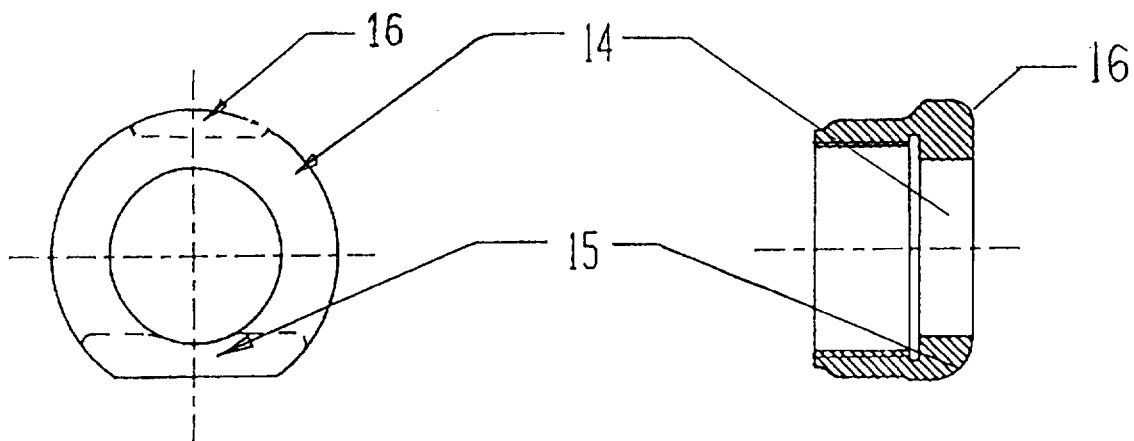




## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(54) Title: MOUTHPIECE FOR BRASS INSTRUMENTS, AND METHOD FOR MAKING THE SAME



## (57) Abstract

The invention relates to a mouthpiece, especially for brass wind instruments, having a cylindrical part connecting to the instrument and a flanged part engaging the lips, characterised by that the flanged part (11) engaging the lip comprises a first flange part (14) being rounded with a rotational symmetry and a second flange part (15) rounded along a straight line perpendicular to the longitudinal axis of the mouthpiece. The invention also relates to a method for making a mouthpiece, especially for brass wind instruments, where the parts with a rotational symmetry (cylindrical part, flanged part) is formed to the exact size by casting, pressing and/or cutting, characterised by that the first flange part (14) with a rotational symmetry on the flanged part (11) is machined first, preferably through cutting, e.g. turning, and following that the second flange part (15) rounded along a straight line is machined, preferably through cutting, e.g. milling.

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Mouthpiece for brass instruments, and  
method for making the same

5 Field of the invention

The invention relates to a mouthpiece for brass instruments,  
and method for making such a mouthpiece.

10

Background of the invention

In the contemporary literature concerning the methodology of  
wind brass instruments it is accepted that for wind instru-  
15 ments, e. g. trumpets the mouthpieces are formed with a plane  
flange or rim surface, having a regular circular form. The  
known literature is concerning only with the improvements of  
the human factors.

20 The firms and factories producing the mouthpieces honour the  
several hundred year old traditions, and though practically  
every part of the mouthpieces undergo changes and development  
for the sake of improved sound quality, the flange surface  
engaging the lips of the musician remained essentially  
25 unchanged. Thus the flange surface is not suitable for  
forming the lips to a proper shape and fixing them in  
position.

On trumpets and other brass instruments the place of creation  
30 of the sound, seen from a instrument-technical point of view,  
is the meeting point between the mouthpiece and the lips, the  
latter being supported by the teeth. The musician is striving  
to form two so called lip strings, placed against each other,  
having a defined length and tension. This is achieved by  
35 pressing the rows of teeth and the gums against the  
mouthpiece. The lip strings form a well-defined and

regulated-sized lip opening, and are fully fixed by supporting the mouthpiece against the teeth.

