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(12) (19) (CA) **Demande-Application**

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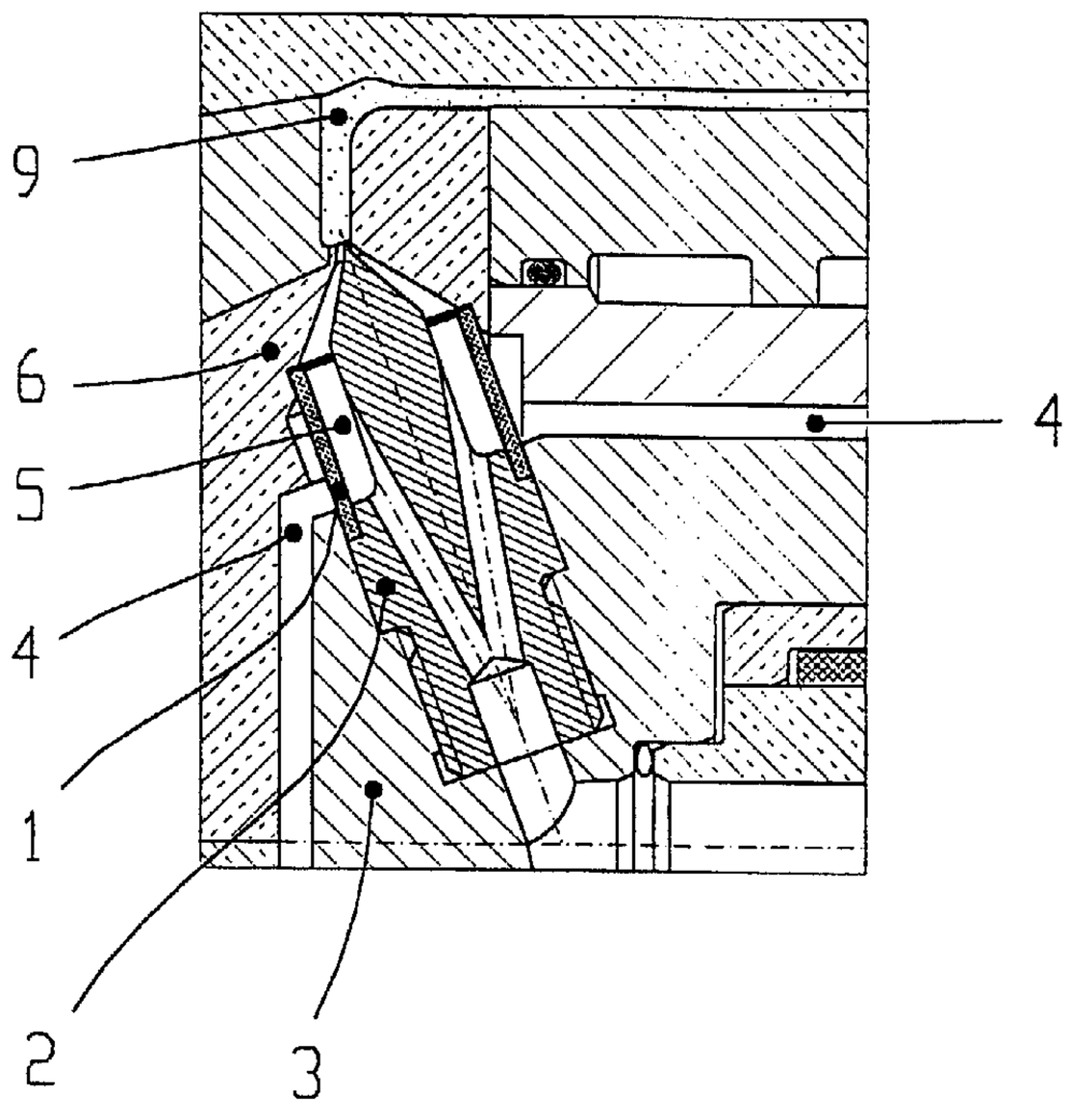
(54) **MANCHON MOBILE DISTRIBUTEUR DE LA MATIERE PLASTIQUE FONDUE PERMETTANT DE COMPENSER LA DILATATION THERMIQUE ENTRE LE CANAL DE CAROTTE CHAUFFE ET L'ENTREE DU MOULE**

(54) **MOVABLE MOLTEN MASS GUIDE SLEEVE TO COMPENSATE FOR TEMPERATURE-DEPENDENT EXPANSION BETWEEN THE HOT CHANNEL AND THE MOLD FEED ORIFICE**



