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

(11) Publication number : **0 184 625 B2**

(12) # NEW EUROPEAN PATENT SPECIFICATION

(45) Date of publication of the new patent specification : **08.09.93 Bulletin 93/36**

(51) Int. Cl.^{5} : **D02G 1/16**

(21) Application number : **85112265.5**

(22) Date of filing : **27.09.85**

(54) **Thread treating nozzle.**

(30) Priority : **03.12.84 US 677591**

(43) Date of publication of application : **18.06.86 Bulletin 86/25**

(45) Publication of the grant of the patent : **16.05.90 Bulletin 90/20**

(45) Mention of the opposition decision : **08.09.93 Bulletin 93/36**

(84) Designated Contracting States : **CH DE FR GB IT LI**

(56) References cited :
EP-A- 0 039 763
EP-A- 0 108 205
EP-A- 0 110 359
GB-A- 872 234
US-A- 2 938 257
US-A- 3 237 269
US-A- 3 261 071
US-A- 3 698 612

(73) Proprietor : **MASCHINENFABRIK RIETER AG**
Postfach 290
CH-8406 Winterthur (CH)

(72) Inventor : **Nabulon, Werner**
Schneehalde 116
CH-8455 Rüedlingen (CH)

EP 0 184 625 B2

Description

The present invention relates to an openable and closable thread treating nozzle comprising a plurality of parts which define between them a thread treating passage and which are movable relative to each other to open and close said passage to enable insertion of a thread. The nozzle preferably comprises only two parts movable relative to each other.

A nozzle of the relevant type is shown in our prior European Patent Application No. 110 359. In that case, a flexible mounting is provided to enable adjustment of one part to make face to face sealing contact with another part of the nozzle.

US-C-3,698,612 shows a pneumatic forwarding device having two separable sections hingeably mounted about an axis parallel to the axis of an internal passageway in the device. In one embodiment of this device, "firm abutment of the two hinged sections can be achieved by manufacturing side plates from a deformable, elastic material" (column 2, lines 48 to 50). The material suggested is a polyurethane rubber which is not suitable for use in high temperature, yarn texturising operations.

US-C-3,237,269 shows an apparatus for fluid treatment of continuous filamentary material having a body member and a cover cooperating to form an enclosed channel. The cover is held by a retaining means. At least one of the cover and the retaining means is of relatively flexible construction in a region situated on one side of the enclosed channel to permit separation of the body member and the cover for lacing of yarn into the channel.

In both US-C-3,698,612 and US-C-3,237,269, therefore, the closing forces are applied from one side only of the passage through the nozzle, namely in the region of a pivot point about which a cover element pivots to open and close the nozzle. In EP-A-110 359 the closing forces are applied in a direction at right angles to the sealing faces, but the flexibility needed to ensure face to face contact is provided only in the mounting for the contact members.

US-C-3,261,071 shows an apparatus for fluid treatment of continuous filamentary material comprising a body member and a cover plate together forming four parallel yarn passages. The cover plate is movable while maintaining a parallel attitude with respect to the face of the fixed body member. The cover is supported and actuated by piston rods, air pressure on the associated pistons exerting a force on the piston rods, pressing the cover into direct contact with the body member, causing the cover to conform closely to the body and sealing the edges of the yarn passages.

In this case, therefore, the closing forces are applied on a surface facing away from the sealing surfaces of the movable cover, but there is no suggestion of elastic deformability in the nozzle parts or their mountings.

The problem of obtaining an adequate seal by relying upon accurate formation of sealing surfaces and of moving means has been explained at some length in EP-C-110 359 and will not be repeated here. These problems become steadily more acute as processing speeds increase while quality requirements in relation to the yarn product demand absolutely uniform processing conditions as between processing positions and (in a given processing position) over time. The required seal should be produced by means as simple as possible, in particular without requiring special manufacturing or adjustment steps.

The invention solves these problems by means of the features set out in the characterising portion of claim 1.

In one embodiment of the invention, which is in accordance with published European Patent Application No. 39763 (corresponding with United States Patent 4435298), the disclosure of which is also hereby incorporated by reference in the present specification, the thread treating passage extends from end to end through an elongate nozzle structure. In such a structure, the flexible part also preferably extends from end to end of the structure.

By way of example, one embodiment of the invention will now be described with reference to the accompanying diagrammatic drawings, in which

Fig. 1 is a vertical elevation, partly in section, of a two-part thread texturizing nozzle in accordance with the invention, and

Fig. 2 is a plan view of the parts shown in Fig. 1, the left hand part being sectioned on the plane II-II in Fig. 1.

The general structure and operation of the texturizing nozzle shown in the drawings has already been described in detail in European Patent Application 39763, referred to above, and also in European Patent Application No. 108205 (corresponding with United States Patent Application Serial No. 433733 filed October 12, 1982), the disclosure of which is also hereby incorporated in the present specification by reference.

In order to avoid superfluous description, the overall construction and operation of the thread texturizing nozzle will not be described again here. The various parts of the illustrated nozzle will, however, be identified and for ease of comparison the reference numerals used will correspond as far as possible with those used in European Patent Application 108205.

