

[54] **APPARATUS FOR PRODUCING FIBRES FROM MELTS**

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[22] Filed: **July 19, 1971**

[21] Appl. No.: **163,752**

[52] U.S. Cl. .... **65/1, 65/135, 65/136, 65/347, 13/6, 425/66**

[51] Int. Cl. .... **C03b 37/02**

[58] Field of Search. .... **65/1, 2, 11 R, 11 W, 65/113, 135, 343, 136; 13/6; 425/66**

[56] **References Cited**  
**UNITED STATES PATENTS**

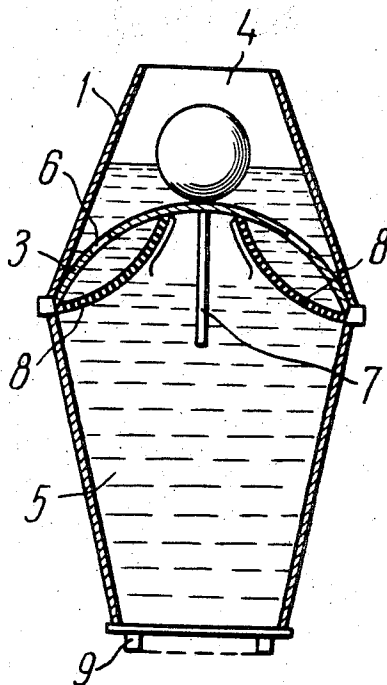
|           |         |                |        |
|-----------|---------|----------------|--------|
| 3,465,283 | 3/1949  | Schlehr .....  | 65/1   |
| 3,485,851 | 10/1949 | Stevens .....  | 65/1 X |
| 3,248,191 | 4/1966  | Canfield ..... | 65/1   |
| 3,479,167 | 11/1969 | Ashman .....   | 65/1   |

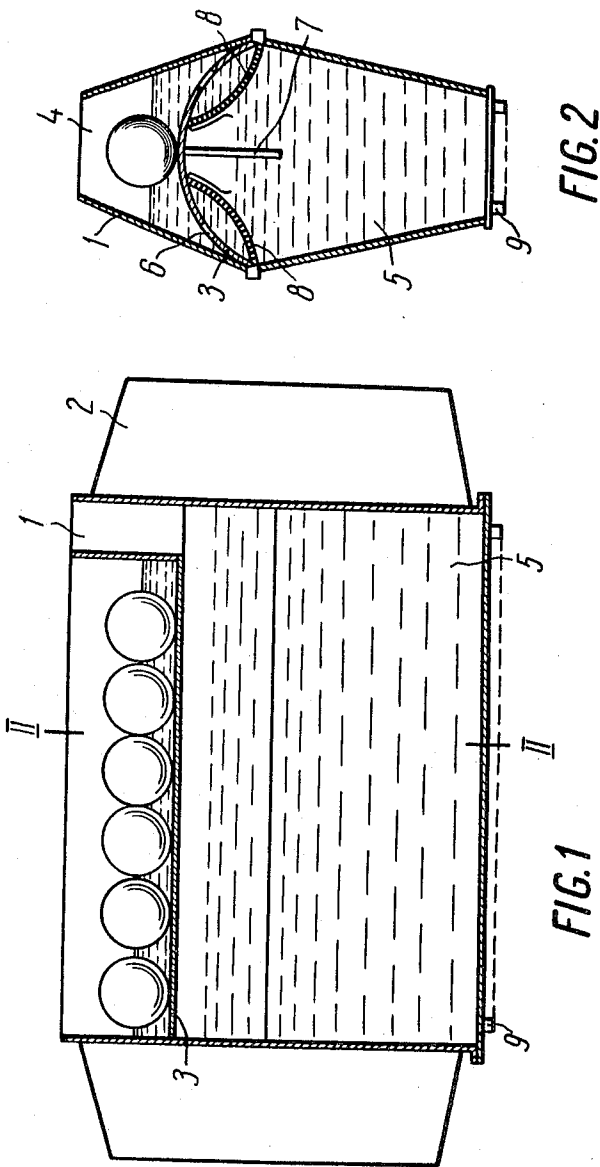
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[57] **ABSTRACT**

In the apparatus a cross partition serving as a heater and dividing the working chamber into a melting and a feeding zone has an upwardly convex shape, which together with an additional heater ensures intensification of the material melting process and the process of melt homogenization. This in turn permits a sharp increase in process efficiency and a reduction in the size of the structure.

**3 Claims, 2 Drawing Figures**





# APPARATUS FOR PRODUCING FIBRES FROM MELTS

The present invention relates to the manufacture of fibres from melts of thermoplastic materials, and more specifically to apparatus for producing fibres from the melts of such materials as glass, slags, minerals, etc.

