Nov. 29, 1966 S. R. ROSENTHAL 3,288,145

TOBACCO ARTICLE

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FIG. 1

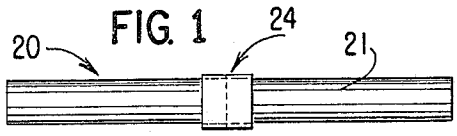


FIG. 2

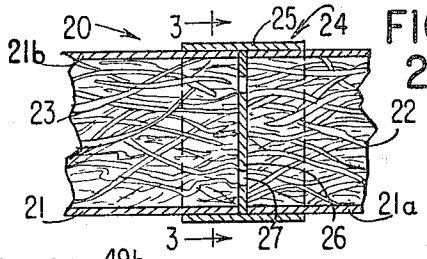


FIG. 3

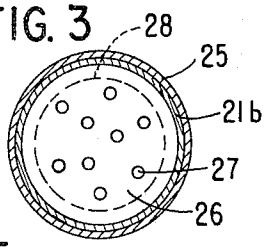


FIG. 4

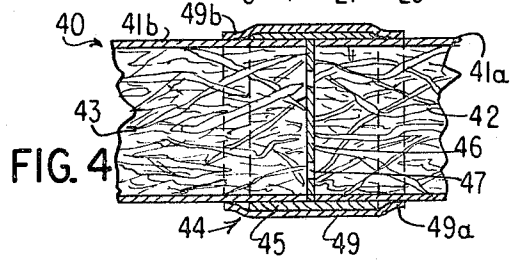


FIG. 5

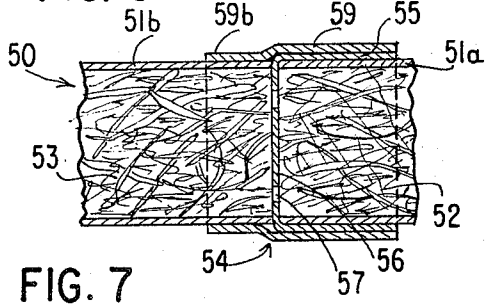


FIG. 6

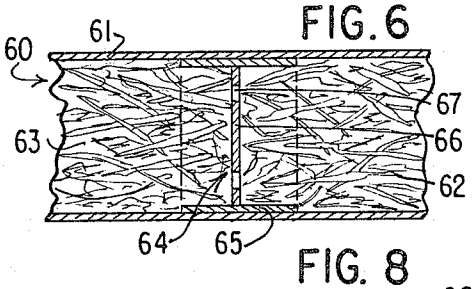


FIG. 7

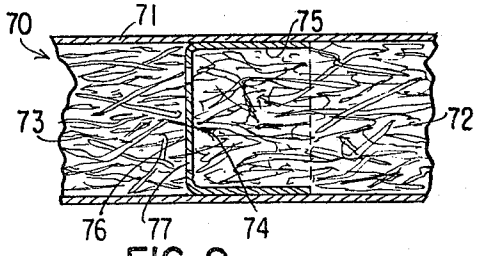


FIG. 8

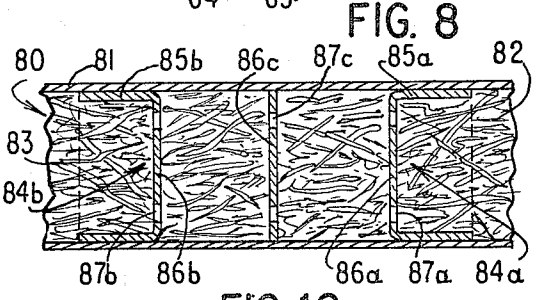


FIG. 9

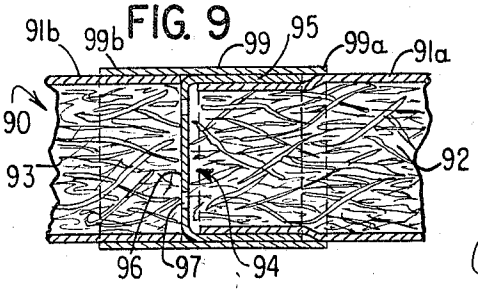
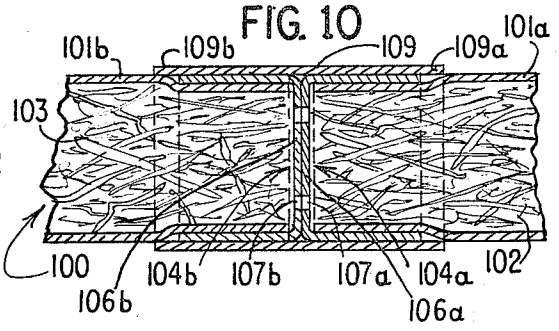


FIG. 10



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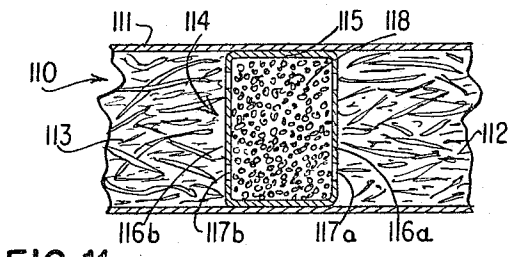


