

## NEW FILTER FOR REMOVING TAR, NICOTINE AND TOXIC COMPOUNDS FROM TOBACCO SMOKE

**P** PATENTED TECHNOLOGY

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### ABSTRACT

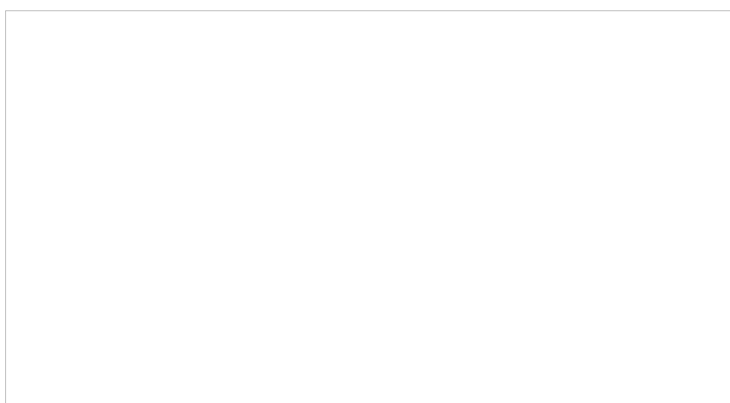
The group of investigation of Processing and pyrolysis of polymers of the University of Alicante has developed a new **combined filter** that eliminates the tar, the nicotine and other toxic gases present in tobacco smoke in a very efficient way more efficiently than current filters available in the market. The invention is characterized because it combines three membranes of different characteristics arranged in a very specific way. The primary membrane (M1), located at the end closest to the tobacco column, is formed by a perforated disk of impermeable material. It also has an outer membrane (M3) of cellulose acetate fiber located at the end in contact with the mouth of the smoker. It can also incorporate a cylindrical intermediate membrane (M2) between M1 and M3 formed by an adsorbent material. This innovative combined filter has a low manufacturing cost, allows to dispense tastes and flavors, and can be applied in both commercial cigarettes and filters for rolling tobacco. Wanted companies interested in acquiring this technology for commercial exploitation.

### ADVANTAGES AND INNOVATIVE ASPECTS

This new combination of membranes provides the following advantages over the systems currently available in the market:

1) Drastically **reduces the inhalation of toxic compounds** by the smoker.

Examples of **reduction percentages** for some substances, among many others:



2) **Greater effectiveness** than current filters.

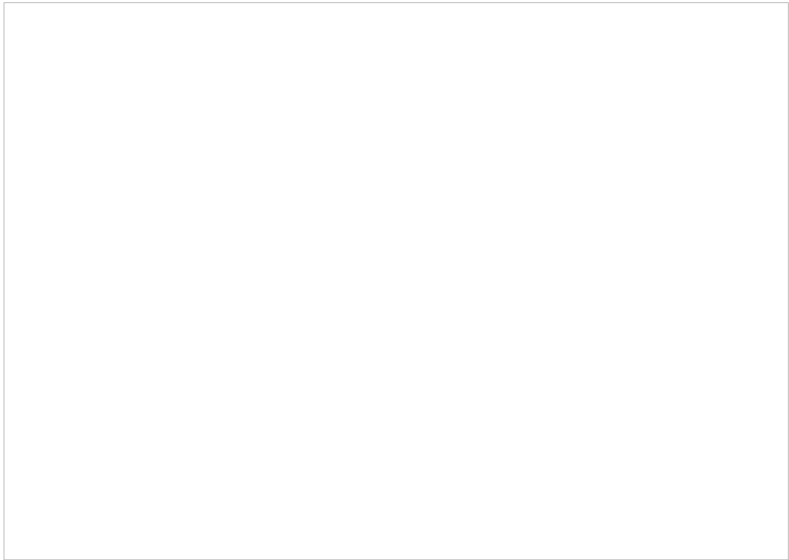
3) **Low manufacturing cost**: less material is required to achieve greater filtering effectiveness.

- 4) Wide **profit** margin for the company.
- 5) It allows dispensing different tastes or flavors to the smoker.
- 6) Draw resistance is maintained during smoking.
- 7) It can be adapted in a simple way to any type of cigarette: both commercial (cigarettes, cigars, cigarillos, unfiltered cigarettes), and in rolling tobacco.
- 8) Versatility of commercialization: the membranes can be manufactured separately and used directly by the consumer in rolling tobacco cigarettes, or already assembled in commercial filters.
- 9) It is a solution much in demand by smokers.

A new type of filter has been developed that includes up to three membranes, each of them with specific characteristics, where the location of these is essential to achieve the objective of improvement in the results of removal of tar, nicotine and toxic compounds of smoke of tobacco, may be applicable to any type of cigarette.

In this sense, the primary membrane (M1) is located next to the tobacco column and in contact with it. This perforated membrane causes an acceleration and post-orifice expansion in the smoke column, which leads to a condensation of the toxic compounds, thus preventing them from coming into contact with the mouth of the smoker.

The positive visual effect for the smoker is very evident, since he can easily verify that the end of the filter in contact with his mouth (M3), is clearly cleaner than with a conventional filter.



*Figure 2: it shows the aspect of a filter after smoking the same tobacco, under the same conditions, not using the membrane M1 (left part of the pictures) as compared to a filter using the M1 membrane (right part of the pictures). It can be observed the high amount of tars condensed in the second case, as well as that the end of the filter in contact with the mouth of the smoker is clearly cleaner in the second case. This fact clearly shows the lower amount of tar inhaled by the smoker if using this innovative filter.*

The proposed location of the membranes must be respected, because a change in them, for example, exchanging M1 with M3, it would cause condensation of the tar in the mouth, generating a very unpleasant sensation for the smoker. In addition, this action can increase the adverse effects for the oral health of the smoker, as well as the adverse aesthetic effect of tar stains on the filter.

Therefore, it is the joint use of the membranes in the proper order, which allows obtaining the favorable results.

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MARKET APPLICATIONS

The present invention is part of the **tobacco industry**, referred to cigarettes, and in particular, a **combined filter** for use in any type of tobacco column, both in the variety of commercial cigarettes, cigars, cigarillos, unfiltered cigarettes, stuffed tubes and hand-rolled cigars.

Therefore, according to its final use, the filter can present different variants.

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#### COLLABORATION SOUGHT

Companies interested in acquiring this invention for commercial exploitation are looked for:

- Patent licensing agreements.
- Development of new applications.
- Agreements regarding technology and knowledge transfer.

Company profile sought:

- 1) Manufacturers of complete nozzles.
  - 2) Membrane manufacturers for filters.
  - 3) Manufacturers of tobacco and cigarettes.
  - 4) Smoking paper manufacturers.
  - 5) Smoking filter manufactures.
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