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(54) **Improved method for manufacturing smoking articles**

(57) A method for manufacturing smoking articles (8) is provided wherein glue is applied to a web of wrapping material (1), said web of wrapping material comprising a plurality of segments for receiving glue, each segment corresponding to a respective portion of wrapping material in which an individual smoking article is to be

wrapped. At least three glue free regions (2) are formed on a first surface of each region, said glue free regions having a combined surface area of at least 45% of the first surface, glue being applied to the remainder of the first surface.

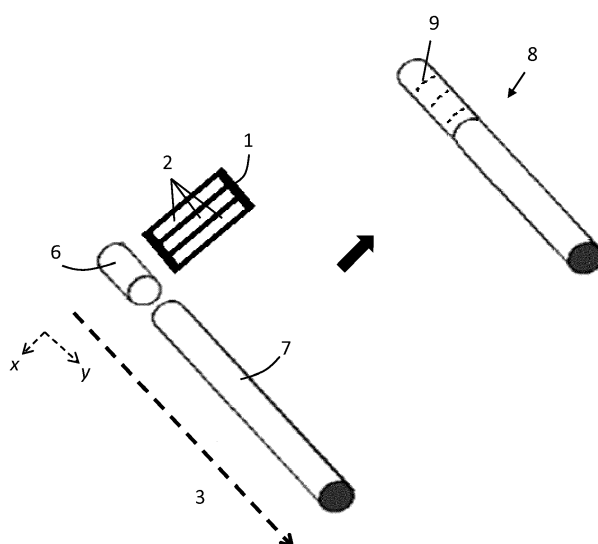


FIG 1

Description

[0001] The present invention relates to a method for manufacturing smoking articles and, in particular, to an improved method for adhering wrapping paper to a smoking article.

[0002] Ventilated cigarettes have become commonplace. These cigarettes comprise a plurality of ventilation orifices, typically laser pierced, in the filter section that dilute the smoke inhaled by a user by allowing some air to be inhaled through the sides of the filter component, thus bypassing the burning tobacco. Existing online laser perforation processes involve perforating the wrapping / tipping paper with a laser beam whilst manufacturing the cigarette. This burns the wrapping paper around the perforation and the glue attaching the wrapping paper to the filter plug and in doing so, contaminates the cigarette with products of combustion that require additional cleaning time to remove and which may not always be entirely removed by the cleaning process.

[0003] It has previously been suggested to provide wrapper paper comprising one large central glue free area, or a plurality of small glue free areas. Neither solution is satisfactory for solving the above-mentioned problem however. Small glue free areas allow for a clean perforation to be made in a specific band, corresponding to one position and one product specification only. However, multiple rows of perforations or perforations at different positions may be required depending on product specifications, in particular in the case of charcoal containing filters or capsule containing filters. This leads to the requirement to have as many gluing rollers as product specifications and to change said rollers each time production changes. Large glue free bands are helpful to compensate or mitigate the above problems associated with small glue free bands as they offer a large range of potential perforation positions. However, large glue free bands often fail to provide an adequate attachment of the wrapping paper to the filter plug and so the wrapping paper may become loose over the filter plug, which is highly unsatisfactory for consumers.

[0004] The present invention seeks to overcome the above-mentioned limitations in the prior art by providing a new and improved method for manufacturing smoking articles, with the further objective of saving glue quantities, production time and thereby costs.

[0005] In accordance with a first aspect of the invention, there is provided a method for manufacturing smoking articles comprising:

applying glue to a web of wrapping material, wherein said web of wrapping material comprises a plurality of segments for receiving glue, each segment corresponding to a respective portion of wrapping material in which an individual smoking article is to be wrapped;

wherein at least three glue free regions are formed on a first surface of each segment, said glue free

regions having a combined surface area of at least 45% of the first surface, glue being applied to the remainder of the first surface.

