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(54) **Thread texturising nozzle.**

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Description

The present invention relates to a thread texturising apparatus comprising a texturising nozzle through which the thread moves along a substantially predetermined path. The thread is subjected to a treating fluid, generally a gas or vapor, while passing through the nozzle. The term «thread» when used herein refers to any continous textile element, particularly but not exclusively synthetic filamentary material, whether mono-filamentary or multi-filamentary.

The invention relates to a generally known type of thread texturising nozzle for a generally known process adapted to texturise a thread by action of a treatment fluid thereon. The nozzle has a texturising chamber in which the main texturising action occurs. This chamber is elongated and defines one section of a thread path extending through the nozzle. The chamber has a perforated wall through which treatment fluid can leave the chamber generally transversely of the path. The nozzle also has means to bring together the fluid and the thread and lead them into the chamber. Prior to the texturising chamber, the fluid preferably exerts a forwarding action on the thread, urging it into the chamber, but this forwarding action is at least substantially reduced and may cease after the fluid enters the chamber due to the exit of fluid through the perforations. The chamber is designed to produce severe turbulence in the fluid therein and/or vibrations, possibly even at a resonance frequency. The fluid is preferably hot, in the form of a vapor or gas; air is preferred although steam may also be used. The temperature of the fluid and the residence time of the fluid and thread in the nozzle prior to entering the texturising chamber, but after being brought together, are preferably such as to heat the thread to an approximately predetermined temperature dependent on the material of the thread and preferably close to the plasticising temperature of the thread. The perforations in the chamber wall are preferably in the form of slits extending along and generally evenly distributed about the thread path.

Thread texturising nozzles of the above general type, are shown in US Patents 3 714 686, 3 908 248, 3 950 831, 4 014 084 and 4 100 659 in the name of B.A.S.F., US Patents 3 983 610 and 4 095 317 to Akzona, German Published Specifications DE-A-2 632 083 to Barmag and US Patents 3 802 038 and 3 849 844 to Neumünstersche Maschinen- und Apparatebau GmbH.

There is a problem which is of special significance in relation to nozzles required for processes, such as texturising, which are relatively complex and which can have a significant influence on the properties and characteristics, e.g. the dyeability, of the thread material itself. In such nozzles, small variations in performance from nozzle to nozzle, or in a given nozzle over time, can produce noticeable variation in the characteristics of the thread. This leads at least to difficulties for the end user of the thread if not to production of poor quality goods from such thread e.g. woven material which exhibits «streaks» because of dyeing variations in the threads used. The achievement of controllable uniformity of operating characteristics of a series of manufactured texturising nozzles raises very serious problems of accurate manufacture at acceptable cost levels.

It is an object of this invention to enable design of a texturising nozzle of a particular, defined type to facilitate accurate manufacture to give controlled, reproduceable characteristics of the textured thread.

The invention provides a thread texturising nozzle in which thread can be texturised while moving along a generally straight path through the nozzle, the nozzle comprising

– means to bring together a thread to be texturised and a treatment fluid at a junction location on said path,

– a texturising chamber providing a section of said path downstream from said junction location considered in the direction of movement of the thread through the nozzle and having a perforated wall to permit fluid to pass out of the chamber in a direction transverse to the path, and

– a guide passage providing said path between said junction location and said texturising chamber, characterised in that

– said means to bring together thread and fluid comprises a thread infeed passage opening onto said junction location and single fluid infeed passage extending along an axis inclined at a small angle to the thread infeed passage and debouching onto said junction location,

– said fluid infeed passage being provided by an open-ended bore of a tube securing means being provided releasably to secure said tube in a passage leading to said guide passage such that all treatment fluid entering the guide passage must flow through said tube.

By way of example a two-part openable and closable nozzle according to the invention, together with variations thereof, will now be described with reference to the accompanying drawings in which:

Figure 1 is a front elevation of one of the parts,

Figure 2 is a section through the second, complementary part on a line corresponding to the line II–II in Figure 1,

Figure 3 is a section through a portion of the embodiment shown in Figures 1 and 2 but illustrating additional elements not shown in those Figures,

Figure 4 is a view similar to Figure 3 showing a modification of the embodiment of Figures 1 to 3, and

Figure 5 is a section through one element of Figure 4 drawn to a larger scale.

The nozzle body shown generally in Figures 1 and 2 comprises a first metal part 10A (Fig. 1) and a second metal part 12A (Fig. 2). Each part has a pair of plane surfaces 16A disposed on either side of a central longidutinal recess made up by a first cavity 15 (Fig. 1), a second cavity 17 (Fig. 2) and a groove 60 (Fig. 1) joining those cavities. Each

sealing surface 16A has a recess 61 to receive a guide on the other body part.

The parts are complementary. The surfaces 16A on part 10A can engage those on part 12A in a sealing manner to provide a tubular body with a through bore formed by the cavities 15 and 17 and grooves 60. In use, a thread is caused to run along a defined thread path including the axis of the bore. The cavities 15 together form a chamber at the «upstream» end of this path, considered with reference to movement of the thread, and the cavities 17 together form a chamber at the downstream end. Each part 10A and 12A constitutes a carrier member for insert elements which in use lie in the chambers formed by cavities 15 and 17. These inserts define the thread path within the chambers.

In Figs. 1 and 2 only the inserts 22 provided in the downstream chamber are illustrated. The inserts in the upstream chamber will be described later with reference to the other Figures. Insert elements 22 together define a texturising chamber 28 (Fig. 1) at the downstream end of the thread path.

