May 12, 1936. A. H. FOX 2,040,733

IGNITION ELEMENT FOR SELF LIGHTING CIGARETTES AND THE LIKE

Filed April 13, 1933

Fig. 1.

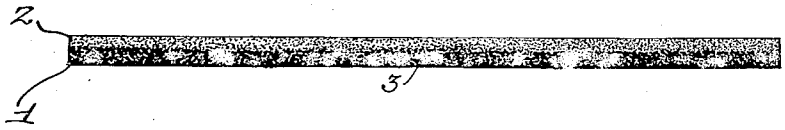
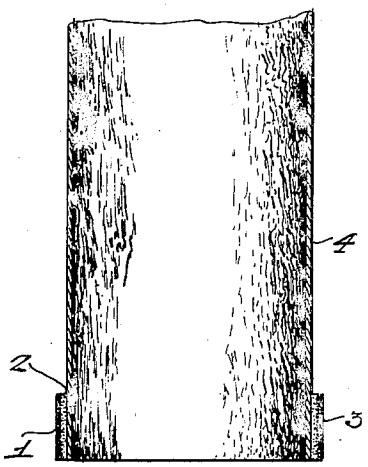


Fig. 2.



Fig. 3.



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IGNITION ELEMENT FOR SELF-LIGHTING CIGARETTES AND THE LIKE

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2 Claims. (Cl. 52—27)

This invention relates to improvements in fuses or igniting elements of a type suitable for use in connection with so-called self-lighting cigarettes and the like, and a principal object of the invention is to provide a novel process of manufacture involving no critical or difficult operations and productive of a generally improved end product.

More specifically an object of the invention is to simplify the methods of manufacturing ignition elements of the stated character and at the same time to provide a product of exceptionally high efficiency in its intended function.

Still another and more specific object of the invention is to provide a novel and improved process for manufacturing ignition elements of relatively high sensitivity and stability in the form of narrow thin flexible bands of a character suitable for application as an encircling band to the end of a cigarette or other tobacco product.

It has previously been proposed in connection with the igniting elements of self-lighting cigarettes and the like to combine with suitable ignition compositions, of the type for example employed in the heads of safety matches, a finely divided organic material such as tobacco dust for the purpose of providing within the structure of the fuse a relative slow-burning coal-forming agent which will remain in an incandescent state for an appreciable length of time after the active igniting elements have been spent. In corporation of this inert material with the active igniting components of the fuse has presented considerable difficulty by reason of the tendency of the material to render the ignition element relatively insensitive. To overcome this tendency, it has also been proposed in effect to partially or wholly segregate the organic materials from the active ignition components so that they do not materially interfere with the normal function of said components. The process of segregation, however, has in itself presented problems which have materially complicated the manufacturing process. I have discovered a simple and highly effective means for accomplishing the desired result, and in addition have provided an ignition element in the form of a thin and flexible band which possesses in high degree the characteristics essential to its use as the igniting element of self-lighting cigarettes.

I have discovered that if the active ignitible ingredients of the ignition element or fuse are mixed with a suitable binder and sufficient of a solvent for said binder to render the mixture fluid and the fluid mixture is then poured upon a flat surface to form a sheet or film of lesser thickness than the desired thickness of the finished product; and if after the setting or drying of this initial film has progressed to a certain point there is poured upon the initial film a second fluid film of required thickness and containing a suitable amount of finely divided organic material preferably in admixture with additional ignitible ingredients and with a binder and sufficient volatile solvent for said binder to afford the required degree of fluidity; and if the composite sheet thus formed is then permitted to dry, a sheet material of a character well suited for production of ignition bands for self-lighting cigarettes is produced. The super-imposed film, if poured upon the first film at the moment when the surface of the last-named film first shows a visible indication of drying will unite with the said first film to form in effect one solid sheet, the finished sheet material giving no indication of the double pour method of manufacture. This sheet material possesses the requisite characteristics of flexibility, strength and high igniting sensitivity, and at the same time possesses in pronounced degree the coal-forming characteristics previously described. By reason of the method of introducing the organic material into the finished product, this will be largely segregated at one face of the sheet material, while the other face of the sheet is composed primarily of the active igniting ingredients.

