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Stewart**

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(54) **CHANTER OF A WIND INSTRUMENT**

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(57) **ABSTRACT**

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**G10D 9/02** (2020.01)

(52) **U.S. Cl.**

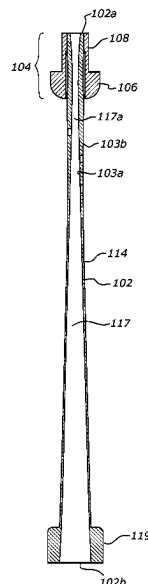
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See application file for complete search history.

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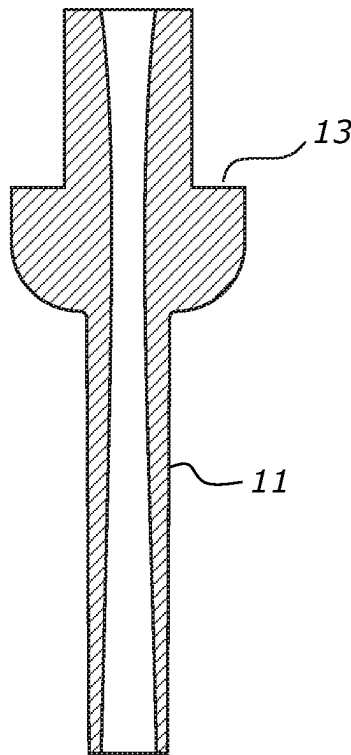
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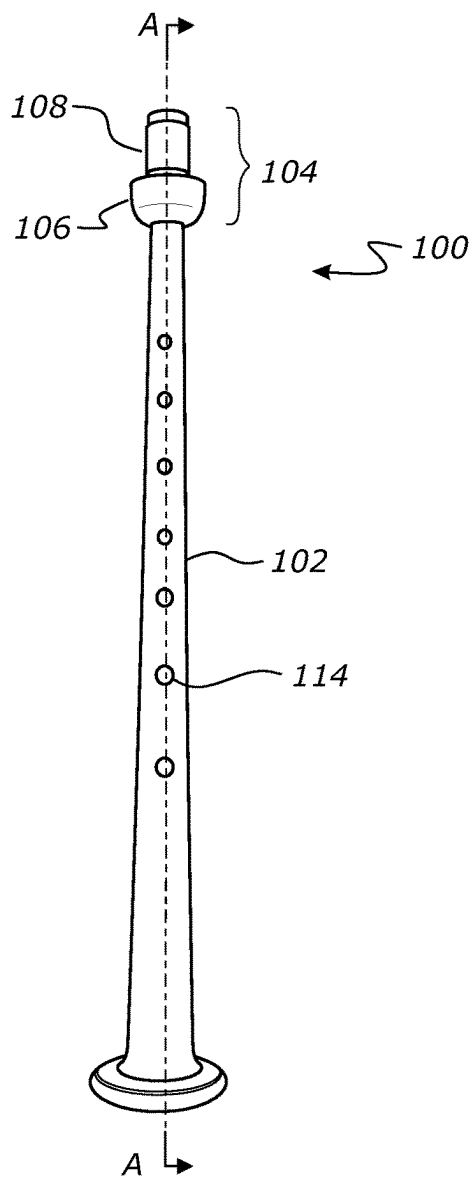
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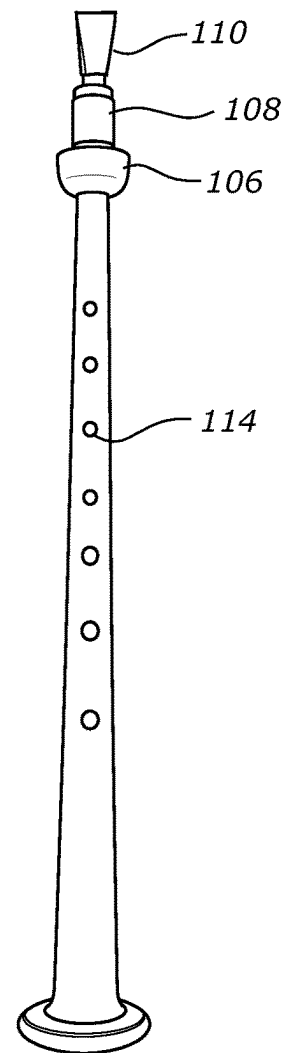
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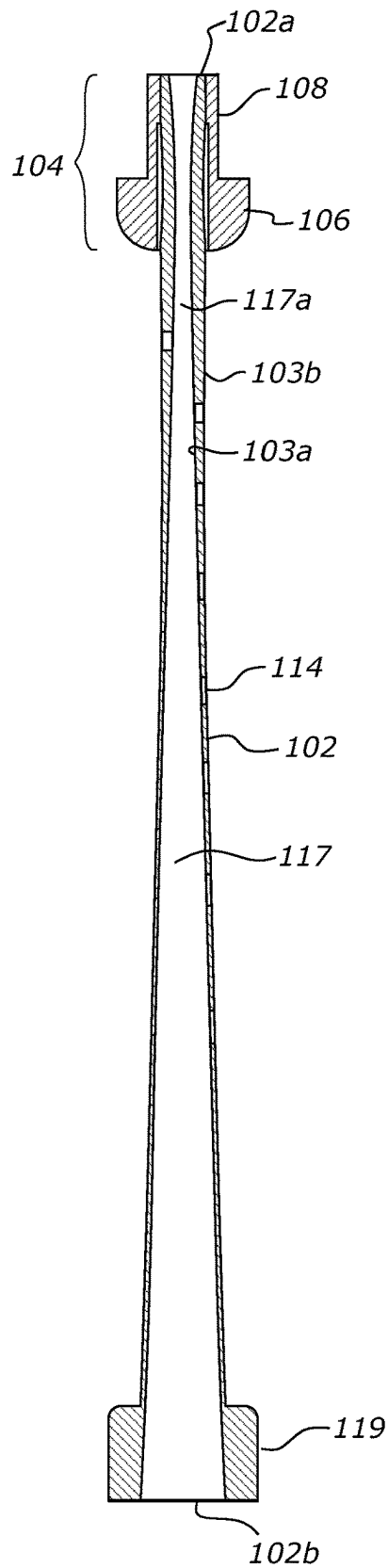
***FIGURE 1***  
*prior art*



