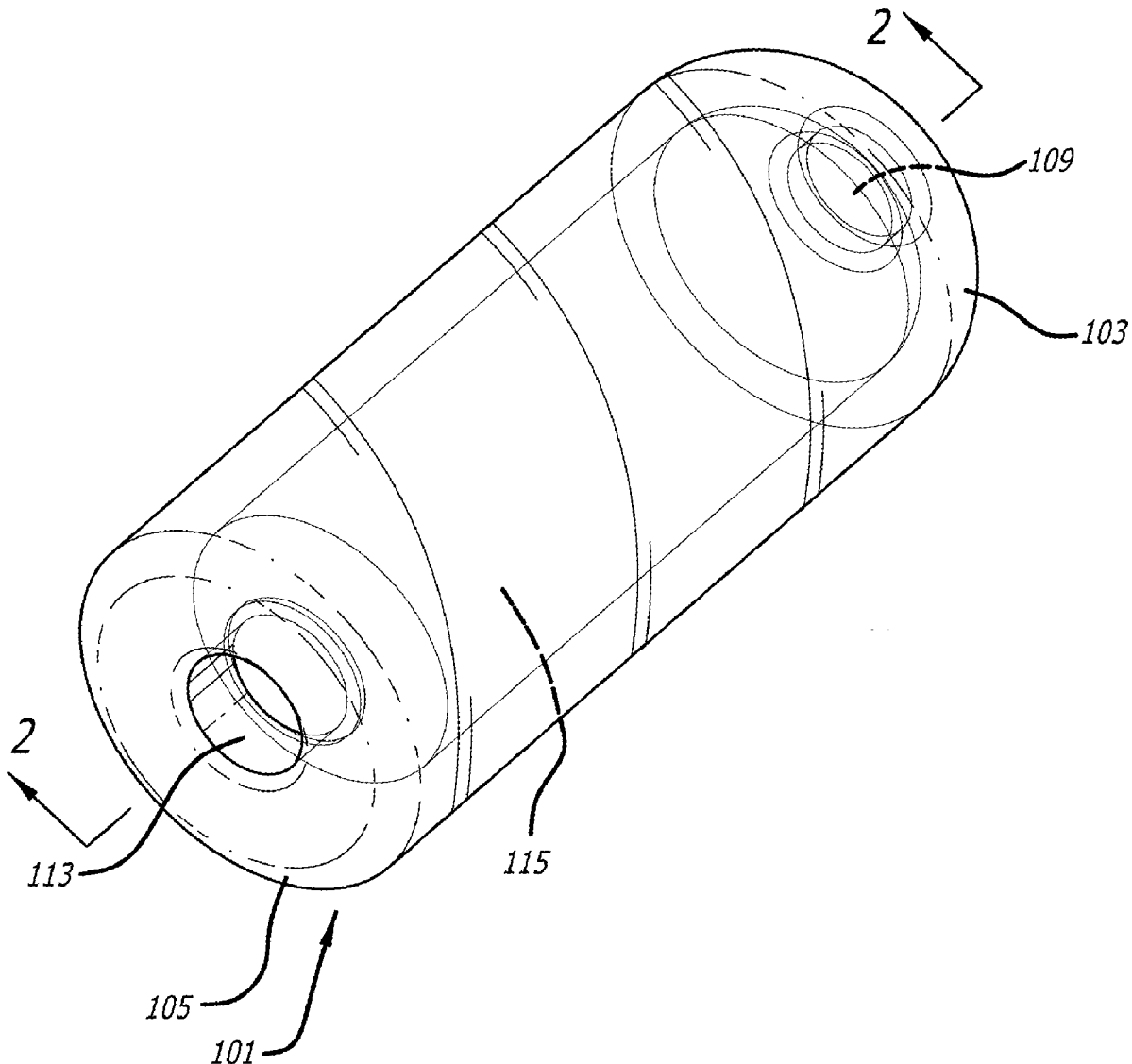


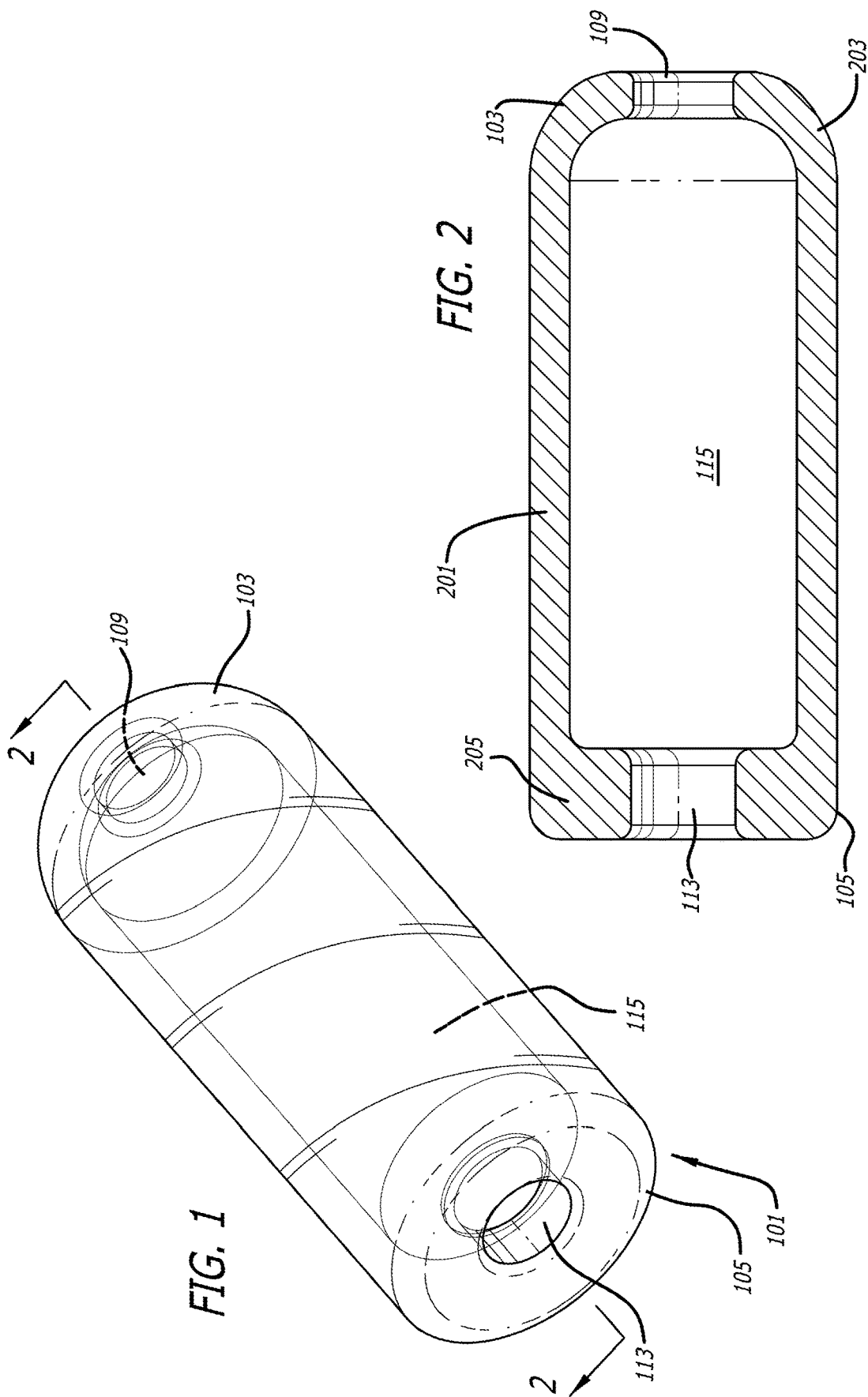


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(19) **United States**(12) **Patent Application Publication**
OU(10) **Pub. No.: US 2023/0094936 A1**(43) **Pub. Date: Mar. 30, 2023**(54) **GLASS TIP FOR USE WITH SMOKABLE
SUBSTANCES CONTAINED WITHIN A
WRAP AND METHOD FOR
MANUFACTURING THE TIP**(71) Applicant: **R.Y.L. Inc.**, Commerce, CA (US)(72) Inventor: **Suk Hwan OU**, Commerce, CA (US)(21) Appl. No.: **17/488,869**(22) Filed: **Sep. 29, 2021****Publication Classification**(51) **Int. Cl.**
A24D 3/18 (2006.01)(52) **U.S. Cl.**
CPC **A24D 3/18** (2013.01)(57) **ABSTRACT**

A method of manufacturing a tip for use with smokable substances. A tube is rotated while applying heat to a section of the tube (step 1). The tube is pulled apart to separate the tube into two sections, each section having a closed end (step 2). Heat is applied to the closed end of one section in a direction to cause it to open (step 3), and then heat is applied in a second direction to the end (step 4). A plug is inserted into the end and a roller is used to form an opening with a flat external surface (step 5). Heat is applied, and the ends are pulled apart to separate the section into two parts (step 7). While continuing to apply heat, air is injected into the opened end to form a tip having openings at its two ends connected by an open chamber (step 8).





