

1

2,930,720

SMOKING COMPOSITION

Joseph Finberg, Chicago, Ill., assignor to ERB-Tobacco Products Co., Inc., Chicago, Ill., a corporation of Illinois

No Drawing. Application May 7, 1958
Serial No. 733,478

17 Claims. (Cl. 131—17)

The present invention generally relates to improved smoking compositions and more particularly relates to improved cigarette, cigar and pipe smoking compositions and the like, which have no nicotine-containing ingredients and to similar compositions which contain decreased amounts of nicotine, but all of which compositions have smoking properties comparable to those of conventional tobacco smoking compositions.

In recent years, there has been considerable investigation of the physiological effects of conventional tobacco smoke on the human system. For the most part, investigators of such effects are in agreement that tobacco smoke is detrimental to the smoker's health. Although all of the substances in ordinary tobacco smoke which are toxic to the human system have not as yet been determined, investigations have clearly shown that nicotine in the concentrations usually present in tobacco smoke is one ingredient of the smoke that is definitely toxic to the smoker. As is well known, nicotine is widely used as a toxic agent, particularly in fumigants and in insecticides. Moreover, it has been found that as little as 40 milligrams of nicotine may be fatal to a human when injected directly into the circulatory system.

Analyses indicate that dried tobacco leaves usually contain from about 1.5 percent to about 8 percent by weight of nicotine, combined with an organic acid, such as citric acid or malic acid. When tobacco is burned, a substantial amount of the nicotine in the tobacco is volatilized and is entrained in the tobacco smoke. When the smoke is inhaled by a smoker, a considerable proportion of the volatilized nicotine in the smoke is rapidly absorbed through the mucous membranes of the upper respiratory tract into the human circulatory system. The nicotine is then available to produce a number of undesirable effects upon the smoker. A small amount of nicotine may also be taken up in the saliva of the smoker and be swallowed. The nicotine may then pass through the gastro-intestinal tract into the circulatory system. The same is true for any tobacco smoke inhaled or swallowed during smoking.

It has been demonstrated that the inhalation of tobacco smoke brings about a pronounced physiological effect upon the cardiovascular system of the smoker, which effect is directly related to the nicotine content of the smoke inhaled.

It has been estimated that when a standard cigarette weighing approximately 1 gram is smoked, perhaps 3 milligrams of nicotine are absorbed into the human physiological system from the approximately 15 to 80 milligrams present in the cigarette smoke (1.5 to 8 percent by weight). The absorption of nicotine in such concentrations into the human physiological system establishes a condition of vaso-constriction in the cardiovascular system of the smoker. At times, such constriction may be sufficiently severe to produce spasms or irregular muscular contractions of the heart and blood vessels. This vaso-constriction of the blood vessels is

2

often accompanied by an acceleration of the heart rate and concomitant rise in systolic and diastolic blood pressure.

The inhalation of nicotine in the usual concentrations in tobacco smoke also appears to have a pronounced effect in contributing to the cause and symptoms of thromboangiitis obliterans (Buerger's disease) and various manifestations of coronary artery disease, such as angina pectoris. It appears that the nicotine acts as a contributory agent rather than a primary cause of these diseases.

Another undesirable physiological effect produced by the nicotine in ordinary tobacco smoke is an increase in gastric acidity in the smoker. This effect is particularly pronounced in persons who are suffering from peptic ulcers.

It is also well known that tobacco smoke irritates the bronchi, lungs and associated areas of the upper respiratory tract, frequently causing what is known as "smoker's cough."

Attempts have been made by various tobacco manufacturers to eliminate or to substantially reduce the amount of nicotine in tobacco to levels which would not produce pronounced physiological effects, such as those described. However, none of such attempts have been proven to be completely successful. Such attempts have been largely directed to cigarette tobacco in contrast to pipe tobacco and cigars, and may be divided into two major categories: (1) those attempts which have been directed to the removal, as by extraction, of all or most of the nicotine from the tobacco itself before use thereof; and, (2) those attempts which have been directed to the removal, as by filters or the like connected to the cigarette, of all or most of the nicotine from the smoke during use of the smoking composition.

None of the so-called de-nicotized tobaccos which have been commercially produced have a nicotine content reduced by a sufficient extent to materially lessen or avoid the harmful effects of nicotine. Moreover, such attempts to de-nicotize tobacco are relatively expensive and time consuming and frequently result in an undesirable modification of certain qualities of the tobacco other than the nicotine content, such as taste and appearance, so that the product is commercially unappealing.

Also discouraging is the fact that commercially available cigarette filters which do not destroy the characteristic tobacco taste of the smoke and also which do not seriously retard the passage of the smoke into the mouth of the smoker, reduce the nicotine content of the smoke so slightly that the physiological effect on the smoker is usually altered only to an insignificant extent.

Tobacco manufacturers have found that, generally, those filters that substantially reduce the nicotine content of the smoke also filter out a large percentage of the flavor-imparting substances in the smoke. Accordingly, when the nicotine content of smoke from high quality mild tobacco is substantially lowered below that of the usual types of unfiltered cigarettes prepared from the same high quality mild tobaccos, the flavor or taste of the smoke is so drastically affected by the filter, that the filtered product is too bland for the usual smoker and therefore commercially unappealing. Attempts have been made to remedy this situation by utilizing more of the stronger flavored, darker tobaccos in filter cigarettes. However, such tobaccos generally also have increased nicotine concentrations over high quality mild tobaccos. Accordingly, although some flavor-imparting substances, and nicotine are trapped by the filter during smoking, the smoke which passes into the smoker's mouth may be comparable in nicotine concentration and flavor-imparting substances with the smoke from unfiltered cigarettes uti-

lizing mild high quality tobaccos. Accordingly, the physiological effects attributable to nicotine have not been alleviated by such measures.

Since the deleterious effects of nicotine cannot be avoided by filtering the smoke or extracting the nicotine from tobacco by current methods without rendering the tobacco composition commercially unsatisfactory, the need has existed for a commercially acceptable nicotine-free tobacco-like composition which can be utilized as a smoking composition. There has also been a need for a composition which contains nicotine in reduced concentrations, preferably those concentrations which are not harmful to the smoker of the composition. Such composition, whether nicotine-free or containing a decreased amount of nicotine, must be commercially satisfactory by reason of taste, color, flavor, texture and other smoking qualities.

