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CIGARETTE PAPER WRAPPER

Milton O. Schur, Asheville, and Robert M. Levy, Brevard, N. C., assignors to Ecusta Paper Corporation, a corporation of Delaware

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This invention relates to cigarette paper and more particularly to cigarette paper treated so as to provide a high degree of combustibility when used as a wrapper for a cigarette and which upon burning of the cigarette, will result in a whitish paper ash, solid and tube-like, similar to that of the ash on a cigar. These burning and ashing characteristics of the cigarette paper are provided to meet the requirements of cigarette smokers in certain foreign countries, especially where the slower burning tobaccos are used.

In addition to the requirement that the cigarettes burn at a relatively fast rate to leave a whitish, substantially continuous, tube-like type of paper ash, certain foreign cigarette manufacturers may require that the cigarette paper alone, i. e., in the absence of tobacco, have a specific burning characteristic, namely, that when the cigarette paper is touched with a glowing ember, it will itself glow and continue to glow after the ember is removed. When the paper has a basis weight of about 10 to 15 grams per square meter, it may be required that the glowing continue until a hole at least about an inch in diameter results. When the basis weight is about 18 to 25 grams, it may be required that a specimen of paper, for example, a strip approximately one inch wide by three inches long, is entirely consumed. The paper ash in this test is required to be whitish in color and flaky.

In the manufacture of cigarette paper, as the basis weight of the sheet is decreased, it becomes increasingly difficult to maintain a high degree of combustibility as defined above. This situation is aggravated if the bast fibers ordinarily used are replaced with wood fibers in the paper furnish.

It has been customary heretofore to meet the combustibility requirement of cigarette paper for use in some foreign countries by incorporating in the cigarette paper small amounts of paper combustion supporting chemicals, such as potassium nitrate. For example, the addition of about 2.5% of potassium nitrate to cigarette paper will substantially increase its burning rate. However, when such amounts of potassium nitrate are used, the paper ash in the "glow test" tends to be dark rather than the desired white. If the amount of the chemical is reduced, the paper ash may become lighter in color, but the burning rate of the cigarette or the solidity of the paper ash tend to become unsatisfactory. Furthermore, even the use of potassium nitrate or the like in the very lightweight papers, e. g., a 12 gram paper, especially one composed of wood fibers, will fail to result in a satisfactory glow test.

To answer all of the foregoing requirements of combustibility and ash characteristics, it has been found necessary to employ means beside the addition of potassium nitrate or other chemicals. After considerable research, we have found that these objectives can be accomplished by incorporating in the cigarette paper a suitably small amount of asbestos fibers to coact with the combustion supporting chemicals, e. g., potassium nitrate. It is sig-

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nificant that the desired results cannot be obtained by the use of either the chemical or the asbestos fibers alone, but are very satisfactorily attained by the joint use of these two constituents. The use of the asbestos fibers permits a reduction in the amount of potassium nitrate or other suitable chemical needed to provide the high degree of combustibility in the paper. Darkening of the paper ash is thereby reduced, and the whitish solid type of ash is more fully realized. It is the coaction or cooperative function of both the combustion supporting chemical and the asbestos fibers that enable the results of this invention to be obtained.

The amount of asbestos fibers used in accordance with this invention is relatively small as compared with the total weight of the cigarette paper. We have found that amounts of asbestos fibers as low as 1% give an appreciable improvement in the ashing properties of the paper, and that amounts up to about 5% of asbestos fibers may be used without producing any adverse effect on the strength, appearance, or other physical properties of the paper. In actual practice, we have found the use of about 3% of asbestos fibers to give the most desirable results.

Regarding the chemical used in this paper, we have found that the desirable burning and ashing properties can be obtained generally with certain of the salts of the alkali metals. Because of the ready availability and low cost, the sodium or potassium salts are preferred, although salts of the other alkali metals will function satisfactorily. Illustrative but non-limiting examples are the nitrates, tartrates, formates, acetates, carbonates, chlorates, and the like of sodium and potassium. Specific examples of compounds which we have used in practice and with which we have obtained very satisfactory results are potassium nitrate, sodium formate, and sodium tartrate. The amount of one or more of these chemicals used in accordance with the present invention is in the order of 1½% or less. For example, amounts as small as 0.1% of the compound will effect appreciable improvement in the burning and ashing properties, and an amount of approximately 1½% may be used without adversely affecting the ashing properties of the paper provided such an amount is used in conjunction with the asbestos fibers to avoid darkening of the ash.