FIG. 11

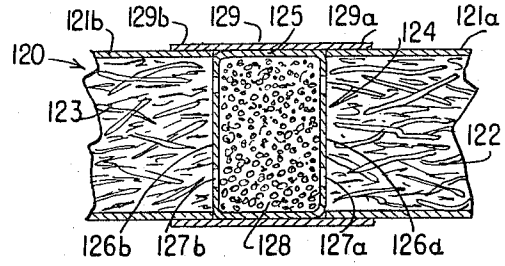


FIG. 12

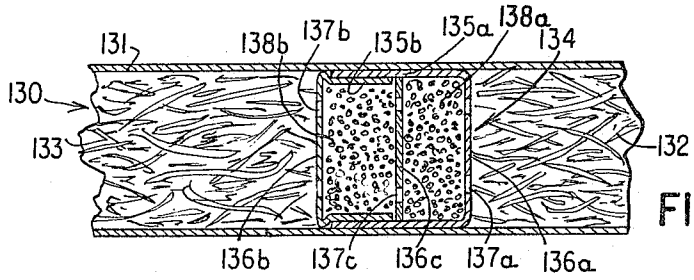


FIG. 13

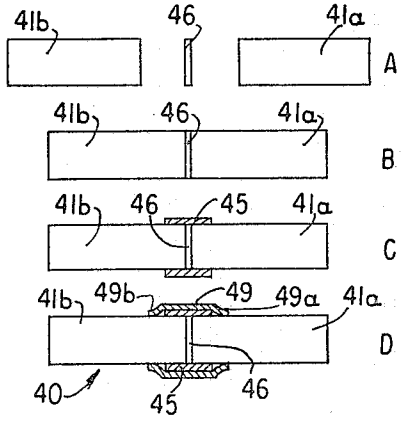


FIG. 14

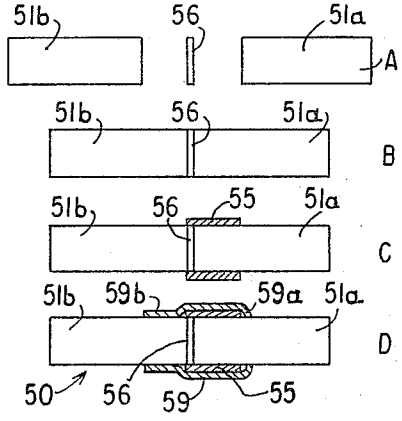


FIG. 15

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FIG. 16

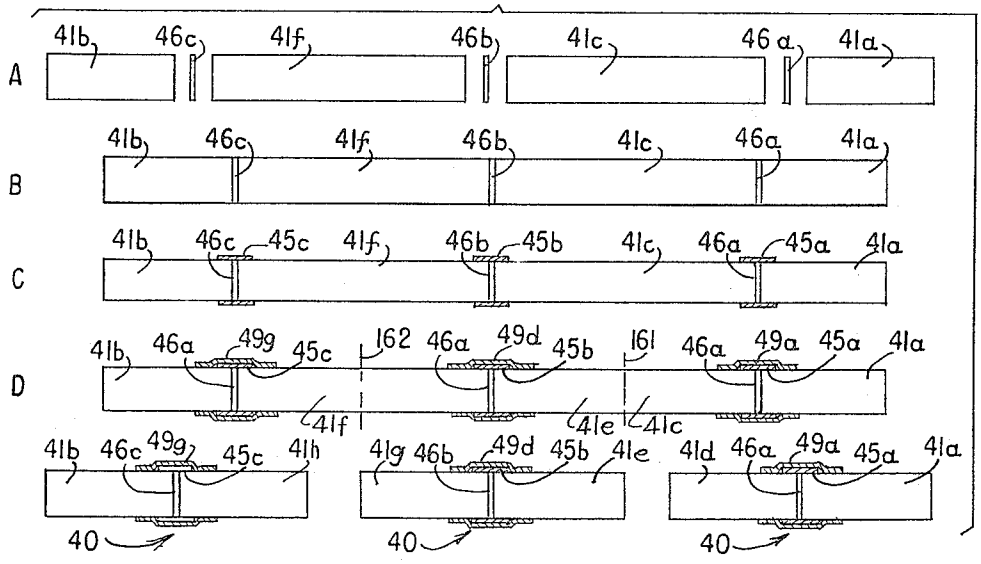


FIG. 17

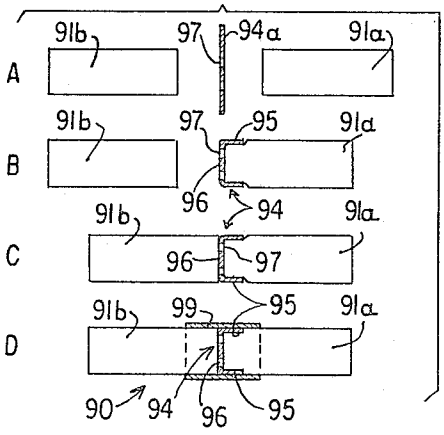
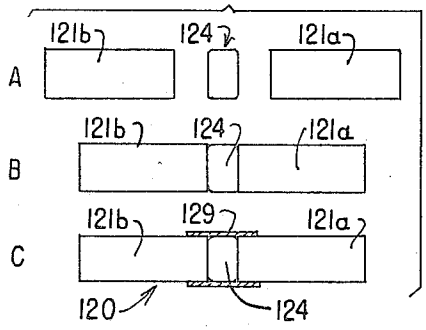


FIG. 18



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United States Patent Office 3,288,145 Patented Nov. 29, 1966

3,288,145

TOBACCO ARTICLE

Sol Roy Rosenthal, 230 E. Delaware Place, Chicago, Ill.

Filed June 10, 1963, Ser. No. 286,534
23 Claims. (Cl. 131—4)

This application is a continuation-in part of my co-pending application Ser. No. 60,159, filed Oct. 3, 1960, now abandoned.

The present invention relates to cigarettes and tobacco articles and more particularly to a highly improved smoke-filtering tobacco product.

It is a well-known fact among those skilled in the tobacco arts that most of the smoke filters heretofore developed and used in the commercial manufacture of cigarettes have not been effective to remove appreciable portions of the nicotine, tars and other harmful constituents of the smoke reaching the user's mouth. It has been found that artificial filters, if they are to be effective to these ends, change the taste of the smoke and also make it difficult to draw on the cigarettes, with the result that they are rejected by most smokers. In order to satisfy their customers, the commercial cigarettes manufactures for the most part have continued to use very poor artificial filters or, if a somewhat more effective filter is employed, a heavier tobacco is used that produces more nicotine, tar and the like. The end result is the same in either case in that the smoker draws into his mouth and lungs smoke that is inadequately filtered and, in the long run, physically harmful to him.

One of the most satisfactory filters for tobacco smoke in cigarettes is the tobacco itself, but this fact has not heretofore been of practical utility in producing a safe and well filtered cigarette because of the natural tendency of most cigarette smokers to smoke each cigarette down to a relatively short butt. Medical evidence seems to indicate that the rate of lung cancer in cigarette smokers is greatest in countries where the smokers tend to smoke their cigarettes down to the shortest butts and, if we accept the proposition that cigarette smoke produces cancer, the medical evidence would appear to be supported by laboratory tests concerning the results produced by smoking cigarettes to short butts. Actual tests have shown, for example, that the smoking of 73% of the length of an ordinary "king-size" cigarette, having a length of about 85 mm., will deposit in the smoker's mouth about 39% to 46% more nicotine and about 35% to 46% more tars than if only 55% of the length of the cigarette is smoked. This startling increase in the amount of nicotine and tar consumed is thus experienced in reducing the butt length a mere 18% of the cigarette's original length. These figures will of course vary, depending upon the brand of cigarettes being tested and upon the nature of the tobacco used therein, but they clearly show the importance of the relationship between the length of the butt and the amount of nicotine and tars to which the smoker is subjected. The tobacco toward the butt end of the cigarette serves effectively to filter the smoke during the early burning of the cigarette, at which time the nicotine and tars are deposited on the particles of tobacco adjacent to the butt end. However, as the butt becomes shorter, the previously deposited nicotine and tars are again thrown into the mainstream of smoke, with the result that the smoker is then subjected to smoke that contains a very high and progressively increasing percentage of tars, nicotine and other undesirable smoke ingredients.

One of the objects of the present invention is to provide a highly improved and yet inexpensive and easily manufactured cigarette that safely and effectively employs the tobacco as a filter and prevents reintroduction

into the mainstream of smoke the nicotine and tars and the like that are deposited upon the tobacco adjacent the butt end of the cigarette. This objective is fulfilled in the present invention by providing a cigarette containing two columns of tobacco in end-to-end position with a fire-stop for preventing the burning from spreading from one column to the other during the act of smoking. The unlighted column of tobacco is thus protected from ignition and is maintained at its full length as a filter for the smoke produced by the other column, none of the tars and nicotine and the like deposited upon the tobacco of the filtering column being reintroduced into the mainstream of the smoke.

Another object of the present invention is to provide a cigarette of the above character which may if desired, be smoked from either end.

Yet another object of the invention is to provide a cigarette of the kind stated above wherein the fire-stop means is comprised of fire resistant ion exchange material for absorbing ionized particles from the smoke.

Still another object is to provide a cigarette or other tobacco article wherein the tobacco is effectively employed as a filter for the smoke.

