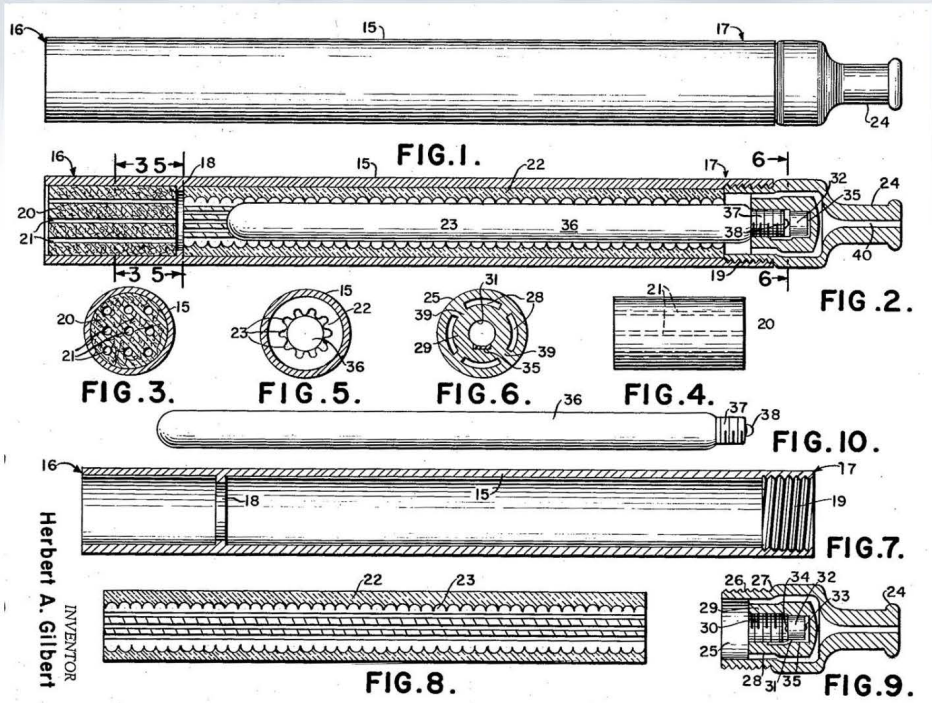
HISTORY



U.S. Pat. No.3,200,819

Source: Gilbert (1963)

An early approximation of the current e-cigarette appeared in a U.S. Patent application submitted in 1963 by Herbert A Gilbert and was patented in August 1965. The application was for a "smokeless nontobacco cigarette," with the aim of providing "a safe and harmless method of smoking" by replacing tobacco and paper with heated, moist, flavored air. A battery-powered heating element would heat the flavor chemicals without combustion.

The first modern e-cigarette was developed in 2003 by the Chinese pharmacist, Hon Lik, a former deputy director of the institute of Chinese Medicine in Liaoning Province. Lik's patent application described a kind of electronic atomizing cigarette.

With support from Chinese investors, in 2004 the product was introduced on the Chinese market under the company name Ruyan. The product gained some attention among Chinese smokers early on as a potential cessation device or an alternative cigarette product. The e-cigarette was part of the U.S. Market by the mid-2000s and by 2010 additional brands started to appear in the nation's marketplace, including Ruyan and Janty.

In August 2013, Imperial Tobacco Group purchased the intellectual property behind the Ruyan e-cigarette for $75 Million. As of 2014 an estimated 90% of the world's production of e-cigarette technology and products came from mainland China. Sales of e-cigarettes in the United States have risen rapidly since 2007.

(USDHHS, 2016, p.10)

CHARACTERISTICS OF E-CIGARETTES

Source: Penn State (2013)

Electronic cigarettes are a diverse group of products that produce a heated aerosol, typically containing nicotine, which users inhale via a mouthpiece. E-cigarettes range widely in design, appearance, and complexity, but generally contain similar components and operate in a similar manner. Common components of e-cigarettes include a battery, a heating coil, an atomizer that transforms the e-liquid to an aerosol, a cartridge that contains the e-liquid, and a mouthpiece (NASEM, 2018, p.55).

The basic operation of e-cigarettes generally follows several steps. First, the user draws upon the e-cigarette mouthpiece. Second, a user either manually presses a switch button to activate a heating element, or draws upon the e-cigarette and an airflow sensor automatically activates it. In automatically activated devices, the airflow sensor detects pressure changes and prompts the flow of power to a heating element and an LED (optional). The e-liquid contained in the device saturates a wick, which the heating element then aerosolizes. This process is commonly called "vaporization." Aerosolized droplets of liquid subsequently flow into the user's mouth and are inhaled into the lungs (NASEM, 2018, p.58).