Each insert element 22 comprises a wall portion 40 (Fig. 1) and flange portions 41, 43. Each flange portion fits neatly into the cavity 17 in its body part 10A or 12A, as best seen in Figure 2, and is secured therein by screws 42. The wall portions 40 together make up a texturising chamber wall of external diameter smaller than the diameter of the downstream chamber and firmly supported at both ends by the end flanges provided at one end by the co-operating flange portions 41 and at the other end by the co-operating flange portions 43. The tubular wall made up by wall portions 40 has twelve longitudinally extending slots 44. As best seen in Figure 2, each insert 22 contains five full slots and two additional slots are formed at the interface when the elements 22 are brought together in the closed nozzle. Each slot 44 extends from end to end of the respective element 22, i.e. through both end flanges, and passes radially completely through the wall between the connecting end flanges. These slots enable communication in use between the texturising chamber 28 and an exhaust chamber 46 provided around the wall 40 by the cavities 17 and 14. Fluid can be exhausted from chamber 46 via outlet parts 50 (Fig. 1) in each part 10A, 12A.

Each body part is also provided with studs (not shown) enabling it to be mounted on an appropriate support structure (not shown) of a texturising apparatus, the receiving members on the support structure being relatively movable to enable opening and closing of the nozzle. Each body part is also partially enclosed by a casing 54 (Fig. 2) of a material of low heat conductivity so as to protect operators from the hot metal of the body parts 10A and 12A in use.

Figure 3 shows a section through the infeed end of the complete nozzle, the section being taken at right angles to the frontal view shown in Figure 1, so that both body parts 10A and 12A, and the join line 76 between them, are visible. Each groove 60 is of triangular cross section, to form a complete guide passage 26A which is square in section. A thread infeed passage 64A is now provided by a simple, triangular section groove in an insert element 78 in the cavity 15 of the body part 12A. The facing surface on an insert element 80 in the cavity 15 of the body part 10A is planar.

Insert element 80 has a recess 82 containing an O-ring 84 encircling the access port of a bore 86. Recess 82 opens in the complete assembly onto a fluid supply passage 88 suitably provided (in a manner not shown in detail) in the body part 10A. Bore 86 leads fluid from supply passage 88 to cavity 87 the upper portion of which, above the bore 86, opens onto the end-face of element 80 and is screwthreaded to receive a closure screw 89 with a sealing washer 91. This opening, provided by the upper portion of the cavity, is provided simply to enable access to the lower portion now to be described and is blocked off in normal use by the screw 89 or any other convenient closure means.

The lower portion of the cavity, below bore 86, comprises a screw threaded section 90 and a further section 92 which is not screw threaded. A bore 94 of relatively small cross section provides a communication passage leading from section 92 to a recess 98 formed in the bottom surface of the element 80, and facing into a widening 72 formed on the upper end of the guide passage 26A. The angle X between the axis of the bore 94 and the adjacent side surface of the element 80 is made as small as practicable.

The bore 94 contains a tube 100 which is secured therein by any convenient means. The illustrated securing means comprises an elastomeric compressible washer 102 clamped between an annular end surface of the cavity 87 and a bush 104. The latter can be urged towards the end surface of the cavity to squeeze the washer against the outer surface of the tube 100 by means of a tubular nut 106 in the screw threaded cavity section 90. Fluid flow communication between the bore 86 and the tube 100 is provided by the interior of the nut 106. The tube is so held relative to the insert element 80 that it will just project into the widening 72. Clearly, positive means could be provided on a tube of definite length to ensure its location in a desired position relative to insert element 80. The bore 96 of the tube 100 constitutes the only fluid infeed passage and the element 80 acts as a receiver element for the fluid infeed tube 100, the latter being releasably secured in its receiver by the securing means referred to above. The latter comprises sealing means, in this case washer 102, to ensure that all infeed fluid must pass through the tube 100.

In the embodiment of Figure 3 the bore configuration of tube 100, and especially the dimensions of the cross section of passage 96, are chosen to provide a desired infeed rate of treatment fluid at a given pressure. By substituting a tube 100 having a different effective cross section for the passage 96, the user can vary the fluid infeed

rate. The tube 100 can be changed via the access opening at the upper end of cavity 87 when the closure screw 89 has been removed. The degree of control obtainable over the infeed rate by means of such tubes is so high that external adjusting controls, such as a throttle in the infeed to the passage 88, can be dispensed with, although this aspect of the invention is not of course limited to use of the flow control tubes 100 without any external control over the infeed rate. Thus each nozzle preferably has an associated set of flow control tubes 100 of different bore configurations i.e. different dimensions of bore cross section and/or different tube length and/or different bore shape.

The bore through each tube 100, providing the passage 96, is preferably circular in cross section. The illustrated tube is of uniform cross section along the full length of the tube, but this is not essential. The length of the tube is preferably chosen in relation to the other operating conditions e.g. type of treatment fluid, supply pressure, etc. to give a directed flow of fluid from the downstream end of the tube with minimum turbulence. A relatively short orifice-type control is unsuitable for this purpose because it creates uncontrollable flow disturbances both at the upstream side and at the downstream side of the orifice and such disturbances prejudice the achievement of uniform texturising conditions both over time and between different nozzles. Also, to avoid undue disturbance in the transfer of fluid from the tube 100 to the guide passage provided by the grooves 60, the tube is aligned as close as possible to the line of the guide passage i.e. angle X is chosen as small as possible and the thread infeed passage 64A is provided in the element 78 only. Also to facilitate disturbance free transport of fluid to the guide passage, the junction region provided by widening 72 may be in the form of a tapering chamber narrowing towards the guide passage 26A as illustrated, although the widening in the body part 12A could be omitted as indicated by the dotted line.

By way of example only the following dimensions of various elements of an embodiment according to Figure 3 are quoted –
Treatment Fluid – Hot Air
Supply Pressure in cavity 87 – 6 bar
Length of Tube 100 – 12 mm
Angle X – 15°

Diameter of Circular Passage 96	Infeed Rate
1,2 mm	3,2 Nm^3/h (M^3 S.T.P.)
1,4 mm	4,5 Nm^3/h (M^3 S.T.P.)
1,6 mm	5,2 Nm^3/h (M^3 S.T.P.)

