March 1, 1927. 1,619,387

L. R. WAUGH

SMOKING UTENSIL

Filed Oct. 5, 1925

Fig. 1

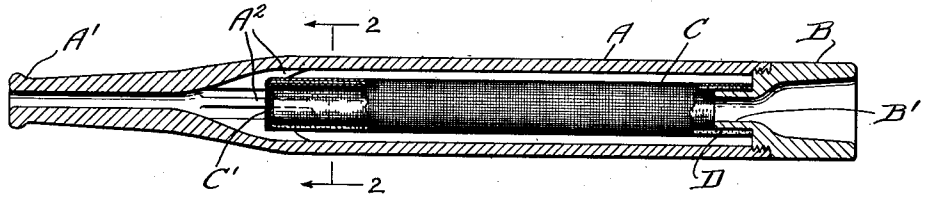


Fig. 2

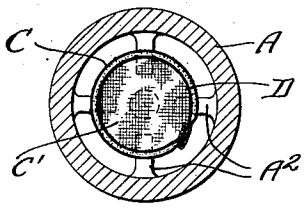


Fig. 3

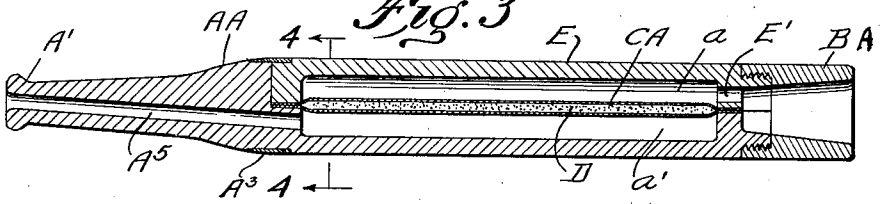


Fig. 4

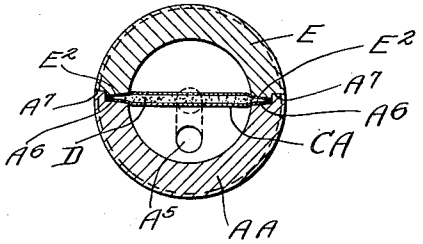
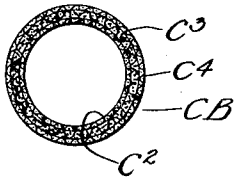


Fig. 5



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UNITED STATES PATENT OFFICE.

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SMOKING UTENSIL.

Application filed October 5, 1925. Serial No. 60,477.

The general object of the present invention is to provide smoking utensils, and by that term I mean to include cigarette and cigar holders and pipes, with simple and effective means for eliminating or rendering innocuous injurious and objectionable constituents of the smoke from tobacco or tobacco-like materials, as the smoke passes to the mouth of the smoker.

In carrying out the invention, I incorporate in the smoking utensil in which the invention is used, a filter through which the smoke is passed and which serves to retain some and render innocuous other harmful or objectionable constituents of the smoke. Many proposals have heretofore been made for the incorporation of a filter in smoking utensils, but the filter which I have provided for the purpose is characterized by the novel provisions made for securing in a simple and effective manner, a large cross sectional area of flow through the filter, and a correspondingly low flow velocity, whereby I obtain an effective filter action without creating an objectionable resistance to the flow of the smoke, and whereby more time is given for chemical action of the filter on the smoke, and whereby I prolong the useful life of each filter which terminates when the filter becomes so fouled by retained impurities as to impair its filtering properties, or to unduly obstruct the flow of smoke through it. My improved filter is especially characterized by the suitable incorporation therein of material eliminating or neutralizing nicotine and other definitely injurious smoke constituents by chemical action.

The combustion of tobacco results in the formation of many different gaseous and vapor constituents such as condensible tar oil vapors, volatile bases such as nicotine, other pyridine bases, pyrol bases and the like. Of these constituents those such as nicotine and others which are most deleterious to the smoker are alkaline and basic in chemical character, and I have discovered that such substances may be eliminated from the smoke or rendered innocuous by incorporating in the filter through which the smoke is passed a suitable chemical having acid properties. There are a large number of chemicals having acid properties which will effectively neutralize basic constituents in smoke, but not all of the substances which are chemically effective are practically suitable. On account of the moisture contained in the atmosphere, materials which are hygroscopic or deliquescent are unsuitable. The filter material with acid properties employed, obviously should be one which does not itself give a harmful or objectionable odor or taste to the smoke. It is practically desirable, of course, that the material with acid properties which is employed in the filter should be relatively cheap and easy to procure, and of course, it should be of a character which permits it to be readily and effectively incorporated in the filter. Filter materials having acid properties which I have tried with satisfactory results, include such acids as boric, salcylic and benzoic acids, and the filter material which I now prefer is powdered boric acid. I have found that boric acid used in the manner described in addition to eliminating objectionable smoke constituents, is advantageous because of its beneficial action on the throat of the user. Boric acid used in the manner described not only does not irritate the throat of the user, but exerts a healing effect when the throat of the user has been irritated or inflamed from some other cause.

