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(54) Title: BRASS WIND MOUTHPIECE

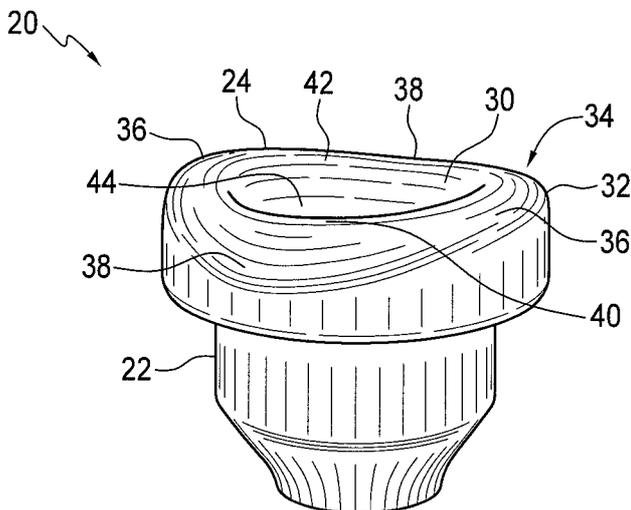


FIG. 1

(57) **Abstract:** The present invention is directed to brass wind mouthpieces (20), and in particular brass wind mouthpieces (20) configured for improved performance and endurance. One aspect of the invention provides that the lateral shoulders (38) of the mouthpiece (20) rim (24), which respectively would face the corners of the musician's lips when the mouthpiece (20) is in use, slope outwardly away from the proximate end of the mouthpiece (20) cup (22).

WO 2008/141450 A1

BRASS-WIND MOUTHPIECE

CROSS REFERENCE TO RELATED APPLICATION

[0001] This application claims the benefit of priority from application
5 serial number CA2,589,302 filed May 18, 2007.

BACKGROUND OF THE INVENTION

1. Field of the Invention

10 [0002] The present invention is directed to brass-wind mouthpieces,
and in particular brass-wind mouthpieces configured for improved performance and
endurance.

2. Description of the Related Art

[0003] A brass-wind mouthpiece is formed as a cup with a convex rim.
15 A musician places the rim against his lips to play a brass-wind instrument. The rim is
therefore the most important interface between instrument and musician.

[0004] In greater detail, the cup has the rim at its proximate end and a
throat at its distal end. The cup also includes a receptacle for a hollow shank adapted
to connect the throat to a mouthpiece-receiver of a brass-wind instrument. The shank
20 has a tubular backbone that conveys air between the cup and the instrument, through a
throat in the base of the cup. A musician applies his lips to the mouthpiece rim and
blows air into the instrument through the throat and the backbone in the shank. This
act causes the musician's upper and lower lips to vibrate, setting up a standing sound

wave in the instrument and producing the characteristic sound of the instrument being played.

[0005] The rim has a circumferential inside edge, a circumferential outside edge and a surface contour extending between the inside edge and the outside
5 edge.

[0006] The contour has a superior abutment adapted to abut a musician's upper lip, an inferior abutment adapted to abut the musician's lower lip, and lateral shoulders adapted to face the corners of the musician's mouth where his upper lip and lower lip meet. The contour also has an impression, which is the path of
10 apex points on the contour around the circumference of the rim, and a bite, which is the portion of the contour between the impression and the inside edge

[0007] The contour of the rim may be rounded or relatively flat. The contour is generally of uniform radius from the inside edge to outside edge of the rim. The impression of the rim is usually close to its center, but is sometimes biased very
15 slightly to the inside or outside edge over the entire circumference of the rim. The contour of the inside portion of the rim ~ the bite —may be somewhat sharper than the contour of the outside portion of the rim, but is generally uniform throughout the circumference of the rim.

[0008] The musician manipulates the pitch of the note being produced
20 by the instrument, in part by movements of his lips. These movements are a combination of changing the tension in the vibrating lips, puckering, rolling the lips in or out, compressing the upper and lower lips together, and varying mouthpiece pressure against the lips. The net result is a change in the frequency of lip vibrations, resulting in a change of the sounded note. The lips must also be periodically stretched

open at their corners and then quickly returned to their original playing position in order to take breath while playing a musical passage.

