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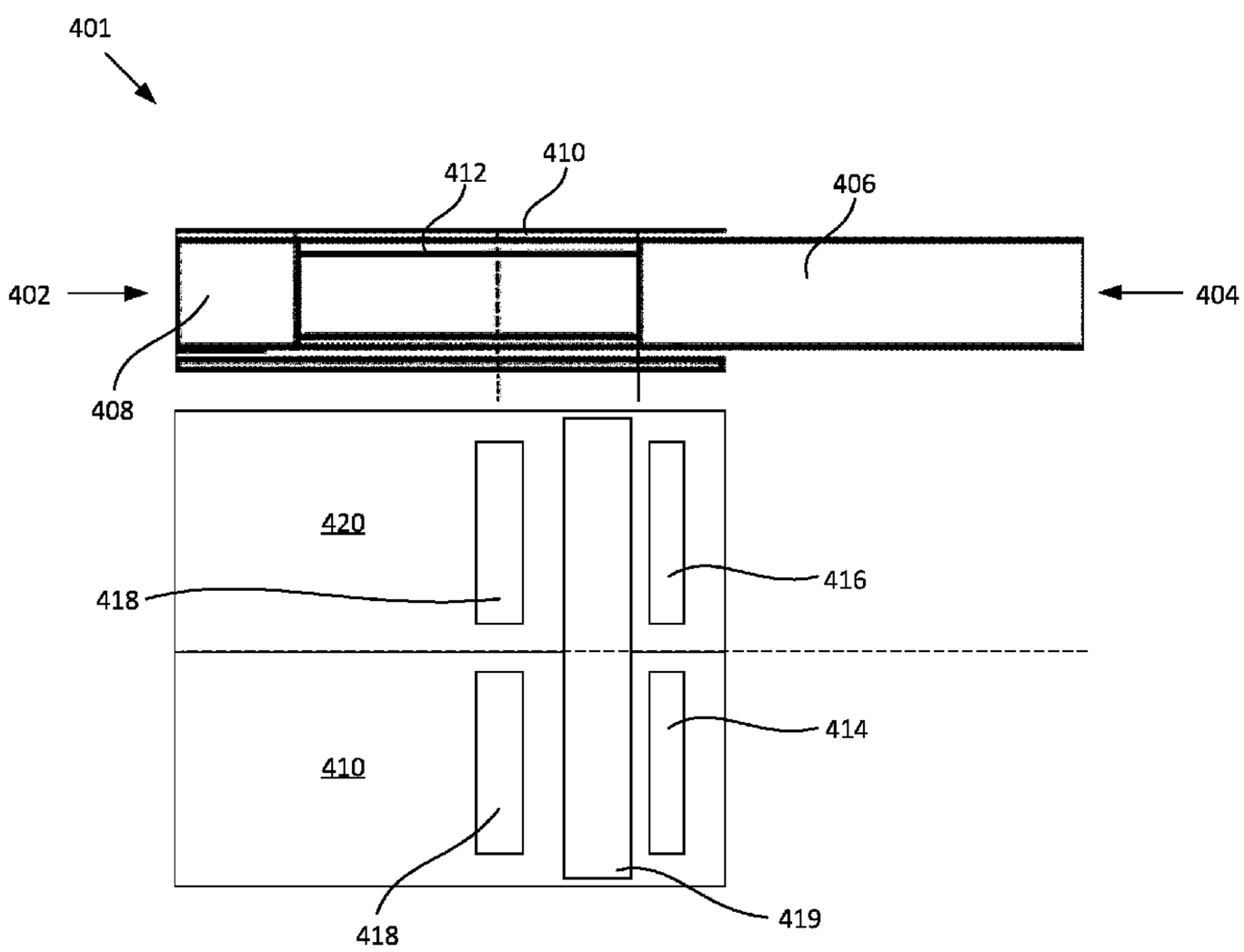


FIG. 4

(57) Abstract: A method of manufacturing a component for an aerosol-generating article (101,201,301,401), comprising taggant, the method comprising the steps of: applying taggant to a component; detecting an amount of the taggant that the component comprises; determining whether the detected amount of taggant is less than a first-predetermined amount; and rejecting a component when the detected amount of the taggant is less than the first-predetermined amount. An apparatus for manufacturing a component for an aerosol-generating article (101,201,301,401), comprising a taggant, the apparatus comprising: a dispenser configured to apply taggant to a component; a sensor (562, 662, 862) configured to detect an amount of the taggant that the component comprises; a controller for determining whether the detected amount of the taggant is less than a first-predetermined amount; and a rejection system configured to reject a component when the detected amount of the taggant is less than the first-predetermined amount. A kit of parts, comprising: a plurality

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of manufacturing apparatuses suitable for the manufacturing of a component for an aerosol-generating article (101,201,301,401); at least one sensor (562, 662, 862) suitable or the detection of an amount of taggant that a component manufactured comprises; a controller to determine whether the amount of taggant that a component comprises, is less than a first-predetermined amount; and a rejection system configured to reject a component that has a taggant amount less than the first-predetermined amount.

Taggant Detection and Rejection Method and Apparatus

The present disclosure relates to a method of manufacturing a component for an aerosol-generating article. More specifically, the present disclosure relates to a method of manufacturing a component for an aerosol-generating article, comprising taggant. The present disclosure also relates to an apparatus for manufacturing a component for an aerosol-generating article, comprising a taggant. The present disclosure further relates to a kit of parts, comprising a plurality of manufacturing apparatuses suitable for the manufacturing of a component for an aerosol-generating article.

Aerosol-generating articles and other consumables are designed for use with specific aerosol-generating products. For example, externally heated tobacco products comprise a holder and a tobacco stick that is designed to be inserted into the holder. Genuine compatible products are typically rigorously tested to ensure the best performance and user experience. The use of non-genuine products may reduce the overall performance and user experience. Moreover, the use of a non-genuine part or component may give rise to problems such as damaging the holder device, for example.

It would be desirable to provide a method (or apparatus) for manufacturing a component for an aerosol-generating article that improves quality assurance.

According to the present invention there is provided a method of manufacturing a component for an aerosol-generating article, comprising taggant. The method comprises the step of applying taggant to a component. The method also comprises the step of detecting an amount of the taggant that the component comprises. The method comprises the step of determining whether the detected amount of taggant is less than a first-predetermined amount. The method comprises the step of rejecting a component when the detected amount of the taggant is less than the first-predetermined amount. The taggant may be a gel, a slurry, a powder, or a foam, for example. The taggant may comprise a uniquely encoded material.

Thus, a taggant is applied to a component, acting as an internal signature of the component that is used for product identification. The taggant of the component may be used to determine, by recognition, whether a component for an aerosol-generating article, and therefore the aerosol-generating article, is a genuine product. This may ensure a suitable product performance and user experience. By having a first-predetermined amount of taggant that, which if not met, the component is rejected, this ensures that all components have a suitable amount of taggant for component recognition, enabling genuine products to be

identified. It is particularly advantageous to have a method comprising the step of rejecting a component when the detected amount of the taggant is less than the first-predetermined amount, since the rejected component is removed from the manufacturing process before the completion of the final product. The rejection system also ensures that all produced consumables that are provided to the consumers will contain the correct concentration of taggant that may allow the aerosol-generating device to recognise the consumable accordingly. The provision of the detection and rejection system also reduces waste materials used on a product.

In some embodiments, instead of detecting and quantifying an amount of the taggant that the component comprises, the method comprises the step of detecting whether the component comprises a taggant. In some embodiments the method comprises the step of detecting whether the component comprises a taggant. In some embodiments the method comprises the step of detecting the presence of taggant. In some embodiments the method comprises the step of detecting the presence of taggant in the component. The method may further comprise the step of rejecting a component when a taggant is not detected. This is advantageous because this ensures that all components have the presence of a taggant for component recognition, allowing genuine products to be identified.

In some embodiments, the step of determining whether the detected amount of taggant is less than a first-predetermined amount comprises determining whether the detected amount of taggant is less than a non-zero amount. In this way, the method not only detects the presence of a taggant, but also if there is an insufficient amount of taggant present, therefore identifying faulty components. Those components can then be rejected. The non-zero amount may be a threshold amount, above which, the component provides a suitable product performance and user experience. By comparing the amount of taggant present with a threshold amount in this way, it can be predicted whether the correct components are in place during manufacture.

For example, in a particular component the amount of taggant detected may be 15 milligrams per square metre and the first-predetermined amount is 20 milligrams per square metre. Since the detected amount is less than the first-predetermined amount, it is determined that the component with less than 20 milligrams per square metre of taggant is faulty and therefore may not have a suitable product performance, and the component is rejected from the manufacturing line.

In some embodiments, the method of manufacturing a component for an aerosol-generating article, comprising taggant, comprises the step of determining if the amount of the taggant that the component comprises, is greater than a second-predetermined amount. In some embodiments, the method comprises the step of rejecting a component when the detected amount of the taggant that the component comprises, is greater than the second-predetermined amount. Therefore, in this way there is provided a range of taggant amounts where the component is rejected. This allows the final products to have a taggant amount that is within an acceptable range. Therefore, product outliers having taggant amounts outside the acceptable range are removed. This allows a taggant detection system to be provided having greater precision, and that is better calibrated for genuine product recognition.

For example, in a particular component the amount of taggant detected may be 450 milligrams per square metre and the second-predetermined amount is 400 milligrams per square metre. Since the detected amount is greater than the second-predetermined amount, it is determined that the component with an amount of taggant that is greater than 400 milligrams per square metre is faulty and therefore may not have a suitable product performance, and the component is rejected from the manufacturing line. The detection of a taggant amount greater than the second-predetermined amount may, for example, show that too much of a particular component is present. In one specific embodiment, the presence of an amount of taggant detected within the tipping paper adhesive may show that too much tipping paper adhesive is applied. It is envisaged that instead of tipping paper adhesive, excess taggant may also be detected when applied to a filter, wrapper, tipping paper, filter plug wrap, susceptor, mouthpiece filter, spacer tube, tobacco element, flavourant element, heat source, aerosol-generating element, or a combination of one or more of these components.

In some embodiments, the method of manufacturing a component for an aerosol-generating article, comprising taggant, comprises the step of determining if the amount of the taggant that the component comprises is less than a first-predetermined amount or greater than a second-predetermined amount. In some embodiments, the method comprises the step of rejecting a component when the detected amount of the taggant that the component comprises, is less than a first-predetermined amount or greater than a second-predetermined amount. In this way, a component having a taggant amount that is outside of the range between the first-predetermined amount and the second-predetermined amount is rejected. This allows final products to have a taggant amount that is within an acceptable range. The first-predetermined amount may be a threshold amount, above which, the component provides a suitable product performance and user experience. The second-predetermined

amount may be a threshold amount, below which, the component provides a suitable product performance and user experience By comparing the amount of taggant present with a threshold amounts in this way, it can be assured that the amount of taggant present is within an acceptable range, and the component containing the taggant provides a suitable product performance and user experience. By comparing the amount of taggant present with the acceptable range, it can be predicted whether the correct components are in place during manufacture.

In some specific embodiments, the method of manufacturing a component for an aerosol-generating article, comprising taggant, comprises the step of determining if the amount of the taggant that the component comprises is less than a first-predetermined amount or greater than a second-predetermined amount, wherein the first-predetermined amount is a non-zero amount. In this way, the method not only detects the presence of a taggant, but an amount of taggant within a component, and rejects the component if the taggant amount is outside of an acceptable range.

For example, the first-predetermined amount of taggant may be 30 milligrams per square metre and the second pre-determined amount of taggant may be 300 milligrams per square metre. If the measured amount of taggant for a component is 200 milligrams per square metre, this value is compared with the acceptable range of values between 30 milligrams per square metre and 300 milligrams per square metre, and it is determined that the component provides a suitable product performance. If however, if the measured amount of taggant for a component is outside of this acceptable range, for example 15 milligrams per square metre or 380 milligrams per square metre, this value is compared with the acceptable range of values, and it is determined that the component does not provide a suitable product performance. This component is rejected from the manufacturing line.