I have now discovered improved smoking compositions having properties which render them commercially acceptable and which have certain distinct advantages over the usual tobacco smoking compositions. The smoking compositions of the present invention are equally adaptable for use in cigarettes, cigars and pipes and are either substantially or completely free of nicotine or may contain nicotine in concentrations ranging to well below those of conventional commercially acceptable nicotine-containing cigarettes, cigars and pipe tobacco mixtures, so as to decrease or wholly eliminate the toxic effects attributable to the nicotine present in the conventional tobacco smoking compositions. Effective control of the nicotine content is achieved so that any nicotine concentration can be obtained in the composition without filtering, extracting or the like. Moreover, the improved compositions of the present invention are completely commercially satisfactory. They fill the long existing need for smooth tasting smoking compositions with tobacco burning qualities, flavor, taste and appearance. The compositions can be formed into high quality cigarettes, cigars and pipe mixtures. Moreover, the compositions can be adjusted so that the smoke therefrom does not irritate but, on the contrary, soothes the human upper respiratory tract, in contrast to conventional tobacco smoke.

The most important ingredient of my improved smoking composition comprises dried, cured leaves from the papaya plant, technically known as the *Carica papaya*, a member of the Caricaceae family of plants. The papaya plant is also known as the melon tree and the pawpaw. The *Carica papaya* plant is in the mature state usually in the form of an unbranched tree of approximately 20 feet in height, with palmately seven lobed leaves of large size. The papaya plant is indigenous to tropical America, Hawaii and various other tropical countries.

For the purposes of the present invention, the leaves of the papaya plant are processed in accordance with conventional methods of tobacco processing. The processed papaya leaves when incorporated in the finished smoking compositions have substantially the same color, texture and burning qualities as processed nicotine-containing tobacco but are substantially non-irritating to the human upper respiratory tract and, of even more importance, contain no nicotine. The leaves of the papaya plant can be readily substituted for or utilized in combination with processed tobacco leaves in the preparation of improved smoking compositions for cigarettes, cigars, pipe mixtures and the like.

Accordingly, the principal object of the present invention is to provide improved smoking compositions, particularly for use in cigarettes, cigars, pipe mixtures and the like. A further object of the present invention is to provide improved smoking compositions including non-nicotine-containing vegetable fibers. It is also an object of the present invention to provide smoking compositions containing at least substantially reduced amounts of nicotine but which have improved smoking characteristics.

Another object of the present invention is to provide nicotine-free smoking compositions, which compositions have taste, color, texture and burning qualities closely resembling those of standard, commercially available nicotine-containing tobacco products. It is also an object of the present invention to provide new smoking compositions which produce none of the harmful effects normally caused by the nicotine present in conventional tobacco smoking compositions, and the smoke from which new smoking compositions is substantially non-irritating to the human upper respiratory tract. It is a further object of the present invention to provide a smoking composition wherein a selected ingredient can be substituted for tobacco without substantially affecting the desirable smoking qualities of the composition, including taste, texture, appearance, burning properties and the like, while still reducing or eliminating the nicotine content thereof and, preferably, certain deleterious effects attributable to the nicotine.

Further objects and advantages of the present invention will be apparent from a study of the following detailed description.

It has been found that papaya leaves when processed in the same manner as tobacco leaves are substantially equivalent thereto in those desirable features upon which the commercial acceptability of tobacco smoking compositions is based. The papaya leaves have the further advantage of being inexpensive, non-irritating and nicotine free. As previously pointed out, the flavor, taste, appearance, burning qualities and other desirable characteristics of the smoking compositions are not depreciated by the introduction of papaya leaves in such compositions. Any substitution of papaya leaves for tobacco in a smoking composition, in accordance with the present invention represents an improvement in the composition, due to a reduction in the irritating quality of the smoke of the composition and also to a decrease in the nicotine content thereof. Since the effects of nicotine on the human system may be considered to be somewhat cumulative and are directly related to the concentration of nicotine, the decrease in nicotine concentration benefits the smoker, the greater the decrease the greater the benefit. It is desirable that the reduction in the nicotine content by substitution of papaya leaves for tobacco be substantial. Preferably, such substitution is carried out to such an extent that the nicotine content of the product is below that which will produce a discernible physiological reaction on the smoker.

It is within the scope of the present invention to provide nicotine-free smoking compositions containing no tobacco, that is, where nicotine-containing tobacco is completely replaced in the composition by papaya leaves. Such compositions may, if desired, comprise papaya leaves and any desired flavoring, emulsifying or other conditioning agents and/or binding agents usual to smoking compositions, since papaya leaves can be substituted for tobacco on a one to one weight basis without deleteriously affecting the quality of the smoking composition. Such complete adaptability of the papaya leaves in smoking compositions either in substitution for or in combination with tobacco is highly beneficial and of distinct commercial advantage.

It has been found that in order to assure that the smoking composition of the present invention will have the desirable smoking characteristics associated with the usual tobacco smoking composition, including aroma, taste, texture, burning qualities and other similar features, a certain amount of processed papaya leaves and tobacco leaves should be present in the smoking composition. Such leaves should preferably have been first subjected to the usual tobacco processing steps, including drying and curing and which may also include, for example, sweating, fermenting and aging, or their equivalents in preparing the leaves for incorporation in the smoking composition. In this connection, the term processed papaya leaves and

5

tobacco leaves is meant to include, but not limit the present invention to, those leaves which undergo one or more curing or aging or similar processing steps during production of the smoking composition and as an incident thereto.

The sum total of the processed tobacco and papaya leaves present in the finished smoking composition should be at least about 70 percent by weight of the total amount of fibrous material, including leaves, in the composition, preferably at least about 90 percent by weight of the fibrous material, including leaves, in the composition. By fibrous material is meant selected vegetable fibers and/or leaves including those hereinafter more specifically set forth. The total amount of fibrous material in the composition should be at least about 70 percent by weight of the finished composition. The remainder of the composition, if any, that is, up to about 30 percent by weight of the finished composition, comprises other materials, as hereinafter more specifically set forth. Accordingly, the sum total of processed papaya leaf and tobacco leaf present in the finished smoking composition should be at least about 49 percent by weight of the finished composition.