Preferably the angle X is not greater than 30° and an angle X less than 20° is highly desirable. Due to production problems, it will not usually be possible to obtain an angle X much less than 10–12°. Preferably the minimum length of tube 100 is 0,4 cm and the preferred length is in the range 0,6 cm to 3 cm.

The lower end of the tube 100 preferably comes as close as possible to the line of the thread path through the nozzle without risking contact between the tube and the thread in use. The tube may be provided with means, e.g. a flange at a location spaced from both ends of the tube to ensure that the downstream end is accurately located relative to thread path e.g. bush 104 may be secured to or integral with tube 100.

As illustrated, it is preferred not to feed treatment fluid to the tube 100 via the closure screw 89 – this could be done by providing a passage through the screw but it would complicated the tube exchange procedure since it would be necessary to disconnect the fluid supply from the screw and/or to provide flexible fluid supply leads, to enable the screw to be removed to provide access to the tube. The alternative possibility, of replacing the tube via the downstream end of bore 94 after removal of the insert element 80, is far too complex. Also the provision of a series of insert elements with unlined bore sections 94 of varying diameter i.e. eliminating the liner tube 100, is relatively costly.

The thread path through the nozzle is preferably straight and the fluid preferably joins the thread path from an infeed passage at a, preferably small, angle thereto. The reversal of this relationship, as shown in US Patent Specification 3 983 610, makes the division of the nozzle, for opening and closing purposes, extremely complex with the risk of very high wear on the nozzle, and disturbance in the system, at the location where the thread path bends to join the straight fluid flow path.

Exchangeable liner tubes, such as tube 100 shown in Figure 3, could of course be used in one-piece texturising nozzles or in a texturising nozzle which is divided, but which does not have insert assemblies at the infeed end and/or outfeed end.

The embodiment illustrated in Figures 1 to 5 offer the following advantages over the prior art.

All of the fluid infeed passes through a single passage which can be manufactured accurately outised the complete assembly. It is only necessary to align this one passage accurately relative to the guide passage 26A and thread infeed passage 64A. Further, replacement of the liner 100 by a tube of different effective cross section in the flow passage 96 enables simple adjustment of the texturising characteristics while the ability to form each passage 96 very accurately ensures accurate control over the infeed of treatment fluid without requiring complex adjustment systems outside the nozzle.

Modification is possible within the scope of the invention. For example, the exchangeable liner tubes such as tube 100 could have a slightly conical bore instead of a bore of uniform circular cross section as illustrated. The bore would taper in the flow direction, i.e. narrowest cross section at downstream end, with a small half angle, i.e. angle between the axis of the bore and a straight

line lying in the internal surface of the tube. The maximum practical half angle would be about 5°. This conical formation of the infeed tube would reduce air speed at the upstream end of the tube, giving lower losses through friction, while still giving adequate air speed at the downstream end. A further modification will now be described with reference to Figures 4 and 5.

Figure 4 illustrates a modification of Figure 1 at the infeed end of the nozzle. The view shown in Figure 4 corresponds with that shown in Figure 3, i.e. the nozzle is shown in a closed position with the body parts 10D and 12D engaging each other on the contact plane 76. The same numerals have been used as far as possible to indicate the same parts. In Figure 4, however, there is no thread infeed insert assembly, the thread infeed passage 64B being formed directly in the body part 12D, i.e. the cavity 15 shown in Figure 1 is eliminated. The control of inflow of treatment fluid is once again effected by a single, tubular flow control element 124 which is of complex construction relative to the simple tube 100 shown in Figure 3, and which will be described further below.

Element 124 is mounted in a cavity 87A similar to the cavity 87 of Figure 3 but provided directly in the body part 10D. Element 124 projects into a bore 94A which provides a communication passage leading from the lower end of the cavity to the groove 60A. Bore 94A is of relatively small cross section relative to the cavity, so that an annular surface 126 is left at the lower end of the cavity. Supply of treatment fluid to the cavity is effected via a supply passage 86A suitably formed in the body part 10D. At its upper end, cavity 87A provides an access opening onto the end face of body part 10D, which opening is screw threaded to receive closure screw 89A. In this embodiment, therefore, the receiver element, receiving the flowcontrol element 124, is the body part 10D itself.

Flow control element 124 (best seen in Figure 5) comprises a tubular body portion 128 having an enlarged end portion 130 at its upstream end and a flange 132 adjacent but spaced from the end portion 130. As illustrated, the enlarged end 130 and flange 132 are integral with the body 128, but they could each be formed separately and secured to the body if required. The external diameter of portion 130 is such that it can be inserted into one end of a spiral spring 134 (Fig. 4) so as to be gripped by the spring. Element 124 is forced into the spring until the latter engages one axial surface of flange 132. Spring 134 extends along the cavity 87A to engage with a guide projection 136 on the end of screw 89A. Spring 134 is longer than cavity 87A, so that the spring provides an urging means producing an axial force urging flange 132 against surface 126. Contact between flange 132 and surface 126 is made by an axially projecting rim 138 formed on the flange. The flexibility of flange 132 is such that it can distort in response to unevenness of surface 126 under the force applied by spring 134 so as to ensure sealing contact of rim 138 with surface 126 on an annulus completely surrounding the entrance to bore 94A. The flange and spring together form a resilient securing means securing flow control element 124 in place.

Element 124 has a throughbore comprising a bore portion 140 of uniform circular cross-section merging with a tapering portion 142. This tapering formation, at least at the entrance, is preferred because it renders the flow control performance of the element less sensitive to damage or malformation of the flow control bore in the entrance region. Bore portion 140 of uniform cross-section actually controls the inflow of treatment fluid. For this purpose, the length 1 of this bore portion is preferably at least equal to and may desirably be up to three times, the diameter of that portion. The requirements regarding the angle between tube 128 and thread infeed passage 64B are the same as those described above for the tube 100 and thread infeed passage 64A. Flow control element 124 could of course be used in a suitably modified embodiment of Figure 3.

