Aug. 25, 1970 N. J. WATERBURY 3,525,582

SMOKING TOBACCO CHARGE INCORPORATING ENCAPSULATED VITAMIN A AND MODE OF INTRODUCTION

Filed Sept. 11, 1967

FIG. 1

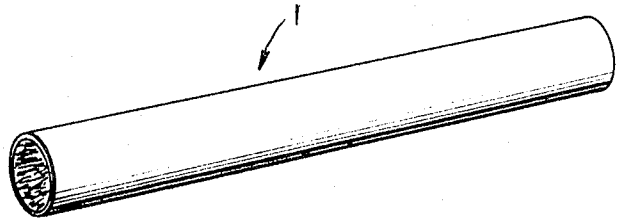


FIG. 2

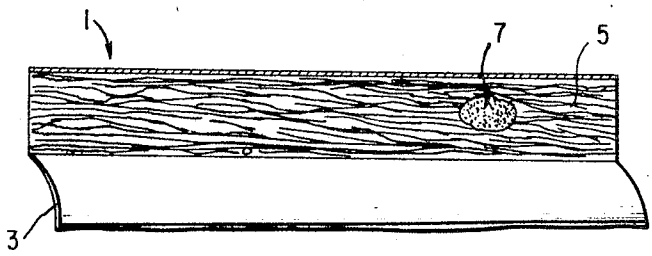
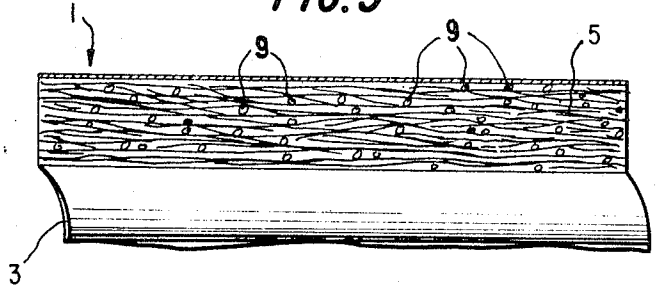


FIG. 3



INVENTOR

NELSON J WATERBURY

BY Sherman & Shallaway

ATTORNEYS

United States Patent Office 3,525,582 Patented Aug. 25, 1970

3,525,582

SMOKING TOBACCO CHARGE INCORPORATING ENCAPSULATED VITAMIN A AND MODE OF INTRODUCTION

Nelson J. Waterbury, Palm Beach, Fla., assignor, by direct and mesne assignments, of seventy percent to F. Barry Haskett, Ocean City, N.J., fifteen percent to Joan Hixon Martin, Washington, D.C., and fifteen percent to Nicholas R. Du Pont, Wilmington, Del.

Continuation-in-part of application Ser. No. 617,219, Feb. 20, 1967, which is a continuation-in-part of application Ser. No. 590,392, Oct. 28, 1966. This application Sept. 11, 1967, Ser. No. 666,810

The portion of the term of the patent subsequent to Sept. 5, 1984, has been dedicated to the Public

Int. Cl. A24b *3/12, 15/04, 1/00*

U.S. Cl. 131—9 4 Claims

ABSTRACT OF THE DISCLOSURE

A method of introducing Vitamin A in droplet or aerosol form into the mouth and respiratory tract of the smoker and a cigarette therefor wherein at least one rupturable capsule containing Vitamin A in aqueous solution is disposed in the tobacco charge. The capsules are rupturable under the influence of either hot tobacco smoke or the heat of the burning tobacco charge.

This application is a continuation-in-part of application Ser. No. 617,219, filed Feb. 20, 1967, now abandoned, which in turn is a continuation-in-part application, Ser. No. 590,392, filed Oct. 28, 1966, now U.S. Pat. 3,339,558, issued Sept. 5, 1967.

The present invention relates to a new and improved smoking article and to a method of introducing material contained therein into the mouth and respiratory tract of the smoker. More particularly, the present invention relates to a cigarette wherein Vitamin A is incorporated in the tobacco charge thereof and is introduced into the mouth and respiratory tract of the smoker by the rupturing of the container or containers in which the Vitamin A is present.

In recent years, there has been considerable research conducted throughout the world with respect to the relationship between cigarette smoking and various diseases such as lung cancer, throat cancer, emphysema, and heart trouble. This research and study has culminated in the recent United States Surgeon-General's report which indicates that there is a definite correlation between cigarette smoking and lung cancer.