In some embodiments, the first-predetermined amount of the taggant is a concentration of 5 milligrams of taggant per square metre. In some embodiments, the first-predetermined amount of the taggant is a concentration of 10 milligrams of taggant per square metre. In some embodiments, the first-predetermined amount of the taggant is a concentration of 20 milligrams of taggant per square metre. In some embodiments, the first-predetermined amount of the taggant is a concentration of 50 milligrams of taggant per square metre. In some embodiments, the first-predetermined amount of the taggant is a concentration of 100 milligrams of taggant per square metre. In some embodiments, the second-predetermined amount of the taggant is 500 milligrams of taggant per square metre. In some embodiments, the second-predetermined amount of the taggant is a concentration of 450 milligrams of

taggant per square metre. In some embodiments, the second-predetermined amount of the taggant is a concentration of 400 milligrams of taggant per square metre. In some embodiments, the second-predetermined amount of the taggant is a concentration of 300 milligrams of taggant per square metre. In some embodiments, the second-predetermined amount of the taggant is a concentration of 250 milligrams of taggant per square metre.

In some specific embodiments there is provided a range that where the detected amount of taggant of the component is between 5 milligrams of taggant per square metre and 500 milligrams of taggant per square metre the component is not rejected. In other words, in some specific embodiments there is provided a range that where the detected amount of taggant of the component is, less than 5 milligrams of taggant or greater than 500 milligrams of taggant per square metre, the component is rejected.

In some specific embodiments, there is provided a range that where the detected amount of taggant of the component is between 10 milligrams of taggant per square metre and 450 milligrams of taggant per square metre, the component is not rejected. In other words, in some specific embodiments there is provided a range that where the detected amount of taggant of the component is, less than 10 milligrams of taggant or greater than 450 milligrams of taggant per square metre, the component is rejected.

In some embodiments, there is provided a range that where the detected amount of taggant of the component is between 25 milligrams of taggant per square metre and 200 milligrams of taggant per square metre the component is not rejected. In other words, in some specific embodiments there is provided a range that where the detected amount of taggant of the component is, less than 25 milligrams of taggant or greater than 450 milligrams of taggant per square metre, the component is rejected.

The range between the first-predetermined amount and the second-predetermined amount may be any desired range. For example, the first-predetermined amount may be 20 milligrams of taggant per square metre and the second-predetermined amount may be 100 milligrams of taggant per square metre. Other ranges for between the first-predetermined amount of taggant and the second-predetermined amount of taggant are also possible.

In some embodiments, the method of manufacturing a component comprises the step of applying taggant to a component, wherein the component is a filter. Alternatively, or in addition, in some embodiments the taggant is applied to other components. In some embodiments, the component is a wrapper. In some embodiments, the component is a tipping

paper. In some embodiments, the component is an adhesive. In some embodiments, the component is a tipping paper adhesive. In some embodiments, the component is a filter plug wrap. In other embodiments, the component is a combination of the mentioned components. The component may be a susceptor, a mouthpiece filter, a spacer tube, a tobacco element, a flavourant element, a heat source, an aerosol-generating element, or any combination of these. Advantageously, the more components that have taggant applied to, the greater the signature marking may be for product identification.

In some embodiments, the method comprises the step of applying the taggant to an interface between a tobacco-rod component and a filter component. By applying the taggant to an interface between the tobacco-rod component and a filter component, the taggant is applied away from the ends. Thus, the taggant is applied on the aerosol-generating article at an interface between the tobacco-rod component and filter component, rather than at the interface between two individual aerosol-generating articles, for example, at an end of adjacent aerosol-generating article. This is advantageous as this enables individual aerosol-generating articles to be distinguished from one another, and taggant amounts for individual aerosol-generating articles to be detected. This enables taggant amounts to be matched more easily to their corresponding aerosol-generating article.

In some embodiments, the method comprises the step of applying the taggant to an inner surface of a tipping paper component. In some embodiments, the taggant is applied to an outer surface of a tipping paper component. In some embodiments, the taggant is applied to both an inner surface of a tipping paper component, and to an outer surface of a tipping paper component.

In specific embodiments, the method comprises the step of applying a taggant substantially around the circumference of the component. In some embodiments, the taggant may be applied around the entire circumference of the component. In other embodiments, the taggant is applied partially around the circumference of the component. It is particularly beneficial to apply the taggant at least substantially around the circumference of the component as this allows taggant to be detected in all orientations of the components. For example, even if during the manufacturing process where the component is to be transferred on a roller, the surface facing the roller may not be exposed to a taggant sensor or reader, having taggant applied substantially around the circumference of the component enables taggant to be detected despite not all surfaces of the component being exposed to sensors.

In some embodiments, the method comprises the step of repeating the detecting and determining steps. Advantageously, the detecting and determining steps are repeated to provide more than one data reading. In some embodiments, the repeat of the detecting and determining steps are carried out on the same aerosol-generating article. Optionally in specific embodiments, the method comprises the step of repeating the rejection step. The method may comprise the steps of repeating the detecting, determining and rejection steps. Repeating the detecting and determining steps is particularly beneficial since this provides an improved reliability of readings. The repeat readings can also be used to determine whether any outliers in data (for example, abnormal or erroneous data) are present. The detecting and determining steps may be repeated, and an average amount of taggant is determined.

In some embodiments, the method comprises the step of detecting the amount of taggant that the component comprises, after the manufacturing step of applying and securing the tipping paper component to another component.

In some embodiments, the method comprises the steps of detecting the amount of taggant and determining whether the detected amount of taggant is less than a first-predetermined amount, and the steps are repeated at different stages of the manufacturing process. In some embodiments, the method comprises the steps of detecting the amount of taggant and determining whether the detected amount of taggant is greater than a second-predetermined amount, and the steps are repeated at different stages of the manufacturing process. In some embodiments, the method comprises the steps of detecting the amount of taggant and determining whether the detected amount of taggant is less than a first-predetermined amount or greater than a second-predetermined amount, and the steps are repeated at different stages of the manufacturing process. It is particularly beneficial to repeat the detecting and determining steps since the amount of taggant may change as the component moves along the manufacturing line. Repeating these steps ensures that the product performance remains suitable. Moreover, it can be determined that the correct components are in place at different stages of the manufacturing process.

In some embodiments the taggant may be present in the adhesive, and by detecting the amount of taggant and rejecting components with too little or too much taggant, where the amount of taggant is not between the first-predetermined amount of taggant and the second predetermined amount of taggant, may indicate components with too little or too much adhesive and thus may be faulty. Components with too little adhesive may not hold together adequately. Components with too much adhesive may be of a different shape.

In other embodiments the taggant may be present in the wrapping paper and by detecting the amount of the taggant may indicate where too little or too much wrapping paper was used to wrap the component. Too little wrapping paper may result in the component falling apart prematurely. Too much wrapping paper may produce a component that is thicker and not easily handled.

Also, according to the present invention there is provided an apparatus for manufacturing a component for an aerosol-generating article, comprising taggant. The apparatus comprises a dispenser configured to apply taggant to a component. The apparatus also comprises a sensor configured to detect an amount of the taggant that the component comprises. The apparatus comprises a controller for determining whether the detected amount of the taggant is less than a first-predetermined amount. The apparatus further comprises a rejection system configured to reject a component when the detected amount of the taggant is less than the first-predetermined amount.

Thus, the apparatus applies taggant to a component, which acts as an internal signature of the component that is used for product identification. The taggant of the component is used to determine, by recognition, whether a component for an aerosol-generating article, and therefore the aerosol-generating article, is a genuine product. The sensor of the apparatus detects the amount of taggant that the component comprises, and the controller compare the detected amount of taggant with a first-predetermined amount of taggant, which if not met, the component is rejected by the rejection system. This apparatus ensures that all components have a suitable amount of taggant for component recognition, enabling genuine products to be identified. It is particularly advantageous to have an apparatus having a rejection system that rejects a component when the detected amount of the taggant is less than the first-predetermined amount, since the rejected component is removed from the manufacturing process before the completion of the final product. This reduces waste materials used on a product which, in any case, is later to be discarded.

In some specific embodiments, the apparatus comprises a controller that is configured to determine whether the detected amount of the taggant is less than a first-predetermined amount, wherein the first-predetermined amount is a non-zero amount. Therefore, not only does the apparatus determine whether a taggant is present, but also if there is an insufficient amount of taggant present, therefore identifying faulty components. Those components can then be rejected. The non-zero amount may be a threshold amount, above which, the component provides a suitable product performance and user experience. By having a controller which determines the detected amount of taggant is less than a first-predetermined

non-zero amount in this way, the non-zero amount is used as a threshold amount, above which, it can be determined that the component provides a suitable product performance and user experience. By comparing the amount of taggant presence with a threshold amount in this way, it can be predicted whether the correct components are in place during manufacture. If it is determined that the amount of taggant present is below the first-predetermined amount of taggant, the component is determined as being faulty, and is rejected from the manufacturing line.

In some embodiments, the controller is configured to determine if the amount of the taggant that the component comprises is less than a first-predetermined amount or greater than a second-predetermined amount. In some embodiments, the apparatus comprises a rejection system that rejects a component when the detected amount of the taggant that the component comprises, is less than a first-predetermined amount or greater than a second-predetermined amount. In this way, when a component contains a taggant amount that is outside of the range between the first-predetermined amount and the second-predetermined amount, that component is rejected. This allows final products to have a taggant amount that is within an acceptable range.

In some specific embodiments, the controller is configured to determine if the amount of the taggant that the component comprises is less than a first-predetermined amount or greater than a second-predetermined amount, wherein the first-predetermined amount is a non-zero amount. In this way, the apparatus not only detects the presence of a taggant, but an amount of taggant within a component, and rejects the component if the taggant amount is outside of an acceptable range.

In some preferred embodiments, the apparatus comprises multiple sensors, each sensor being configured to detect an amount of the taggant. By having multiple sensors that are each configured to detect an amount of the taggant, the amount of taggant can still be detected if, for example, one of the sensors is inoperable. Another reason why this setup is advantageous is because the sensors are placed in different areas, and are thus capable of detecting the amount of taggant at different points in time, or in different locations of the component. For example, the sensors may be used to determine the amount of taggant at different points along the manufacturing process. The sensors may additionally, or alternative be positioned directed towards a different part of the component.

In some embodiments, the apparatus comprises at least a sensor positioned in the manufacturing line after the application and securing of a tipping paper component to another component.

In some embodiments, the apparatus comprises at least one sensor positioned in the manufacturing line after wrapping of the component. The component that is wrapped may be a filter component, for example.

In specific embodiments, the apparatus comprises at least one sensor positioned in the manufacturing line after manufacture of a component. The component that is manufactured may be an aerosol-forming substrate, such as a tobacco plug component, for example.

In some embodiments, the apparatus comprises multiple sensors, each of which are positioned at different stages of the manufacturing process. In some specific embodiments, the sensors detect the amount of taggant. In some embodiments, the amount of taggant is measured by the sensors at different stages of the manufacturing process and the controller determines whether the detected amount of taggant is less than a first-predetermined amount. In some embodiments, the amount of taggant is measured by the sensors at different stages of the manufacturing process and the controller determines whether the detected amount of taggant is greater than a second-predetermined amount. In some embodiments, the amount of taggant is measured by the sensors at different stages of the manufacturing process and the controller determines whether the detected amount of taggant is less than a first-predetermined amount or greater than a second-predetermined amount. By having multiple sensors, each of which are positioned at different stages of the manufacturing process, it can be ensured whether the product performance remains suitable. If it is determined that the product performance is not suitable, then the rejection system of the apparatus may reject the component. Moreover, it can be determined that the correct components are in place at different stages of the manufacturing process.

In specific embodiments, the sensor comprises an emitter and a reader. In some embodiments, the emitter emits a signal and the reader reads a return signal from the taggant. By having a sensor which has both an emitter and a reader, the required number of sensors within the system is reduced.