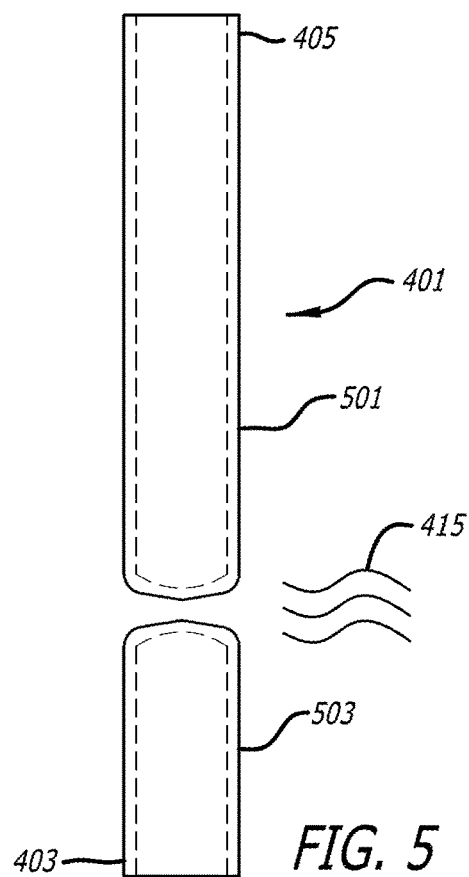
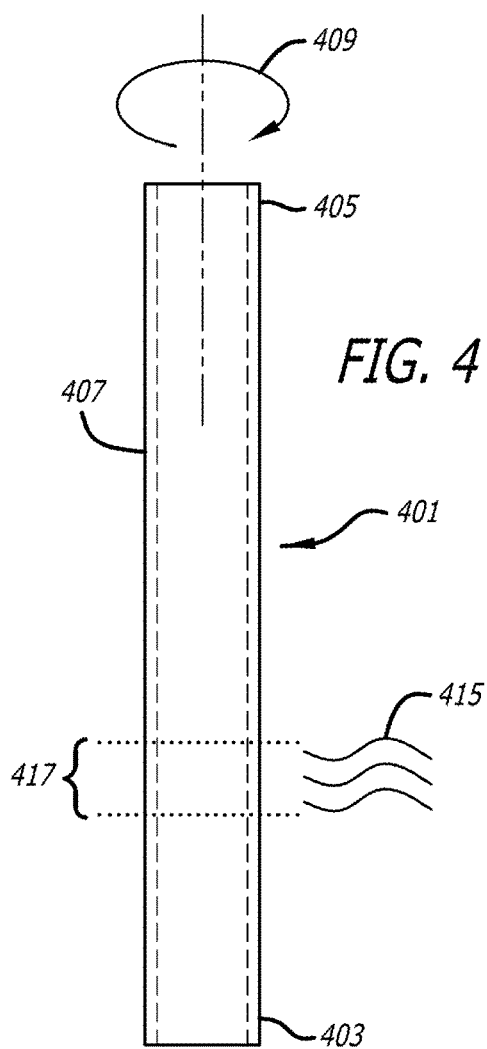
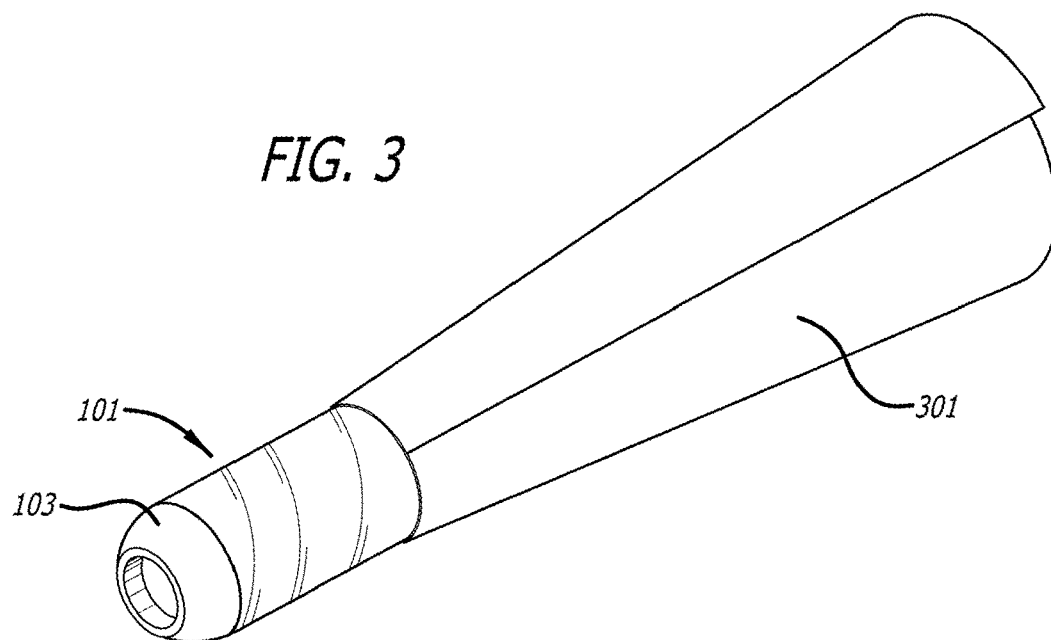