[0009] Conventional mouthpiece rim contours impose significant physical and physiological limitations on the musician, leading to problems of decreased lip mobility, lip and face muscle fatigue, lip swelling, and impaired blood and oxygen supply to the lip tissues inside the mouthpiece. These problems translate into impaired range, lack of endurance and an impaired ability to smoothly move between notes (flexibility). Conventional rims also make it difficult to achieve satisfactory replacement of the lips in their original position after taking a breath.

10 [0010] The present invention addresses these problems.

SUMMARY OF THE INVENTION

[0011] One aspect of the present invention provides for a new type of brass-wind mouthpiece having a rim contour that improves both performance and endurance. This new contour can be incorporated into the design and manufacture of a new mouthpiece or applied as a modification to any existing mouthpiece.

15

[0012] In one embodiment, there is provided a mouthpiece having lateral shoulders that slope outwardly away from the proximate end of the cup.

20 [0013] The impression may have a variable radius. So configured, the radius of the impression is shortest proximate the lateral shoulders, where the impression is proximate the inside edge of the rim. The radius of the impression is longest proximate the superior and inferior abutments, where the bite is pronouncedly rounded.

[0014] The inside edge may have a smaller radius proximate the shoulders than the abutments, such that the rim presents an ovular opening with its major axis aligned with the upper and lower abutments.

[0015] The shoulders may define a dip in the contour toward the distal
5 end of the cup and thereby reduce the volume of the cup.

[0016] The bite may be sharper proximate the shoulders than the abutments. The bite is narrower proximate the shoulders than the abutments.

[0017] The shoulders might have a flat contour, a rounded contour or a combination and the respective shoulders might even differ in at least one of: contour,
10 angle of slope, and direction of slope. As a result of such asymmetry, the upper abutment and lower abutment might be different sizes.

BRIEF DESCRIPTION OF THE DRAWINGS

15 [0018] Other advantages of the present invention will be readily appreciated, as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings wherein:

[0019] Figure 1 is a bottom, left, front isometric view of a mouthpiece
20 according to one embodiment of the present invention;

[0020] Figure 2 is a left elevation view of the mouthpiece of Figure 1;

[0021] Figure 3 is a top plan view of the mouthpiece of Figure 1;

[0022] Figure 4 is a front elevation view of the mouthpiece of Figure
1;

[0023] Figure 5 is a rear elevation view of the mouthpiece of Figure 1;
and

[0024] Figure 6 is a cross-sectional view along the cutting-plane 6-6 of
the mouthpiece of Figure 1.

5

DETAILED DESCRIPTION OF THE INVENTION

[0025] *(a) Structure of Specific Embodiments*

[0026] The structure of the invention will now be illustrated by
10 explanation of specific, non-limiting, exemplary embodiments shown in the drawing
figures and described in greater detail herein. The embodiments are characterized by
a number of features that can be variously combined.

[0027] Referring to the Figures, wherein like numerals indicate
corresponding parts throughout the several views, a brass-wind mouthpiece **20**
15 according to one embodiment of the present invention is generally illustrated.

[0028] As is conventional, the mouthpiece **20** includes a cup **22** having
a rim **24** at its proximate end and a throat **26** at its distal end. The cup **22** either
projects or receives in a receptacle **28** a hollow shank (**not shown**) adapted to connect
the throat **26** to a mouthpiece-receiver (**not shown**) of a brass-wind instrument (**not**
20 **shown**).

[0029] Also as is conventional, the rim **24** has a circumferential inside
edge **30**, a circumferential outside edge **32** and a surface contour **34** extending
between the inside edge **30** and the outside edge **32**. The contour **34** has a superior
abutment **36** adapted to abut a musician's upper lip, an inferior abutment **36** adapted

to abut the musician's lower lip, and lateral shoulders 38 adapted to face the corners of the musician's mouth where his upper lip and lower lip meet. The contour 34 also has an impression 40, which is the path of apex points on the contour 34 around the circumference of the rim 24, and a bite 42, which is the portion of the contour 34
5 between the impression 40 and the inside edge 30.

