

Chemical Heating Element and Nicotine Deposit for a Smokeless Cigarette

Summary

Dr. Gunter Festel has developed a chemical heating element and a nano-nicotine deposit for a smokeless cigarette. It has been experimentally confirmed, that the required temperature for a release of nicotine when using the right construction and appropriate chemicals can be achieved. The know-how and the respective patent applications are to be sold/licensed out.

Background

For the last 15 years, the tobacco industry has endeavoured to develop products to minimise or prevent the health hazardous properties of cigarettes. Different kinds of cigarette substitution products with a strongly reduced concentration of cancer-causing substances have been developed. As many of these products are only remotely similar to the traditional cigarette, they are termed as nicotine delivery devices.

Gunter Festel has been studying this area for many years. Patent research and own experimental work were the basis for the identification and development of attractive key technologies for a smokeless cigarette, such as a chemical heating element and a nano-nicotine deposit/delivery system. The know-how and patent applications of the chemical heating element are to be sold and the nano-nicotine deposit technology licensed out.

Chemical Heating Element

The smokeless cigarette reaches the required temperature through the exothermic reaction of CaO with water. The water-CaO-mixture serves as a heat reservoir, which allows a continual heat release over a time period of up to 4 minutes. Important for the functioning are the right composition and amount of the components CaO and H₂O as well as one or more additional chemical compounds as promoters, in order to achieve the required reaction.

The main premiss of the development was the possibility of a simple and cost efficient production of the smokeless cigarette. The smokeless cigarette with the measurements of a traditional cigarette weighs just a little more than a traditional cigarette. The production costs

of a traditional cigarette lie at around 3 Eurocent/cigarette. A detailed calculation of the production costs for this smokeless cigarette showed costs of around 4 Eurocent/cigarette.

Release of Nicotine

Standard nicotine release experiments show that with a temperature of 160-180°C of the air stream in front of the filter a good release performance and the required 60-80°C in the smoker's mouth can be achieved. Our experiments showed, that through the appropriate modification, a satisfactory release performance could be reached at 80°C. Without the modification, much higher temperatures are needed. The nicotine release was examined over time and the results of a series of tests showed, that the applied nicotine is continually, puff for puff, released. With the determined release curves and through a special loading technique, the filter can be loaded with the exact amount of nicotine. Especially the maximum legal limit of 1mg nicotine content of a cigarette can be adhered to.

Nicotine Deposit

It is shown that the loss of nicotine in the filter even after various modifications is significant. The loss of nicotine, when storing the cigarettes, lies at around 10% per day. But through an airtight packaging of the nicotine loaded filter, the loss can be reduced to 2% per day, thus guaranteeing the short-term storage.

A separately developed nano-nicotine deposit guarantees a good shelf life and an optimal nicotine release. Especially the combination of the chemical heating element and the nano-nicotine deposit has great advantages. The nano-nicotine deposit technology is currently in the final development stage and is not to be sold, but can be licensed.

Disclaimer

FESTEL CAPITAL has prepared this document to the best of FESTEL CAPITAL's knowledge and belief based on all available information. FESTEL CAPITAL takes no warranty for the accuracy and completeness of this information. Therefore, all liability for costs or damage resulting from information and conclusions in this document is excluded.

FESTEL CAPITAL

FESTEL CAPITAL is an advisory and investment firm focusing on the commercialisation of technologies in the areas of energy, environment, health, materials and nutrition.

Contact: Dr. Gunter Festel, Schürmattstrasse 1, CH-6331 Hünenberg/Zug, Phone +41 41 780 1643, Mobile +41 796 527 112, E-Mail gunter.festel@festel.com.