

CN 201 667 985 U discloses a filter rod with visible perfume beads, wherein a cavity is formed between tow sections, and one or more of the perfume beads are arranged in the cavity. The perfume beads contain perfume liquid and can optionally be broken by a consumer to emit fragrance. The filter rod further comprises transparent molding paper and tipping paper with a transparent section or transparent tipping paper. However, it is difficult to ensure that the perfume liquid remains substantially in the cavity.

~~It is thus a preferred object to~~ Embodiments of the present invention address these issues.

~~It is also a preferred object of the invention to~~ Embodiments of the present invention provide a smokeable article that allows to visualize the presence and operation of a breakable capsule in the smoking article in an intuitive way.

Breakable capsules are known for delivering a burst of flavor when ruptured. However, it is an issue that the flavor, typically a liquid, can travel through the smokeable article, such as by capillary action, when the capsule is ruptured.

~~Thus, it is yet another preferred object to~~ Embodiments of the present invention reduce or avoid that the liquid released from a breakable article reaches the mouth or hands of the consumer.

~~Accordingly, the invention provides~~ According to a first aspect of the present invention, there is provided a smoking article comprising a smokeable material and a mouthpiece in axial alignment with the smokeable material, the mouthpiece comprising at least three segments, one segment defining a cavity disposed between two other segments, the cavity enclosing a fluid-containing breakable capsule, and a first wrapper circumscribing the mouthpiece, wherein the wrapper comprises a substantially smooth transparent section overlaying at least a part of the cavity, such that the capsule is at least partially visible through the wrapper, wherein the first wrapper has one or more layers of transparent varnish applied thereto.

This provides the benefit, that the consumer can see the capsule, and therefore knows how to operate the capsule. In particular, as the consumer can see the capsule before activating the fluid release by rupturing the capsule, this provides an effective and rapid way of notifying the consumer of the presence of the capsule in the smoking article. It further allows the consumer to confirm the intactness of the capsule prior to rupture. Additionally, where rupture is to be caused by the application of pressure against the capsule, it enables the consumer to apply pressure in exactly the right location to achieve an efficient rupture of the capsule. The transparent varnish applied on the first wrapper enables that the first wrapper, which may be transparent, remains substantially or entirely impermeable to fluids, in particular after the capsule is broken. Thus, the fluid released from the capsule does not travel through the first wrapper after being released from the capsule, such that it can be avoided that the liquid reaches the mouth or hands of the consumer.

~~The invention further provides~~ According to a second aspect of the present invention, there is provided a mouthpiece for a smoking article, the mouthpiece comprising at least two segments, a cavity being disposed between two of the segments, the

cavity enclosing a fluid-containing breakable capsule, and a first wrapper circumscribing at least part of the mouthpiece, wherein the wrapper has one or more layers of transparent varnish applied thereto, and wherein the wrapper comprises a substantially smooth transparent section overlaying at least a part of the cavity, such that the capsule is at least partially visible through the wrapper.

~~The invention also provides~~ According to a third aspect of the present invention, there is provided a method of producing a smoking article comprising:
 providing a plurality of discrete filters comprising two or more filter segments,
 providing a substantially smooth sheet of transparent material, which has one or more layers of transparent varnish applied thereto,
 placing the discrete filters in axial alignment with a tobacco rod such that at least two of the filter segments are placed in a spaced apart arrangement so as to define a cavity section,
 placing a breakable fluid-containing capsule in the cavity section; and
 wrapping the sheet of transparent material around at least a portion of the discrete filters, the cavity section and the tobacco rod, forming a smoking article.

The capsule may be adapted to release a fluid material, when the capsule is subjected to external force or pressure, such as squeezing, by the consumer. In particular, the capsule may release a liquid material. The capsule thus comprises a breakable wall. In some embodiments, several capsules may be provided in a cavity, though it is preferred that a single capsule is located in the cavity.

The capsule may contain an additive, which modifies the characteristics of the smoke of the smoking article. Such additives may comprise flavours, neutralizing agents, or other smoke modifiers, such as chemical reagents. Additionally, the additives may also include diluents, solvents or processing aids. In a preferred embodiment, the additive is one or more flavorants, such as a liquid flavour, flavour formulation or flavour-containing material. Suitable capsules as well as their manufacture are known in the art. An example of capsules that can be used in the present context are described in WO-A-2007/010407.

The transparent section of the first wrapper is substantially smooth. By "substantially smooth" it is meant that the transparent section does not have a pattern or image impressed onto its surface such that the pattern or image is raised from the overall surface. In particular, the surface of the transparent section of the filter element has only a normal surface roughness inherent to the respective material. That means that the transparent section in this embodiment is not embossed. This provides an advantageous feature that the transparent section can be located not only visually but also preferably by touch since the smooth section will typically have a different feel from the sections surrounding it.

