- a mobile element placed in the axial seat of the nozzle body, having a front skirt-shaped portion and having a second output orifice, said mobile element being movable in translation in the axial seat towards the first output orifice under the effect of a gas pressure exerted on the mobile element until the front skirt-shaped portion of the mobile element protrudes outside the axial seat through the first output orifice, and

- an elastic element placed in the axial seat between the nozzle body and the mobile element exerting an elastic return force on the mobile element in a direction tending to move the mobile element ~~away from a part to be cut~~back into the axial seat,

~~characterized in that~~wherein the front skirt-shaped portion has an end portion in which the external diameter decreases progressively in the direction of the second output orifice.

As applicable, the nozzle according to embodiments of the invention may have one or more of the following technical features:

- the front skirt-shaped portion also has a cylindrical portion of substantially constant external diameter.

- the end portion has at least one bevel forming an angle (α) with the front face of the nozzle body.

- the angle of the bevel is between 0.1° and 80°, and preferably between 10° and 45°.

- the external profile of the end portion is truncated-cone-shaped.

- the external profile of the end portion has at least one curved portion.

- the external profile of the end portion has at least one convex portion.

- the at least one convex portion has a radius of curvature of between 0.1 mm and 2 mm.

- the cylindrical portion has an external diameter of between 3 mm and 8 mm.

- the end portion has an external diameter of between 2.5 mm and 7 mm at the second output orifice.

- when the mobile element moves in translation in the axial seat towards the first output orifice located at the front face of the nozzle body, the front skirt-shaped portion of the mobile element protrudes outside the axial seat through the first output orifice of the front face of the nozzle body.

- the bottom of the axial seat of the nozzle body has a shoulder, and the peripheral wall of the mobile element has a stop, the elastic element being positioned between the shoulder and the stop.

- at least one sealing element is placed between the nozzle body and the mobile element, for example one or more O-rings.

- said at least one sealing element is placed in a peripheral slot made in the external peripheral wall of the mobile element.

Claims

1. A laser nozzle for laser beam cutting including:

- a nozzle body having an axial seat and a first output orifice located at the front face of the nozzle body,

- a mobile element placed in the axial seat of the nozzle body, having a front skirt-shaped portion and having a second output orifice, said mobile element being movable in translation in the axial seat towards the first output orifice under the effect of a gas pressure exerted on the mobile element until the front skirt-shaped portion of the mobile element protrudes outside the axial seat through the first output orifice, and

- an elastic element placed in the axial seat between the nozzle body and the mobile element exerting an elastic return force on the mobile element in a direction tending to move the mobile element ~~away from a part to be cut~~back into the axial seat,

wherein the front skirt-shaped portion has an end portion in which the external diameter decreases progressively in the direction of the second output orifice.

2. The nozzle as claimed in the preceding claim, wherein the front skirt-shaped portion also has a cylindrical portion of substantially constant external diameter.

3. The nozzle as claimed in one of claims 1 or 2, wherein the end portion has at least one bevel forming an angle with the front face of the nozzle body.

4. The nozzle as claimed ~~in one of the preceding claims~~claim 3, wherein the angle of the bevel is between 0.1° and 80°, and preferably between 10° and 45°.

5. The nozzle as claimed in one of the preceding claims, wherein ~~the~~ an external profile of the end portion is truncated-cone-shaped.

6. The nozzle as claimed in one of the preceding claims, wherein ~~the~~ an external profile of the end portion has at least one curved portion.

7. The nozzle as claimed in one of the preceding claims, wherein ~~the~~ an external profile of the end portion has at least one convex portion.

8. The nozzle as claimed in claim 7, wherein the at least one convex portion has a radius of curvature of between 0.1 mm and 2 mm.

9. The nozzle as claimed in ~~one of the preceding claims~~claim 2, wherein the cylindrical portion has an external diameter of between 3 mm and 8 mm.

10. The nozzle as claimed in one of the preceding claims, wherein the end portion has an external diameter of between 2.5 mm and 7 mm at the second output orifice.

11. A laser focusing head having at least one focusing optic, wherein it also includes a laser nozzle according to one of the preceding claims.

12. A laser facility including a laser generator, a laser focusing head and a laser-beam conveying device linked to said laser generator and to said laser focusing head, wherein the laser focusing head is as claimed in claim 11.

13. The facility as claimed in claim 12, wherein the laser generator is a CO_2, YAG, fiber or disk laser generator.

14. A laser beam cutting method, the method comprising using a nozzle as claimed in one of claims 1 to 10, a laser focusing head as claimed in claim 11 or a facility as claimed in one of claims 12 or 13.