

Laminated Object Manufacturing

Presentation by :

Manan Tayal

170100005

Manufacturing Automation ME637

Department of Mechanical Engineering
Indian Institute of Technology Bombay

Laminated Manufacturing

Industrial Visits

- A visit to Sanjeev Flexi Pack PVT. LTD, Mumbai as well as its manufacturing unit in Sonale Village, Bhiwandi.
- Shree Swastic Paper Industries, Dapode, Bhiwandi
- Atmiya Manufacturing, PVT LTD, Surat
- CK Engineering, Surat
- Glossian Polly LLP, Surat

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Sanjeev Flexi Packing

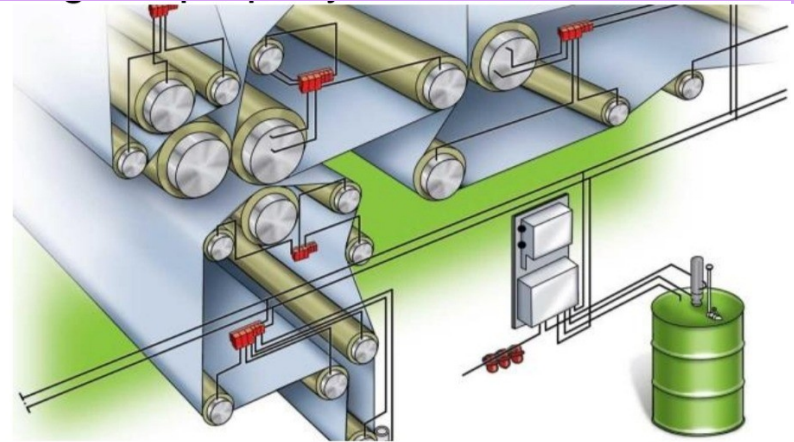
- Visited the Sanjeev Packaging company office in Mulund. Mr. Sanjeev Shah, the CMD of this company told us a few things regarding the packaging material of plastic laminated paper bags (food grade packing) and why they are coated like that.
- Basically, one side of paper is coated with **polyester** which does not melt easily, so coated outside and the other side is coated with **PE** (polyethene) which is coated inside.
- So for our application we need **PE coating on both sides**, which they can manufacture (in their manufacturing facility in Sonale village, Bhiwandi) only if we give them a minimum order of 1 tonne.
- Also, it was very kind of Mr. Sanjeev to give us permission to visit the company's manufacturing unit.



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Sanjeev Flexi Packing

- In the manufacturing facility, we saw the rollers' arrangements to **optimize the tension** in the paper/plastic sheets, which included use of **multiple rollers**.
- Also, they used sensors to make sure the sheets remain aligned properly.



This type of roller arrangement they use in their company



Glued plastic



raw plastic

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Shree Swastik Paper Industries

- Visited Shree Swastik paper distributors in Dapode, Bhiwandi, who provided us the samples of different types of papers (recycled and virgin quality) of different GSMs.
- However they didn't have the butter paper whose sample was given by Sanjeev packaging.



100 and 120 GSM paper roll



Plastic Coated craft paper

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Atmiya manufacturing

- Atmiya Manufacturing, Surat manufactures paper bag making machines.
- They used sequential rollers to control tension in the paper
- And they glued the papers only at places where required (as can be seen in the video in the next slide)
- But the problem was that their machine required manual tension adjustment

❖ AM-003 :- Bag Size- 25 Inch

1	Paper Bag Size	Width : 10 cm to 42 cm Length : 16 cm to 65 cm
2	Side/bottom Gusset	4 to 16 cm
3	Strength of Paper	16 BF to 38 BF
4	GSM of Paper	20 gsm to 120 gsm
5	Paper Roll Width	90 cm
6	Production per Min	150 to 200 pcs per min.
7	No. of Printing	Without Printing
8	Area (Feet ²)	8x15
9	Motor	3 HP
10	Counting System	Digital Counter with batch counting
11	Gum Tank Capacity (Tail)	2 KG
12	Gum Tank Capacity (Centre)	1 KG
11	Power Supply	Single Phase or Three Phase
12	Gum Type	Water Based Binding Gum

www.paperbagmachine.com E-Mail: atmiya@india705@gmail.com

Specification of paper and gum used in the machine



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Atmiya manufacturing



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CK Engineering

CK Engineering, Surat makes paper plates and paper donas as well as paper laminating machine (but it was metal lamination)

Link to their machine's working
is:<https://youtu.be/JRiDeDfWtw>

They also didn't had automatic tension adjusting system in their machines.

