(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 547 700 A1**

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **92203901.1**

(51) Int. Cl.5: **D01D 4/06**

(22) Date of filing: **12.12.92**

(30) Priority: **19.12.91 IT MI913420**

(43) Date of publication of application:
23.06.93 Bulletin 93/25

(84) Designated Contracting States:
AT BE CH DE DK ES FR GB GR IE LI LU MC NL PT SE

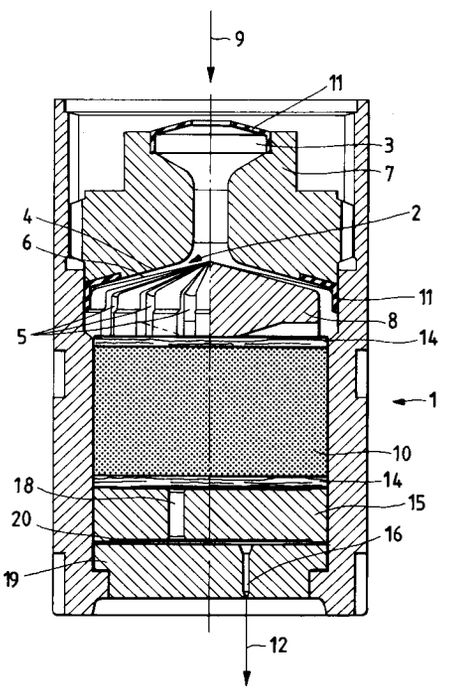
(71) Applicant: **SAVIO S.p.A.**
Via Udine 105
I-33170 Pordenone(IT)

(72) Inventor: **Prodi, Paolo**
Via Cavour 3
I-48100 Ravenna(IT)
Inventor: **Pasotti, Daniele**
Via Emilia 237
I-40026 Imola, Bologna(IT)
Inventor: **Pini, Mauro**
Via Ciamei 10
I-48018 Faenza, Ravenna(IT)

(74) Representative: **Henke, Erwin et al**
Ing.Barzanò & Zanardo Milano S.p.A. Via Borgonuovo, 10
I-20121 Milano (IT)

(54) Distributor disc for molten thermoplastic material, for a spinning head.

(57) The invention provides a distributor disc (8) for molten thermoplastic material feeding a spinning head for spinning synthetic yarn, said distributor disc (8) having an upper conical crown-like surface (6) provided with a plurality of concave radial grooves (5) shaped with their cross-section substantially in the form of a circular arc which gradually increases in size from the centre to the periphery at the grooved outer circumferential edge.



EP 0 547 700 A1

This invention relates to a distributor disc for molten thermoplastic material fed to a spinning head for spinning plastic masses, to obtain synthetic yarn. The mass to be spun is fed onto said distributor disc, so that in flowing over its conical crown-like surface it is distributed uniformly by a plurality of concave radial grooves in spoke arrangement, which converge with, and expel the molten thermoplastic material into, grooves in the outer circumferential edge of the disc.

It is known to produce yarn from thermoplastic masses, such as polyesters, polyamides etc., by the extrusion spinning method. In this respect, the mass of thermoplastic synthetic material to form the yarn is preferably fed by an extrusion press along a central channel to the inlet of a spinning head, from which the yarn emerges through sized nozzles to be collected on winding devices.

The starting polymer in the solid state passes initially through a heating process in which it is melted to the liquid state, after which it is fed by an extrusion press or any other suitable member to the actual spinning block.

This spinning block comprises in practice a disc for distributing the molten polymer entering the underlying filter block. In known constructions, this molten polymer distributor disc has substantial drawbacks, related to the formation of static molten masses, ie residual material which solidifies in the corners between the wall of the spinning block and the surface of the distributor disc. The residual material which solidifies during spinning on the one hand contributes hydrodynamic resistance to the flow of the molten polymer, and on the other hand after a more or less lengthy period of operation reduces the passage cross-section, to finally block the spinning process.

Again, any residues which disintegrate and reach the seats of the underlying spinning nozzles can negatively influence the spinning process underway. The applicant, after careful research, has conceived a distributor disc for molten thermoplastic material, the subject of the present invention, which obviates the aforesaid drawbacks by an original solution which makes it impossible for any residual molten material to solidify by stagnancy. Said distributor disc for thermoplastic material comprises a conical crown-like surface in which there are provided a plurality of concave radial grooves with their cross-section gradually increasing from the centre to the periphery at the grooved outer circumferential edge. Said concave radial grooves are arranged as spokes uniformly distributed over the conical crown-like surface of the disc, each concave radial groove converging with and opening into a respective groove in the grooved outer circumferential edge. Said grooves in the outer circumferential edge are of substantially rectangular shape with sufficiently rounded corners.

The present invention will be more apparent with reference to the accompanying drawing, which shows one embodiment of the claimed distributor disc.

The figure of the single accompanying drawing shows a schematic section on a vertical axis though a spinning block comprising the distributor disc for molten thermoplastic material of the present invention.

The polymer in the molten liquid state is fed under pressure in the direction 9 into the central entry duct 3 of the spinning block 1. All this is well known to the expert of the art. As is also known, the path for the molten polymer entering the spinning block 1 must be made fluid-tight by gaskets 11 of suitable material. The molten polymer flows under pressure through the central duct 3 in the block 7 and onto the conical crown-like surface 6 of the distributor disc 8. Said molten polymer is distributed circumferentially and flows uniformly along the direction 2 within the circumferential space between the surfaces 6 and 4. On said surface 6 the molten polymer is obliged to enter concave radial grooves 5 in spoke arrangement, said radial grooves 5 being concave and with their cross-section gradually increasing in size from the centre of the conical surface 6 to the periphery at the grooved outer circumferential edge of the distributor disc 8.

