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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**Energy saving apparatus for Water Pump****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 16th 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.

Fee Rs 1000 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 16th 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

Energy saving apparatus for Water Pump

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 an apparatus known as draft tube means cone for water pump. More particularly relates to draft tube for water pump having high water discharge velocity.

Prior art:

Water pump and generally electric water pump set employed in agriculture purposes are designed to lift water as standard equipments having certain delivery head with particular suction and delivery pipe diameters. The applications of such pumps are for irrigation wherein water is lifted from water wells, bore wells, lakes as well as from water canals. In general application water discharge is required at ground level. Total water head of such installations varies with season due to varying water levels however; there are situations where the water head is much lower than the water pump total head capacity. The users are desirous of getting maximum discharged water volume to maximize irrigation. It is customary to procure water pump with high head capacity due to uncertainty of water levels and further suction and delivery pipes with smaller diameter are preferred due to economical constraints. It is known that if actual water head is lesser than designed water head the water delivery discharge is at high velocity and pumps operate at very poor efficiency. In certain regions electric tariff for agriculture is subsidized so many places high power consumption becomes of less consequence for the users. However, such high power consumption is not desirable where there are power shortages and further it adds to global warming. It therefore strongly felt to address aforesaid problem to reduce power consumption of such water pump installations without compromising on other performance parameters.

Problems to be solved:

In order to overcome such ground reality a necessity is felt for an apparatus which will convert the high velocity head in useful water head to improve the efficiency means minimize power consumption of such installation without reducing the quantity of water discharged from the water pump. A novel apparatus resembling

a draft tube which minimizes power consumption, improves efficiency, suitable for standard pipe diameters, easy to install and economically affordable is proposed in the present invention.

These and other advantages will be more readily understood by referring to the following detailed description for a novel energy saving apparatus for water pump disclosed hereinafter with reference to the accompanying drawings and which are generally applicable to other water pump to fulfill particular application illustrated hereinafter.

Object:

1. Primary object of the present invention is to lower electric power consumption or fuel consumption of the water pump installation by improving the efficiency means to minimize global warming.
2. Important object of the present invention is to keep the normal water discharge unaffected.
3. Another object of the present invention is to minimize discharge velocity of the water pump.
4. Another object of the present invention to convert the velocity head into useful static head.
5. Further objective of the present invention is not to affect normal working of the water pump in the situation when discharge velocity of the water pump is basically low due to higher operating water head.
6. Yet another object of the present invention to target the most popular ratings of the water pump sets to maximize the scope of applications so as to save maximum energy.
7. A still further object of the present invention is to provide add on apparatus with an ease of installation by providing an inbuilt standard pipe fitment thereby avoiding any need of additional accessories.

8. Still another object of the present invention is to have an apparatus which is easy to manufacture and at affordable price.

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 specification provides the summary of an energy saving apparatus for water pump. When water pumps are deployed to lift water from various sources they face serious problems of varying water head to a great extent. Water head may vary right from few metres to hundreds of metres according to the seasons. Hence power pumps designed for high heads are preferred by farmers to cater for the yearly water level variations. It is known that the input power requirement is maximum when the total water head is lowest because water discharges at a high velocity causing heavy losses which overloads the driving equipment like electric motor contributing to poor efficiency. This problem is further aggravated when smaller discharge pipe diameters are used being a common practice due financial constraints. According to the preferred embodiment of the present invention all aforesaid problems are solved by the present invention to reduce the power requirements and improve the efficiency of installation. Though the preferred embodiment can be realized for most of the water pumps, presently the embodiment is targeted to cover popular agriculture electric water pumps specifications from 2.2 Kw to 10 Kw rating with maximum water head from few metres to more than 100 metres with discharge pipe diameter of 50mm to 100 mm. For a typical installation power saving more than 50% can be realized. Furthermore the permanent installation of the present embodiment does not affect the normal working of the installation under various conditions.

