

# A brief history of the electronic cigarette

## Conceptual

American Indians have been growing tobacco in the new world since 600 BC. It was originally used in their religious ceremonies as a sacred plant. Christopher Columbus brought the tobacco plant back to Europe and pipe smoking became a popular hobby of the upper class. By the seventeenth century tobacco had become an important part of European and American culture. Tobacco was used as snuff, in pipes, and hand rolled into cigars and cigarettes.

It wasn't until an automatic tobacco rolling machine, which was invented in 1881, caused a dramatic increase in cigarette production and the popularity of cigarettes spread.

While it would take decades before smoking was linked with cancer and heart disease, it was quickly realized that smoking cigarettes irritated the respiratory system. A primary objective of inventors became to create an imitation cigarette which gave the user pleasure similar to that of an ordinary cigarette without the irritation and health hazards.

Over the years various inhalers, vaporizers and mouthpieces were created by individuals and by the tobacco companies. Both RJ Reynolds and Phillip Morris filed patents for electrical smoking systems.<sup>1</sup>

Two inventions were devices that had a breakable cartridge containing a flavored liquid.

Frank Bartolomeos patent for a "Smoking Device" was issued in 1958. His artificial cigarette had a breakable ampule which was hermetically sealed and contained a filler material, such as cotton which was saturated with nicotine and/or tar to provide the taste and flavor of tobacco. Side vents allowed air to be sucked through the capsule to mix with the flavoring.

Barolomeos invention was to mimic cigarette smoking but to "provide a fireless, lightless smoke". His reason for this device was because: "There are many places where smoking is not permitted because of the re (sic) hazard present as around explosives or because conditions forbid the showing of a light as at night in time of war".<sup>2</sup>

In 1967, Chien-Hshuing Chang from Taiwan developed a similar artificial cigarette with a breakable ampule containing a flavored liquid.<sup>3</sup>

But it was Herbert A. Gilbert, a two pack-a-day smoker, who took the creation of a true non-combustible a step further when he added a means to heat the filler material. A patent was issued to him in 1965 for a "smokeless non-tobacco cigarette" which delivered flavored steam without combustion.

His idea was resembled a traditional cigarette where warm, moist flavored air could be drawn into the mouth or lungs. A cartridge would hold a harmless chemical solution used for flavoring. Solutions suggested included mentholated water and a solution to simulate Scotch whisky. An insulated vacuum tube or light bulb powered by a battery was to provide the heating element which would heat the liquid.

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He stated that the purpose of his invention was; "to provide a safe and harmless means for and method of smoking by replacing burning tobacco and paper with heated, moist, flavored air; or by inhaling warm medication into the lungs in case of a respiratory ailment under direction of a physician."

Gilbert was never able to bring his product successful to market.<sup>4</sup>

Favor cigarettes were on the market for a short period of time in the early 1980's. Inside of a tube that looked like a traditional cigarette was paper that was soaked with nicotine. The FDA deemed Favor cigarettes to be a nicotine delivery system and therefore classified it as a drug and banned it. One of the original promoters of Favor says they were the first to use the term, "vaping" in relationship to their invention.<sup>5</sup>

Early versions of the current electronic cigarette were introduced in China in 2003 or 2004 when Hon Lik, a Chinese pharmacist working in medical research, created a device he called "A flameless electronic atomizing cigarette". Hons father was a heavy smoker who died of lung cancer, which prompted Hon to try to quit his own nicotine addiction. He had tried going cold turkey numerous times and used the nicotine patch without success. He also was experimenting with Chinese medicine.

One rumor is that the idea came to him in a bizarre dreamed fueled by the nicotine patch he had forgotten to take off before bed. He went to bed coughing and wheezing, and dreamed he was drowning in a sea when the waters around him turned into a fog and lifted him up so he could breathe.

Hons first try at a smokeless device doesn't resemble the electronic cigarette on the market today. Instead of an atomizer, he used a piezoelectric ultrasound element which made the device bigger and bulkier than the current electronic cigarettes and the molecules in the vapor were too large to effectively deliver the solution. He refined his ideas and in 2003 had his invention patented in China.

The company Hon worked for, Golden Dragon Holdings, changed its name to Ruyan meaning "like smoke" or "resemble smoke" in

Chinese. They received their international patent in 2007 when e-cigarettes were then introduced into the United States and Europe.

So what originally started as a revolutionary cessation device has evolved into a recreational product surrounded by controversy. The FDA's attempt at regulating electronic cigarettes when they were first imported into the United States in 2008/2009 is one of the reasons why current electronic cigarettes are not allowed to be advertised as a "cessation device". But that is a story for another day (Figure 1).

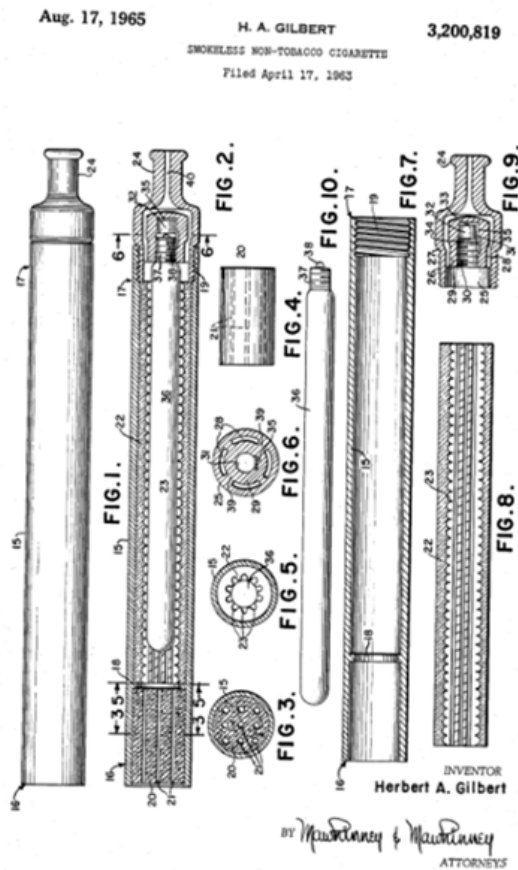


Figure 1 Vacuum tube or light bulb powered battery.

## Acknowledgements

None.

## Conflict of interest

The author declares no conflict of interest.

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