These and other objects and advantages of the present invention will be apparent from the following description, taken with the accompanying drawings, wherein:

FIGURE 1 is an elevational view of a cigarette constructed in accordance with and embodying therein the principles of the present invention;

FIG. 2 is a greatly enlarged longitudinal sectional view of the intermediate portion of the cigarette shown in FIG. 1;

FIG. 3 is a view in lateral cross section through the cigarette of FIG. 2 along the line 3—3 thereof;

FIG. 4 is another enlarged longitudinal sectional view of the intermediate portion of a cigarette that is a modification of the one illustrated in FIGS. 1 to 3;

FIG. 5 is another enlarged longitudinal sectional view of the intermediate portion of a cigarette showing still another variation;

FIG. 6 is a similar view showing yet another variation;

FIG. 7 is an enlarged longitudinal sectional view of the intermediate portion of a cigarette made in accordance with the present invention and employing a cup of metal foil as the fire barrier therein;

FIG. 8 is an enlarged longitudinal sectional view of a cigarette similar to FIG. 7, but illustrating the use of two oppositely facing metal foil cups with a barrier therebetween as fire barriers;

FIG. 9 is an enlarged longitudinal sectional view of a modified form of the cigarette shown in FIG. 7;

FIG. 10 is another enlarged longitudinal sectional view showing a modified form of the cigarettes of FIGS. 8 and 9;

FIG. 11 is an enlarged longitudinal sectional view of the intermediate portion of yet another embodiment of the cigarette to the present invention wherein a capsule is disposed within the cigarette to serve as the fire barrier;

FIG. 12 is another enlarged longitudinal sectional view of a modification of the cigarette illustrated in FIG. 11;

FIG. 13 is a similar enlarged sectional view of the modification of the cigarette illustrated in FIGS. 11 and 12;

FIG. 14 is a schematic and diagrammatic illustration of the method of forming the cigarettes of FIGS. 1 to 4 in accordance with the present invention;

FIG. 15 is a schematic and diagrammatic illustration of the method of forming the cigarette of FIG. 5 of the present invention;

FIG. 16 is a schematic and diagrammatic illustration of

yet another method of making the cigarettes of FIGS. 1 to 4 in accordance with the present invention;

FIG. 17 is a schematic and diagrammatic illustration of the method of making the cigarette of FIG. 9 of the present invention; and

FIG. 18 is a schematic and diagrammatic illustration of the method of forming the cigarette of FIG. 12 of the present invention.

Referring now to the drawings, and particularly to FIGS. 1 to 3 thereof, the numeral **20** therein designates a cigarette constructed in accordance with the present invention, the cigarette **20** preferably being the normal length and including the usual outer paper wrapper **21** which is divided into a right-hand section **21***a* and a left-hand section **21***b* (see FIG. 2). Within the wrapper **21** there are two columns **22** and **23** of smoking tobacco disposed in end-to-end position, the tobacco column **22** more particularly being within the wrapper section **21***a* and the tobacco column **23** being more particularly within the wrapper section **21***b*. Intermediate the two columns of tobacco there is provided a non-inflammable fire barrier generally designated by the numeral **24** and comprising an outer longitudinally extending and cylindrical fire barrier **25** and an inner lateral fire barrier **26**, the fire barriers **25** and **26** being formed of metal foil and co-operating to form cup-like receptacles for the associated ends of the wrapper sections **21***a* and **21***b* and the associated tobacco columns **22** and **23**, respectively.

The longitudinal fire barrier **25** contacts the outer surface of the wrapper sections **21***a* and **21***b* completely around the periphery of the adjacent ends thereof and more particularly extends therealong for a distance of at least about 4 mm., it having been found in accordance with the present invention that this longitudinal extent of the fire barrier **25** will positively stop burning of the wrapper **21** during drawing upon the lighted cigarette **20**, particularly in combination with the lateral fire barrier **26**. The inner surface of the longitudinal fire barrier **25** has a layer of adhesive material thereon which adhesively secures the barrier **25** to the adjacent ends of the wrapper sections **21***a* and **21***b* to hold the various parts assembled and thus to form the cigarette **20**. The longitudinal fire barrier **25** may also have the outer surface thereof colored or otherwise decorated to impart a distinctive appearance to the completed cigarette **20**.

The lateral fire barrier **26** is generally circular in shape and contacts the inner surface of the longitudinal fire barrier **25** completely around the periphery thereof so as positively to provide a barrier between the wrapper sections **21***a* and **21***b* and also to provide a barrier between the tobacco columns **22** and **23**. In order to permit the smoker to draw in the usual manner through the cigarette **20**, the lateral fire barrier **26** is provided with a plurality of holes **27** therein, see particularly FIG. 3, it having been found that the aggregate total of the cross-sectional area of the holes **27** should be between about 0.90 and 1.13% of the cross-sectional area of the cigarette **20** in order not to interfere with normal drawing therethrough.

In a typical example of the cigarette **20**, the diameter thereof is about 7.5 mm. and the length thereof is about 70 mm. for a regular size cigarette and about 85 mm. for a king size cigarette. When the cigarette has such dimensions, the metal foil from which the fire barrier **24** is formed preferably has a thickness from about 0.02 mm. to about 0.03 mm., the preferred metal foil being aluminum metal foil having the required thickness. As mentioned above, the longitudinal extent of the longitudinal fire barrier **25** must be at least about 4 mm. positively to stop the burning of the associated cigarette while drawing therethrough, and the longitudinal extent of the fire barrier **25** may be as much as 6 mm. It has been found that if the longitudinal extent of the longitudinal fire barrier **25** is less than about 4 mm., fire will be propagated along and between the wrapper sections **21***a* and **21***b* and will be transferred between the tobacco columns **22** and **23** if the user is drawing upon the cigarette when the fire reaches the barrier **24**. It is undesirable to have a greater longitudinal extent of the barrier **25** than about 6 mm. since this unduly limits the useful and smokable length of the wrapper sections **21***a* and **21***b* and the associated tobacco columns **22** and **23**, respectively.

When the parts have the dimensions described herein, the lateral fire barrier **26** preferably has from about 8 to about 10 of the holes **27** therein, 9 of the holes **27** being illustrated in FIG. 3 of the drawings. To insure stopping of the fire at the barrier **24**, the holes **27** must be positioned at least about 1 mm. from the adjacent surface of the wrapper **21** and must fall within the circle indicated by the dashed line **28** in FIG. 3 so as to leave a zone about 1 mm. wide between the line **28** and the wrapper **21** that is free of holes. The holes **27** should also be positioned apart at least about 1 mm. It has been found that the holes **27** must have a size of less than about 0.6 mm. to prevent the transfer of fire between the tobacco columns **22** and **23** during drawing on the cigarette. The preferred size of the holes **27** is from about 0.225 mm. to about 0.275 mm. and the holes **27** preferably represent an aggregate cross-sectional area of from about 0.4 to about 0.5 mm.^{2}, thereby insuring against transfer of fire through the openings and, at the same time, maintaining the normal draw characteristics of the cigarette. If the number of holes **27** in the barrier **26** is substantially fewer than 8, the size of each of the holes **27** must be so large, if normal drawing is to be maintained, that fire will tend to be transmitted therethrough between the tobacco columns **22** and **23** during drawing. The sizes of the individual holes set forth above and the spacing therebetween and the aggregate cross-sectional area thereof are important in insuring a free and natural draw to the cigarette **20** while providing an effective fire stop to prevent the transfer of fire between the tobacco columns **22** and **23**. The sizes of the holes **27**, however may be decreased if their number is correspondingly increased so as to maintain the free and natural draw characteristics of the cigarette. For example, the size of the holes **27** may be decreased to as small as about 0.112 mm. to 0.137 mm., provided the number of holes is increased to about 32 to 40, but the use of such small openings in such large number involves manufacturing problems in the production of the barrier **26** which, at this time, make it preferable to use fewer holes of the preferred size and number referred to above.

Either end of the cigarette **20** illustrated in FIGS. 1 to 3 may be lighted, and the cigarette may be smoked in the usual fashion. The tobacco columns **22** and **23** are packed with the usual compactness, and the holes **27** in the lateral fire barrier **26** when constructed as described above will avoid any substantial obstruction to the draw of the cigarette **20**. If it is assumed, for example, that the right-hand end of the cigarette **20** is lighted by the user, the tobacco column **22** will be smoked in the usual fashion by the user, with the smoke produced by the burning of the tobacco column **22** passing through the openings **27** in the lateral fire barrier **26** and through the entire tobacco column **23** before it reaches the mouth of the user. In passing through the tobacco column **23** the smoke is adequately filtered by the strands of tobacco therein, the tars and nicotine and other harmful ingredients from the smoke adhering to or being absorbed in the strands of tobacco. When the fire in the tobacco column **22** reaches the fire barrier **24** and when the supply of tobacco in the column **22** has been substantially exhausted, the fire will automatically be extinguished by the fire barrier **24**, with the result that the tobacco column **23** will not be ignited and the tars and nicotine and other harmful materials previously deposited thereon from the smoke of the tobacco column **22** will never be released or reintroduced into the mainstream of the smoke for consumption by the user. The tobacco column **23**, by virtue of the fire barrier **24**, is thus maintained as an ideal and effective filter for the cigarette without adversely

affecting the draw of the cigarette, without changing the taste thereof, and without permitting harmful amounts of nicotine and tar and the like to reach the smoker's mouth.

