

[54] **SIMULATED SMOKING DEVICE**
 [76] Inventor: **Jon P. Ray**, 12544 Judson Rd., San Antonio, Tex. 78233
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Related U.S. Application Data

[63] Continuation of Ser. No. 947,373, Oct. 2, 1978, abandoned.
 [51] Int. Cl.³ **A24F 47/00**
 [52] U.S. Cl. **131/270; 128/202.21**
 [58] Field of Search 131/8 A, 10.1, 170 A, 131/170 R, 261 A, 10.3, 10.5; 128/202.21

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Primary Examiner—Stephen C. Pellegrino
Attorney, Agent, or Firm—Arnold, White & Durkee

[57] **ABSTRACT**

A simulated smoking device, adapted for non-burning or non-combustion uses, comprises: a container defining a passageway therethrough; a source of vaporizable nicotine in fluid communication; and means for preventing the evaporation of said nicotine during periods of non-use. The source of vaporizable nicotine may be an absorbent material which has a nicotine-bearing material absorbed therein. The absorbent may also have absorbed therein a pH adjustment, water and/or flavoring ingredients. The device, at ambient temperatures and pressures, releases nicotine vapors into air drawn through the passageway of the container during use.

34 Claims, 5 Drawing Figures

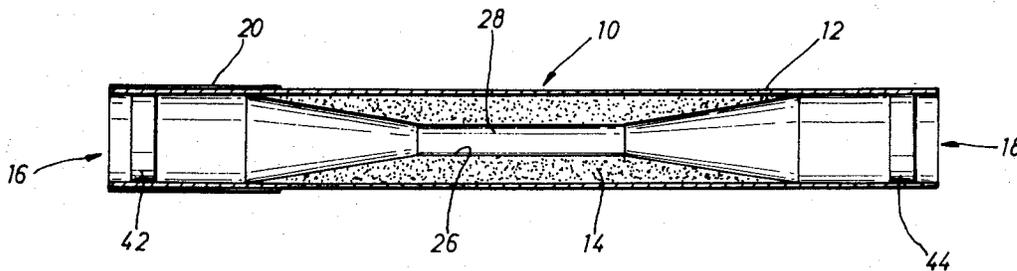


FIG. 1

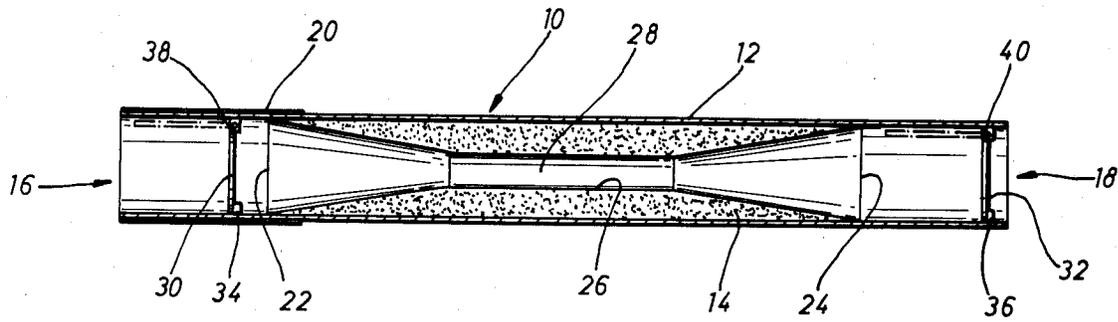


FIG. 2

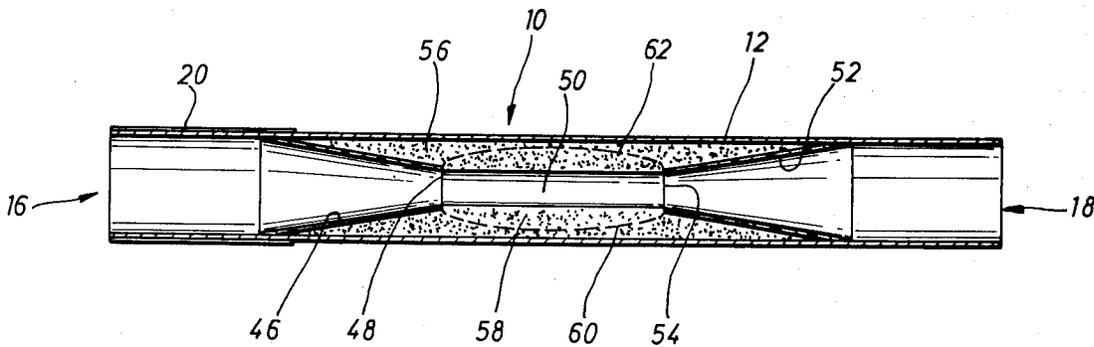
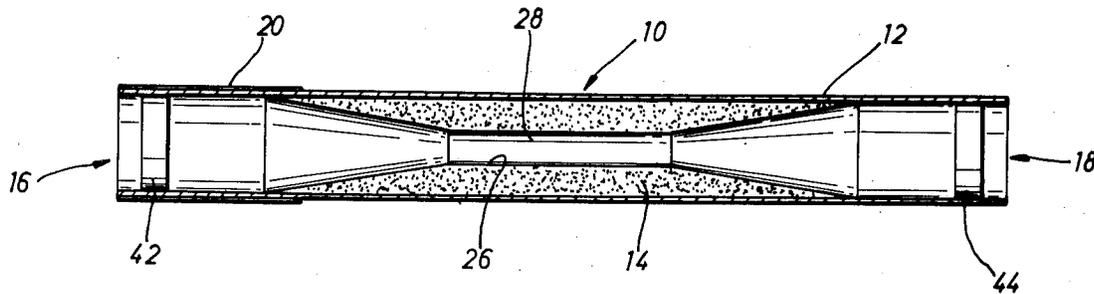


FIG. 3

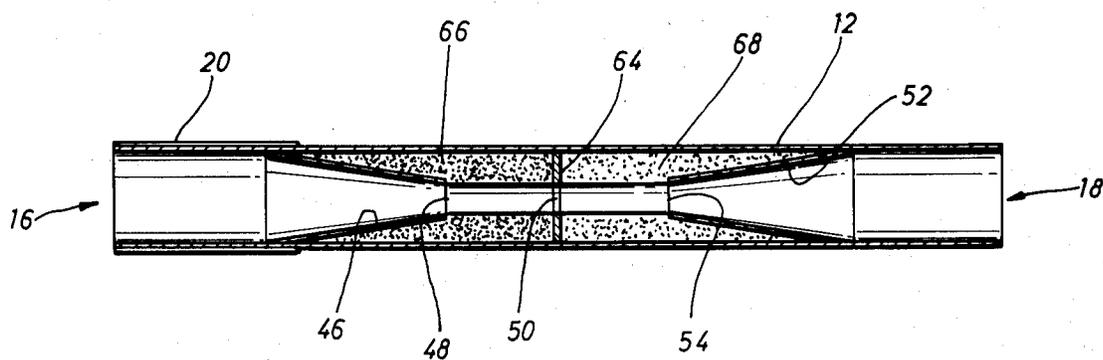
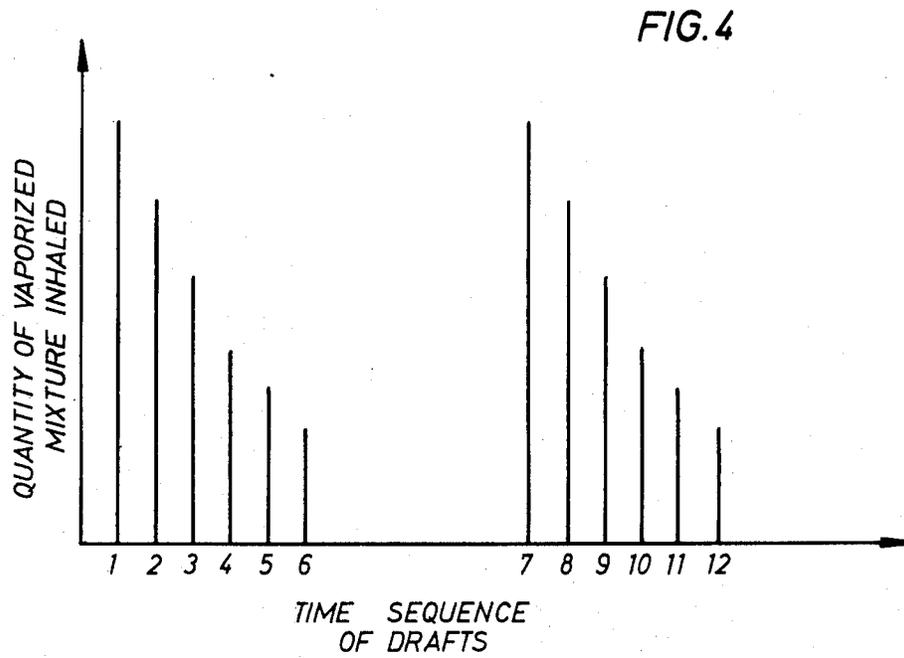