[0030] *Sloping Lateral Shoulders 38 of the Rim 24*

[0031] The lateral shoulders 38 of the rim 24, which respectively would face the corners of the musician's lips when the mouthpiece 20 is in use, slope outwardly away from the proximate end of the cup 22. That portion of the shoulders
10 38 that would be in close contact with the lips is therefore significantly narrower than the superior and inferior abutments 36 of the rim 24. This configuration is opposite to previously taught contour 34 variations for a rim 24, which have tended to have uniform radius or to slope into the mouthpiece 20 cup 22, but not away.

[0032] *Varying Rim 24 Contour 34 and Impression 40*

15 **[0033]** The impression 40 and contour 34 of the rim 24 vary along the circumference of the rim 24.

[0034] The impression 40 has a variable radius. The radius of the impression 40 is shortest proximate the lateral shoulders 38, where the impression 40 is proximate the inside edge 30 of the rim 24. The radius of the impression 40 is
20 longest proximate the superior and inferior abutments 36, where the bite 42 is pronouncedly rounded.

[0035] *Rim 24 Contour 34 Shifted Medially Toward Center*

[0036] In proportion to the degree of slope of the shoulders 38, the plane of the metal removed impinges on the inside edge 30 of the cup 22. This

relationship has the effect of moving the inside edge 30 medially and contributing to a slightly oval shape to the cup 22. The longitudinal axis of the oval is oriented in a superior and inferior direction when the instrument is played, contrary to the orientation of other oval mouthpiece 20 designs.

5 [0037] Thus, the inside edge 30 has a smaller radius proximate the shoulders 38 than the abutments 36, such that the rim 24 presents an ovular opening 44 with its major axis aligned with the upper and lower abutments 36. The cup 22 presents the oval opening due to a combination of the medially shifted lateral contour 34 of the rim 24 in conjunction with the pronounced rounding of the inner rim 24
10 contour 34 superiorly and inferiorly.

[0038] *Lateral Dip 46 of Rim 24 Contour 34*

[0039] The sloping of the shoulders 38 also introduces a lateral dip 46 in the side profile of the rim 24. This lateral dip 46 arises as a secondary characteristic from the sloping of the lateral shoulders 38 of the rim 24, and is designed to be a more
15 acute curve than that formed by the contour 34 of the musician's supporting lips and teeth, in order to create a pressure differential between the shoulders 38 and the superior and inferior abutments 36 of the rim 24. This contour 34 of the rim 24 is distinct from previous designs, which have sought to match the contour 34 of the musician's lips and teeth in order to distribute pressure evenly.

20 [0040] The lateral dip 46 is also unique in that it is associated with a rim 24 contour 34 that steeply slopes to the outside in the perpendicular axis of the rim 24 at the same location. The shoulders 38 define a dip 46 in the contour 34 toward the distal end of the cup 22 and thereby reduce the volume of the cup 22.

[0041] *Variable Inner Rim 24 Sharpness (or Bite 42)*

[0042] The variable contour 34 of the rim 24 produces a variable bite 42, being sharper and narrower laterally at the shoulders 38 than superiorly and inferiorly at the superior and inferior abutments 36.

5 [0043] *(b) Operation of Specific Embodiments*

[0044] The operation of these specific embodiments of the invention will now be described.

[0045] The contour 34 of the rim 24 interacts with the musician's anatomy and physiology in a unique way. The sloping lateral shoulders 38 leave space
10 for the lip tissue to expand and grip the mouthpiece 20 while contracting and puckering to play a higher note. This arrangement improves range, endurance, and flexibility. The increased space for lip movement also improves the ability to open the corners of the lips for a breath, and to then replace them to their original position without the difficulty associated with conventional rims 24. The critical central
15 vibrating portions of the upper and lower lips are pinned in place by the relatively wider superior and inferior abutments 36 of the rim 24 while the lateral lips are able to move while breathing. The decrease in the volume of the cup 22 is minimal and does not appreciably affect the tone of the instrument.

