



METHOD AND MEANS FOR CONTROLLING FLOWRATE OF MOLTEN FLUID

IITM Technology Available for Licensing

Problem Statement

- Generally, in many applications, there is an indeed requirement of controlled flow of molten liquid materials.
- In the prior arts, the motors/regulators/ other media had discussed for controlling fluid flow.
- In essence of prior arts literature survey, there is **no separate device** for precise **control of molten liquid and cold liquids**, including control of molten liquid at low flow rates.
- Another issue stated that the solidification of the molten liquid due to cooling below the melting point. Hence, the present patent provides the solution to address the issues.

Technology Category/ Market

Chemical Engineering: Device for controlling flow of molten liquid

Industry: Fluid dynamics, Fluid mechanics, Semiconductor Manufacturing devices, Pharmaceutical, Chemical Plants;

Applications: Fluid Dynamics, Semiconductor Manufacturing devices, Pharmaceuticals, Chemical plants.

Market: The global computation fluid dynamics market attained a value of **USD 1.8** billion in 2020, and is expected to grow in the forecast period of 2023 to **2028** at a CAGR of **12%** to reach **USD 3.5** billion by **2026**.

Technology

- Present invention describes about a device for controlling flow of a molten liquid at a precise low flow rates, wherein maximum flowrate can be achieved is equal to the natural flow rate of the liquid, when it is not controlled.

- The device includes following elements as listed in below:

1

•A metal container with top and bottom nozzles with an on-off valves, wherein said container is partially filled with molten fluid & partially with air, & said nozzle and non-conducting pipe are filled with air ;

2

•A syringe or any airtight pump wherein syringe discharges said air into the metal container;

3

•A non conducting pipe to connect the syringe with metal container, and air released displaces the molten metal where the flow of air from the syringe pump controls the flow of molten liquid.

- The usage of a syringe pump helps to achieve very low rate with precision.
- The flow of air from the syringe pump controls the flow of molten liquid.
- Said device controls the flow of molten fluids, cold fluids and any other fluids, where control flow rates are required.
- Entire device is kept airtight together with the syringe pump.

Intellectual Property

IITM IDF Ref. 1355;

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TRL (Technology Readiness Level)

TRL- 3, Proof of Concept Ready Stage

Research Lab

Prof. Pushpavanam S;

Department of Chemical Engineering,
IIT Madras

CONTACT US

Dr. Dara Ajay, Head
Technology Transfer Office,
IPM Cell- IC&SR, IIT Madras

IITM TTO Website:
<https://ipm.icsr.in/ipm/>

Email: smipm-icsr@icsrpis.iitm.ac.in

sm-marketing@imail.iitm.ac.in

Phone: +91-44-2257 9756/ 9719

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Key Features / Value Proposition

❖ Technical Perspective:

1. The device can control the flow rate of **molten fluid** to **avoid solidification** of the molten liquid inside the device.
2. The device can control the flow rate of **molten fluids** and **cold fluids** and any **other fluids**, wherein the **controlled flow rates** are **required**.

❖ Industrial Perspective:

1. Patent literature used to **control the flow-rates** of **corrosive chemicals** since it **minimizes the exposure of the liquid to the surfaces**.

Images

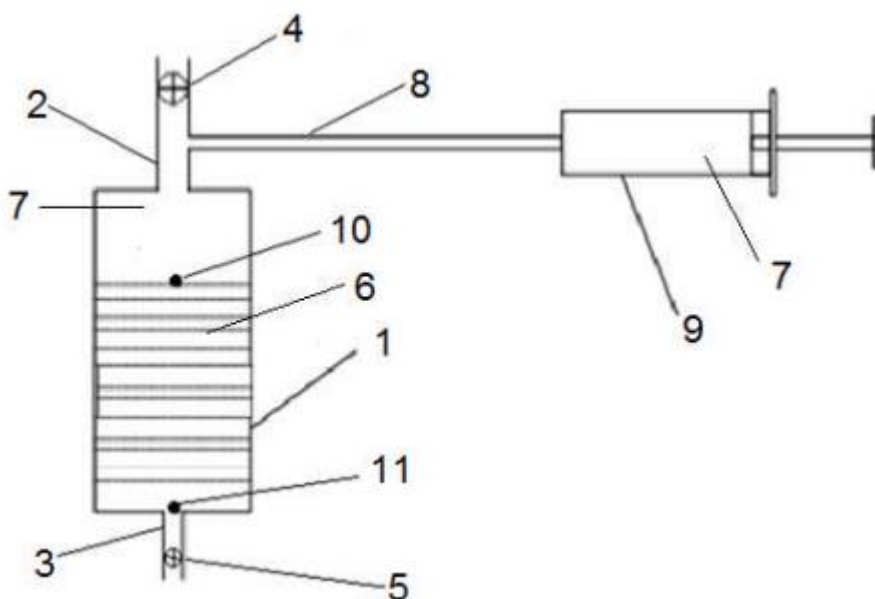


FIG. 1: Illustrates a device for controlling flowrate of the molten fluid

CONTACT US

Dr. Dara Ajay, Head
Technology Transfer Office,
IPM Cell- IC&SR, IIT Madras

IITM TTO Website:
<https://ipm.icsr.in/ipm/>

Email: smipm-icsr@icsrpis.iitm.ac.in

sm-marketing@imail.iitm.ac.in

Phone: +91-44-2257 9756/ 9719