Thus, in the report of the Surgeon-General of January 1964, it was found that (1) the death rate for smokers of cigarettes is approximately 70% higher than for nonsmokers; (2) cigarette smoking is causally related to lung cancer in men, and the risk of developing lung cancer increases with the duration of smoking and the number of cigarettes smoked per day, and is diminished by discontinuing cigarette smoking; (3) that cigarette smoking is a significant factor in the causation of laryngeal cancer in men; (4) cigarette smoking is the most important cause of chronic bronchitis in the United States, and a relationship exists between pulmonary emphysema and cigarette smoking; and (5) male smokers have a higher death rate from coronary artery disease than nonsmokers.

Even before the report of the Surgeon-General of the United States indicated a positive relationship between cigarette smoking and these various diseases, considerable research was conducted in an attempt to isolate and determine the nature of the ingredients in the smoke of cigarettes and other smoking articles which have a deleterious effect upon the human body.

Subsequent to the report of the Surgeon-General of the United States, even more research has been conducted in order to isolate, and determine the nature of, the harmful ingredients in an attempt to produce a safer cigarette. In this respect, it has been determined that there are a great number of carcinogenic substances in the smoke of tobacco, the most notable of these being 3,4-benzopyrene.

Attempts to isolate this material and similar carcinogenic materials found in the smoke of tobacco and remove these materials therefrom have not been successful enough to bring a safer cigarette to the public market. Exemplary attempts have included various methods of treating the tobacco while it is growing and after it has been prepared for use in the smoking article. Such attempts, however, have not been successfully adopted in that such treatments cannot effectively remove a substantial portion of the carcinogenic material because of the inability of such treatment methods to effectively isolate these harmful ingredients.

Previous attempts to filter out the harmful carcinogenic materials found within the tobacco smoke have similarly been completely unsuccessful since no adequate filtering means has yet been devised which can eliminate these materials without simultaneously removing, to an appreciable extent, the desirable aroma and taste of the tobacco smoke.

It has been known in the past to treat the tobacco with various vitamins in an attempt to produce a charge of tobacco which will have less of a deleterious effect upon the smoker. Again, however, such attempts have been unsuccessful since it is inevitable that the beneficial effect associated with the vitamin or other treating agent is lost because of undue exposure to moisture, the atmosphere and heat during the subsequent processing and standing of the tobacco.

U.S. Pat. 3,339,558, issued Sept. 5, 1967 to the inventor of the present invention relates to an improved smoking article and to a method of introducing the valuable Vitamin A into the mouth and respiratory tract of the smoker. The invention recited in that patent relates to a process of introducing Vitamin A into the mouth and respiratory tract of the smoker and to a smoking article wherein one or more capsules of Vitamin A are disposed within the filter medium at the mouth end of the cigarette or similar smoking article. In order to release the Vitamin A so that it can be entrained in the form of tiny droplets or an aerosol in the smoke emanating from the smoking article, the smoker applies slight pressure to the filter element, which slight pressure is capable of rupturing the capsule containing the valuable vitamin. In this way, the patentee has found it possible to introduce the Vitamin A into the mouth and respiratory tract of the smoker where it can have its known beneficial effects.

By employing a capsule which remains closed to the atmosphere prior to rupturing just before smoking the cigarette, it has been found possible to retain the valuable Vitamin A in its most active form in an aqueous solution. Therefore, the Vitamin A is not deteriorated by exposure to the atmosphere, and is not employed in the dry solid form. If this latter form is employed, the possibility that the vitamin in unaltered form may not be introduced into the respiratory tract of the smoker is always present.

It has been shown in the past that Vitamin A is essential to the human body because of its general function in the protection of the eye's retinal system and in the prevention of lesions in many parts of the body. In addition, however, it has been shown that the introduction of Vitamin A into the respiratory tract greatly tends to reduce harmful effects on the epithelial tissue thereof.

The present invention comprises an improvement in the smoking article and process shown in U.S. Pat. 3,339,558. The present invention, while embodying one or more capsules containing Vitamin A and a process for the introduction of Vitamin A into the mouth and respiratory tract of the smoker, presents an improvement in that the capsule material is one which can be ruptured as by melting, disintegration or other decomposition under the influence of hot tobacco smoke or the heat of the burning tobacco charge. In this way, it has now been found possible to produce a smoking article and a process for the introduction of valuable Vitamin A into the mouth and respiratory tract of the smoker without the necessity of a mechanical rupturing of the capsule or capsules of Vitamin A within the smoking article.