Where the finished smoking composition contains no processed tobacco whatever, processed papaya leaves should be present in an amount at least about 70 percent by weight of the fibrous constituents of the composition and at least 49 percent by weight of the composition. In nicotine-free compositions containing no tobacco, a satisfactory smoking composition with the necessary color, texture, flavor and burning qualities for a commercially acceptable product cannot be obtained if the concentration of processed papaya leaves is below that specified.

Accordingly, a part of my invention comprises the provision of a composition containing processed papaya leaves but no tobacco leaves. Vegetable fibers or leaves other than tobacco and papaya may also be present in the finished composition up to about 30 percent by weight of the fibrous material in the composition. In addition, small amounts of tobacco conditioning agents, including moisture, flavoring agents, humectants and the like, usually present in smoking compositions, may be utilized, the total of such constituents not exceeding about 30 percent by weight of final composition.

Where processed papaya leaves are utilized together with processed tobacco leaves in the smoking composition e.g. to dilute the concentration of nicotine in the composition, it has been found, as previously indicated, that in order to provide a satisfactory smoking product it is necessary that the total amount, by weight, of the papaya leaves and tobacco leaves be at least 70 percent by weight of the fibrous materials in the finished product, preferably at least about 90 percent by weight of the fibrous material in the finished product.

The remainder, if any, of the product may include the following materials, in the amounts as previously indicated: (1) one or more selected and processed non-nicotine-containing vegetable fibers and/or leaves; and/or, (2) the usual tobacco conditioning agents and/or binding agents and other materials.

Among the non-nicotine-containing vegetable fibers or leaves which may be mixed with papaya leaves and tobacco in making up the total amount of fibrous material in the smoking composition, and which are particularly effective are processed hop leaves, primrose leaves and colts-foot leaves. Those smoking compositions of the present invention which include coltsfoot leaves have an especially soothing effect upon the mucous membranes of the human upper respiratory tract. However, in addition, the processed and unprocessed fibers and leaves from the following vegetable species can be employed in the improved smoking composition:

Beet leaves	<i>Marrubium vulgare</i> leaves
Groundsell	<i>Zea maize</i>
Rhubarb	Comfrey
Stinging nettle	Mallow

6

Sorrel	Ox tongue
Prickly broom	Chestnut
Oak leaves	Eucalyptus
Angostura	Golden-regen
5 Cascarilla	Maple leaves
Mamey	Patchouli
Silkana	Rose leaves
Anona	Sapodilla
Star apple	Ceriman
10 Leaves <i>Robinia pseudo-acacia</i>	Soursop
Folia <i>Adonis vernalis</i>	Guava
Wormwood leaves	Folia <i>Asmina triolba</i>
Angelica	Althea leaves
15 <i>Fatsia japonica</i>	<i>Ferula sumbul</i>
Bebeeru tree leaves	<i>Aralia spinose</i>
Dutch rose leaves	Leaves of melilot (yellow)
Flag lily	<i>Trilisa odoratissima</i>
Spinach leaves	Cypripedium flower
20 Corn silk	Candelilla plant
Carrot tops	Cabbage leaves
Soy fibers	Lettuce leaves
Sweet elder flower	<i>Calendula officinallis</i>
Chamomile leaves (Spanish)	Mentha piperita leaves
25 <i>Cassia senna</i> (Indian)	<i>Drosera rotundifolia</i>
<i>Crocus sativa</i> (French or Spanish)	<i>Cassia fistula</i>
<i>Vanilla planifolia</i>	<i>Carthamus tinctorius</i>
30 <i>Yerba mate</i> leaves	Paraguay tea leaves
	<i>Ilex paraguensis</i>
	Nasturtium leaves
	Ethovan or vanirome

During the preparation of the final smoking composition, as previously indicated, conditioning agents and/or binding agents and other materials may be added to the mixture of fibrous ingredients. The conditioning agents are usually mixed with the dried and cured smoking mixture during "casing" of the mixture, as in conventional tobacco processing. The "casing" step consists of spraying a solution or suspension of flavoring materials, aromatics, sweeteners, coloring agents and humectants onto the dried and cured mixture.

The same substitutes which are used as flavoring agents, sweeteners, coloring agents and humectants in the casing of tobacco may be used in the casing of processed papaya leaves, with or without processed tobacco leaves and one or more of the non-nicotine containing vegetable fibers and/or leaves previously described present. Preferably, the conditioning agents are utilized in amounts of from about 12.5 percent to about 17.5 percent of the total weight of the finished smoking composition, although amounts of up to about 30 percent by weight can be utilized. The following is a list of the better known ingredients which can be combined in the casing material to treat the dried cured smoking mixture.

55 Honey	Gum karaya	Essential oils
Sucrose	Rum flavor	Anise
Mapeline	Gum resins	Juniper
Vanillin	Molasses	Clove
Vanilla bean	Propylene glycol	Angelica
60 Fruit flavors	Apple juice	Prune juice
Tragacanth	Apple cider	Tonka bean
Gum arabic		

Either niacin or rutin or both substances may also be incorporated in the smoking composition, if desired, preferably by being added to the casing material. Both niacin and rutin have certain beneficial effects in smoking compositions.

When a smoking composition containing niacin is smoked, niacin passes into the smoke and is brought into contact with the mucous membranes of the upper respiratory tract of the smoker. The niacin is then at least in part absorbed from the smoke and is passed through the mucous membranes into the human circulatory system. The absorbed niacin causes a dilation of the blood vessels of the smoker with a resultant relaxation of tension

and the production of an overall pleasant or satisfied feeling (euphoria). The amount of niacin used in substantially all instances in the smoking compositions should be within the general range of from about 0.1 to about 2.5 percent by weight of the final smoking composition. Smaller amounts have decreased effects, while larger amounts are unnecessary therapeutically.

Rutin may be included in the smoking composition to prevent capillary fragility in the smoker of the composition. It has been found that the amount of rutin which should be added to the smoking composition to provide the desired effect is also from about 0.1 percent to about 2.5 percent by weight of the entire smoking composition. The various advantages of including niacin and rutin in smoking compositions are fully disclosed in my co-pending application, Serial No. 462,389, entitled "Improved Smoking Composition," filed on October 14, 1954.

