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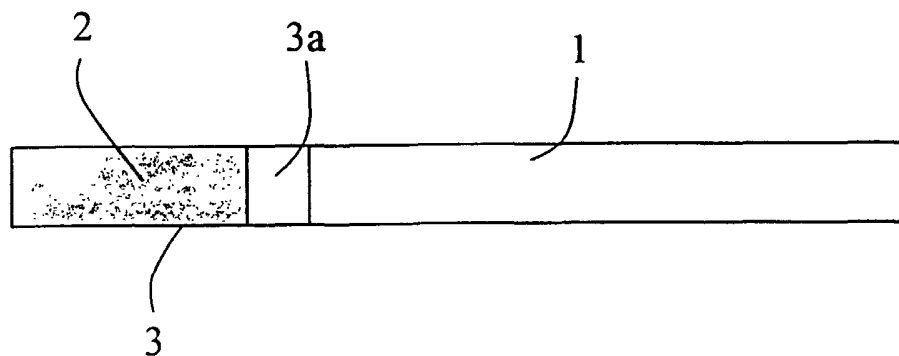
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(54) Title: CIGARETTE FILTER



(57) Abstract: The present invention relates to a filter cigarette. It comprises a tobacco rod (1) wrapped in a thin paper, a filter (2) and a tipping paper (3) which wraps around the filter and holds it to the tobacco rod. The tipping paper has an openwork design over an area of at least 50 mm² and the wrapper situated below these orifices in the openwork design is provided with microopenings. The purpose of these orifices in the openwork design, which have a total area of at least 50 mm², is to allow a portion of the CO to exit from the smoke before inhalation.



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CIGARETTE FILTER

FIELD OF THE INVENTION

5 The present invention relates to a filter cigarette comprising a tobacco rod wrapped in a thin paper or similar material, a filter and a tipping paper which wraps around the filter and joins it to the tobacco rod.

10

PRIOR ART

It has been known for decades to use a filter tip, joined to the tobacco rod, to retain a portion of the constituents of the smoke, this filter tip being joined to the cigarette via a tipping paper, which is often made from a special paper in order not to stick to the lips. With the aim of reducing the toxicity of tobacco smoke, provision has been made for ventilated cigarettes which have a filter wrapped in an air-permeable paper and in a tipping paper with perforations. In this way, the air sucked through the perforations is mixed in the filter with the sucked-in smoke and the content of tar, nicotine, CO and other harmful molecules is reduced by dilution.

At this stage, it is important to point out that various tests have been carried out regarding the ventilation of the filter and two significant observations have been made: both the tar, on the one hand, and the nicotine and CO, on the other hand, are reduced in direct proportion to the ventilation. Secondly, it turned out that better ventilation is obtained by using microperforations rather than macro-perforations, that is to say that, for the same permeability of the tipping paper, there is greater ventilation when the number of perforations is higher.

It turns out, from the above, that, if it is desired to further reduce the content of CO in the smoke, it can be obtained by increasing the ventilation but, at the same time, the content of nicotine and of tar is also reduced, which is not necessarily desirable as there may be an effect on the taste of the cigarette.

SUMMARY OF THE INVENTION

10

The aim of the present invention is to provide a filter cigarette which makes it possible to selectively reduce the content of CO and of other small harmful molecules without having an effect, at least a significant effect, on the content of nicotine and of tar.

15

It is known that, as it is not possible to retain the CO by means of a filter, there has always been a search to produce less CO and various techniques have been used. One of these techniques is the use of a porous cigarette paper which allows the CO, which is a very small molecule, to exit from the tobacco rod during smoking. The final part of the tobacco rod, even if the cigarette paper is porous, is covered by the tipping paper, which prevents the CO molecules from exiting, when close to the filter.

20

25

The Inventor has looked for a means for reducing the amount of CO inhaled by the smoker and has found a means for allowing the CO to exit, even to the end of smoking.

30

The distinguishing feature of the cigarette according to the invention is that said tipping paper has an openwork design over an area of at least 50 mm² and that the wrapper situated below these orifices in the openwork design is provided with microopenings.

35

This is because, by producing orifices in the openwork design which have an area of at least 50 mm², and provided that the wrapper situated below these orifices
5 in the openwork design is provided with microopenings, which, according to one alternative form, can be simple pores and, according to another alternative form, microperforations, a decrease in the inhaled CO of the order of 3 to 20% is obtained with virtually no effect
10 on the content of nicotine and of tar.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

According to a preferred alternative embodiment, said
15 orifices in the openwork design extend solely over the part of the tipping paper covering the tobacco rod, which, of course, is provided with a porous or micro-perforated paper.