Thus, in accordance with the present invention, the rupturing of the capsule or capsules containing Vitamin A under the influence of hot tobacco smoke or the heat of the burning tobacco charge allows for the introduction of Vitamin A into the respiratory tract of the smoker in the form of tiny droplets or an aerosol dispersed or entrained within the smoke. The Vitamin A, in the form of an aqueous solution, is incorporated into the rupturable capsule in the charge of the smoking article in a controlled amount so that when the cigarette is lit and suction is applied thereto by the smoker, the smoke passing through the tobacco charge ruptures the capsule of Vitamin A, allowing such Vitamin to be dispersed throughout the tobacco charge and entrained as tiny droplets or an aerosol by the smoke and carried by the smoke into the mouth and respiratory tract of the smoker. Since Vitamin A is one of the known materials for the maintenance of good health, especially with regard to the epithelial tissue, the present invention provides an improved mode of introducing such valuable material into individuals.

It is therefore a principal object of the present invention to provide a method and/or smoking article for introducing Vitamin A into the mouth and respiratory tract of the smoker.

It is a further object of the present invention to provide a smoking article, e.g., a cigarette containing Vitamin A.

A still further object of the present invention comprises the employment of at least one rupturable capsule within the tobacco of a smoking article, which rupturable capsule releases Vitamin A upon rupturing of the capsule under the influence of the hot tobacco smoke or the heat of the burning tobacco charge.

Still further objects and advantages of the smoking article of the present invention, as well as the process of the present invention for the introduction of Vitamin A into the mouth and respiratory tract of the smoker, will become more apparent from the following more detailed description and the accompanying drawings wherein:

FIG. 1 is a perspective view of a cigarette in accordance with the present invention;

FIG. 2 is a cross-sectional view of the cigarette of FIG. 1 in accordance with the embodiment of the present invention; and

FIG. 3 is a cross-sectional view of the cigarette of FIG. 1 in accordance with another embodiment of the present invention.

In all of the figures, like numerals represent like elements.

FIG. 1 represents a cigarette **1** in accordance with the present invention.

The cigarette **1** is shown in cross section in FIG. 2. This figure illustrates a cigarette including a tobacco charge **5** within a burnable wrapper or casing **3**.

Situated within the tobacco charge **5** is a rupturable capsule **7** containing the Vitamin A. The Vitamin A is maintained within the rupturable capsule **7** either in the form of a liquid or a vapor, the liquid form being preferred. The Vitamin A may occur as the pure material or may be conveniently employed as an aqueous solution located within the rupturable capsule **7**. The term "solution" as used herein means solutions which are clear, show no dispersion visible to the naked eye, and remain so indefinitely. This type of Vitamin A aqueous solution, e.g., oil-water solution of Vitamin A, is fully illustrated in U.S. Pat. 2,417,299, issued Mar. 11, 1947, and the disclosure of this patent is incorporated herein by reference.

When an aqueous solution of Vitamin A is employed, the water which is released upon the rupturing of the capsule **7** by the influence of the hot smoke or by the heat of the burning tobacco charge aids in addition in moisturizing the smoke which is produced from the burning tobacco charge **5**. The moisturizing effect of the release of the water by the rupturing of the capsule **7** not only tends to reduce the temperature of the smoke passing into the mouth and respiratory tract of the smoker, but also, it has been found that the moisturizing of the smoke tends to aid the cilia, which are fine, hair-like projections or cells on the linings of the bronchial tubes.

It is noted that in addition to the presence of an aqueous solution of Vitamin A within the rupturable capsule **7**, it is also possible to include other health-benefitting agents, i.e., other vitamins, specifically Vitamin C and Vitamin E, which have been found to act favorably in conjunction with Vitamin A. In addition, various flavoring agents such as menthol, pectin or chlorophyll can be added in order to produce a more pleasing flavor in the tobacco smoke.