FIG. 6

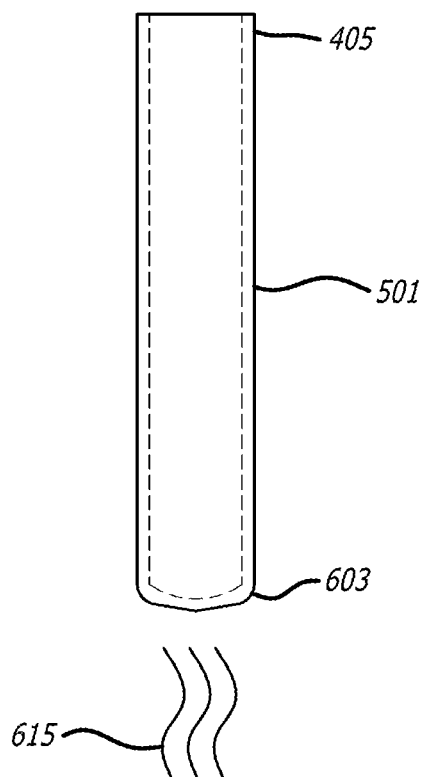


FIG. 7

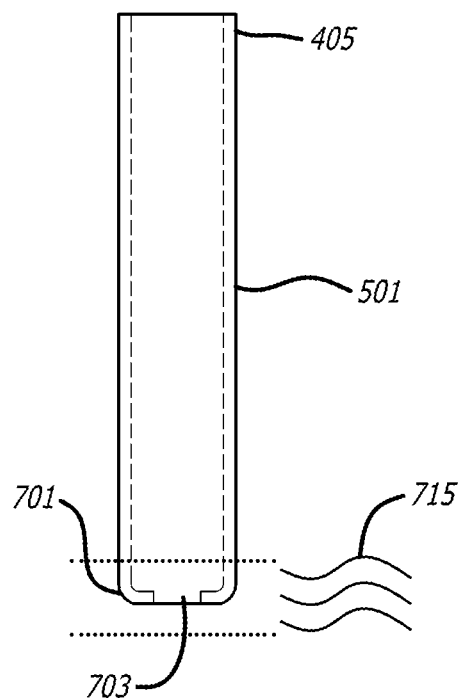


FIG. 8

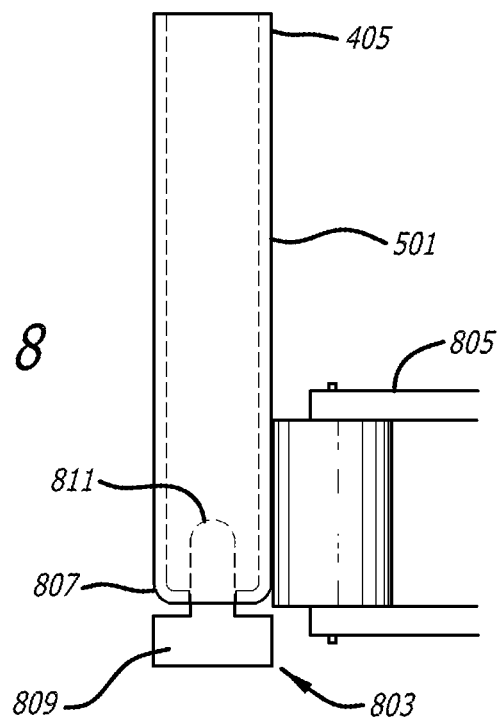


FIG. 9

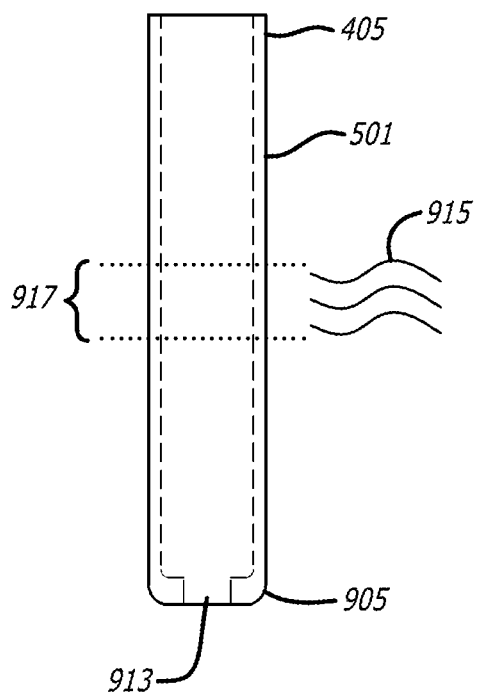


FIG. 10

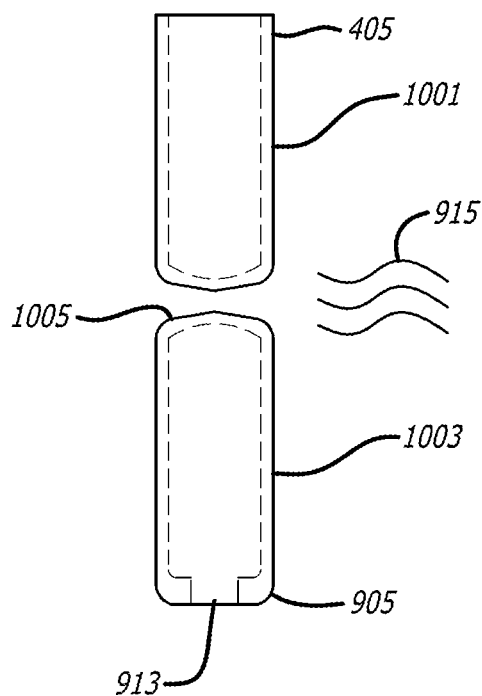
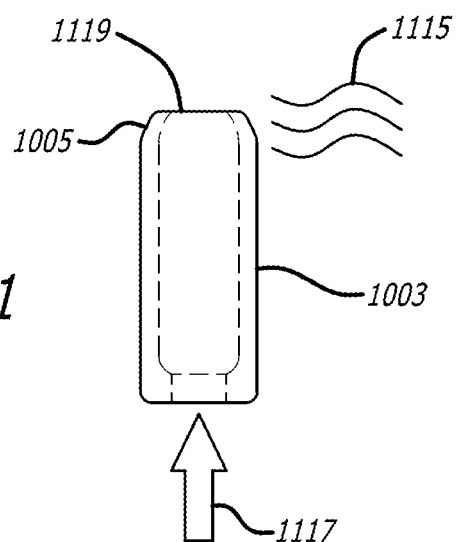