When closure screw 89A is removed, spring 134 can be withdrawn from cavity 87A and will simultaneously withdraw flow control element 124 because of the gripping contact between the spring and end portion 130. Spring 134 may also be suitably secured to closure screw 89A for removal therewith, but the securing arrangement should not cause rotation of the flow control element in the cavity in response to screwing or unscrewing of the closure 89A.

Claims

1. A thread texturising nozzle in which thread can be texturised while moving along a generally straight path through the nozzle, the nozzle comprising

– means (64A, 86, 87, 96; 64B, 84A, 87A, 140) to bring together a thread to be texturised and treatment fluid at a junction location on said path,

– a texturising chamber (28) providing a section of said path downstream from said junction location considered in the direction of movement of the thread through the nozzle and having a perforated wall to permit fluid to pass out of the chamber in a direction transverse to the path, and

– a guide passage (26A; 26B) providing said path between said junction location and said texturising chamber, characterised in that

– said means to bring together thread and fluid comprises a thread infeed passage (64A; 64B) opening onto said junction location and single fluid infeed passage (96; 140) extending along an axis inclined at a small angle to the thread infeed passage and debouching onto said junction location,

– said fluid infeed passage being provided by an open-ended bore (96; 140, 142) of a tube (100; 128), securing means (102, 104, 106; 132, 134) being provided releasably to secure said tube in a passage (94; 94A) leading to said guide passage (26A; 26B) such that all treatment fluid

entering the guide passage must flowe through said tube.

2. A nozzle as claimed in claim 1, characterised in that said tube is one of a plurality of such tubes having respective individual bore configurations and alternatively mountable in said passage (94; 94A) leading to said guide passage.

3. A nozzle as claimed in claim 1 or 2 characterised in that at least a portion (96; 140) of said open-ended bore is of uniform circular cross-section along its entire length, the length of said portion being at least equal to the diameter thereof.

4. A nozzle as claimed in claim 3 characterised in that another portion (142) of said open-ended bore is of tapering cross-section, the smallest cross-section thereof merging into said portion (140) of uniform cross-section.

5. A nozzle as claimed in any of claims 1 to 4 characterised in that said securing means (102, 104, 106; 132, 134) is located in a cavity (87; 87A), which provides an access opening closed in normal operation by a removable closure (89; 89A), and a supply passage for treatment fluid debouches onto said cavity between the closure and the tube (100; 128).

6. A nozzle as claimed in any of claims 1 to 5 wherein the nozzle comprises two carrier members (10D, 12D) adapted to engage one another to enclose an open-ended elongated space containing said path, characterised in that one of said carrier members (10D) provides a receiver element receiving said tube (128) and the other carrier member (12D) has a groove (64B) which provides said thread infeed passage.

7. A nozzle as claimed in any one of claims 1 to 5 wherein the nozzle comprises two carrier members (10A, 12A) adapted to engage one another to enclose an open-ended elongated space containing said path characterised in that a least one of the carrier members (10A) has releasably secured thereto an insert element (80), which lies within said space when the carrier members engage one another, and which provides a receiver element receiving said tube (100), the thread infeed passage being provided on the other carrier member (12A).

8. A nozzle as claimed in claim 7 characterised in that said other carrier member (12A) also carries an insert element (78) having a groove (64A) which provides said thread infeed passage.

9. A nozzle as claimed in any of claims 1 to 8 characterised in that said securing means (132, 134) comprises a flange (132) on the tube (128), said flange being flexible to form a sealing contact with an abutment surface (126) encircling the tube.

10. A nozzle as claimed in claim 9 characterised in that said flange (132) is integral with the tube (128).

11. A nozzle as claimed in claim 9 or claim 10 characterised in that said securing means (132, 134) comprises urging means (134) operable to exert a force on said flange (132) urging it towards said abutment surface (126).

12. A nozzle as claimed in claim 11 characterised in that said urging means (134) comprises a spring.

13. A nozzle as claimed in claim 12 or 13 characterised in that said tube (128) and said urging means (134) are releasably connectable for mounting as a unit.

Patentansprüche

1. Eine Fadentexturierdüse, in welcher Faden während des Bewegens entlang eines generell geraden Weges durch die Düse texturiert werden kann; die Düse umfasst dabei

. – Mittel (64A, 86, 87, 96; 64B, 86A, 87A, 140) um einen zu texturierenden Faden und Behandlungsmedium an einer Zweigstelle in diesem Weg zusammenzubringen,

– eine Texturierkammer (28), welche einen Abschnitt dieses Weges stromabwärts nach der Zweigstelle, in Bezug auf die Bewegungsrichtung des Fadens durch die Düse bildet und welche eine perforierte Wand hat, um dem Medium das Austreten aus der Kammer in einer Richtung quer zum Weg zu erlauben und

– eine Führungspassage (26A; 26B), welche den genannten Weg zwischen der Zweigstelle und der Texturierkammer ergibt, dadurch gekennzeichnet, dass

– die genannten Mittel, um das Medium und den Faden zusammenzubringen, eine Fadeneinspeisepassage (64A; 64B) beinhaltet, welche in die genannte Zweigstelle mündet, sowie eine einzelne Mediumeinspeisepassage (96; 140), welche sich entlang einer Achse erstreckt, die mit einem kleinen Winkel zur Fadeneinspeisepassage schräg ist und in die Zweigstelle ragt,

– die genannte Mediumeinspeisepassage ist durch eine durchgehende Bohrung (96; 140, 143) eines Rohres (100; 128) gegeben, wobei Befestigungsmittel (102, 104, 106; 132, 134) lösbar vorgesehen sind, ums genannte Rohr in einer Passage (94; 94A) festzusetzen, welche zu der genannten Führungspassage (26A; 26B) führt und zwar derart, dass das gesamte Behandlungsmedium, welches in diese Führungspassage eintritt, durch das genannte Rohr fliessen muss.