FIG. 5

SIMULATED SMOKING DEVICE

This is a continuation of application, Ser. No. 947,373, filed Oct. 2, 1978 now abandoned.

BACKGROUND OF THE INVENTION

This invention relates to non-combustible cigarettes designed to reduce or eliminate the disadvantages associated with conventional smoking habits using combustible cigarettes.

The use of nicotine has long been practiced by persons in many cultures, who derive satisfaction from the substance. Nicotine is a toxic liquid alkaloid having the formula $C_5H_4NC_4H_7NCH_3$. When the nicotine is obtained from tobacco, as by chewing, sniffing, or smoking the substance, the amount of nicotine absorbed into the body generally does not build up to a harmful dose, but produces certain pleasurable effects, frequently leading to habitual use.

One of the most popular versions of nicotine use involves the smoking of cigarettes. When the tobacco in a conventional cigarette is ignited, the combustion of the processed tobacco leaves within the cigarette causes the release of vaporous nicotine, which is drawn through the cigarette and into the user's mouth and lungs when the user sucks or inhales air through the cigarette.

The relative mildness of a cigarette, as compared to a pipe or cigar, permits a user to draw the smoke from the burning cigarette directly into the lungs. The nicotine vapors in the cigarette smoke are rapidly assimilated into the bloodstream of the user from the lungs, so that cigarette smoking provides a method by which a user may very quickly feel the effects of the nicotine.

Although nicotine can thus be readily introduced into the body through cigarette smoking, the combustion of the tobacco, with the consequent elevated temperatures required in this process, unfortunately result in a number of undesirable consequences associated with smoking combustible cigarettes. Of primary concern are the serious health hazards known to result from smoking combustible cigarettes. Although the nicotine content of a cigarette is not believed to cause any serious adverse long term health effects on the human body, many other components which are harmful are present in tobacco smoke. Some of these other constituents are known carcinogens, for example. A table listing some of the harmful components in tobacco smoke may be found on pp. 496-501 of the publication Tobacco and Tobacco Smoke, Studies in Experimental Carcinogenesis (1967) by Ernest L. Wynder and Dietrich Hoffman of the Sloan-Kettering Institute for Cancer Research. The teaching of that publication is hereby incorporated by reference into this application. Furthermore, the smoking of combustible cigarettes may pose a significant fire hazard. Many fires which have occurred both within buildings and in natural environments have been attributable to burning cigarettes which were carelessly discarded. In addition, substantial economic losses can be attributed to smoking, including significant damage to business and personal property resulting from burns in clothing, carpeting, furniture, etc. caused by stray ashes from cigarettes. Cigarette smoking has also become increasingly objectionable because of the discomfort it may cause to nonsmokers who are exposed to the smoke and odor produced by the smoking habit.