FIG. 11



**GLASS TIP FOR USE WITH SMOKABLE
SUBSTANCES CONTAINED WITHIN A
WRAP AND METHOD FOR
MANUFACTURING THE TIP**

FIELD

[0001] The invention is directed to a tip made of glass or similar materials for use with rolled papers or similar materials containing tobacco or other smokable substances. The invention is also directed to a method of manufacturing such a tip.

BACKGROUND

[0002] Various devices exist for smoking substances such as tobacco. The most commonly used device is a cigarette or cigar, which consists of tobacco or other smokable substance rolled within a thin paper which can be made from a variety of products. The cigarette or cigar is ignited at one end and smoke, which is emitted from the smokable substance (once ignited or smoldering), is inhaled or tasted from the other end. However, the paper or other substance tends to break-down with moisture from the mouth and heat from the substance being smoked. As a result, a tip made of glass or a similar material to which the paper containing the smokable substance is attached by being wrapped around the tip is sometimes used. Although the term tip is used herein, the device is sometimes referred to as a filter. Accordingly, the device can be considered to be either a tip or a filter.

SUMMARY

[0003] The invention is directed to a tip made of glass or similar material and a process of manufacturing the tip. The glass tip is for use with a substance (e.g. tobacco) to be smoked which is wrapped in paper or similar material. The tip has a bullet like shape which is generally cylindrically shaped with one end which is flat and the other end slightly rounded. There are openings at both ends through which smoke from a smokable substance passes when a user inhales after the substance is ignited. The smokable substance is placed on the paper which is then wrapped around the smokable substance to form a cylinder or cone like structure which contains the smokable substance. A small space may be maintained at one end of the paper so that that the end when formed as part of the cylinder or cone can fit over the tip, or the tip can simply be pressed into the paper cylinder or cone which would force any of the smokable substance in the cylinder or cone further into the tube. Such force, although it may slightly compress the substance within the cylinder or cone, has little if any effect since the amount of compression of the smokable substance is very small.

[0004] The process for making the tip includes heating a narrow section of a tube (e.g. a glass tube) in the shape of a cylinder having an opening at both ends. The heated section is near one of the two ends. The tube should be rotating at from 200 revolutions per minute (RPM) to 300 RPM during the entire process. After the tube is heated enough to manipulate it, in one embodiment, the tube is separated at the heated section by pulling the two ends apart. One of the sections is used for the remainder of the process. The end where the tube was separated is closed as a result of the pulling. Heat is then applied to the closed end in a direction towards the closed end until an opening is formed

at that end. Heat is then applied to the side wall of that end. The heat is removed and a steel or graphite plug is inserted into the formed opening while a steel or graphite roller is applied to the side. This causes the opening to conform to the shape of the plug while the end is flattened. After the glass has cooled so that it is no longer malleable, heat is applied to the tube a distance away from the flattened end which corresponds to a desired length of the tip. The tube is again separated at this point which results in the tube being closed at the point of separation. Heat is applied to this point while air is blown into the flat end which causes a dome shape to form before an opening is formed in the tube at this point opposite the flattened end.

[0005] In this manner, a glass tip is formed which has the overall shape of a bullet, that is a cylinder with a flat end and a rounded end. Since the glass is slightly thicker at the flattened end than the rounded end, a narrow ring appears to exist around the flattened end which enhances the bullet like appearance. The filter includes a chamber which extends from the flat end to the rounded end with a uniform diameter except at the two ends where the diameter decreases slightly to conform to the diameter of the two openings, one at each end of the tip. In an embodiment, the opening at the rounded end has a diameter which is slightly larger than the diameter of the opening at the flattened end. In other embodiments, the two holes are the same size, or the opening at the rounded end has a diameter which is slightly smaller than the diameter of the opening at the flattened end.

[0006] In another embodiment, a tip for use with a substance to be smoked wrapped in paper or similar material is provided. The tip may include a receiving chamber having an open end dimensioned to receive the end of the paper or similar material containing the smokable substance which is wrapped around the smokable substance to form a cylinder or cone which is attached the tip at one end. In this regard, although the term cone is used herein, the actual shape of the wrapper in this case is a conical frustum since the end which would be the tip of the cone is not present. However, for ease of reference, and since not important to an understanding of the invention, all references to cone herein should be understood be a conical frustum. In the case of a cone, the narrow end, that is the end with the smaller diameter, is the one attached to the tip. The receiving chamber extends the length of the tip to the opposite end of the tip which also has an opening to allow smoke from the smokable substance to be inhaled. This second opening may be axially aligned with the open end of the receiving chamber. In addition, the two open ends may have the same or different diameters.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] The embodiments of the invention are illustrated by way of example and not by way of limitation in the figures of the accompanying drawings in which like references indicate similar elements. It should be noted that references to "an" or "one" embodiment of the invention in this disclosure are not necessarily to the same embodiment, and they mean at least one. Also, a given figure may be used to illustrate the features of more than one embodiment of the invention in the interest of reducing the total number of drawings, and as a result, not all elements in the figure may be required for a given embodiment.