[0006] Providing at least three glue free regions, wherein the glue free regions occupy at least 45% of the surface area of the first surface, provides an excellent balance between ensuring that the segment properly may adhere to a filter plug meanwhile enabling significant glue savings and flexibility for perforating the wrapping paper within glue free regions so as to form clean ventilation orifices. The glue free regions are preferably separated from one another. In this case, the glue free regions have distinct boundaries that are separated from one another by areas of the first surface on which glue has been applied. Alternatively, two or more of the glue free regions may be interconnected. In this case, a glue free region will have a recognisable and broadly distinct shape, wherein said shapes partially abut onto one another or are connected. For example, each glue free region may be a separate, substantially rectangular, parallel glue free band, each surrounded by glue and connected by a common acutely angled, or orthogonal, glue free band.

[0007] More than three glue free regions are preferably formed on the first surface. Preferably still, the combined surface area of the glue free regions is more than 50% of the first surface. This provides even greater flexibility for where perforations can be made, without compromising the eventual adhesion of the segment onto a smoking article.

[0008] Each glue free region may have a different width, shape or surface area. The width, shape or surface area of the glue free regions may hence be tailored depending on product specifications, for example so that it is appropriate for capsule containing filters or otherwise. In practice the choice of nozzle used to apply glue can mean that a minimum width for each region of glue on the first surface is unavoidable however.

[0009] In a further advantageous arrangement, a plurality of inclined glue free regions extend at an acute angle with respect to a seam line of the segment, said seam line being aligned with the longitudinal axis of the smoking article to be wrapped. The smoking article to be wrapped is typically a cylindrical filter component, such as a plug of filter material covered in plug wrap, which is aligned with a cylindrical rod of smoking material about a common longitudinal axis. The seam line is the interface at which an edge of the segment, when rolled around the smoking article, overlaps the underlying segment.

[0010] The glue free regions preferably extend from one side of the first surface, fully across the first surface to an opposite side, said sides being aligned with the longitudinal axis of the smoking article to be wrapped. This allows for a complete row of perforations to be made around the smoking article, within the glue free regions and up to the edge of the segment.

[0011] The method preferably further comprises cut-

ting said web into a wrapping section comprising two adjoined segments; and wrapping said wrapping section around a cylindrical filter component of a smoking article so that the first surface of the segments adheres to the filter component. Cigarettes are typically formed back-to-back, with a common filter component separating two cylindrical rods of smoking material. Two segments may hence be cut together from a web and applied to a common cylindrical filter component, which is later cut in two at the mid-point of the filter component to produce two cigarettes.

[0012] The method preferably further comprises applying a plurality of perforations through the glue free regions. Said perforations may be applied before wrapping said segments around a filter component, however most preferably are applied after wrapping said segments around a filter component. Said perforations are preferably applied using a laser, however alternatively may be created using electric sparking for example. Furthermore, said perforations preferably extend into the filter component. For example, the perforations may extend into the plug of filter material and through a layer of plug wrap so as to form ventilation orifices for diluting the smoke inhaled by a user (with some air now having travelled through the filter and not the burning tobacco). As previously described, the method may preferably further comprise cutting said filter component in half, as defined in the longitudinal axis of the filter component. This step produces the individual smoking article from two back-to-back adjoined smoking articles.

[0013] In accordance with a second aspect of the invention, there is provided wrapping material for smoking articles comprising:

a plurality of segments, wherein each segment corresponds to a respective portion of wrapping material in which an individual smoking article is to be wrapped;
wherein at least three glue free regions are formed on a first surface of each segment, said glue free regions having a combined surface area of at least 45% of the first surface, glue being applied to the remainder of the first surface.

[0014] Examples of the invention will now be discussed with reference to the accompanying drawings, in which:-

Figure 1 is a schematic illustration of an example of a smoking article manufactured according to the invention;

Figure 2 is an illustration of a first example of wrapping paper according to the invention;

Figure 3 is an illustration of a second example of wrapping paper according to the invention;

Figure 4 is an illustration of a third example of wrapping paper according to the invention;

Figure 5 is an illustration of a fourth example of wrapping paper according to the invention;

Figure 6 is an illustration of a fifth example of wrapping paper according to the invention; and

Figure 7 is an illustration of a sixth example of wrapping paper according to the invention.