Accordingly, two nozzle parts are indicated with the numerals 10 and 12 respectively. Part 10 is mounted on a suitable carrier (not shown) by means, examples of which have already been disclosed in the prior applications referred to above. The mounting for the part 12 will be described in greater detail later in this specification.

Part 10 is in the form of an elongated block, made

in one piece and having a plane face 26 (see Fig. 2). Part 12 is in the form of an elongated plate-like element having a plane face 28. When the nozzle is correctly closed, surfaces 26 and 28 make face to face contact and form a seal against passage of texturizing fluid between them.

Part 10 has a groove 34 in surface 26 extending from one end of the block (the "downstream" end). Part 12 has a groove 36 in surface 28, extending from one end to the other of the plate element and being slightly widened at its upstream end (see Fig. 1). When surfaces 26 and 28 are brought into correct engagement, grooves 34 and 36 are aligned to provide a passage extending from end to end through the nozzle but of varying cross-section therealong.

This passage defines a thread path through the nozzle, various details of which can be obtained from the prior applications. Treatment fluid is fed into the passage at a junction location 42 (Fig. 1) at which the thread and the fluid are brought together. The treatment fluid is fed to the junction location by way of a bore 52 in part 10 leading to a chamber 54 and thence by way of a metering tube 56 to the junction location. Chamber 54 opens on to the upstream end of the block, and is closed in use by a closure plate 63 which can be removed to give access to the chamber and the metering tube 56. Tube 56 is retained in the desired position by means of a compression spring 60 extending between the closure 63 and the tube. A thread guide 61, secured to the closure 63, assists in guiding a thread correctly into the passage.

A texturizing chamber (details not shown) is provided adjacent the downstream end of the thread passage by suitable formation of the block 10 and plate 12 as shown in European Application 108205 referred to above. Treatment fluid is permitted to leave the texturizing chamber transversly of the thread path and passes into an out-flow port 72 (in block 10) which contains a flow-controlling throttle 76.

The structure now to be described differs radically from that shown in the prior applications, and new reference numerals will be used. The plate element 12 is mounted on a plate-mounting structure generally indicated by numeral 120. This structure comprises a box-like support and housing portion 122. As best seen in the section in Fig. 2, portion 122 is open-sided on its side facing block 10 and the plate-element 12 is located to "cover" this open side of portion 122. Element 12 is retained relative to portion 122 by means of four retaining devices 124 (one only visible in Fig. 1) adjacent respective corners. Each retaining device comprises a sleeve 126 with an internal screw thread and a pair of screws entering the sleeve from opposite ends thereof. For reasons which will become clear hereinafter, the retaining effect of devices 124 permits some relative movement between element 12 and portion 122. For this purpose, a clearance is left between element 12 and the sleeve 126 of each retaining device 124, and a compression spring 128 is provided between the head of one screw and an abutment surface in the portion 122.

Within the box-like portion 122 there are two chambers separated by a transverse partition 130 (Fig. 1). The chamber 132 which is at the upper end of the nozzle as viewed in Fig. 1, together with the contents thereof, will be described in detail. The lower chamber 134, and the contents thereof, are substantially the same, and will not be described separately.

A through-bore 136 (Fig. 2) extends transversly through portion 122 at right angles to the thread passage and substantially parallel to the faces 26 and 28. Bore 136 is so located that the longitudinal axis thereof lies approximately in the plane of the surface defining the "back" of the chamber 132, that is the surface opposite the open "front" side of the chamber. A cylindrical pin 138 is located, for example by a press fit, in the bore 136 so that the pin extends across the whole width of chamber 132 (Fig. 2). Seated on pin 138 is a pair of levers 140, 142 respectively, both of which are visible in Fig. 2 but only one of which can be seen in Fig. 1. Each lever 140, 142 is in the form of a rectangular bar, and the levers are disposed (as best seen in Fig. 2) adjacent respective side walls of the chamber 132. Each bar has a semi-circular recess corresponding to the pin 138, and when seated on the pin each bar is spaced slightly from the back surface of chamber 132. Thus, the bars are free to pivot slightly about the longitudinal axis of pin 138.

Bars 140, 142 are joined at their upper ends by a pin 144, and at their lower ends by a pin 146, each of these pins having a longitudinal axis parallel to the longitudinal axis of pin 138. Seated on pin 144 is a lever 148, and seated on pin 146 is a lever 150. Levers 148, 150 each have a semi-circular recess corresponding to the respective pins 144, 146, and each has at its upper and lower ends respectively a forwardly projecting abutment portion 152. As can be seen in both Figures, the abutment portions 152 project beyond the front, open side of portion 122, whereas all other parts of the lever structure remain within the chamber 132. Abutment portions 152 engage the reverse face of plate 12 so that a gap 154 is left between the plate and the front edge of support portion 120. Each lever 148, 150 is free to pivot about the longitudinal axis of its pin 144 or 146 until each of the abutment portions 152 engages the reverse face of plate 12.