In preparing the smoking compositions of the present invention, the leaves and any fibers which may be present, that is, the total amount of fibrous constituents are preferably first processed to the dried and cured state. After such processing, the leaves and fibers are blended together with additional materials and subjected to certain procedures to convert the mixture to the desired final form, that is, to cigars, cigarettes and pipe mixtures.

In the processing of the specified papaya and other leaves and fibers to the dried and cured state, conventional tobacco processing techniques or equivalent techniques can be employed. In this connection, the papaya leaves, for example, may be dried and cured, as by sun drying, or by exposing the leaves to air currents and artificial heat, or by any other equivalent means convenient to conventional tobacco drying and curing. During curing, papaya leaves lose their chlorophyll, become flexible and change color to approximate that of nicotine-containing tobacco. As indicated, the other types of vegetable leaves and/or fibers utilizable in the compositions of the present invention may also be dried and cured according to conventional tobacco processing techniques.

The vegetable leaves and fibers, including papaya and tobacco leaves, may be subjected to the drying and curing operations separately or in admixture. The processing may also include sweating, fermenting and aging under suitable conventional tobacco processing conditions to fully develop the desirable properties of the smoking ingredients. The processed leaves and fibers can then be stored until ready for conversion into the final form of composition of the present invention. Alternatively, curing, aging and similar treating steps subsequent to drying can be carried out during the conversion of the smoking composition into final form.

Subsequent to drying and curing but before conversion of the vegetable leaves and fibers to the final product, the leaves and fibers may be separately shredded and graded according to conventional tobacco processing techniques to eliminate undesired coarse stems, veins and the like. Thereafter, the different types of leaves and fibers may be mixed together in the desired proportions in accordance with the principles of the present invention. Alternatively, the various selected vegetable fibers and leaves, including papaya leaves, after drying and curing can be mixed together in the proper proportions before shredding and grading. It should be noted that the shredding and grading steps may be carried out or eliminated as called for by the particular conversion method utilized.

In this connection, smoking mixtures may be subjected to either "homogenization" or to "non-homogenization" procedures. The homogenization procedures include steps of grinding up and later reconstituting the leaves and/or fibres, so that grading may not be necessary, while the non-homogenization techniques do not include such steps. For example, in the preparation of cigarette mixtures by a non-homogenization technique it

is usually advantageous to remove by grading the coarsest veins and stems which would provide the mixture with an undesirable uneven texture. However, where a cigarette mixture is prepared by homogenization, it is often advantageous not to grade out the stems and veins of papaya leaves which impart a lighter color to the smoking mixture, since such light color may be desirable in the product.

Conventional non-homogenization techniques for the conversion of processed tobacco leaves into smoking composition can be employed for the compositions of the present invention. Such techniques usually include, after the described shredding and grading steps, where desired or necessary, mixing of the various leaves and fibers together in the desired proportions, if this has not already been carried out, followed by a casing step, utilizing the conventional conditioning agents previously specified, to which rutin and niacin may be added, if desired.

In the casing step, the mixture of leaves and/or fibers, that is, the fibrous material or mixture including papaya, is sprayed or otherwise contacted with the casing material until such mixture has a casing material content of from about 30 to about 35 percent. In certain circumstances, it may be desirable to eliminate the casing step, in which event the dried and cured leaf mixture may merely be adjusted to the desired moisture content by the addition thereto of water, as by spraying, steaming, etc.

In accordance with conventional non-homogenization practice, after the mixture of leaves and/or fibers and casing material has reached a casing content of from about 30 to about 35 percent, it is placed in a heated room and heated under pressure, as for example, 10,000 to 20,000 pounds per square inch, to bring about an aroma which closely resembles that of pure nicotine-containing tobacco. It should be understood that such mixture may include tobacco and/or vegetable leaves and fibers previously described, and does include papaya leaves. During this heating step, the moisture content of the mixture is reduced by evaporation to between about 7 and about 12½ percent by weight of final composition.

The heated mass may then be shredded or re-shredded, as desired, to produce strands of suitable size for the manufacture of a composition particularly for use as a smoking composition for cigarettes, pipes and the like. The stranded mixture may then be aged or ripened. The aging technique fully develops the taste, flavor, appearance and other qualities of the product. After the aging step, the mixture may be sprayed with a small amount of moisture, flavoring agent and/or humectant or the like. It is then ready for final forming, packaging and distribution. It should be understood that the described technique is only illustrative and that any other conventional tobacco processing techniques would also be satisfactory.

In the case of a pipe mixture, the mass of smoking material may be left unshredded until ready for aging or use, at which time it is preferably pressed into blocks under considerable pressure and is then sliced into desired sizes in order to impart to the pipe mixture suitable texture and burning qualities. In the case of a cigarette mixture, the finished smoking composition may be passed to cigarette making equipment to be encased in cigarette paper and otherwise transformed into finished cigarettes.

Conventional non-homogenization tobacco conversion techniques such as those described can be satisfactorily employed in the preparation of smoking compositions of the present invention, particularly cigarette and pipe mixtures and, in fact, are preferred over homogenization techniques for pipe mixture manufacture. However, in the case of cigarette and cigar manufacture, it has been found that conventional homogenization techniques are preferable. Such homogenization techniques can also be utilized to advantage in the manufacture of pipe mixtures.

Homogenization techniques, in general, provide smoother, more uniform, veinless and stemless products of pleasing appearance and high quality. In the case of pipe mixtures, a somewhat non-uniform textured smoking composition is expected by the smoker, so that homogenization need not be employed. However, with cigarettes uniformity of appearance, texture, flavor, taste and burning properties is of considerable importance. When the cigarette mixture contains a number of ingredients, as is the usual case, it is preferable to obtain uniformity in the blend by a homogenization technique. Stems and veins should either be removed from the smoking mixture, as by grading, or be ground up to small size, as per the homogenization technique. Presence of the stems and veins is advisable where a considerable proportion of dried cured papaya leaf is utilized in the blend because of the lighter color of the stems and veins, which color is imparted to the smoking mixture. Light color is traditionally associated with milder higher quality smoking mixtures.