In the construction of my improved filter I may incorporate the chemical material with acid properties in a porous filter body of fabric or paper, by coating or impregnating the body with a solution containing said material and then drying the filter in which case the acid crystals formed when the filter dries are interspersed through the latter. When the filter is formed in the manner described, I advantageously line or cover it at one or both sides by a protective layer of thin porous cloth. At the present, I prefer in practice that the chemical material with acid properties employed in the filter be in the form of a powder or mass of fine granules, and be held between layers of fabric. The fabric which I prefer to employ is a rather thick and loosely woven web of wool, wool being somewhat preferable to silk and much superior to cotton for the purpose. In some cases I may pass the smoke through a filter composed wholly or mainly of a porous mass of boric acid granules or the like, which, preferably, are enclosed in a cloth sack or the like, to facilitate renewal of the filter when its fouling makes renewal desirable; but in general, as already indicated, I

prefer to place a comparatively thin layer of the chemical material with acid properties between layers of woven wool.

The various features of novelty which characterize my invention are pointed out with particularity in the claims annexed to and forming a part of this specification. For a better understanding of the invention, however, its advantages and specific advantages attained with its use, reference should be had to the accompanying drawings and descriptive matter in which I have illustrated and described preferred embodiments of the invention.

Of the drawings:

Fig. 1 is a longitudinal section through a cigarette holder;

Fig. 2 is a transverse section on the line 2—2 of Fig. 1;

Fig. 3 is a longitudinal section through a cigarette holder of modified construction;

Fig. 4 is a transverse section on the line 4—4 of Fig. 3; and

Fig. 5 is a transverse section of a tubular filter of modified form.

In Figs. 1 and 2 of the drawings, A represents a cigarette holder of tubular form terminating at one end in a mouth-piece A′, and having a threaded socket at its opposite end to receive an end piece B in which the cigarette to be smoked is inserted. The end member B comprises a tubular portion B′ of reduced diameter which extends into the hollow body of the holder. Within the holder is placed the filter C which in this form of my invention is a hollow cylinder coaxial with the holder A and having its end adjacent the mouth-piece A′ closed as indicated at C′, and having its other end open to receive the tubular portion B′ of the end member B which fits snugly in the cylindrical filter and assists in positioning the latter. Advantageously, and as shown, the holder A is provided adjacent its mouth-piece end with centering lugs A^2 for the closed end of the tubular filter C.

The tubular filter C, as shown, is formed by rolling a web of fabric, which advantageously is a loosely woven and rather thick piece of woolen cloth, into cylindrical form with a layer D of a suitable chemical having acid properties such as boric acid, between the two layers of the cloth. Of course, there may be more than two layers of cloth and more than one layer of the chemical, but ordinarily I consider a single layer of chemical between two layers of cloth sufficient. The overlapping longitudinal edges of the cloth may be stitched or pasted to the intervening cloth layer. The closed end C′ of the filter may be formed in any suitable manner, as, for example, by compressing the corresponding end portion of the cloth employed in the filter, or by means of a non-porous disc about which the cylindrical body of the cylinder is wound. The parts are proportioned to provide an annular space between the body of the cigarette holder and the filter which is sufficiently large in cross section to permit of a free flow of the smoke outward through the filter at all points along the length of the body portion of the latter.

The filter shown in Figs. 1 and 2 in addition to the general advantages and characteristics of the invention, possesses the special advantages of marked simplicity and effectiveness of construction, and of affording a relatively very large flow area for the smoke, and its cylindrical form is especially desirable moreover, because the tendency of the smoke to form whirling rings when passing through the interior of such a filter. Those rings expand outwardly and their whirling motion prolongs the time of contact of the smoke with the filter and thereby increases the efficacy of the latter.

