



Solar laminator

Student Award - Third

Mr Amandeep Singh

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Background

Amandeep (21), now a student in first year of graduation, made a laminating machine run on solar energy when he was in 12th standard. This machine gives almost the same output as that of an electricity-operated laminator when sun is hot. Now there is no need to worry about the frequent power losses.

He was born in Ganeshgarh village, Ganganagar district of Rajasthan, at his maternal grandparent's house. After a year, he along with family moved to Maloth in Punjab and stayed with his paternal grandparents. He studied till class 3rd there and then came to Sangaria along with his parents.

He had interest in studies till class six but thereafter joined Bharat Scouts and Guides and started losing his interest in studies. He concentrated more on the scout course then and won a Presidential outstanding scout award in the year 2000.

His father is a Registered Medical Practitioner and a Life Insurance Corporation agent. His mother is a

homemaker and his younger brother is doing graduation in pharmacy.

Genesis

In 2000, when he was in class 10th he copied a preexisting project and submitted it during a science fair in school. But when he saw many new projects made being by the students themselves, he felt guilty for submitting something that was not original. He decided that next time he would develop an original idea.

One day, he went to a Photostat shop with a friend to get an important document laminated but since there was no power the work could not be done. This triggered the thought that if they had a solar-based laminator they might have got their lamination done on time.

In 2002, when he was in class 12th, he participated in a district level science fair where he got this chance to convert his idea into reality and built the prototype. He first examined solar cookers and laminators to understand their individual working.

Upon seeing the heating filament inside the laminator, he thought if he could replace it with a black box and surround it with mirrors, his purpose of using solar light for lamination could be achieved. To verify this, he took a small box and kept a black box inside it, focused mirrors over it and kept it in sunlight. After some time he noted the temperature and as he had expected, it had increased up to 40° C, which was higher than the surrounding temperature.

This gave him a boost and he built a few electric powered laminators using 100W bulbs, rollers and small mirrors. Then he developed the solar powered laminator, which he demonstrated to the then Chief Minister of Rajasthan and won first prize. Based on this, he was selected for the Jawahar Lal Nehru Rashtriya Vigyan Pradarshani held in November 2003 at Dehradun and was one of the 30 participants who received appreciation from the Hon'ble President.

In December 2003, he participated in Intel Science Talent Discovery Fair at Hyderabad and cleared the first two rounds before bowing out of the competition.



The machine can also be used as a conventional electrical lamination machine in absence of solar energy by switching on the bulbs fitted inside. On a sunny day, it can laminate the document of A4 size in 15 minutes.

Most hard paper documents get damaged over time with the effect of sunlight, moisture and elements present in the environment. Lamination helps in preservation of important hard documents such as property deeds, educational

certificates, birth and dead certificates, ration, voters ID and PAN cards, etc., to keep them intact for a long time. This is a good product for areas where electricity supply is erratic or not present at all.

This solar laminator might facilitate the process of preserving documents in rural India where lack of properly preserved documents often creates confusion and conflicts.

Amandeep has been provided financial support for developing and improving his laminator from NIF's Value Addition and Research and Development (VARD) fund through GIAN North, Jaipur.

Innovation

US patent 6786265 (Sept. 7, 2004), 5,853,531 (Sept. 24, 1997) and 5421947 (June 6, 1995) describe various laminators working on electrical energy for improving quality of lamination (by having a protecting edge and applying proper tension) and the last one discloses laminating machine for photographs. There are not many who have ever used solar energy for lamination.

The device consists of a wooden box, four rollers, a mirror, a mirror stand, a handle, glass and a couple of two mm thick iron sheets. The mirror has been fitted on the wooden box, so that it focuses solar radiation on metallic plates.

The paper to be laminated is placed between two lamination sheets, slipped in with the help of a roller, and passed through the heated metallic plates. The laminated item comes out smoothly without any wrinkles. The machine laminates both sides of the sheet in one pass.