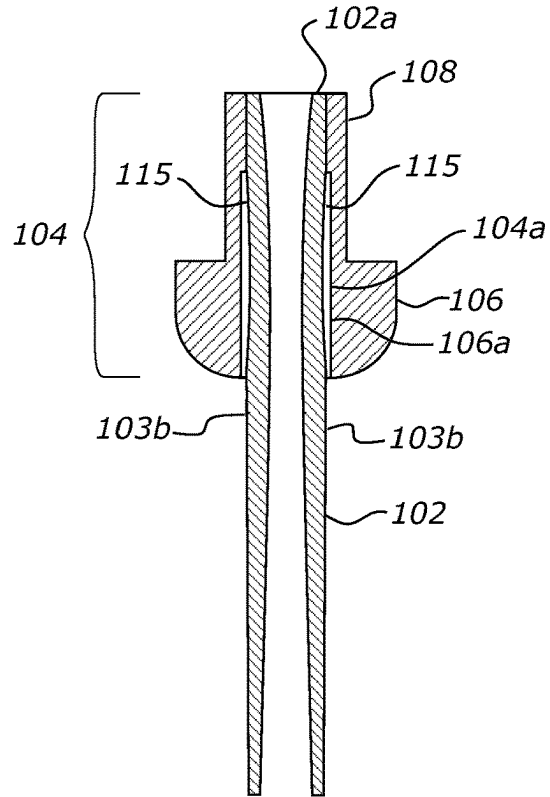
**FIGURE 2**



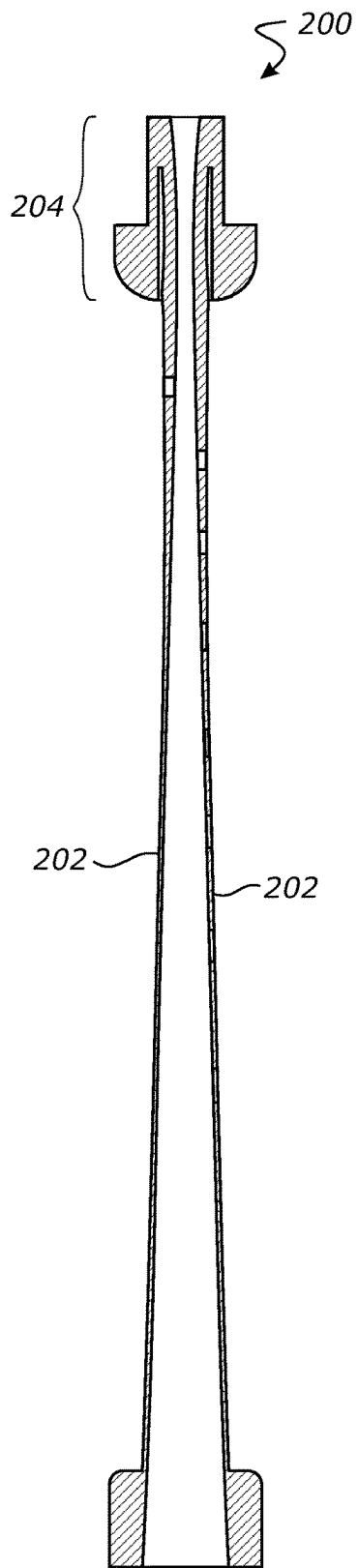
**FIGURE 3**



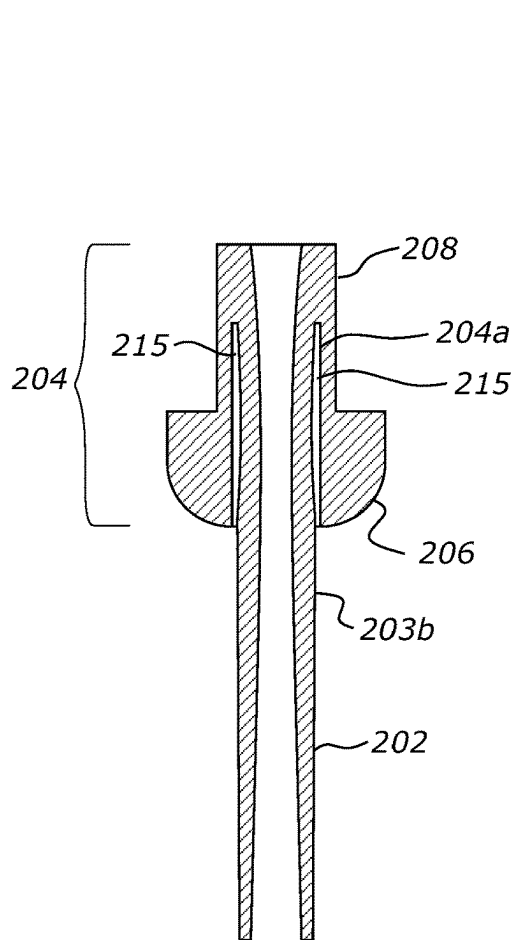
**FIGURE 4**



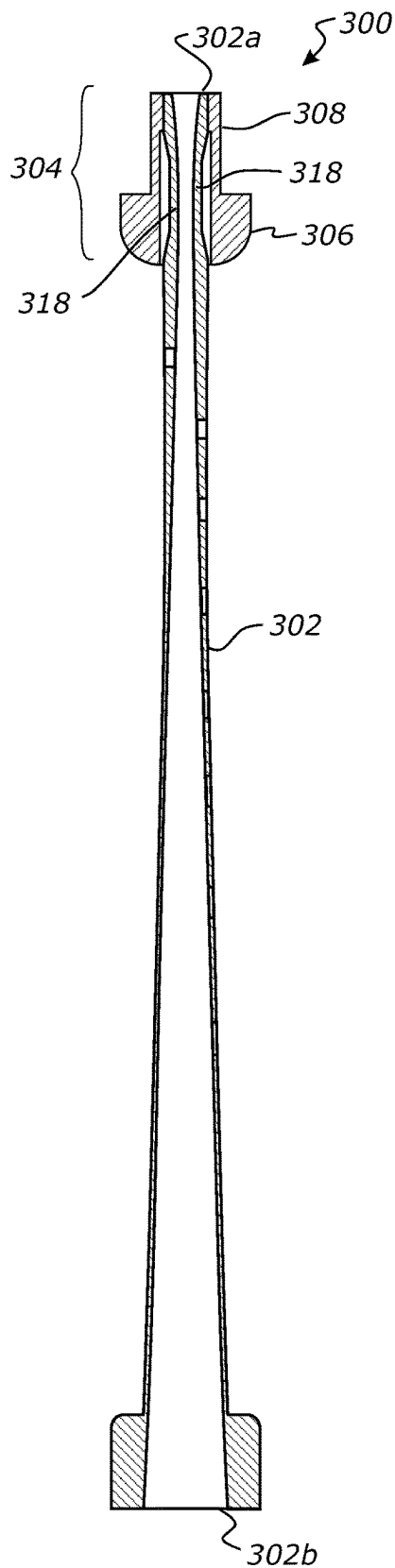
**FIGURE 5**



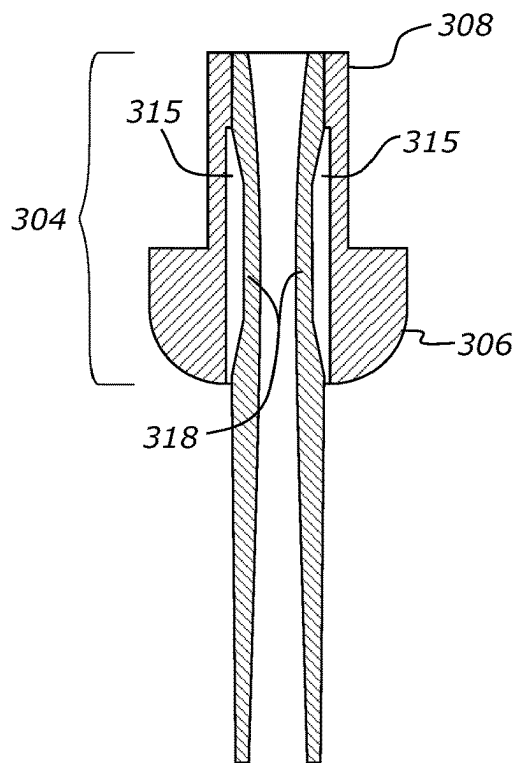
**FIGURE 6**



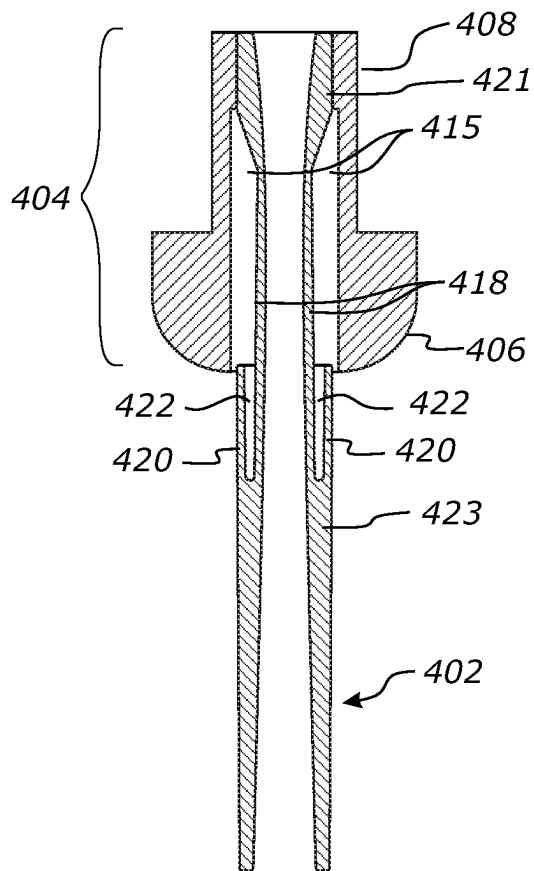
**FIGURE 7**



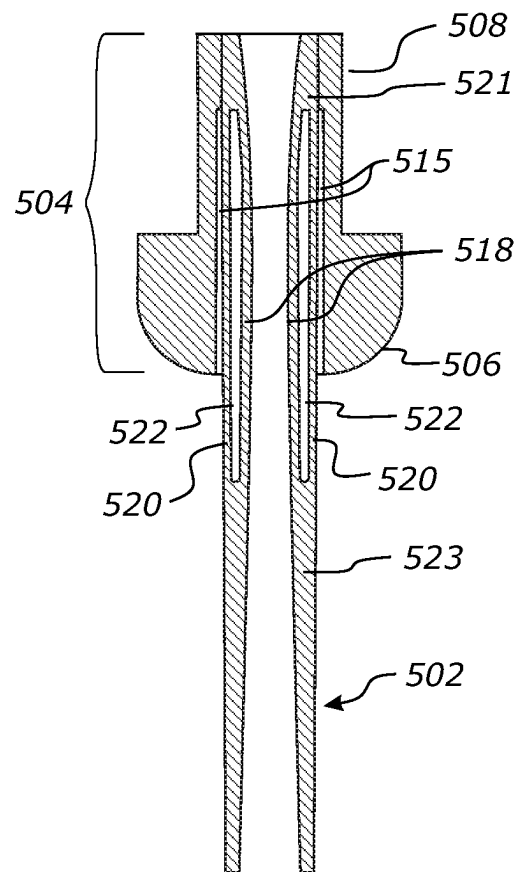