There is illustrated in FIG. 4 of the drawings a modification of the cigarette **20** illustrated in FIGS. 1 to 3, the cigarette of FIG. 4 being generally designated by the numeral **40**, the corresponding parts of the cigarette **40** being numbered in a like manner as the corresponding parts of the cigarette **20**. There is added to the cigarette **40** a third tubular wrapper **49** which is formed of paper and extends around the longitudinal fire barrier **45** and beyond the ends thereof and has a first portion **49***a* in contact with and secured to the wrapper section **41***a* and a second portion **49***b* in contact with the secured to the wrapper section **41***b*. The fire barrier **44** serves to stop the fire when the cigarette **40** is lighted from either end despite the presence of the third wrapper or overwrap **49**. Preferably the inner surface of the wrapper **49** has an adhesive layer thereon for securing the portions **49***a* and **49***b* to the wrapper sections **41***a* and **41***b*, respectively. The wrapper **49** may also have the outer surface thereof colored, metallized, or the like to impart a distinctive appearance to the cigarette **40**.

The cigarette **50** illustrated in FIG. 5 is similar to the cigarette **40** illustrated in FIG. 4 but differs therefrom in that the longitudinal fire barrier **55** contacts the lateral fire barrier **56** at one end thereof and extends therefrom at least about 4 mm. along only the wrapper section **51***a* and is preferably adhesively secured thereto. The tubular wrapper **59** contacts only the longitudinal fire barrier **55** and the wrapper section **51***b* and is adhesively secured thereto to interconnect the wrapper sections **51***a* and **51***b* and the associated tobacco columns **52** and **53** respectively.

There is illustrated in FIG. 6 of the drawings yet another cigarette **60** which is a modification of the cigarette **20** illustrated in FIGS. 1 to 3. In the cigarette **60**, the tubular wrapper **61** is preferably made in a single section rather than two sections and the longitudinal fire barrier **65** is disposed within the wrapper **61** rather than exterioraly thereof as is the case in the cigarette **20** wherein the longitudinal fire barrier **25** is disposed exteriorly of the wrapper sections **21***a* and **21***b*. In all other respects the cigarette **60** of FIG. 6 is constructed like the cigarette **20** of FIG. 2 and has the various critical dimensions set forth above with respect to the cigarette **20**.

There are illustrated in FIGS. 7 to 10 of the drawings four different cigarettes embodying the principles of the present invention but constructed in a manner such that the longitudinal fire barrier and the lateral fire barrier are integral to form a cup for the adjacent end of the associated tobacco column. More particularly, the cigarette **70** of FIG. 7 includes a paper wrapper **71** containing two tobacco columns **72** and **73** disposed in end-to-end relationship, a fire barrier generally designated by the numeral **74** being disposed intermediate the tobacco columns. The fire barrier **74** is cup-shaped and is preferably formed of aluminum foil and includes a substantially cylindrical side wall **75** and an integral diaphragm or lateral wall **76** interposed between the two tobacco columns **72** and **73**. The outer surface of the cylindrical wall **75** is in contact with the inner surface of the wrapper **71** around the entire periphery thereof for a longitudinal extent of at least about 4 mm. and up to about 6 mm. The lateral wall **76** is provided with a plurality of holes **77** therein, the construction and arrangement of the wall **76** and the holes **77** being like that of and having the dimensions of the lateral fire barrier **26** and the holes **27** described above with respect to FIGS. 1 to 3. The cup **74** completely surrounds and receives therein the adjacent end of the tobacco column **72** and is effective positively to stop the burning of the wrapper **71** and to prevent transfer of fire between the tobacco columns **72** and **73** even during drawing thereon and regardless of which end of the cigarette **70** is lighted.

There is illustrated in FIG. 8 a further modification of the cigarette of the present invention, wherein a tobacco column **82** is separated from a tobacco column **83** by two fire barriers **84***a* and **84***b* which are in all respects like the fire barrier **74** described above and illustrated in FIG. 7. The lateral fire barriers **86***a* and **86***b* are spaced-apart and the space therebetween is filled with tobacco packed in the usual manner and substantially centrally thereof is a third fire barrier **86***c* having holes **87***c* therein, the fire barrier **86***c* and the holes **87***c* being positioned and having dimensions within the ranges discussed above when describing the lateral fire barrier **26** and the holes **27** of the cigarette **20**. Thus, when the tobacco column **82** is lighted, the smoke therefrom must not only pass through the tobacco column **83** to be filtered as described above, but the smoke also comes into contact with the several lateral barriers **86***a*, **86***b* and **86***c* which will tend to cool the smoke and to condense thereon certain undesirable constituents of the smoke. The fire barriers presented will also effectively extinguish the fire in the tobacco column **82** when the supply of tobacco therein becomes substantially exhausted and will positively prevent the fire from spreading to the tobacco column **83**, even though there is normal drawing thereon, thereby preventing burning of the latter tobacco column and preventing the residues absorbed thereby and condensed upon the barriers **86***a*, **86***b* and **86***c* from being reintroduced into the smoke that would reach the user's mouth. Conversely, if the outer end of the tobacco column **83** is lighted, the tobacco column **82** will be maintained as a filtering agent for the smoke and the various fire barriers will stop the burning of the tobacco and the wrapper **81** in the same manner as described above when the tobacco column **82** is lighted.

There is shown in FIG. 9 of the drawings a modification of the cigarette illustrated in FIG. 7, the cigarette **90** of FIG. 9 including a tubular wrapper having a pair of spaced-apart wrapper sections **91***a* and **91***b* within which are disposed tobacco columns **92** and **93**, respectively. The left-hand end of the tobacco column **92** and the associated wrapper **91***a* are shown disposed within a cup generally designated by the numeral **94** and constructed like the cup **74** of FIG. 7 and having the same critical dimensions of the cylindrical wall **95**, the lateral wall **96**, and the holes **97** thereof as the like parts in the cup **74** of FIG. 7. The tobacco columns **92** and **93** rejoined by a third tubular wrapper or overwrap **99** which extends around the cup **94** and particularly the cylindrical wall **95** thereof and has one end portion **99***a* in contact with and adhesively secured to the adjacent end of the wrapper **91***a* around the circumference thereof and an end portion **99***b* in contact with and adhesively secured to the adjacent end of the wrapper **91***b* around the circumference thereof. The cigarette **90** can be smoked from either end and the cup barrier **94** will positively stop burning of the wrappers **91***a*, **91***b* and **99** and prevent transfer of fire between the tobacco columns **92** and **93**, even during drawing therethrough, and regardless of which end of the cigarette **90** is lighted. Accordingly, at least one of the cigarette columns **92** or **93** will be preserved as a filter for the burning of the other tobacco column as has been explained above.

