

# Paper Bag Making Machine

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## ABSTRACT

**Paper bags also offer many eco-friendly benefits to those who use them. They can be taken care of and continually reused. They are both recyclable and biodegradable. Paper bags are made from a renewable natural resource, can be reused repeatedly and can be shipped to a paper mill and remade into new paper. In fact, it actually requires less energy for paper bags to be recycled than it does for plastic. Paper bags are also biodegradable and pose less of a threat to the environment and wildlife.**

**Keywords: Paper bag, Ecofriendly, cost reduction, simple screw mechanism, paper envelope.**

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## I. INTRODUCTION

Carry bags has become a more convenient way to carry daily necessities and for packaging in small quantities. The well-known form of such bags is in the form of plastic bags. Despite of all known hazards of plastic pollution, it's prevalent and pervasive in India. Plastic bags are one of the worst and most unnecessary plastic polluters of the earth While we may be accustomed to seeing every bit of our food wrapped in air-tight plastic wrap, food and coffee shouldn't be limited to only plastic. Since they were developed in 1852, paper bags continue to be a popular bagging item, despite the competition from plastic bags. While you may not be able to find them in as many stores as you once could, paper bags continue to be a popular choice for shopping and food Item Paper bags have come a long way since The humble beginnings in the mid-eighteenth century, with manufacturers developing paper bags that are more resilient and durable.

Their box-shaped design also allows them to stand upright and hold more goods at once. When compared with plastic bags, they are also much safer. For example, a child is not likely to suffocate from accidentally putting a paper bag over their head, as they are with plastic bags.

We need small size bags every day for various purposes like grocery, fruits, and vegetables. We use plastic

bags for such purposes. Plastic shopping bags have a surprisingly significant environmental impact for something so seemingly innocuous. As well as being an eyesore, one is amazed at the number of plastic bags littering our streets and waterways. Plastic shopping bags kill large numbers of wildlife each year. One of the most dramatic impacts is on marine life. To avoid above harmful effects of Plastic Bags, viable alternative is required which is Paper Bag. Actually, Paper Bag is being used but in very small scale. Conventional Paper Bag requires special paper which increases the overall cost of the Paper Bag. This is the main cause due to which the use of Paper Bag is less. Also initial investment cost is very much in conventional Paper Bag Machine. So it cannot be used for small scale production.

All these problems are eliminated in our machine. We have developed a machine whose initial cost is less, which will not require any special paper and can be used for small scale production. Our machine will help a poor family to earn money through small scale production of Paper Bag. The paper bag will be produced from the regular size Paper to reduce the cost of the bags. Once the bag is used it still can be sold to a scrap vendor earning back small amount of the cost for the paper bag. This not only reduces waste but also promotes the recycling.

## II. LITERATURE SURVEY

Margaret E. Knight (February 14, 1838 – October 12, 1914), an American inventor, while living in Springfield, Massachusetts, Knight invented a machine that folded and glued paper to form the flat bottomed brown paper bags familiar to shoppers today.[4] What was significant in this invention was that flat bottom bags were thereafter used widely world over. The nature of this invention consists in the peculiar construction of a machine for the manufacture of flat or Satchel-bottom bags from a continuous tube of paper fed from a roll over a former, cut, folded, pasted, and delivered. At that time this was a big invention. On June 12, 1883 the U.S. Patent office issued #279,505 to Chas Stilwell a patent for a paper bag machine. After fighting for the Union in the Civil War, Charles Stilwell began to tinker with the idea of making a better paper bag. Paper bags already existed at this time, but they had many flaws. They had to be pasted together by hand; their V -shaped bottoms prevented them from standing on their own; and they were not easily collapsible or conveniently stackable. In the summer of 1883, Stilwell put into operation the first machine to produce paper bags. The bags had flat bottoms for standing up straight by themselves and pleated sides that made them easy to fold and stack.