In some embodiments the sensor does not have an emitter but reads signals from the taggant directly.

In some embodiments the signal comprises a spectroscopic signal. Alternatively, or additionally, in some embodiments the signal comprises a light signal, a phosphorescent signal, an electromagnetic signal or any combination thereof.

In some embodiments, the apparatus further comprises an adhesive dispenser for dispensing adhesive. In some embodiments, the adhesive dispenser comprises a glue application roller. In some embodiments, the glue application roller comprises grooves.

In some specific embodiments, the dispenser further comprises a mask configured to shield the dispensed taggant from reaching undesired areas. For example, the mask may shield the dispensed taggant from reaching and therefore filling perforation holes in the aerosol-generating article. This is particularly beneficial because perforation holes will not be blocked.

Further, according to the present invention there is provided a kit of parts. The kit of parts, of the present invention, comprises a plurality of manufacturing apparatuses suitable for the manufacturing of a component for an aerosol-generating article. The kit of parts, of the present invention, also comprises at least one sensor suitable for the detection of an amount of taggant that a component manufactured comprises. The kit of parts, of the present invention, comprises a controller to determine whether the amount of taggant that a component comprises, is less than a first-predetermined amount. The kit of parts, of the present invention, further comprises a rejection system configured to reject a component that has a taggant amount less than the first-predetermined amount.

As used herein, the term “adhesive” is used to describe a substance used for adhering or sticking to a surface of a component or a material.

As used herein, the term “aerosol-generating article” is used to describe an article that is able to generate, or release, an aerosol.

As used herein, the term “amount” is used to describe a quantity of a material, component or object. An amount may be used to describe a number, a mass, extent or size in a quantitative manner.

As used herein, the term “apply” is used to describe a process of supplying or dispensing a material to another material, for example, on a material or within a material.

As used herein, the term “component” is used to describe an element of a larger whole. For example, component is used to describe a part of an aerosol-generating article. Component may also refer to more than one part of an aerosol-generating article.

As used herein, the term “concentration” is used to describe an amount of a substance per unit area, or volume. For example, the concentration is used to quantify an amount or density of a substance within a component.

As used herein, the term “detect” is used to describe a process of identifying the presence of a substance.

As used herein, the term “dispenser” is used to describe a device or a means which is able to dispense, or apply, a substance to a material, for example, to a surface of a material, or within a material.

As used herein, the term “emitter” is used to describe a device that emits a signal.

As used herein, the term “faulty” as in “faulty component”, is used to describe any component that does not have the desired characteristics. As used herein, the term “interface” is used to describe the overlapping portion or boundary between two components. The interface may also be used to describe a further component that joins two components together. For example, the tipping paper of an aerosol-generating article may form an interface between the filter component and the aerosol-forming substrate.

As used herein, the term “predetermined” is used to describe a parameter that is established in advance. For example, a predetermined amount of taggant is established before the detection step of the amount of taggant.

As used herein, the term “reject” is used to describe a process of discarding a component. The term reject is also used to describe the process of preventing the component from proceeding downstream in a manufacturing process.

As used herein, the term “rod” is used to describe a component, segment or element, having a generally cylindrical cross-section, for use in an aerosol-generating article. The aerosol-generating article may comprise a number of different rods, for example, a filter rod. The cylindrical cross-section may be a circular cross-section or an oval cross-section, for example.

As used herein, the term “sensor” is used to describe a device which is used to measure a physical property of an environment. For example, the sensor may be a device that is used in the manufacturing process for measuring a physical property of a component for an aerosol-generating article, to identify the component.

As used herein, the term “taggant” is used to describe a marker used to identify a component.

As used herein, the term “threshold” is used to describe a limit or boundary of an amount of taggant, which determines the suitability of the component which comprises the taggant. For example, below a threshold of 20 milligrams per square metre of taggant present in a component, it is determined that a component is not suitable. Components having less than 20 milligrams per square metre of taggant may be rejected as being faulty.

As used herein, the phrase “undesired area” is used to describe a part or a portion of a component where taggant is not wanted.

Below, there is provided a non-exhaustive list of non-limiting examples. Any one or more of the features of these examples may be combined with any one or more features of another example, embodiment, or aspect described herein.

Below, there is provided a non-exhaustive list of non-limiting examples. Any one or more of the features of these examples may be combined with any one or more features of another example, embodiment, or aspect described herein.

Example Ex1: A method of manufacturing a component for an aerosol-generating article, comprising taggant, the method comprising the step of applying taggant to a component. The method comprises the step of detecting an amount of the taggant that the component comprises. The method also comprises the step of determining whether the detected amount of taggant is less than a first-predetermined amount. The method comprises the step of rejecting a component when the detected amount of the taggant is less than the first-predetermined amount.

Example Ex2: A method of manufacturing an aerosol-generating article, or component thereof, according to Example Ex1, further comprising the step of determining if the amount of the taggant on, or within, the component is greater than a second-predetermined amount. The method further comprises the step of rejecting a component when the detected amount of the taggant on, or within the component is greater than the second-predetermined amount.

Example Ex3: A method of manufacturing a component, according to Example Ex1 or Example Ex2, wherein the first-predetermined amount of the taggant is a concentration of 5 milligrams of taggant per square metre.

Example Ex4: A method of manufacturing a component, according to any one of the preceding Examples, further comprising the step of applying taggant to a component wherein the component is: a filter, a wrapper, a tipping paper, an adhesive, a tipping paper adhesive, a filter plug wrap, or any combination of the before mentioned components.

Example Ex5: A method of manufacturing a component, according to Example Ex4, wherein the component is: a susceptor, a mouth piece filter, a spacer tube, a tobacco element, a flavourant element, a heat source, an aerosol-generating element, or any combination of the before mentioned components.

Example Ex6: A method of manufacturing a component, according to any preceding Example, further comprising the step of: applying the taggant to an interface between a tobacco-rod component and a filter component.

Example Ex7: A method of manufacturing a component, according to any preceding Example, further comprising the step of: applying the taggant to an inner surface of a tipping component.

Example Ex8: A method of manufacturing a component, according to any preceding Example, further comprising the step of: applying a taggant substantially around the circumference of the component.

Example Ex9: A method of manufacturing a component, according to any preceding Example, further comprising the step of: repeating the detecting and determining steps, and if applicable, the rejection step.

Example Ex10: A method of manufacturing a component, according to any preceding Example, further comprising the step of: detecting the amount of taggant that the component comprises, after the manufacturing step of applying and securing the tipping paper component to another component.

Example Ex11: An apparatus for manufacturing a component for an aerosol-generating article, comprising a taggant, the apparatus comprising a dispenser configured to apply taggant to a component. The apparatus also comprises a sensor configured to detect

an amount of the taggant that the component comprises. The apparatus comprises a controller for determining whether the detected amount of the taggant is less than a first-predetermined amount. The apparatus further comprises a rejection system configured to reject a component when the detected amount of the taggant is less than a first-predetermined amount.

Example Ex12: An apparatus according to Example Ex11, comprising multiple sensors, each sensor being configured to detect an amount of the taggant.

Example Ex13: An apparatus according to Example Ex11 or Example Ex12, further comprising at least one sensor positioned in the manufacturing line after the application and securing of a tipping paper component to another component.

Example Ex14: An apparatus according to any one of Examples Ex11 to Ex13, further comprising at least one sensor positioned in the manufacturing line after wrapping of the component.

Example Ex15: An apparatus according to any one of Examples Ex11 to Ex14, further comprising at least one sensor positioned in the manufacturing line after manufacture of a tobacco plug component.

Example Ex16: An apparatus according to any one of Examples Ex11 to Ex15, wherein the sensor comprises an emitter and a reader, wherein the emitter emits a signal and the reader reads a return signal from the taggant.

Example Ex17: An apparatus according to any one of Examples Ex11 to Ex16, further comprising an adhesive dispenser for dispensing adhesive.

Example Ex18: An apparatus according to Example Ex17, wherein the adhesive dispenser comprises a glue application roller.

Example Ex19: An apparatus according to Example Ex18, wherein the glue application roller comprises grooves.

Example Ex20: An apparatus according to any one of Examples Ex11 to Ex19, wherein the dispenser further comprises a mask configured to shield the dispensed taggant from reaching undesired areas.

Example Ex21: A kit of parts, comprising a plurality of manufacturing apparatuses suitable for the manufacturing of a component for an aerosol-generating article. The kit of parts also comprises at least one sensor suitable for the detection of an amount of taggant that a component manufactured comprises. The kit of parts comprises a controller to determine whether the amount of taggant that a component comprises, is less than a first-predetermined amount. The kit of parts further comprises a rejection system configured to reject a component that has a taggant amount less than the first-predetermined amount.

Reference will now be made to the drawings, which depict one or more embodiments described in this disclosure. However, it will be understood that other embodiments not depicted in the drawings fall within the scope of this disclosure. Like numbers used in the figures refer to like components, steps and the like. However, it will be understood that the use of a number to refer to a component in a given figure is not intended to limit the component in another figure labeled with the same number. In addition, the use of different numbers to refer to components in different figures is not intended to indicate that the different numbered components cannot be the same or similar to other numbered components. The figures are presented for purposes of illustration and not limitation. Schematic drawings presented in the figures are not necessarily to scale.

Figure 1 illustrates a cut-away cross-sectional schematic side profile of an aerosol-generating article.

Figure 2 illustrates a cut-away cross-sectional schematic side profile and a partial section view of an aerosol-generating article.

Figure 3 illustrates a cut-away cross-sectional schematic side profile of an aerosol-generating article.

Figure 4 illustrates a cut-away cross-sectional schematic side profile and a partial section view of an aerosol-generating article.

Figure 5 illustrates a schematic representation of an example embodiment of an apparatus for manufacturing a component for an aerosol-generating article.

Figure 6 illustrates a schematic representation of another example embodiment of an apparatus for manufacturing a component for an aerosol-generating article.

Figure 7 illustrates a schematic representation of an example embodiment of an apparatus for manufacturing a component for an aerosol-generating article.

Figure 8 illustrates a schematic representation of a further example embodiment of an apparatus for manufacturing a component for an aerosol-generating article.

Figure 1 shows an aerosol-generating article **101**. The aerosol-generating article **101** has a proximal end **102** and a distal end **104**. The aerosol-generating article **101** has an aerosol-forming substrate **106** located at the distal end **104**. The aerosol-generating article **101** has a means for heating the aerosol-forming substrate **106** to a temperature to form an aerosol. To heat the aerosol-forming substrate **106**, the aerosol-generating article **101** is provided with a heating element that, at least partially, surrounds, and is adjacent to, or in close proximity with, the aerosol-forming substrate **106**. The heating element may be inserted into the aerosol-forming substrate **106**.

On the proximal end **102**, the aerosol-generating article **101** is provided with a filter **108**. The aerosol-forming substrate **106** is heated and forms an aerosol. When a negative pressure is applied to the proximal end **102** of the aerosol-generating article **101**, the aerosol is drawn through the filter **108** at the proximal end **102.**

The aerosol-generating article **101** has a hollow acetate tube **112** that is positioned in between the filter **108** and the aerosol-forming substrate **106**. The hollow acetate tube **112** is placed in coaxial alignment with the filter **108** and the aerosol-forming substrate **106**. The filter **108**, hollow acetate tube **112** and the aerosol-forming substrate **106** are assembled within a tipping paper **110**. In this example, the tipping paper **110** is arranged over the filter **108** at the proximal end **102** of the aerosol-generating article **101**. The tipping paper **110** covers the entirety of the hollow acetate tube **112**. The tipping paper **110** partially covers the aerosol-forming substrate **106** at an end opposite the distal end **104** of aerosol-generating article **101**. In some examples, the filter **108** is wrapped in a filter plug wrapper. In some examples, the hollow acetate tube **112** is wrapped in a hollow acetate tube plug wrapper. Additionally, or alternatively, the aerosol-forming substrate **106** may be wrapped in an aerosol-forming substrate plug wrapper. In some examples, additionally or alternatively, the aerosol-generating article **101** is provided with one or more of: a susceptor, a mouthpiece filter, a spacer tube, a tobacco element, a flavourant element, a heat source, an aerosol-generating element. The aerosol-generating article **101** may be provided with any combination of these.