2. Eine Düse gemäss Anspruch 1, dadurch gekennzeichnet, dass das genannte Rohr eines einer Mehrzahl solcher Rohre ist, welche entsprechend individuelle Bohrungen aufweisen und welche alternativ in der genannten Passage (94; 94A) montierbar sind und in die genannte Führungspassage führen.

3. Eine Düse gemäss Anspruch 1 oder 2, dadurch gekennzeichnet, dass mindestens ein Teil (96; 140) der genannten durchgehenden Bohrung einen gleichmässigen kreisförmigen Querschnitt entlang seiner ganzen Länge aufweist, wobei die Länge des genannten Teiles mindestens dem Durchmesser davon entspricht.

4. Eine Düse nach Anspruch 3, dadurch gekennzeichnet, dass ein anderer Teil (142) der genannten durchgehenden Bohrung einen konischen Querschnitt aufweist, wobei der kleinste

Querschnitt davon in den Teil (140) mit gleichmässigem Querschnitt übergeht.

5. Eine Düse gemäss jedem der Ansprüche 1 bis 4, dadurch gekennzeichnet, dass die genannten Befestigungsmittel (102, 104, 106; 132, 134) in einer Vertiefung (87; 87A) vorgesehen sind, welche eine Zutrittsöffnung vorsieht, die im normalen Betrieb durch einen wegnehmbaren Verschluss (89; 89A) geschlossen ist, und dass eine Zulieferpassage für das Behandlungsmedium in die genannte Vertiefung zwischen dem Verschluss und dem Rohr (100; 128) übergeht.

6. Eine Düse gemäss irgendeinem der Ansprüche 1 bis 5, worin die Düse zwei Tragelemente (10D, 12D) beinhaltet, welche angepasst sind, um sich gegenseitig zu berühren, um dadurch einen durchgehenden länglichen Raum einzuschliessen, welcher den genannten Weg beinhaltet, dadurch gekennzeichnet, dass eines der genannten Tragelemente (10D) ein Aufnahme-Element ergibt, welches das genannte Rohr (128) aufnimmt und dass das andere Tragelement (12D) eine Nute (64B) aufweist, welche die genannte Fadeneinspeisepassage ergibt.

7. Eine Düse gemäss irgendeinem der Ansprüche 1 bis 5, worin die Düse zwei Tragelemente (10A, 12A) beinhaltet, welche angepasst sind, um sie gegenseitig aufzunehmen und einen durchgehenden länglichen Raum zu umschliessen, welcher den genannten Weg beinhaltet, dadurch gekennzeichnet, dass mindestens eines der Tragelemente (10A) ein Einführelement (80) daran lösbar befestigt hat, welches innerhalb des genannten Raumes liegt, wenn die Tragelemente sich gegenseitig umfassen und welches ein Aufnahme-Element ergibt, das das genannte Rohr (100) aufnimmt, wobei die Fadenaufnahmepassage am anderen Tragelement (12A) vorgesehen ist.

8. Eine Düse gemäss Anspruch 7, dadurch gekennzeichnet, dass das genannte andere Tragelement (12A) ebenfalls ein Aufnahme-Element (78) trägt, welches eine Nute (64A) hat, die die genannte Fadeneinspeisepassage ergibt.

9. Eine Düse gemäss irgendeinem der Ansprüche 1 bis 8, dadurch gekennzeichnet, dass die Sicherheitsmittel (132, 134) einen Flansch (132) an Rohr (128) beinhalten, wobei der genannte Flansch flexibel ist, um einen dichtenden Kontakt mit einer Wiederlagerfläche (126) zu bilden, welche das Rohr umkreist.

10. Eine Düse gemäss Anspruch 9, dadurch gekennzeichnet, dass der Flansch (132) einen integrierenden Bestandteil des Rohres (128) bildet.

11. Eine Düse gemäss Anspruch 9 oder 10, dadurch gekennzeichnet, dass die genannten Sicherheitsmittel (132, 134) Druckmittel (134) beinhalten, welche eine Kraft auf den genannten Flansch (132) ausüben, um diesen gegen die genannte Wiederlagerfläche (126) zu drängen.

12. Eine Düse gemäss Anspruch 11, dadurch gekennzeichnet, dass die genannten Druckmittel (134) eine Feder beinhalten.

13. Eine Düse gemäss Anspruch 12 oder 13, dadurch gekennzeichnet, dass das genannte Rohr (128) und das genannte Druckmittel (134) lösbar miteinander verbunden sind, um als Einheit montiert werden zu können.

Revendications

1. Une tuyère de texturation de fil, dans laquelle le fil peut être texturé, pendant son déplacement le long d'un chemin généralement droit, à travers une tuyère; la tuyère comprend pour cela:

– un moyen (64A, 86, 87, 96; 64B, 86A, 87A, 140) pour rassembler un fil à texturer et un média de traitement, dans un lieu de jonction situé sur ce chemin,

– une chambre de texturation (28) qui forme une section de ce chemin, située en aval du lieu de jonction par rapport à la direction de déplacement du fil à travers la tuyère, et qui possède une paroi perforée, afin de permettre au média de sortir de la chambre dans un sens perpendiculaire du chemin, et

– un passage de guidage (26A; 26B) qui forme le chemin cité entre le lieu de jonction et la chambre de texturation, caractérisé par le fait que

– ledit moyen pour rassembler le média et le fil comprend un passage d'alimentation de fil (64A; 64B) qui débouche dans ledit lieu de jonction, ainsi qu'un seul passage d'alimentation de média (96; 140) qui s'étend le long d'un axe et qui est incliné avec un petit angle par rapport au passage d'alimentation de fil, et qui aboutit dans le lieu de jonction,

– ledit passage d'alimentation de média est donné par un trou continu (96; 140, 143) d'un tuyau (100; 128), des moyens de fixation (102, 104, 106; 132, 134) étant prévus d'une manière détachable, afin d'assurer le tuyau mentionné dans un passage (94; 94A) qui mène audit passage de guidage (26A; 26B), et ceci de telle façon que la totalité du média de traitement, qui rentre dans ce passage de guidage, doit s'écouler à travers ledit tuyau.