It will be seen from the Figures that the overall external dimensions of the combination of the plate 12 and its support 120 correspond very closely with those of the block 10. This enables the combination 12, 120 to be mounted in a mounting system (not shown) which has been designed to receive a pair of block-type nozzle parts, for example as shown in European Patent Application 108 205. For this purpose, support 120 is provided with suitable openings

154' for cooperation with retaining elements (not shown) of the mounting system which can be identical with that shown in Application 108 205. This exchangeability of part types is not, of course, essential but does enable substitution of the combination 12, 120 in existing nozzle structures.

Whatever mounting system is used for the block 10 and the combination 12, 120, these parts will be associated in use with a nozzle closing system. This could be, for example, of the general type shown in European Patent Application 110359 comprising a "scissors"-type linkage with the block 10 and combination 12, 120 mounted on respective arms of the scissors linkage, with those arms being openable and closable by a suitable drive mechanism, for example the pressurizable piston and cylinder unit shown in European Application 110359. As the scissors linkage urges the nozzles parts together, ramp elements 156 (see especially Fig. 2 tend to cancel out any coarse misalignment, and a locating pin 158 on plate 12 enters a locating opening 160 in block 10 to ensure the required alignment of grooves 34, 36 to form the thread passage. In Fig. 1, pin 158 is hidden behind element 156 on plate 12.

The material and the dimensions of plate 12 are so selected in relation to the closing forces applied by the closing system that the plate is elastically deformable under those forces when surface 28 is driven against surface 26. Elastic deformation is hindered only in those regions in which the plate is contacted by the abutments 152, that is in eight specific contact regions (four associated with the upper chamber 132 and four with the lower chamber 134). The arrangement of levers within each chamber is such that each abutment 152 achieves a predetermined area of contact with the plate 12 and that the closing forces are evenly distributed between these eight contact areas. As can be seen from Fig. 2, each contact area straddles the thread path as viewed in a direction normal to the contact area. Accordingly, the closing force is applied in regions immediately bordering on the grooves 34, 36 and at a plurality of intervals spaced along the length of the thread path.

Assume now that surface 28 first makes contact with surface 26 in a localized zone at any arbitrary position on those surfaces. Since the closing forces are distributed along the length of the nozzle, there will be a net moment tending to pivot plate 12 about its region of first contact with block 10 so as to bring other regions of surfaces 28 and 26 into face to face contact. Since plate 12 is elastically deformable as referred to above, it can flex in response to this net moment so that face to face contact is made at least over the central zone of each of surfaces 26 and 28 (that is the zones to either side of the grooves 34 and 36), and along the full length of the thread path. Depending upon the mis-matching of the surfaces 26 and 28, face to face sealing contact may not be achieved in regions close to the longitudinal edges of those surfaces. However, this is not essential for practical purposes provided sealing contact has been made in the central zones referred to above.

In the above description attention has been concentrated upon the flexing of plate 12 in order to ensure sealing contact despite inevitable inaccuracies in manufacture and assembly. However, the adjustable mounting provided by the lever systems within housing 122 also permit some adjustment of plate 12 relative to block 10 during the closing movement even without flexing of the plate. Such adjustment has already been referred to in European Patent Application 110 359, and said application also shows a mounting system for blocks (such as block 10 and a combination 12, 120) to enable the mounting system to take up manufacturing and assembly inaccuracies. It may be found appropriate to arrange the mounting system to take up coarse inaccuracies, and to provide flexibility in plate 12 sufficient to enable fine adjustments to ensure sealing contact.

Plate 12 is preferably of metal and, for reasons given further below, preferably has excellent heat conducting properties. In order to provide the plate with the maximum possible flexibility, it is preferably made as thin as possible while leaving adequate strength for the plate to absorb the closing forces even after formation of the groove 36. The heat flow properties of the combination 12, 120 are quite clearly different from those of, say, the block 12 shown in European Patent Application 108 205. The provision of the chambers 132, 134 substantially reduces the cross section available for heat flow in the combination 12, 120.

The invention has been described by reference to a texturizing nozzle, particularly one in accordance with prior patent applications. The invention is not, however, limited to such use. It can be applied in any thread treating nozzle, for example a nozzle for applying twist to thread or for creating so called "entanglements" (an "interlacing" nozzle), or even a nozzle for simple forwarding of a thread. However, the invention is considered to have its most useful application in texturizing nozzles where very considerable pressures of thread treating medium (for example air or steam) are encountered.

Claims

1. A thread treating nozzle comprising a plurality of parts (10, 12) which define between them a thread treating passage and which are movable relative to each other to open and close said passage to enable insertion of a thread, at least one of the parts (12) being formed as a flexible plate characterised in that means (152) is provided to apply closing forces to a face of said plate (12) op-

posite to and substantially aligned with said passage (34, 36), the material and dimensions of the plate (12) being selected in relation to the applied closing forces so that the plate (12) is elastically deformable under the applied closing forces to permit adjustment of said plate (12) under said forces to make face to face sealing contact with another part (10) or parts of the nozzle.

2. A nozzle as claimed in claim 1 characterised in that said plate (12) is mounted on a plate-mounting structure (120).

3. A nozzle as claimed in claim 2 characterised in that the plate (12) and the plate-mounting structure (120) are movable together towards and away from the other part (10).