[0046] The maximum pressure point between conventional rims 24
20 and the lips is at the lateral margin of the rim 24. This is because the natural convexity of the anterior surface to the slightly open teeth (as they are positioned for playing) produces an anatomical high point where the lips meet under the lateral mouthpiece 20 rim 24. The arterial blood supply courses from lateral to medial. Venous and lymphatic drainage of the lips courses from medial to lateral. Pressure of the lateral

rim 24 of conventional mouthpieces 20 impairs blood and lymph flow at this point, resulting in impaired blood supply, oxygen and nutrient starvation of the central lip tissues, decreased lymphatic and venous blood drainage, and lip swelling. Impedance to flow is a function of the degree of compression of vessels, and the length of the vessel over which that restriction is applied. These factors produce musician fatigue and impaired endurance and general playing ability.

[0047] Other oval mouthpiece 20 designs have sought to evenly distribute the mouthpiece 20 pressure around the entire circumference of the rim 24. The sloping lateral shoulders 38 of the present embodiments seek to offload pressure from the lateral portions of the rim 24 to an even greater degree, thereby producing the opposite effect of concentrating pressure on the superior and inferior abutments 36 of the rim 24. The decreased pressure acting over a shorter length of local vascular structures improves blood and lymphatic flow, which decreases lip swelling and fatigue. It also increases lip mobility in this area, since less surface area of the lip and rim 24 are in contact, decreasing the amount of friction between the surfaces.

[0048] Transfer of a greater proportion of surface area of contact from the shoulders 38 to the relatively wider superior and inferior abutments 36 of the rim 24, which lie over the smooth surfaces of the teeth instead of the sharp teeth edges 30, 32, also improves comfort for any given degree of mouthpiece 20 pressure.

[0049] Thus, it will be seen from the foregoing embodiments and examples that there has been described a way to improve comfort, endurance, range, and flexibility without any sacrifice in tone or other playing characteristics of any given mouthpiece 20 cup 22.

[0050] Obviously, many modifications and variations of the present invention are possible in light of the above teachings and may be practiced otherwise than as specifically described while within the scope of the appended claims. That which is prior art in the claims precedes the novelty set forth in the "characterized by" clause. The novelty is meant to be particularly and distinctly recited in the "characterized by" clause whereas the antecedent recitations merely set forth the old and well-known combination in which the invention resides. These antecedent recitations should be interpreted to cover any combination in which the inventive novelty exercises its utility. In addition, the reference numerals in the claims are merely for convenience and are not to be read in any way as limiting.

[0051] While specific embodiments of the invention have been described and illustrated, such embodiments should be considered illustrative of the invention only and not as limiting the invention. It will be understood by those skilled in the art that various changes, modifications and substitutions can be made to the foregoing embodiments without departing from the principle and scope of the invention as defined in the claims.

[0052] For example, the slope of the shoulders 38 can vary in contour 34, angle and orientation. The contour 34 of the sloping shoulders 38 can be flat or rounded. The slope will affect the overall width the mouthpiece 20 and degree of ovate shape of the cup 22. The orientation of the slope of the two lateral shoulders 38 can be parallel or angled with respect to one another. Angled orientations will produce an inequality between the lengths of the superior and inferior abutments 36 of the rim 24. In playing the instrument the wider or narrower segments of the rim 24 can be placed on the top or bottom lip depending on musician preference.

[0053] Thus useful embodiments would include shoulders 38 having a flat contour 34, a rounded contour 34, or a combination, upper abutments 36 that are either larger or smaller than their corresponding lower abutments 36, and respective shoulders 38 differing in at least one of: contour 34, angle of slope, and direction of slope.

5

CLAIMS

What is claimed is:

1. A brass-wind mouthpiece (20) comprising:

a cup (22) having a rim (24) at its proximate end and a throat (26) at its
5 distal end, the distal end having a receptacle (28) for a hollow shank ((not shown))
adapted to connect the throat (26) to a mouthpiece-receiver ((not shown)) of a brass-
wind instrument ((not shown)), the rim (24) having a circumferential inside edge (30),
a circumferential outside edge (32) and a surface contour (34) extending between the
inside edge (30) and the outside edge (32), the contour (34) having a superior
10 abutment (36) adapted to abut a musician's upper lip, an inferior abutment (36)
adapted to abut the musician's lower lip, and lateral shoulders (38) adapted to face the
corners of the musician's mouth where his upper lip and lower lip meet, the contour
(34) further having an impression (40) that is the path of apex points on the contour
(34) around the circumference of the rim (24) and a bite (42) that is the portion of the
15 contour (34) between the impression (40) and the inside edge (30)