**FIGURE 8**



**FIGURE 9**

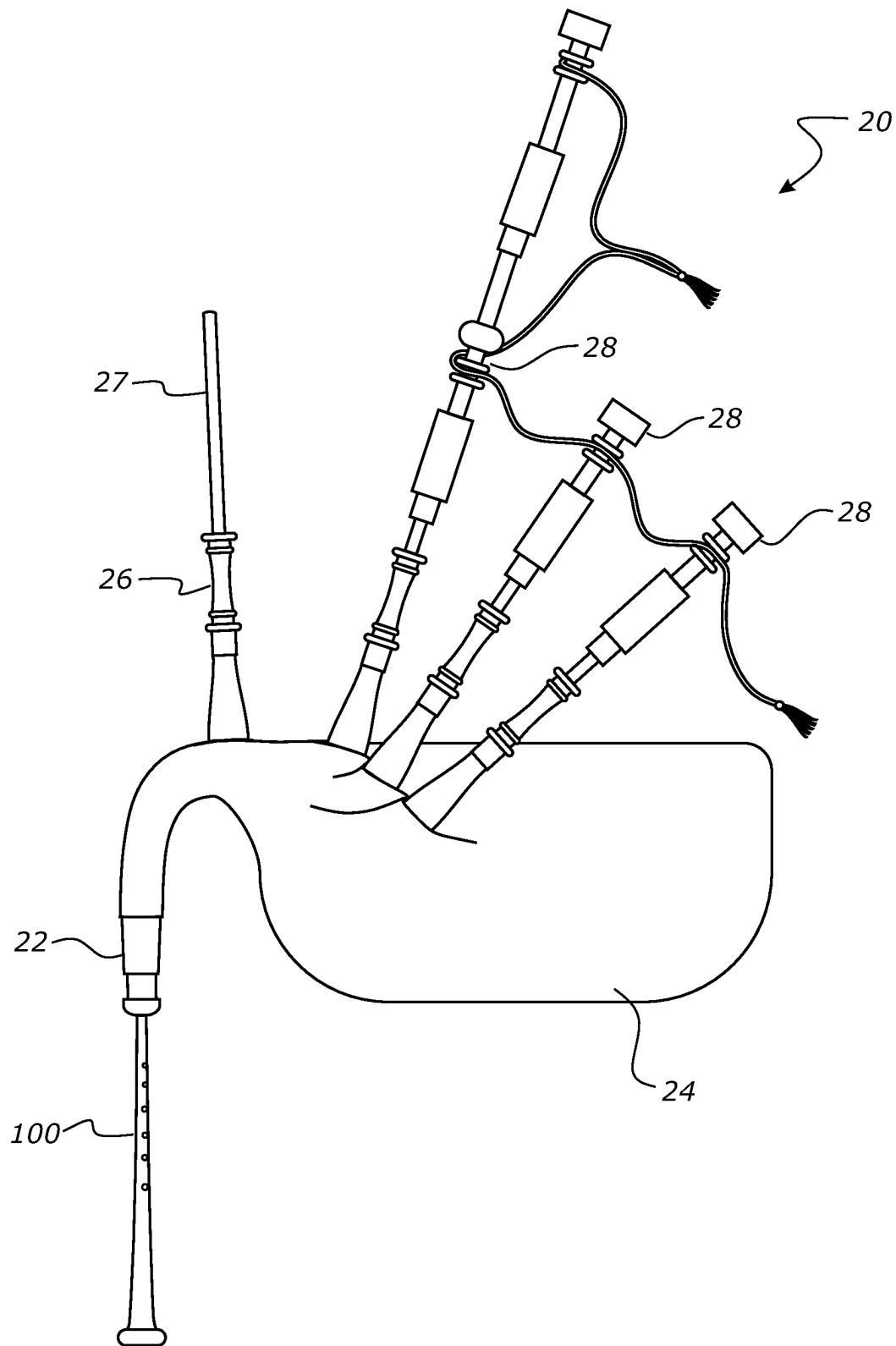


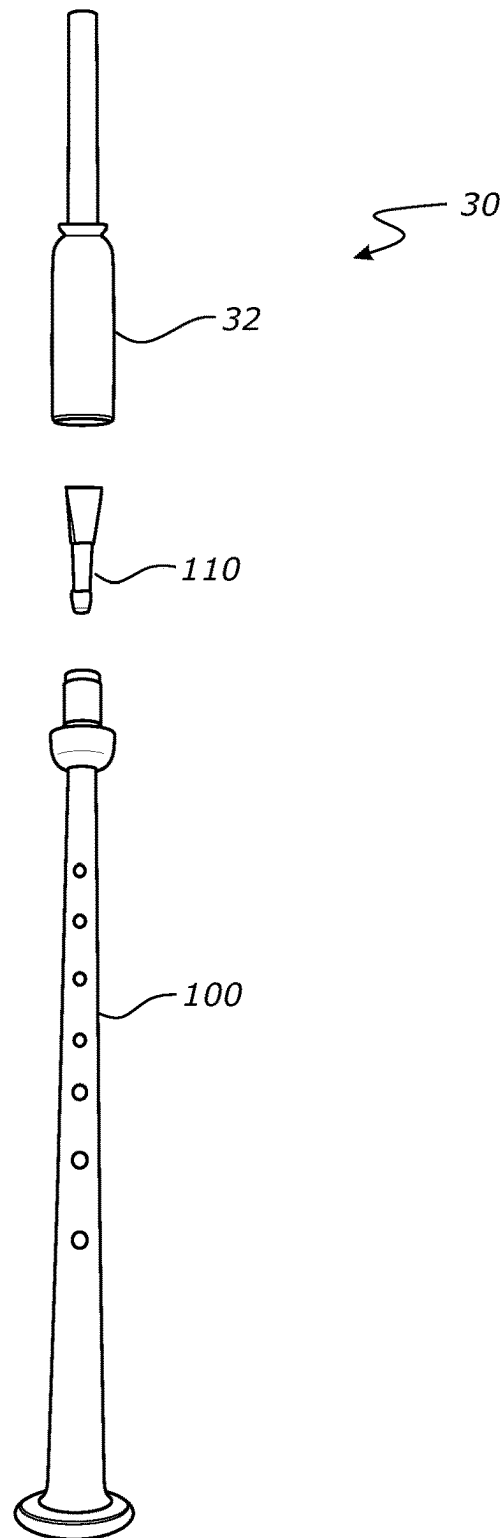
**FIGURE 10**



**FIGURE 11**



**FIGURE 12**



**FIGURE 13**

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## CHANTER OF A WIND INSTRUMENT

The present invention relates to a wind instrument. More particularly but not exclusively it relates to a chanter of a bagpipe.