The term "transparent" is used to describe a material which allows at least a significant proportion of incident light to pass through, so that it is possible to see through the material. In embodiments of the present invention, the transparent section allows sufficient light to pass

through it such that capsule is visible in the filter element. The transparent section may be completely transparent. Alternatively, the transparent section may have a lower level of transparency while still transmitting sufficient light such that the capsule is visible from the outside of the filter element. Preferably, "transparent" denotes a total percentage light transmission of 40% or more, more preferably 50% or more, even more preferably 60% or more, most preferably 70% or more, as measured using a Hunterlab Colorquest XE Spectrophotometer.

In some cases, the substantially transparent section of the wrapper may be tinted or colored, or may have repeating patterns or other type of graphics applied thereto as long as such patterns or graphics are not raised from the overall surface of the sheet.

The first wrapper is usually an inner wrapper. Thus, the substantially smooth first wrapper may form a circumferential wall for the cavity. The first wrapper may only be partially transparent, such as by comprising transparent window portions, while otherwise being at least partially printed or formed of an opaque material. In other embodiments, substantially all of the first wrapper may be transparent. The thickness of the first wrapper is preferably at least about 25 micrometers, more preferably between about 25 micrometers and about 45 micrometers. The base weight of the first wrapper is preferably at least about 40 grams per square meter (gsm) and more preferably between about 40 gsm and about 65 gsm. In a particularly preferred aspect, the first wrapper is a transparent film.

Preferably, the first wrapper is substantially air impermeable. It may be biodegradable. Examples of suitable materials for use as wrapper materials include polymers and cellulose-based materials. Transparent cellulose film is preferred and cellophane is particularly preferred. This is because cellophane is biodegradable. Other biodegradable polymers may also be suitable. Polypropylene may be suitable since it is substantially impermeable to fluid.

The first wrapper is covered with a transparent varnish. Throughout the specification, the term 'varnish' is used to denote a liquid coating that solidifies upon curing. Curing can be performed using any known standard technique, though ultraviolet curing is preferred.

Suitable varnishes for use in embodiments of the present invention are known in the art and commercially available from, for example, Schmid Rhyner AG of Adliswil, Switzerland. An example of a particularly preferred varnish is a nitrocellulose lacquer. Such a lacquer can further improve air impermeability of the first wrapper. The transparent varnish is preferably provided on the inside of the first wrapper. In particular, the transparent varnish may be applied by printing.

In one embodiment, multiple layers of transparent varnish can be provided on the first wrapper.

In a further aspect, an opaque second wrapper comprising at least one opening may be provided around the first wrapper. The second or outer wrapper may be formed by using paper with a weight from about 40 to about 60 gsm. The at least one opening may be formed by a die-cut. The, or each, opening forms a window, through which the capsule can be seen.

Alternatively, the outer wrapper may comprise a transparent film, while the first wrapper is preferably only at least partially formed from a transparent film.

An outer wrapper made from a transparent film preferably has a weight of about 40 gsm to about 90 gsm.

In one embodiment, the at least one opening is a die-cut opening. This facilitates the production of an outer wrapper, which may be die-cut before being used in a standard cigarette manufacturing equipment.

In another embodiment, the outer wrapper may only cover part of the filter element, namely substantially the upstream segment. A further outer wrapper may be provided, which covers the downstream segment, such that the cavity is not covered by the outer wrappers. In this case, the outer wrappers can both be opaque.

As used herein, the terms 'upstream' and 'downstream' are used to describe the relative position of portions or components of mouthpieces and smoking articles according to embodiments of the invention in relation to the direction of mainstream smoke drawn through the mouthpieces and smoking articles during use thereof. For example, in a mouthpiece where the cavity is upstream of a mouth end segment, mainstream smoke is drawn first through the cavity and then through the mouth end segment.

In one embodiment, the diameter of the capsule relative to the diameter of the cavity is such that the capsule is substantially immobilized inside the cavity. For instance, the relative diameter of the capsule may be about 88% to about 99% of the diameter of the cavity. This renders the capsule easy to locate and rupture whilst still allowing air to flow past the unruptured capsule. In another embodiment, the relative diameter of the capsule to the cavity is such that it is mobile within the cavity. For instance the capsule may be about 60 to about 87% of the diameter of the cavity. This improves the visibility of the capsule as a separate element and allows the capsule to move inside the cavity to attract further attention of the consumer. Furthermore, the cavity being larger than the capsule provides a better visibility of the release of the fluid, when the capsule is opened. Nevertheless, it is important that the capsule is not so small that it becomes very difficult for a consumer to crush. For instance, a capsule having a relative diameter of about 30% or less compared to the diameter of the cavity is not preferred.