4. A nozzle as claimed in claim 2 or claim 3 characterised in that retaining means (124) is provided to retain said plate (12) on said structure (120) while permitting relative movement therebetween.

5. A nozzle as claimed in claim 2, 3 or 4 characterised in that said plate-mounting structure (120) comprises a box-like support and housing portion (122) which is open-sided on its side facing said other part (10), the plate (12) being located so as to cover this open side of the support and housing portion (122).

6. A nozzle as claimed in claim 5 characterised in that the overall external dimensions of the combination of the plate (12) and its support structure (120) correspond very closely with those of the said other part (10).

7. A nozzle as claimed in claim 5 or claim 6 characterised in that said means (152) to apply closing forces is provided in said support and housing portion (122) and acts between said portion (122) and said plate (12).

8. A nozzle as claimed in claim 7 characterised in that said means (152) comprises a plurality of levers (140, 142, 148, 150) adapted to engage the plate (12) on its face opposed to the surface (28) thereof which engages the other part (10) to form a seal.

9. A nozzle as claimed in any one of claims 5 to 8 characterised in that the plate (12) is mounted on the structure (120) so as to leave a gap (154) between the front edge of the support portion (122) and the plate (12) and the means (152) to apply closing forces extends across this gap to apply said forces to the plate.

10. A nozzle as claimed in any one of claims 2 to 9 characterised in that the plate - mounting structure (120) and the other part (10) are mounted on a mounting system enabling said relative movement to open and close said passage.

11. A nozzle as claimed in claim 10 characterised in that said mounting system forms a part of a nozzle closing system, for example comprising a scissors type linkage, with the plate mounting structure (120) and said other part (10) mounted on respective arms of the linkage (EP 110 359), and a drive mechanism to operate the linkage.

12. A nozzle as claimed in any preceding claim characterised in that said other part (10) comprises a block having a groove (34) in its surface (26) facing the plate (12) and further provided with bore (52) by way of which treatment fluid can be supplied to said groove (34).

13. A nozzle as claimed in claim 12 characterised in that the thread passage (34, 36) leads to a texturising chamber, which permits treatment fluid to leave the chamber transversely of the thread path.

14. A nozzle as claimed in any preceding claim characterised in that the elastic deformability of the plate (12) is such as to permit the plate (12) to flex under a net moment tending to pivot the plate (12) about a region of first contact with the other part (10) if the facing surfaces (28, 26) of the plate (121) and said other part (10) first make contact in a localised zone at any arbitrary position on those surfaces.

15. A nozzle as claimed in claim 14 characterised in that flexing caused by the said net moment is such that face to face contact is made at least over the zones to either side of and along the full length of the thread path.

16. A nozzle claimed in any preceding claim characterised in that the plate (12) is made of metal.

17. A nozzle as claimed in claim 16 characterised in that the metal has excellent heat conducting properties.

18. A nozzle as claimed in claim 1 characterised in that said flexible part (12) is mounted on a rigid support member (122) by means (124) permitting relative movement between the flexible part (12) and the support member (122).

19. A nozzle as claimed in claim 1 or claim 18 characterised in that said flexible part (12) is provided

with a groove (36) adapted to cooperate with a groove (34) in said other part (10) or parts to define said passage and hence a thread path.

20. A nozzle as claimed in claim 1, 18 or 19 characterised in that said flexible part (12) is carried by a flexible mounting, for example of a known type (European Patent Application No. 110 359).

21. A nozzle as claimed in claim 20 characterised in that said flexible mounting includes balancing means (138, 140, 142, 144, 146, 148, 150) for distributing closing force over said flexible part (12).

22. A nozzle as claimed in claim 21 characterised in that said balancing means comprises at least one lever (140, 142), at least two abutment elements (148, 150) a pivot mounting (138) for the lever, and secured to the lever (140, 142) by respective pivot mountings (144, 146), the pivot mountings (144, 146) for the abutment elements (148, 150) being disposed to either side of the pivot mounting (138) for the lever.

23. A nozzle as claimed in claim 22 characterised in that the pivot axis of each said pivot mounting (138, 144, 146) extends substantially at right angles to the thread path along said passage (34, 36) and in a plane parallel thereto.

24. A nozzle as claimed in any one of claims 20 to 23 characterised in that said means (152) to apply closing forces is provided on said abutment elements (148, 150).

Patentansprüche

1. Fadenbehandlungsdüse, bestehend aus einer Mehrzahl von Teilen (10, 12), die einen Fadenbehandlungsdurchgang begrenzen und im Verhältnis zueinander zum Öffnen und Schliessen des Durchganges für das Einsetzen eines Fadens bewegbar sind, wobei zumindest einer der Teile (12) als elastische Platte ausgebildet ist, dadurch gekennzeichnet, dass ein Mittel (152) zur Ausübung von Verschlusskräften auf eine Fläche der Platte (12) gegenüber des Durchganges (34, 36) und im wesentlichen mit diesem ausgerichtet vorgesehen ist, wobei das Material und die Abmessungen der Platte (12) in bezug auf die ausgeübten Verschlusskräfte gewählt werden, so dass die Platte (12) unter den ausgeübten Verschlusskräften elastisch verformbar ist, so dass eine Einstellung der Platte (12) unter den Kräften möglich ist, um mit einem anderen Teil (10) oder Teilen der Düse in dichten flächenanliegenden Kontakt zu kommen.