20 According to an alternative embodiment, the orifices in the openwork design are found solely over the filter, which, in that case, is wrapped in a porous or microperforated wrapper.

25 According to another alternative embodiment, the orifices in the openwork design are found both over the part of the tipping paper covering the filter and over the part covering the tobacco rod.

30 BRIEF DESCRIPTION OF THE DRAWINGS

The invention will be described in more detail using the appended drawing.

35 Figure 1 is a view of a conventional cigarette.

Figures 2 to 5 exhibit a tipping paper according to the

invention.

A cigarette comprising a tobacco rod 1, a filter 2 and the tipping paper 3, which, on the one hand, wraps
5 around the filter and, on the other hand, wraps around the part 3a, the tobacco rod, is represented in figure 1. The filter, with ventilation or without ventilation, is of any type used in the tobacco industry.

10

The tipping paper according to the invention exhibits different alternative forms, the first of which, represented in figure 2, is a tipping paper 31 provided with holes 31a which, in the present case, are oval but
15 can have any other shape. These holes represent a total area of at least 50 mm^2 which makes possible the discharge of CO molecules and of other small harmful molecules, provided, of course, that the paper surrounding the tobacco rod 1 is porous or
20 microperforated.

Another tipping paper 32, provided with cutouts 32a also situated over the part of the tipping paper applied to the end of the tobacco rod 1, has been
25 represented in figure 3. Here again, the wrapper of the tobacco rod must be porous and/or microperforated in order to allow the discharge of the CO molecules or of other small harmful molecules.

30 A tipping paper 33, provided over the part covering the filter with openings 33a which can also have any shape and, as in the preceding cases, must represent a total area of at least 50 mm^2 , is represented in figure 4.

35 Finally, in figure 5, the tipping paper 34 is provided with openings 34a which are found on both sides of the junction between the filter 2 and the tobacco rod 1.

Both the wrapper of the filter 2 and the wrapper of the tobacco rod 1 must be porous or microperforated in order to allow the discharge of the CO molecules or other small harmful molecules.

5

It is obvious that the cutouts of round, oval or rectangular holes can also be replaced by letters or figures or any other decorative shapes.

10 To confirm the above, the Inventor has carried out tests according to the tables below using openings over a total area of 150 mm² which is situated over the part of the tipping paper covering the tobacco rod. In test 1, the two series of cigarettes were slightly
15 different and, for a lower filter ventilation and a total ventilation itself also lower, the CO decreased by 11% with a tipping paper with an openwork design. In test 2, the two series of cigarettes were identical, the filter ventilation is alike in both cases, while
20 the total ventilation increased slightly for the modified cigarette and the decrease in CO is 15%.

The decreases in CO are significant and cannot be obtained by a conventional filter ventilation system
25 without changing the content of tars and of nicotine. It is therefore clearly a selective decrease. Furthermore, the decrease in CO is independent of the fact that the filter is ventilated or is not ventilated.

