

Laxmi Asu Making Machine

National First
Mechanical and Electronics



C Mallesham
Nalgonda, Andhra Pradesh

Before weaving various patterns on the loom, a hand winding process of yarn is required in the traditional 'Tie & Dye' Pochampalli silk saree tradition. This is a very tedious and cumbersome process and involves two and fro moving of the hand thousands of time in a span of four-five hours. Mallesham (37), a traditional weaver, has made a device to mechanize this process and relieve women, who generally do this task, from the drudgery involved.

Learning early: Chintakindi Mallesham was born in a traditional weaver's family in a small village of handloom weavers, Sharjipet. His parents, Laxminaraan and Laxmi taught him to weaving from his tenth year onwards. By studying during nights and working during the day, he could complete his studies regularly till class seventh. Thereafter he took private tuitions to fulfill his desire of completing class tenth, which he could clear only after three attempts. But in view of weak financial condition of his family, he finally gave up studies in 1986. Though he did not have much time for other pursuits, he did like opening up dysfunctional radios and transistors and see the arrangement of components inside.



Keeping a tradition alive

His family has been pursuing the tradition of weaving Pochampalli saris for several generations. Pochampalli¹ silk sari is an exquisite tradition of double *ikat* style of weaving with a wide variety of colours and intricate designs of geometrical patterns. It is distinguished because it has similar appearance of design on the front as well as the back side of sari. Before weaving these patterns on loom, hand winding process of yarn has to be pursued, called *Asu*. This process involves moving hand, over a space of one meter up and down around semi-circularly arranged pegs, 9000 times for one sari, demanding high concentration and accuracy. On each peg one has to wind four times before moving to the next peg. For each sari almost four to five hours are required. Entire design on the saris is totally dependent on the *Asu* process. Traditionally, ladies of the family performed this activity as it was done sitting under the shade or at home. But it involved long hours and lot of physical effort. After the *Asu* process, designs are marked on the threads and tied suitably, and then dyed in selected colours. The coloured threads are wound on spindles and used in looms for weaving sari, incorporating the beautiful designs and patterns of this tradition.



Genesis: All for mother's pain

His mother, Laxmi, used to do the *Asu* for the saris woven by his father and him. In a day, at the maximum, she could do the *Asu* for two saris only, as it involved 18000 *to* and *fro* movements of one hand. This caused tremendous pain in her shoulders and elbow joints. She would often tell her son that she could not do this any more. She also did not want his wife to go through the same ordeal and suggested him to look for other avenues. For untrained and less educated Mallesham, it was not easy. Also, doing *Asu* just for two saris per day was not enough to fetch sufficient income. This was not the case with his family alone. Women of his

community looked after family, performed usual household chores and also worked for 8-9 hours to supply *Asu* material for two to three saris per day for eking out a precarious living. Working on the loom was not too strenuous for him, but the pain of his mother did bother him a great deal. He wondered if there could be an alternative method for *Asu* that would mean a better living condition as well as less physical drudgery for his mother. If there is a power loom to replace manual loom, why can not there be a mechanical device to alleviate his mother's pain? This thought became the genesis of the *Asu* Machine. And at the age of 20 years, in 1992, this young innovator started his dream project.

Earning, Saving, Improving Machine, Again Earning...

Mallesham, did not have much knowledge about mechanical or electrical technology. But what he had was a strong desire to relieve his mother's pain, which egged him on to achieve his goal. He started working on the idea and divided the entire process into five different parts. Part by part, he developed and fitted mechanical devices to a wooden frame. Since he did not have the right technical knowledge many times he ended up wasting money in buying incorrect parts. That money used to be the savings of days of his hard work. He then had to wait for some time to pool in his savings again and buy more parts. He did not get much free time since he had to work on loom by the day and on the *Asu* machine in the night. Earning, saving, spending on his project, became a cycle that went on for four years. At the age of 24, he married Swarna. His wife supported him by giving him whatever money she had. With that money, he managed to complete three parts successfully in 1997. But by then he had drained all his resources. He stopped weaving and looked for loans.