Known in the art are apparatus for producing fibres from molten glass, wherein heating elements placed inside the housing are disposed so as to form a cross partition which divides the chamber into an upper melting zone, and lower feeding zone. The partitions have heretofore been made plane or convex downwardly.

For the melt penetration from the upper melting zone into the lower feeding zone, perforations are made in the partition (see, for example, US Pats. Nos. 3,013,095; 3,013,096; cl. 65-4, and 3,028,442, cl. 13-6).

The main disadvantage of the conventional apparatus for producing said fibres is the insufficient intensity of the glass melting process, as well as of the melt homogenation and degassing.

As far as we are aware, a certain increase in the process intensity has been achieved through enlarging the volume of the apparatus structure. As is known, this significantly (not less than 1.5 times) raises the consumption of the platinum-rhodium alloy wherefrom such apparatus are made; in addition, the enlargement of the apparatus also involves a sharp increase in the electric power consumption.

An object of the present invention is to eliminate the disadvantages of the conventional apparatus for producing fibres from melts.

Another object of the invention is to provide maximum heating of the melt surface layers in the feeding zone of the chamber, and to develop in these surface layers upward degassing and homogenizing melt flows.

With these objects in view, in an apparatus to produce fibres from molten thermoplastic materials wherein inside the working chamber there is placed a heating element made and disposed so as to form a cross partition having perforations for the melt penetration, according to the invention, the partition formed by the heater has an upwardly convex shape, and at least one additional heater is located under the latter partition.

Such a design rules out formation over the partition of any significant layer of the glass melt between the partition-heater and the remaining unmelted glass.

To provide optimum conditions for the melt degassing and homogenation the partition perforations most preferably are installed in the lower lying portions thereof.

When the perforations are disposed as described above, it is preferable to establish netted elements under the partition opposite the perforations.

Following is a detailed description of the invention in a particular embodiment thereof with references to the appended drawings, wherein:

FIG. 1 shows the apparatus for producing fibres from molten thermoplastic materials, in a section;

FIG. 2 is a section taken along line II-II in FIG. 1.

The apparatus comprises a housing 1 whose walls are heated by means of current conductors 2; mounted inside the chamber formed by housing 1 is a heater 3 made as a cross partition separating the chamber into an upper melting zone 4 and a lower feeding zone 5.

Perforations 6 for the melt penetration are made in the lower portions of the partition.

Under the partition-heater 3 one additional plate heater 7 is mounted along the apparatus under the highest portion of the partition. The inner heaters 3 and 7 are fed from the same current conductors 2.

The partition can also be made perforated all over its surface. In this case it is advisable to make the partition netted. Perforations 6 in the first-mentioned embodiment are made only along the lower edges of the partition, and they should naturally be wider as compared to the case when the partition is perforated all over its surface, so that the overflowing of the melt into the lower zone 5 of the chamber may be intensive enough. Disposition of the perforations along said edges of the partition enables maximum possible heating of the melt surface layer in chamber 5 to be generated by heater 7.

In the latter case, placed rather advantageously opposite perforations 6 below the partition should be netted elements 8 to provide for homogenation of the melt issuing from perforations 6.

Any thermoplastic material can be used for manufacturing fibres, such as glass, slags, minerals, etc.

The thermoplastic material in the form of lumps, grains, etc. is continuously supplied into the upper, i.e., melting, zone 4 of the chamber of the apparatus. Upon contacting the heated walls of the housing and the heater 3 the material melts, its melt overflowing through perforations 6 into the lower zone 5 of the chamber. Having issued from perforations 6 the melt then passes through the netted elements 8 being thereby homogenized.

Since heater 3 has the form of an upwardly convex partition, the melt actively flows down the surface of heater 3, thus the beads of the unmelted glass are always practically in direct contact with heater 3. This intensifies the material melting process. Also, due to the convex shape of the partition the melt passing through the perforations flows down its inner surface in a thin layer from the centre to the periphery. Thus, the melt flows to the high-temperature zone in thin layers, and the volume of the lower part 5 of the chamber is filled with melt from the periphery.

As a result, optimum conditions are provided for overheating the melt surface layers, thus forming upward flows which intensify the process of the melt homogenation. Then the melt enters orifices 9 and issues therefrom in jets to be formed into fibres.

Due to the above-described design of the apparatus resulting an intensified process of glass melting and melt homogenation, maximum efficiency can be achieved with the size of the apparatus being 1.5 times less than conventional apparatus.

What we claim is:

1. An apparatus for producing fibres from molten thermoplastic materials, comprising: a housing; a heater in said housing disposed so as to form an upwardly convex cross partition; perforations in said cross partition serving to let through the melt; at least one additional heater located below said partition; and orifices arranged in the lower part of the housing and serving to form the fibres.

2. An apparatus as in claim 1, wherein said perforations in said partition are located in its lower portions.

3. An apparatus as in claim 2, wherein located below said partition opposite said perforations are netted elements.

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