According to a preferred embodiment of the present invention a water pump installation is provided with delivery pipe of certain dimension for the discharge of water. The velocity of discharged water increases when water head encountered by the pump decreases. The energy in discharged water is proportional to the square of velocity. In order to reduce the energy of such discharge it imperative to reduce the velocity without affecting the discharged quantity of water. The preferred embodiment of the present invention is an apparatus similar to draft tube which is attached to the delivery pipe of the water pump. Draft tube provides a gradually expanding discharge passage for water flowing from the discharge pipe. When water flows in the draft tube from smaller area to larger area and if change of such area means diameter is more, the water tries to separate from the wall which is known as

cavitations hence angle of the draft tube cone is restricted between 5° to 7° however; 6° is preferred for most of the applications. The draft tube supplements the action of the water pump by deriving the energy remaining in the velocity head of water discharging from the delivery pipe. Draft tubes are shaped to decelerate velocity of water flow with a minimum loss so the kinetic energy of the flow discharged from the delivery pipe efficiently regained by conversion into suction head. For the draft tube to operate properly its discharge opening must be adequately submerged beneath the final discharged water level. If the discharge opening is inadequately submerged, air can enter the draft tube and the suction head could be lost. During the installation or defective non-returning valve attached to suction pipe or due to any other reason the discharge pipe and draft tube may be filled up with air means void of water. During the initial run the air is driven out by the pressure of water however, air trapped in the draft tube cannot be removed due to negative pressure which may hamper its working so an air release non returning valve and a damper to partially cover the outlet of draft tube are to be provided. Before the pump is to be started the damper is pulled down on the draft tube so as to partially cover its outlet opening. After the starting of the pump the trapped air gets released from the air release non returning valve because of the partial discharge from the draft tube which increases the outlet velocity develops higher pressure inside. In this manner the entire air from the installation including the draft tube gets removed and replaced by water and the air release non returning valve starts discharging water. Partial discharge of water from the draft tube covers up the outlet opening and fills up the water tank and the damper is lifted away from the draft tube outlet opening for the normal working of installation. For repetitive operations of sound installations, the afore said procedure may not be repeated.

According to first preferred embodiment of the present invention an energy saving apparatus means a specially designed draft tube means cone, hitherto referred to as cone comprises a conically shaped apparatus having an inlet diameter and outlet diameter where the outlet diameter is larger than inlet diameter and it further comprises pipe threads formed on the inlet side to take up threaded pipe whereas the outlet is provided with outlet openings of adequate area being normal to the tube axis and the cone larger end means towards the outlet is fixed to a water tank so that when the discharge fills the water tank the cone outlet openings are adequately submerged and further an air release non returning valve near inlet and a damper near the outlet openings are provided for releasing the air trapped in the cone.

Another preferred embodiment of the present invention is an adaptor, hitherto referred to as draft tube adaptor, in the form a draft tube of which one end be attached to the first preferred embodiment and other to a discharge pipe of smaller diameter.

These and other features and advantages will be more readily understood by referring to the following detailed illustrations for a novel energy saving apparatus for water pump disclosed hereinafter with reference to the accompanying drawings and which are generally applicable to other water 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 1/3 comprises Figure-1 illustrating partial sectional views of elevation and plan of draft tube, Figure-2 showing partial sectional elevation and plan of draft tube adaptor,

Sheet 2/3 comprises Figure-3 showing partial sectional elevation and plan of damper. Figure-4 shows partial sectional elevation and plan of water tank.

Sheet 3/3 comprises Figure-5 illustrating the assembly of draft tube and water tank attached to the discharge outlet of the water pump, Figure-6 illustrating the assembly of draft tube, draft tube adaptor and water tank attached to the discharge outlet of the water pump.

Detailed description:

Figure-1 shows partial cross section of elevation and plan of draft tube 10 used in first preferred embodiment presently showing suitable for 65 mm discharge pipe diameter of water pump. Water inlet is shown by arrow 18. Draft tube has an inlet diameter 12, internal pipe threading 13 is provided between inlet diameter 14 and 12. an air release non returning valve 15 is fixed close to the inlet diameter 12. The cone of the draft tube is formed between diameter 12 and diameter 16 and makes a preferred $\frac{1}{2}$ angle 11 of 6^0 to the axis of the cone where diameter 16 is larger than inlet diameter 12. Outlets 20 are provided at the larger diameter of the cone. Arrows 19 show the preferred direction of discharge of the water through the opening 20.

Figure-2 shows partial cross section of elevation and plan of draft tube adaptor 30 used in second preferred embodiment presently showing suitable for 50 mm discharge pipe diameter of water pump. Water inlet is shown by arrow 39. Water outlet is shown by arrow 40. Draft tube has an inlet diameter 32, internal pipe threading 33 is provided between inlet diameter 34 and 32. An air release non returning valve 35 is fixed close to the inlet diameter 32. The cone of the draft tube is formed between diameter 32 and diameter 36 and makes a preferred $\frac{1}{2}$ angle 31 of 6° to the axis of the cone where diameter 36 is larger than inlet diameter 32. Arrows 19 show the preferred direction of discharge of the water through the opening 36. External pipe threading 38 is provided on the larger diameter 37 to suit 65 mm pipe which can be fitted to inlet of draft tube as described in Figure-1.

