

- [54] **MOUTHPIECES FOR MUSICAL INSTRUMENTS**
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- [52] U.S. Cl.....**84/398**
- [51] Int. Cl.....**G10d 9/02**
- [58] Field of Search.....84/398, 399

[56] **References Cited**

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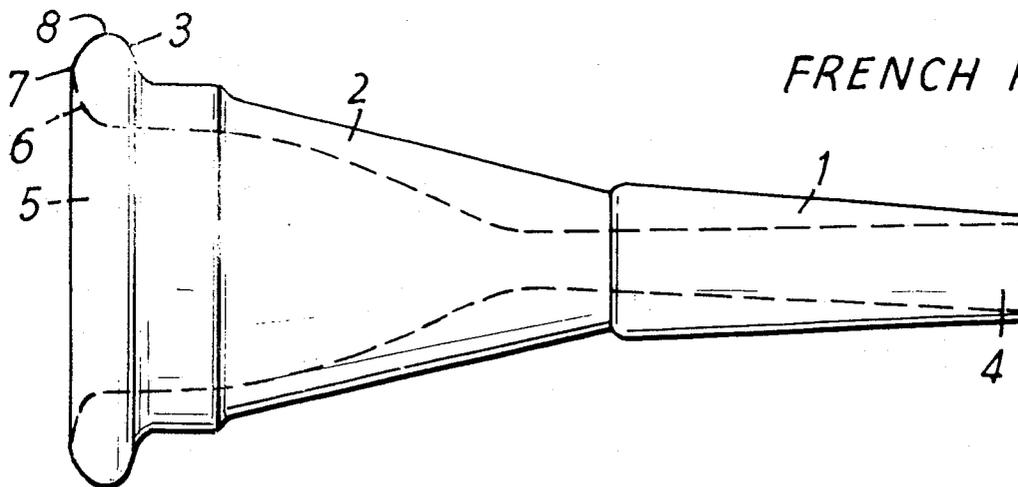
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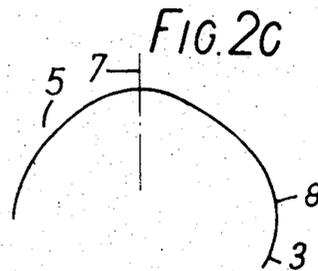
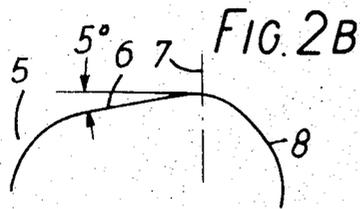
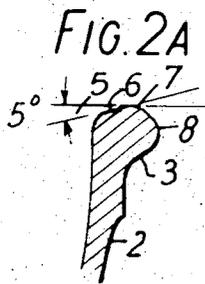
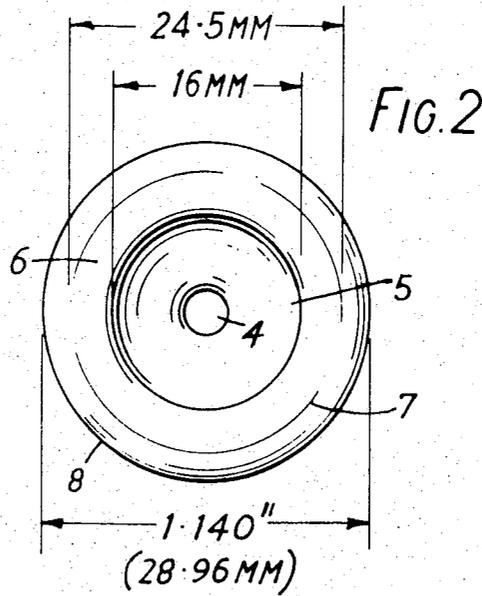
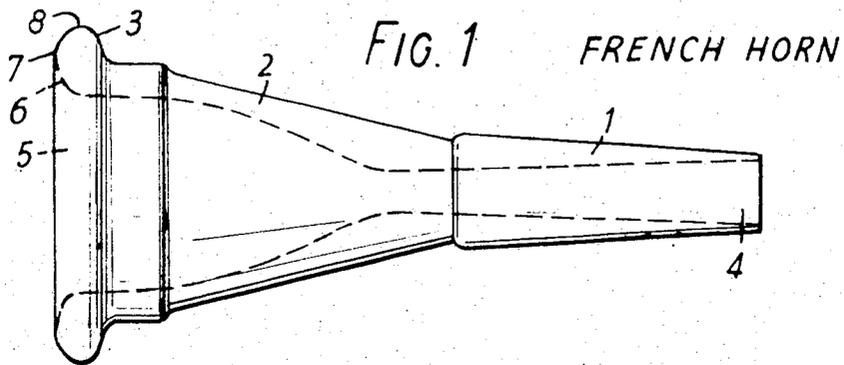
[57] **ABSTRACT**