A modification of the cigarette of FIG. 9 is illustrated in FIG. 10 of the drawings and is generally designated by the numeral **100**. The cigarette **100** differs from the cigarette **90** by employing a first cup barrier **104***a* to surround and receive the adjacent end of the tobacco column **102** and its associated wrapper **101***a* and a second cup barrier **104***b* to receive and to surround the adjacent end of the tobacco column **103** and its associated wrapper **101***b*. The cup barriers **104***a* and **104***b* are in all respects constructed and arranged alike and like the cup barrier **94** of FIG. 9, it being understood that the holes **107***a* and **107***b* therein must be in general alignment so as not

to interfere with normal drawing through the cigarette **100**. The two tobacco columns **102** and **103** are connected by a third tubular wrapper or overwrap **109** which contacts and surrounds both of the cup barriers **104***a* and **104***b* and has a first end portion **109***a* overlying and adhesively secured to the outer surface of the adjacent end of the wrapper **101***a* around the entire periphery thereof and a second end portion **109***b* overlying and adhesively secured to the outer surface of the adjacent end of the wrapper **101***b* around the entire periphery thereof. The cigarette construction of FIG. 10 possesses all of the advantages pointed out above with respect to the cigarette construction of FIG. 9 and more specifically it positively prevents burning of the wrappers past the cup barriers **104***a* and **104***b* and positively prevents the transfer of fire between the tobacco columns **102** and **103**, even during drawing upon the cigarette **100** and regardless of which end the cigarette **100** is lighted and smoked.

Tests have indicated that a great variety of complex chemical substances are contained in tobacco smoke, including nicotines, tars and certain vapor phase constituents. Among these vapor phase constituents are aldehydes and ketones which are considered by some investigators to be those that are the most irritating and harmful to the smoker if they reach his mouth or lungs. These aldehydes and ketones may be unionized or in an ionized or partially ionized form as they pass through the cigarette. Accordingly, a layer of granular or comminuted filtering porous material such as a molecular sieve type resin, or an ion exchange resin, or an ion retardation resin or an ion exclusion resin, or combinations thereof, may be profitably included in the cigarette of the present invention. These resin materials are well known and they are fire resistant so that they provide an ideal material for a fire barrier. Resin materials, such as those produced by The Dow Chemical Company, Midland, Michigan, under the trademark "Dowex," are readily available on the market and are excellent for this purpose. In addition to limiting the burning of the cigarette to one of the tobacco columns and thus maintaining the other tobacco column as an effective filter for the solids contained in the tobacco smoke, they also absorb by ion exchange action, or by retardation or exclusion as the case may be, the harmful aldehydes and ketones contained in the vapor phase of the smoke produced by the burning of the tobacco column.

There are illustrated in FIGS. 11, 12 and 13 of the drawings cigarettes made in accordance with the present invention incorporating therein as a part of the fire barrier an additional filtering material which may be tobacco or one of the resin materials discussed in the preceding paragraph. Referring first to FIG. 11, the cigarette **110** thereof includes the usual paper wrapper **111** containing tobacco columns **112** or **113** between which is disposed a capsule generally designated by the numeral **114** and including a cylindrical side wall **115** in contact with the inner surface of the wrapper **111** completely around the circumference thereof for a longitudinal distance of at least about 4 mm., and a pair of lateral walls **116***a* and **116***b* having holes **117***a* and **117***b* therein. The walls **116***a* and **116***b* respectively close the opposite ends of the cylindrical wall **115** to provide the capsule **114** within which is disposed the filtering material generally designated by the numeral **118**. The walls **115**, **116***a* and **116***b* are preferably formed of metal foil, such as aluminum foil, and the capsule **114** is filled or substantially filled with any suitable filtering material **118** which may include any of the materials listed above. The construction and arrangement of the lateral walls **116***a* and **116***b* and the respective holes **117***a* and **117***b* are like and have dimensions like the lateral barrier **26** and the holes **27** discussed above with respect to the cigarette **20**. The cigarette **110** can be lighted from either end, the unlighted tobacco column serving as an effective filter for the smoke produced by the burning of the lighted tobacco column without adversely affecting the taste or the draw of the cigarette, and the unlighted tobacco column is maintained as a filter by the fact that the capsule **114** prevents the spread of fire from the lighted tobacco column to the filtering tobacco column or along the tubular wrapper **111** past the cylindrical wall **115**. Furthermore, the material **118** contained in the capsule **114** has filtering properties, as previously indicated, and when the material **118** includes one or more of the various resins referred to above, it effectively absorbs the harmful organic ingredients including aldehydes, ketones, and the like contained in the vapor phase of the smoke.

The cigarette **120** illustrated in FIG. 12 of the drawings is a modification of the cigarette **110** of FIG. 11 and includes a pair of wrapper sections **121***a* and **121***b* filled respectively with tobacco columns **122** and **123**. Disposed between the adjacent ends of the tobacco columns **122** and **123** is a capsule **124** substantially identical in all respects to the capsule **114** described above, except that the outer diameter of the cylindrical wall **125** is substantially equal to the outer diameter of the wrapper sections **121***a* and **121***b*. The tobacco columns **122** and **123** and the capsule **124** are all connected together by a third tubular wrapper or overwrap **129** which contacts the cylindrical wall **125** completely around the periphery thereof and has a first end portion **129***a* in contact with and adhesively secured to the adjacent end of the wrapper **121***a* around the entire periphery thereof and a second end **129***b* in contact with and adhesively secured to the adjacent end of the wrapper **121***b* around the entire periphery thereof. The cigarette **120** of FIG. 12 has all of the desirable properties of the cigarette **110** of FIG. 11 and more specifically, can be smoked from either end and yet will not transfer fire between the tobacco columns **122** and **123** or along the wrappers **121***a*, **121***b* and **129** even when drawing thereon, whereby to preserve one of the tobacco columns as a filter for the smoke produced by burning the other, the capsule **124** providing additional filtering and absorption.

FIG. 13 illustrates a modified form of the cigarette shown in FIG. 11, and more specifically, shows a modified form of the capsule. The capsule **134** of the cigarette **130** in FIG. 13 includes a first outer cylindrical wall **135***a* having the right-hand end closed by a lateral wall **136***a* having holes **137***a* therein, the wall **135***a* telescopically receiving therein a second cylindrical wall **135***b* which has the left-hand end thereof closed by a lateral wall **136***b* having holes **137***b* therein. Also disposed within the capsule **134** is a lateral wall **136***c* having a plurality of holes **137***c* therein dividing the capsule into two compartments, the right-hand compartment being preferably filled with a first filtering material **138***a* and the left-hand compartment being preferably filled by a second filtering material **138***b*. The filtering materials **138***a* and **138***b* may be either the same or a different filtering material or mixture of filtering materials. Each of the lateral walls **136***a*, **136***b* and **136***c* has an arrangement of the holes therein like the lateral fire barrier **26** discussed above and the filtering materials **138***a* and **138***b* are a porous mass so as substantially not to interfere with the normal draw through the cigarette **130**.

Turning now to FIG. 14 of the drawings, the method of forming the cigarettes of FIGS. 1 to 4 will be described and as is diagrammatically illustrated in FIG. 14A, there first are provided the tubular wrapper sections **41***a* and **41***b* filled respectively with the tobacco columns **42** and **43** and arranged substantially in axial alignment with the adjacent ends spaced apart and receiving therebetween the lateral fire barrier **46**. The wrapper sections **41***a* and **41***b* are then moved axially toward each other and toward the fire barrier **46**, as in FIG. 14B after which the longitudinal fire barrier **45** is wrapped around the junctions between the lateral fire barrier **46** and the tubular wrapper sections **41***a* and **41***b* as illustrated in the step of FIG. 14C. If the inner surface of the metal foil

forming the longitudinal fire barrier 45 is provided with an adhesive coating, it will be understood that the foil 45 will suitably interconnect the parts to form a cigarette like the cigarette 20 of FIGS. 1 to 3. If no adhesive layer is provided on the inner surface of the metal foil 45 or if it is desired to provide a paper overwrap thereabout, the third tubular wrapper 49 is provided about the longitudinal fire barrier 45 and the outer ends 49*a* and 49*b* thereof are wrapped around and preferably adhesively secured to the outer surface of the adjacent ends of the tubular wrappers 41*a* and 41*b*, respectively, whereby to form the completed cigarette 40 of FIG. 4.

