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Water-lifting vane pump- the 'HYDRO-GEN'

CONSOLATION

Imli Toshi (22), hails from Mokokchung, Nagaland and has done his BSc and also obtained a Post Graduate diploma in Computer applications. Hailing from a farming background, Imli has also got hands on experience in some of the problems faced by rural farmers. Currently unemployed, he has always had a keen interest in machinery and automobiles and his other innovations include an innovative egg-boiler and hot-water filter.

Genesis The idea of this innovative pump came into his mind while he was washing his car at home. For this he needed to go to the water fall just near his house for filling up his bucket with water every time. Then he thought of the possibility of diverting the water to his car-washing place with a certain height. These thoughts resulted in the development of this innovative low discharge energy pump.

The Innovation

The innovation is a horizontally submerged centrifugal pump which works without the help of electricity or any fossil fuels (petrol, diesel) to power the motion. It is a novel combination of a Vane pump and spiral bladed water turbine. The vane pump offers the best combined characteristics of sustained high level performance, energy efficiency, trouble-free operation and low maintenance cost and Imli Toshi has managed to drive such a pump using the natural flow of river/dam water.

The innovation consists of the following main parts namely PVC casing, two supporters, shaft with spiral blades, Ball (used as a bearing), Thrust bearing and

three levers for supporting the shaft, a circular wooden block, three flat blades and Delivery pipe.

The pump is completely submerged in flowing water and the linear velocity of the water is used to drive the spiral blade shaft that is coupled to the pump and this provides the rotational velocity of the pump. This pump can lift water up to a height of one meter.

Advantages

This compact device can develop a good vacuum and does not require very high water velocity to run the turbine and thus it can be used in small channels or rivers. Continuous water supply and the uniform load distribution on the motor throughout the cycle due to the balanced system are some other salient features. This pump costs about Rs.800 which is much lower than the investment required for conventional pumps. As no electricity is required the operating costs are minimized. Whereas in a conventional pump set used for irrigation in the agricultural fields, at least around Rs.300/- per day is required. Installation costs are also eliminated as this pump just needs to be set in the water channel one night before the required day, as discharge rate is very slow. The maintenance cost of this pump is much less and there is no problem of rusting. Further it is light weight and hence portable and easy to handle.

user's wish. It can be used by a person whether he is inside or outside the room and can be adaptable for all types of doors. Another point in its favour is that it is suited for the rooms/ toilets used by mentally challenged patients and persons suffering from epilepsy as unauthorized/ accidental locking can be prevented.

A free spirit

After retiring from government service , Gobinda has devoted his time to creative works. The lack of interest of his family has not dampened his enthusiasm as he confides that when he starts a journey he is always determined to reach the goal. He is also the author of a book "Phrases and Idioms" which took him five years to complete. Most of his annual pension of Rs.48, 000 goes into experiments conducted in a small tool room at his house. Some of his other innovations include several small attachments to his cot which facilitate reading while lying down and some changes to his gate-locks which are now maintenance free in nature. He hopes that the L-Drop auto protector will be manufactured and used widely not only in India but also in the rest of the world. At the same time , he stresses the fact that he is an innovator and not a businessman and hence has left manufacturing to others. Expressing his desire to be free in all respects, he quotes a line from the poem, 'Miller of Dee'-... "I envy nobody and nobody

envies me". He goes on to say "Like the Miller, now, I am also a happy man without anxieties"

Test Report

The first model of the pump was tested in NERWRI (North Eastern Regional Water Research Institute). When the water speed was one meter per minute(3.3ft/minute) the speed of the shaft was 5 r.p.m. and the discharge from the vane pump was noted as one litre per 40 seconds (90 litres per hour) at one metre head and one m/s velocity of water. It operated at low cut-in of two feet per second.

Of great rural relevance

This pump is cheap and runs on its own. It is a low cost, self generating water pump which can be used to pump water from a feed water channel to the crop field. This could also be used in remote mountain areas where it can be used just to raise water from a river on to adjacent areas. This rotating unit can also be used for generating power or used for any other secondary agrarian mechanical operation.