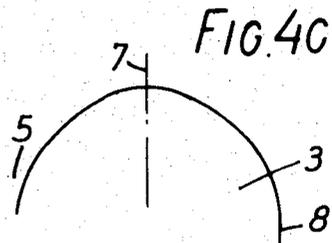
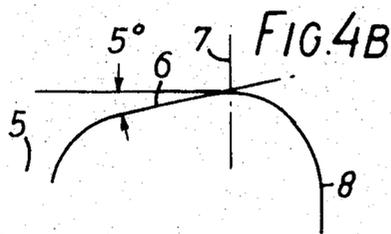
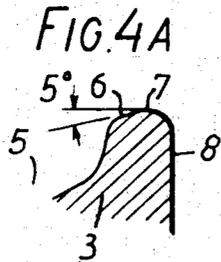
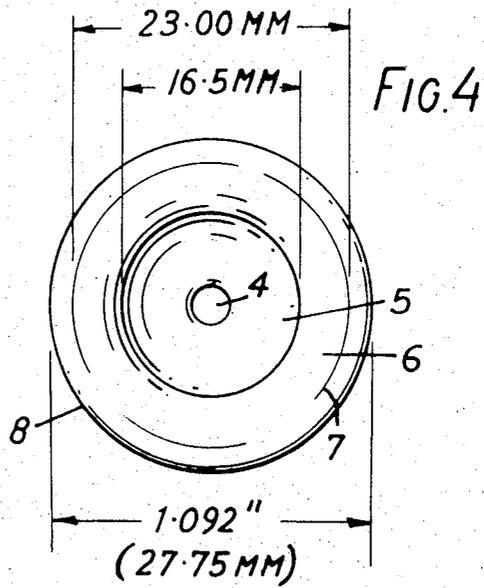
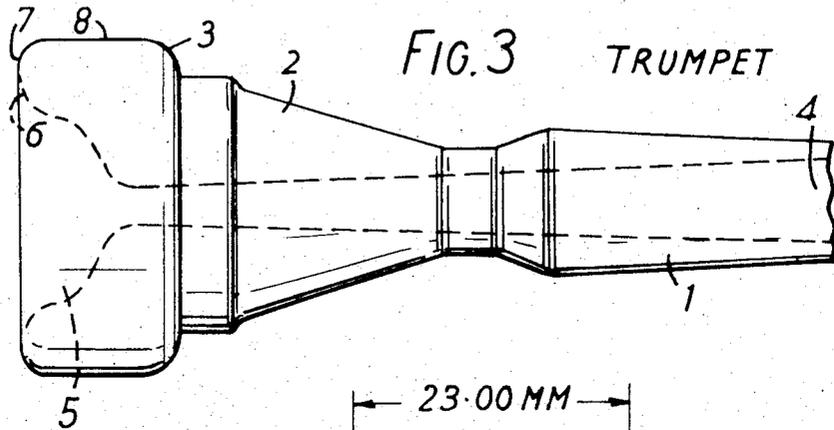
A mouthpiece, particularly for the orchestral brass instruments having an invert lay, whereby the ridge, or high spot, of the rim of the mouthpiece is sensed by the instrument player as being nearer the rim periphery than to the mouthpiece cup.