Figure-3 shows partial cross section of elevation and plan of damper 80. It is conical in shape and $\frac{1}{2}$ angle 84 equal to the half angle 11 of cone 10 (Figure-1) and having a thickness 87. It has small diameter 82 and large diameter 81. The large diameter 81 is smaller than the large diameter 17 of cone 10 (Figure-1) such that the damper partially covers the outlet opening 20 (Figure-1) when placed on cone 10 (Figure-1). The flag 81 has a diameter 86, meant for holding and up & down movement, is located on the small diameter 82.

Figure-4 shows partial cross section of elevation and plan of water tank 70. The internal diameter 72 of the tank 70 is larger than the outer diameter 17 of draft tube 10 (Figure-1). A circular projection rim 71 is provided having an internal diameter 73 so that outer diameter 17 of the draft tube 10 (Figure-1) fits snugly to form a proper assembly of the apparatus.

Figure-5 illustrates the assembly and positioning of water pump (not shown) discharge pipe 60, draft tube 10, and water tank 70. Water inlet direction to the apparatus is shown by arrow 61, water 52, draft tube water outlet 20, water discharge flow direction 19, positioning of tank on projected rim 71 and draft tube diameter 17. It further shows the water discharge 53 from the tank 70. The assembly is placed on horizontal platform 54 and the axis of the draft tube to be kept vertical position as shown by arrow 57. It shows the position of air releasing non returning valve 15 at the smaller diameter 12 of the tube 10. It further shows the desired movement of damper 80 by bidirectional arrow 85a. It shows the position 85b of damper 10 partially covering outlet opening 20 of cone 10 for removing the trapped air through air releasing non returning valve 15 at the time of starting the water pump. After the removal of air the damper is kept at position 85a.

Figure-6 shows the assembly and positioning of water pump (not shown) discharge pipe 50, draft tube adaptor 30, draft tube 10 and water tank 70. Water inlet direction to the apparatus is shown by arrow 51, water 52, draft tube water outlet 20, water discharge flow direction 19, positioning of tank on projected rim 71 and draft tube diameter 17. It further shows the water discharge 53 from the tank 70. The assembly is placed on horizontal platform 54 and the axis of the draft tube to be kept vertical position as shown by arrow 57. It shows the position of air releasing non returning valve 15 at the smaller diameter 32 of the tube 30. It further shows the desired movement of damper 80 by bidirectional arrow 85a. It shows the position 85b of damper 10 partially covering outlet opening 20 of cone 10 for removing the trapped air through air releasing non returning valve 15 at the time of starting the water pump. After the removal of air the damper is kept at position 85a.

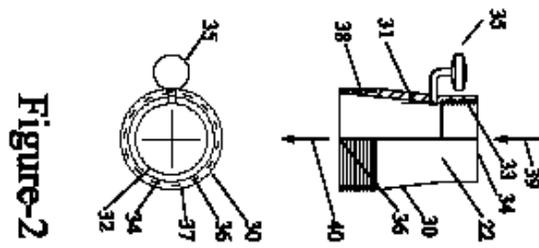
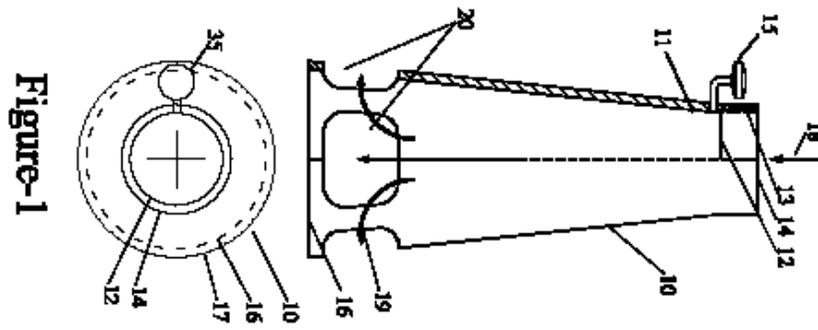
Further objects and features can be readily understood by any person skilled in the art by referring to the detail description and appended claims of the invention.