[0015] Figure 1 illustrates the components which form an example of a smoking article, in this case a ventilated cigarette 8, manufactured according to the invention. Co-ordinate axes are shown for reference wherein the ordinate y-axis extends along the longitudinal axis of the cigarette 8 and the abscissa x-axis extends in a horizontal direction which is perpendicular to this.

[0016] A cylindrical rod of pre-wrapped smoking material (such as tobacco) 7 is aligned with a cylindrical filter component 6 about a common longitudinal axis 3. A portion of wrapping paper 1 (also referred to as tipping paper) is obtained from a web comprising a plurality of said segments. The dimensions of the segment 1 correspond to the amount of wrapping paper required for an individual smoking article (in particular to the filter section). Glue is applied to all areas of a first surface of the segment except the glue free regions 2. At least three glue free regions are provided on the first surface of each segment, wherein the combined surface area of the glue free regions is at least 45% of the first surface. The opposing (second) surface of the web (that eventually forms the outer surface of the smoking article 8) is not coated in glue though may typically be treated with a material to prevent the outer surface of the cigarette 8 from sticking to the lips of a user. This second surface may typically be dyed with a cork pattern and colour.

[0017] The segment 1 is wrapped around the outside of the filter component 6 and partially covers the tobacco rod 7 also so as to secure the tobacco rod 7 to the filter component 6. The glue applied to the first surface then binds these components together to produce the smoking article 8, as shown by Figure 1. Figure 1 is a schematic illustration only for the sake of clarity as in practice most cigarettes are produced in a back-to-back (or 'end-to-end') manner; i.e. two at a time. A double-length cylindrical filter component is longitudinally aligned with pre-wrapped tobacco rods at either end. A wrapping section consisting of two adjoined segments 1 is then cut from a web of wrapping material to which glue has been applied. The wrapping section is then wrapped around the double-length filter component and the ends of the tobacco rods so as to secure the tobacco rods to the filter. The double-length filter component wrapped in wrapping paper is then cut in half through the horizontal axis so as to produce two individual smoking articles 8.

[0018] Once the wrapping paper has adhered to the filter component 6 and tobacco rod 7, small perforations 9 are applied using one or more lasers. This creates a plurality of ventilation orifices that penetrate the wrapping paper and the filter component 6 beneath. The filter component 6 comprises a plug of filter material (such as cellulose acetate) which is wrapped in a non-porous plug wrap material. It is desirable that the perforations extend

through the wrapping paper and the plug wrap material into the plug itself so that air can be drawn through the ventilation orifices 9 when a user inhales smoke from the ventilated cigarette 8. In alternative examples, for example wherein the plug wrap material is porous, the perforations 9 may be applied to the wrapping paper prior to attachment onto a filter component 6.

[0019] Each perforation 9 is applied within a glue free region 2 so as to avoid burning the glue applied to the segment 1. In this example, three rows of perforations 9 are produced, wherein each row corresponds to one of the three glue free regions 2 and each comprises a plurality of perforations. By applying the perforations within glue free regions 2 only, it is no longer necessary to clean the smoking articles 8 of burnt adhesive. This is beneficial to the user as the cleaning process cannot be guaranteed to be entirely successful in removing all of the combustion products and so some remaining burnt adhesive may block ventilation orifices or be consumed by the user. There are also clear benefits to the manufacturer as the removal of this cleaning process increases the throughput of the cigarette manufacturing process. In some examples this can amount to approximately 14 minutes being saved for every 24 hours in which the process runs. Furthermore, as less glue is consumed, additional savings on glue are also achieved.