Accordingly, homogenization of cigarette smoking mixtures to provide smoother higher quality mixtures is preferred. Such homogenization can be carried out on a shredded or unshredded smoking mixture. There is no need to grade the mixture before homogenization. The homogenization can proceed according to any of the conventional homogenization procedures which heretofore have been utilized with respect to tobacco, as, for example, those set forth in U.S. Patent No. 2,598,680, issued June 3, 1952, to W. G. Frankenburg, U.S. Patent No. 2,592,554, issued April 15, 1952, to the same inventor, and U.S. Patent No. 2,592,553, issued April 15, 1952, to W. G. Frankenburg and P. W. Garbo. As the first step in a typical homogenization technique, the smoking mixture can be ground or chopped up in any of the several well known types of pulverizers utilizable for the purpose. As previously indicated, the mixture may include stems and veins.

The grinding is preferably carried out to provide a ground smoking mixture substantially all of which will pass through a 100 mesh screen. The mixture may vary somewhat in composition according to intended use, that is, cigarettes, cigars or pipe mixtures. A coarser or finer mixture can also be prepared as desired.

The ground mixture is then treated with binding agents with or without conditioning agents, as previously described. Such treatment can be carried out at about ambient temperature. The binding agent acts to convert the ground mixture into a workable plastic mass which can be rolled out into sheets and which will hold together, even when dry. The binding agent for this purpose may, for example, comprise a gel-forming material, such as sodium alginate or a water-soluble derivative of cellulose, such as methyl cellulose, carboxymethyl cellulose or hydroxyethyl cellulose, in aqueous or other solution or dispersion. A preferred derivative is one which has a viscosity of at least 1500 centipoises at about 25° C. when about 2 percent, by weight, is dissolved in water. The aqueous solution is usually utilized in an amount of between about 2 and about 6 parts by weight to 1 part by weight of the ground mixture, that is, to provide a paste of the consistency of neat cement mortar when the mixture and solution are admixed. In the finished dry state the smoking compositions contain any suitable amount of the binding agent, preferably between about 3 and about 8 percent by weight.

Other materials in addition to the binding agent and the conditioning agents, such as humectants, flavoring agents, emulsifiers and the like, may be added to the ground mixture. These include bentonite or other similar substances which add strength and minimize crumbling of the mixture, while improving the burning qualities. Niacin and rutin may be added. Glycerine or other plasticizer in a small amount, for example, about 2 percent by weight or more, can also be added to the mixture. Fine glass fibers

of about 0.002 inch diameter may also be added in small amount to increase the resiliency and flexibility of the product. The selection of materials to be added to the smoking mixture is within the skill of one versed in the art and will necessarily depend on the intended use of the composition, and the desired characteristics of the product.

After the addition of the binder, conditioning agents and other compounds if any and after mixing of the ground mixture therewith to form a plastic mass, the mass can then be rolled out into thin sheets or extruded into thin ribbons or otherwise pressed or formed into desired shapes by any suitable means.

If the smoking composition is to be utilized only for pipe mixtures and/or cigarettes, thin ribbons may be preferred, although large sheets could also be utilized by appropriate shredding. Where the smoking composition is to be utilized mainly for cigars, sheets are desired.

The sheets, ribbons or other desired shapes of formed material are then dried under any suitable temperature conditions to a coherent self-supporting product having a moisture content of, for example, between about 7 and about 12½ percent by weight. In this connection, a relatively low temperature, for example, about 50° C. may be employed. However, if desired, elevated temperatures up to about 700° C. or more may be utilized for short periods of time, such elevated temperatures having the effect of somewhat curing and/or aging the smoking mixture, that is, processing it, as previously described.

After the sheets, ribbons, etc. are dried to the desired degree they then can be shredded or otherwise shaped or worked to appropriate form and size. It is sometimes preferred to subject the dried sheets, ribbons, etc. to humidification conditions, as for example, 10°-20° C. and 70-80 percent humidity, in order to increase their plasticity and flexibility, thereby facilitating the final forming operations. Furthermore, a final spraying with casing material may be carried out, if desired. In the case of a cigarette smoking mixture, the shredded mixture may, for example, be humidified, sprayed lightly with casing material and then passed to cigarette forming machinery for further cutting, shaping and encasing in cigarette paper and packaging. Pipe mixtures, after suitable shredding and/or cutting operations to provide the finished texture, may also be humidified and/or sprayed with casing materials before final packaging.

Sheets of the dried homogenized smoking mixture may be converted into cigars without shredding and according to the same techniques which are conventionally applicable to the formation of cigars from dried, cured tobacco leaves. In this connection, homogenization techniques are controlled so that the dried sheets have suitable transverse and longitudinal tensile strength, smooth texture, even-smoking qualities, good combustion and the like and can be utilized as the fillers and binders of cigars. Since cigar wrappers constitute not more than about 16 percent by weight of the cigars, tobacco wrappers can, of course, be utilized with the fillers and/or binders of the present invention for cigar manufacture while still providing cigars with reduced nicotine level and improved properties.

Of course, sheets of the dried homogenized smoking mixture can also be utilized for the cigar wrapper. In the preparation of such sheets for the wrapper it is preferred to somewhat increase the flexibility of the mixture by increasing the proportion of plasticizers, such as glycerine, added to the ground mixture before or during forming into the wet plastic mass, over that previously specified. In addition, gums, glass fibers and bentonite may be added to the mixture, also to increase the flexibility of the finished sheet.

In addition, it is preferred that the wrapper for a cigar have a lighter, more golden hue than the filler and binder. Accordingly, a higher percentage of papaya veins and stems is added to the mixture utilized for the wrapper before grinding, in order to lighten the ultimate color of the

11

sheet, particularly if papaya leaves are to be present in the mixture to a substantial extent. Of course, light mild tobacco may be utilized, if desired, to a higher percentage in the wrapper mixture than in the binder and filler mixtures, in order to impart the desired golden color. The relative percentages of the constituents within the range previously specified for the smoking compositions of the present invention will necessarily depend upon the particular constituents, in addition to papaya leaves, selected for use in forming the cigar wrapper, binder and filler, as well as the cigarette and pipe smoking mixtures.

Other homogenization procedures than those set forth can be employed to provide the desired improved smoking compositions.

The following examples more particularly illustrate certain features of the present invention.

Example I

A non-nicotine containing, that is, nicotine-free, smoking composition was prepared from papaya leaf previously cured in a conventional manner.