CLAIMS

We claim:-

1. An add on energy saving apparatus for water pump which saves energy, reduces the discharge velocity and converts it in to useful water head, does not reduce normal water discharge, does not affect normal working of water pump, easy to install, easy to manufacture and cost effective;
2. The first preferred embodiments of the apparatus as claimed in claim 1 comprising:
 - a. A cone having small inner diameter opening and large inner diameter opening;
 - b. The smaller diameter opening for water inlet and large diameter opening for water outlet;
 - c. The cone having a thickness to sustain weight of water and pressure;
 - d. the cone having height means length;
 - e. The half angle of cone preferably between 5° and 7° ;
 - f. A threaded part to fix delivery pipe to small diameter end;
 - g. Discharge outlet openings for water discharge formed on the cone near the large diameter end;
 - h. Material for cone preferably thermo-plastic;
 - i. An air release non returning valve for the cone fitted near small diameter;
 - j. A damper to close or to open the discharge outlet opening of the cone;
 - k. The damper movable up & down on the cone;
 - l. A water tank to support, position and fix the cone and cone assembly;
 - m. The diameter of the water tank to suit the discharge velocity;
 - n. The height of the water tank to cover the discharge outlet openings of cone completely;
 - o. Material for tank preferably thermo-plastic;
 - p. The apparatus preferably mounted vertically;
3. second preferred embodiments of the apparatus as claimed in claim 1 comprising:
 - a. A cone having small inner diameter opening and large inner diameter opening;

- b. The smaller diameter opening for water inlet and large diameter opening for water outlet;
 - c. The cone having a thickness to sustain weight of water and pressure;
 - d. The cone having height means length;
 - e. The half angle of cone preferably between 5° and 7° ;
 - f. An air release non returning valve for the cone fitted near small diameter;
 - g. A threaded part to fix delivery pipe to small diameter end;
 - h. A threaded part on large diameter end to fix the small diameter of cone as claimed in 1;
 - i. Material preferably thermo-plastic;
 - j. An air release non returning valve for the cone fitted near small diameter;
4. The device as recited in claim 1 to 3 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 Figure-1, Figure2, Figure-3, Figure-4, and Figure-5