## BACKGROUND OF THE INVENTION

Wind instruments such as bagpipe or practice chanters are well known. Such musical instruments produce sound by a vibrating column of air, either using a reed or lips of the musician. The melody pipe or chanter of such wind instruments has finger holes (or sound holes) that are played to produce the tune. A chanter allows the user to control the melody.

Traditionally chanters of such wind instruments are made as one complete piece with no joins in the fabrication, be it traditional wooden chanters or the more modern injection moulded chanters. Also, there are no gaps between the chimney (shaft) and the top portion of the chamber to reduce the length of connection of the chimney and the top portion (bulb/tenon joint). This is shown in FIG. 1. Whilst such known chanters provide the purpose of playing the sound and controlling the melody, the vibrancy of the sound produced is not as desired.

Also, such known chanters are not as reliable in performance as desired especially with weaker, easier to blow chanter reeds which tend to make a squeal sound on the lower notes (e.g. on the lowest 2 notes) of the chanter when playing quick top hand notes or transitioning from the higher notes (e.g. from the highest 2 notes) to the lower notes (e.g. to the lowest 2 notes).

## OBJECT OF THE INVENTION

It is an object of the present invention to provide a chanter of a wind instrument which overcomes or at least partially ameliorates some of the abovementioned disadvantages and/or which at least provides the public with a useful choice.

Alternately or additionally, it is an object of the present invention to provide a chanter of a bagpipe which overcomes or at least partially ameliorates some of the abovementioned disadvantages and/or which at least provides the public with a useful choice.

## STATEMENTS OF THE INVENTION

In a first aspect, the invention resides in a chanter of a wind instrument, the chanter comprising:

a chimney section that is substantially tubular (and/or has a hollow interior region) and extends from a first end portion of the chimney section to a second end portion of the chimney section or vice-versa and has an internal wall (internal surface) and an external wall (external surface), the second end portion located opposite the first end portion; and

a top section at which a chanter reed is located or is configured to be located, at least a portion of the top section is located adjacent and around the external wall of the chimney section, and is spaced apart from the chimney section thereby forming or defining a gap or an empty space between at least a portion of the external wall of the chimney section and at least a portion of an inner surface of the top section.

In one embodiment, the gap or the empty space extends from a lower end of the top section that is proximal to the

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second end portion towards the direction of an upper end of the top section that is proximal to the first end portion.

In one embodiment, the top section located proximal to the first end portion.

In one embodiment, the top section is more proximal to the first end portion than to the second end portion.

In one embodiment, the top section is more distal to the second end portion than to the first end portion.

In one embodiment, at least the lower end of the top section does not contact the external wall of the chimney section due to the gap or the empty space.

In one embodiment, the gap or the empty space extends from the lower end towards the direction of the upper end for at least a quarter of the total distance between the lower end and upper end.

In one embodiment, the gap or the empty space does not extend fully from the lower end to the upper end.

In one embodiment, the top section is located at or proximal to the first end portion.

In one embodiment, the top section extends from the first end portion towards the second end portion.

In one embodiment, the top section extends from the first end portion towards the second end portion along less than quarter of the total length of the chimney section.

In one embodiment, the top section comprises or forms a bulb of a chanter, wherein the bulb or at least a portion thereof is located adjacent and around the external wall of the chimney section and is spaced apart from the chimney section so that the gap or the empty space is formed or defined around the external wall of the chimney section and at least a portion of an inner surface of the bulb.

In one embodiment, the chimney section has a non-uniform wall thickness along its length.

In one embodiment, the wall thickness of the chimney section tapers from the first end portion to or towards the second end portion.

In one embodiment, the chanter reed is configured to be located within a reed seat that is part of or is coupled with the top section.

In one embodiment, the chanter reed is a single reed or a double reed.

In one embodiment, the top section comprises or forms a tenon of the chanter that is located at or proximal to the first end portion of the chimney section.

In one embodiment, the chanter reed is configured to be located within a reed seat that is part of or is coupled with the tenon.

In one embodiment, the bulb is integrally formed with the tenon.

In one embodiment, the top section and the chimney section are two separate pieces.

In one embodiment, the tenon and the chimney section are two separate pieces.

In one embodiment, the top section is integrally formed with the chimney section.

In one embodiment, the tenon is integrally formed with the chimney section.

In one embodiment, the external wall of the chimney section comprises a neck region at a portion that is adjacent to the gap or the empty region.

In one embodiment, the wall thickness of the neck region is less than the wall thickness of portions of the external wall immediately above the neck region.

In one embodiment, the wall thickness of the neck region is less than the wall thickness of portions of the external wall immediately below the neck region.

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In one embodiment, the neck region is substantially trapezoidal in cross-section at a plane that is parallel to a longitudinal axis of the chimney section along which the chimney section extends from the first end and the second end or vice-versa.

In one embodiment, the chanter or at least one or more components of the chanter is made out of carbon fibre.

In one embodiment, the bulb is hollow cylindrical in shape.

In one embodiment, the tenon is tubular or hollow cylindrical in shape.

In one embodiment, at least an internal diameter of the bulb is larger than at least an internal diameter of the tenon.

In one embodiment, at least an external diameter of the bulb is larger than at least an external diameter of the tenon.

In one embodiment, an internal and/or an external diameter of the tenon is larger than an internal and/or an external diameter of the chimney section.

In one embodiment, at least an internal diameter of the tenon is larger than at least an internal diameter of the chimney section at or proximal to the first end portion.

In one embodiment, at least an external diameter of the tenon is larger than the at least an external diameter of the chimney section at or proximal to the first end portion.

In one embodiment, at least an internal diameter of the chimney section at the second end portion is larger than at least the internal diameter of the tenon.

In one embodiment, at least an internal diameter of the chimney section at the second end portion is larger than at least the external diameter of the tenon.

In one embodiment, an internal and/or an external diameter of the chimney section tapers from the first end portion to or towards the second end portion.

In one embodiment, a sole of the chanter is located at or proximal to the second end portion.

In one embodiment, a plurality of sound holes is formed along the chimney section.

In one embodiment, the chimney section or the external wall of the chimney section comprises a neck region at a portion that is adjacent to the empty space or the gap.

In one embodiment, the wall thickness of the neck region is less than the wall thickness of portion of the chimney section immediately above the neck region.

In one embodiment, the wall thickness of the portion of the chimney section immediately below the neck region.

In one embodiment, a further or second empty space or second gap is formed at a lower portion of the neck region, the second empty space being in addition to a first empty space (the first empty space being said empty space or said gap).

In one embodiment, the second empty space is in the form of a cavity or a recess.

In one embodiment, the second empty space is formed at the chimney section between its internal wall and external wall.

In one embodiment, the second empty space extends along the longitudinal axis of the chimney section from a portion that is adjacent to the lower end of the top section (or from the portion that is adjacent to a lower end of the bulb) towards the direction to the second end of the chimney section.

In one embodiment, the second empty space extends to only a part of total length of the chimney section.

In one embodiment, the second empty space extends only a part of total distance between the lower end of the top section or lower end of the bulb and the second end of the chimney section.

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In one embodiment, the second empty space merges with or is coalesce to the first empty space or the gap thereby forming a single empty space or a single gap.

In one embodiment, the second empty space is fully enclosed between the internal wall and the external wall of the chimney section.

In one embodiment, the second empty space is adjacent to the first empty space and extends parallel to the first empty space towards the direction to the second end of the chimney section.

In one embodiment, width of the second empty space may be non-uniform or inconsistent.

In one embodiment, a barrel or barrel region is formed at a portion where the second empty space is formed.

In a second aspect, the invention resides in a chanter of a wind instrument, the chanter comprises a chimney section, the chimney section of the chanter being substantially tubular (and/or has a hollow interior region) extending longitudinally from a first end portion of the chimney section to a second end portion of the chimney section or vice-versa, the chimney section is configured to receive a blown air through the first end portion, and the second end portion is located opposite the first end portion, wherein the chanter further comprises a bulb, the bulb of the chanter or at least a portion thereof is located adjacent and around an external wall (external surface) of the chimney section and is spaced apart from the chimney section thereby forming or defining a gap or an empty space around at least a portion of the external wall of the chimney section and at least a portion of an internal wall (internal surface) of the bulb.

