

Friction Match



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Background Information

Fire was and still is a necessity for humankind. It has many uses, from giving us the ability to survive in harsh environments to allowing us to process foods. As time went by there were newer more efficient ways to produce fire, but the process was still not simple.

The Problem

- Humankind needed fire to survive, but acquiring a fire was sometimes a hard task. Making a fire took a long time and under harsh conditions, making a fire was not possible.
- This problem affected all humans, some animals as well.
- Fixing this problem was essential to the progression of humankind, fire is a necessity and without it many would not have survived.

The Solution

- The solution was invented in 1826 by English chemist, John Walker
- The solution was a “friction match”
- A “friction match” is a match that would ignite itself and be used to light more wood to start a fire.



The “Science” Behind a Match

- A match head is made up from potassium chlorate and sulfur.
- The striking surface is made from powdered glass and red phosphorous.
- When the match is struck on the surface, the red phosphorous is heated up and turns into white phosphorous which is very volatile, the potassium chlorate releases oxygen which fuels the flame and the sulfur combines with the oxygen to keep the flame burning

Match Head



Striking Surface



The Process/Challenges

- John Walker's first attempt at the friction match was not successful.
- Him and many other engineers went through various experiments to make it most efficient.
- The first match prototype, the match head burnt too strongly and would burn off the wood and the match head would detach.
- Another prototype, included white phosphorous which was very toxic, and was shortly banned.

Outcomes

- The friction match became an instant hit around the world and was used by everyone.
- Over 500 billion matches are used per year worldwide.
- The uses of a match are unlimited and are widely used

How it can be Improved

- The friction match only works in dry conditions, and only ignites if struck on the striking surface.
- Matches that light under any condition are currently being developed.
- Matches that ignite when striking on any surface is also another improvement for “friction matches.”
- Matches have been improved by making the matchhead bigger and the stick longer

Any Condition Matches



Strike Anywhere Matches



Long Matches