(57) L'invention concerne un manchon dynamique distributeur de la matière plastique fondue, du type articulé, destiné à compenser les différences de dilatation dans le canal chauffant à écoulement interne isolé par des fentes d'aération, dans des moules d'injection pour transformer les matières plastiques. Les manchons de ce

(57) The invention relates to a dynamic molten mass guide sleeve with an articulated motion to compensate for differences in expansions in the inner flow hot channel with air gap insulation in injection molding of plastics. To date, fixed molten mass guide sleeves required extremely stringent location deviations and

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type, ancrés à demeure, revendiqués jusqu'à présent, présentaient des tolérances de montage extrêmement serrées et entraînaient souvent une rupture d'empreinte ou bien des fuites par suite de différences de dilatation. Le manchon décrit dans la présente invention, lequel comporte des lèvres d'étanchéité périphériques à ses deux extrémités et est monté entre le canal chauffant (3) et l'empreinte (6), compense le phénomène de dilatation thermique et permet, grâce à une étanchéification de la fente d'aération (4) une séparation thermique plus nette dans la région de l'entrée du moule d'injection.

often led to mold cavity ruptures or leakage as a result of differences in expansions. The inventive sleeve is fitted with peripheral sealing lips on both ends and is mounted in-between the hot channel (3) and the mold cavity (6). Said sleeve compensates for heat expansions and enables well-defined temperature separation in the mold feed orifice area of the injection mold by sealing the air gap (4).

(26360E.DOC Prt: 10.09.1999 CE)

Abstract

The invention relates to a dynamic molten mass guide sleeve with an articulated motion to compensate for differences in expansions in the inner flow hot channel with air gap insulation in injection molding of plastics. To date, fixed molten mass guide sleeves required extrremely stringent location deviations and often led to mold cavity ruptures or leakage as a result of differences in expansions. The inventive sleeve is fitted with peripheral sealing lips on both ends and is mounted in-between the hot channel (3) and the mold cavity (6). Said sleeve compensates for heat expansions and enables well-defined temperature separation in the mold feed orifice area of the injection mold by sealing the air gap (4).

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MOVABLE MOLTEN MASS GUIDE SLEEVE TO COMPENSATE FOR TEMPERATURE-DEPENDENT EXPANSION BETWEEN THE HOT CHANNEL AND THE MOLD FEED ORIFICE

Field of the Invention

Hot runner systems in injection molds for the treatment of thermoplastic materials.

Prior Art

Systems of the prior art have rigidly mounted molten mass guide sleeves. Their expansion must be calculated very precisely. These applications require extremely stringent mounting tolerances and often lead to mold cavity ruptures or leakage as a result of temperature differences. Higher temperatures may lead to ruptures since there is not enough room for the expansion. Lower temperatures may lead to leakage since there is too much play between the sealing lip and the feed orifice of the mold cavity.

Detailed Description of the Invention

The present invention relates to the feed orifice area in the air gap insulated inner flow hot runner system for the treatment of thermoplastic materials.

Hot runner systems are mounted in injection molding tools. Injection molding tools are mounted in injection molding machines. The injection molding machine introduces molten thermoplastic materials into the injection molding tool under high pressure (up to 2,500 bar) and at high temperatures (up to 400 °Celsius). The hot molten mass is supplied through the heated hot runner system to the cooled or tempered mold cavity (6).

Consequently, the heated hot runner system (3) is located in the cooled tool. The two parts must be thermally separated without prejudice to tightness.

In this respect, the better the insulation, the better the hot runner.

The best possible thermal separation is the air gap (4).

The temperature differences cause differences in expansion.

The molten mass guide sleeve (1) of the invention is the connecting piece between the heated hot runner system (3) and the cooler mold cavity (6 and 9).

The molten mass guide sleeve comprises a needle (2) which guides the molten mass (5) from the heated nozzle body (3) to the feed orifice in the mold cavity (6).

The heating causes a relative movement which is absorbed by the molten mass guide sleeve without losses in tightness despite high internal pressures and high temperature differences. The molten mass guide sleeve is characterized by cambered sealing lips at both ends at its circumference.

The cylindrical outlet of the heated nozzle body and the cylindrical inlet of the cooler mold cavity form the two sealing elements which cooperate with the molten mass guide sleeve. The molten mass guide sleeve is loosely mounted so that it can move like an articulation.

In the case of multiple nozzles or lateral feeding methods, minor geometrical errors due to the expansion of the heated hot runner system are inevitable. The outlet of the hot

nozzle body is not exactly aligned with the inlet of the mold cavity.