2. Düse nach Anspruch 1, dadurch gekennzeichnet, dass die Platte (12) auf einer Plattenbefestigungskonstruktion (120) angebracht ist.

3. Düse nach Anspruch 2, dadurch gekennzeichnet, dass die Platte (12) und die Plattenbefestigungskonstruktion (120) gemeinsam zu dem anderen Teil (10) hin- und von diesem wegbewegbar sind.

4. Düse nach Anspruch 2 oder 3, dadurch gekennzeichnet, dass ein Halterungsmittel (124) zur Halterung der Platte (12) auf der Konstruktion (120) vorgesehen ist, während eine verhältnismässige Bewegung zwischen diesen möglich ist.

5. Düse nach Anspruch 2, 3 oder 4, dadurch gekennzeichnet, dass die Plattenbefestigungskonstruktion (120) einen kastenähnlichen Träger- und Gehäuseteil (122) umfasst, der an seiner, dem anderen Teil (10) gegenüberliegenden Seite offen ist, wobei die Platte (12) so angeordnet ist, dass sie diese offene Seite des Träger- und Gehäuseteils (122) bedeckt.

6. Düse nach Anspruch 5, dadurch gekennzeichnet, dass die gesamten äusseren Abmessungen der Kombination von Platte (12) und ihrer Trägerkonstruktion (120) jenen des anderen Teils (10) annähernd entsprechen.

7. Düse nach Anspruch 5 oder 6, dadurch gekennzeichnet, dass das Mittel (152) zum Ausüben von Verschlusskräften in dem Träger- und Gehäuseteil (122) vorgesehen ist und zwischen dem Teil (122) und der Platte (12) wirkt.

8. Düse nach Anspruch 7, dadurch gekennzeichnet, dass das Mittel (152) eine Mehrzahl von Hebel (140, 142, 148, 150) umfasst, die zum Erfassen der Platte (12) an jener Fläche ausgebildet sind, die der Oberfläche (28) gegenüberliegt, die mit dem anderen Teil (10) zur Bildung eines dichten Verschlusses in Eingriff steht.

9. Düse nach einem der Ansprüche 5 bis 8, dadurch gekennzeichnet, dass die Platte (12) an der Konstruktion (120) so befestigt ist, dass ein Spalt (154) zwischen dem vorderen Rand des Trägerteils (122) und der Platte (12) verbleibt und das Mittel (152) zum Ausüben der Verschlusskräfte sich über diesen Spalt erstreckt, um die Kräfte auf die Platte auszuüben.

10. Düse nach einem der Ansprüche 2 bis 9, dadurch gekennzeichnet, dass die Platten-Befestigungskonstruktion (120) und der andere Teil (10) auf einem Befestigungssystem montiert sind, was eine relative Bewegung zum Öffnen und Schliessen

des Durchganges zulässt.

11. Düse nach Anspruch 10, dadurch gekennzeichnet, dass das Befestigungssystem Teil eines Düsenverschlusssystems ist, wobei es zum Beispiel eine schererenartige Verbindung umfasst, gemeinsam mit der Plattenbefestigungskonstruktion (120) und dem anderen Teil (10), der an entsprechenden Armen der Verbindung (EP 110 359) befestigt ist, und einem Antriebsmechanismus zur Bedienung der Verbindung.

12. Düse nach einem der vorangehenden Ansprüche, dadurch gekennzeichnet, dass der andere Teil (10) einen Block mit einer Ausnehmung (34) an seiner Oberfläche (26) gegenüber der Platte (12) umfasst und ferner mit einer Bohrung (52) versehen ist, durch die der Ausnehmung (34) Behandlungsfluid zugeführt werden kann.

13. Düse nach Anspruch 12, dadurch gekennzeichnet, dass der Fadendurchgang (34, 36) zu einer Texturierkammer führt, wodurch das Behandlungsfluid quer zu dem Fadenweg aus der Kammer geleitet werden kann.

14. Düse nach einem der vorangehenden Ansprüche, dadurch gekennzeichnet, dass die elastische Verformbarkeit der Platte (12) derart ist, dass sich die Platte (12) unter einem Nettomoment biegen kann, das dazu neigt, die Platte (12) um einen ersten Kontaktbereich mit dem anderen Teil (10) zu schwenken, wenn die gegenüberliegenden Oberflächen (28, 26) der Platte (121) und des anderen Teils (10) zum erstenmal in einem begrenzten Bereich in irgendeiner beliebigen Position auf diesen Oberflächen in Kontakt kommen.

15. Düse nach Anspruch 14, dadurch gekennzeichnet, dass das durch das Nettomoment bewirkte Verbiegen derart ist, dass der flächenanliegende Kontakt zumindest über den Bereichen an jeder Seite und entlang der vollen Länge des Fadenweges entsteht.