Referring now to **Figure 2**, there is provided an aerosol-generating article **201**. Aerosol-generating article **201** is substantially the same as aerosol-generating article **101** in **Figure 1**. Aerosol-generating article **201** is provided with tipping paper **210** that is arranged over the filter **208** at the proximal end **202**, over the hollow acetate tube **212**, and partially over the aerosol-forming substrate **206**. **Figure 2** illustrates a section view of the tipping paper **210** from one end at the proximal end **202** of the aerosol-generating article **201** to the opposite end that partially covers the aerosol-forming substrate **206**. An inner surface of the tipping paper **210** is provided with a coating of adhesive **220**. The adhesive **220** is provided to attach the tipping paper **210** to the rod of the aerosol-generating article **201**. The adhesive **220** in this example is a glue **220**. Glue **220** is applied on the inner surface of the tipping paper **210**. The glue **220** contains a taggant. The taggant has a concentration of 150 milligrams per square metre. It is envisaged that the taggant may have any concentration between 5 milligrams per square metre to 500 milligrams per square metre. In this particular example, the glue **220** is sprayed onto the inner surface of the tipping paper **210**. In this example, the taggant is mixed with the glue **220** prior to the application of the glue **220** onto the inner surface of the tipping paper. In some examples, the glue **220** is applied using a roller, such as a roller having grooves. The glue **220** may alternatively be applied by printing.

Thus, the inner surface of the tipping paper **210** is provided with an adhesive **220** containing taggant. It is also envisaged that in some examples, the inner surface of the tipping **210** is provided with a taggant directly applied using a spray nozzle, or by printing, or by using a roller. The tipping paper **210** is provided with a glue line **214** at a location where the tipping paper **210** overlaps the aerosol-forming substrate **206**. The tipping paper **210** is also provided with a reinforced glue line **216** at the location where the tipping paper **210** overlaps the aerosol-forming substrate **206**. The glue line **214** and the reinforced glue line **216** are provided to assist the attachment of the tipping paper **210** to the aerosol-forming substrate **206**. In some examples, glue line **214** is provided. In other examples, reinforced glue line **216** is provided. In yet other examples, both glue line **214** and reinforced glue line **216** are provided so as to attach the tipping paper **210** to the aerosol-forming substrate **206**. In the example illustrated in **Figure 2**, the tipping paper **210** is provided with a glue free zone **218**. The glue free zone **218** is an area **218** that is absent of glue **220**. This is so that the glue **220**, does not block perforation holes in the aerosol-generating article **201**, for example. In some examples, the glue free zone **218** has substantially less glue **220** relative to that on the inner surface of the tipping paper **210**.

Figure 3 shows an aerosol-generating article **301**. The aerosol-generating article **301** has a proximal end **302** and a distal end **304**. The aerosol-generating article **301** has an

aerosol-forming substrate **306** located at the distal end **304**. The aerosol-generating article **301** is provided with a heating source **324** that is configured to heat the aerosol-forming substrate **306** to a temperature to form an aerosol. The aerosol-generating article **301** is also provided with a heat-conducting element **326** arranged around and in direct contact with the heating element **324** and a portion of the aerosol-forming substrate **306** located near the distal end **304** of the aerosol-generating article **301**. The heat-conducting element **326** in this example is a stainless-steel tube **326** but it is envisaged that the heat-conducting element **326** may be any suitable heat-conducting material.

The proximal end **302** of the aerosol-generating article **301** is provided with a filter **308**. The aerosol-forming substrate **306** is heated by the heating element **324** by conduction. This transfers heat energy to the aerosol-forming substrate **306** to produce an aerosol. The aerosol is drawn through the filter **308** at the proximal end **302**, when a negative pressure is applied to the proximal end **302** of the aerosol-generating article **301**.

The aerosol-generating article **301** is provided with a hollow acetate tube **312** that is positioned in between the filter **308** and the aerosol-forming substrate **306**. The hollow acetate tube **312** is placed in coaxial alignment with the filter **308** and the aerosol-forming substrate **306**. The filter **308**, hollow acetate tube **312** and the aerosol-forming substrate **306** are assembled within a tipping paper **310**. The tipping paper **310** is arranged to cover the filter **308**, cover the hollow acetate tube **312**, and arranged to partially cover the aerosol-forming substrate **306**. The inner surface of the tipping paper **310** is provided with a coating of glue **320** to attach to the rod of the aerosol-generating article **301**. As can be seen from **Figure 3**, the glue **320** is applied in two distinct areas on the circumference of the aerosol-generating article **301**, separated from one another along the length of the aerosol-generating article **301**. The glue **320** application areas are separated by a glue free zone **318**. The glue free zone **318** is absent of glue **320**. This is so that the glue **320**, does not block perforation holes in the aerosol-generating article **301**, for example. In some examples, the glue free zone **318** has substantially less glue **320** than the glue **320** application areas. The glue **320** contains a taggant. More specifically, the inner surface of the tipping paper **310** is provided with glue **320** containing taggant.

In other embodiments, other components of the aerosol-generating device **301** may instead or additionally be provided with a taggant. For example, a taggant may be applied by spraying, by printing, or by rolling, to the components of the aerosol-generating device **301**. The taggant may be applied to any or a combination of: a wrapper, an adhesive **320**, a tipping paper adhesive, a filter plug wrap, or an aerosol-forming substrate plug wrap. It is further

envisaged that the taggant may be applied to any or a combination of: a susceptor, a mouthpiece filter, a spacer tube, a tobacco element, a flavourant element, a heat source **324**, or an aerosol-generating element. The taggant may alternatively or additionally incorporated into the raw materials that are used to manufacture, for example, any or a combination of: a wrapper, an adhesive **320**, a tipping paper adhesive, a filter plug wrap, an aerosol-forming substrate plug wrap, a susceptor, a mouthpiece filter, spacer tube, a tobacco element, flavourant element, a heat source **324**, or an aerosol-generating element. The raw materials may constitute the components of the aerosol-generating article **301**. Taggants are uniquely encoded materials or chemistries that are virtually impossible to duplicate. Taggants can be used to identify the origin for a product, such as the aerosol-generating article **301**, for example.

For illustrative purposes, the area denoted by **322** indicates a taggant detection zone **322** located at the junction between the aerosol-forming substrate **306** and the hollow acetate tube **312**. The taggant detection zone **322** may be located at any part of the aerosol-generating article **301** that comprises a taggant. For example, the taggant detection zone **322** may be at a location containing the component which has a taggant, for example any or a combination of: an adhesive **320**, a tipping paper adhesive, a filter plug wrap, an aerosol-forming substrate plug wrap, a susceptor, a mouthpiece filter, spacer tube, a tobacco element, flavourant element, a heat source **324**, or an aerosol-generating element. It is envisaged that there may be provided more than one taggant detection zone **322** on the aerosol-generating article **301**.

A corresponding detection system on an apparatus is provided. The apparatus will be described in more detail with reference to **Figures 5 to 8**. The apparatus is provided with a sensor that detects the amount of the taggant that the component comprises. In this particular example, the sensor of the apparatus detects the amount of taggant which is contained in the taggant detection zone **322**. Although the taggant detection zone **322** in this example is positioned at the junction between the aerosol-forming substrate **306** and the hollow acetate tube **312**, it is envisaged that the taggant detection zone **322** may be located elsewhere on the aerosol-generating article **301** that comprises a taggant.

Figure 4 shows an aerosol-generating article **401**. Aerosol-generating article **401** is substantially the same as aerosol-generating article **201** in **Figure 2** and comprises a proximal end **402** and a distal end **404.** Aerosol-generating article **401** is provided with tipping paper **410** that is arranged over the filter **408** at the proximal end **402**, over the hollow acetate tube **412**, and partially over the aerosol-forming substrate **406**. An inner surface of the tipping paper **410** is provided with a coating of adhesive **420**. The adhesive **420** is provided to attach tipping

paper **410** to the rod of the aerosol-generating article **401**. The adhesive **420** in this example is a glue **420**. Glue **420** is applied on the inner surface of the tipping paper **410**. The glue **420** contains a taggant. The taggant has a concentration of 150 milligrams per square metre. It is envisaged that the taggant may have any concentration between 5 milligrams per square metre to 500 milligrams per square metre. In this particular example, the glue **420** is sprayed onto the inner surface of the tipping paper **410**.

The inner surface of the tipping paper **410** is provided with an adhesive **420** containing taggant. The tipping paper **410** is provided with a glue line **414** at a location where the tipping paper **410** overlaps the aerosol-forming substrate **406**. The tipping paper **410** is provided with a reinforced glue line **416** at the location where the tipping paper **410** overlaps the aerosol-forming substrate **406**. The glue line **414** and the reinforced glue line **416** are provided to attach the tipping paper **410** to the aerosol-forming substrate **406**. The tipping paper **410** is provided with a glue free zone **418**. The glue free zone **418** is an area **418** that is absent of glue **420**. This is so that the glue **420**, does not block perforation holes in the aerosol-generating article **401**, for example. In some examples, the glue free zone **418** has substantially less glue **420** relative to that on the inner surface of the tipping paper **410**.

The tipping paper **410** is provided with an additional glue line **419** comprising taggant. Glue line **419** is sprayed onto the tipping paper **410** to increase the concentration of taggant. The quantity of taggant may be increased. The increase of the concentration or the quantity of taggant improves the ease of detection of the taggant. In this example, the additional glue line **419** is sprayed by an adhesive nozzle. The additional glue line **419** has a width off 4 millimetres. Alternatively or in addition, the taggant may be incorporated in the raw materials that are manufactured to form any or a combination of: a wrapper, an adhesive **420**, a tipping paper adhesive, a filter plug wrap, an aerosol-forming substrate plug wrap, a susceptor, a mouthpiece filter, spacer tube, a tobacco element, flavourant element, a heat source **424**, or an aerosol-generating element.

Figure 5 illustrates an example of an apparatus **500**. The apparatus **500** is used for detecting the presence and quantity of the taggant in glue. In this example, the apparatus **500** is used for detecting the presence and quantity of the taggant in glue applied to tipping paper **110** (not shown). The apparatus **500** has a series of transport drums **550**,**552**,**554**,**556** configured to transport along them, a component for an aerosol-generating article. In this example, the transport drums **550**,**552**,**554**,**556** are arranged to transport tipping paper **110** towards another part of the manufacturing process where the tipping paper **110** is assembled with other components (not shown) to produce an aerosol-generating article.

The apparatus **500** is provided with a guiding roller **566** which receives the tipping paper **110** from a transport drum **554**. The guiding roller **566** directs the tipping paper **110** to a combiner **560** downstream towards an assembly station (not shown), where the tipping paper **110** is assembled with other components to form an aerosol-generating article. Between the guiding roller **556** and the combiner **560**, a sensor **562** is arranged directed towards the tipping paper **110**. The sensor **562** emits a sensing signal **564** that is used to determine whether the tipping paper **110** comprises a taggant, and the amount of taggant present. In some examples, the sensor **562** detects the taggant concentration that the tipping paper **110** comprises. More specifically, the sensor **562** emits a signal **564** towards the tipping paper **110**. In this particular example, the signal **564** is a spectroscopic signal. The taggant in this example has an identifiable spectroscopic signature. When the taggant is exposed to the emitted signal **564**, the taggant absorbs a portion of the emitted signal **564** and alters the spectroscopic signal. The signal is reflected and picked up by the sensor **562**. The return signal is used to identify the taggant on the tipping paper **110** and its amount. It is envisaged that the signal **564** may be a light signal, a phosphorescent signal, an electromagnetic signal, or any suitable signal that may identify the taggant. In one example, the sensor **562** emits a light signal **564** which causes the taggant to absorb a specific wavelength, for example 1000 nanometres, or a wavelength range, for example between 930 nanometres and 1020 nanometres. The wavelengths of the light return signal received by the sensor **562** determines the absorbed wavelength of light and determines the taggant by reading the absent wavelength(s). The emitter of the sensor **562** may be a light-emitting diode. The receiver of the sensor **562** may be a photodiode. Other wavelengths are envisaged. In such cases, the emitter and receiver of the sensor **562** are tuned to the absorption and emission properties of the taggant. Additional optics, such as for example, a lens or a filter, may be provided to the sensor or in front of the sensor **562** to improve its sensitivity.