The method of making the cigarette 50 of FIG. 5 is illustrated in FIG. 15 of the drawings, this method being a variation of the method illustrated in FIG. 14 of the drawings and described above. There first are provided in general longitudinal alignment the tubular wrapper sections 51*a* and 51*b* filled with the tobacco columns 52 and 53, respectively, the adjacent ends of the wrapper sections 51*a* and 51*b* being spaced apart to receive therebetween and in general alignment the lateral fire barrier 56 as illustrated in the step of FIG. 15A. As illustrated in the step of FIG. 15B, the wrapper sections 51*a* and 51*b* are moved longitudinally toward each other and against the opposite sides of the lateral fire barrier 56 after which the metal foil band to form the longitudinal fire barrier 55 is wrapped about the assembly and positioned to overlie the periphery of the lateral fire barrier 56 and the adjacent end of the wrapper section 51*a*, see FIG. 15C. In order to secure the various parts in the assembled positions, the tubular wrapper or overwrap 59 is applied about the band 55 and with one end 59*a* contacting and adhesively secured to the adjacent end of the wrapper section 51*a* around the entire periphery thereof and the other section 59*b* placed in contact with and adhesively secured to the adjacent end of the wrapper section 51*b* around the entire periphery thereof, thus to form the completed cigarette 50 of FIG. 5, see FIG. 15D.

A modified method of making the cigarette 40 of FIG. 4 is illustrated in FIG. 16 of the drawings, this method being adapted to produce a plurality of the cigarettes 40 substantially simultaneously. There first are provided in general longitudinal alignment in FIG. 16A from right to left a tubular wrapper section 41*a* filled with a column of tobacco and having a length equal substantially to one-half the length of the finished cigarette 40; a lateral fire barrier 46*a* like the fire barrier 46 described above with respect to FIG. 4; a tubular wrapper section 47*c* having a tobaco column therein and having a length equal substantially to the length of the finished cigarette 40, i.e., substantially to twice the length of the tubular wrapper section 41*a*; a lateral fire barrier 46*b* identical to the lateral fire barrier 46*a*; a tubular wrapper section 41*f* filled with a tobacco column and having a length equal substantially to the length of the finished cigarette 40, i.e., about twice the length of the wrapper section 41*a*; a lateral fire barrier 46*c* identical in construction to the fire barriers 46*a* and 46*b*; and a tubular wrapper section 41*b* filled with a tobacco column and having a length substantially equal to that of the wrapper section 41*a*, i.e., about one-half the length of a finished cigarette 40. In the next step of the method illustrated in FIG. 16B, the parts of FIG. 16A are moved inwardly toward the center to place the adjacent ends of the various wrapper sections in contact with the adjacent surfaces of the various lateral fire barriers 46*a*, 46*b* and 46*c*. Thereafter, as illustrated in FIG. 16C, there is applied about each of the lateral fire barriers 46*a*, 46*b* and 46*c* a band of metal foil forming the longitudinal fire barriers 45*a*, 45*b* and 45*c*, respectively, the ends of the longitudinal fire barriers 45*a*, 45*b* and 45*c* extending over and covering and being in contact with the adjacent ends of the adjacent wrapper sections around the entire periphery thereof. Next the third tubular wrappers 49*a*, 49*d* and 49*g* are applied about the longitudinal fire barriers 45*a*, 45*b* and 45*c*, respectively, and are adhesively secured to the adjacent ends of the adjacent tubular sections to form a single continuous cigarette assembly as illustrated in FIG. 16D, the assembly of FIG. 16D having a length equal substantially to that of three of the cigarettes 40. Finally, the cigarette assembly of FIG. 16D is cut or severed at two points along the lines 161 and 162 to form three of the cigarettes 40. More specifically, the tubular section 41*a* and a subular section 41*d* corresponding to the right-hand half of the tubular section 41*c* are held against the lateral fire barrier 46*a* with the longitudinal fire barrier 45*a* therearound by the third tubular wrapper 49*a* to form a first cigarette 40; a wrapper section 49*d* being the left-hand half of the wrapper section 41*c* is joined to a wrapper section 41*g* being the right-hand end of the wrapper section 41*f* with the lateral fire barrier 46*b* therebetween and the longitudinal fire barrier 45*b* therearound and held together by the third tubular wrapper 49*d* to form the second or middle cigarette 40; and the wrapper section 41*h* being the left-hand half of the wrapper section 41*f* is joined to the wrapper section 41*b* with the lateral fire barrier 46*c* therebetween and the longitudinal fire barrier 45*c* therearound and held together by the third tubular wrapper 49*g* to form the third or left-hand cigarette 40 in FIG. 16E.

As a modification of the method illustrated in FIG. 16 of the drawings, if the longitudinal fire barriers 45*a*, 45*b* and 45*c* in FIG. 16C are provided with adhesive on the surface thereof disposed toward the various wrapper sections, these longitudinal fire barriers can secure together the various wrapper sections and upon cutting the wrapper sections 41*c* and 41*f* at the midpoints thereof, three of the cigarettes 20 of FIGS. 1 to 3 can be formed therefrom. It further is pointed out that the method of FIG. 16 and the modification thereof set forth above can be further modified by providing additional tubular wrapper sections like the wrapper section 41*c* or 41*f* wtih additional lateral fire barriers 46 to extend the length of the cigarette assembly to any desired extent to achieve further economies in the manufacture of the cigarettes 40 or the cigarettes 20 as the case may be.

The method of making the cigarette 90 of FIG. 9 is illustrated in FIG. 17 of the drawings. There first are provided in general longitudinal alignment the tubular wrapper sections 91*a* and 91*b* filled with the tobacco columns 92 and 93, respectively, the adjacent ends of the wrapper sections 91*a* and 91*b* being spaced-apart to receive therebetween a sheet 94*a* of metal foil. The metal foil sheet 94*a* has centrally thereof a plurality of holes shaped and arranged like the holes 97 in FIG. 9 and the remainder of the sheet is imperforate. The area of the holes 97 and the adjacent end of the wrapper section 91*a* are moved together as in FIG. 17B with the area of the holes 97 disposed centrally of the wrapper section 91*a* and the outer portions of the sheet 94*a* are folded around the adjacent end of the tubular section 91*a* to form the longitudinal fire barrier 95 and the lateral fire barrier 96 upon the adjacent end of the wrapper section 91*a*. The adjacent end of the wrapper section 91*b* is then moved against the adjacent surface of the lateral fire barrier 96 as in FIG. 17C, after which the third tubular wrapper 99 is applied about the wrapper section 91*a* and 91*b* in contact with the adjacent ends thereof and adhesively secured thereto about the entire periphery thereof, thus forming the completed cigarette 90.

As a first modification of the method illustrated in FIG. 17 of the drawings, a pre-formed cup 94 including the longitudinal cylindrical wall 95 and the lateral wall 96 with the holes 97 therein may be used in place of the metal foil sheet 94*a* illustrated. In forming the cigarette using the pre-formed cup, the adjacent end of the wrapper section 91*a* is inserted therein after which the third wrapper 99 is disposed thereabout to form a completed cigarette 90. The method illustrated in FIG. 17 can be further modified to apply a cup to both of the adjacent ends of the wrapper sections, either by using two of the metal foil sheets 94*a*

or by using two pre-formed cups **94**. After the application of the cups **94** to the adjacent ends of the wrapper sections **91***a* and **91***b*, the third wrapper **99** is applied thereabout to form a completed cigarette, the cigarette having the form illustrated in FIG. 10 of the drawings, namely, the cigarette **100** thereof.