and characterized by,

the lateral shoulders (38) sloping outwardly away from the proximate
end of the cup (22);

the impression (40) having a variable radius, the radius of the
20 impression (40) being shortest proximate the lateral shoulders (38), where the
impression (40) is proximate the inside edge (30) and the radius of the impression
(40) being longest proximate the superior and inferior abutments (36), where the bite
(42) is pronouncedly rounded;

the inside edge (30) having a smaller radius proximate the lateral shoulders (38) than the abutments (36) such that the rim (24) presents an ovular opening (44) with its major axis aligned with the upper and lower abutments (36);

the shoulders (38) defining a dip (46) in the contour (34) toward the distal end of the cup (22) and thereby reducing the volume of the cup (22);

the bite (42) being sharper proximate the shoulders (38) than the superior and inferior abutments (36); and

the bite (42) being narrower proximate the shoulders (38) than the superior and inferior abutments (36).

10

2. A brass-wind mouthpiece (20) having a cup (22) with a rim (24) at its proximate end and a throat (26) at its distal end, the rim (24) having a circumferential inside edge (30), a circumferential outside edge (32) and a surface contour (34) extending between the inside edge (30) and the outside edge (32), the contour (34) having a superior abutment (36) adapted to abut a musician's upper lip, an inferior abutment (36) adapted to abut the musician's lower lip, and lateral shoulders (38) adapted to face the corners of the musician's mouth where his upper lip and lower lip meet, the contour (34) further having an impression (40) that is the path of apex points on the contour (34) around the circumference of the rim (24) and a bite (42) that is the portion of the contour (34) between the impression (40) and the inside edge (30), characterized by the lateral shoulders (38) sloping outwardly away from the proximate end of the cup (22).

15
20

3. A brass-wind mouthpiece (20) as set forth in claim 2 further characterized by the impression (40) having a variable radius.

4. A brass-wind mouthpiece (20) as set forth in claim 3, further
5 characterized by the radius of the impression (40) being shortest proximate the shoulders (38).

5. A brass-wind mouthpiece (20) as set forth in claim 4, further characterized by the impression (40) proximate the shoulders (38) being proximate the
10 inside edge (30).

6. A brass-wind mouthpiece (20) as set forth in claim 4, further characterized by the radius of the impression (40) being longest proximate the abutments (36).

15

7. A brass-wind mouthpiece (20) as set forth in claim 6, further characterized by the bite (42) being pronouncedly rounded proximate the abutments (36).

20 8. A brass-wind mouthpiece (20) as set forth in claim 2 further characterized by the inside edge (30) having a smaller radius proximate the shoulders (38) than the abutments (36).

9. A brass-wind mouthpiece (20) as set forth in claim 8 further characterized by the rim (24) presenting an ovular opening (44) with its major axis aligned with the upper and lower abutments (36).

5 10. A brass-wind mouthpiece (20) as set forth in claim 2 further characterized by the shoulders (38) defining respective dips (46) in the contour (34) toward the distal end of the cup (22).

10 11. A brass-wind mouthpiece (20) as set forth in claim 10 further characterized by the dips (46) reducing the volume of the cup (22).

15 12. A brass-wind mouthpiece (20) as set forth in claim 2 further characterized by the bite (42) being sharper proximate the shoulders (38) than the abutments (36).

13. A brass-wind mouthpiece (20) as set forth in claim 12 further characterized by the bite (42) being narrower proximate the shoulders (38) than the superior and inferior abutments (36).

20 14. A brass-wind mouthpiece (20) as set forth in claim 2 further characterized by the shoulders (38) having a flat contour (34).

15. A brass-wind mouthpiece (20) as set forth in claim 2 further characterized by the shoulders (38) having a rounded contour (34).

16. A brass-wind mouthpiece (20) as set forth in claim 2 further characterized by the upper abutment (36) and lower abutment (36) being different sizes.