The apparatus **500** is capable of rejecting a component if it comprises an amount of taggant that is less than a predetermined amount. The apparatus **500** is provided with a control (not shown) which determines whether the amount of taggant detected by the sensor **562** is below a first-predetermined amount. In some examples, the control determines whether the amount of taggant detected by the sensor **562** is greater than a second-predetermined amount. The apparatus **500** in this example is provided with a rejection system (not shown). The rejection system is designed to reject a component if it comprises an amount of taggant that is less than a first-predetermined amount. The rejection system is designed also to reject a component if it comprises an amount of taggant that is greater than a second-predetermined amount. In this particular example, the tipping paper **110** is rejected if it comprises a taggant having a concentration of less than 5 milligrams per square metre. The tipping paper **110** is

rejected if it comprises a taggant having a concentration of more than 500 milligrams per square metre. In some examples, the rejection system is designed to reject a component if it comprises having a concentration, or amount, of less than a first-predetermined amount, for example 20 milligrams per square metre. Not only is a component rejected if it does not contain a taggant, but a component is also rejected if it does not comprise a suitable amount of taggant. That is, is a component has an amount of taggant which is below a threshold amount of taggant of 20 milligrams per square metre, then it is determined that the component is faulty and does not provide suitable product performance. For example because some components are not present. In a similar way, in other examples, the rejection system is designed to reject a component if it comprises having a concentration, or amount, of greater than a second-predetermined amount, for example 550 milligrams per square metre. Above the threshold amount, it is determined that the component is faulty and would not provide a suitable product performance. An excess amount of taggant may indicate too much of a particular component is present. For example, if a high concertation of taggant is present in a component, where the taggant is present in glue, then it may be determined that too much glue is applied to the component.

After the sensor **562** detects the amount of taggant, a controller compares the detected amount of taggant with a predetermined amount of taggant. In this particular example, the controller determines whether the amount of taggant detected by the sensor **562** is within the range of 5 milligrams per square metre and 500 milligrams per square metre. If the detected amount of taggant is within the range of 5 milligrams per square metre and 500 milligrams per square metre, a positive signal is provided. The range in this particular example is 5 milligrams per square metre and 500 milligrams per square metre, but it is envisaged that other ranges may be applicable. For example, the range may be from 10 milligrams per square metre to 500 milligrams per square metre, or from 5 milligrams per square metre to 200 milligrams per square metre, or from 20 milligrams per square metre to 100 milligrams per square metre, for example. The positive signal is interpreted to mean that the tipping paper **110** comprises a suitable amount of taggant. However, if the detected amount of taggant is outside of the range of 5 milligrams per square metre and 500 milligrams per square metre, a negative signal is provided by the sensor **562**. This negative signal indicates that the tipping paper **110** is to be rejected. The tipping paper **110** part corresponding to the negative signal is discarded and prevented from further being processed in the apparatus **500**. The tipping paper **110** is removed from the apparatus. The portion of the tipping paper **110** corresponding to the negative signal may be rejected. In some examples, the full batch of the tipping paper **110** is rejected. In some examples, the machinery is stopped when a negative signal is detected, and the operator carries out a corrective action. The corrective action may be to change the source

of the component, to change the glue tank, or to verify that the machine applies glue to the component, or that the machine applies glue evenly to the component, for example. In this example, the taggant is applied to and detected from the tipping paper 110, but it is envisaged that the taggant may be applied to and detected from any or a combination of: an adhesive, a tipping paper adhesive, a filter plug wrap, an aerosol-forming substrate plug wrap, a susceptor, a mouthpiece filter, spacer tube, a tobacco element, flavourant element, a heat source, or an aerosol-generating element, for example.

It is also envisaged that in some examples, the apparatus **500** is used for detecting the presence of the taggant in glue. That is, the sensor **562** detects whether the tipping paper **110** comprises taggant. The sensor **562** emits a signal **564** towards the tipping paper **110** in the form a spectroscopic signal. The taggant has an identifiable spectroscopic signature. If a taggant is present, the taggant is exposed to the signal **564** emitted from the sensor **562**. The taggant absorbs a portion of the emitted signal **564** such that the spectroscopic signal is modified. When the signal **564** is reflected and picked up by the sensor **562**, the sensor **562** determines that the tipping paper **110** comprises a taggant (that is, a taggant is present). Depending on whether the presence of a taggant is detected, the apparatus is designed to either reject the component or to keep the component. In this particular example, the tipping paper **110** is rejected if no taggant is detected by the sensor **562**. In some examples, the entire component containing the tipping paper **110** is rejected if no taggant is detected by the sensor **562**. By rejecting the tipping paper **110** or the entire component, the part is prevented from being further processed in the apparatus **500**. In one example, the apparatus **500** is used for detecting the presence of the taggant in glue applied to tipping paper **110** (not shown). In other examples, the taggant may be applied to and detected from any or a combination of: an adhesive, a tipping paper adhesive, a filter plug wrap, an aerosol-forming substrate plug wrap, a susceptor, a mouthpiece filter, spacer tube, tobacco element, flavourant element, a heat source or an aerosol-generating element.

Figure 6 shows an apparatus **600** having a plurality of transport rollers **650**,**652**,**654**,**656** used to transport an aerosol-generating article (not shown) along them. The apparatus **600** detects the presence and quantity of the taggant applied to the aerosol-generating article. More specifically, in this example, the apparatus **600** is used to detect the presence and quantity of the taggant in the filter of the aerosol-generating article. In other examples, it is envisaged that the taggant is included in any or a combination of: a wrapper, an adhesive, a tipping paper adhesive, a filter plug wrap, or an aerosol-forming substrate plug wrap, a susceptor, a spacer tube, a tobacco element, a flavourant element, a heat source, or an aerosol-generating element. The transport rollers **650**,**652**,**654**,**656** are provided with a

grooved surface that is designed to receive the aerosol-generating article. The apparatus **600** is provided with a first sensor **662** directed towards roller **650**. The apparatus **600** is provided with a second sensor **672** downstream from the first sensor **662**. The second sensor **672** is directed towards roller **652**.

The first sensor **662** emits a first sensing signal **664** towards the filter component on drum **650** that is used to determine whether the filter component comprises a taggant, and the amount of taggant present. When the taggant in the filter is exposed to the emitted signal **664**, the taggant absorbs a portion of the emitted signal **664** and alters the spectroscopic signal. The signal is reflected and picked up by the first sensor **662**. The return signal is used to identify the taggant in the filter and its amount. The second sensor **672** emits a second sensing signal **674** towards the filter component on drum **652** that is used to determine whether the filter component comprises a taggant, and the amount of taggant present. When the taggant in the filter is exposed to the emitted signal **674**, the taggant absorbs a portion of the emitted signal **674** and alters the spectroscopic signal. The signal is reflected and picked up by the second sensor **672**. In some examples, the sensors **662**,**672** are angularly offset from one another. In some examples, a different number of sensors **662**,**672** are provide, directed towards any of transport rollers **650**,**652**,**654**,**656** provided in the apparatus **600**. A sensor may be desired after most or all manufacturing steps where taggant is present, and it is desired to determine whether taggant is present in desired amounts or concentrations. Thus, faulty components may be rejected. It is particularly beneficial to have additional sensors for important or costly manufacturing steps, where faulty components would constitute a longer downtime or have large associated costs.

The apparatus **600** is provided with a control (not shown) which determines whether the amount of taggant detected by any or both of the sensors **662**,**672** is below a first-predetermined amount. In some examples, the control determines whether the amount of taggant detected by any or both of the sensors **662**,**672** is greater than a second-predetermined amount. In other examples, the control determines an average amount of taggant detected between the sensors **662**,**672** and compares the average amount to the predetermined amount. The apparatus **600** in this example is provided with a rejection system (not shown). The rejection system is designed to reject an aerosol-generating article if the filter comprises an amount of taggant that is less than a first-predetermined amount. The rejection system is designed also to reject an aerosol-generating article if the filter comprises an amount of taggant that is greater than second-predetermined amount. The sensors **662**,**672** each detect the amount of taggant in the same way as sensor **562** in the above example. However, since two sensors **662**,**672** are provided, each sensor **662**,**672** can operate individually to

detect an amount of taggant simultaneously at different locations of the same aerosol-generating article. In some examples, each sensor **662**,**672** can operate to detect an amount of taggant simultaneously on different aerosol-generating articles. In some examples, additional sensors may be positioned at different stages along the manufacturing process, to ensure that the amount of taggant present in the component remains within an acceptable range as the component moves along the manufacturing line. This ensures that the product performance remains suitable.

Figure 7 shows a portion of an apparatus **700** having a drum **752**. The drum **752** has a central axis **753** about which the drum **752** rotates. The drum **752** has a plurality of grooves disposed around the circumference, in which aerosol-generating articles **101** are received. The aerosol-generating articles **101** are provided with a hollow acetate tube (not shown). The hollow acetate tube is formed from raw materials mixed with a taggant. Thus, the hollow acetate tube of the aerosol-generating article **101** contains a taggant. As the drum **752** rotates about its axis **753**, the aerosol-generating articles **101** are transported on a path along the circumference of drum **752**. A first sensor **762** is arranged to emit a first signal **764** towards the aerosol-generating articles **101** as they are transported on drum **752**. A second sensor **772** is arranged downstream from the first sensor **762**. The second sensor **772** is arranged to emit a plurality of second signals **774** towards the aerosol-generating articles **101** at a location downstream of the first signal **764**. When an aerosol-generating article **101** is transported on the drum **752**, the aerosol-generating article **101** passes by the first sensor **764** to be sensed, and then passes by the second sensor **772**, to be sensed.

The first sensor **762** emits a first signal **764** towards the aerosol-generating article **101** on the drum **752**. The first sensor **762** determines whether the aerosol-generating article **101** comprises a taggant and if so, the amount of taggant that is present. When the taggant in the hollow acetate tube of the aerosol-generating article **101** is exposed to the emitted first signal **764**, the taggant absorbs a portion of the signal **764** and alters the spectroscopic signal. The signal is reflected and picked by the first sensor **762**. The return signal is used to identify the taggant in the aerosol-generating article **101**, and its amount. The second sensor **772** emits a plurality of second signals **774** towards the aerosol-generating articles **101** on drum **752** to determine whether the aerosol-generating article **101** comprises a taggant, and the amount of taggant present. When the taggant in the hollow acetate tube of the aerosol-generating article **101** is exposed to the emitted second signal **774**, the taggant absorbs a portion of the emitted signal **774** and alters the spectroscopic signal. The signal is reflected and picked by the second sensor **772**. In this particular example, the second sensor **772** is designed to emit three signals **774**. The provision of multiple signals **774** emitted by a single sensor **772** allows

the aerosol-generating articles **101** to be detected at higher speeds. For example, the second sensor **772** is capable of detecting the amount of taggant comprised in the aerosol-generating articles **101** at a maximum speed of 10,000 articles per minute, or approximate 6 milliseconds per article. In some examples, an average signal between each of the multiple signals **774** of the second sensor **772** is provided.

After the sensors **762**,**772** detect the amount of taggant comprised in the aerosol-generating articles **101**, a controller compares the detected amount of taggant with a predetermined amount of taggant in substantially the same way as described with reference to **Figure 6**. However, in this example, the controller determines whether an average amount detected by sensors **762**,**772** is within the range of taggant amounts corresponding to a positive signal.