2. Une tuyère selon revendication 1, caractérisée par le fait que le tuyau mentionné représente un d'une pluralité de tels tuyaux, lesquels possèdent des trous individuels correspondants, qui peuvent être montés alternativement dans ledit passage (94; 94A) et qui mènent dans ledit passage de guidage.

3. Une tuyère selon revendication 1 ou 2, caractérisée par le fait qu'au moins une partie (96; 140) du trou continu mentionné possède une section circulaire régulière le long de toute sa longueur, la longueur de la partie mentionnée correspondant au moins au diamètre de celle-ci.

4. Une tuyère selon revendication 3, caractérisée par le fait qu'une autre partie (142) du trou continu mentionné possède une section conique, laquelle débouche avec sa plus petite section et avec une section régulière dans la partie (140).

5. Une tuyère selon n'importe quelle des revendications 1 à 4, caractérisée par le fait que lesdits moyens de fixation (102, 104, 106; 132, 134) sont localisés dans une cavité (87; 87A) qui prévoit une ouverture d'accès qui, pendant la marche normale, est fermée par une fermeture amovible

(89; 89A),et qu'un passage de livraison pour le média de traitement débouche dans la cavité mentionnée entre la fermeture et le tuyau (100; 128).

6. Une tuyère selon n'importe quelle des revendications 1 à 5, dans lesquelles la tuyère comprend deux éléments porteurs (10D, 12D), qui sont adaptés le façon à pouvoir s'engager l'un dans l'autre, de manière à engendrer un espace continu allongé, comprenant ledit chemin, caractérisée par le fait qu'un des éléments porteurs mentionnés (10D) forme un élément de réception, lequel reçoit ledit tuyau (128), et que l'autre élément porteur (12D) possède une rainure (64B) qui forme le passage d'alimentation de fil cité.

7. Une tuyère selon n'importe quelle des revendications 1 à 5, dans lesquelles la tuyère comprend deux éléments porteurs (10A, 12A), qui sont adaptés de façon à pouvoir s'engager l'un dans l'autre de manière à engendrer un espace continu allongé comprenant ledit chemin, caractérisée par le fait qu'au moins un des éléments porteurs (10A) possède un élément d'insertion (80) fixé d'une manière amovible sur celui-ci, élément, qui est situé dans l'espace cité, lorsque les éléments porteurs s'engagent l'un dans l'autre, et qui forme un élément de réception qui reçoit ledit tuyau (100), le passage de réception de fil étant prévu dans l'autre élément porteur (12A).

8. Une tuyère selon revendication 7, caractérisée par le fait que l'autre élément porteur cité (12A) porte également un élément de réception (78), qui possède une rainure (64A) qui forme le passage d'alimentation de fil mentionné.

9. Une tuyère selon n'importe quelle des revendications 1 à 8, caractérisée par le fait que le moyen de sécurité (132, 134) comprend une flange (132) sur le tuyau (128), la flange citée étant flexible, afin de former un contact étanche avec une surface d'aboutement (126) qui encercle le tuyau.

10. Une tuyère selon revendication 9, caractérisée par le fait que la flange (132) forme une partie intégrante du tuyau (128).

11. Une tuyère selon revendication 9 ou 10, caractérisée par le fait que dit moyen de sécurité (132, 134) contient un moyen de pression (134), lequel exerce une force sur ladite flange (132), de manière à presser celle-ci contre ladite surface d'aboutement (126).

12. Une tuyère selon revendication 11, caractérisée par le fait que ledit moyen de pression (134) contient un ressort.

13. Une tuyère selon revendication 12 ou 13, caractérisée par le fait que ledit tuyau (128) et ledit moyen de sécurité (134) sont reliés l'un à l'autre d'une manière amovible et peuvent être montés comme une unité.

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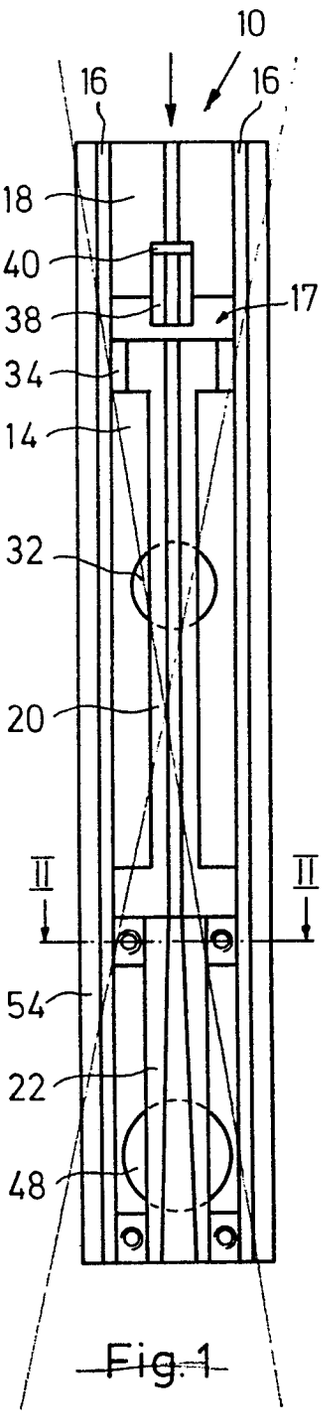

