

Sonic system for obtaining high pressure for water jet cutting machine

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Description:

The patent offers a new solution of an abrasive water jet cutting machine with amplifier included in the cutting head. The novelty consists of a sonic transfer through pressure waves.

Problem to be solved

The technical problem solved by the invention is to provide an amplifier system which avoids the intrusion of the working fluid in the seal and which operates at high pressure without loss of flow, offering high energy efficiency and reliability.

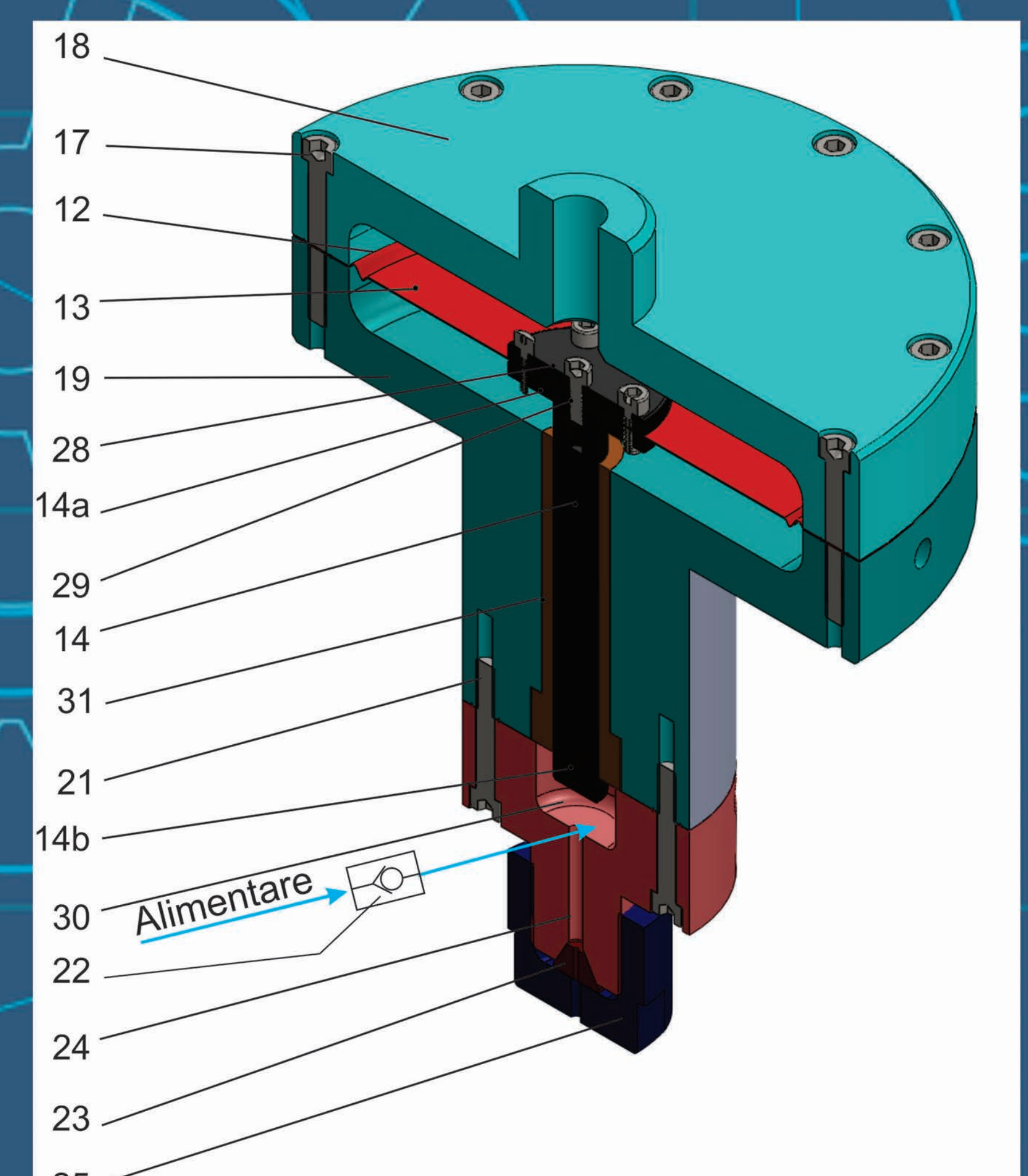
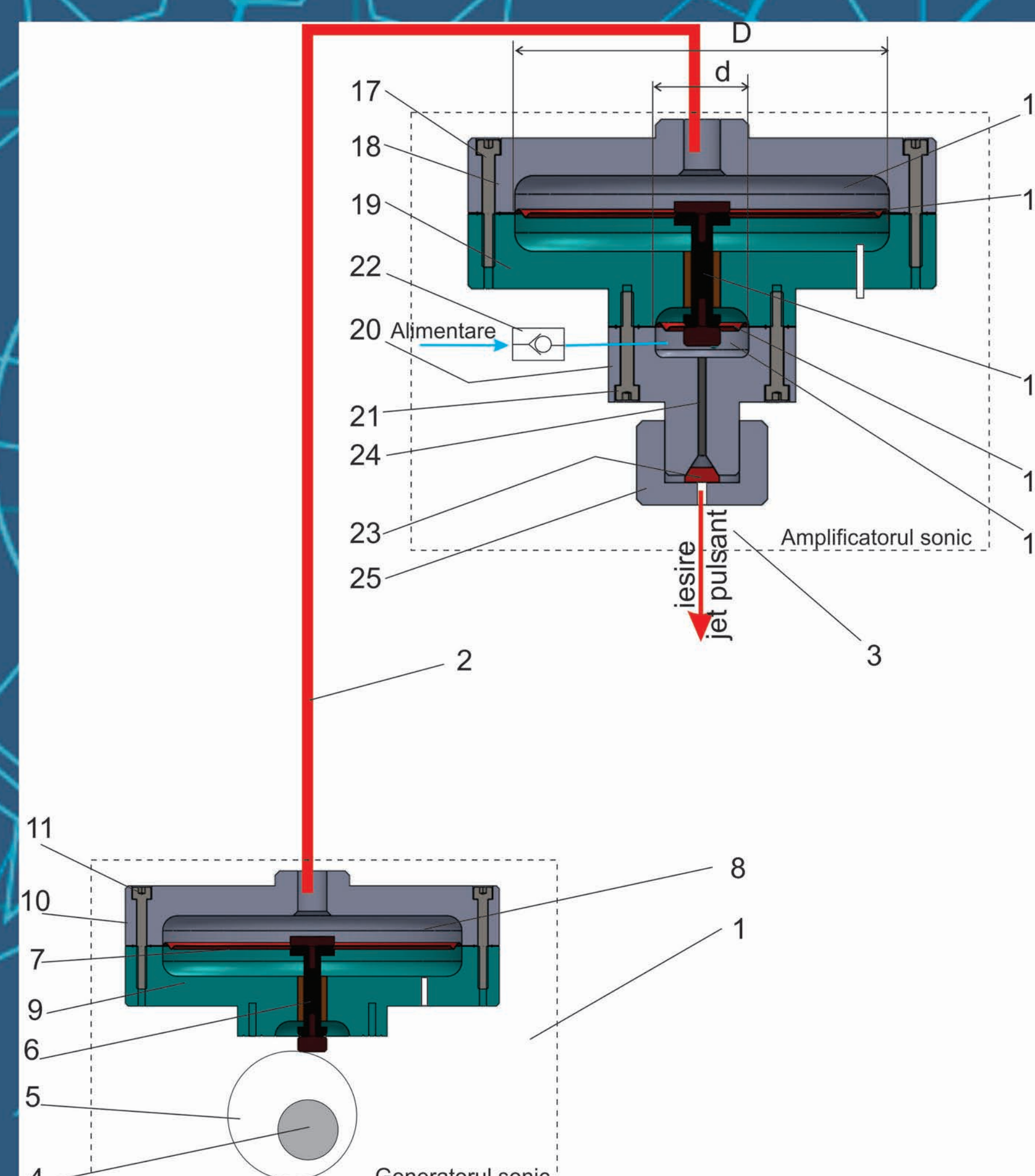
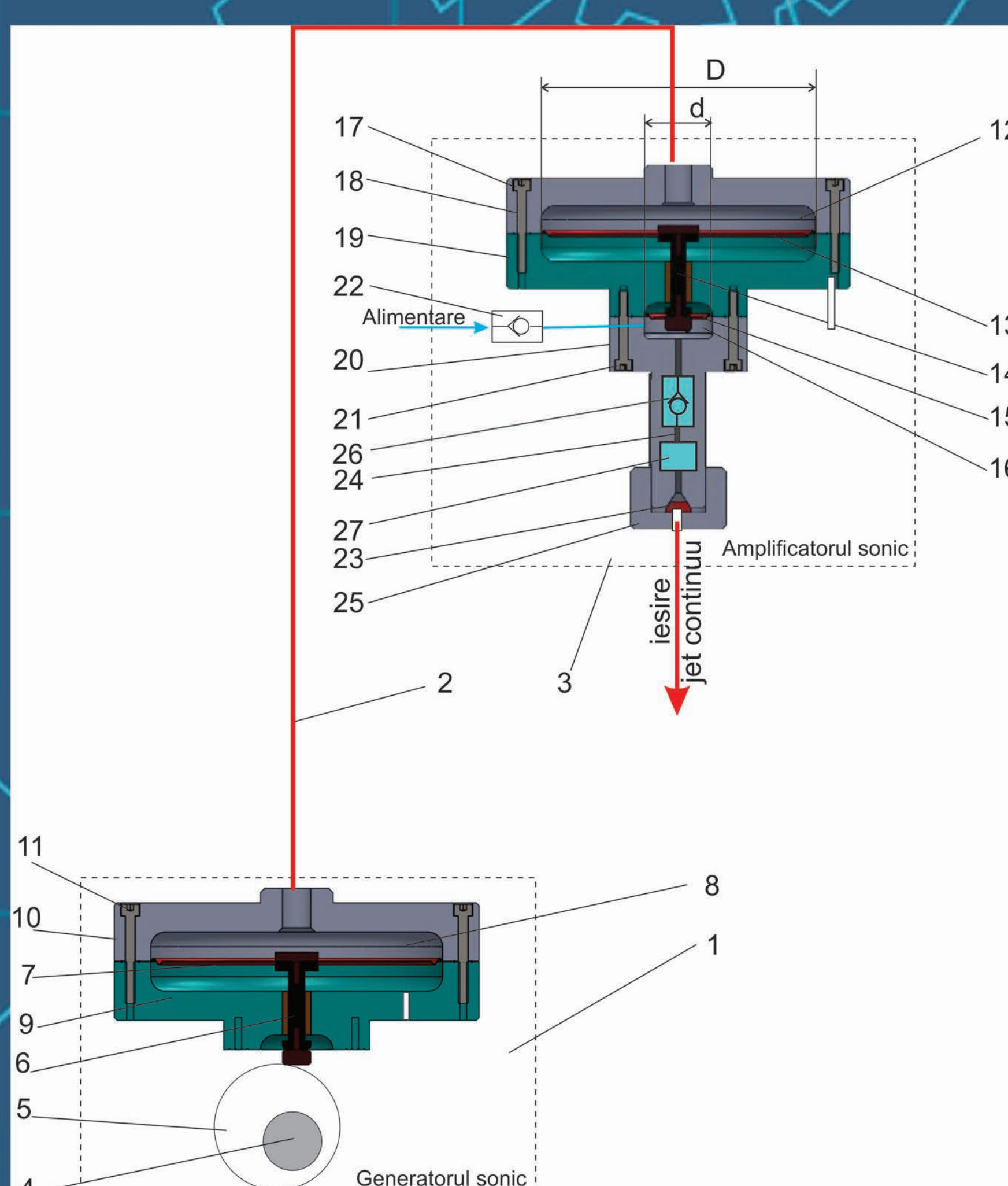
Solution

The high-pressure amplifier according to the invention solves the technical problem by using a sonic generator with a membrane which amplifies pressure and produces pressure waves working as a high pressure pump. Pressure amplification occurs due to the difference in diameters of the membrane 13 and the plunger 14 or the membrane 15 upon which it acts. The amplification factor is $(D/d)^2$, where D is the diameter of the membrane 13 and d is the diameter of the membrane 15 or the plunger 14.

The amplifier according to the invention has the following advantages:

- ☒ technological and constructive simplicity
- ☒ high reliability
- ☒ high volumetric efficiency because of no flow losses through the seal
- ☒ rapid change of membrane
- ☒ possibility of making membranes out of corrosion-resistant materials depending on the specific application

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Applicability:
machine tools