In one embodiment, the chimney section has a non-uniform wall thickness along its length.

In one embodiment, the wall thickness of the chimney section tapers from the first end portion to or towards the second end portion.

In one embodiment, the chanter reed is configured to be located within a reed seat that is part of or is coupled with the top section.

In one embodiment, the top section comprises a tenon of the chanter that is located at or proximal to the first end portion of the chimney section.

In one embodiment, the chanter reed is configured to be located within a reed seat that is part of or is coupled with the tenon.

In one embodiment, the bulb is integrally formed with the tenon.

In one embodiment, the top section and the chimney section are two separate pieces.

In one embodiment, the tenon and the chimney section are two separate pieces.

In one embodiment, the top section is integrally formed with the chimney section.

In one embodiment, the tenon is integrally formed with the chimney section.

In one embodiment, the external wall of the chimney section comprises a neck region at a portion that is adjacent to the gap.

In one embodiment, the wall thickness of the neck region is less than the wall thickness of portions of the external wall immediately above the neck region.

In one embodiment, the wall thickness of the neck region is less than the wall thickness of portions of the external wall immediately below the neck region.

In one embodiment, the neck region is substantially trapezoidal in cross-section at a plane that is parallel to a

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longitudinal axis of the chimney section along which the chimney section extends from the first end and the second end or vice-versa.

In one embodiment, the chanter or at least one or more components of the chanter is made out of carbon fibre.

In one embodiment, an internal and/or an external diameter of the bulb is larger than an internal and/or external diameter of the tenon.

In one embodiment, an internal and/or an external diameter of the tenon is larger than an internal and/or an external diameter of the chimney section.

In one embodiment, an internal and/or an external diameter of the tenon is larger than the an internal and/or an external diameter of the chimney section at the first end portion.

In one embodiment, an internal and/or an external diameter of the tenon is smaller than the internal diameter of the chimney section at the second end portion.

In one embodiment, an internal and/or an external diameter of the chimney section tapers from the first end portion to or towards the second end portion.

In one embodiment, a sole of the chanter is located at or proximal to the second end portion.

In one embodiment, a plurality of sound holes is formed along the chimney section.

In one embodiment, the gap/empty space extends from a lower end of the top section that is proximal to the second end portion towards the direction of an upper end of the top section that is proximal to the first end portion.

In one embodiment, at least the lower end of the top section does not contact the external wall of the chimney section due to the gap/empty space.

In one embodiment, the gap/empty space extends from the lower end towards the direction of the upper end for at least a quarter of the total distance between the lower end and upper end.

In one embodiment, the gap/empty space does not extend fully from the lower end to the upper end.

One of more statements of the first aspect as described above may equally apply to the second aspect.

In a third aspect, the invention resides in a chanter of a wind instrument, the chanter comprising a bulb and a chimney section, the bulb of the chanter or at least a portion thereof is located adjacent and around an external wall (external surface) of the chimney section of the chanter, at least a portion of the bulb being spaced apart from the chimney section thereby forming or defining a gap or an empty space around the external wall of the chimney section and at least a portion of an internal surface of the bulb.

In one embodiment, the gap or the empty space extends around the external wall of the chimney section and at least a portion of an internal surface of the a tenon of the chanter, the tenon being coupled with or is integrally formed with the bulb.

One of more statements of the first aspect and/or second aspect as described above may equally apply to the third aspect.

In a fourth aspect, the present invention resides in a bagpipe chanter, the bagpipe chanter comprises a chimney section that is substantially tubular in shape (and/or has a hollow interior region) extending longitudinally from a first end portion of the chimney section to a second end portion chimney section or vice-versa, wherein the chimney section is configured to receive a blown air through the first end portion and the second end portion is configured to be located opposite the first end portion, wherein the bagpipe chanter further comprises a bulb, the bulb of the chanter or

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at least a portion thereof is located adjacent and around an external wall (external surface) of the chimney and is spaced apart from the chimney thereby forming a gap or an empty space around the external surface of the chimney and at least a portion of an internal wall (internal surface) of the bulb.

One of more statements of the first aspect and/or second aspect as described above may equally apply to the fourth aspect.

In a fifth aspect, the present invention resides in a bagpipe that comprises a chanter as described in any one of the statements above.

In a sixth aspect, the present invention resides in a practice chanter instrument that comprises a chanter as described in any one of the statements above, and a mouth-piece coupled with the chanter.

In a seventh aspect, the invention resides in a musical instrument comprising a chanter as defined in any one of the statements above, wherein the musical instrument is selected from any one of the following:

- i. a bagpipe; and
- ii. a practice chanter.

In one embodiment, the practice chanter further comprises a mouth piece that is coupled to the chanter as defined in any one of the statement above.

Other aspects of the invention may become apparent from the following description which is given by way of example only and with reference to the accompanying drawings.

The entire disclosures of all applications, patents and publications, cited above and below, if any, are hereby incorporated by reference.

In this specification where reference has been made to patent specifications, other external documents, or other sources of information, this is generally for the purpose of providing a context for discussing the features of the invention. Unless specifically stated otherwise, reference to such external documents is not to be construed as an admission that such documents, or such sources of information, in any jurisdiction, are prior art, or form part of the common general knowledge in the art.

As used herein the term “and/or” means “and” or “or”, or both.

As used herein “(s)” following a noun means the plural and/or singular forms of the noun.

For purposes of the description hereinafter, the terms “upper”, “lower”, “right”, “left”, “vertical”, “horizontal”, “top”, “bottom”, “lateral”, “longitudinal” and derivatives thereof shall relate to the invention as it is oriented in the drawing figures. However, it is to be understood that the invention may assume various alternative variations, except where expressly specified to the contrary. It is also to be understood that the specific devices illustrated in the attached drawings and described in the following description are simply exemplary embodiments of the invention. Hence, specific dimensions and other physical characteristics related to the embodiments disclosed herein are not to be considered as limiting.

It is acknowledged that the term “comprise” may, under varying jurisdictions, be attributed with either an exclusive or an inclusive meaning. For the purpose of this specification, and unless otherwise noted, the term ‘comprise’ shall have an inclusive meaning, allowing for inclusion of not only the listed components or elements, but also other non-specified components or elements. The terms ‘comprises’ or ‘comprised’ or ‘comprising’ have a similar meaning when used in relation to the system or to one or more steps in a method or process.

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As used hereinbefore and hereinafter, “(s)” following a noun means the plural and/or singular forms of the noun.

When used in the claims and unless stated otherwise, the word ‘for’ is to be interpreted to mean only ‘suitable for’, and not for example, specifically ‘adapted’ or ‘configured’ for the purpose that is stated.

The entire disclosures of all applications, patents and publications, cited above and below, if any, are hereby incorporated by reference.

#### BRIEF DESCRIPTION OF THE DRAWINGS

The invention will now be described by way of example only and with reference to the drawings in which:

FIG. 1: is a cross-sectional view on an upper region of a known chanter.

FIG. 2: shows a chanter according to a first embodiment of the present invention.

FIG. 3: shows the chanter of FIG. 2 with a chanter reed.

FIG. 4: shows a cross-sectional view of the chanter of FIG. 2 along A-A axis.

FIG. 5: is a detailed view of the upper region of the chanter of FIG. 4.

FIG. 6: is a cross-sectional view of a chanter according to a second embodiment of the present invention.

FIG. 7: is a detailed view of the upper region of the chanter of FIG. 6.

FIG. 8: is a cross sectional view of a chanter according to a third embodiment of the present invention.

FIG. 9: is a detailed view of the upper region of chanter of FIG. 8.

FIG. 10: is a detailed view of the upper region of a chanter according to a fourth embodiment of the present invention.

FIG. 11: is a detailed view of the upper region of a chanter according to a fifth embodiment of the present invention.

FIG. 12: shows a bagpipe comprising a chanter of FIG. 2.

FIG. 13: shows an exploded practice chanter instrument comprising chanter of FIG. 2 and a mouth piece.

