Modified design for air blowers[35]

CONSOLATION

Yagnesh Mehta (39) hails from Ahmedabad, Gujarat. He did his B.Com from LG College of Commerce in 1986. His family consists of his wife and son. His father was director, Land revenues in the state government. After completing graduation Yagnesh joined a company called Magnet Duplicators, manufacturing Cyclo-style machines. He worked in that company for about two years and in 1988 he joined another company called Seagon Systems. He joined this company when it had just started manufacturing air curtains. So he was able to learn the manufacturing process during his tenure with them.

In 1989 Yagnesh left Seagon systems and started his own concern in partnership with a friend. His company was called Natural Environment Control Systems. He was assembling air curtains and selling them through this concern. His partnership did not last for long and in 1992; he started an independent company called Natural Environment Controls (NEC).

Today he has an office and a factory. He invests whatever he has into his innovations. Some of his other innovations include an improved hand-disinfector with micro-processor control which he has started selling and electro-magnetic locks.

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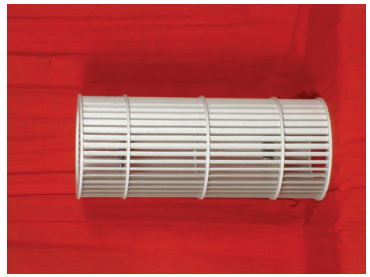
Genesis Till 1992, Yagnesh did not manufacture the blowers used for air curtains but used to get the fabrication done from outside. He purchased the motors from the market and used to design and assemble air curtains.

But the air curtains he used to sell had a lot of defects. In these the fins made of aluminium were joined with the ring and then the blowers were joined with each other. Yagnesh observed that because of too many joints, the air curtain was making too much noise while rotating due to loosened blades, the joints would sometimes come off, they used to slip, etc. In addition since the fins were made of aluminium, they used to bend very easil and part of the aluminium used to get converted into powder dust form due to certain chemical reactions. Also as the fins were 1.8 micron in thickness, when the air stroked the edges of the fins, due to the thickness, backpressure was generated. This sometimes caused the bending or breaking of the fins or the burning of the motor. Due to these problems, his customers used to complain and this affected his goodwill.

So Yagnesh started searching for an alternative in 1993-94. At that time, he came across an imported wall-mounted air-conditioner manufactured in Japan, in which the blower was made of plastic. Yagnesh then imported a blower from Hitachi, Japan to study it. He noticed that this blower was made of multiple pieces joined together, but that at high rpm it would break off due to lack of strength. Yagnesh then got the idea of using plastic



and decided to start working on the plastic fins. The main problems were that the fins were irregular in dimension because of the moulding procedure and there was no adhesive available which could add to the strength of the blower. Searching for some solution, Yagnesh contacted CIPET (Central Institute for Plastic Engineering and Technology) but was told that it was very difficult to extrude aerofoil shape from ABS plastic. Around this time, Yagnesh contacted Mr. Parera (an expert in the field of plastics) who told him that he already had a similar concept based technology with him. But to test that, a die needed to be made. He offered to take up the project with Yagnesh, if he was willing but warned him that risk was involved. The project cost was estimated at two lakh rupees. At that time, Yagnesh was already struggling under a debt of about 6-7 lakh rupees. Still he borrowed money from lenders on interest and invested it in this project. After six months the fins were ready but not the outer ring. So Yagnesh got a die made for the outer ring according to the newly designed fins. Now the problem was how to join the fins to the outer ring so that the blower doesn't break. Yagnesh contacted Bayer ABS, manufacturers of plastic granules and got to know about the ultrasonic welding technology. But the machine used for this was very expensive and Yagnesh could not afford it.

After about two months, he got to know from Bayer that a particular chemical could be used as an adhesive. But they were not so sure about the chemical reactions. Yagnesh did a test experiment and found that when put into this chemical, ABS melts in about twenty four hours and results in a paste, which can be used as an adhesive. With this adhesive he joined the fins with the outer plates. This was in 1998-99.

The Innovation

Yagnesh has made an innovative design for the blower using ABS plastic material. He has been able to extrude ABS plastic and make fins out of it for the blower. The fins he made are of aerodynamic profile with the edges being narrower than the middle portion. Due to their aerodynamic profile, there is low obstruction to air flow as compared to aluminium/stainless steel fins which are flat and rectangular in profile. He uses a special chemical mixed with ABS plastic as adhesive for his blower. This adds to the strength of the blower.

Advantages

This blower would be cheaper than the aluminium/ stainless steel blower. Power consumption is reduced in this blower as the backpressure is reduced on account of the aerodynamic profile of the fin. The strength of the modified blower is more than the conventional aluminium blower thus cutting down on maintenance costs. There is negligible noise and vibration as compared to aluminium blowers. Other existing plastic blowers which are used in Window and split Air conditioners have joints and are not suitable for high static pressure applications such as in package units of A/c plants. This is what Pankaj R Dhirkar, Executive Director Dikshit Consultants and Engineers Pvt. Ltd and past President, Indian Society of Heating, Refrigerating and Air Conditioning Engineers, has to say about this blower:

"This has all the advantages of a metal blower as well as that of a plastic one. It will solve the problem of using a large sized blower as in the case of a metal one and besides will not face the problem of corrosion or powder separation. ABS plastic blower will be more durable as compared to a metal blower but will have equal precision… The power consumption would also be reduced due to this innovative design."

This innovative concept can also be used in industries dealing with the manufacturing of axial fan, continuous grill etc and many more where single mould is not applicable or product strength is essential.

Negotiating with the formal sector

With this prototype, Yagnesh contacted Amtrex Hitachi in Kadi. At that time, Hitachi had a requirement of about 1500 blowers per month and was purchasing blowers at the cost of Rs 1200 per blower. Yagnesh offered to sell them his blower at Rs.700. But for manufacturing these blowers a die was required which would cost one lakh rupees. Yagnesh made a proposal to Hitachi to share the cost of the die on 50:50 basis. But Hitachi

took six months to consider this and still reached no conclusion. So Yagnesh decided to go for it himself.

Well deserved success

In 2001, Yagnesh opened a new firm which he named Sri Aerodynamics products and started manufacturing air curtains. He started assembling the blower himself in the hall of his home (of which one room was rented and his family was living in the second). He and his wife were the sole employees. He got his first order on 14th Jan 2001 and he made the delivery on Jan 18th. Since then Yagnesh has not looked back. He is just relieved that his bad times are over. He recollects some of his struggles during the process of developing this innovation. There were times when he had no source of income. He had to manage the household on whatever past savings he had. To bring in some cash, he even rented the master bedroom of ahis two-room house. Yagnesh acknowledges that he was able to get through that bad phase only because of his wife. She has been his constant support and source of inspiration while going through the ordeal.

Future Plans

Yagnesh Mehta wants this innovation to contribute to the air conditioning and AHU market worth more than Rs. 50 crores in India which is currently dominated by imported blowers manufactured by EBM, Nicotra, Nadi and PUNKER. He feels that we have not succeeded in this market because we do not have facilities for laboratory testing for providing technology feedback. *"Whatever is with you, share it and learn from others - you can even reach heaven this way,"* is the belief that guides Yagnesh.