They told that they bought their paper rolls from Vapi, Gujarat

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Glossian Poly LLP

- Glossian Polly LLP provides Poly Coated Chromo Paper 50 – 100GSM and also makes paper cups
- They used automatic tension measuring and adjustment mechanism
- (I could not see much because it was holi that day and the manger was out of station. So I was asked to come next time)



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A Few problems and their possible solutions

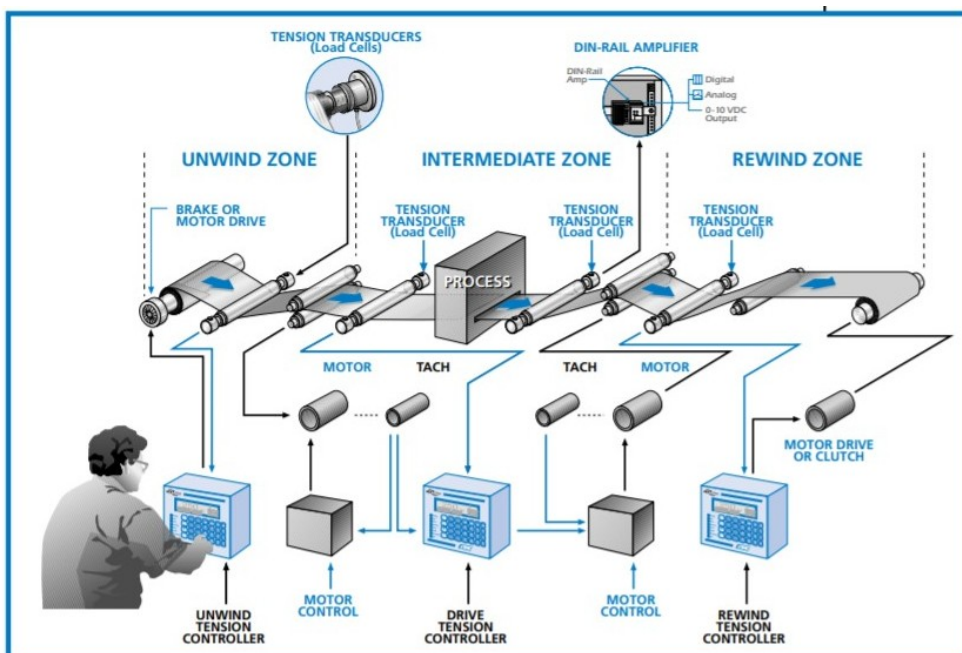
1. Alignment of consecutive rollers so that the paper do not start to tear from one end and slack at the other.

Possible solution use of **laser based alignment tool** to make sure the rolls are parallel to each other



2. Web Tension Control: **Load cells** are used to measure tension and the value is displayed on an indicator. The operator still manually adjusts the tension. This requires a great deal of operator intervention.

Possible Solution: Load cells can be used along with **controllers and actuators** to automatically measure and adjust web tension. This approach requires **minimum operator intervention**. (Refer to Figure)



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Things we need to work on

- We need to improve our roller system to optimize for tension control in paper.
- Need to study on quality and thickness of paper which is suitable for our use
- Required Strength of paper
- Plastic laminated VS Glue coating
- Alignment of Rollers (as discussed in the last slide)
- Web tension control using load cells along with controllers and actuators to automatically and adjust web tension.



A 3D CAD model of a mechanical testing machine. The machine has a blue rectangular frame. On the left and right sides, there are large grey rollers mounted on vertical white supports. A red curved track or guide runs along the top of the frame. In the center, there is a complex assembly of white and grey components, including a vertical plate and a series of horizontal rollers or guides. Several black arrows indicate the direction of movement or force: one points from the left roller towards the center, another from the right roller towards the center, and a third points from the top track towards the center. A vertical pink line is also visible in the center of the machine.

Thank You