#### DETAILED DESCRIPTION OF THE INVENTION

FIG. 1 shows a cross-sectional view on an upper region of a known chanter of a wind instrument/woodwind instrument such as a bagpipe or a practice chanter instrument. As shown in FIG. 1 and as mentioned above, known chanters are made as one complete piece with no joins and in the fabrication. Also, there is no gap/empty space between the chimney 11 and the top portion 13 of the chanter to reduce the length of connection of the chimney 11 and the top portion 13. Due to such arrangements, the vibrancy and projection of the sound is produced especially due to a damping effect in the upper region of the chanter which is not desirable.

The performance of such known chanters is also not as reliable.

It is therefore desirable to have a chanter that provides an overall increase in the vibrancy and projection of tone. Also, it is desirable to have a chanter that is reliable in performance which negates or reduces a squeal sound on the lower notes (e.g. on the lowest 2 notes) when playing the quick top hand notes or transitioning from the higher notes (e.g. from the highest 2 notes) to the lower notes (e.g. to the lowest 2 notes).

With reference to FIGS. 2 to 5, in which similar features are generally indicated by similar numerals, a chanter 100 for a wind instrument such as a bagpipe or a practice chanter instrument according to a first aspect of the invention.

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As shown, the chanter 100 comprises a chimney (hereinafter referred to as a chimney section 102), and a top section 104. The chimney section 102 is substantially tubular (and/or has a hollow interior region) and extends from a first end portion 102a of the chimney section 102 to a second end portion 102b of the chimney section 102 or vice-versa and has an internal wall 103a (i.e., internal surface) and an external wall 103b (i.e., external surface). FIG. 2 also shows a longitudinal axis A-A along which the chimney section 102 of the chanter 100 extends. A blown air is configured to be received by the chimney section 102 through the first end portion 102a and the second end portion 102b that is located opposite the first end portion 102a.

The top section 104 is the section where the chanter reed 110 or at least a portion of the chanter reed 110 is located or is configured to be located. This is shown in FIG. 3. The chanter reed 110 may be part of the chanter 100. The top section 104 is also referred to as a seal of the chanter as at least a portion of the top section 104 is configured to sealingly engage with a chanter stock (if the instrument is a bagpipe) or with a mouthpiece (if the wind instrument is a practice chanter or similar).

A skilled person will know what a chanter reed 110 is and therefore it need not be described here in detail. But, in general, the chanter reed 110 is the portion that vibrates as air is passed through thereby creating the characteristic sound of the wind instrument such as a bagpipe or a practice chanter instrument. A plurality of sound holes 114 are formed along the chimney section 102 as shown.

FIG. 4 is a cross-sectional view of the chanter 100 of FIG. 2 along the longitudinal axis A-A. FIG. 5 is a detailed view of the upper region of the chanter 100 of FIG. 3.

As shown in FIGS. 4 and 5, at least a portion of the top section 104 are located adjacent or around the external wall 103b of the chimney section 102. The top section 104 are spaced apart from the chimney section 102 thereby forming or defining a gap 115 (i.e. empty space/void region) between the external wall 103b of the chimney section 102 and at least a portion of the inner surface 104a of the top section 104. As shown, the inner surface 104a faces towards the external wall 103b of the chimney section.

The top section 104 may be located at or proximal to the first end portion 102a of the chimney section 102. The top section 104 are located more proximal to the first end position 102a than to the second end portion 102b. The top section 104 is located more distal to the second end portion 102b than the to the first end portion 102a.

As shown, the top section 104 extends from the first end portion 102a towards (i.e. towards the direction) of the second end portion 102b. Preferably, the top section 104 extends from the first end portion 102a towards the second end portion 102 along less than a quarter of the total length of the chimney section 102.

As shown in FIGS. 2 to 5, the top section 104 comprises a bulb 106 of the chanter 100. A skilled person will readily appreciate what a bulb of a chanter is, but in general, is the portion that is configured to abut against a chanter stock (if the instrument is a bagpipe) to or with a mouthpiece (if the wind instrument is a practice chanter or similar) during use.

As shown in FIGS. 4 and 5, at least the portion of the bulb 106 is located adjacent and around the external wall 103b of the chimney section 102 and is spaced apart from the chimney section 102 so that the gap 115 is formed around the external wall 103b of the chimney section 102 and at least the inner surface 106a of the bulb 106.

As shown the chimney section **102** has a non-uniform wall thickness. The wall thickness of the chimney section **102** tapers from the first end portion **102a** to the second end portion **102b**.

As shown in FIGS. **4** and **5**, the internal surface, i.e., internal walls **103a** of the chimney section **102** are non-parallel (or non-uniform in cross section that is orthogonal to the longitudinal axis of the chimney section **102**) so that a bore **117** defined by the internal walls **103a** is non-uniform in size (e.g. substantially conical) along the length of the chimney section **102**. The internal walls **103a** of the chimney section **102** are non-parallel so that the bore **117** has a throat portion **117a** (or internal walls **103a** of the chimney section **102** defines a throat portion **117a**) which is the narrowest portion of the bore **117** (or narrowest portion defined by the internal walls **103a** of the chimney section). The throat portion **117a** is located between the first end portion **102a** and the second end portion **102b** of the chimney section **102**. The widest portion of the bore **117** or the widest portion defined by the internal walls **103a** of the chimney section **102** is located at or proximal to the second end portion **102b**. The throat portion **117a** of the bore **117** is located at the region of the chimney section that is adjacent to the bulb **106**. Portion of the bore **117** at the first end portion **102a** is narrower than the portion of the bore at the second end portion **102b** but wider than the throat portion **117a**.

Alternatively, in some embodiments, the internal wall **103a** may be parallel (or "cylindrical") for the full length of the chimney section **102** and/or the full length of the chanter **100** so that the hollow region/bore **117** is uniform size throughout the length of the chimney section **102**. In other words, the internal walls **103a** of the chimney section **102** may be uniform in cross section that is orthogonal to the longitudinal axis of the chimney section **102**.

The top section **104** further comprises a tenon **108** of the chanter **100** that is located at or proximal to the first end portion **102a** of the chimney section **102**. The chanter reed **110** is configured to be located within a reed seat **112** that is part of or is coupled with the top section **104**, more specifically the tenon **108**. A skilled person will know what a tenon **108** of a chanter is, but in general, it is that portion of the chanter that is configured to be sealingly engage with a chanter stock (if the instrument is a bagpipe) or with a mouthpiece (if the wind instrument is a practice chanter or similar). The chimney section **102** is configured to be held in place via the tenon **108** and at least for that reason, the tenon **108** is located above the bulb **106** and is narrower than the bulb **106**. So, the tenon **108** may also be referred to as a neck of the top section **104**. The outside/external diameter of the tenon **108** is less than the outside/external diameter of the bulb **106**. In one embodiment, the internal and/or the external diameter of the bulb is larger than an internal and/or external diameter of the tenon. In one embodiment, the internal and/or the external diameter of the tenon **108** is larger than the internal and/or the external diameter of the chimney section **102** at or proximal to the first end portion **102a**. In one embodiment, the internal and/or the external diameter of the tenon **108** is smaller than the internal diameter of the chimney section **102** at or proximal to the second end portion **102b**. So, internal diameter of the chimney section **102** at the second end portion **102** is larger than the internal and/or external diameter of the tenon **108**.

In one embodiment, the internal and/or the external diameter of the chimney section **102** tapers from the first end portion **102a** to or towards the second end portion **102b**.

The bulb **106** and/or the tenon **108** need not necessarily be of the same shape as shown in FIGS. **4** and **5** and could be of many other suitable shapes.

It is most preferred that the top section **104** and the chimney section **102** are two separate pieces and are bonded to each other using suitable bonding means such as adhesives or similar. Similarly, the tenon **108** and the chimney section **102** are also two separate pieces. The bulb **106** is integrally formed with the tenon **108**.

As shown in FIGS. **4** and **5**, due to the gap **115** in the chanter **100** of the present invention the length of the connection of the chimney section (shaft) to the top section **104** (the bulb **106** and tenon **108**) is significantly reduced. Such a reduction in the length of connection or contact area between the chimney section **102** and at least the portion of the top section **104** means an increase in the vibrating length of the chimney section **102**. Hence, it can be appreciated that the present invention can allow free vibrations of the chimney section **102** close/proximal to the chimney reed **110** (e.g. as close/proximal to the chimney reed **110** as possible). With such arrangements, the sound that is generated using the chanter **100** of the present invention can be more vibrant as compared to the sound made using the previously known chanters with arrangements as shown in FIG. **1**.

