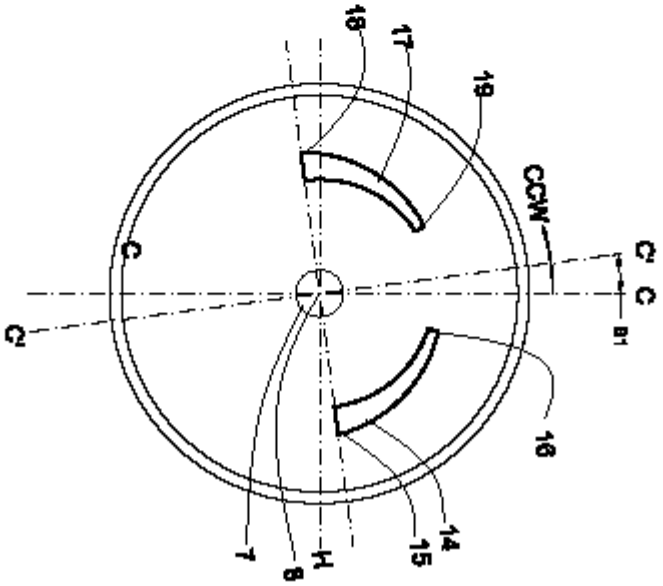

Figure-10

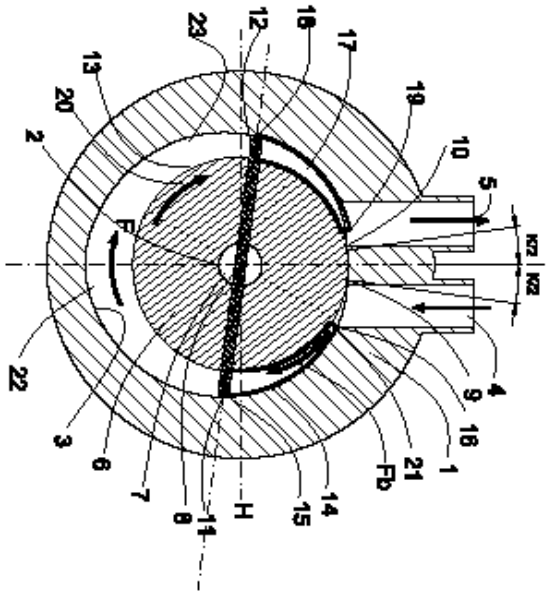

Figure-11

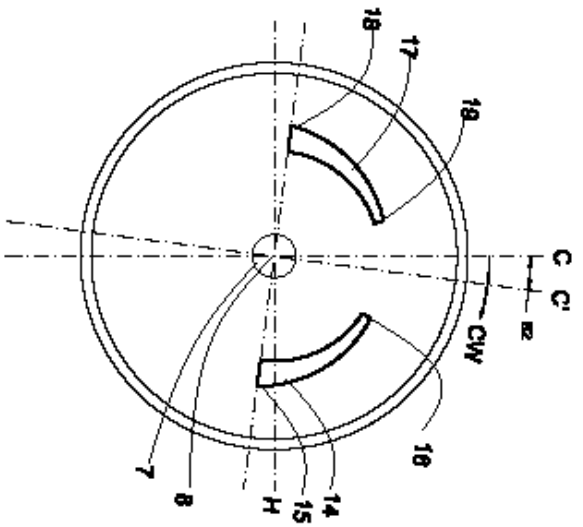

Figure-12

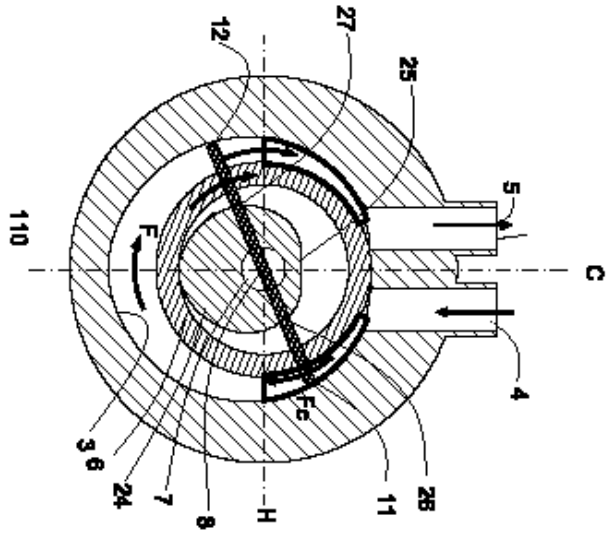

Figure-13

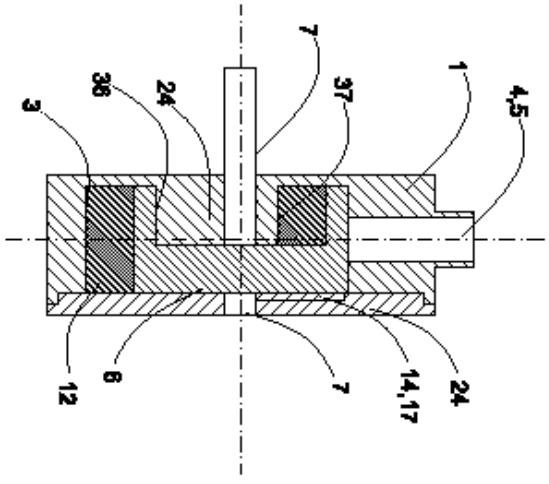

Figure-14

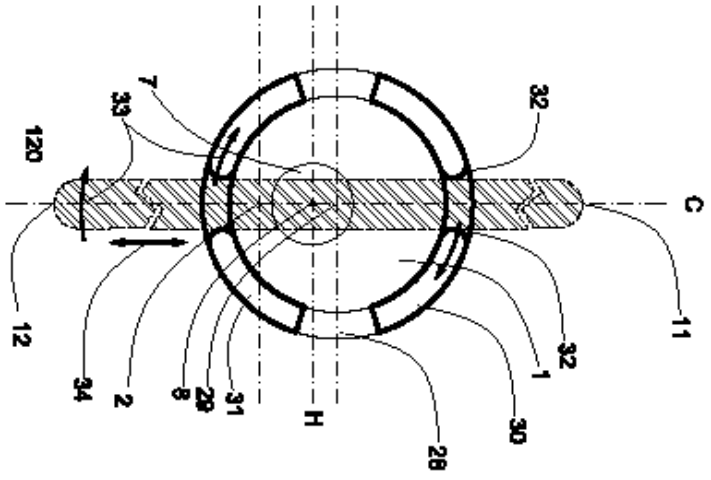

Figure-15

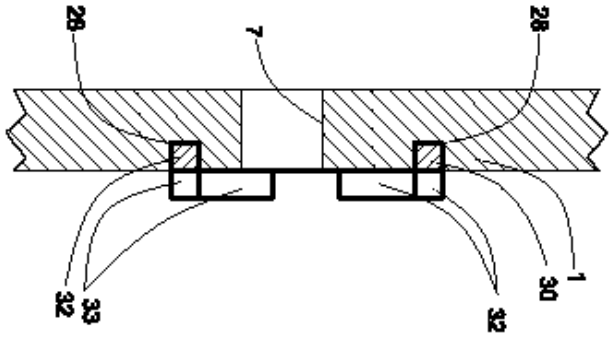

Figure-16

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 27th day of May 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 15th day August 2010

Name: Ingole Vijay Tulshiram

Ingole Ashutosh Vijay

Ingole Paritosh Vijay

To,
The Controller of Patents
The Patent Office
At Mumbai