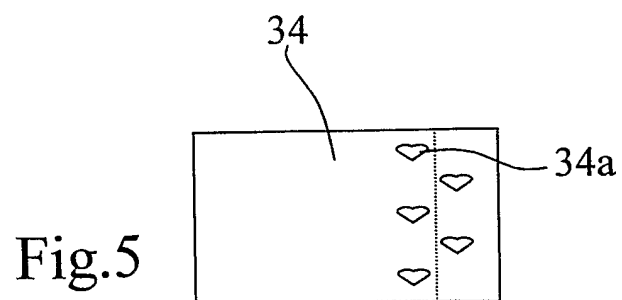
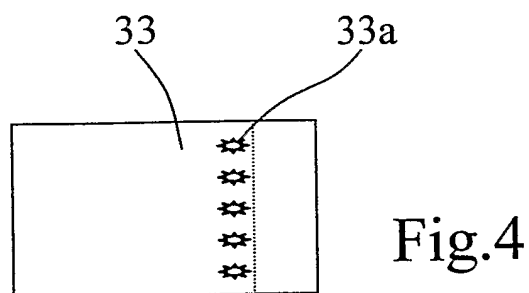
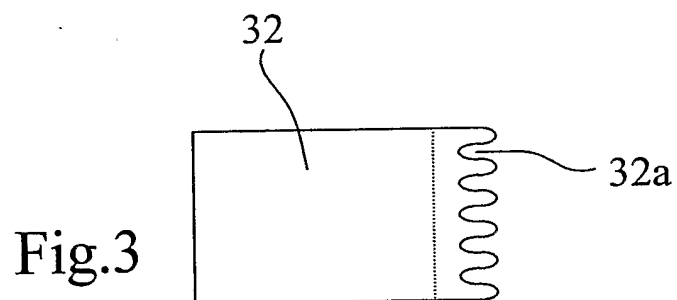
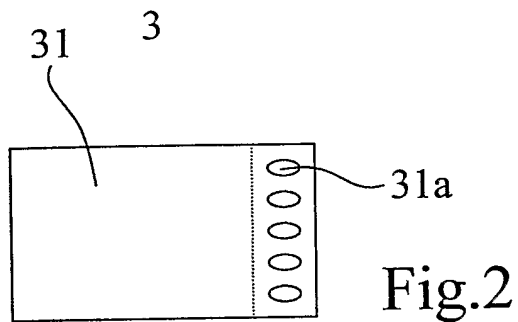
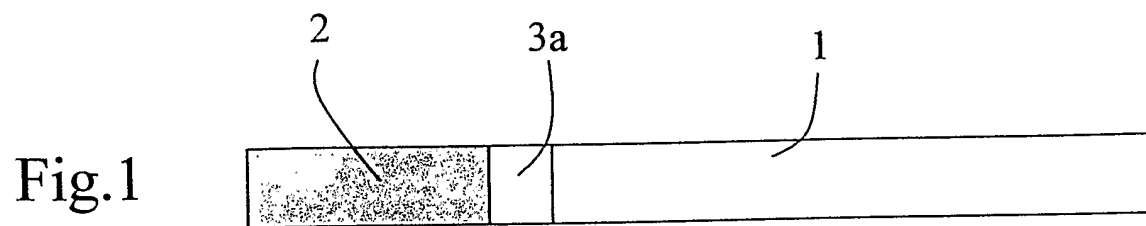
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I.	Reference	Modified tipping paper (opening 150 mm ²)
Cigarette paper porosity:	38.6 CU	38.6 CU
Filter ventilation:	50%	47.2%
Cigarette ventilation (total):	53.8%	52.8%
Smoking according to ISO:		
Number of draws:	6.1	6.1
Tars:	3.1 mg	3.3 mg
CO:	3.71 mg	3.30 mg

II.	Reference	Modified tipping paper (opening 150 mm ²)
Cigarette paper porosity:	48.6 CU	48.6 CU
Filter ventilation:	59%	59%
Cigarette ventilation (total):	60.4%	61.6%
Smoking according to ISO:		
Number of draws:	6.5	6.6
Tars:	4.3 mg	4.2 mg
CO:	5.05 mg	4.27 mg

CLAIMS

1. A filter cigarette comprising a tobacco rod wrapped in a thin paper or similar material, a filter and a tipping paper which wraps around the filter and holds it to the tobacco rod, wherein said tipping paper has an openwork design over an area of at least 50 mm² and wherein the wrapper situated below these orifices in the openwork design is provided with microopenings.
2. The filter cigarette as claimed in claim 1, wherein the microopenings are pores.
3. The filter cigarette as claimed in either of claims 1 and 2, wherein said orifices in the openwork design extend solely over the part of the tipping paper covering the tobacco rod.
4. The filter cigarette as claimed in either of claims 1 and 2, wherein the orifices in the openwork design of the tipping paper extend solely over the part covering the filter.
5. The filter cigarette as claimed in either of claims 1 and 2, wherein the orifices in the openwork design are found both over the part of the tipping paper covering the filter and over the part covering the tobacco rod.



INTERNATIONAL SEARCH REPORT

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According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A24D A24C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

WPI Data, PAJ, EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	FR 2 395 716 A (OLIN CORPORATION) 26 January 1979 (1979-01-26) the whole document	1-3
A	US 4 766 911 A (OGLESBY) 30 August 1988 (1988-08-30) the whole document	1-3
A	GB 989 479 A (THE IMPERIAL TOBACCO COMPANY LIMITED) 22 April 1965 (1965-04-22) the whole document	1-3
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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INTERNATIONAL SEARCH REPORT

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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