Perseverance

No one was ready to give him loans. Everyone knew that he might default at repayment. As it is, it was difficult for most of the weavers to make two ends meet, repaying a loan for R and D would have been quite difficult for him to pay. Determined, he approached all the people with the hope that some good hearted Samaritan might help him financially. Some did help by

extending loans. With that money some more parts of the *Asu* machine were completed. He used to go to Hyderabad to shop for relevant components. By observing different machines parts, he managed to complete some more portions of the machine successfully. After sometime he reached a stage where he did not know what to do, which components to fit and from where to get more money. He needed some technological help also but did not know whom to approach.

By then, his family was fed up with his desire of making a machine for the *Asu* process. They perceived it to be a useless distraction. His father, uncle and in-laws advised him not to pursue the idea of the *Asu* machine and get back to weaving seriously. Frequent visits of money lenders demanding repayment, also stressed the family. His neighbours mocked at him commenting that he did not want to work and making the machine was just an alibi. "*Asu poyadamlo kastalu oka mee ammake unnaya?* (Is your mother alone going through this ordeal and not any other woman?" they quipped.

He decided to leave the village to make a living in Hyderabad. This way, he thought he would be able to clear the debts and avoid constant discouragement. Packing the semi-finished machine in a room, he went to Hyderabad in mid 1997 and started working with an electrical contractor on daily wages. There he worked for a year, regularly sending home some money. After a year, he shifted the unfinished machine to Hyderabad and fitted it in his rented room. He started working part time to earn more money. The additional money was used for buying machine components. Within a short while, it was almost ready except for one movement. He reached a blind alley where he had no idea about which part to use in the machine for a particular activity that involved the thread to go round the peg and slide down to the last thread perfectly. This action was taking a long time in becoming functional in the machine.

The Breakthrough

In Feb 1999, he went to work in a machine shop in Balanagar area in Secunderabad. A number of machines caught his attention. He started

observing each one of them. The owner shouted that he had come for work and not for watching the machines. This incited him to watch the various machines even more seriously. In one, he noticed a movement similar to what he required in his machine. Immediately he told the shop owner that he was off for the day and was prepared to forego the wages. He rushed to a workshop, and got a component manufactured to suit the requirement. With his heart palpitating, he reached his room, fitted the component to the machine, and started the operation. The machine worked to his great excitement. Next day he disassembled the machine and took it to a friend's house in Aler. The machine was reassembled and Mallesham demonstrated the *Asu* process. His friend used the *Asu* machine processed yarn for weaving a sari. The quality that came out was better than the one obtained through hand operated *Asu* process. The news spread like wild fire and there was a beeline at his friend's house to see the *Asu* machine.

History was made that day. It was for the first time that a machine was used for *Asu* process, which was done by hands for centuries.



The first machine, made in 1999, was mounted on a wooden frame. Next year, in the second machine, the same was changed to steel, also the speed of operation was marginally increased, a provision for stopping the machine when the thread got cut was incorporated in addition to some other minor improvements. This was the first machine to be sold. This was followed by sale of sixty machines in 2001 followed by the sale of almost hundred pieces each year from 2002 to 2004. In order to improve the automation process many electronic components were incorporated by him in 2005. The number of threads on each peg could also now be adjusted. These changes resulted in almost 90 per cent noise reduction. The revised design also helped reduce electricity consumption. Considering the fact that most weavers would not be able to afford the new machine, Mallesham took special care to incorporate such changes which did not escalate the cost.. He has sold over three hundred such machines over the last few years.

Using this machine, the time to finish one sari has reduced from four hours to one hour and thirty minutes. This means that instead of two saris per day, now six saris could be made and that too in a wide variety of designs, which was not possible earlier. Also, the mechanized *Asu* making process need not be supervised much.