The German published document DE OS 33 30 459 discloses a mouthpiece with a non-plane surface. Here the supporting  
5 flange surface of the mouthpiece is formed as a concave cylindrical surface. This known solution does not adequately assist the creation of the sounds, because it does not shape and fix the lips properly, and hence it is not suited for the creation of clear sounds.

10

An other approach to solve the above-mentioned problem is disclosed in the Hungarian patent application No. P 92 04132. With this known solution the flange surface of the mouthpiece is formed to the individual lip shape of the musician. The  
15 mouthpieces so formed are suited to meet high demands, but they need a difficult modelling and their manufacture is lengthy and cumbersome.

20

Hence, it is the object of the present invention to define a mouthpiece that is simple to manufacture, and may be produced in series production with low cost, and which mouthpiece eliminates the problems of conventional mouthpieces, ensuring the perfect fit of the mouthpiece and the most proper pressure of the musician's lips. Further, it is an  
25 object of the invention to provide a method for making a mouthpiece according to the invention.

30

#### Summary of the invention

35

According to the invention, this is solved with a mouthpiece having a cylindrical part connecting to the instrument and a flanged part engaging the lips, where the flanged part engaging the lip comprises a first flange part being rounded with a rotational symmetry and a second flange part rounded along  
a straight line perpendicular to the longitudinal axis of the mouthpiece.

Preferably, the second flange part rounded along a straight line is formed on the flanged part where the flanged part is engaging the lower lip.

5 Advantageously, on the flanged part there is formed a third flange part rounded along a straight line, opposite of the second flange part engaging the lower lip. This is especially advantageous on mouthpieces of a larger size, making the placement of the mouthpiece easier, alleviating problems  
10 caused by the closeness of the nose to the mouth.

In a preferred embodiment, the mouthpiece is formed of two parts, the first part comprising a cylindrical part connecting to the instrument, and the second part comprising a  
15 flanged part engaging the lips of the musician, and the two parts are interconnected by means of a releasable connection. Advantageously, the cylindrical part and the flanged part are interconnected by means of a threaded connection.

20 The mouthpieces for brass instruments are normally made by manufacturing the cylindrical part, which attaches to the instrument and the flanged part engaging the lips of the musician to exact size by casting, pressing and/or cutting. According to an other aspect of the invention, the mouth-  
25 piece according to the invention is manufactured with a process where the first flange part with a rotational symmetry on the flanged part is machined first, preferably through cutting, e. g. turning, and following that the second flange part rounded along a straight line is  
30 machined, preferably through a cutting, e. g. milling.

#### Brief description of the drawings

35 A preferred, non-limiting embodiment of the invention is described in detail with reference to the accompanying drawings, where

Fig. 1. illustrates the structure of a known mouthpiece,  
Fig. 2a-b. is a schematic drawing illustrating the position  
of the mouthpiece on the mouth,  
Fig. 3. is a side view of the mouthpiece of the  
5 invention, partly in section,  
Fig. 4. is a front view of the flanged part of the mouth  
piece of Fig. 3, and  
Fig. 5. is a side sectional view of the flanged part of  
the mouthpiece of Fig. 3.

10

Detailed description of a preferred embodiment

Fig. 1 shows a mouthpiece with a generalised structure,  
having a flanged part 1, and attached thereto a funnel 2 with  
15 a relatively thick wall and with decreasing diameter,  
continuing with the cylindrical part 3, with the latter  
attaching to the music instrument. The flanged part 1, the  
funnel 2 and the cylindrical part 3 are all bodies of rota-  
tion having axial symmetry, with their inner and outer walls  
20 having circular cross sections. The general structure of the  
mouthpiece shown on Fig. 1. is the same for all brass inst-  
ruments, but the geometrical size is different with the  
different instruments. The exact values emerged through  
experiments and experience during a long time, and today  
25 these values are de facto standards. It is a great disadvan-  
tage of the mouthpieces with standard flange surface, that  
these do not take into consideration the functional and  
structural differences between the two rows of teeth and the  
lips, and thus they are not able to adjust to those diffe-  
30 rences. As a result, very few musicians are able to master  
the instruments perfectly.

