Feb. 21, 1967 R. E. GUNTHER 3,304,943

CIGARETTES WITH SMOKE COOLERS

Filed March 6, 1964

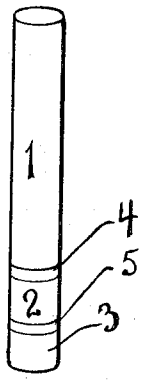


FIG. 1

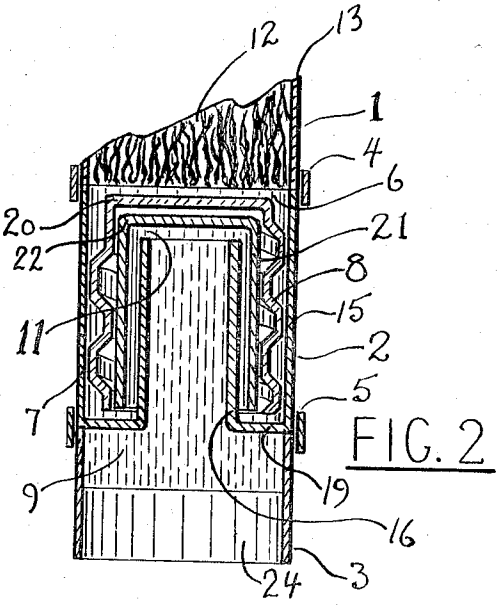


FIG. 2

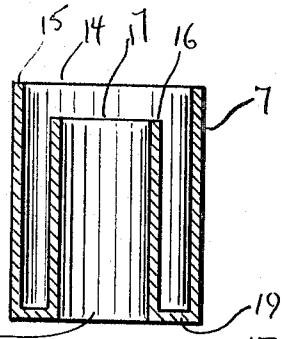


FIG. 3

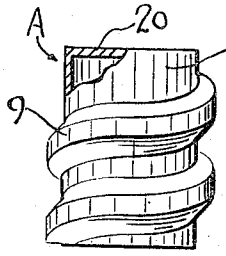


FIG. 5

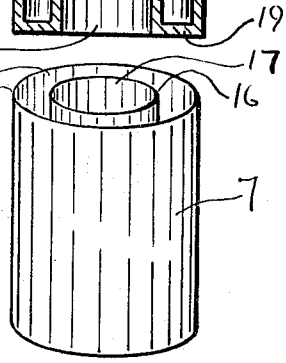


FIG. 4

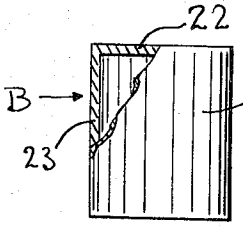


FIG. 6

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CIGARETTES WITH SMOKE COOLERS

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1 Claim. (Cl. 131—10.5)

This invention pertains to cigarettes having integral cooling means for lowering the temperature of the smoke before filtration.

Possible physiological effects that might be ascribed to constituents of cigarette smoke have recently been the subject of much contention. In an effort to eliminate or at least appreciably lessen these effects the manufacturers have provided cigarettes with a variety of filter types. The filters are presented with a fairly difficult task, however, in that the substances passing through them are either in an extremely finely divided condition or present as hot vapors. The filtration can be carried out much more effectively if the smoke is first cooled. In this way the so-called tars can be condensed into droplets, and these in turn can aid in trapping particulate matter in the smoke even if it is there in extremely small sizes.

It is an object of this invention to provide a new and improved type of cigarette, in the smoking of which an appreciably greater proportion of smoke-entrained tars may be removed than has heretofore been possible by filtration alone.

It is a further object of this invention to provide a new and improved type of cigarette having an integral smoke filtration means following a cooling means.

It is another object of this invention to provide sequential cooling and filtration of smoke without having to resort to externally applied devices such as cigarette holders, for which there is a widespread aversion, especially among men.

The manner in which these and other objects are attained is set forth in the following specification, taken in conjunction with the drawings.

In the drawings, FIGURE 1 shows an overall view in elevation of the exterior of the new cigarette. FIGURE 2 shows a sectional view through the tip end of the cigarette. FIGURE 3 shows in section the body of a smoke cooling portion of the cigarette, while FIGURE 4 shows a smoke cooler body in a perspective view. FIGURE 5 is an elevation of a smoke cooler baffle portion cut away to illustrate some of the structure. FIGURE 6 is an elevation of a smoke cooler internal shield, again with a portion in cutaway to illustrate structure.

FIGURE 1 shows the cigarette which is the object of this invention to consist of three main parts: a conventional cigarette body **1**, a smoke cooler **2** and a filter tip **3**. FIGURE 1 shows also a sealing means **4** applied between the cigarette body **1** and the smoke cooler **2**, and another sealing means **5** applied between the smoke cooler **2** and the filter tip **3**.