Preferably, the segments either side of the cavity are adapted such that the main fraction of the fluid of the capsule remains in the cavity when the capsule is broken. However, the fluid may be slowly absorbed by the segments. Nevertheless, immediately

botanicals or spices. Some or all of these segments may be at least partially visible through transparent sections of the filter element.

Preferably the smokeable material comprises a tobacco rod.

Preferably, a wrapper, namely the first wrapper or the outer wrapper, is at least partially wrapped around the mouthpiece and the tobacco rod, to connect the mouthpiece and the tobacco rod.

Thus, Embodiments of the invention further relates to a smoking article according to the present invention, wherein an outer wrapper is at least partially wrapped around mouthpiece in the form of the filter element and a tobacco rod, to connect the filter element and the tobacco rod. The outer wrapper may circumscribe the filter element along the entire length of the filter element.

Smoking articles according to embodiments of the present invention may be filter cigarettes or other smoking articles in which smokeable material, in particular tobacco material, or another combustible material is combusted to form smoke. Alternatively, smoking articles according to embodiments of the invention may be articles in which material is heated to form an aerosol, rather than combusted. In one type of heated smoking article, tobacco material or another aerosol generating material is heated by one or more electrical heating elements to produce an aerosol. In another type of heated smoking article, an aerosol is produced by the transfer of heat from a combustible or chemical heat source to a physically separate aerosol forming material, which may be located within, around or downstream of the heat source.

The capsule is visible through at least one opening. Alternatively, several openings may be provided around the circumference of the outer wrapper in the region of the cavity.

Filters that comprise a cavity as used in the smoking article according to the invention may be produced using known machinery for producing charcoal filters, such as that described in EP-A-1,571,933. Such machinery is commercially available, for example from Filtrona International Ltd., Great Britain.

Preferably, the overall length of smoking articles according to embodiments of the present invention is between about 70 mm and about 128 mm, more preferably about 84 mm.

Preferably, the external diameter of filters and smoking articles according to embodiments of the present invention is between about 3 mm and 8.5 mm, more preferably about 7.9 mm.

Preferably, the overall length of filters according to embodiments of the present invention is between about 18 mm and about 36 mm, more preferably about 27 mm.

Preferably, the length of each individual segment of filters according to embodiments of the present invention is between about 5 mm and about 22 mm.

In smoking articles according to embodiments of the invention, the mouth end segment of the filter may comprise a hollow tube or recess. The hollow tube or recess may be formed when the filter is attached to a rod of smokeable material by, for example, tipping paper to form a

smoking article according to embodiments of the present invention. Preferably, the recess further comprises a cylindrical element that adds structural strength to the tube, for example a paper or carton tube that is overwrapped by the tipping material. Recess filters are well known in the art, for example, in WO-A-2004/089124.

In smoking articles according to embodiments of the invention, the filter may comprise a restrictor segment. A restrictor segment affects the resistance to draw and other fluid dynamics of the smoking article and also affects the formation of carbon monoxide and carbon dioxide. Restrictors in smoking articles are known in the art, for example from the International patent application WO-A2-2008/059377.

Filters according to embodiments of the present invention may be produced by forming separate continuous rods comprising multiple units of each individual segment of the filter. Then these separate rods are combined in a known manner in one or more stages to form a continuous filter rod comprising multiple units of the filter. The continuous filter rod may then be subsequently severed at regular intervals by a cutting mechanism to yield a succession of discrete filters according to embodiments of the invention.

Preferably, smoking articles according to embodiments of the present invention comprise a wrapped rod of tobacco cut filler. Preferably, smoking articles according to embodiments of the present invention have a total nicotine free dry particulate matter (NFDPM) or "tar" delivery of up and about 10 mg. More preferably, the "tar delivery" is between 1 mg and 10 mg and more preferably about 6 mg.

Smoking articles according to embodiments of the present invention may be packaged in containers, for example in soft packs or hinge-lid packs, with an inner liner coated with one or more flavorants.

The invention will now be further described with reference to exemplary embodiments as shown in the following figures:

Figure 1 shows a cross sectional view of a filter element according to one embodiment of the invention.

Figure 2 shows a cross sectional view of a filter element according to another embodiment of the invention.

Figure 3 shows a cross sectional view of a smoking article according to one embodiment of the invention.

Figure 4 shows a cross sectional view of a smoking article according to another embodiment of the invention.

Figure 5 shows a perspective side view of a smoking article according to an embodiment of the invention.

Figure 1 shows a mouthpiece in the form of a filter element 1 for a smoking article according to a first embodiment of the invention. The filter element 1 has a substantially