The cross-section gradually increases in size in order to maintain the circumferential passage section for the molten polymer substantially constant. This latter flows uniformly into the discoidal space 14, to pass through the filter block 10 and then into the underlying discoidal space 14, from which it leaves to pass through the plate 15 via the sized passage holes 18, from which it emerges to flow firstly into the discoidal space 20 and then through the sized nozzles 16 in the plate 19. From the plate 19, which represents the actual spinning element, the molten polymer leaves in the direction 12 in its final spun yarn form to be collected on an underlying winding unit (not shown).

The description is given by way of example only, it being apparent that modifications in terms of detail can be made to the distributor disc according to the present invention, but without leaving the scope of the inventive idea as claimed hereinafter.

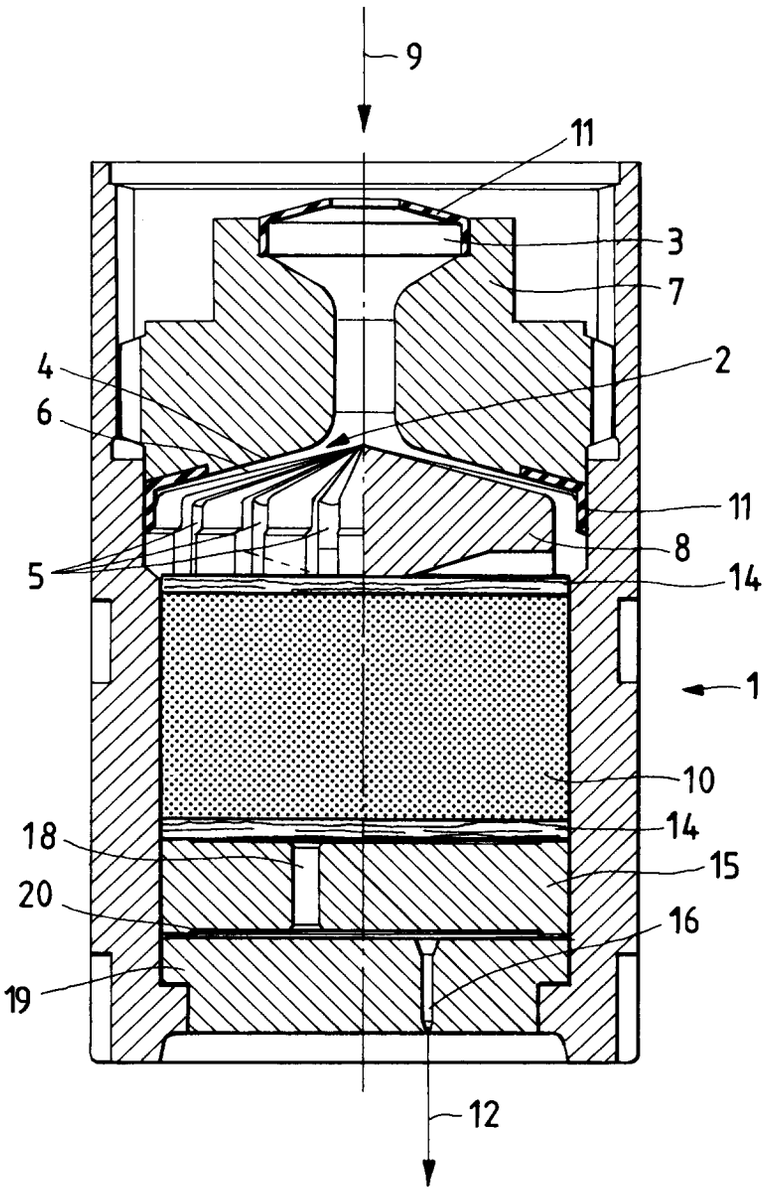
Claims

1. A distributor disc for molten thermoplastic material feeding a spinning head for spinning plastic masses, to obtain yarn or similar filiform elements, the molten mass being fed to said disc by a screw press or pump via a duct

delivering to the centre of said disc a metered quantity of spinning mass, which flows over the curved conical crown-like surface of the disc and into the underlying filter block, to pass under pressure to a plate carrying a series of nozzles as the actual spinning implement, said distributor disc being characterised by comprising in its conical crown-like surface a plurality of concave radial grooves with their cross-section substantially in the form of a circular arc which gradually increases in size from the centre to the periphery at the grooved outer circumferential edge.

2. A distributor disc for molten thermoplastic material feeding a spinning head as claimed in claim 1, characterised in that the concave radial grooves are arranged as spokes uniformly distributed over the conical crown-like surface of the disc, each concave radial groove converging with and opening into a respective groove in the grooved outer circumferential edge.

3. A distributor disc for molten thermoplastic material feeding a spinning head as claimed in claim 2, characterised in that the grooves in the outer circumferential edge are of substantially rectangular shape with sufficiently rounded corners.


9
11
3
7
4
2
6
11
8
5
14
1
10
18
14
15
20
16
19
12

European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 92 20 3901

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	US-A-3 762 850 (HELMUT WERNER ET AL.) ---		D01D4/06
A	SOVIET INVENTIONS ILLUSTRATED Section Ch, Week 8303, 2 March 1983 Derwent Publications Ltd., London, GB; Class A, AN 83-06904K & SU-A-912 781 (SYNTH FIBRES RES) 17 March 1982 * abstract * -----		

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

D01D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	26 MARCH 1993	TARRIDA TORRELL J.B.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P0401)