FIGURE 2 being in section, shows the internal construction of the cigarette in detail. A portion of the cigarette body **1** is seen with a tobacco filler **12** within a paper wrapping **13**. The body **1** is shown to be sealed to the smoke cooler **2** by sealer **4** as in FIGURE 1. The smoke cooler **2** is shown to comprise a cooler body **7** within which is a frictionally fitted baffle **8**, and inside the baffle is an internal shield **21**, which is in turn frictionally fitted within the baffle. The baffle and its internal shield are positioned above and at a distance from the smoke cooler body's bottom portion which is shown in FIGURE 2 as connecting web **19**. Further features of significance shown in FIGURE 2 are a closed top **20** of the smoke baffle **8**, and a closed top **22** of the internal shield **21**; also inner wall **16** of the smoke cooler body

7 and also the cooler body's outer wall **15**, as well as the fact that the smoke cooler's wall are joined at the bottom ends by a lower web **19**. The smoke cooler **2** has a smoke inlet **6** comprising the entry from the tobacco filler portion **12** of the cigarette body **1** to the space between the smoke cooler body's outer wall **15** and the baffle **8**. The smoke cooler **2** has a smoke outlet **11** comprising the exit from the space between smoke cooler body's inner wall **16** and the internal shield **21**. Shown below the smoke cooler **3** and sealed thereto by sealer **5** is filter tip **3**. Inside filter tip **3** and also extending into the space inside smoke cooler body's inner wall **16** is some filter media **9**. The lower end of the filter tip **3** comprises a mouthpiece **24**.

FIGURE 3 shows in section the smoke cooler body **7** by itself for the sake of clarity. Shown in this view as in FIGURE 2 are smoke cooler body outer wall **15** and inner wall **16**, as well as the web **19** connecting inner and outer walls at the lower end of the cooler body. Shown in this view is the upper opening **17** of the inner wall **16** and the somewhat higher upper opening **14** of the outer wall **15**. There is also a lower opening **18** shown in this view of the cooler body.

FIGURE 4 shows a perspective elevation of the smoke cooler body discussed under the descriptions of FIGURES 2 and 3. Shown in this view is the cooler body **7** with its outer wall **15** and its inner wall **16**, the opening **14** in the outer wall and the opening **17** in the inner wall.

FIGURE 5 shows a smoke cooler baffle **8** in elevation. The smoke cooler baffle is the same unit shown in FIGURE 2 in section, and is here illustrated in this way for more clarity. Especially of importance is helical ribbing **9** in this view. The letter A points toward a small cutaway portion to show again that the baffle is closed at its upper end by smoke baffle top **20**.

FIGURE 6 shows internal cooler shield **21** in elevation with a small portion indicated by letter B in cutaway in which may be seen internal shield wall **23** and internal shield top **22**.

With the various parts of the cigarette assembled as shown in FIGURE 2 it is ready for use. When the cigarette is then lit and smoked, the smoke travels through the tobacco filler at first as usual. When the smoke emerges from the tobacco filler it is guided by the closed end **20** of the baffle **8** into the smoke inlet **6** of the cooler. The smoke travels at first in a downward direction in the view shown in FIGURE 2 moving between the outer wall of the cooler and the baffle until its direction is reversed when it reaches the bottom of the cooler where the web **19** is located. The smoke then passes up inside of the internal shield in the space between the shield and the inner wall of the cooler body to emerge thru outlet **11**, whereafter it is subjected to the action of the filter media **9** as it passes toward and out through the mouthpiece.

The preferred form of the baffle being provided as shown with helical ribbing, the smoke as it passes down between the outer cooler body wall and the baffle is made to travel a much elongated path. This assures the smoke of making intimate and extended contact with the outer wall of the cooler. The outer wall being exposed to the atmosphere in its exterior location on the cigarette, it acts as a heat exchanger and cools the smoke before it gets to the filter. The inner shield **21** prevents the smoke from coming in direct contact with the baffle again as it passes back up toward the initial area of contact with the filter media, and this in turn avoids reheating the already cooled smoke. The construction described provides several advantages. Mechanically, it results in a compact unit that is structurally strong, with the filter portion extending into the cooled, rather than having one as sort of an appendage to the other.

The principal advantage and the essential purpose lies in the cooling effect brought about, and its attendant effects. The latter include condensation of so-called tars which is the most important, as well as enhanced enjoyability while smoking for the absence of any heat sensation in the mouth.

The cooled smoke is subject to more efficient filtration also because it permits the filter to operate by absorption as well as by adsorption. It puts less of a demand on the filter media used because tapping of tars is much less difficult than trying to trap this portion of the smoke, while allowing physically similar flavor and aroma fractions to pass while they are all present in vapor-like form.

In the construction of the cooler the preferred material to be used is aluminum. This metal is fairly inexpensive, which is an important factor in a one-time used article; it is also a very good conductor of heat. Aluminum itself has an attractive appearance and it may also be easily given decorative treatments to enhance its appearance even further.

I claim:

In a cigarette having a wrapper and a charge of tobacco therein, a tubular filter mouthpiece and a cooling means intermediate the mouthpiepe and the cigarette, the said cooling means comprising a large metallic outer tubular portion of a diameter substantially the same as that of the mouthpiece and the cigarette and adapted to be secured thereto and provided with a smaller inner tubular section shorter in length than the outer section and which is connected by an annular flat sealing web portion to the lower edge of the outer tubular portion to form an annular well, the inner tubular portion housing a filter element which is continuous with the filter in the mouthpiece, a double element cup shaped baffle element having an outer helical rib disposed within the well with the bases of said baffle element disposed over the top of the inner tubular section and in spaced relationship thereto, in such wise that a helical and then reversely extending smoke path is provided for the smoke to follow from the tobacco, first, between the outer helical wall of the baffle and the inner wall of the large tubular element, then under the cap-like baffle and then between the inner element of the baffle and the outer and top walls of the inner tubular section and finally after a second reversal of its path through the filter, to the mouthpiece.

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