[0008] FIG. 1 illustrates a perspective view of one embodiment of the invented glass tip.

[0009] FIG. 2 illustrates cross section of the glass tip taken along line 2-2 of FIG. 1.

[0010] FIG. 3 illustrates the glass tip with an applied wrapper.

[0011] FIG. 4 illustrates a glass tube being processed with a first step during which heat is applied to a portion of the tube as the tube is rotating.

[0012] FIG. 5 illustrates the glass tube being processed with a second step during which the tube is separated into two sections at the portion where heat is applied.

[0013] FIG. 6 illustrates the glass tube being processed with a third step during which heat is directed into a closed end of the glass tube to create an opening.

[0014] FIG. 7 illustrates the glass tube being processed with a fourth step during which heat is applied to an end of the glass tube with the created opening.

[0015] FIG. 8 illustrates the glass tube being processed with a fifth step during which a plug is inserted and a roller applied to the end of the glass tube which was heated during the fourth step to form an opening at that end which conforms to the shape of the inserted plug.

[0016] FIG. 9 illustrates the glass tube being processed with a sixth step during which heat is applied to a section of the glass tube above the opening formed during the fifth step.

[0017] FIG. 10 illustrates the glass tube being processed with a seventh step during which the ends of the tube are pulled apart to separate a section of the tube which will become the glass tip.

[0018] FIG. 11 illustrates the portion of glass tube separated during the seventh step being processed with an eighth step during which the completed glass tip is formed.

DETAILED DESCRIPTION

[0019] Several embodiments of the invention with reference to the appended drawings are now explained. Whenever aspects of the embodiments described here are not explicitly defined, the scope of the invention is not limited only to the parts and steps shown, which are meant merely for the purpose of illustration. Also, while numerous details are set forth, it is understood that some embodiments of the invention may be practiced without these details. In other instances, well-known machines, structures, and techniques have not been shown in detail so as not to obscure the understanding of this description.

[0020] FIG. 1 illustrates one embodiment of a tip, typically made from glass or similar material, from which a substance in a wrapper may be smoked. In one embodiment, tip 101 may be a tip that includes a first end portion 105, a second end portion 103 and a middle portion 107. The first end portion 105 may be substantially open by first end opening 113. The second end portion 103 may be substantially open with an opening 109 through which a fluid may pass from the first end portion to the second end portion. The fluid may, for example, be a vapor or gas given off by a substance (e.g. tobacco) within a wrapper. The middle portion 107 may be a tubular member having a substantially hollow interior 115. The substance to be smoked (e.g. tobacco) may be packed within a wrapping paper (not shown in FIG. 1) formed into cylinder or cone containing the smokable substance by inserting first end portion 105 into one end of the cylinder or cone such that the cylinder or cone surrounds first end portion 105. During use, a flame is applied to an end of the cylinder or cone containing the

smokable substance opposite the end surrounding end portion 105 so that the substance packed within the wrapper is caused to burn or smolder and emit a vapor. The vapor from the burning or smoldering substance then can be inhaled by a user through the opening 109 after passing through opening 113 and middle portion 107.

[0021] FIG. 2 illustrates a cross-sectional side view of the tip of FIG. 1 along line 2-2. From this view, it can be seen that the substantially hollow interior 115 of tip 101 is defined by wall 201 first end portion 105 is defined by wall 205, and second portion 103 is defined by wall 203. As best seen in FIG. 2, wall 205 is thicker than wall 201, and is relatively uniform in thickness until its transition to wall 201. Wall 203 may get progressively thicker from its transition with wall 201 until it reaches opening 109. Alternatively, wall 203 may get progressively thinner or may stay the same thickness during this transition.

[0022] The diameter of tip 101 should be sized so that a paper cylinder or cone containing a smokable substance will fit around end 105 of tip 101 and held in place by friction and/or an adhesive, which may be moisture activated, applied to tip 101 and/or the end of the wrapper which fits around end 105.

[0023] FIG. 3 shows tip 101 with a wrapper 301 containing a smokable substance attached to end 105 of tip 101. As shown in FIG. 3, wrapper 301 is in the shape of a cone with its narrow end around end 105. Although wrapper 301 is not part of the invention, it is shown in FIG. 3 to illustrate how tip 101 is used with wrapper 301. As previously noted, wrapper 301 could also be in the form of a cylinder. There are many known techniques for filling wrapper 301 with a smokable substance and forming the wrapper into a cone (or cylinder). However, since the details surrounding wrapper 301 and its smokable substance content are not needed for an understanding of the invention, such details are not set forth herein. However, as should be evident, the amount of overlap of wrapper 301 with tip 101 should be sufficient to ensure that the wrapper remains attached to the tip while in use, without extending too close to end 103.