16. Düse nach einem der vorangehenden Ansprüche, dadurch gekennzeichnet, dass die Platte (12) aus Metall besteht.

17. Düse nach Anspruch 16, dadurch gekennzeichnet, dass das Metall ausgezeichnete wärmeleitende Eigenschaften besitzt.

18. Düse nach Anspruch 1, dadurch gekennzeichnet, dass der elastische Teil (12) an einem festen Trägerelement (122) durch Mittel (124) befestigt ist, die eine relative Bewegung zwischen dem elastischen Teil (12) und dem Trägerelement (122) zulassen.

19. Düse nach Anspruch 1 oder 18, dadurch gekennzeichnet, dass der elastische Teil (12) mit einer Ausnehmung (36) versehen ist, die für das Zusammenwirken mit einer Ausnehmung (34) in dem anderen Teil (10) oder Teilen ausgebildet ist, um den Durchgang und somit einen Fadenweg zu begrenzen.

20. Düse nach Anspruch 1, 18 oder 19, dadurch gekennzeichnet, dass der elastische Teil (12) von einer elastischen Befestigung, zum Beispiel einer bekannten Art (Europäischer Patentantrag Nr. 110 359) gehalten wird.

21. Düse nach Anspruch 20, dadurch gekennzeichnet, dass die elastische Befestigung Ausgleichsmittel (138, 140, 142, 144, 146, 148, 150) zur Verteilung der Verschlusskraft über diesem elastischen Teil (12) enthält.

22. Düse nach Anspruch 21, dadurch gekennzeichnet, dass das Ausgleichsmittel zumindest einen Hebel (140, 142), zumindest zwei Widerlagerelemente (148, 150), eine Drehbefestigung (138) für den Hebel, die an dem Hebel (140, 142) durch entsprechende Drehbefestigungen (144, 146) angebracht sind, umfasst, wobei die Drehbefestigungen (144, 146) für die Widerlagerelemente (148, 150) an jeder Seite der Drehbefestigung (138) für den Hebel angeordnet sind.

23. Düse nach Anspruch 22, dadurch gekennzeichnet, dass die Drehachse jeder der Drehbefestigungen (138, 144, 146) sich im wesentlichen in rechten Winkeln zu dem Fadenweg entlang des Durchganges (34, 36) und in einer parallelen Ebene dazu erstreckt.

24. Düse nach einem der Ansprüche 20 bis 23, dadurch gekennzeichnet, dass das Mittel (152) zum Ausüben der Verschlusskräfte an den Widerlagerelementen (148, 150) vorgesehen ist.

Revendications

1. Buse de traitement de fil, comprenant une pluralité de parties (10, 12) qui définissent entre elles un passage de traitement de fil et qui sont mobiles l'une par rapport à l'autre, afin d'ouvrir et fermer le passage pour permettre l'insertion d'un fil, et où au moins une des parties (12) est formée comme une plaque flexible,
caractérisée par le fait
qu'un moyen (152) est prévu pour exercer des

forces de fermeture sur une surface de la plaque (12), opposée au passage (34, 36) et alignée essentiellement avec celui-ci, et où la matière et les dimensions de la plaque (12) sont choisies en relation des forces de fermeture exercées, de sorte que la plaque (12) est déformable élastiquement sous l'effet des forces de fermeture exercées, de manière à permettre un réglage de la plaque (12) sous l'effet de ces forces afin d'établir un contact étanche par surfaces adjacentes avec une autre partie (10) ou des parties de la buse.

2. Buse selon revendication 1, caractérisée par le fait que la plaque (12) est montée sur une structure de fixation de plaque (120).

3. Buse selon revendication 2, caractérisée par le fait que la plaque (12) et la structure de fixation de plaque (120) sont déplaçables ensemble vers l'autre partie (10) et en s'éloignant de celle-ci.

4. Buse selon revendication 2 ou 3, caractérisée par le fait qu'un moyen de retenue (124) est prévu pour retenir la plaque (12) sur la structure (120), alors qu'un mouvement relatif entre elles est possible.

5. Buse selon revendication 2, 3, ou 4, caractérisée par le fait que la structure de fixation de plaque (120) comprend une pièce de support et de carter en forme de boîte (122) qui est ouverte sur le côté faisant face à l'autre partie (10), et où la plaque (12) est agencée de telle manière qu'elle recouvre ce côté ouvert de la pièce de support et de carter (122).

6. Buse selon revendication 5, caractérisée par le fait que la totalité des dimensions extérieures de la combinaison de la plaque (12) et de sa structure de support (120) correspondent d'une manière très proche à celles de l'autre partie (10).

7. Buse selon revendication 5 ou 6, caractérisée par le fait que le moyen (152) servant à exercer des forces de fermeture est prévu dans la pièce de support et de carter (122) et agit entre la pièce (122) et la plaque (12).

8. Buse selon revendication 7, caractérisée par le fait que le moyen (152) comprend une pluralité de leviers (140, 142, 148, 150) adaptés pour s'engager dans la plaque (12) du côté opposé à la surface (28) qui s'engage dans l'autre partie (10) afin de former un joint étanche.