The cured papaya leaf was first graded to remove stems and large veins, after which the remaining leaf was placed in a hollow rotating cylinder having tumbling vanes and was tumbled while being continuously sprayed with a conventional casing material. The casing material comprised a solution having the following composition:

Constituents:	Percent by weight of final composition
Vanillin -----	0.50
Maple sugar -----	0.50
Gum karaya -----	1.00
Glycerine -----	3.00
Water -----	7.50

Excess water was added to facilitate spraying. The spraying during tumbling of the papaya leaf was continued until the casing material was present in approximately the indicated amount except that the excess water was present to provide a total casing content of about 35 percent. The papaya leaf containing the casing material was then passed into a warm room where it was kept under an elevated temperature and a pressure of about 10,000 pounds per square inch until the moisture content was reduced to approximately 12½ percent by weight. The papaya leaf was then placed in drums and ripened for a period in excess of four months. When fully ripened, the papaya leaf was spread out and again sprayed with a small amount of the same casing material as previously used, so that the final concentration of the casing material, as previously set forth, was reached.

The product was then ready to be cut or shredded and then incorporated into cigarettes, pipe mixtures and other tobacco-like products. A portion of the mixture was converted into a pipe mixture by first placing it into a press and then compressing it into blocks. The blocks were then fed into a slicer where they were cut into slices.

The resulting mixture contained no tobacco or nicotine-containing ingredients, but had substantially the same texture, flavor, aroma and burning qualities as tobacco. In addition, the mixture had a soothing effect on the mucous membranes of the smoker, and was generally a very satisfactory smoking composition.

Example II

A non-nicotine containing smoking composition was prepared from cured papaya leaf, as specified in Example I.

After grading, the cured papaya leaf was tumbled in a hollow rotating cylinder. During tumbling, the papaya leaf was continuously sprayed with the following casing material:

12

Constituents:	Percent by weight of the final smoking composition
Lupulin -----	0.25
Maple sugar -----	0.25
Caramel -----	1.25
Licorice root -----	0.50
Rutin -----	0.50
Niacin -----	0.50
Glycerol -----	3.00
Distilled H ₂ O -----	7.00

Excess water was added to the composition before spraying. The spraying was continued until the casing material was present in approximately the indicated amount, except that excess water was present so that the total casing content of the papaya leaf was 30 to 35 percent, after which the papaya leaf-casing mixture was heated and pressed, the moisture being reduced to 7 percent by weight, and the mixture was then aged in the manner set forth in Example I. After the aging step, the mixture was sprayed with a small amount of the casing material. After spraying, the mixture was cut as desired and was then ready for use as a finished pipe smoking composition.

In addition to being free of nicotine while having substantially the same smoking characteristics as tobacco, the finished smoking composition had beneficial therapeutic characteristics due to the presence of effective amounts of niacin and rutin which were included in the casing material.

Example III

A nicotine-containing smoking composition having reduced irritant effects on the human upper respiratory tract and a substantially reduced concentration of nicotine was prepared from a mixture of vegetable fibers of the following composition:

Constituents:	Percent by weight of finished product
Papaya leaves -----	75
Tobacco -----	10

The vegetable fiber mixture was processed in the manner previously described in Examples I and II, except that the following casing material was utilized:

Constituents:	Percent by weight of finished product
Lupulin -----	0.25
Maple sugar -----	0.25
Caramel -----	2.00
Licorice root -----	0.50
Rutin -----	0.50
Niacin -----	0.50
Glycerol -----	4.00
Distilled H ₂ O -----	7.00

The proportion of niacin used in the casing material was sufficient to compensate in the finished smoking composition for the vaso-constricting action on the usual smoker of the nicotine contained in the tobacco. This composition was found to be particularly suitable, with respect to texture and appearance, for use as a pipe mixture. Moreover, the nicotine content of the composition was reduced to such an extent that the harmful effects of the nicotine-containing tobacco were substantially avoided, while still maintaining desirable smoking properties equivalent to those of pure tobacco.

Example IV

A satisfactory nicotine-containing composition particularly for use as a pipe mixture and having a considerably reduced tobacco concentration while still retaining ex-

13

cellent smoking properties was prepared from a mixture of vegetable fibers of the following composition:

Constituents:	Percent by weight of finished product
Papaya leaves -----	35.00
Tobacco -----	35.00
Coltsfoot leaves -----	2.50
Eucalyptus leaves -----	2.50

The vegetable mixture was processed in the manner previously described in Examples I to III, inclusive, the following casing material being utilized:

Constituents:	Percent by weight of finished product
Lupulin -----	0.50
Maple sugar -----	0.50
Caramel -----	3.00
Licorice root -----	0.50
Rutin -----	1.00
Niacin -----	1.50
Glycerol -----	6.50
Distilled H ₂ O -----	11.50

The proportion of niacin utilized in the casing material was sufficient to substantially nullify the vaso-constricting action of the nicotine in the tobacco of the composition. Moreover, when the composition was smoked, the presence of reduced amounts of tobacco in the smoke, together with substantial amounts of papaya, coltsfoot and eucalyptus leaves accounted for a very soothing effect on the mucous membranes of the smoker's upper respiratory tract.

Example V

An improved smoking composition, particularly suitable for use in cigarettes, was prepared by an homogenization technique from papaya leaves and tobacco previously cured in a conventional manner.

Whole cured papaya leaves and tobacco leaves, together with a small additional amount, about 2 percent, of papaya leaf stems, were ground to a powder, all of which passed through a 100 mesh screen.

The ground mixture of papaya and tobacco was then mixed with an aqueous solution of a binder and a casing material comprising humectants, flavoring agents and containing other treating agents to comprise, when reduced in moisture by a subsequent step, the following final composition:

Constituents:	Percent by weight of final composition
Papaya -----	61.00
Tobacco -----	10.00
Methyl cellulose -----	6.00
Water -----	12.50
Glycerine -----	5.00
Gum karaya -----	3.00
Maple sugar -----	1.00
Vanillin -----	0.50
Niacin -----	0.50
Rutin -----	0.50

The mixing was continued, water being added as needed, until the wet mixture had the consistency of neat mortar. The wet mixture was then worked into the form of thin long ribbons, and passed to a flat surface for drying. The ribbons were dried until the previously indicated water concentration of about 12.50 percent, by weight of finished product, was obtained. The dried ribbons were then reshredded to finer form and passed to cigarette forming machinery where they were encased in cigarette paper and cut to appropriate size, and otherwise fabricated into finished cigarettes.