The contour of the mouthpiece, in axial cross-section, provides a radiused transition region from the mouthpiece rim to the outer periphery and a further radiused transition region from the mouthpiece rim to the inner cup. Therebetween is a flat region which is downwardly inclined in the inward direction, so providing the rim with a circular ridge which is nearer to the periphery than to the cup.

7 Claims, 10 Drawing Figures







MOUTHPIECES FOR MUSICAL INSTRUMENTS

This invention relates to mouthpieces for musical instruments, particularly, but not solely, mouthpieces for the French horn, cornet, trumpet and trombone.

Conventional mouthpieces for brass instruments provide a circular ridge, or high spot when the axial cross section on a radius is considered, from which ridge the rim falls away with a curved contour inwardly to the inner cup part and outwardly to the outer periphery. This high spot or ridge is ordinarily located at about the middle of the rim.

When a conventional mouthpiece is pressed to the lips of the player, it is found that this high spot or ridge pins the player's lips and restricts the vibratory movement required.

The object of the present invention is to provide an improved mouthpiece in this respect.

Accordingly, the invention provides a mouthpiece for a musical instrument comprising a rim having a contour, in axial cross-section, with a flattened region, intermediate the highest part of the rim and the inner cup, which is downwardly inclined towards the cup, thereby providing an invert lay of the mouthpiece against the player's lips.

This construction normally results in the highest part of the rim being nearer to the outer periphery than to the inner cup and may further provide a mouthpiece, as is the case for a French horn mouthpiece, which is wider than the conventional French horn mouthpiece.

In order that the invention may be readily carried into practice, two embodiments will now be described in detail, by way of example, with reference to the accompanying drawings, in which:

FIG. 1 is a side elevation view of a mouthpiece, according to the present invention, for a French horn;

FIG. 2 is an end elevation view of the mouthpiece of FIG. 1;

FIG. 2A is an axial cross section of part of the mouthpiece of FIGS. 1 and 2 showing the rim contour;

FIG. 2B is the axial cross section view of FIG. 2A to an enlarged scale;

FIG. 2C is a similar axial cross section of part of one conventional mouthpiece for a French horn;

FIG. 3 is a side elevation view of a mouthpiece, according to the present invention, for a trumpet;

FIG. 4 is an end elevation view of the mouthpiece of FIG. 3;

FIG. 4A is an axial cross section of part of the mouthpiece of FIGS. 3 and 4 showing the rim contour;

FIG. 4B is the axial cross section view of FIG. 4A to an enlarged scale; and

FIG. 4C is a similar axial cross section of part of one conventional trumpet mouthpiece.

FIGS. 1, 2, 2A and 2B show a French horn mouthpiece member having a tapered shank 1, which fits into a corresponding internally tapered end of a French horn. The mouthpiece has a conical portion 2 tapering outwardly to the mouthpiece rim 3. The mouthpiece member has an internal bore 4 which tapers down to a minimum bore within the conical portion 2 and then expands outwardly forming the mouthpiece cup 5.

The mouthpiece rim 3, as shown in section in FIG. 2A and enlarged in FIG. 2B, has a downwardly inclined circular flat region 6 which lies between the

mouthpiece cup 5 and the high spot, or circular ridge, 7 of the rim. Beyond the ridge 7, the contour rounds off to the outer periphery 8.

In this example, the mouthpiece member is 2½ inches in length with a tapered shank 1 of 1 1/32 inches length. The external taper of the shank 1 and the internal taper of the bore 4 are both 1½°. The external taper of the conical portion 2 is 15°.

The depth of the rim 3 is 3/16 inch and its external diameter is 1.140 inches, that is 29.0 mm. approximately. The mouthpiece size, that is the cup 5 diameter, is 16 millimeters and the diameter of the ridge 7 is 24.5 millimeters. Hence the ridge 7 is located at 2.25 millimeters from the outer periphery 8 and 4.25 millimeters from the cup 5. The radial width of the circular flat region 6 is nearly 2 millimeters and the angle of inclination towards the cup 5 is 5°.

By way of comparison, FIG. 2C shows the contour of a conventional mouthpiece, wherein the high spot or ridge 7 is central of the rim 3, midway between the cup 5 and the outer periphery 8, and there is no downwardly inclined flat part corresponding to the region 6 of FIGS. 2A and 2B.