9. Buse selon l'une des revendications 5 à 8, caractérisée par le fait que la plaque (12) est montée sur la structure (120) de telle manière qu'il reste une fente (154) entre le bord de devant de la pièce de support (122) et la plaque (12), et le moyen (152) servant à exercer les forces de fermeture s'étend au travers de cette fente afin d'exercer les forces sur la plaque.

10. Buse selon l'une des revendications 2 à 9, caractérisée par le fait que la structure de fixation de plaque (120) et l'autre partie (10) sont montées sur un système de fixation qui permet le mouvement relatif pour ouvrir et fermer le passage.

11. Buse selon revendication 10, caractérisée par le fait que le système de fixation forme une partie d'un système de fermeture de buse qui comprend par exemple une liaison du type ciseaux, conjointement avec la structure de fixation de plaque (120) et l'autre partie (10), qui est fixée sur des bras correspondants de la liaison (EP 110 359), et un mécanisme d'entraînement pour actionner la liaison.

12. Buse selon l'une des revendications précédentes, caractérisée par le fait que l'autre partie (10) comprend un bloc possédant une rainure (34) sur sa surface (26) faisant face à la plaque (12), et est en plus pourvue d'un trou (52) à travers lequel du fluide de traitement peut être amené vers la rainure (34).

13. Buse selon revendication 12, caractérisée par le fait que le passage de fil (34, 36) mène vers une chambre de texturation, qui permet au fluide de traitement de quitter la chambre, transversalement au parcours du fil.

14. Buse selon l'une des revendications précédentes, caractérisée par le fait que la déformabilité élastique de la plaque (12) est telle que la plaque (12) peut fléchir sous un moment net qui a tendance à pivoter la plaque (12) autour d'une zone de premier contact avec l'autre partie (10), lorsque les surfaces opposées (28, 26) de la plaque (12) et l'autre partie (10) viennent pour la première fois en contact, dans une zone localisée, dans une position arbitraire sur ces surfaces.

15. Buse selon revendication 14, caractérisée par le fait que le fléchissement produit par le moment net est tel que le contact par surfaces adjacentes se fait au moins sur les zones situées de chaque côté, et sur toute la longueur du parcours du fil.

16. Buse selon l'une des revendications précédentes, caractérisée par le fait que la plaque (12) est constituée de métal.

17. Buse selon revendication 16, caractérisée par le fait que le métal possède des propriétés de conductibilité thermique excellentes.

18. Buse selon revendication 1, caractérisée par le fait que la partie flexible (12) est fixée sur un membre de support rigide (122) à l'aide d'un moyen (124) qui permet un mouvement relatif entre la partie flexible (12) et le membre de support (122).

19. Buse selon revendication 1 ou 18, caractérisée par le fait que la partie flexible (12) est pourvue d'une rainure (36) adapté pour le travail en coopération avec une rainure (34) dans l'autre partie (10) ou les parties, afin de définir le passage du fil et ainsi son parcours.

20. Buse selon revendication 1, 18 ou 19, caractérisée par le fait que la partie flexible (12) est maintenue par une fixation flexible, par exemple d'un type connu (demande de brevet européenne N° 110 359).

21. Buse selon revendication 20, caractérisée par le fait que la fixation flexible comprend un moyen d'équilibrage (138, 140, 142, 144, 146, 148, 150) permettant de répartir la force de fermeture sur la partie flexible (12).

22. Buse selon revendication 21, caractérisée par le fait que le moyen d'équilibrage comprend au moins un levier (140, 142), au moins deux éléments de butée (148, 150), un montage à pivot (138) pour le levier, qui sont fixés sur le levier (140, 142) par les montages à pivot correspondants (144, 146), et où les montages à pivot (144, 146) pour les éléments de butée (148, 150) sont disposés de chaque côté du montage à pivot (138) pour le levier.

23. Buse selon revendication 22, caractérisée par le fait que l'axe de pivotement de chaque montage à pivot (138, 144, 146) s'étend essentiellement à angle droit par rapport au parcours du fil, le long du passage (34, 36), et dans un plan parallèle à celui-ci.

24. Buse selon l'une des revendications 20 à 23, caractérisée par le fait que le moyen (152) servant à exercier des forces de fermeture est prévu sur les éléments de butée (148, 150).