Figure 8 shows a portion of an apparatus **800** having a first drum **850** and a second drum **852**. The first drum **850** has a first central axis **851** about which the first drum **850** rotates. The second drum **852** has a second central axis **853** about which the second drum **852** rotates. The second drum **852** has a plurality of protuberances **882** raised from the surface of the second drum **852**. The protuberances **882** are spaced apart about the circumference of the second drum **852**. The protuberances **882** are designed to engage an aerosol-generating article **101** so as to transport the aerosol-generating article **101** on a path along the circumference of the second drum **852**. At a point where the aerosol-generating article **101** passes through and between the first drum **850** and the second drum **852**, the first drum **850** engages the aerosol-generating article **101**. This rotates the aerosol-generating article **101** rotates about its own axis in the direction denoted by the arrow **103**.

A sensor **862** is provided at a location that allows the sensor **862** to be directed towards the aerosol-generating article **101** positioned between the first drum **850** and the second drum **852**. When the aerosol-generating article **101** is rotated about its axis, sensor **862** emits a signal **864** towards the aerosol-generating article **101** as the article **101** rotates. This allows the aerosol-generating article **101** to be exposed to the sensor **862** in more than one position. There is provided visibility about the circumference of the aerosol-generating article **101**. The sensor **862** determines whether the aerosol-generating article comprises a taggant, and the concentration of taggant present. When the taggant in the article **101** absorbs the emitted signal **864**, the spectroscopic signal is altered. The signal reflects back at and is picked by the sensor **862**. The return signal is used to determine the taggant in the aerosol-generating article **101**, and the concentration of taggant present. The signal is then compared with a

predetermined concentration of taggant in substantially the same way as described with reference to **Figure 6**.

All scientific and technical terms used herein have meanings commonly used in the art unless otherwise specified. The definitions provided herein are to facilitate understanding of certain terms used frequently herein.

As used in this specification and the appended claims, the singular forms “a”, “an”, and “the” encompass embodiments having plural referents, unless the content clearly dictates otherwise.

As used in this specification and the appended claims, the term “or” is generally employed in its sense including, alternatively or in addition, unless the content clearly dictates otherwise.

As used herein, “have”, “having”, “include”, “including”, “comprise”, “comprising” or the like are used in their open-ended sense, and generally mean “including, but not limited to”. It will be understood that “consisting essentially of”, “consisting of”, and the like are subsumed in “comprising,” and the like.

The words “preferred” and “preferably” refer to embodiments of the invention that may afford certain benefits under certain circumstances. However, other embodiments may also be preferred under the same or other circumstances. Furthermore, the recitation of one or more preferred embodiments does not imply that other embodiments are not useful, and, is not intended to exclude other embodiments from the scope of the disclosure, including the claims.

Any direction referred to herein, such as “top”, “bottom”, “left”, “right”, “upper”, “lower”, and other directions or orientations are described herein for clarity and brevity are not intended to be limiting of an actual device or system. Devices and systems described herein may be used in a number of directions and orientations.

The embodiments exemplified above are not limiting. Other embodiments consistent with the embodiments described above will be apparent to those skilled in the art.

Claims

1. A method of manufacturing a component for an aerosol-generating article, comprising taggant, the method comprising the steps of:
- applying taggant to a component;
- detecting an amount of the taggant that the component comprises;
- determining whether the detected amount of taggant is less than a first-predetermined amount; and
- rejecting a component when the detected amount of the taggant is less than the first-predetermined amount.

2. A method of manufacturing a component, according to claim 1, wherein the first-predetermined amount of the taggant is a concentration of 5 milligrams of taggant per square metre.

3. A method of manufacturing a component, according to claim 1 or claim 2, further comprising the step of: applying taggant to a component wherein the component is: a filter, a wrapper, a tipping paper, an adhesive, a tipping paper adhesive, a filter plug wrap, or any combination of the before mentioned components.

4. A method of manufacturing a component, according to any preceding claim, further comprising the step of: applying the taggant to an interface between a tobacco-rod component and a filter component.

5. A method of manufacturing a component, according to any preceding claim, further comprising the step of: applying the taggant to an inner surface of a tipping paper component.

6. A method of manufacturing a component, according to any preceding claim, further comprising the step of: applying a taggant substantially around the circumference of the component.

7. A method of manufacturing a component, according to any preceding claim, further comprising the step of: repeating the detecting and determining steps, and, if applicable, the rejection step.

8. A method of manufacturing a component, according to any preceding claim, further comprising the step of: detecting the amount of taggant that the component comprises,

after the manufacturing step of applying and securing the tipping paper component to another component.

9. An apparatus for manufacturing a component for an aerosol-generating article, comprising a taggant, the apparatus comprising:
- a dispenser configured to apply taggant to a component;
- a sensor configured to detect an amount of the taggant that the component comprises;
- a controller for determining whether the detected amount of the taggant is less than a first-predetermined amount; and
- a rejection system configured to reject a component when the detected amount of the taggant is less than the first-predetermined amount.

10. An apparatus according to claim 9, comprising multiple sensors, each sensor being configured to detect an amount of the taggant.

11. An apparatus according to claim 9 or claim 10, further comprising at least a sensor positioned in the manufacturing line after the application and securing of a tipping paper component to another component.

12. An apparatus according to any one of claims 9 to 11, further comprising at least one sensor positioned in the manufacturing line after wrapping of the component.

13. An apparatus according to any one of claims 9 to 12, further comprising an adhesive dispenser for dispensing adhesive, wherein the adhesive dispenser comprises a glue application roller, further wherein the glue application roller comprises grooves.

14. An apparatus according to any one of claims 9 to 13, wherein the dispenser further comprises a mask configured to shield the dispensed taggant from reaching undesired areas.

15. A kit of parts, comprising:
- a plurality of manufacturing apparatuses suitable for the manufacturing of a component for an aerosol-generating article;
- at least one sensor suitable for the detection of an amount of taggant that a component manufactured comprises;
- a controller to determine whether the amount of taggant that a component comprises, is less than a first-predetermined amount; and
- a rejection system configured to reject a component that has a taggant amount less than the first-predetermined amount.

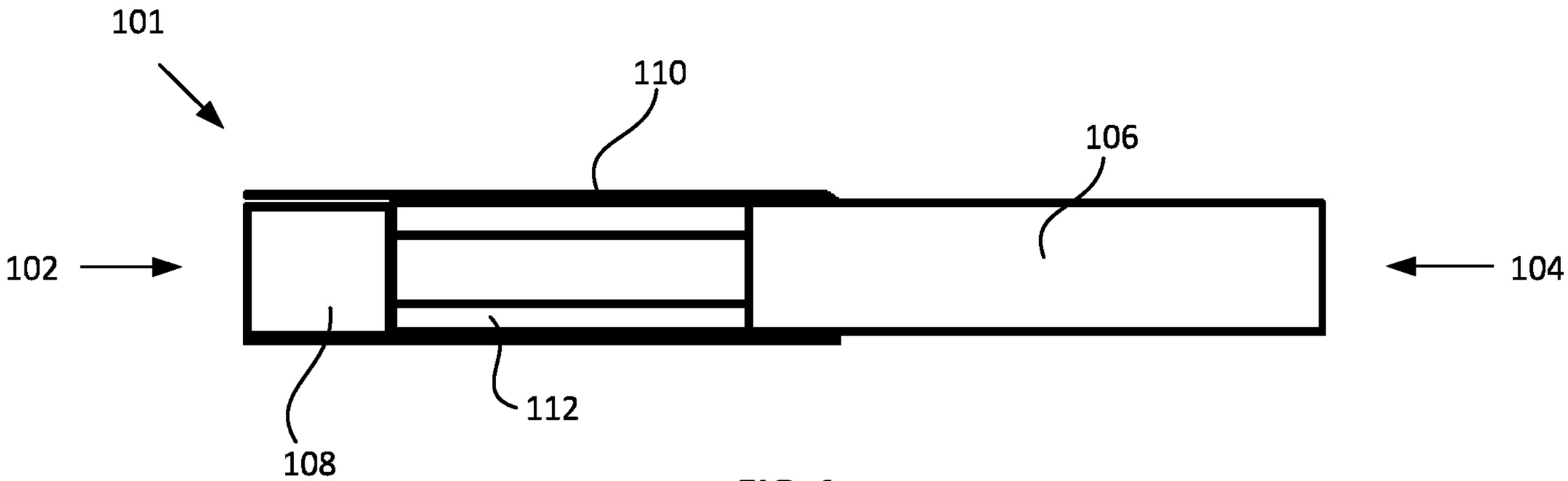

101
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106
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FIG. 1

