

MARGARET E. KNIGHT



" I see no reason why a woman cannot make inventions as well as a man."

Margaret E. Knight (1838–1914) was an extraordinary American inventor and engineer, celebrated as one of the first women to receive widespread recognition for her contributions to industrial and mechanical engineering. She was often referred to as "Lady Edison" because of her innovative spirit and the sheer number of patents she held.

An Innovative Mind

Over her lifetime, Margaret Knight was awarded **27 patents** and credited with nearly **100 inventions** across a variety of industries. Her most famous invention is the machine that created **flat-bottomed paper bags**, which are still in use today. Before her invention, paper bags were typically flat envelopes and unsuitable for carrying bulky or heavy items. Her machine automatically cut, folded, and glued paper to produce a sturdy, flat-bottomed bag. This invention revolutionized the packaging industry. Knight held patents for a wide range of devices, including a rotary engine, improvements to machinery for cutting shoes, a clasp for robes, improvements to sewing machines and more.

More information

[National Inventors Hall of Fame](#)
[Paper Bag Machine](#)

Experiment

Manually build a flat-bottomed paper bag.

Steps:

What you need:

- Rectangular paper, glue or tape, ruler

1. Take a rectangular piece of paper.
2. Fold one side over the other lengthwise to form a tube and secure with glue/tape.
3. Fold up the bottom about 5 cm and crease well.
4. Open the folded bottom and flatten into a diamond shape.
5. Fold the top and bottom points of the diamond inward and secure them with glue/tape.
6. Flatten the sides slightly to create folds for expansion.



Questions & Discussion

1. What was the most challenging part about making the bag?
2. How much surface area of paper did you use to obtain the resulting height of the bag?
3. How tall would the bag be if you used a paper double the surface area?
4. What would you change to make the bag stronger (hold more weight)?
5. Is there anything you can add to improve your design?
6. How would you go about designing a machine to create such bags?
7. Discuss the engineering design cycle.



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