[0024] FIG. 4 illustrates a side view of one embodiment of a tube from which a tip for use with a wrapper may be manufactured. Tube 401 may, for example, be a glass tube made from clear borosilicate glass (33 exp) such as that available from Pacific Vial Manufacturing Inc., of Commerce, Calif. Tube 401 may include a first end portion 403 and a second end portion 405 which are connected by a middle portion 407. The second end portion is shown as being separated from middle portion 407. However, tube 401 is a single continuous piece from which multiple glass tips are formed. After each tip is formed as described with reference to FIG. 11, the tube 401 is lowered so as to enable the next tip to be formed by repeating steps 3-8 until the entire length of tube 401 has been utilized to make additional tips.

[0025] As shown in FIG. 4, tube 401 may be rotated as shown by arrows 409 throughout all of the processing operations as disclosed herein. In an embodiment, tube 401 may be rotated at a rate of from about 200 revolutions per minute (RPM) to about 300 RPM during the entire process described with reference to FIGS. 4-11. Tube 401 may be rotated by inserting tube 401 into any conventional machine operable to rotate a vial at the desired RPM.

[0026] During a first step, once tube 401 is rotating, heat 415 may be applied to section 417 of tube 401. The heat 415

may be applied by, for example, a burner aligned with section 417 of tube 401. In an embodiment, oxygen, natural gas and compressed air are combined to form a flame so that the temperature of the applied heat is set so that the glass to which it is being applied will soften so that the glass is easily stretched and shaped as is well known in the art. However, by way of example, the working point temperature for clear borosilicate glass (33 exp) is 1240° C., with a softening point of 825° C. and an annealing point of 565° C. The specifics of the ratios of the, oxygen, natural gas and compressed air to reach the desired temperature depend on the type of glass or other material used to make the tip, the specifics of which are well known in the art. Heating section 417 softens the glass material of tube 401 so that the portion of the tube below section 417 may be separated from the portion of tube 401 above section 417.

[0027] As shown in FIG. 5, during a second step, once section 417 shown in FIG. 4 has been sufficiently heated, tube 401 which is clamped (not shown) at its top end 405 and bottom end 403, is pulled apart so that it is separated into two sections 501 and 503. Section 503 is scrapped for possible recycling.

[0028] It should be noted that although specific processing parameters (e.g. rotation speed) may be disclosed herein, the parameters can vary depending upon, for example, the machine speed. For example, the heating time of the vial during any processing step disclosed herein depends on machine speed, which may produce around 22 parts per minute (ppm) at a rotation speed of for example, from 200-300 RPM depending on machine speed and desired result. At 22 ppm, heat is applied for about 3 seconds per piece. As noted above, the specific temperatures, and times are dependent on the specifics of the glass or other material used to make the tip. Such specifics are well known to persons having ordinary skill in the art and therefore need not be further disclosed herein.

[0029] FIG. 6 illustrates a third step during which after the further processing operation of applying heat to section 417 of the tube to produce section 501, in the processing operation shown in FIG. 6, as a fourth step, end 603 of section 501 has heat 615 applied in a direction as shown which causes end 603 to open which is shown as end 701 in FIG. 7. Heat 615 should be relatively tightly focused on end 603 to limit the size of the opening 703 shown in FIG. 7. Once open end 703 is formed, heat 715 is applied to end 701 in a direction as shown in FIG. 7. The direction of applied heat as shown in FIGS. 4 and 5 is horizontal while the direction of applied heat shown in FIG. 6 is vertical. Of course, these directions depend on the orientation of the machine used in the process, and such directions instead of vertical and horizontal, can be horizontal and vertical, respectively. Accordingly, all references to vertical and horizontal should be understood to mean perpendicular to each other without regard to specific directions.

[0030] After the processing operation shown in FIG. 7, as a fifth step, in the processing operation shown in FIG. 8, a steel or graphite plug 803 and steel or graphite roller 805 are applied to end 701 of section 501 while it is still soft from the application of heat 715 which has been removed, with plug 803 inserted in a vertical or horizontal direction while roller 805 is applied in a horizontal or vertical direction until opening 913 is created at end 905 as shown in FIG. 9. That is, the two directions should be perpendicular to each other. Plug 803 and roller 805 may be part of the machine used to

heat and/or rotate tube 501. Plug 803 and roller 805 are applied to tube 501 at end 807 while tube 501 is rotating. Plug 803 has a flat base 809 and a pin 811 shaped to form opening 913 shown in FIG. 9. Applying a pressure to tube 501 by plug 803 and roller 805 at end 807, causes the formation of opening 913 at end 905 of tube 501. The pressure applied may depend on how soft the glass is after the heating process but, in some cases may be, for example, from about 2-4 pounds per square inch. The amount of time the pressure is applied will depend on the machine speed, but at the specified speeds is about three seconds.

[0031] In the processing operation shown in FIG. 9, as a sixth step, heat 915 is applied to section 917 of part 501. In this manner, as described above with reference to FIG. 4, heating section 917 softens the glass material of tube 501 so that the portion of the tube below section 917 may be separated from the portion of tube 501 above section 917 as described above with reference to step 1 and FIG. 4.