[0020] Figures 2-7 illustrate various examples of segments of wrapping paper in accordance with the invention. In these illustrations, each segment shown has a substantially rectangular shape, wherein the longest sides are aligned with the longitudinal y-axis and the shorter sides or edges are aligned with the x-axis. The glue free regions are shown by the unshaded regions inside each segment, whereas the cross-hatched / shaded regions show areas on the first surface to which glue has been applied. In each example at least three glue free regions are provided on the first surface of the segment, the glue free regions having a combined surface area of at least 45% of the first surface. This has been found to produce an excellent flexibility in where perforations may be applied to the wrapping paper without burning adhesive, whilst ensuring that the wrapping paper is sufficiently well adhered to the smoking article.

[0021] In the first example shown by Figure 2, three separate glue free regions, in the form of rectangular bands extend substantially across the horizontal width of the segment 20 and occupy a combined surface area of 47% of the first surface. In Figure 3, four rectangular glue free bands together occupy 51 % of the first surface of the segment 30. In Figure 4, the segment 40 comprises two rectangular glue free bands and a castellated glue free region above which together occupy 52% of the surface area. Differently shaped glue free regions may be desired, for example, wherein the filter component comprises a capsule. The glue free regions in the first, second and third examples shown by Figures 2 to 4 extend across the majority of the width of the segment (in the x-direction) and are each separated from one another by

regions of glue on the first surface. These narrow strips of glue ensure that the segment is properly adhered to the smoking article across its entire horizontal width. Each rectangular band is parallel to one another and has edges that are aligned in the vertical direction.

[0022] The segment 50, shown in the fourth example of Figure 5, could be interpreted as comprising either three separate or three interconnected glue free regions. For example, first and second regions are shown in the top left and bottom right hand corners, with a remaining region shown in the centre of the segment 50. Alternatively, the central region alone could be interpreted as comprising four inclined bands / regions, connected by a horizontal band. The term 'band' here is intended to refer to a quadrilateral with two pairs of parallel sides, wherein adjacent sides are of different lengths (the angle between two adjacent sides can be 90 degrees or otherwise). The combined surface area of glue free regions in this example is 45% of the first surface.

[0023] In Figures 2 to 5, the glue free regions do not extend all of the way across the first surface to the edges / sides of the segment. Coating the edges of the first surface in glue ensures proper adhesion for these edges however it also limits the areas to which perforations can be applied without burning adhesive. In the fifth and sixth examples shown by Figures 6 and 7, glue free regions are provided that extend to the longitudinal edges of the segments 60, 70. The glue free regions of segment 60 comprise a central horizontal rectangular band with a plurality of inclined bands provided above and below this (neither of which extend to the edges of the segment 60). The inclined bands are connected by separate horizontal bands that extend across the entire width of the segment 60 to the edges. In the sixth example of Figure 7, the glue free regions comprise seven parallel glue free bands (or stripes) that are inclined with respect to the edges of the segment 70 and which extend to one or both edges of said segment 70.

[0024] When the segment is wrapped around a cylindrical smoking article, it is wrapped so that the first surface partially overlaps the second surface. A seam line, aligned with the longitudinal axis of the smoking article, is visible to the user as the point of overlap. An example of this is illustrated by the vertical line 77 in Figure 7. In this example, the glue free regions at the longitudinal edges of the segment 70 can be seen to overlap at the seam line 77 (as shown by the small horizontal lines extending out from either side of the segment 70). This overlap of glue free regions allows for perforations to be made just inside of the seam line 77 when the segment is wrapped without burning any adhesive beneath.