A Social and Financial Revolution

Overwhelmed by the response of the weaver community, he decided to pass on the comfort to all the women of weaver community. No mother would undergo the suffering like his mother did, for so long. With the help of his brother and other family members he started a workshop in 2000 to produce the *Asu* machines for supplying these to the weavers. He was now a contented man as his machine helped a wide cross section of weaver community involved in Pochampalli silk sari tradition. Employment, productivity and marketability have visibly increased. Separate work centers for only *Asu* have come up especially by those who could not afford a loom. Ladies who were hitherto engaged in manual *Asu* process have now learnt to weave on looms like men. They have been able to supplement


their family income. Some loom-less weavers have set up ' *Asu* Machine Center' only and started supplying *Asu* to weavers with looms. This is a new opportunity, only possible with Mallesham's machine. For those weavers who wanted to stop weaving due to the difficulty in manual *Asu* process, he has become a ray of hope. His mother can't stop praising him.

Support and recognition

A prominent local news paper "Eenadu" covered his story in 2001. A demonstration was also organised in Bangalore in 2002, which was covered by the Times of India in its local edition. Subsequently, Maa TV, a local telugu TV also channel covered his innovation in the same year. Recognising the utility of the *Asu* machine, in 2001, an international aid agency in Bangalore provided a grant of Rs 1.5 lakh for the purchase of a lathe machine and a milling machine besides Rs 1 lakh given as working capital to start the manufacturing of *Asu* machines for supply to the weavers.

For the last two years, Honey Bee network in Andhra Pradesh has been actively supporting his endeavours. Thanks to their efforts, Silk board was persuaded to give subsidy and State Bank of Hyderabad agreed to finance the buyers of this machine. His machine has been demonstrated before the students and faculty of Mallareddy Institution, who also felicitated him. His story has been published in both English and Telugu in Honey Bee and *Palle Srujna* newsletters respectively.

In October 2008, Mallesham was felicitated in a Workshop at Osmania University Engineering College, Hyderabad. His machine was named "Laxmi *Asu* Machine" after her mother and dedicated to her. The machine is in the process of being patented. When invited to the Inventors of India workshop, November 2008 at IIM Ahmedabad, Mallesham's story inspired all the participants no less. The possibility of introducing his machine for different weaving styles in other parts of India is also being explored. He also participated in the "My Story." session of TIE Conference in Bangalore in December 2008. This was followed by his participation in the FAB 5: *The Fifth International Fab Lab Forum and Symposium on Digital Fabrication*



meet organized by MIT, Boston, NIF, IIT Kanpur, and CoEP, at Pune in August 2009, which was attended by over a hundred participants from India and abroad. He has also developed a machine for wire winding for gelatin rods used in mining exploration.

The road ahead

Till date Mallesham has sold over 600 *Asu* machines. His mother does not complain of pain in her arms any more. And Mallesham's happiness is beyond measure noticing the relieved faces of the women of the weaving community. But he is not satisfied yet! His first aim is to provide *Asu* machine to all the families of silk sari weaving community in the state. He then plans to develop a loom for weaving sarees, which would do away with the need to use hand and legs for operating the loom. He has already developed a small prototype. He mentions that most of the younger generation is keeping away from weaving due to the very strenuous leg and hand work required for working on the looms. It involves 3000 movements of legs and similar number of hand movements per sari, over a period of 2-3 days. Because of this many weavers are switching over to other jobs, which require less physical work. Mallesham has almost completed a machine, which imitates the manual movements of hands and legs to weave a sari. Another tryst with destiny probably!

¹*Pochampalli sari got geographical indications certification (GI) a few years back making its copying outside its region illegal. The saris of this tradition are woven by over 30000 families residing in 3000 villages of Nalgonda and Warangal districts of Andhra Pradesh with about 90 per cent of them being located in Nalgonda itself.*