[0032] As shown in FIG. 10, as a seventh step, once section 917 shown in FIG. 9 has been sufficiently heated by heat 915, tube 501 which is clamped (not shown) at its top end 405 and bottom end 905 is pulled apart so that it is separated into two sections 1001 and 1003 with section 1003 having a bottom 905 and a top 1005. Section 1003 is then processed in an eighth step according to FIG. 11 with heat 1115 applied to top 1005 with air 1117 introduced into opening 913 which creates opening 1119 in top 1005. In order to prevent opening 1119 from the flame used to supply the heat should be sharp and focused with the amount of air controlled so that the top 1005 begins to have a rounded shape before it pops a small hole forming opening 1119.

[0033] After the eighth step is completed, the glass tip 101 of FIG. 1 has been produced.

[0034] Referring back to FIG. 10, the section 1001 of the tube which was separated is returned to the step 2 processing described with reference to FIG. 5, except that after step 7, the separated section 1003 becomes tip 101 rather than being the scrapped piece 503. The steps 3-8 are repeated to produce another glass tip. This process is then repeated additional times until the complete length of the tube has been processed. In an embodiment, the glass tube introduced in step 1 has a length of about 60 inches. Of course, the number of tips produced is a function of the original length of glass tube 401 and the length of each tip 101.

[0035] While certain embodiments have been described and shown in the accompanying drawings, it is to be understood that such embodiments are merely illustrative of and not restrictive on the broad invention. For example, although a glass tip for smoking is described herein, it is contemplated that the tip may be made of any non-flammable material can be manipulated and shaped as described herein and that will hold its shape in use while smoking a smokable substance. Representatively, the tube may be a made of another inflammable material such as a ceramic or insulated metal material. In addition, it should be understood that each of the processing operations disclosed herein may be performed by a single machine or a combination of machines, such that each of the steps are considered automated and capable of being performed without user intervention. The various speeds, temperatures, pressures and timings are also non-limiting unless expressly recited in the claims. That is, although changes can be made to any or all of the various speeds, temperatures, pressures and timings, to produce a glass tip, these factors are all interrelated, so

that, for example, if a lower temperature burner is used, then the timing would need to increase. However, the arrangement of process steps as disclosed herein was developed to provide optimal conditions for producing a large number of tips in a short time. Thus, although, the invention is not limited to the specific constructions and arrangements shown and described herein and various other modifications may occur to those of ordinary skill in the art, the scope of the invention is defined solely by the following claims.

What is claimed is:

1. A method of manufacturing a tip for use with smokable substances, the method comprising:

rotating a tube along its longitudinal axis in one direction; applying heat to a section of the rotating tube;

clamping said tube at its ends and pulling said ends apart to separate said tube into first and second sections, and removing said applied heat, each section having a closed end after said separation;

applying heat to said closed end of said first section of said tube to cause said closed end to open;

applying heat to said opened end of said first section of said tube in a direction perpendicular to said opened end;

removing said heat applied to said opened end of said rotating tube and inserting a plug into said opened end while it is still soft from the applied heat after said removing;

simultaneously with said inserting, applying a roller in a direction perpendicular to said inserting to form an opening in said first section of said rotating tube with a flat external surface;

clamping said first section at its ends;

applying heat to a section of said first section distal from said opened end;

pulling said ends of said first section apart at said heated section of said first section, to separate said first section into two parts, wherein one of said two parts includes said opening with said flat external surface;

while continuing to apply heat to said section distal from said opened end, injecting air into said opened end to form an opening in said distal section to form a tip having openings at its two ends connected by an open chamber between said two ends.

2. The method defined by claim 1 wherein said heat applied to said section of the rotating tube is with a burner aligned with said section of the rotating tube.

3. The method defined by claim 2 wherein said burner uses oxygen, natural gas and compressed air combined to form a flame so that the temperature of the applied heat is set so that the tube to which it is being applied will soften the tube to enable the tube to be stretched and shaped.

4. The method defined by claim 1 wherein said rotating is from 200-300 RPM during each of said steps.

5. The method defined by claim 1 where pressure applied by said plug and roller is approximately 2-4 pounds per square inch.

6. The method defined by claim 5 wherein the pressure is applied for approximately 3 seconds.

7. The method defined by claim 1 wherein said rotating, clamping, heating and pulling, inserting and applying are performed repeatedly to produce a plurality of tips from a single tube.

8. The method defined by claim 1 wherein said tube is a glass material.

9. The method defined by claim 1 wherein each of said steps is performed serially using a single machine configured to perform each of said steps serially.

10. The method defined by claim 1 wherein said applied heat is for borosilicate glass with a working point temperature of 1240° C., a softening point temperature of 825° C. and an annealing point temperature of 565° C.

11. A tip manufactured according to the method of claim 1.

12. A tip for being attached to a wrapper containing a smokable substance, said tip comprising a tube having a generally cylindrical shape, having one flattened end with a first opening and one generally rounded end with a second opening, said first and second openings fluidly connected to each other by a chamber disposed between the two ends, the chamber and said two ends being axially aligned.

13. The tip defined by claim 12 wherein a diameter of said first opening is smaller than a diameter of said second opening.

14. The tip defined by claim 12 wherein a diameter of said first opening is larger than a diameter of said second opening.

15. The tip defined by claim 12 wherein a diameter of said first opening is substantially the same size as a diameter of said second opening.

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