Fig. 1

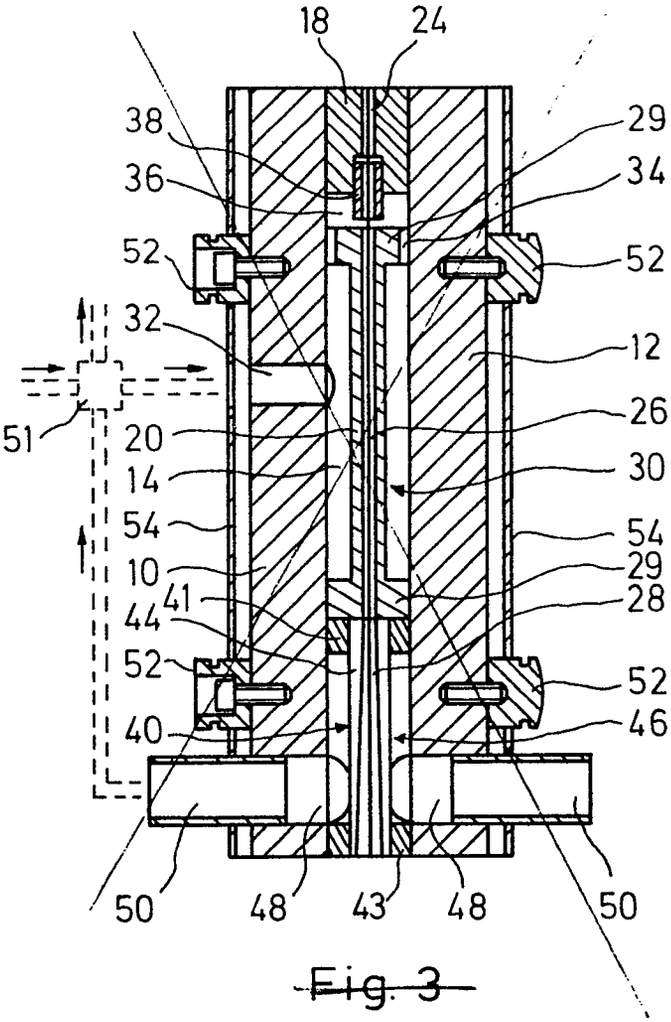

Fig. 3

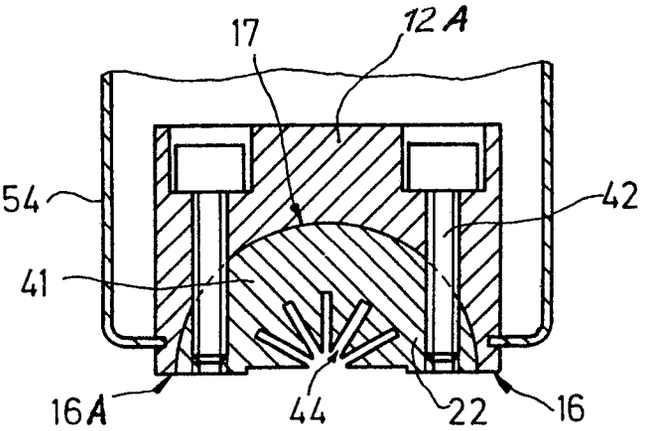

Fig. 2

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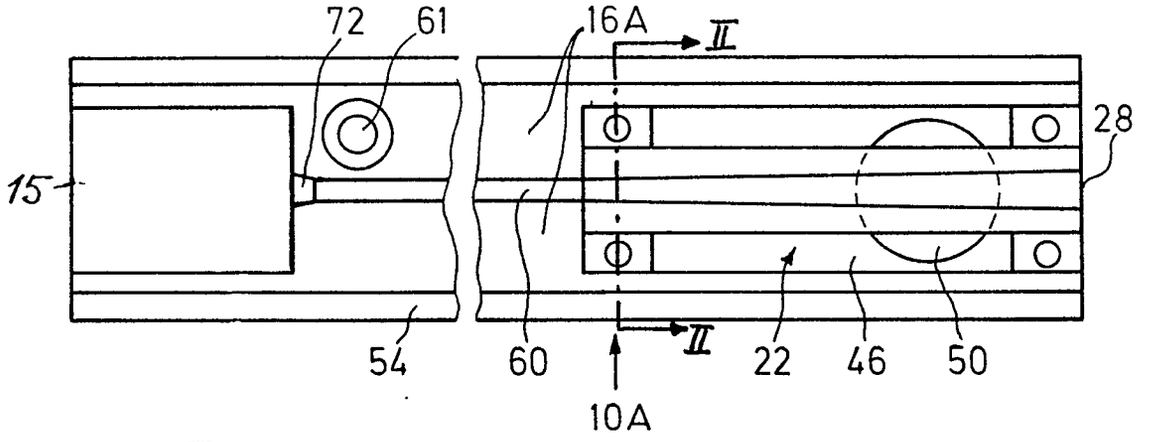