Claims

1. A method for manufacturing smoking articles comprising:

- applying glue to a web of wrapping material, wherein said web of wrapping material comprises a plurality of segments for receiving glue, each segment corresponding to a respective portion of wrapping material in which an individual smoking article is to be wrapped; wherein at least three glue free regions are formed on a first surface of each segment, said glue free regions having a combined surface area of at least 45% of the first surface, glue being applied to the remainder of the first surface.
2. A method according to claim 1, wherein the glue free regions are separate from one another.
 3. A method according to claim 1, wherein the glue free regions are interconnected.
 4. A method according to any of claims 1 to 3, wherein more than three glue free regions are formed on the first surface.
 5. A method according to any of the preceding claims, wherein the combined surface area of the glue free regions is more than 50% of the first surface.
 6. A method according to any of the preceding claims, wherein each glue free region has a different width, shape or surface area.
 7. A method according to any of the preceding claims, wherein a plurality of inclined glue free regions extend at an acute angle with respect to a seam line of the segment, said seam line being aligned with the longitudinal axis of the smoking article to be wrapped.
 8. A method according to any of the preceding claims, wherein the glue free regions extend from one side of the first surface, fully across the first surface to an opposite side, said sides being aligned with the longitudinal axis of the smoking article to be wrapped.
 9. A method according to any of the preceding claims, further comprising:
 - cutting said web into one or two segments; and wrapping said segments around a cylindrical filter component of a smoking article so that the first surface adheres to the filter component.
 10. A method according to any of the preceding claims, further comprising applying a plurality of perforations to the glue free regions.
 11. A method according to claim 10, as dependent on claim 9, wherein said perforations are applied after wrapping said segments around a filter component.
 12. A method according to claims 10 or 11, wherein said perforations are applied using a laser.
 13. A method according to any of claims 10 to 12, wherein said perforations extend into the filter component.
 14. A method according to any of claims 9 to 13, further comprising cutting said filter component in half, as defined in a longitudinal axis of the filter component.
 15. Wrapping material for smoking articles comprising:
 - a plurality of segments, wherein each segment corresponds to a respective portion of wrapping material in which an individual smoking article is to be wrapped; wherein at least three glue free regions are formed on a first surface of each segment, said glue free regions having a combined surface area of at least 45% of the first surface, glue being applied to the remainder of the first surface.