Preferably, the chanter **100** or at least some of the components of the chanter **100** is made out of carbon fibre to enhance its strength. Alternatively, the chanter **100** or at least the components thereof may be made out of many other suitable materials such as but not limited to a polymeric material (e.g. injection moulded plastic), African Blackwood or other suitable timber.

A sole **119** of the chanter **100** is located at or proximal to the second end portion **102b** of the chimney section **102**.

Alternatively, the top section **204** may be integrally formed with the chimney section **202** as shown in the cross-sectional view of a further embodiment of the chanter **200** in FIGS. **6** and **7**. Apart from the top section **204** being integrally formed with the chimney section **202**, the chanter **200** of FIGS. **6** and **7** are substantially the same as the chanter **100** as described above. The difference between chanter **100** and chanter **200** can be determined by comparing FIGS. **4** and **5** with FIGS. **6** and **7** respectively. In FIGS. **6** and **7**, the features that are similar to those shown in FIGS. **4** and **5** are identified with the same reference numeral, incremented by 100. Most of the description of the apparatus **100** of a preferred embodiment above, equally applies to the apparatus **700** and therefore need not be described again in too much detail. Only the main features will be discussed.

As shown in FIGS. **6** and **7**, the top section **204** is spaced apart from the chimney section **202** thereby forming a gap **215** or empty region between the external wall **203b** of the chimney section **202** and the inner surface **204a** of the top section **204**. In FIGS. **6** and **7**, it is shown that the top section is integrally formed with the chimney section (i.e. as a one piece). However, the embodiment shown in FIG. **3** is most preferred than the embodiment shown in FIG. **5** as the chimney section that is bonded to the top section (which is a separate piece than the chimney section) provides better performance.

FIG. **8** is a cross-section view of a chanter **300** according to a further embodiment of the present invention. FIG. **9** is a detailed view of the upper region of the chanter **300** shown in FIG. **8**. Chanter **300** is essentially the same as chanter **100**.

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as described above and therefore most of the descriptions above relating to chanter **100** equally applies to chanter **300**. In FIGS. **8** and **9**, the features that are similar to those shown in FIGS. **4** and **5** are identified with the same reference numeral, incremented by 200. As such only the differences will be described in detail or only the main features will be discussed.

The differences between chanter **100** and chanter **300** can be determined by comparing FIGS. **4** and **5** with FIGS. **8** and **9** respectively.

As shown, in chanter **300**, the chimney section or the external wall of the chimney section comprises a neck region **318** at a portion that is adjacent to the empty space/gap **315**. The wall thickness of the neck region **318** is less than the wall thickness of portion **321** of the chimney section immediately above the neck region **318** and preferably also the thickness of the portion **323** of the chimney section below the neck region **318**.

In one embodiment, the neck region **318** is substantially trapezoidal in cross-section at a plane that is parallel to a longitudinal axis of the chimney section **302** along which the chimney section **302** extends from the first end **302a** to the second end **302b** or vice-versa.

Having a neck region **318** is advantageous as it can reduce the mass of the material or reduce the total mass of the chanter and can help to aid/enhance the vibrancy.

FIG. **10** is a cross-section view of a portion (more specifically the upper region) of a chanter according to a further embodiment of the present invention. FIG. **10** may also be referred to as a detailed view of an upper region of a chanter of a further embodiment of the present invention. As shown, the upper region includes the top section **404** and also a portion of the chimney section proximal to that top section **404**. In FIG. **10**, the features that are similar to those shown in FIGS. **4** and **5** are identified with the same reference numeral, incremented by 300.

The differences between chanter **100** and chanter of the embodiment of FIG. **10** can be determined by comparing FIGS. **4** and **5** with FIG. **10**. Apart from the upper region as shown in FIG. **10**, the rest of the chanter in this embodiment may be identical to the chanter **100** of FIG. **4**.

As shown, in the embodiment of FIG. **10**, the chimney section or the external wall of the chimney section **402** comprises a neck region **418** at a portion that is adjacent to the empty space/gap **415**. The wall thickness of the neck region **418** is less than the wall thickness of portion **421** of the chimney section immediately above the neck region **418** and preferably also the wall thickness of the portion **423** of the chimney section immediately below the neck region **418**.

At a lower portion of the neck region **418**, there is a further/second empty space or gap **422**. This second empty space may be in the form of a cavity or a recess. This second empty space **422** is in addition to the first empty space (gap **415**). The second empty space **422** is formed at the chimney section **402** between its internal wall **403a** and external wall **403b**. The second empty space **422** extends along the longitudinal axis of the chimney section **402** from a portion that is adjacent to the lower end of the top section **404** (more specifically, from the portion that is adjacent to lower end of the bulb **406**) towards the direction to the second end of the chimney section **402**. The second end of chimney section is the end that is distal to the top section **404**. The second empty space **422** extends only a part of the total length of the chimney section **402**. The second empty space **422** extends only a part of the total distance between the lower end of the top section **404** (more specifically, lower end of the bulb **406**) and the second end of the chimney section **402**. The

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second empty space **422** opens up to the gap **415** thereby forming a single gap/empty space. In order words, the second empty space **422** merges with/is coalesce to the gap **415** thereby forming a single gap/empty space.

FIG. **11** is a cross-section view of a portion (more specifically the upper region) of a chanter according to a further embodiment of the present invention. FIG. **11** may also be referred to as a detailed view of an upper region of a chanter of a further embodiment of the present invention. As shown, the upper region includes the top section **504** and portion of the chimney section proximal to that top section **504**. In FIG. **11**, the features that are similar to those shown in FIGS. **4** and **5** are identified with the same reference numeral, incremented by 400.

The differences between chanter **100** and chanter of FIG. **11** can be determined by comparing FIGS. **4** and **5** with FIG. **11**. Apart from the upper region as shown in FIG. **11**, the rest of the chanter in this embodiment is identical to the chanter **100** of FIG. **4**.

As shown, in the embodiment of FIG. **11**, the chimney section **502** or external wall of the chimney section **502** comprises a neck region **518** at a portion that is adjacent to the empty space/gap **515**. The wall thickness of the neck region **518** is less than the wall thickness of portion **521** of the chimney section immediately above the neck region **518** and preferably also the wall thickness of the portion **523** of the chimney section immediately below the neck region **518**.

Between the internal wall **503a** and external wall **503b** of the chimney section **502**, there is a further/second empty space or gap **522**. This second empty space **522** is in addition to the first empty space, the first empty space (gap **515**). The second empty space **522** is fully enclosed between the internal wall **503a** and the external wall **503b** of the chimney section **502**. The second empty space **522** is adjacent to the gap **515** and extends parallel to the gap **515** towards the direction to the second end of the chimney section **502**. The second end of chimney section is the end that is distal to the top section **504**. The second empty space **522** is longer than the gap **515**. The width of the second empty space is non-uniform or inconsistent. The second empty space **522** extends only a part of the total length of the chimney section **502**. Unlike in the embodiment of FIG. **10**, second empty space **522** does not merge with nor is coalesce to the gap **515**, as the second empty space **522** is enclosed between the internal wall **503a** and external wall **503b** of the chimney section.

What is common between the embodiments of FIGS. **10** and **11** is that each of them comprise a second empty space **422**, **522** between the internal and external walls of the chimney section. Therefore, each of them form a barrel/barrel region **420**, **520** at a portion where such second empty space is formed. As shown, in the embodiment of FIG. **10**, a partial length or shorter barrel/barrel region **420** whereas in the embodiment of FIG. **11**, a full length or longer barrel/barrel region **530** is formed. Having such a barrels or barrel regions allow extension of the neck region in each of those embodiments. The barrels also cover the neck region from the view and therefore is also aesthetically pleasing/appealing. Furthermore, having a barrel/barrel region can also help to maintain the strength of the chanter at the neck region. For example, having a full length or longer barrel/barrel region **520** can help avoid the strength of the chanter from being compromised due to the longer neck region **518**.

The extension of the neck region as a longer neck region can further reduce the stiffness at the upper portion/top part of the chimney section adding to the vibrancy of the tone especially on the top hand notes. Also, increasing the length



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of the neck region can reduce the mass of the material or reduces the total mass of the chanter. In addition, such a reduced mass can help to further aid/enhance the vibrancy.