This error is compensated by the molten mass guide sleeve without any losses in tightness. In addition, the high internal pressure slightly inflates the sleeve and firmly presses the sealing lips against the circumference of the outlet and the inlet, thus ensuring absolute tightness.

This allows greater distances between the zero point of expansion of the nozzle body and the feed orifice of the mold cavity than in systems of the prior art.

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List of Drawings

FIG. 1 disposition of the molten mass guide sleeve in the case of an oblique application;

FIG. 2 disposition of the molten mass guide sleeve in the case of a radial application;

FIG. 3 disposition of the molten mass guide sleeve in the case of an axial application; and

FIG. 4 the molten mass guide sleeve of the invention, reference numerals 11 and 13 referring to the hot area, and numerals 12 and 14 referring to the cold area.

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Claims

1. Molten mass guide sleeve, characterized by an articulated motion in the case of expansion differences in the air gap insulated inner flow hot runner system.

2. Molten mass guide sleeve according to claim 1, characterized in that thermoplastic plastic material is guided from the heated nozzle body to the cooler mold cavity without leakage.

3. Molten mass guide sleeve according to claim 1, characterized in that internal pressures up to 2,500 bar and temperature differences up to 400 °Celsius can be bridged.

4. Molten mass guide sleeve according to claim 1, characterized in that the sleeve is loosely mounted and seals with the circumference at both its ends.

5. Molten mass guide sleeve according to claim 2, characterized in that an air gap is present between the heated nozzle body and the cooler mold cavity for insulation.

6. Molten mass guide sleeve according to claim 4, characterized in that a cambered sealing lip is provided at both ends on the circumference.

7. Molten mass guide sleeve according to claim 4, characterized in that the high internal pressure expands the sleeve, thereby providing a circumferential sealing action of the cambered ends.

8. Molten mass guide sleeve according to claim 4, characterized in that geometrical irregularities caused by differences in expansion are compensated.

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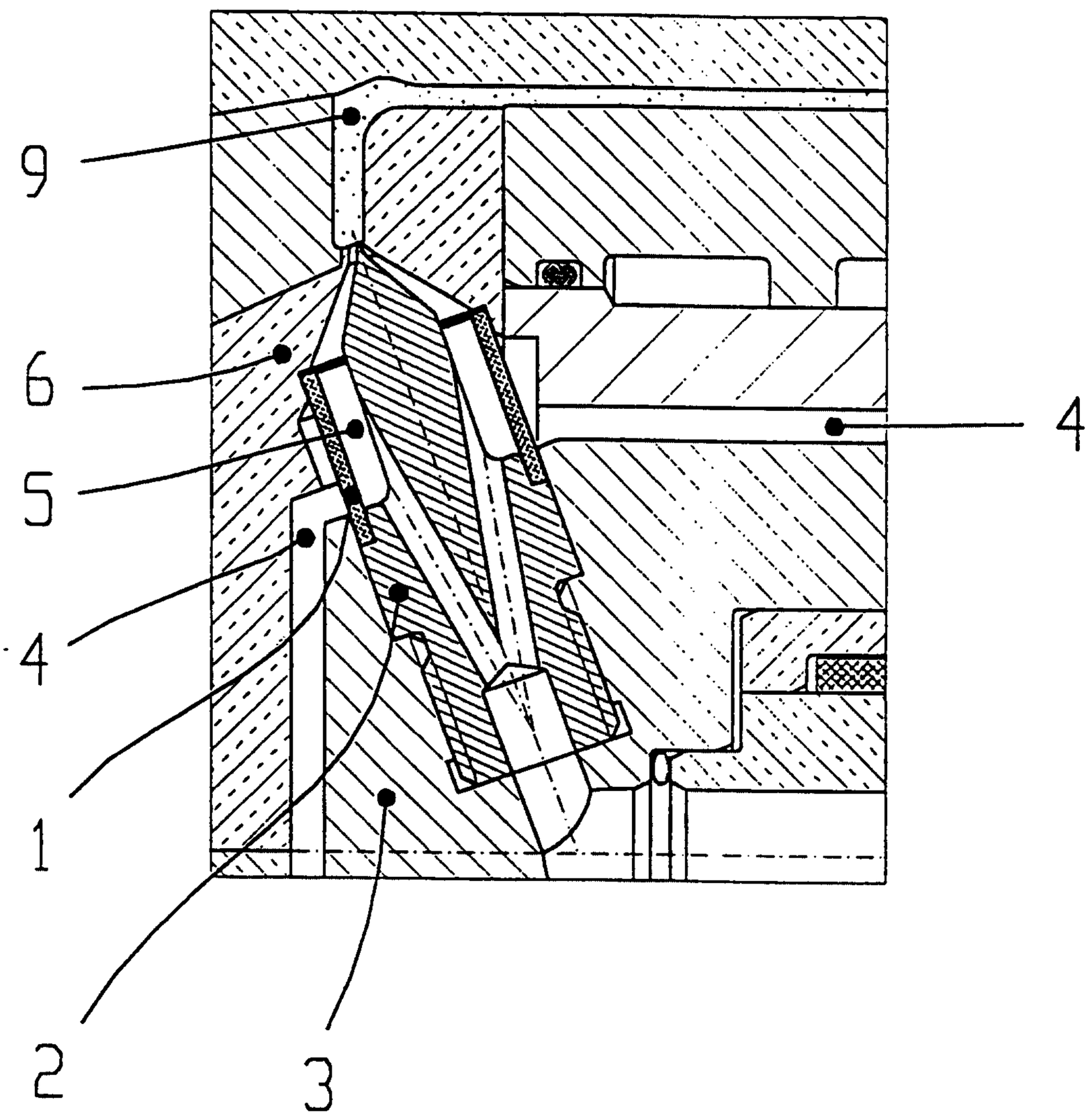