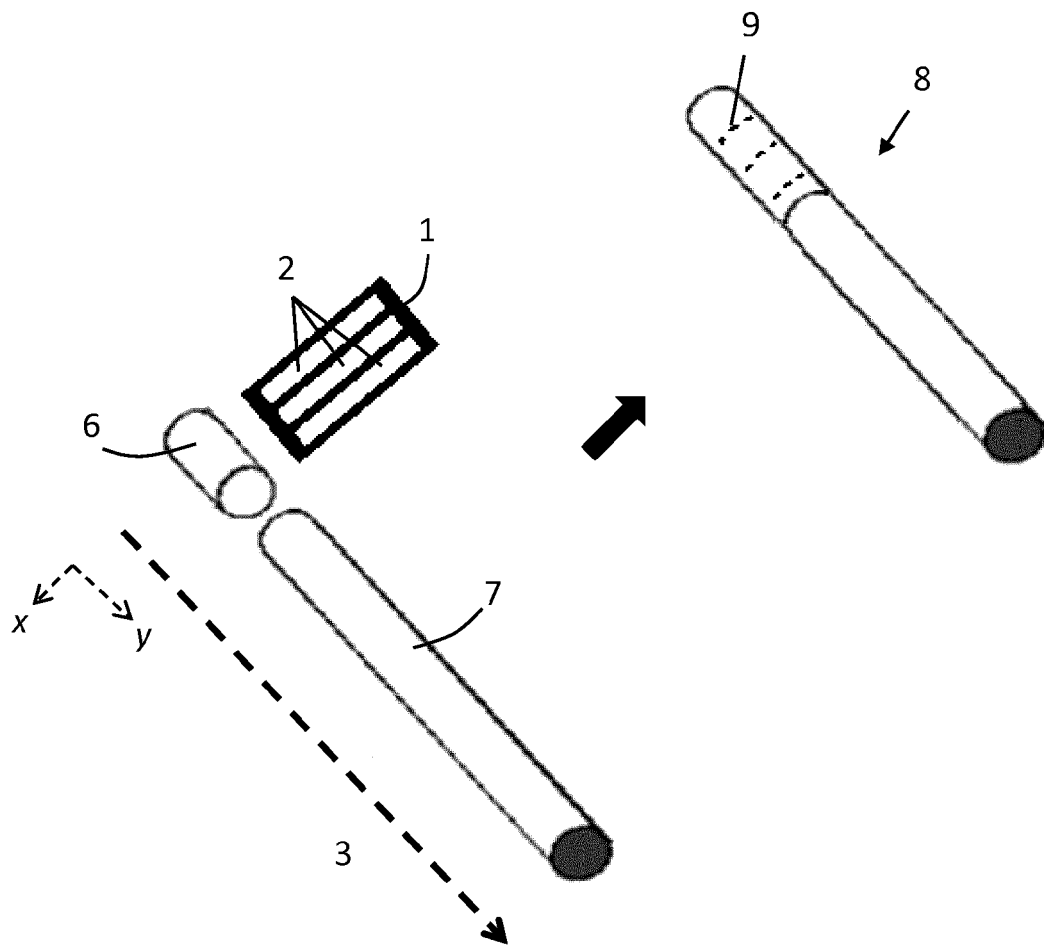


FIG 1

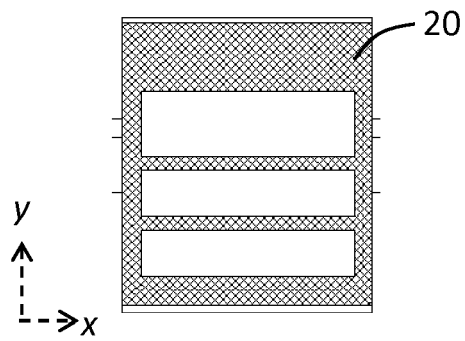


FIG 2

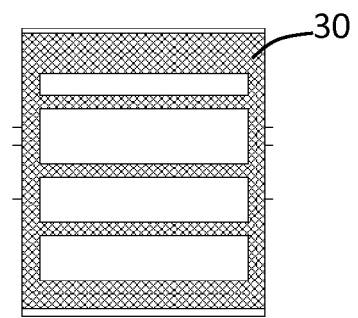


FIG 3

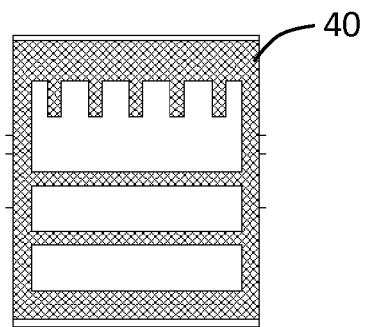


FIG 4

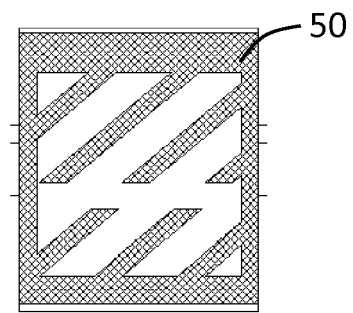


FIG 5

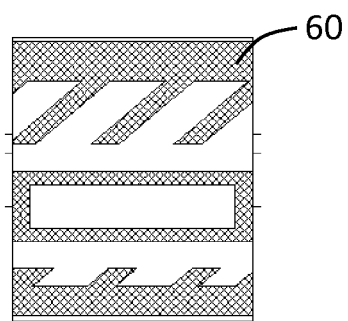


FIG 6

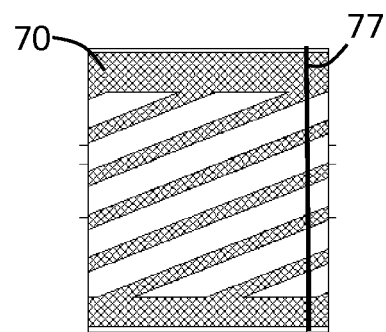


FIG 7



EUROPEAN SEARCH REPORT

 Application Number
 EP 14 19 4165

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The present search report has been drawn up for all claims			
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CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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