The rupturable capsule **7** is composed of any natural or synthetic material which is capable of being ruptured by melting or disintegration or other decomposition at the temperature of the tobacco smoke or burning tobacco charge. In this respect, suitable materials include, for example, gelatin, solidified egg white, thermoplastic synthetic resins which melt at a sufficiently low temperature, and thermosetting synthetic resins which disintegrate at a temperature below the temperature of the tobacco smoke, or heat of the burning tobacco charge.

The tobacco smoke passing through the tobacco charge or the heat of the burning tobacco charge will cause the rupturable capsule **7** to rupture by melting or disintegration or other decomposition, thereby releasing the Vitamin A. The smoke passing through the tobacco will therefore entrain or disperse the Vitamin A and other materials released from the rupturable capsule **7** in the form of tiny droplets or an aerosol and carry such entrained or dispersed material into the mouth and respiratory tract of the smoker. The smoking article, therefore, allows for a new and improved method or mode for the introduction of the valuable Vitamin A into the respiratory tract of the smoker where it can have its beneficial effects.

FIG. 3 illustrates a further embodiment of the present invention. This figure again illustrates a conventional cigarette wherein a tobacco charge **5** is present within a burnable wrapper or casing **3**. Located within the tobacco charge **5** is a multiplicity of small capsules, e.g., microcapsules **9**, containing Vitamin A.

The microcapsules **9** within the filtering material **5** are composed of the same material set forth for the capsule **7** in FIG. 2. Thus the microcapsules are composed of a material which is capable of being ruptured by melting, disintegration or other decomposition either under the influence of hot tobacco smoke or by the heat of the burning tobacco charge.

The term "microcapsule" as employed in reference to FIG. 3 relates to capsules which are small and numerous enough so that the tobacco charge contains a multiplicity thereof which, when ruptured, release a pre-determined amount of Vitamin A to be dispersed or entrained within the smoke emanating from the smoking article so as to be passed with said smoke into the respiratory tract of the smoker.

While the embodiments shown in FIGS. 2 through 3 have been shown as separate embodiments of the present invention, it is, of course, obvious that these embodiments can be successfully combined in the production of advantageous smoking articles.

It is pointed out with respect to the figures herein described that any number of rupturable capsules can be employed as long as one such capsule is present within the smoking article. Thus, while FIG. 2 shows the employment of merely one large capsule containing Vitamin A and FIG. 3 illustrates the employment of a multiplicity of small capsules within the tobacco charge, it is obvious that any number of capsules can be utilized. Thus, for example, it is possible to employ two, three, four, etc., capsules ranging in size from very large capsules as pictured in FIG. 2 to small or microcapsules as shown in FIG. 3.

In addition, it is possible that under some circumstances a stabilizing agent may be added to the capsules containing Vitamin A so as to prevent the same from degrading. In this respect, any of the conventional oxidation stabilizers can be successfully employed in the Vitamin A composition within the rupturable capsules.

I claim:

1. A method for introducing Vitamin A into the mouth and respiratory tract of the smoker, which method comprises locating at least one rupturable capsule in the tobacco charge of a cigarette, said rupturable capsule containing a controlled amount of Vitamin A in an aqueous solution, said capsule being capable of releasing Vitamin A in the form as tiny droplets or an aerosol whereby the Vitamin A will be carried to the mouth and respiratory tract of the smoker in such form, said capsules being rupturable under the influence of either hot tobacco smoke or the heat of the burning tobacco charge.

2. The method of claim 1 wherein said rupturable capsule comprises a multiplicity of microcapsules.

3. A cigarette for introducing Vitamin A into the mouth and respiratory tract of the smoker comprising a tubular wrapper having a tobacco charge therein, said tobacco charge containing at least one rupturable capsule containing a controlled amount of Vitamin A in an aqueous solution, said capsule being capable of releasing Vitamin A in the form as tiny droplets or an aerosol whereby the Vitamin A will be carried to the mouth and respiratory tract of the smoker in such form, said capsule being rupturable under the influence of either hot tobacco smoke or the heat of the burning tobacco charge.

4. The cigarette of claim 3 wherein said rupturable capsule comprises a multiplicity of microcapsules.

References Cited

UNITED STATES PATENTS

2,992,647	7/1961	Figge	131—15 X
3,334,636	8/1967	Zuber	131—10.1
3,339,558	9/1967	Waterbury	131—9 X

FOREIGN PATENTS

188,572	3/1964	Sweden.

MELVIN D. REIN, Primary Examiner

U.S. Cl. X.R.

131—17, 144