In attaching bands cut from this sheet material to cigarettes or other tobacco products, that face of the band in which the coal-forming materials are mainly distributed is applied to the cigarette, which results in the exposure of the active igniting elements for ready ignition by frictional contact with a suitable striking surface. The fact that the combustible organic materials were originaly in admixture with igniting components insures an adequate progression of the flame initiated at the outer surface of the band to all portions of the coal-forming ingredients, so that the use of all of the organic materials in the production of the coal or incandescent band is assured, and no more of the inert organic materials need be employed than will produce a coal of the desired character.

As the active igniting composition, I have found that the following mixture affords exceptionally good results:

	Grammes
Powdered glass	.36
Dichromate of potash	.27
Manganese dioxide	.18
Chlorate of potash	3.6
Sulfur	.75

These ingredients when mixed with 40 c. c. of a 5% solution of cellulose acetate in acetone, with sufficient additional acetone to make a total mix of 90 c. c., may be poured upon a flat surface, preferably glass, to form a film .006 of an inch in thickness, which is allowed to stand until the surface gives indication of drying. On this partly

dried film, I now pour a mixture of the following composition:

	Grammes
Powdered glass	.22
Dichromate of potash	.59
Manganese dioxide	.13
Chlorate of potash	3.15
Powdered hickory wood	3.6

the foregoing being mixed in 40 c. c. of a 5% acetone solution of cellulose acetate together with sufficient additional acetone to bring the total mixture to 90 c. c. This mixture also is poured to a depth of .006 of an inch, affording a finished product of approximately .012 of an inch. The composite sheet is now permitted to thoroughly dry, after which it may be removed from the plate and cut into strips of a size to afford an encircling band for cigarettes or other tobacco products of the desired width.

It will be noted that while the second pour contains all of the active ingredients of the igniting composition with the exception of the sulfur, which is replaced by the powdered wood, the relative proportions of the active ingredients of this mixture differ to a considerable extent from that in the igniting composition forming the first pour. These differences have been found by test to produce an end product of the most desirable characteristics. It will be understood that either or both of the compositions of the two pours may be varied without departure from the invention, which consists primarily in the discovery that by manipulation of the igniting composition and organic material described above, it is possible to produce by an extremely simple and uncritical process an ignition band for self-lighting cigarettes and the like having in pronounced degree all the characteristics desirable in an igniting element used for this purpose.

In the attached drawing, which is provided for the purpose of illustrating the invention:

Figure 1 shows an enlarged edge view of a sheet or strip of a fuse composition made in accordance with the procedure outlined above;

Fig. 2 is a view in perspective of a cigarette to one end of which a fuse strip has been applied in the form of an encircling band, and

Fig. 3 is an enlarged transverse sectional view of the cigarette and of the attached fuse band.

In Fig. 1, that portion of the strip constituting the first pour of the aforedescribed process is shown in relatively dark stipling and is indicated by the reference numeral 1, the second or superimposed pour being represented by the relatively light stipling, as indicated by the reference numeral 2. This fuse material is applied to the cigarette in the form of a narrow band 3 encircling one end of the cigarette, which is indicated by the reference numeral 4. As illustrated in Fig. 3 and as previously described, the fuse band is applied with the side indicated by the reference numeral 2 in contact with the paper of the cigarette, to which it is adhesively attached. This brings that side of the fuse which contains the organic combustible material in contact with the cigarette, while the outer or exposed face of the fuse is composed of the relatively sensitive igniting materials.

I claim:

1. As a new article of manufacture, a fuse material in the form of a composite sheet consisting of successively formed interunited layers, one of said layers consisting of powdered glass .36 gramme, dichromate of potash .27 gramme, manganese dioxide .18 gramme, chlorate of potash 3.6 grammes, sulfur .75 gramme, and cellulose acetate 2 c. c., and the other of said layers consisting of powdered glass .22 gramme, dichromate of potash .59 gramme, manganese dioxide .13 gramme, chlorate of potash 3.15 grammes, powdered hickory wood 3.6 grammes, and cellulose acetate 2 c. c.

2. As a new article of manufacture, a fuse material in the form of a sheet, the opposite surface portions of which are formed approximately of the following compositions:

(1)	Powdered glass	.36 gramme
	Dichromate of potash	.27 gramme
	Manganese dioxide	.18 gramme
	Chlorate of potash	3.6 grammes
	Sulfur	.75 gramme
	Cellulose acetate	2 c. c.
(2)	Powdered glass	.22 gramme
	Dichromate of potash	.59 gramme
	Manganese dioxide	.13 gramme
	Chlorate of potash	3.15 grammes
	Powdered hickory wood	3.6 grammes
	Cellulose acetate	2 c. c.

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