In the modified construction shown in Figs. 3 and 4, the barrel or body AA of the cigarette holder is half cut away at one side for the major portion of its length, the opening being closed by a part E semi-cylindrical in cross section. The part E is secured to the body part AA at the end remote from the mouth piece A′ by the end piece BA which, in this form, is provided with an internally threaded socket receiving end portions of the body part AA and the end member E which unite to form an externally threaded cylinder. At its other end the part E extends under a cylindrical flange A^3 carried by the member AA, and which advantageously is in the form of a metal band surrounding the holder. The filter CA in this construction is a flat pad-like structure clamped at its edges between portions of the parts AA and E. To minimize the possibility of leaky joints, the longitudinal edges of the part E are provided with oppositely inclined surfaces E^2 which unite with corresponding side edge surfaces A^6 of the member AA, to provide diametrically opposed V-shaped channels opening into the bore of the cigarette holder and in which the edges of the filter CA are received. To assist in bringing the side edges of the parts E and AA into proper register and in sealing the joints against air leakage, the part AA is advantageously provided with longitudinal rib portions A^7 at the outer edges of the surfaces A^6 which enter rabbets formed for the purpose in the member E at the outer edges of the surfaces E^2.

The filter CA shown in Figs. 3 and 4, is advantageously formed by two rectangular strips of woolen cloth or other suitable porous fabric with a layer D of powdered boric acid or the like, between the fabric layers. The filter CA divides the chamber space in the cigarette holder into two compartments *a* and *a′*. The mouth-piece channel A^5 opens

into the compartment *a'*, while the smoke drawn through a cigarette held in the end piece BA enters the compartment *a* through a suitable port E' formed in the end portion of the member E.

With the construction shown in Figs. 3 and 4, the filter proper is somewhat simpler in form, and somewhat easier to construct than that shown in Figs. 1 and 2. While the filter CA provides a flow area for the smoke passing through it which is relatively smaller than is obtainable with the filter C of Figs. 1 and 2, the filter CA nevertheless provides a smoke flow path relatively much larger in cross section than the transverse section of the bore of the holder. With each form of construction filter renewal may be quickly and easily effected, when fouling of the filter makes renewal desirable.

In the modified form of cylindrical filter shown in Fig. 5, three concentric cloth layers C^2, C^3, and C^4 are employed. As shown, each layer is formed of a piece of cloth bent into cylindrical shape with abutting side edges which may be stitched or pasted together. The central layer C^3 is formed preferably of relatively thick and loosely woven woolen cloth in which acid crystals are deposited by first wetting the cloth with an acid containing solution and then drying the cloth, whereby the crystals formed as the water content of the solution evaporates, are interspersed through the cloth. The inner and outer cloth layers C^2 and C^4 are advantageously formed of comparatively thin and porous cloth and serve to protect the acid containing intermediate cloth layer from mechanical injury, and to prevent any of the acid crystals from being swept out of the filter and into the mouth of the smoker with the smoke stream.

It will be understood of course that the cloth portions of the filters C, CA, and CB are of themselves effective to arrest dust and condensable tar oil and like vapors in the smoke, and also to arrest some of the nicotine and other positively deleterious constituents of the smoke. Along with a suitable material having acid properties, I may incorporate in the filter other materials to perfume or flavor the smoke.

While in accordance with the provisions of the statutes I have illustrated and described the best forms of my invention now known to me, it will be apparent to those skilled in the art that the general principles of my invention may be embodied in other forms of construction, and I do not wish the claims hereinafter made to be limited to particular details of construction and arrangement disclosed herein more than is made necessary by the terms of the claims and by the prior state of the art.

Having now described my invention what I claim as new and desire to secure by Letters Patent, is:

1. In a smoking utensil comprising a channel through which the smoke passes to the mouth of the user, the improvement which consists in a filter located in said channel and comprising acid material adapted to neutralize deleterious basic constituents of the smoke, and layers of cloth in which said acid material is held such filter providing a path of smoke flow appreciably larger in cross section than said channel.

2. In a smoking utensil comprising a channel through which the smoke passes to the mouth of the user, the improvement which consists in a filter located in said channel and comprising layers of cloth and boric acid held between said layers of cloth, and providing a path of smoke flow through the filter appreciably larger in cross section than said channel.

3. In a smoking utensil comprising a channel through which the smoke passes to the mouth of the smoker, the improvement which consists in a filter located in said channel and comprising a layer of loosely woven woolen cloth and a finely divided material in contact with said layer and adapted to neutralize deleterious constituents of the smoke by chemical action.

4. In a smoking utensil comprising a tubular barrel, the improvement which consists in a tubular filter axially disposed in the bore of said barrel and dividing the latter into a smoke inlet compartment within, and a smoke outlet compartment surrounding said filter, said filter incorporating a material having acid properties adapted to neutralize deleterious basic constituents of the smoke.

Signed at New York city, in the county of New York, and State of New York, this 3rd day of October, A. D. 1925.

LESTER R. WAUGH.