The asbestos fibers used in accordance with this invention are advantageously beaten or otherwise defiberated to the point that the individual fibers or fibrils are of a size comparable to the cellulosic fibers from which the cigarette paper is principally made. The asbestos may be defibered in a beater prior to its addition to the cellulosic fibers or the asbestos and cellulose fibers may be added to the beater and defibration and mixing caused to take place simultaneously. This manner of incorporation of the asbestos fibers provides the fibers in the cigarette paper furnish at the time the furnish reaches the paper machine and at which point calcium carbonate or other suitable carbonate filler is commonly added to render the paper generally porous and combustible. The amount of calcium carbonate or other filler content of the paper is usually in the order of about 20% to 30% of the total weight of the paper, and as above mentioned, the asbestos fiber content may vary from approximately 1% to 5% based on the total weight of the finished paper.

The combustion supporting chemical, e. g., potassium nitrate or sodium formate, is advantageously incorporated in the paper web after it is formed on the paper machine. These chemicals may be incorporated in the paper after the paper web has been formed and partially or completely dried by operations such as spraying or through use of a conventional size press located in the drier section of the paper machine.

As a specific but non-limiting illustration of the pro-

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cedure used in accordance with this invention, a cigarette paper weighing 20 grams per square meter and made of flax fibers and containing approximately 24% calcium carbonate as a filler was produced in the usual manner except that it contained approximately 3% of finely-divided asbestos fiber, based on the total weight of fiber. It was impregnated at the size press with 0.75% sodium nitrate, based on the total weight of paper. Cigarettes formed with this paper yielded on burning, a white, solid, tube-like ash. A strip of the paper when touched by a glowing cigarette, began to glow and was entirely consumed, leaving an almost white ash.

A paper, such as that described in the preceding paragraph, was impregnated with 0.5% of sodium formate instead of sodium nitrate at the size press. Cigarettes formed with the resulting paper burned and produced a similar type of whitish, continuous tube-like ash. A strip of the paper ignited with a glowing cigarette was entirely consumed, leaving an almost white ash.

In another specific example, the cigarette paper was of the very light weight type, i. e., it weighed 12 grams per square meter, and was made of wood fibers. It contained 19% calcium carbonate filler and was impregnated with varying quantities of sodium nitrate. It badly failed to meet the glow test requirement. However, in another run of paper of similar weight, filler content, and fiber composition except for the inclusion of about 3% asbestos, the paper after impregnation with 0.8% sodium nitrate met the glow test and ash appearance requirements very satisfactorily.

A cigarette paper wrapper treated in accordance with this invention, as above described, effects an increase of at least about 5% to 25% in the burning rate of the cigarette, over that obtained with paper containing no asbestos or combustion supporting chemical depending upon the type of tobacco used.

The scope of the invention is indicated in the following claims.

We claim:

1. A highly combustible cellulosic paper cigarette wrapper that produces upon burning of the cigarette a whitish, solid, tube-like ash, said paper consisting of a predominant proportion of cellulosic fibers selected from the group consisting of bast fibers and wood fibers, a carbonate filler, approximately 1% to 5% asbestos fibers, and approximately 0.1% to 1½% of a non-explosive combustion supporting alkali metal salt, said asbestos and alkali metal salt coacting to provide the aforesaid ashing characteristics of the cigarette paper wrapper.

2. A highly combustible cellulosic paper cigarette wrapper that produces upon burning of the cigarette a whitish solid, tube-like ash, said paper consisting of a predominant proportion of cellulosic fibers selected from the group consisting of bast fibers and wood fibers, a carbonate filler, and approximately 1% to 5% asbestos fibers and approximately 0.1% to 1½% of a salt selected from the group consisting of nitrates, tartrates, formates, acetates, carbonates and chlorates of the alkali metals, said asbestos and alkali metal salt coacting to provide the aforesaid ashing characteristics of the cigarette paper wrapper and to effect at least about 5% to 25% faster burning of the cigarette.