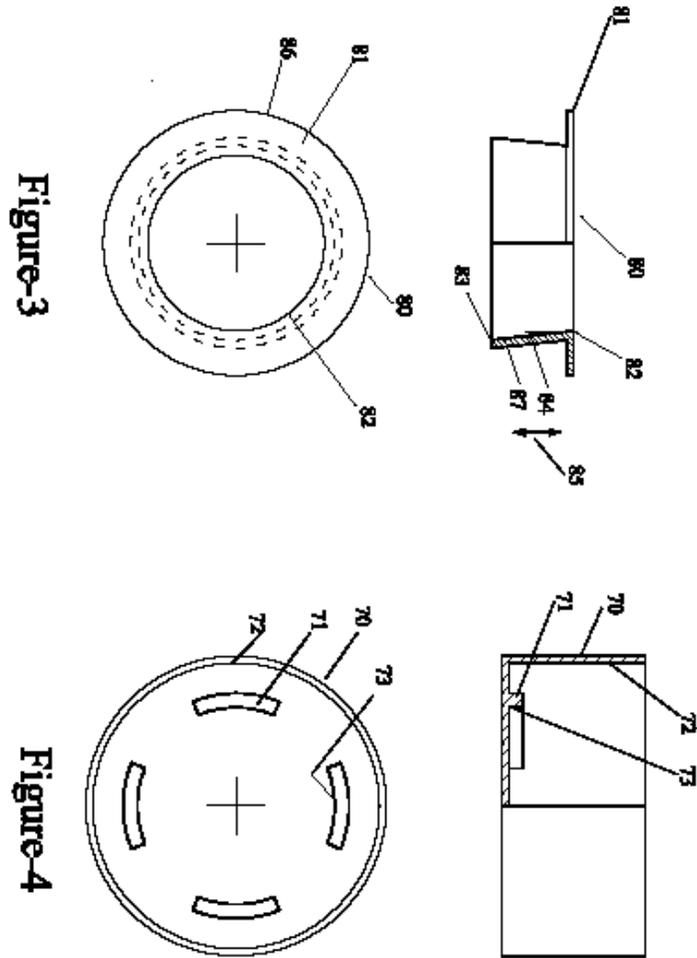
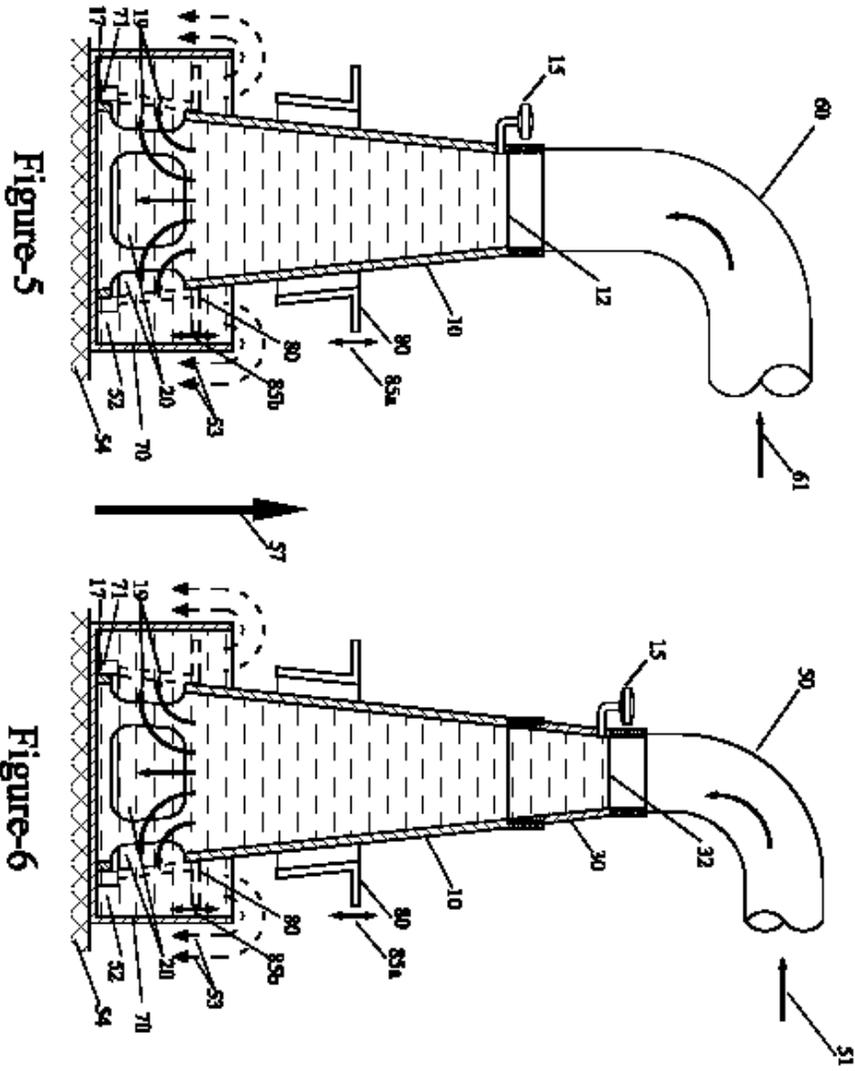


Figure-3

Figure-4



ABSTRACT

Water pump and generally electric water pump set employed in agriculture purposes are designed to lift water as standard equipments having certain delivery head with particular suction and delivery pipe diameters. The applications of such pumps are for irrigation wherein water is lifted from water wells, bore wells, lakes as well as from water canals. In general application water discharge is required at ground level. Total water head of such installations varies with season due to varying water levels however; there are situations where the water head is much lower than the water pump total head capacity. The users are desirous of getting maximum discharged water volume to maximize irrigation. It is customary to procure water pump with high head capacity due to uncertainty of water levels and further suction and delivery pipes with smaller diameter are preferred due to economical constraints. It is known that if actual water head is lesser than designed water head the water delivery discharge is at high velocity and pumps operate at very poor efficiency. In certain regions electric tariff for agriculture is subsidized so many places high power consumption becomes of less consequence for the users. However, such high power consumption is not desirable where there are power shortages and further it adds to global warming. It therefore strongly felt to address aforesaid problem to reduce power consumption of such water pump installations without compromising on other performance parameters.

In order to overcome such ground reality a necessity is felt for an apparatus which will convert the high velocity head in useful water head to improve the efficiency means minimize power consumption of such installation without reducing the quantity of water discharged from the water pump. A novel apparatus resembling a draft tube which minimizes power consumption, improves efficiency, suitable for standard pipe diameters, easy to install and economically affordable is proposed in the present invention.

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 16th day September 2010

Signature

Ingole Vijay Tulshiram

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

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 16th day September 2010

Name: Ingole Vijay Tulshiram

Ingole Ashutosh Vijay

Ingole Paritosh Vijay

To,
The Controller of Patents
The Patent Office
At Mumbai