



## **Natural Water Cooler, auto air kick pump and others**

**Arvindbhai  
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An accomplished technician and fabricator, Arvindbhai Patel (57 years) is a persistent innovator who has never learnt to give up. With his keen mind, he has developed many innovative products such as Natural Water Cooler, Auto Air Kick Pump, Auto Compression Sprayer and Innovative tongs.

For the past twenty years, Arvindbhai has devoted himself to the expression of his creative genius, undeterred by economic hardship and lack of support. He was born in the village Vanch, 10 km from Ahmedabad, in 1955. His family practiced agriculture, but Arvindbhai's mind could not be satisfied with this. He wanted to do something different. A long period of struggle and economic hardship followed but he remained undeterred. And today Arvindbhai probably has the maximum number of technology licensing for several of his innovations among all the grassroots innovators.

Youngest among six siblings, he could study only up to class tenth. With nobody else educated in his family, Arvindbhai only had his motivation to pursue his studies. After completing school, he tried to enroll in a commerce course. However, as the medium of education was English, he couldn't cope with it and had to discontinue. Later he joined an automobile garage and learnt practical skills of auto repairs for two years.

In 1980, he traveled to Saudi Arabia, where he worked for a few years and returned back to settle down in his native village. He lived there till 1993 and thereafter moved to Ahmedabad. Arvind's wife Jaishree is a schoolteacher who holds a Masters in Arts and a Bachelor's in Education. Their son is a mechanical engineer while daughter is a physiotherapist. Both his children have been instrumental in triggering ideas in him for new innovations. Initially, his wife considered him to be over enthusiastic and asked him to

concentrate on a steady job and leave alone, the work on innovations as it did not earn him regular money. But her views changed once the products were widely used and he started getting widespread recognition.

Arvindbhai's innovations are in diverse fields. However, the ones in the non-conventional energy sector have been more widely appreciated. These include a water cooler, low cost solar water heater, auto air-kick pump, and innovative application of the windmill, amongst others.

#### 'Natural' Water cooler

The idea of the water cooler came to Arvindbhai when once he was running a fever. His wife repeatedly applied cold packs to his forehead to keep the temperature in check. This gave him an idea to use the same principle to develop a water cooler, which would not require electricity. In his natural water cooler, water is passed through copper coils covered with cotton cloth, which is continuously being moistened by a dripper. Evaporation of water from the cloth wrapped on the coil cools the water inside. He has obtained a patent for this cooler, which was facilitated by



SRISTI/GIAN West. He was also supported under the Micro Venture Innovation Fund (MVIF) scheme of NIF for commercialisation of this technology. GIAN West also facilitated the technology transfer of this cooler to entrepreneurs.

The cooler is useful for supplying cool drinking water in hot summer, particularly in areas where electricity is absent or erratic. It is suitable for schools, banks, hospitals, bus and railway stations and similar such places. Initially, Arvindbhai manufactured his water cooler in three different capacities of 5, 10 and 20 litres. But now he is only manufacturing 100 and 150 litres capacity coolers. About 600 units of different capacities have been sold so far and are in use. Using the same concept, he has also been trying to develop a cold storage for vegetables.

#### Auto Compression Sprayer

In case of conventional sprayers, spraying is done by continuous pumping by hand, which is tedious and tiring. Shortage of labour is also a big problem as spraying has to be done at a particular time, failing which the pest attacks can be a serious problem.

Arvinbhai Patel has modified a knapsack sprayer into an auto compression pesticide sprayer. He realised that the jerks produced during walking could be utilized for the oscillation of the piston in a cylinder. So he used a spring and additional weight to magnify these jerks to generate requisite pressure in the tank to spray the pesticide. This device thus works on the concept of dead-weight oscillation, which causes the reciprocation of the piston and results in spraying action. While the technology holds great promise, effort is on to optimize the spring size and material vis-à-vis the dead weight keeping in mind the pumping efficiency.

#### Auto Air-Kick Pump

This innovation is a low cost, portable, compact aid to inflate tyre tubes/punctures of any vehicle, particularly two-wheelers, having kick start or auto start mechanism. One can fix the problem on the spot so that the vehicle can reach the nearby gas station or repair shop.

This device converts the compressor of two-wheeler into an air pump. A pinch of polymer granules is also inserted in the tube to seal the leakage.



The user can kick and fill air in the tube. This may last for a few kilometers to reach a puncture repairing shop. An entrepreneur from Mumbai had taken non-exclusive license for this technology and sold more than 2500 pieces, mainly in North Eastern India. Arvinbhai later modified his technology suitably to adapt it for four wheelers as well.

#### Suraksha Tong

In everyday life, one has to deal with hot plates and vessels regularly, mostly in kitchen. Tongs are the commonly used gadgets used for holding hot or heavy utensils, which is inevitable in any kitchen, laboratory, and mechanical workshop. Tongs available in the market are often clumsy and unsatisfactory for the user. In most of the cases, they are unreliable and cause accidents.

Arvinbhai keenly watched the functioning of the common household tongs and discussed the problems with users. Using the feedback obtained, he designed a tong made of stainless steel pipe having length adjustment facility to fit vessels with different diameters. Spring mechanism is provided for length adjustment facility. End of each



shafts are connected with semi-circular arc type plate and handle grip to hold edge of the utensil, which ensures safe lifting and usage. A set of two tongs can easily hold 10–15 kg weight.

#### Other efforts

Arvindbhai developed a fascination for solar energy, which drove him to fabricate a 50-litre solar water heater in 1985. He used HDPE/PVC for the storage tank and straw of bajra (pearl millet) for insulation. Between 1985 and 1990, he made eight different models for trying out different materials and correcting the flaws or deficiencies he came across until he was fully satisfied.

The idea of harnessing wind power struck Arvindbhai sometime in 1996 when he was looking at clothes drying in the wind. He used a curtain, a rod and an air pump to fashion a rough model of a wind tunnel. After several experiments and fabricating different models, he came out with a horizontal 'Low Air Thrust Multi-curtain System'. The device, Arvindbhai visualises, can be beneficially used for pumping water, heating water, inflating tyres, drip irrigation and even for running a grinder/juicer.

Normally, while one person flies a kite, another person holds the reel, allowing it to unroll as per requirement. Once during the kite festival, his daughter refused to hold the reel for her brother who was flying the kite. To settle the children's quarrel, he designed a new reel holder to wind the kite thread. With this new holder, a person can fly a kite without an assistant to hold the reel.

Arvindbhai is a man driven with passion to strive continuously to deliver something new and better for the society. Despite several setbacks, resistance from the family and financial constraints, he has been single mindedly pursuing his passion, which at many times, is quite inspiring for other people. His mind is continuously buzzing with new ideas and eyes are always on the lookout for problems, which he can engage his mind with.