5

17. A brass-wind mouthpiece (20) as set forth in claim 2 further characterized by the respective shoulders (38) differing in at least one of: contour (34), angle of slope, and direction of slope.

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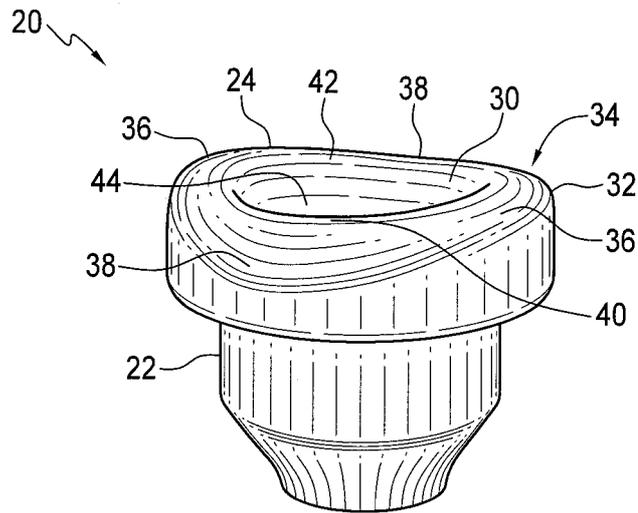


FIG. 1

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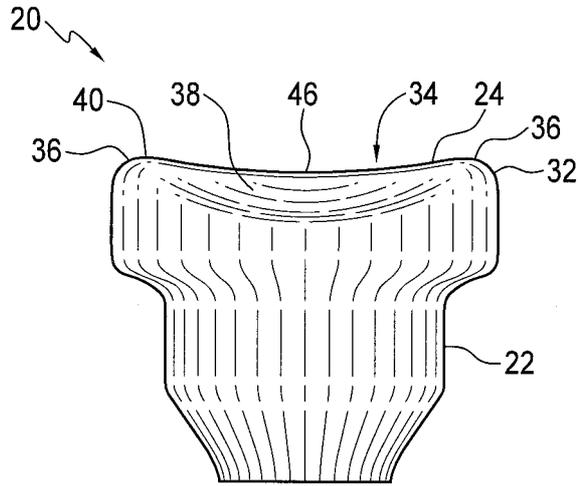


FIG. 2

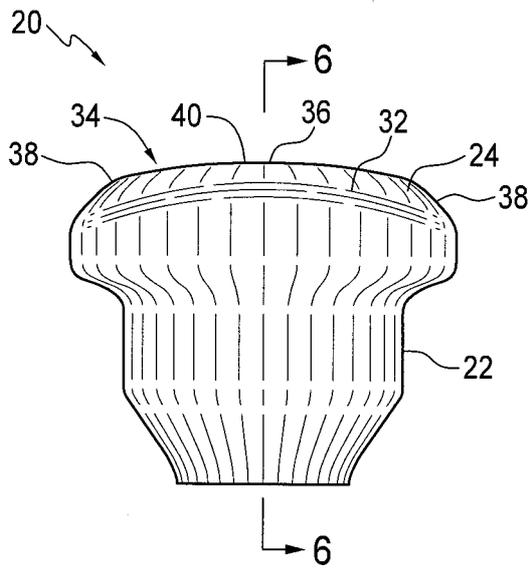


FIG. 3

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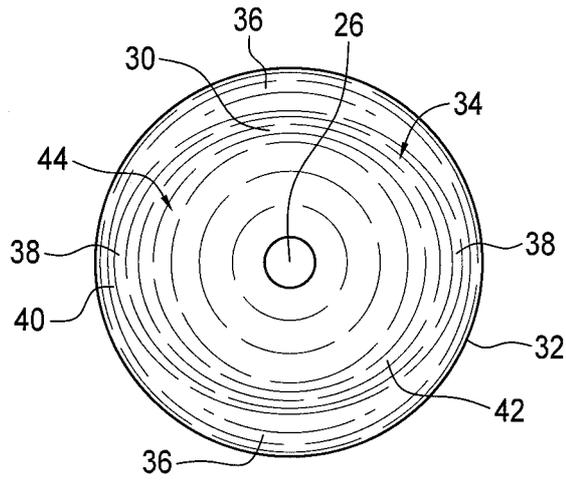