The measurements made with the mouthpieces according to the  
invention have proved, that the mouthpiece ensures the  
possibility to create clear sounds in the full sound range of  
35 the instrument. This may be achieved with traditional  
mouthpieces only in exceptionally rare cases.

Fig 2a illustrates the placement of a generally formed mouthpiece, e.g. that of a trumpet on the mouth, the teeth and the gums, respectively. The flange surface 9 of the mouthpiece is limited by two concentric circles. As it is perceived from the drawing, the flange surface 9 covers mostly the upper teeth 4 and lower teeth 6, and covers to a small extent also the upper gums 5 and lower gums 7. Between the lips pressed against the flange surface 9 of the mouthpiece and the upper and lower teeth 4 and 6 there is formed the lip opening 8, whereby the lip strings are defined by the part of the lip opening 8 falling within the area covered and surrounded by flange surface 9. The mouthpiece itself and therewith the instrument is supported on the fixed upper teeth 4, whereas the width of the lip opening 8 may be varied by moving lower teeth 6. The tension of the lip strings is controlled by the facial muscles.

Fig. 2b shows the placement of the mouthpiece of the invention on the mouth, the teeth and the gums, respectively. As it is perceived from the drawing, the upper part of the flanged part of the mouthpiece is supported by the upper teeth and partly by the upper gum, while the lower part of the flanged part of the mouthpiece is supported only by the lower teeth. With this novel solution the position of the lower lips in relation to the flange surface 9 is changed, and a the forming of a regular lip opening 8, and therewith the creation of clear sounds is made possible.

The shaping of the mouthpiece according to the invention is shown on Figs. 3 to 5. The embodiment shown on the drawings are made of two parts, but a one-part design is also feasible. One of the two parts comprises the 12 funnel and the 13 cylindrical part connecting to the narrow end of the 12 funnel. These parts retain their dimensions characteristic of a given instrument. The other of the two parts is the flanged part 11 of the mouthpiece, which is connected releasable to the 12 funnel, on the embodiment shown with a threaded connection. The inner surface of the flanged part 11

is formed so that a smooth fit and transition to the inner surface of the funnel 12, providing a smooth continuation thereof. The flange surface of the flanged part 11 is formed so that it has a first flange part 14 being rounded with a rotational symmetry, and a second flange part 15, the latter being rounded along a straight line perpendicular to the longitudinal axis of the mouthpiece. The second flange part 15 is shaped so that its inner edge is approximately between the inner rim of the mouthpiece and 1/3-rd of the radius of the outer rim - measured from the central axis -, but never reaches the central axis of the mouthpiece. Opposite of the second flange part 15, there is a narrower, third flange part 16, also rounded along a straight line perpendicular to the longitudinal axis of the mouthpiece and parallel to the straight line of the second flange part 15 (Fig. 4.).

According to the invention, the mouthpiece with the variable flange cross-section is shaped so that the flange surface is pressing the lips of the person playing on the instrument exactly at the right position, and is fixing it at the same time. The forming of the necessary lip opening for sounding the instrument properly is greatly facilitated. The use of the instrument is not exhausting for the musician, even after longer playtime.