Because of these undesirable side effects of combustible cigarette smoking, attempts have been made from time to time to provide an acceptable substitute for combustible cigarette smoking which will eliminate or ameliorate the adverse consequences mentioned above. Tobacco concentrates, for example, have been processed into a tablet form which may be sucked or chewed in the mouth of the user, the nicotine being absorbed into the user's body through the lining of the mouth. Such a tablet, of course, does not provide the user with the feel of a cigarette between his or her lips. Furthermore, a tablet smoking substitute cannot provide the user with an opportunity to draw air and vapors into the mouth nor inhale that air and vapors into the lungs, which is an essential part of the conventional smoking habit. These activities constitute an important aspect of the psychological and physiological affinity which a smoker acquires for the habit. Without an effective substitute for such smoking activities, a tablet form of tobacco is likely not to satisfy the smoker and may thus result in a return to combustible cigarette smoking.

In another approach to providing a substitute for smoking, it has been recognized that processed tobacco, such as that contained in cigarettes, will release vapors even when it is heated to a temperature lower than the ignition point of the tobacco. Thus, a smoker might draw air through such heated tobacco and thereby obtain the vapors which are released in conventional smoking without also inhaling the noxious by-products of tobacco combustion. Devices manufactured according to this technique, however, have sometimes used a second isolated portion of tobacco, which is ignited, as the source of heat. Although such a device is chambered so that the products of combustion are not directly inhaled by the user in the act of drawing air through such a device, the harmful by-products of combustion are nevertheless released into the air surrounding the user. Thus, substantial amounts of the deleterious combustion by-products may nevertheless be inhaled by the user and surrounding persons through breathing the ambient air. In addition, with such a substitute device, substantially the same fire hazards are presented as with conventional smoking devices, and there remains the potential for burn damage to carpets, furniture, clothing, etc. Alternatively, the tobacco in this method may be heated by various pyrophorous materials, which are mixed together with the tobacco. Such materials react with oxygen, alcohol, water, etc. and thereby produce sufficient heat to cause the tobacco to release vapors. With this technique, however, any by-products of the combustion reaction, which occurs within the tobacco mix, will also tend to be inhaled through the device by the user. Thus, there is the danger of adverse health consequences resulting whenever any of these by-products are toxic or otherwise harmful. Furthermore, the structure of such devices tend to be unduly complex, resulting in a relatively high manufacturing cost.

Various other smoking substitutes have been developed which include cigarette simulating devices containing various materials which approximate the taste and aroma of tobacco or release various other additional aromatic vapors which are intended to have a satisfying effect on the user when those vapors are inhaled. In one such device, synthetic materials simulating the taste and aroma of tobacco are micro-encapsulated within a cigarette substitute device. The desired vapors are released by squeezing or crushing the device,

causing the capsules to burst and the vapors to be released into the air drawn through the device. In another such device, the flavor and taste components of tobacco are saturated within a capsule containing an absorbent material, and, when punctured, the capsule releases the aroma and flavor volatiles of tobacco into the air drawn through the device. These devices, however, have failed to take into account that the primary physiological phenomenon related to cigarette smoking, which must be provided in any effective substitute, is the sudden introduction of nicotine vapor into the user's lungs to satisfy the user's habit.

Thus, despite the various attempts which have been made to provide effective substitutes for combustible cigarettes, no one has developed a device which permits the user to inhale controlled amounts of nicotine vapors, free of all known or suspected carcinogens, sufficient to satisfy a nicotine habit without the need for combustion or other heating means and without the need for the user taking some unfamiliar action other than the actions performed in the conventional smoking habit, namely drawing or sucking a gaseous mixture through a cigarette and inhaling that gaseous mixture into the lungs of the user.

Therefore, a need has developed for a substitute for combustible cigarettes which will release nicotine vapors into the air drawn through the substitute by a smoker without the need for any heating means or any action on the user's part other than drawing air through the cigarette as is done with a conventional cigarette.