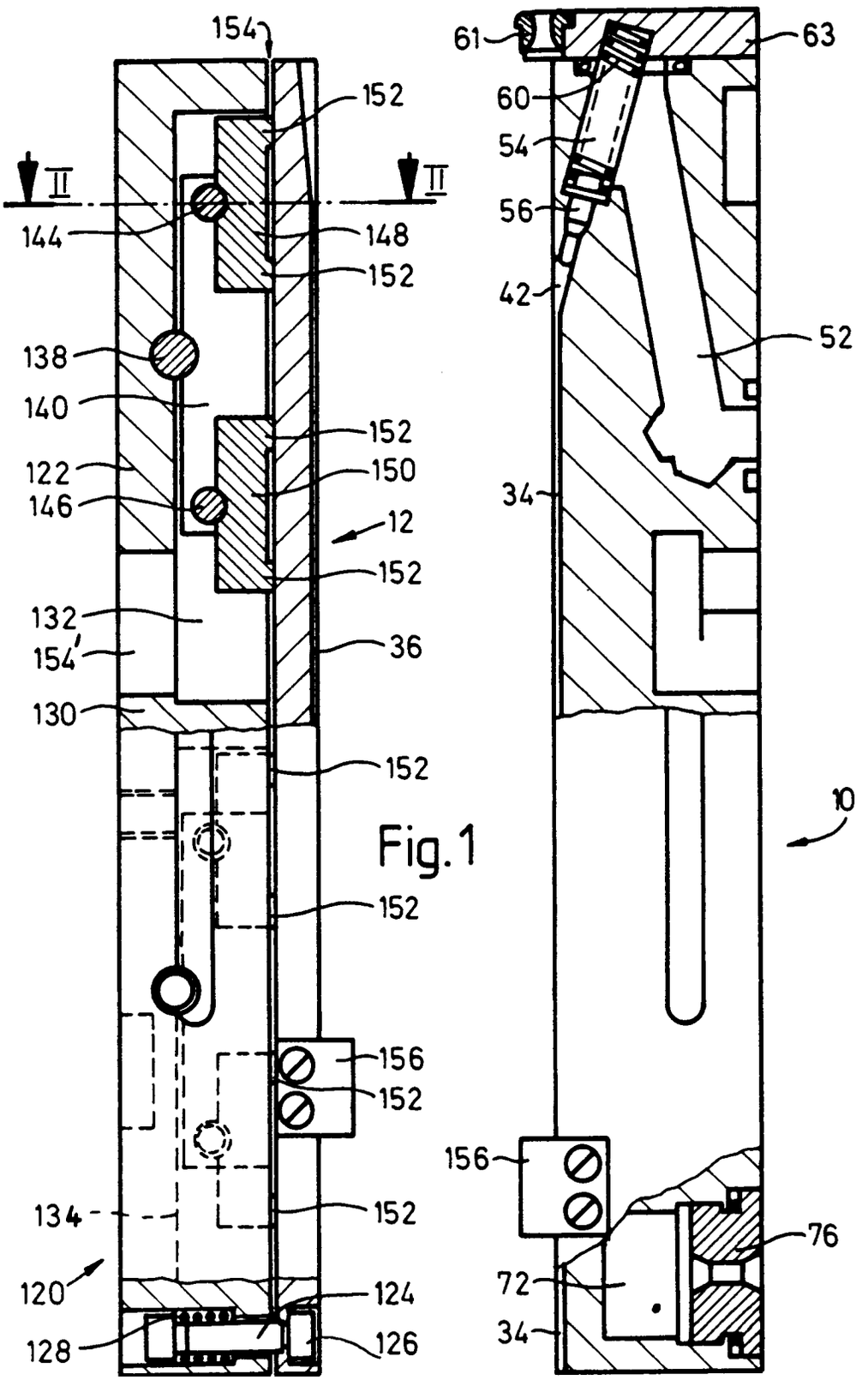
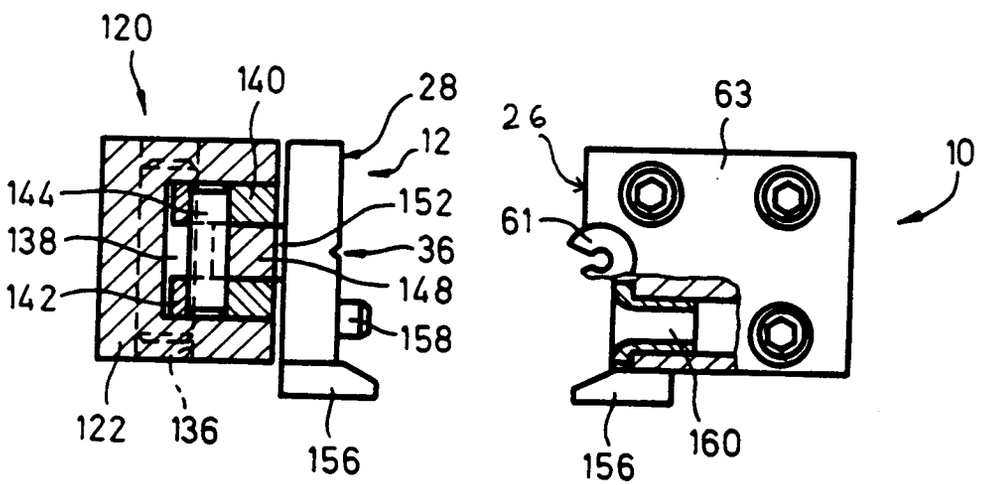

154
152
II
II
144
148
152
138
140
152
122
150
146
12
152
132
154'
36
130
152
152
156
152
134
152
120
124
128
126
61
63
60
54
56
42
52
34
10
156
76
72
34

Fig.1

Fig. 2


120
140
28
12
144
152
138
36
142
148
158
122
136
156
26
63
10
61
156
160