3. A highly combustible cellulosic paper cigarette wrapper consisting of a predominant proportion of cellulosic fibers selected from the group consisting of bast fibers and wood fibers, a carbonate filler, approximately 1% to 5% of asbestos fibers, and approximately 0.1% to 1½% of potassium nitrate.

4. A highly combustible cellulosic paper cigarette wrapper consisting of a predominant proportion of cellulosic fibers selected from the group consisting of bast fibers and wood fibers, a carbonate filler, approximately 1% to 5% of asbestos fibers, and approximately 0.1% to 1½% of sodium formate.

5. A highly combustible cellulosic paper cigarette wrap-

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per that produces upon burning of the cigarette a whitish, solid, tube-like ash, said paper consisting of a predominant proportion of flax fibers, a carbonate filler, approximately 1% to 5% asbestos fibers, and approximately 0.1% to 1½% of a non-explosive combustion supporting alkali metal salt, said asbestos fibers and alkali metal salt coacting to provide the aforesaid ashing characteristics of the cigarette paper wrapper and to effect at least about 5% to 25% faster burning of the cigarette.

6. A highly combustible cellulosic paper cigarette wrapper that produces upon burning of the cigarette, a whitish solid, tube-like ash, said paper consisting of a predominant proportion of wood fibers, a carbonate filler, approximately 1% to 5% asbestos fibers, and approximately 0.1% to 1½% of a non-explosive combustion supporting alkali metal salt, said asbestos and alkali metal salt coacting to provide the aforesaid ashing characteristics of the cigarette paper wrapper and to effect at least about 5% to 25% faster burning of the cigarette.

7. A highly combustible cellulosic paper cigarette wrapper that produces upon burning of the cigarette a whitish, solid, tube-like ash, said paper having a basis weight of approximately 10 to 15 grams per square meter, and consisting of a predominant proportion of cellulosic fibers selected from the group consisting of bast fibers and wood fibers, a carbonate filler, approximately 1% to 5% asbestos fibers, and approximately 0.1% to 1½% of a non-explosive combustion supporting alkali metal salt, said asbestos fibers and alkali metal salt coacting to provide the aforesaid ashing characteristics of the cigarette paper wrapper and to effect at least about 5% to 25% faster burning of the cigarette.

8. A highly combustible cellulosic paper cigarette wrapper that produces upon burning of the cigarette, a whitish, solid, tube-like ash, said paper having a basis weight of approximately 12 grams per square meter and consisting of a predominant proportion of wood fibers, a carbonate filler, approximately 1% to 5% asbestos fibers, and approximately 0.1% to 1½% of a non-explosive combustion supporting alkali metal salt, said asbestos fibers and alkali metal salt coacting to provide the aforesaid ashing characteristics of the cigarette paper wrapper and to effect at least about 5% to 25% faster burning of the cigarette.

9. A highly combustible wood fiber paper cigarette wrapper that produces upon burning of the cigarette, a whitish, solid, tube-like ash, said paper consisting of a predominant proportion of cellulosic fibers selected from the group consisting of bast fibers and wood fibers a carbonate filler, approximately 1% to 5% asbestos fibers and approximately 0.1% to 1½% of a non-explosive combustion supporting alkali metal salt.

10. A highly combustible cellulosic cigarette paper having a basis weight of about 10 to 15 grams per square meter and having the property that when touched with a glowing ember and the ember removed, it will glow to produce a hole at least about an inch in diameter, and the ash resulting from said glowing will be whitish and flaky, said paper consisting of a predominant proportion of cellulosic fibers selected from the group consisting of bast fibers and wood fibers, a carbonate filler, approximately 1% to 5% asbestos fibers, and approximately 0.1% to 1½% of a non-explosive combustion supporting alkali metal salt.

11. A highly combustible cellulosic cigarette paper having a basis weight of about 18 to 25 grams per square meter and having the property that when touched with a glowing ember and the ember removed, it will glow until the paper is entirely consumed and the ash resulting from said glowing will be whitish and flaky, said paper consisting of a predominant proportion of cellulosic fibers selected from the group consisting of bast fibers and wood fibers, a carbonate filler, approximately 1% to 5% asbestos fibers, and approximately 0.1% to 1½% of non-explosive combustion supporting alkali metal salt.

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