FIG. 4

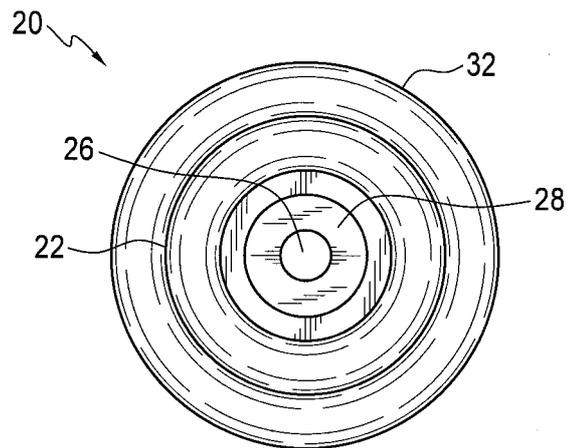


FIG. 5

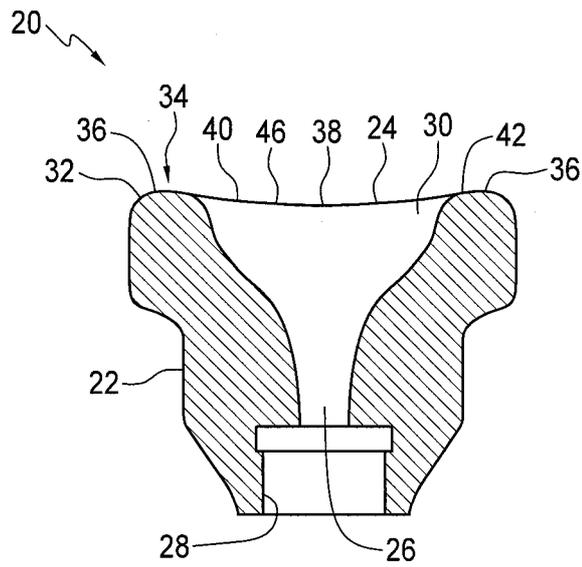


FIG. 6

A CLASSIFICATION OF SUBJECT MATTER IPC <i>GIOD 9/02</i> (2006 01) According to International Patent Classification (FPC) or to both national classification and IPC		
B FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) IPC <i>GIOD 9/02</i> (2006 01)		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic database(s) consulted during the international search (name of database(s) and, where practicable, search terms used) Techsource, Derwent and Fampat (mouthpiece), Google (mouthpiece, brass, horn, trumpet)		
C DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No
X, O	URL http://www.wedgemouthpiece.com/idl06.html * Video of a concert demonstrating the invention on 27 April 2007 (27-04-2007)	1-17
A	FR 2834 815 Laurent 01 October 1998 (01-10-1998) * Fig 1-5*	1-17
A	De 197 46 559 Sixt 01 October 1998 (01-10-1998) * Fig 1-Fig 4*	1-17
A	URL http://hnwhite.com/Kmg/Mouthpieces/1932%20Complete%20mouthpiece%201st%20Large.jpg 1932 (1932) *Fig on bottom right	1-17
<input type="checkbox"/> Further documents are listed in the continuation of Box C		<input checked="" type="checkbox"/> See patent family annex
* Special categories of cited documents	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	
A document defining the general state of the art which is not considered to be of particular relevance	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	
E earlier application or patent but published on or after the international filing date	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	
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)	& document member of the same patent family	
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		
Date of the actual completion of the international search	Date of mailing of the international search report	
9 July 2008 (09-07-2008)	18 July 2008 (18-07-2008)	
Name and mailing address of the ISA/CA Canadian Intellectual Property Office Place du Portage I, C1 14 - 1st Floor, Box PCT 50 Victoria Street Gatineau, Quebec K1A 0C9 Facsimile No 001-819-953-2476	Authorized officer Jean Fortin 819- 997-7985	

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No
PCT/CA2008/000967

Patent Document Cited in Search Report	Publication Date	Patent Family Member(s)	Publication Date
FR2834815	18-07-2003	NONE	
DE19746559	01-10-1998	NONE	