Referring to FIG. 18 of the drawings, the method of forming the cigarette of FIG. 12 will be described. There first are provided the tubular wrapper sections **121***a* and **121***b* filled respectively with the tobacco columns **122** and **123** and arranged substantially in axial alignment with the adjacent ends spaced apart and receiving therebetween the capsule **124**, all as is illustrated in FIG. 18A. The wrapper sections **121***a* and **121***b* are then moved axially toward each other and toward the capsule **124** as in FIG. 18B, after which the third wrapper **129** is wrapped around the junctures between the capsule **124** and the wrapper sections **121***a* and **121***b* as illustrated in FIG. 18C. The inner surface of the wrapper **129** has an adhesive layer thereon which serves securely to adhere the adjacent ends of the wrapper **129** to the outer surface of the adjacent ends of the wrapper sections **121***a* and **121***b*, respectively.

The foregoing description of certain preferred embodiments of the cigarettes of the present invention and the methods of making the same has been given for clarity of understanding only, and no unnecessary limitations are intended thereby, for it will be apparent to those skilled in the art that numerous additional variations, changes and modifications may be made in the cigarettes of the present invention and the method of making the same without departing from the true spirit and scope of the appended claims.

What is claimed is:

1. A cigarette comprising a longitudinally extending tubular wrapper, two columns of tobacco in end-to-end position within said wrapper, a lateral fire barrier of metal foil between the adjacent ends of said two columns of tobacco, and a longitudinal fire barrier of metal foil extending from said lateral fire barrier and in thermal contact with said wrapper around the entire periphery thereof, said cigarette being adapted to be smoked from either end with one of said columns of tobacco serving as a filter for the smoke produced by the burning of the other column of tobacco, said lateral fire barrier being porous so as to present substantially no resistance to drawing therethrough during the smoking of said other column of tobacco, said longitudinal fire barrier being cylindrical and extending at least about 4 mm. longitudinally of said wrapper and around the entire periphery thereof, said fire barriers cooperating positively to stop burning of said wrapper and said other column of tobacco even during drawing therethrough when said other column of tobacco is substantially consumed.

2. The cigarette set forth in claim **1**, wherein said lateral fire barrier and said longitudinal fire barrier are in contact with each other around the entire periphery of said lateral fire barrier.

3. The cigarette set forth in claim **1**, wherein said lateral fire barrier and said longitudinal fire barrier are integral around the entire periphery of said lateral fire barrier.

4. A cigarette comprising a longitudinally extending tubular wrapper, two columns of tobacco in end-to-end position within said wrapper, a lateral fire barrier of metal foil between the adjacent ends of said two columns of tobacco, and a longitudinal fire barrier of metal foil extending from said lateral fire barrier and in thermal contact with said wrapper around the entire periphery thereof, said cigarette being adapted to be smoked from either end with one of said columns of tobacco serving as a filter for the smoke produced by the burning of the other column of tobacco, said lateral fire barrier having a plurality of holes therein having an area equal to from about 0.90% to about 1.13% of the cross-sectional area of said tubular wrapper so as to present substantially no resistance to drawing therethrough during the smoking of said other column of tobacco, said longitudinal fire barrier being cylindrical and extending at least about 4 mm. longitudinally of said wrapper and around the entire periphery thereof, said fire barriers cooperating positively to stop burning of said wrapper and said other column of tobacco even during drawing therethrough when said other column of tobacco is substantially consumed.

5. A cigarette comprising a longitudinally extending tubular wrapper, two columns of tobacco in end-to-end position within said wrapper, a lateral fire barrier of metal foil between the adjacent ends of said two columns of tobacco, and a longitudinal fire barrier of metal foil extending from said lateral fire barrier and in thermal contact with said wrapper around the entire periphery thereof, said cigarette being adapted to be smoked from either end with one of said columns of tobacco serving as a filter for the smoke produced by the burning of the other column of tobacco, said lateral fire barrier having a plurality of holes therein all spaced at least about 1 mm. from the periphery thereof and spaced from each other at least about 1 mm. and having a total area aggregating from about 0.90% to about 1.13% of the total cross-sectional area of said wrapper so as to present substantially no resistance to drawing therethrough during the smoking of said other column of tobacco, said longitudinal fire barrier being cylindrical and extending at least about 4 mm. longitudinally of said wrapper and around the entire periphery thereof, said fire barriers cooperating positively to stop burning of said wrapper and said other column of tobacco even during drawing therethrough when said other column of tobacco is substantially consumed.

6. The cigarette set forth in claim **5**, wherein said tubular wrapper has a diameter of about 7.5 mm., and said lateral fire barrier has from about 8 to about 10 holes therein each having a diameter in the range from about 0.225 mm. to about 0.275 mm., the aggregate cross-sectional area of said holes being from about 0.4 to about 0.5 $mm.^2$.

7. A cigarette comprising a longitudinally extending tubular wrapper, two columns of tobacco in end-to-end position within said wrapper, a lateral fire barrier of metal foil between the adjacent ends of said two columns of tobacco, and a longitudinal fire barrier of metal foil extending from said lateral fire barrier and in thermal contact with said wrapper around the entire periphery thereof, said cigarette being adapted to be smoked from either end with one of said columns of tobacco serving as a filter for the smoke produced by the burning of the other column of tobacco, said lateral fire barrier being porous so as to present substantially no resistance to drawing therethrough during the smoking of said other column of tobacco, said longitudinal fire barrier being cylindrical and extending at least about 4 mm. and up to about 6 mm. longitudinally of said tubular wrapper and around the entire periphery thereof, said fire barriers cooperating positively to stop burning of said wrapper and said other column of tobacco even during drawing therethrough when said other column of tobacco is substantially consumed.

8. A cigarette comprising a longitudinally extending tubular wrapper having a diameter of about 7.5 mm., two columns of tobacco in end-to-end position within said wrapper, a lateral fire barrier of aluminum foil between the adjacent ends of said two columns of tobacco, and a longitudinal fire barrier of aluminum foil extending from said lateral fire barrier and in thermal contact with said wrapper around the entire periphery thereof, said cigarette being adapted to be smoked from either end with one of said columns of tobacco serving as a filter for the smoke produced by the burning of the other column of tobacco, said lateral fire barrier having from about 8 to about 10 holes therein spaced from the outer periphery

thereof at least about 1 mm. with adjacent holes spaced-apart at least about 1 mm. from each other, said holes having a diameter in the range from about 0.225 mm. to about 0.275 mm. and having an aggregate cross-sectional area from about 0.4 to about 0.5 mm.^{2}, said longitudinal fire barrier being cylindrical and extending at least about 4 mm. up to about 6 mm. longitudinally of said wrapper and around the entire periphery thereof, said fire barriers co-operating positively to stop burning the said wrapper and said other column of tobacco even during drawing thereof when said other column of tobacco is substantially consumed.

9. A cigarette comprising a pair of longitudinally extending tubular wrappers, each of said wrappers having a column of tobacco therein, a lateral fire barrier of metal foil between the adjacent ends of said wrappers and said columns of tobacco, and a longitudinal fire barrier of metal foil extending from said lateral barrier exterioraly of said wrappers and in thermal contact with at least one of said wrappers around the entire periphery thereof, said cigarette being adapted to be smoked from either end with one of said columns of tobacco serving as a filter for the smoke produced by the burning of the other column of tobacco, said lateral fire barrier being porous so as to present substantially no resistance to drawing therethrough during the smoking of said other column of tobacco, said longitudinal fire barrier being cylindrical and extending at least about 4 mm. longitudinally of said wrappers and around the entire periphery thereof, said fire barriers co-operating positively to stop burning the said wrappers and said other column of tobacco even during drawing therethrough when said other column of tobacco is substantially consumed.