## Claims

1. Mouthpiece for wind instruments, especially for brass wind instruments, having a cylindrical part connecting to the instrument and a flanged part engaging the lips,  
5 characterised by that the flanged part (11) engaging the lip comprises a first flange part (14) being rounded with a rotational symmetry and a second flange part (15) rounded along a straight line perpendicular to the longitudinal axis  
10 of the mouthpiece.
2. Mouthpiece according to claim 1, characterised by that the second flange part (15) rounded along a straight line is formed on the flanged (11) part where the flanged part (11)  
15 is engaging the lower lip.
3. Mouthpiece according to claim 2, characterised by that on the flanged part (11) there is formed a third flange part (16) to be engaged with the upper lip and rounded along a  
20 straight line, opposite of the second flange part (15) engaging the lower lip.
4. Mouthpiece according to any one of the preceding claims, characterised by that the mouthpiece is formed of two parts,  
25 the first part comprising a cylindrical part (13) connecting to the instrument, and the second part comprising a flanged part (11) engaging the lips of the musician, and the two parts are interconnected by means of a releasable connection.
- 30 5. Mouthpiece according to claim 4, characterised by that the cylindrical part (13) and the flanged part (11) are interconnected by means of a threaded connection.
6. Method for making a mouthpiece, especially a mouthpiece  
35 for brass instruments according to the preceding claims, where the parts with a rotational symmetry (cylindrical part, flanged part) is formed to the exact size by casting, pressing and/or cutting, characterised by that the first

flange part (14) with a rotational symmetry on the flanged part (11) is machined first, preferably through cutting, e. g. turning, and following that the second flange part (15) rounded along a straight line is machined, preferably through  
5 cutting, e. g. milling.