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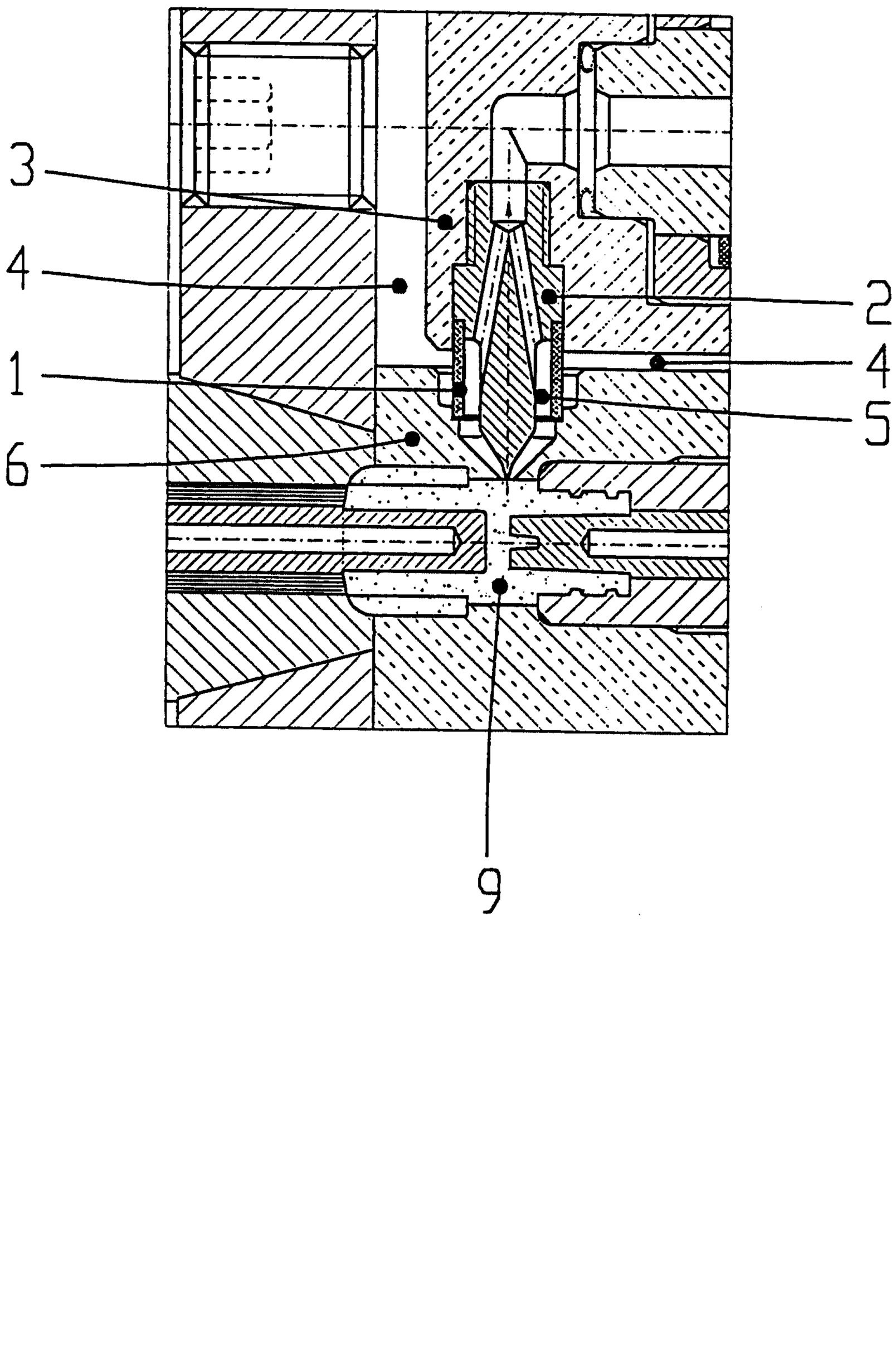