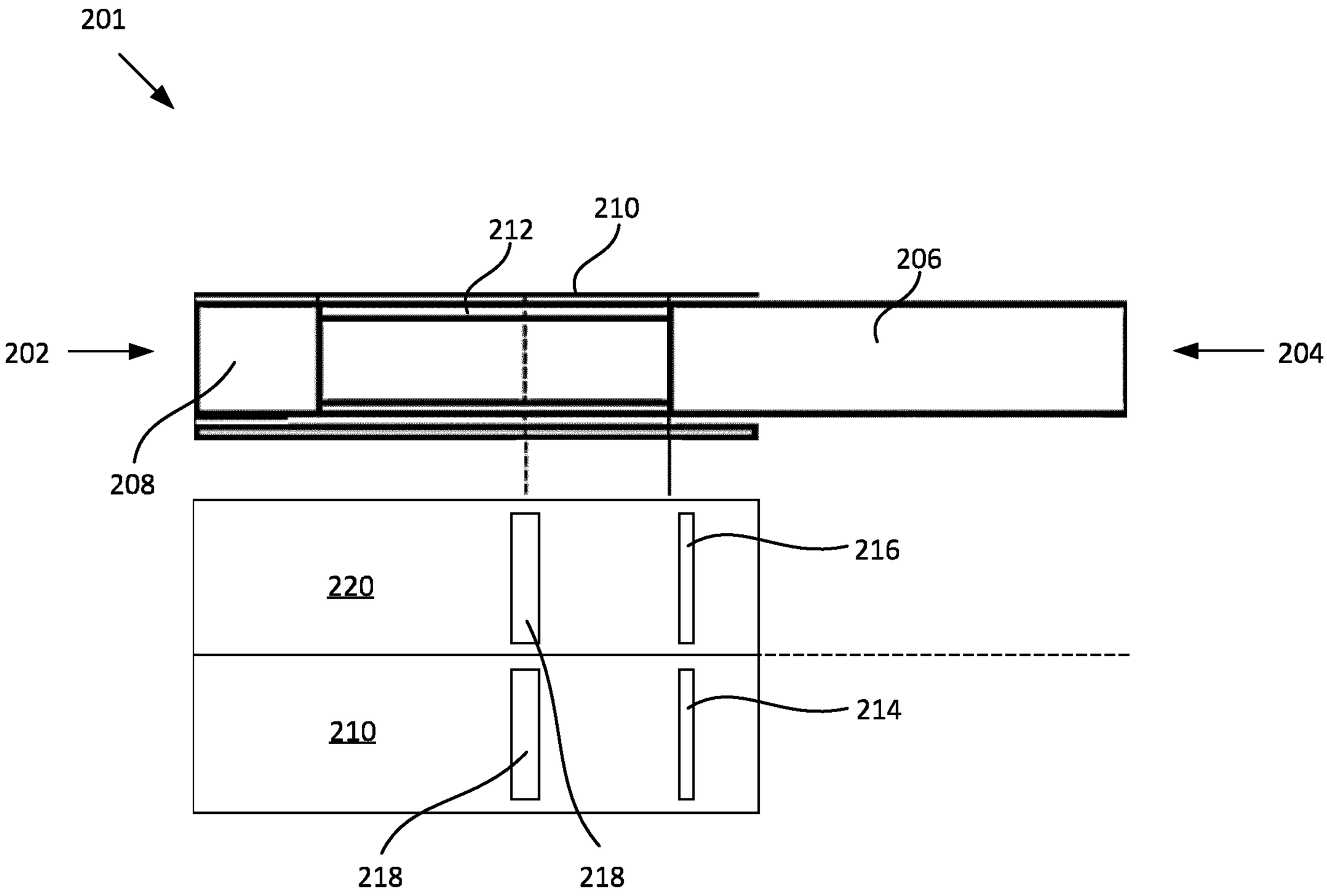

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FIG. 2

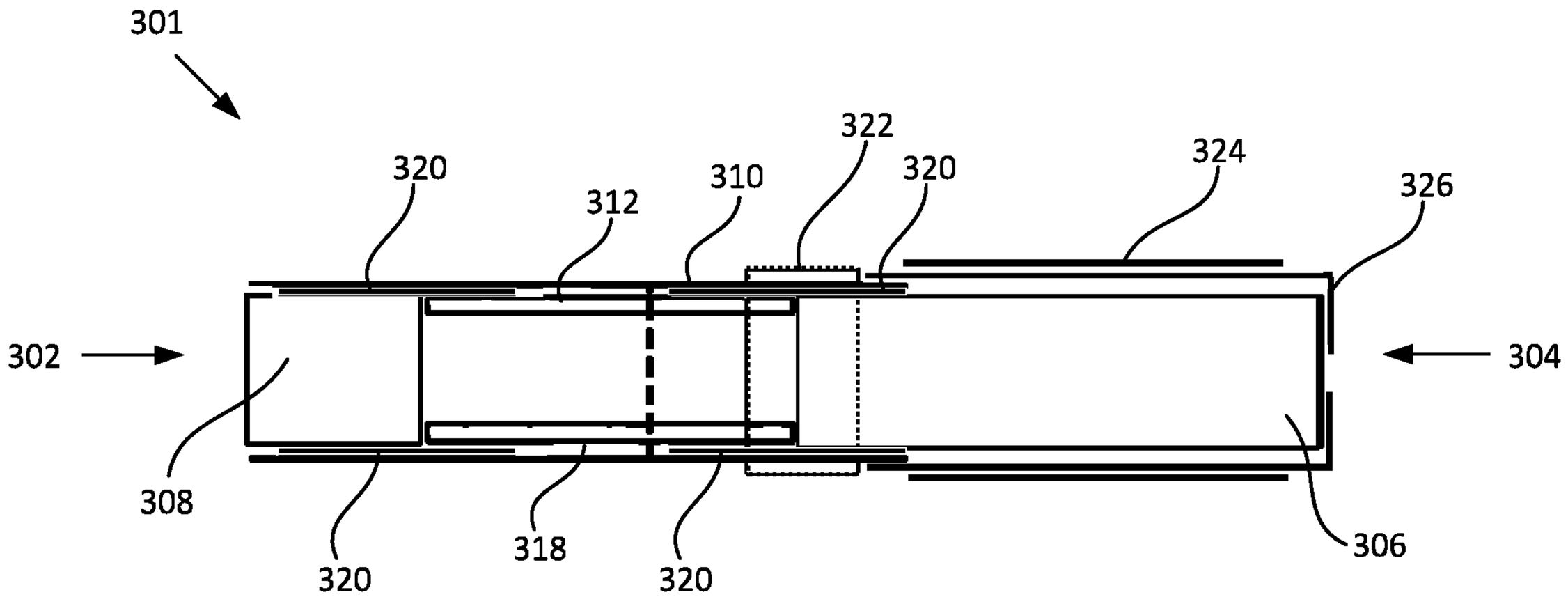

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FIG. 3

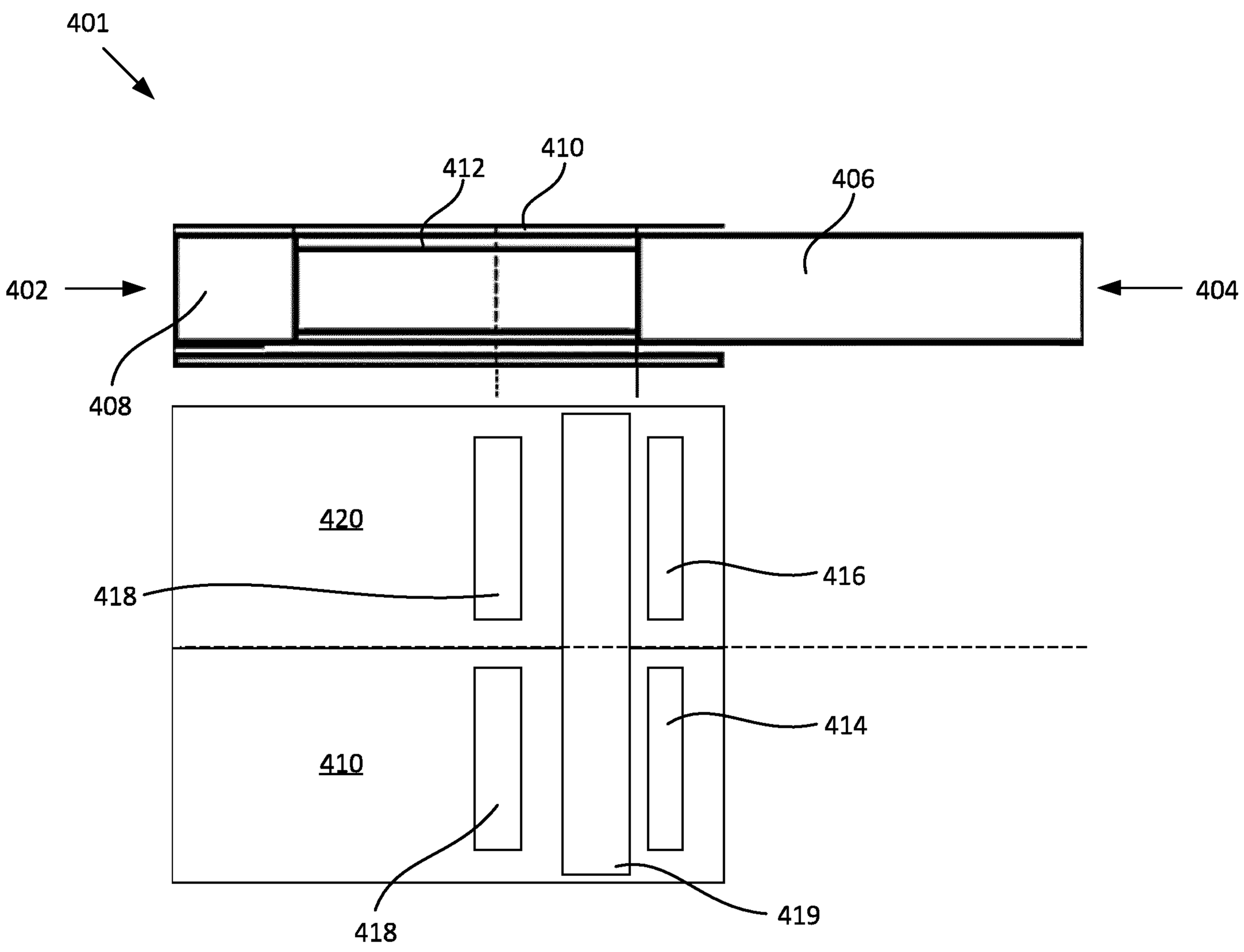

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FIG. 4

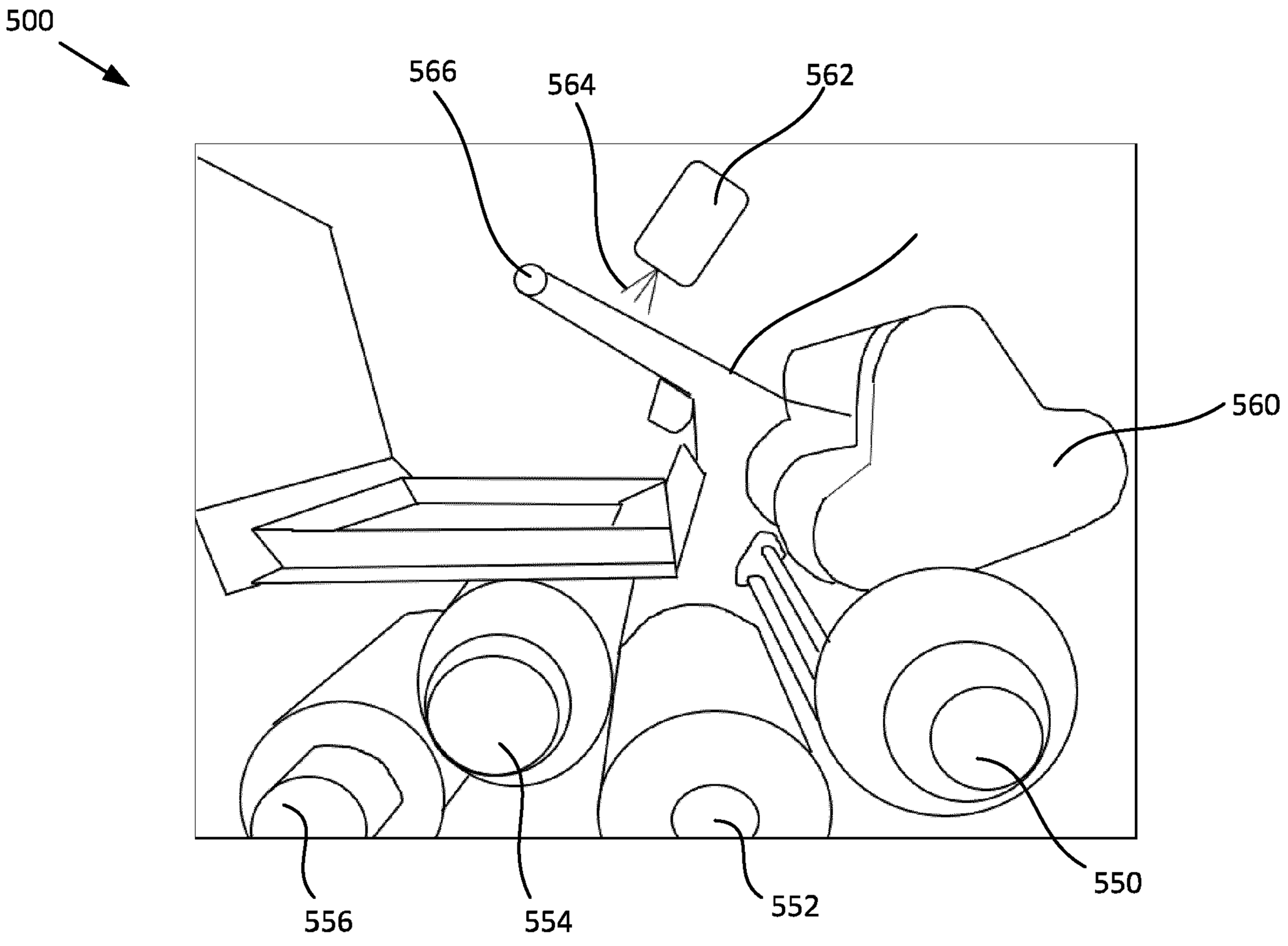

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FIG. 5

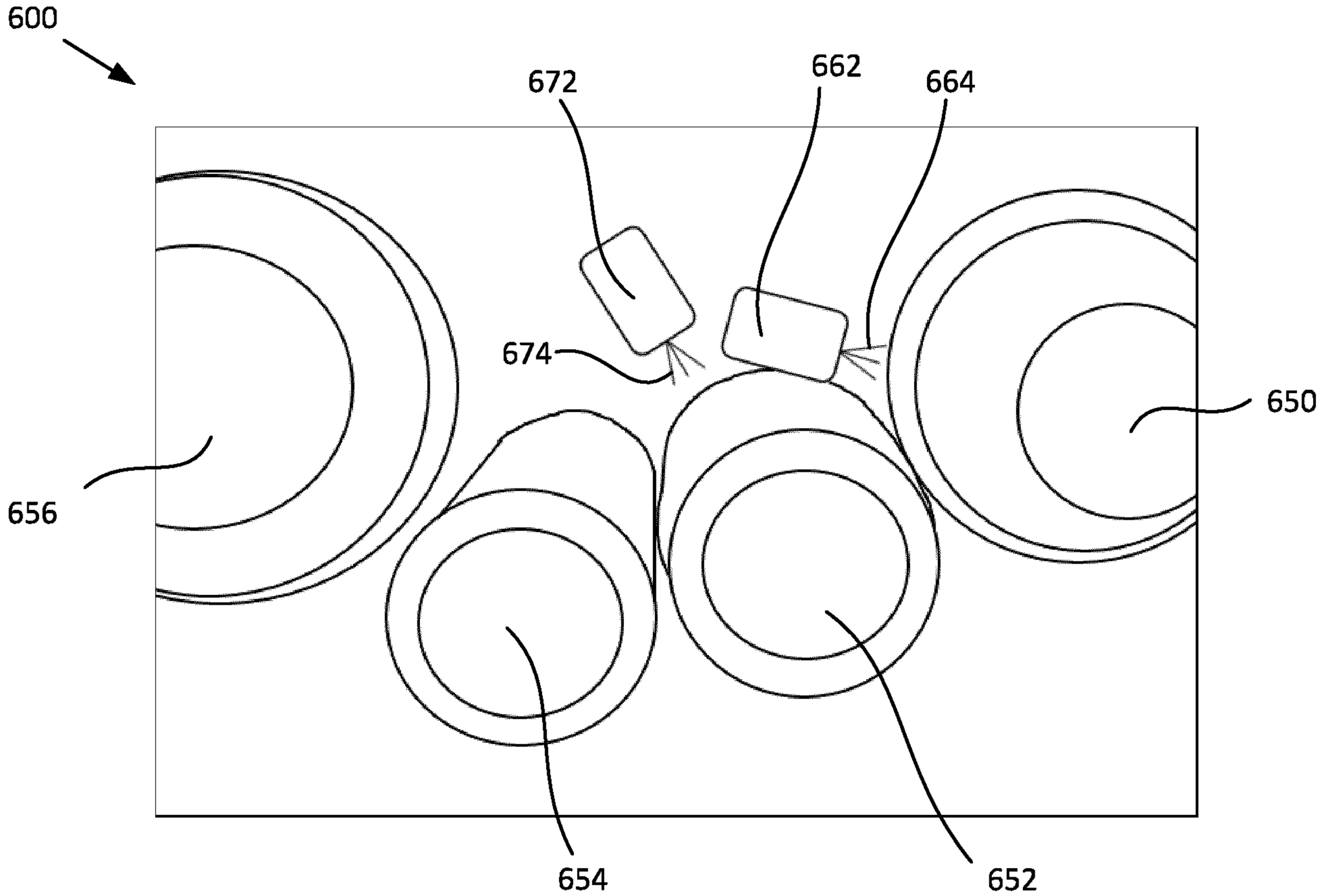

600
672
662
664
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652

FIG. 6

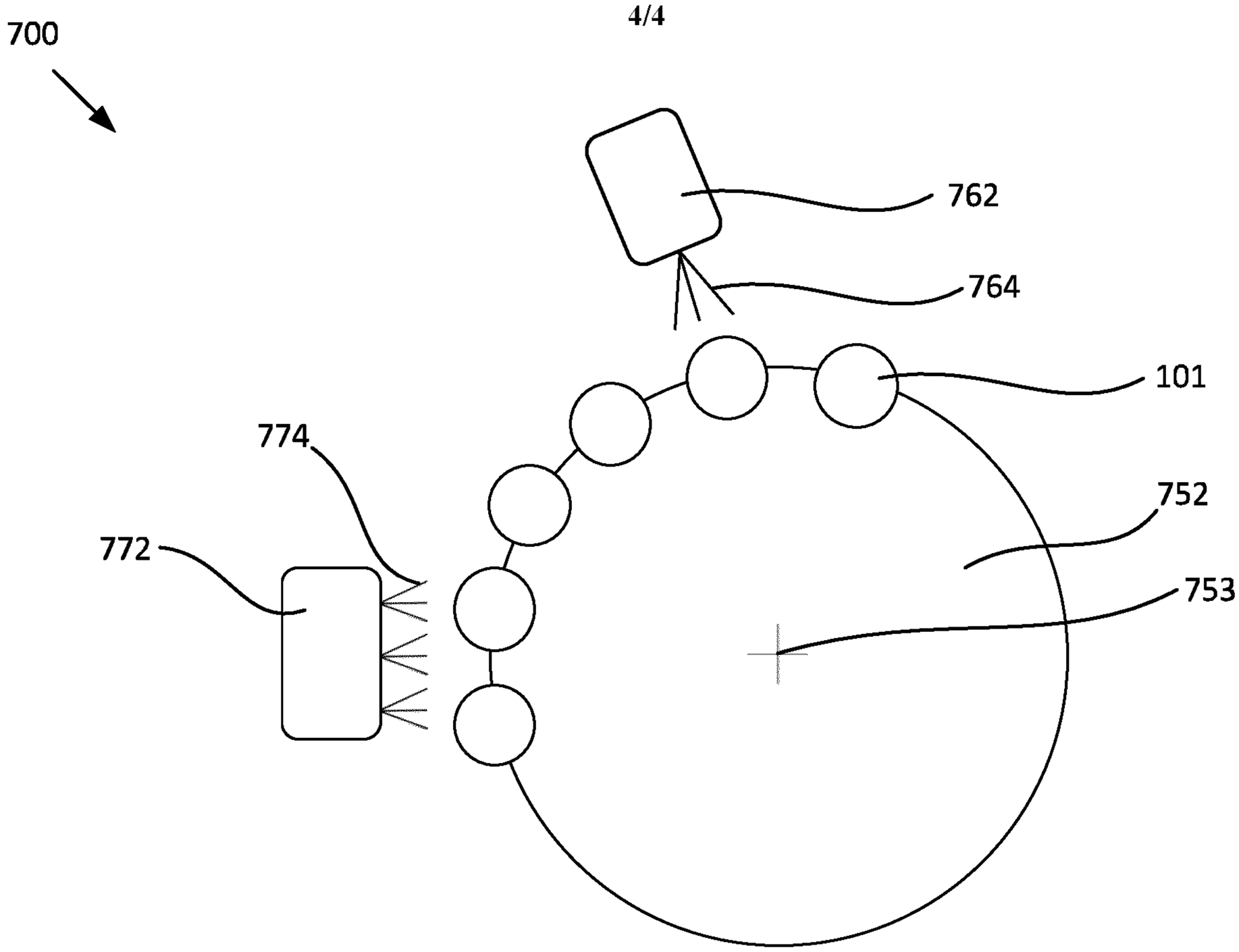

700
762
764
101
774
752
772
753

FIG. 7

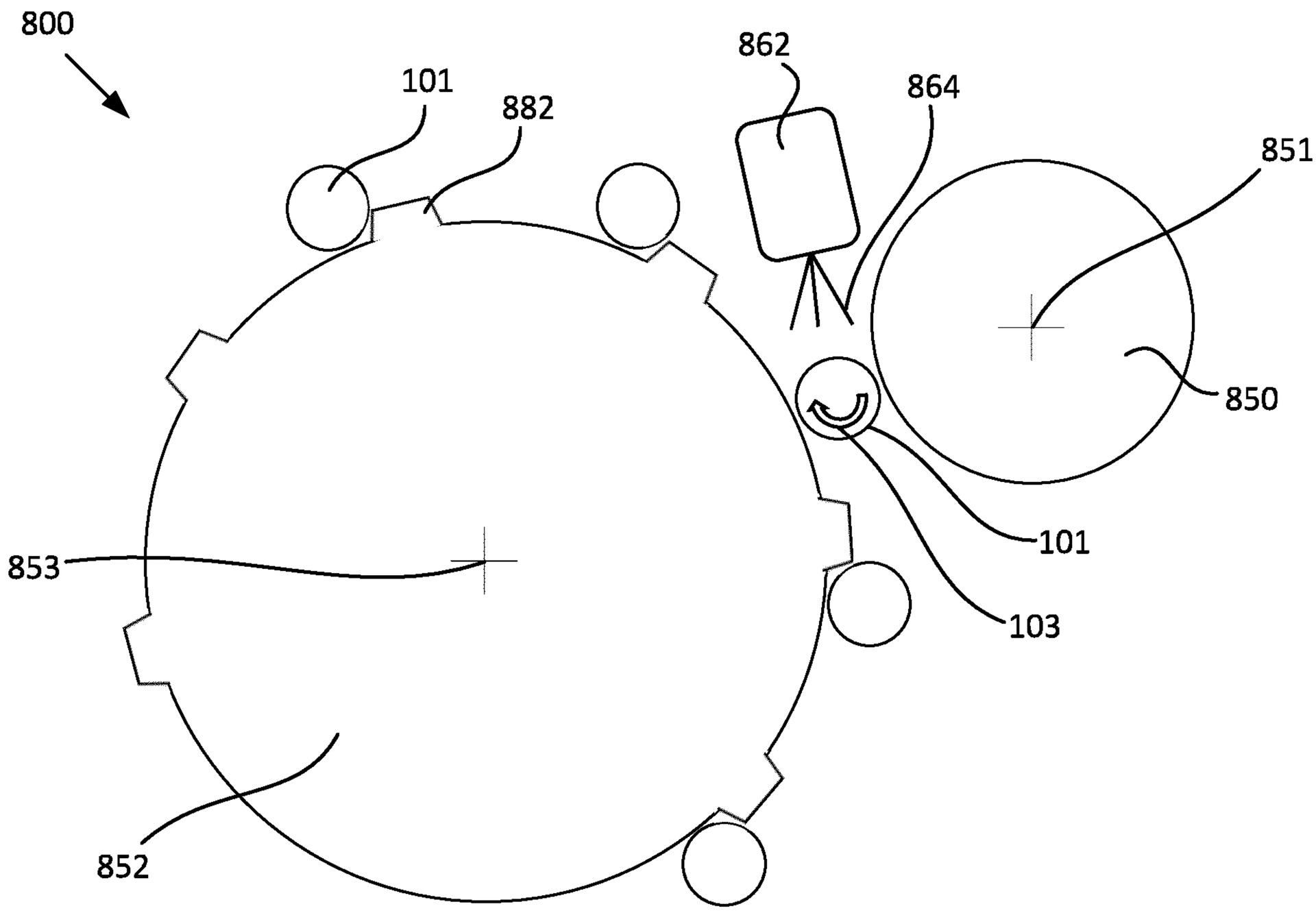

800
862
101
882
864
851
850
101
853
103
852

FIG. 8

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2020/087875

A. CLASSIFICATION OF SUBJECT MATTER
INV. A24C5/01 A24C5/60 A24D1/20
ADD.

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)
A24C A24D

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 practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 3 076 812 A1 (PHILIP MORRIS PRODUCTS SA [CH]) 12 October 2016 (2016-10-12) paragraphs [0007], [0020], [0025], [0032], [0068], [0071], [0089]; figures 3, 4	1-15
X	US 2013/320237 A1 (CADIEUX EDMOND J [US] ET AL) 5 December 2013 (2013-12-05) paragraphs [0033] - [0035]; figures 2,3	1,9,15
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A	EP 3 406 148 A1 (PHILIP MORRIS PRODUCTS SA [CH]) 28 November 2018 (2018-11-28) paragraphs [0005], [0009]; figure 1	1,9,15

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

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"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
31 March 2021	15/04/2021
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer Schwarzer, Bernd

INTERNATIONAL SEARCH REPORT

Information on patent family members

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International application No
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