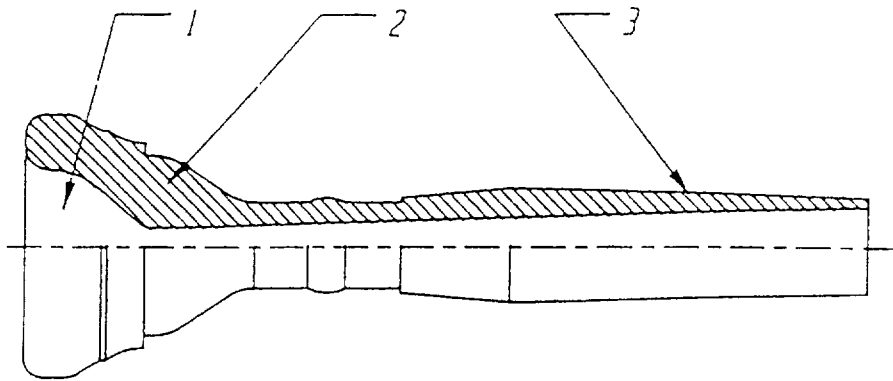


FIG. 1

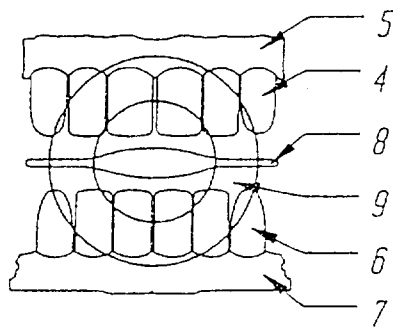


FIG. 2a

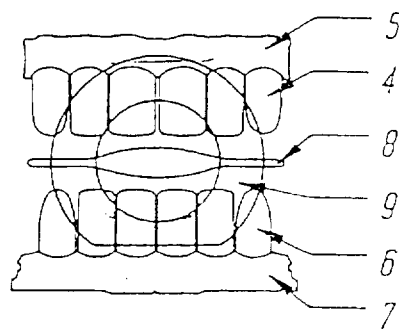


FIG. 2b

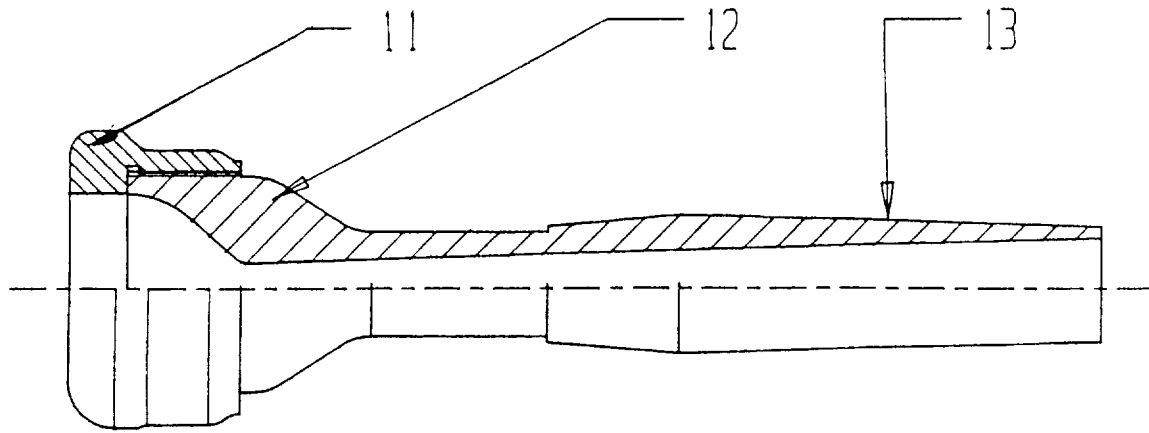


FIG. 3

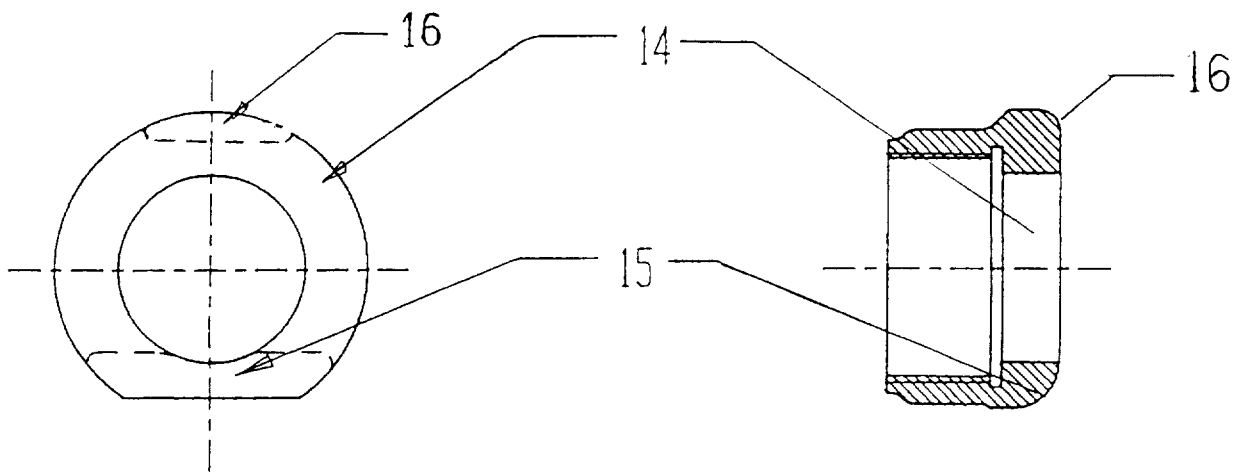


FIG. 4

FIG. 5

# INTERNATIONAL SEARCH REPORT

Intern. Application No  
PCT/HU 95/00059

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 6 G10D9/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC 6 G10D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages                                    | Relevant to claim No. |
|------------|---|-----------------------|
| A          | US,A,1 842 681 (A.A. LUNOW) 26 January 1932<br>see page 1, column 1, line 42 - column 2, line 71; examples 1,2<br>--- | 1                     |
| A          | US,A,1 655 656 (W.N. MORRIS) 10 January 1928<br>see figures 1,2<br>---  | 1                     |
| A          | GB,A,261 419 (P. AKA) 23 June 1927<br>see figures 1-4<br>-----  | 1                     |

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Date of the actual completion of the international search

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| US-A-1842681                           | 26-01-32         | NONE                    |                  |
| US-A-1655656                           | 10-01-28         | NONE                    |                  |
| GB-A-261419                            |                  | NONE                    |                  |