FIGS. 3, 4, 4A and 4B show a trumpet mouthpiece member having parts corresponding to those of the French horn mouthpiece of FIGS. 1, 2, 2A and 2B, indicated by the same reference numerals.

In particular, as shown in FIGS. 4A and 4B, the high spot or ridge 7 of the rim lies nearer the outside 8 than to the cup 5 and, between the ridge 7 and the cup 5 lies a circular, flat, downwardly inclined part 6.

In this example, the mouthpiece member is 3 7/16 inches in length with a tapered shank 1 15/16 inches long overall, including a short portion of reverse taper. The external taper of shank 1 and the internal taper of bore 4 are both 1½°. The conical part 2 is of 15/16 inches length and 15° taper.

The depth of rim 3 is 9/16 inch and its external diameter is 1.090 inches, that is 27.74 millimeters. The mouthpiece size, that is the cup 5 diameter, is 16.5 millimeters and the diameter of the ridge 7 is 23 millimeters. Hence the ridge 7 is located at 2.37 millimeters from the outer periphery 8 and 3.25 millimeters from the cup 5. The radial width of the circular flat region 6 is rather less than 2 millimeters and the angle of inclination towards the cup 5 is 5°.

By way of comparison, FIG. 4C shows the contour of a conventional trumpet mouthpiece, wherein the high spot or ridge 7 is central of the rim 3, midway between the cup 5 and the outer periphery 8, and there is no downwardly inclined flat part corresponding to the part 6 of FIGS. 4A and 4B.

It will be understood that the examples given are by way of example and not limiting. Thus, the radius of the transitional surface between the inverse lay and the outer periphery may be varied. This will slightly vary the location of the ridge or high spot 7, a reduced radius taking the ridge or high spot 7 nearer to the outside. This radius may vary between 2 millimeters and 3 millimeters, at least.

The radius of the transitional surface between the inverse lay and the cup 5 may also be varied, but this change will not vary the position of the ridge or high spot 7.

The surface 6 is defined as flat, relatively to the continuously curved surface of conventional rims, as shown in FIGS. 2C and 4C, but the surface 6 may be flared outwardly and not precisely a conical surface.

Since the human lips are curved outwardly, a flat rim surface which is exactly at right angles to the axis, that is has no inverse lay, will give the player the subjective feeling of a high spot near the cup. Satisfactory limits for the angle of inverse lay are considered to be from 4° to 6°, but not greatly outside these limits. If the surface is flared, giving a curved surface 6, it is considered that the minimum angle of inverse lay, which will then be adjacent the ridge 7, should be about 4°.

Notwithstanding these recommended dimensional limits, the over-riding requirement for musical performance is that the player feels the high spot or ridge 7 to be located near the outside of the rim and nearer to the outer periphery 8 than to the cup 5, so giving the required freedom to the player's lips.

I claim:

1. A mouthpiece for a musical instrument comprising a rim having a contour with a flattened region, intermediate the highest part of the rim and the inner cup, which is downwardly inclined towards the cup, thereby providing an invert lay of the mouthpiece against the

player's lips.

2. A mouthpiece as claimed in claim 1, in which the flattened region is slightly flared outwardly from the cup to the highest part of the rim.

3. A mouthpiece as claimed in claim 1, in which the flattened region is downwardly inclined at an angle between 4° and 6°.

4. A mouthpiece as claimed in claim 1, in which the flattened region forms a part of the surface of a cone and has a uniform angle of downward inclination not less than 4° and not exceeding 6°.

5. A mouthpiece as claimed in claim 2, in which the angle of downward inclination of the flared surface varies, but is nowhere less than 4°.

6. A mouthpiece as claimed in claim 1, having a rim contour such that the highest part of the rim lies nearer to the outer periphery than to the inner cup.

7. A mouthpiece as claimed in claim 1, in which the radial distance of the rim, from the cup to the outer periphery, is between 10 millimeters and 15 millimeters and the highest point, or ridge, of the rim is located at approximately one-third this distance from the outer periphery.

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