Fig. 1

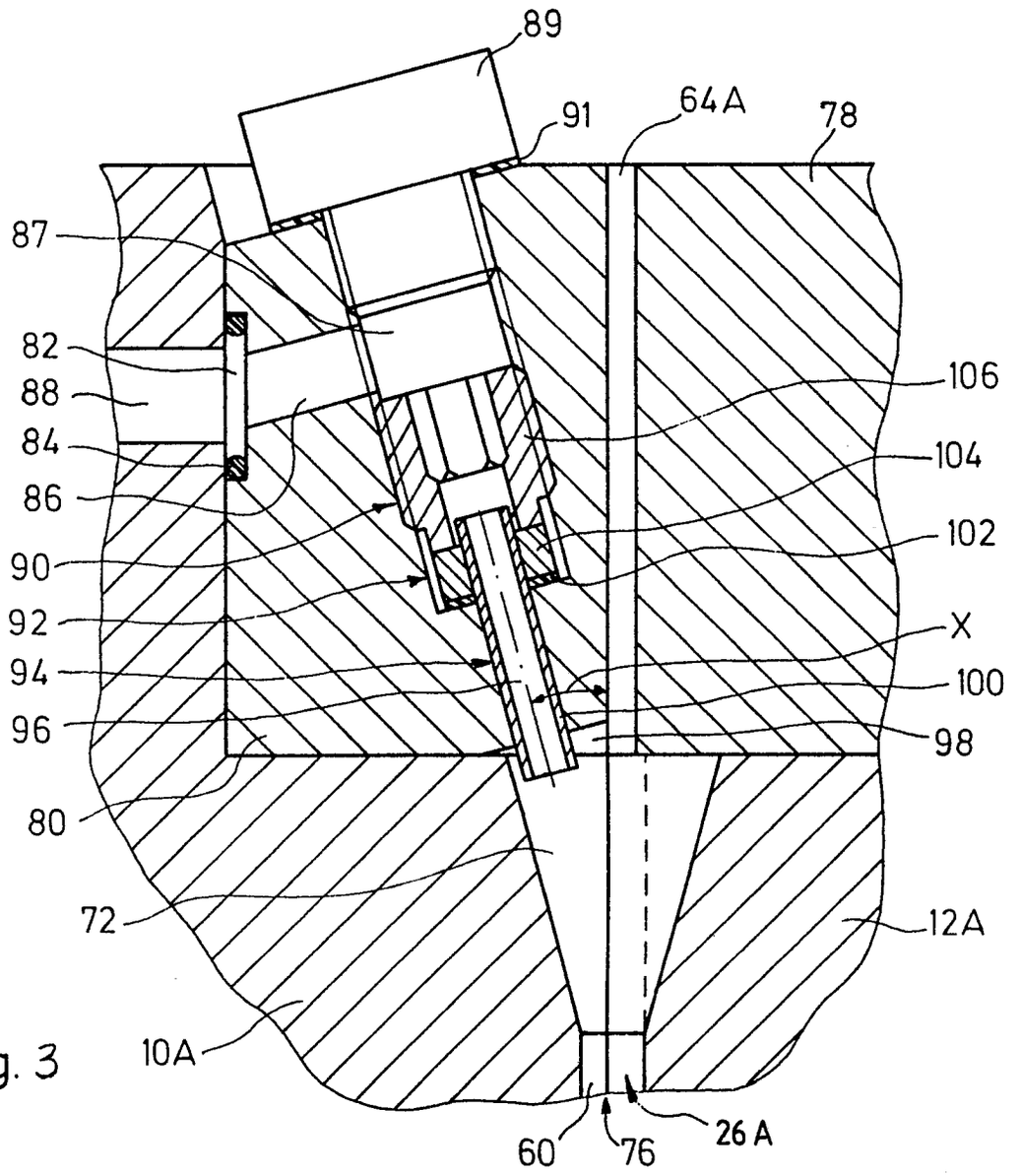

Fig. 3

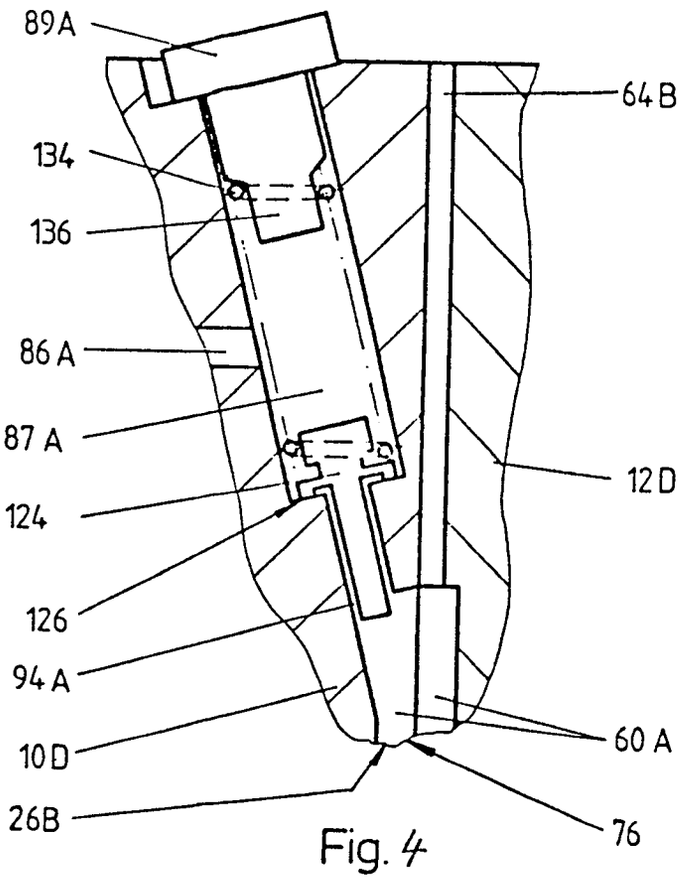
89A
64B
134
136
86A
87A
12D
124
126
94A
10D
60A
26B
76

Fig. 4

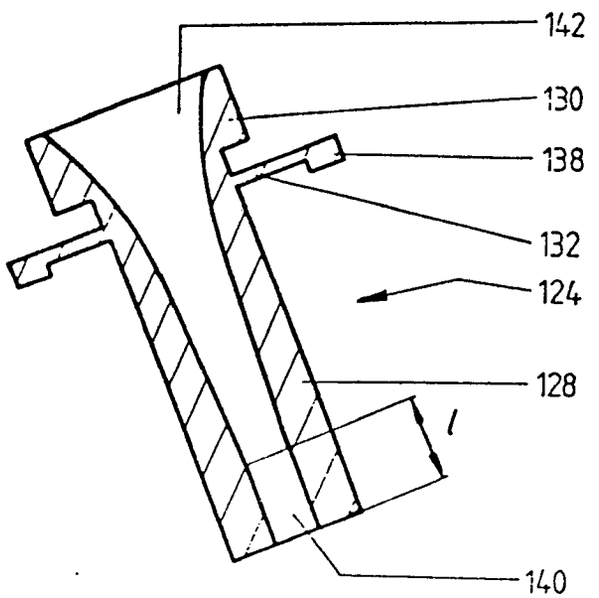
142
130
138
132
124
128
l
140

Fig. 5