FIG. 12 shows an example of a wind instrument in the form of a bagpipe 20 comprising the chanter 100 as described above. As shown, the bagpipe 20 comprises a chanter stock 22, bag 24, blowpipe 26, mouthpiece 27, and drone pipes 28. All such components and working principle of such components of the bagpipe 20 will be known to the person skilled in the art and therefore need not be described herein in detail. At least a portion of the top section 104 of the chanter 100 is coupled/sealingly engaged with the chanter stock 22 as shown in FIG. 12. It can be appreciated that instead of chanter 100, the bagpipe 20 may comprise chanter 200 or chanter 300 as described above. Similarly, it can be appreciated that instead of chanter 100, the bagpipe 20 may comprise chanter as described above with reference to FIGS. 10 and 11.

FIG. 13 shows an example of a wind instrument in the form of a practice chanter instrument 30 comprising the chanter 100 as described above. As shown, the practice chanter instrument 30 comprises a mouthpiece 32 with which at least a portion of the top section 104 of the chanter 100 may be coupled/sealingly engaged. Components and working principle of such components of the practice chanter instrument 30 will be appreciated by the person skilled in the art and therefore need not be described herein in detail. It can be appreciated that instead of chanter 100, the practice chanter instrument 30 may comprise chanter 200 or chanter 300 as described above. Similarly, it can be appreciated that instead of chanter 100, the practice chanter instrument 30 may comprise chanter as described above with reference to FIGS. 10 and 11.

Therefore, it may be appreciated that the present invention may reside in a chanter 100, 200, 300 of a wind instrument. A chimney section 102, 202, 302 of the chanter 100, 200, 300 may be substantially tubular extending longitudinally from a first end portion 102a, 202a, 302a to a second end portion 102b, 202b, 302b or vice-versa. A blown air may be configured to be received by the chimney section 102, 202, 302 through the first end portion 102a, 202a, 302a and the second end portion 102b, 202b, 302b may be located opposite the first end portion 102a, 202a, 302a. The bulb 106, 206, 306 of the chanter 100, 200, 300 or at least a portion thereof may be located adjacent and around an external wall 102b, 202b, 302b of the chimney section 102, 202, 302 and may be spaced apart from the chimney section 102b, 202b, 302b thereby forming a gap 115, 215, 315 around the external wall 102b, 202b, 302 of the chimney section 102, 202, 302 and at least a portion of an inner surface 106a, 206a, 306a of the bulb 106, 206, 306. Although, described with reference to the embodiments shown in FIGS. 2 to 9, the description in this paragraph may equally apply to the embodiments of chanter described with reference to FIGS. 10 and 11.

Thus, from the above, it can be appreciated that in one aspect, the present invention may reside in a bagpipe chanter. The chimney section may be substantially tubular (and/or has a hollow interior region that is a bore). The chimney section may extend longitudinally from a first end portion to a second end portion or vice-versa. The chimney section may be configured to receive a blown air through the first end portion. The second end portion may be configured to be located opposite the first end portion. A bulb of the chanter or at least a portion thereof may be located adjacent and around an external wall (external surface) of the chimney section and is spaced apart from the chimney section

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thereby forming/defining a gap around the external wall of the chimney section and at least a portion of an inner surface of the bulb.

Similarly, from the description above, it can be appreciated that the invention may reside in a chanter of a wind instrument in which a bulb of the chanter or at least a portion thereof may be located adjacent and around an external wall (external surface) of a chimney section of the chanter. At least a portion of the bulb may be spaced apart from the chimney section thereby forming or defining a gap or an empty space around the external wall of the chimney section and at least a portion of an internal surface of the bulb. The gap or the empty space may extend around the external wall of the chimney section and at least a portion of an internal surface of the a tenon of the chanter, the tenon may be coupled with or is integrally formed with the bulb.

Where in the foregoing description reference has been made to elements or integers having known equivalents, then such equivalents are included as if they were individually set forth.

Although the invention has been described by way of example and with reference to particular embodiments, it is to be understood that modifications and/or improvements may be made without departing from the scope or spirit of the invention.

The invention claimed is:

1. A chanter of a wind instrument, the chanter comprising: a chimney section that is substantially tubular and extends from a first end portion of the chimney section to a second end portion of the chimney section or vice-versa and has an internal wall and an external wall, the second end portion located opposite the first end portion; and a top section at which a chanter reed is located or is configured to be located, at least a portion of the top section is located adjacent and around an external wall of the chimney section, and is spaced apart from the chimney section thereby forming or defining a gap or an empty space between at least a portion of the external wall of the chimney section and at least a portion of an inner surface of the top section.
2. The chanter as claimed in claim 1, wherein the gap or the empty space extends from a lower end of the top section that is proximal to the second end portion towards the direction of an upper end of the top section that is proximal to the first end portion.
3. The chanter as claimed in claim 1, wherein the top section comprises or forms a bulb of a chanter, wherein the bulb or at least a portion thereof is located adjacent and around the external wall of the chimney section and is spaced apart from the chimney section so that the gap or the empty space is formed or defined around the external wall of the chimney section and at least a portion of an inner surface of the bulb.
4. The chanter as claimed in claim 1, wherein the chanter reed is configured to be located within a reed seat that is part of or is coupled with the top section.
5. The chanter as claimed in claim 1, wherein the chanter reed is a single reed or a double reed.
6. The chanter as claimed in claim 1, wherein the top section comprises or forms a tenon of the chanter that is located at or proximal to the first end portion of the chimney section.
7. The chanter as claimed in claim 1, wherein the external wall of the chimney section comprises a neck region at a portion that is adjacent to the gap or the empty region.

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8. The chanter as claimed in claim 1, wherein the chanter or at least one or more components of the chanter is made out of carbon fibre.

9. The chanter as claimed in claim 1, wherein an internal and/or an external diameter of the chimney section tapers from the first end portion to or towards the second end portion.

10. The chanter as claimed in claim 7, wherein a further or a second empty space or second gap is formed at a lower portion of the neck region, the second empty space being in addition to a first empty space, the first empty space being the empty space or the gap.

11. The chanter as claimed in claim 10, wherein the second empty space is in the form of a cavity or a recess.

12. The chanter as claimed in claim 10, wherein the second empty space is formed at the chimney section between its internal wall and external wall.

13. The chanter as claimed in claim 10, wherein the second empty space extends along the longitudinal axis of the chimney section from a portion that is adjacent to the lower end of the top section towards the direction to the second end of the chimney section.

14. The chanter as claimed in claim 10, wherein the second empty space extends to only a part of total length of the chimney section.

15. The chanter as claimed in claim 10, wherein the second empty space merges with or is coalesce to the first empty space or the gap thereby forming a single empty space or a single gap.

16. The chanter as claimed in claim 10, wherein the second empty space is fully enclosed between the internal wall and the external wall of the chimney section.

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17. The chanter as claimed in claim 10, wherein the second empty space is adjacent to the first empty space and extends parallel to the first empty space towards the direction to the second end of the chimney section.

18. The chanter as claimed in claim 10, wherein a barrel or barrel region is formed at a portion where the second empty space is formed.

19. A chanter of a wind instrument, the chanter comprises a chimney section, the chimney section of the chanter being substantially tubular or has a hollow interior region extending longitudinally from a first end portion of the chimney section to a second end portion of the chimney section or vice-versa, the chimney section is configured to receive a blown air through the first end portion, and the second end portion is located opposite the first end portion, wherein the chanter further comprises a bulb, the bulb of the chanter or at least a portion thereof is located adjacent and around an external wall of the chimney section and is spaced apart from the chimney section thereby forming or defining a gap or an empty space around at least a portion of the external wall of the chimney section and at least a portion of an internal wall of the bulb.

20. A chanter of a wind instrument, the chanter comprising a bulb and a chimney section, the bulb of the chanter or at least a portion thereof is located adjacent and around an external wall of the chimney section of the chanter, at least a portion of the bulb being spaced apart from the chimney section thereby forming or defining a gap or an empty space around the external wall of the chimney section and at least a portion of an internal surface of the bulb.

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