The cigarettes were found to be substantially the same as conventional tobacco cigarettes in color, texture, 75

14

flavor, taste, aroma and general appearance, but were also found to be much milder and less irritating to the mucous membranes of the upper respiratory tract and to produce substantially no effects attributable to nicotine. In this connection, what small amount of nicotine was present was nullified with respect to its vaso-constricting effects by the action of niacin present in the cigarettes in the proportion indicated.

Example VI

An improved nicotine-free smoking composition, particularly adapted for use in cigarettes, was prepared by an homogenization technique substantially identically as set forth in Example V, except that the composition had the following finished formulation:

Constituents:	Percent by weight of final composition
Papaya leaves (including 5 percent added stems and veins) -----	82.50
Methyl cellulose -----	4.50
Vanillin -----	0.50
Maple sugar -----	0.50
Gum karaya -----	2.00
Glycerine -----	3.00
Water -----	7.00

The composition was then converted into cigarettes by a conventional technique, including re-shedding, encasing in a cigarette paper and trimming to length.

It was found that the cigarettes so produced had substantially the same appearance, texture, color and flavor, and the mild taste and aroma of high quality conventional cigarettes. In addition, the new cigarettes had substantially no irritating effects on the upper respiratory tract of the smoker nor did the produce any of the effects attributable to nicotine, since nicotine was absent from the formulation, no tobacco being utilized.

Example VII

An improved smoking composition, particularly suitable for cigars, was prepared by a conventional homogenization technique from papaya leaves and tobacco previously cured in a conventional manner.

Two batches of smoking mixture were prepared. Batch A was utilized in preparing the filler and binder of the cigar, while batch B was utilized for the wrapper.

Batch A comprised a mixture of whole papaya leaves and tobacco leaves, which mixture was finely ground to pass through a 100 mesh screen. Ground batch A was then mixed with an aqueous solution of a binder and a casing material and containing other treating agents to provide, when reduced in content during a subsequent step, the following final composition:

Constituents:	Percent by weight of final composition
Papaya -----	35.50
Tobacco -----	35.50
Hydroxyethyl cellulose -----	6.00
Water -----	12.50
Glycerine -----	5.00
Bentonite -----	1.00
Niacin -----	1.50
Rutin -----	1.50
Maple sugar -----	0.50
Licorice root -----	0.50
Caramel -----	0.25
Lupulin -----	0.25

The mixing was continued with the separate addition of water until an easily spreadable paste was obtained. This paste was then rolled out on a smooth surface into large thin sheets of the desired thickness and allowed to dry at ambient temperature (about 40° C.) to the moisture content previously specified. The dried sheets

were then cut into suitable sizes for use as fillers and binders and were then combined with cigar wrappers prepared in generally the same manner but from batch B.

Batch B comprised papaya leaves and tobacco leaves to which was added about 3 percent by weight of papaya leaf veins and stems to lighten the color of the mixture. As indicated, batch B was processed in a manner similar to batch A. However, after grinding, batch B was mixed with a casing material, binder and other agents to provide the following final composition:

Constituents:	Percent by weight of final composition
Papaya (including 3 percent by weight of added veins and stems) -----	35.50
Tobacco -----	35.50
Hydroxymethyl cellulose -----	6.00
Water -----	11.00
Glycerine -----	7.00
Niacin -----	1.50
Rutin -----	1.50
Maple sugar -----	0.25
Licorice root -----	0.25
Caramel -----	0.25
Bentonite -----	0.25
Glass fibers (0.002 inch diameter) -----	1.00

The mixture was mixed with added water, then spread out to dry in the form of thin sheets, as previously described for batch A mixture.

The sheets were dried at about 700° C. to 11 percent by weight moisture content over a short period of time, cut into suitably sized pieces and assembled according to conventional cigar making technique into cigars as the wrappers thereof. Other compositions prepared from batch A were utilized as the fillers and binders for the cigars.

The improved cigars had the appearance of high quality commercially appealing conventional cigars with a light golden colored wrapper and pleasing aroma, taste and burning qualities. Moreover, the cigars had a decreased nicotine content and were less irritating to the upper respiratory tract than conventional cigars. No vaso-constrictive effects were noticeable in the usual smoker from smoking the improved cigars.

Example VIII

Improved nicotine-free cigars were prepared by a conventional homogenization technique, as described in Example VII, from papaya whole leaves and coltsfoot leaves previously cured in a conventional manner.

Batch A smoking mixture was utilized in making the filler and binder and when ground and treated with casing material, binding agent, etc., rolled into sheets and dried, as described in Example VII, yielded the following final composition:

Constituents:	Percent by weight of final composition
Papaya -----	80.00
Coltsfoot -----	1.00
Methyl cellulose -----	5.00
Water -----	7.00
Glycerine -----	3.00
Bentonite -----	1.00
Maple sugar -----	0.50
Vanillin -----	0.50
Gum karaya -----	2.00

Batch B from which the wrapper was made included 4 percent by weight of papaya veins and stem added to the whole papaya leaves and coltsfoot leaves. After grinding, mixing with casing material, binding and other agents, rolling out into thin sheets and drying, the resultant wrapper sheets had the following final composition:

Constituents:	Percent by weight of final composition
Papaya (including 4 percent by weight of added veins and stem) -----	80.00
Coltsfoot -----	1.00
Methyl cellulose -----	6.00
Water -----	7.00
Glycerine -----	2.00
Maple sugar -----	0.50
Vanillin -----	0.50
Gum karaya -----	1.00
Glass fibers (0.001 inch diameter) -----	1.00
Bentonite -----	1.00

Cigars made from the described compositions were completely free of nicotine, substantially non-irritating and mild smoking. Moreover, they had substantially all of the desirable characteristics of high quality cigars, including general appearance, aroma and flavor.

From the foregoing, it is readily seen that improved smoking compositions are provided which overcome the usual objections encountered with tobacco compositions. In this connection, the smoking compositions of the present invention have improved smoking properties while reducing or eliminating the physiological effects of nicotine on the human system. Various modifications in the compositions of the present invention and their methods of preparation as are within the skill of those versed in the art are contemplated as being within the scope of the present invention.