10. The cigarette set forth in claim **9**, wherein said longitudinal fire barrier extends substantially equal distances from said lateral fire barrier and is in contact therewith and with both of said wrappers around the entire periphery thereof.

11. The cigarette set forth in claim **9**, wherein said longitudinal fire barrier extends in only one direction from said lateral fire barrier and surrounds the adjacent end of only one of said wrappers.

12. A cigarette comprising a pair of longitudinally extending tubular wrappers, each of said wrappers having a column of tobacco therein, a lateral fire barrier of metal foil between the adjacent ends of said wrappers and said columns of tobacco, a longitudinal fire barrier of metal foil extending from said lateral barrier exterioraly of said wrappers and in thermal contact with at least one of said wrappers around the entire periphery thereof, and a tubular overwrap extending around said longitudinal fire barrier and the adjacent ends of said wrappers and secured to said wrappers to hold said wrappers and said columns of tobacco in operative position against said lateral fire barrier, said cigarette being adapted to be smoked from either end with one of said columns of tobacco serving as a filter for the smoke produced by the burning of the other column of tobacco, said lateral fire barrier being porous so as to present substantially no resistance to drawing therethrough during the smoking of said other column of tobacco, said longitudinal fire barrier being cylindrical and extending at least about 4 mm. longitudinally of said wrappers and around the entire periphery thereof, said fire barriers cooperating positively to stop burning the said wrappers and said other column of tobacco even during drawing therethrough when said other column of tobacco is substantially consumed.

13. The cigarette set forth in claim **12**, wherein said longitudinal fire barrier extends substantially equal distances from said lateral fire barrier and is in contact therewith and with both of said wrappers around the entire periphery thereof.

14. The cigarette set forth in claim **12**, wherein said longitudinal fire barrier extends in only one direction from said lateral fire barrier and surrounds adjacent end of only one of said wrappers.

15. In a cigarette comprising a longitudinally extending tubular wrapper, two columns of tobacco in end-to-end position within said wrapper, a lateral fire barrier of metal foil between the adjacent ends of said two columns of tobacco, and a longitudinal fire barrier of metal foil extending from said lateral fire barrier and in thermal contact with said wrapper around the entire periphery thereof, said cigarette being adapted to be smoked from either end with one of said columns of tobacco serving as a filter for the smoke produced by the burning of the other column of tobacco, said lateral fire barrier being porous so as to present substantially no resistance to drawing therethrough during the smoking of said other column of tobacco, said longitudinal fire barrier being cylindrical and surrounding said lateral fire barrier and in contact therewith and engaging the inner surface of said wrapper and extending in both directions from said lateral fire barrier a total distance of at least about 4 mm., said fire barriers cooperating positively to stop burning of said wrapper and said other column of tobacco even during drawing therethrough when said other column of tobacco is substantially consumed.

16. A cigarette comprising a longitudinally extending tubular wrapper, two columns of tobacco in end-to-end position within said wrapper, a lateral fire barrier of metal foil between the adjacent ends of said two columns of tobacco, and a longitudinal fire barrier of metal foil integral with the periphery of said laterial fire barrier and extending therefrom and in thermal contact with said wrapper around the entire periphery thereof, said lateral fire barrier and said longitudinal fire barrier cooperating to provide a cup-shaped form occupied by the adjacent end of one of said columns of tobacco, said cigarette being adapted to be smoked from either end with one of said columns of tobacco serving as a filter for the smoke produced by the burning of the other column of tobacco, said lateral fire barrier being porous so as to present substantially no resistance to drawing therethrough during the smoking of said other column of tobacco, said longitudinal fire barrier extending from said lateral fire barrier at least by 4 mm. longitudinally of said wrapper and around the entire periphery thereof, said fire barriers cooperating positively to stop burning of said wrapper and said other column of tobacco even during drawing therethrough when said other column to tobacco is substantially consumed.

17. A cigarette comprising a pair of longitudinally extending tubular wrappers, each of said wrappers having a column of tobacco therein, a lateral fire barrier of metal foil between the adjacent ends of said wrappers and said columns of tobacco, a longitudinal fire barrier of metal foil integral with the periphery of said lateral fire barrier and extending therefrom exteriorally of the associated wrapper and in thermal contact therewith around the entire periphery thereof, said lateral fire barrier and said longitudinal fire barrier cooperating to provide a cup-shaped pocket occupied by one end of the associated column of tobacco, and a third wrapper extending around said longitudinal fire barrier and the adjacent ends of said pair of wrappers and secured thereto to hold the adjacent ends thereof in operative relationship to said cup-shaped pockets, said cigarette being adapted to be smoked from either end with one of said columns of tobacco serving as a filter for the smoke produced by the burning of the other column of tobacco, said lateral fire barrier being porous so as to present substantially no resistance to drawing therethrough during the smoking of said other column of tobacco, said longitudinal fire barrier being cylindrical and extending at least about 4 mm. longitudinally of said wrappers and around the entire periphery thereof, said fire barriers cooperating positively to stop burning of said wrappers and said other column of tobacco even during draw-

ing therethrough when said other column of tobacco is substantially consumed.

18. A cigarette comprising a longitudinally extending tubular wrapper, two columns of tobacco in end-to-end position within said wrapper, a pair of spaced-apart lateral fire barriers of metal foil between the adjacent ends of said two columns of tobacco, and a longitudinal fire barrier of metal foil extending between said lateral fire barriers and in thermal contact therewith and with said wrapper around the entire periphery thereof, said lateral fire barriers and said longitudinal fire barrier cooperating to provide a capsule containing therein a filter material, said cigarette being adapted to be smoked from either end with one of said columns of tobacco serving as a filter for the smoke produced by the burning of the other column of tobacco, said laterial fire barriers being porous and said filter material being porous so as to present substantially no resistance to drawing therethrough during the smoking of said other column of tobacco, said longitudinal fire barrier being cylindrical and at least extending about 4 mm. longitudinally of said wrappers and around the entire periphery thereof, said fire barriers cooperating positively to stop burning of said wrapper and said other column of tobacco even during drawing therethrough when said other column of tobacco is substantially consumed.

19. The cigarette set forth in claim 18, wherein, said filter material is tobacco.

20. The cigarette set forth in claim 18, wherein, said filter material is an adsorption resin for adsorbing certain constituents of the smoke produced during the burning of said cigarette.

21. The cigarette set forth in claim 18, wherein said longitudinal fire wall is integral with said lateral fire barriers at the opposite ends thereof.

22. The cigarette set forth in claim 18, wherein, said longitudinal fire wall includes a pair of telescoping cylinders integral respectively at the outer ends thereof with said lateral fire barriers, and there further is provided within said capsule a porous partition wall.

23. A cigarette comprising a pair of longitudinally extending tubular wrappers, each of said wrappers having a column of tobacco therein, a pair of spaced-apart lateral fire barriers of metal foil between the adjacent ends of said wrappers and said columns of tobacco, a longitudinal fire barrier of metal foil extending between the said lateral fire barriers and in contact therewith around the peripheries thereof, said lateral fire barriers and said longitudinal fire barrier cooperating to provide a capsule containing therein a filtering material, and a third wrapper extending around said longitudinal fire barrier and the adjacent ends of said pair of wrappers and secured thereto to hold the adjacent ends thereof in operative relationship to said capsule, said cigarette being adapted to be smoked from either end with one of said columns of tobacco serving as a filter for smoke produced by the burning of the other column of tobacco, said lateral fire barriers and said filtering material being porous so as to present substantially no resistance to drawing therethrough during the smoking of said other column of tobacco, said longitudinal fire barrier being cylindrical and extending at least about 4 mm. longitudinally of said wrappers and around the entire periphery thereof, said fire barriers cooperating positively to stop burning of said wrappers and said other column of tobacco even during drawing therethrough when said other column of tobacco is substantially consumed.

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