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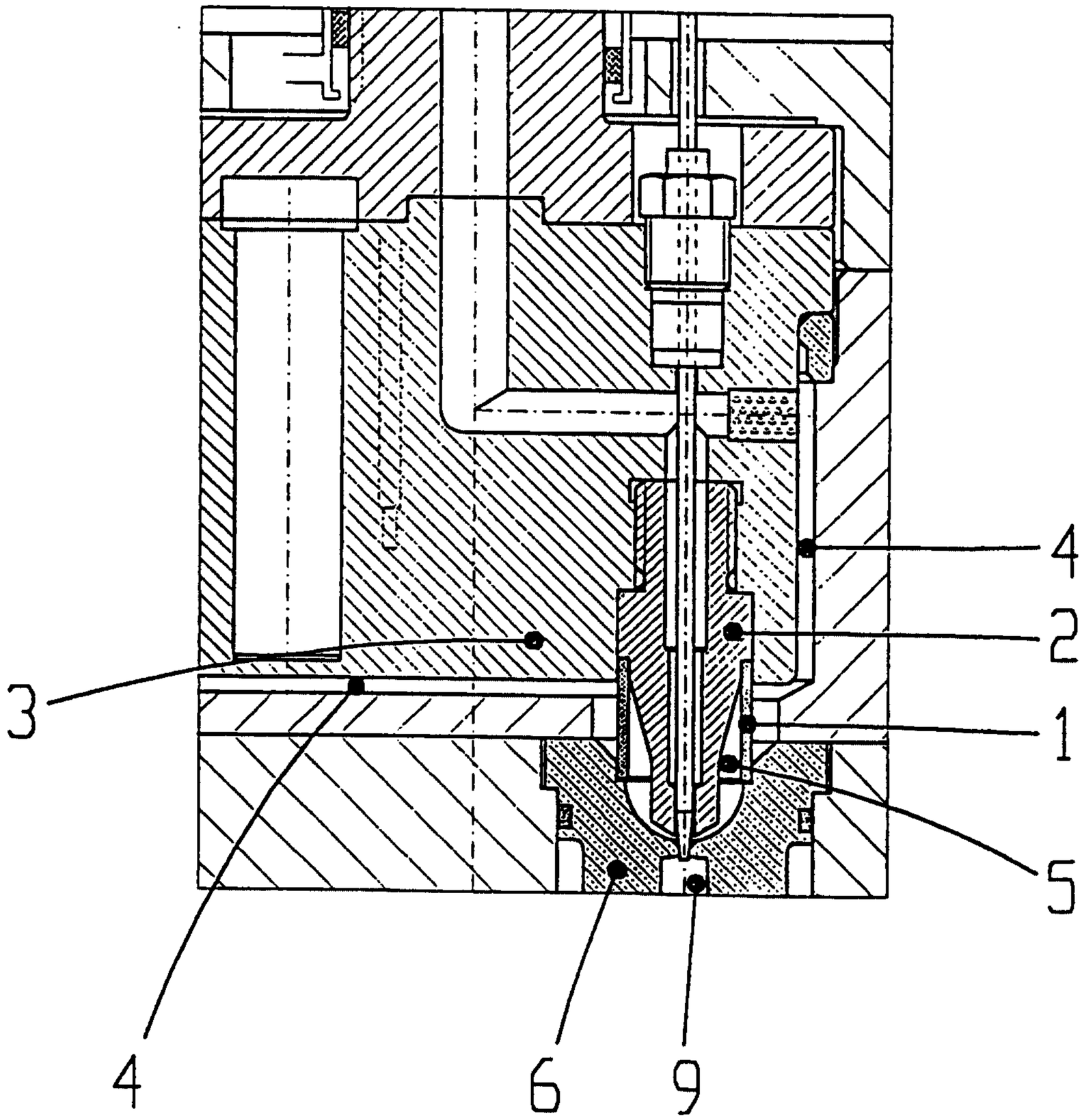

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