This application is a continuation-in-part of my co-pending application, U.S. Serial No. 660,451, filed on May 21, 1957.

Certain features of the present invention which are believed to be new are set forth in the following claims.

I claim:

1. An improved smoking composition comprising a mixture of vegetable fibers, at least about 70 percent by weight of said fibers and at least about 49 percent by weight of said composition being papaya leaf.
2. An improved smoking composition comprising a mixture of vegetable fibers, said composition containing at least about 90 percent by weight of said fibers of papaya leaf.
3. An improved, nicotine-free smoking composition comprising a mixture of nicotine-free vegetable fibers, at least about 70 percent by weight of said fibers and at least about 49 percent by weight of said composition being papaya leaf.
4. An improved, non-nicotine containing smoking composition comprising a mixture of non-nicotine containing vegetable fibers, at least 90 percent by weight of said fibers being papaya leaf.
5. An improved smoking composition comprising a mixture of vegetable fibers, at least about 70 percent by weight of said fibers and at least 49 percent by weight of said composition being a mixture of papaya leaf and tobacco leaf.
6. An improved smoking composition comprising a mixture of vegetable fibers, said composition containing at least about 90 percent, by weight of said fibers, of a mixture of papaya leaf and tobacco leaf.
7. An improved smoking composition comprising about 85 percent by weight of a mixture of cured papaya leaf and tobacco leaf, said composition also containing about 15 percent by weight of tobacco casing material.
8. An improved smoking composition comprising a mixture of vegetable fibers and niacin, said fibers containing at least about 70 percent by weight of a mixture of papaya leaf and tobacco and said composition containing at least about 49 percent by weight of a mixture of papaya leaf and tobacco, from about 0.1 to about 2.5 percent by weight of niacin also being present.
9. An improved, non-nicotine containing smoking composition comprising a mixture of nicotine-free vegetable

17

fibers and niacin, said fiber mixture containing at least about 70 percent by weight of papaya leaf and said composition containing at least about 49 percent by weight of papaya leaf, from about 0.1 to about 2.5 percent by weight of niacin also being present.

10. An improved, non-nicotine containing smoking composition comprising a mixture of nicotine-free vegetable fibers and niacin, said fibrous mixture containing at least about 70 percent by weight of papaya leaf and said composition containing at least about 49 percent by weight of papaya leaf, from about 0.1 to about 2.5 percent, by weight of final composition, of niacin, and 0.1 to about 2.5 percent, by weight of final composition, of rutin also being present.

11. An improved smoking composition particularly suitable for cigarettes and cigars, said composition having been prepared by an homogenization procedure and comprising a mixture of dry ground vegetable fibers and a suitable binding agent for said fibers, said fibers being bound into a coherent flexible mass by said binding agent, said fibers containing at least about 70 percent by weight of a mixture of ground papaya leaf and ground tobacco leaf.

12. An improved smoking composition particularly suitable for cigarettes and cigars, said composition having been prepared by an homogenization procedure and comprising a mixture of ground vegetable fibers and a minor amount of a water-soluble cellulose derivative as a binding agent, said agent in 2 percent by weight aqueous solution having a viscosity of at least 1500 centipoises at 25° C., said fibers being bound together into a coherent mass by said binding agent, said fibers containing at least about 70 percent by weight of a mixture of ground papaya leaf and ground tobacco leaf.

13. An improved smoking composition particularly suitable for cigarettes and cigars, said composition having been prepared by homogenization and reconstitution of a mixture of vegetable fibers and a minor amount of a water-soluble cellulose derivative as a binding agent into the form of sheets, said agent in 2 percent by weight aqueous solution having a viscosity of at least 1500 centipoises at 25° C., said fibers being bound together in said sheets by said binding agent, said composition also containing flavoring agents, said fibers being present in an amount of at least about 70 percent, by weight of final composition, and containing at least about 70 percent, by weight of said fibers, of a mixture of papaya leaf and tobacco leaf.

14. An improved nicotine-free smoking composition particularly suitable for cigarettes and cigars, said com-

18

position having been prepared by an homogenization procedure and comprising a mixture of ground vegetable fibers and a suitable binding agent therefor, said fibers being bound together in a coherent mass by said binding agent, said fibers containing at least about 70 percent by weight of ground papaya leaf.

15. An improved nicotine-free smoking composition particularly suitable for cigarettes and cigars, said composition having been prepared by an homogenization procedure and comprising a mixture of finely ground vegetable fibers including at least 70 percent by weight of cured ground papaya leaf, and a water-soluble cellulose derivative as a binding agent, said agent holding said fibers in a coherent mass, said agent having a viscosity of at least 1500 centipoises in 2 percent by weight aqueous solution at 25° C.

16. An improved nicotine-free smoking composition particularly suitable for cigarettes, said composition having been prepared by homogenization and reconstitution of a nicotine-free-mixture of vegetable fibers, including at least 70 percent, by weight of said fibers, of cured papaya leaf, a water-soluble cellulose derivative as a binding agent, said agent holding said fibers in a coherent mass, said agent having a viscosity of at least 1500 centipoises in 2 percent by weight aqueous solution at 25° C., and flavoring agents, said fibrous mixture being present in an amount of at least about 70 percent, by weight of final composition.

17. An improved smoking composition particularly suitable for cigar wrappers, said composition having been prepared by homogenization and reconstitution into thin sheets of a mixture of dry ground vegetable fibers, including at least about 70 percent, by weight of said fibers, of a mixture of cured ground whole papaya leaf, cured ground tobacco leaf, and added cured ground papaya leaf veins, a minor amount of a water-soluble cellulose derivative as a binding agent, a plasticizer and flavoring agents, said binding agent holding said mixture, together with said plasticizer and said flavoring agents, in a coherent mass in said sheets, whereby a light colored cigar wrapper of high quality is provided, said binding agent, plasticizer and flavoring agents comprising not more than 30 percent, by weight of final composition.

References Cited in the file of this patent

Dispensatory of the U.S. of A., Osol, Farrar, 1955, pub. by J. B. Lippincott, 2139 pages, pp. 1782 and 1783 especially cited.

Plant Alkaloids, Thomas Anderson Henry, pub. by Blakiston's Sons, 1924, 445 pages, p. 381 especially cited.