Dubbed the S.O.S., or Self-Opening Sack, it remains in widespread use today. With the birth of the American supermarket in the early 1930s, demand for Stilwell's paper bags skyrocketed. Their versatility, strength, and low cost made them first a nationwide then a worldwide phenomenon. After that many improvements were involved and on August 19, 1890, The U.S. Patent office issued # 434,461 to black inventor, William Purvis [5] for a paper-bag machine, the combination of two suction-formers having perforated surfaces, between which the ends of the paper tube are fed, and provided with two independent grooves arranged at different positions of the length of the formers and out of line with each other . He later licensed the paper bag invention to Union Paper Bag Co, of New York. U.S. patent office issued #1176641 to H. A. Barnett on 21 st March, 1961, where another design of a bag was proposed by him.

## III. METHOD AND MATERIAL

The main aim of our project is easily fold the paper on prototype. Here we are using three motors, slider, roller mechanism, grid glue, stopper, conveyor belt, frame for this mechanism etc,

- Material Used : Mild Steel
- Welding Used: Electric Arc Welding
- Ball Bearing 2 ID : 20mm OD : 30mm
- Conveyor Belt Thickness : 5mm,Width : 30 cm  
Length : 100 cm
- Motor :30rpm

### Function of each part:-

1. Motor: here total three motor are using .one is used for rolling the conveyor one is used for glue and third one is used for folding t e paper.
2. Stopper: stopper is used to prevent the paper from slipping.
3. Lead screw: lead screw is used for applying glue on paper.

### Working:

When conveyor starts to rotate then papers also start to sliding that time glue start to applying on paper. When paper come across the last stopper then paper automatically stop to sliding then third motor will start to rotate then paper will fold automatically.



Fig. prototype

Sr.no	Components	No.of material
1.	Roller	2
2.	Motor	3
3.	Frame	1
4.	Paper Folding System	1
5.	Glue(grid)	2
6.	Stopper	2
7.	Conveyor	1
8.	Stud	1

#### IV. CONCLUSION

Main purpose of this study was to.

- Automate paper envelope machine in order to reduce the man power and to increase the efficiency and quality of the product and ultimately to increase the preparedness to face emergency situations.
- This system contains the parts which are easily available.
- Almost all the single paper folding machines currently available in the market are very much expensive. Simple and easy mechanisms are used in this system that's why this system is easy to operate.
- As compared to other machine this machine is cheaper.

#### V. FUTURE SCOPE

The machine that we manufactured is in prototype stage and lot of improvements need to be added before it is made commercially available. The various sub-systems need to be optimized to give overall efficient and profitable machine. Various scopes for development are as follows:

##### 1. Use of vacuum pump:

The vacuum pump can be used in driving the paper instead of direct feeding. It is costly but effective measure. The travel time of paper can be greatly reduced decreasing the cycle time. Also it will grip the paper surface better resulting in removal of the support provided for paper travel. This results in reducing weight and components in machine. But it will lead to higher initial as well as operational cost.

##### 2. Reduction in cycle time:

The cycle time required to manufacture a bag can be greatly reduced by providing constant feed and improvising the travel speed of the paper. Use of sophisticated electronic circuit will result in proper sequencing of the operations and thus the operation time and delay will be greatly reduced thus improving cycle time.

##### 3. Use of single drive for roller:

Currently machine employs different drives to operate roller and gum mechanism which can be integrated into one drive. The different drives currently can be integrated by using chain drive. Also this saves time and maintenance cost. Motor cost is reduced thus machine cost is effective and operating cost reduces.

##### 4. Automatic paper feed mechanism

The paper feed currently is done manually. At a later stage the paper feed can be done using automated feed machine which would reduce human intervention and increase the productivity of machine. Also the machine feed could be controlled according to required production rate and amount of sales.

##### 5. Variable bag sizes:

For now the bag produced in the machine has fixed size and dimensions. This makes it difficult for multipurpose use.

Thus in future the size of the bag can be varied by using different folding sheet at the beginning thus ensuring variety of bag dimension produced.

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