Furthermore, it would be advantageous to provide such a non-combustible cigarette with a means by which various flavoring agents, moisturizers, and pH controlling agents might be added to adjust the desired qualities of the vapor inhaled from the device.

In addition, it would be advantageous to provide a noncombustible cigarette in which the static evaporation of the nicotine material and the dilution of the nicotine material by exposure to moisture may be prevented.

It would also be advantageous to provide a non-combustible cigarette in which the sequential concentrations of nicotine vapor released can be controlled and programmed according to the rate of repeated inhalations and the time between periods of repeated inhalations.

It would be advantageous as well to provide a non-combustible cigarette in which multiple vaporizable mixtures having incompatible characteristics can be separately stored so that the multiple vapors can be combined in the air drawn through the device.

SUMMARY OF THE INVENTION

This invention provides a simulated smoking device which is adapted for non-burning or non-combustion uses. This device, hence, provides the user with the nicotine desired from for example, a conventional cigarette without the need of either burning, causing combustion or having to somehow elevate the temperature of to cause the vaporization of nicotine from tobacco. The device comprises a container defining a passageway therethrough and a source of vaporizable nicotine in fluid communication with the passageway such that nicotine vapors are released into air drawn through the passageway by the user. The source of vaporizable nicotine may comprise an absorbent material having absorbed therein a nicotine-bearing material. The device should be provided with means to prevent the evaporation of nicotine when the device is not in use.

The means may include means, such as flaps, which are pressure responsive such that no nicotine is permitted to evaporate when the device is not in use but, in use, nicotine is evaporated into air drawn through the passageway by the user.

The device may include a constriction within the passageway which is formed by the absorbent material. The device may also include a means containing a source of vaporizable nicotine, which means is disposed within the container and providing for the reduction of pressure of air drawn through the passageway.

The non-combustible cigarette of this invention includes a container defining a passageway therethrough, an absorbent member disposed within the container and communicating with the passageway, a nicotine mixture disposed within the absorbent member, and a constriction within the passageway which communicates with the absorbent member, the cigarette thereby being adapted to release vapors from the mixture into air drawn through the passageway by a user. The nicotine mixture within the cigarette may be selected from the group consisting of nicotine (d), nicotine (l), nicotine (dl), nicotine salts, and nicotine esters. The nicotine mixture may further include orange flavoring, lemon flavoring, menthol, spearmint flavoring, peppermint flavoring, cinnamon flavoring, or other ingredients for flavoring and pH adjustment of the mixture, and water to adjust the humidity of the vapors released.

The cigarette may additionally include a closure at each end of the passageway, each closure comprising a resilient flap affixed to the container and adapted to seal the passageway during periods of nonuse, while yielding to allow air to be drawn through the passageway by the user. The cigarette may further include moisture seals at either end of the passageway, which comprise a porous plug disposed across the passageway, the plug being adapted to provide minimal resistance to the flow of gases therethrough yet prevent the flow of liquids therethrough.

In a preferred embodiment, the container is cylindrical in shape, with an outer diameter, a length, and a weight, selected to simulate the appearance of a conventional cigarette. The cigarette may further include a cylindrical band affixed around a first end of the cylinder, the band being adapted to simulate the appearance of a filtertip.

In a more particular embodiment, the absorbent member of the cigarette comprises an absorbent cylinder with an external diameter corresponding to the inner diameter of the container, whose ends are recessed from the ends of the container, thereby preventing contact between the absorbent member and the mouth of a person using the device.

In another more particular embodiment, the passageway of the cigarette comprises a first tapered portion bounded by a first frustoconical sidewall and tapering inward from a first end of the container, a second tapered portion bounded by a second frustoconical sidewall and tapering inward from a second end of the container, and a central cylindrical portion which communicates between the first portion and the second portion, the sidewall of the central portion being defined by the absorbent member. In this embodiment, the diameter and length of the central portion may be selected to provide a predetermined rate of vapor release from the absorbent mixture.

In a still more particular embodiment, an annular divider is disposed between the container and the cen-

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