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(54) **A FIBRE SPLICER AND METHOD FOR SPLICING FIBRES**

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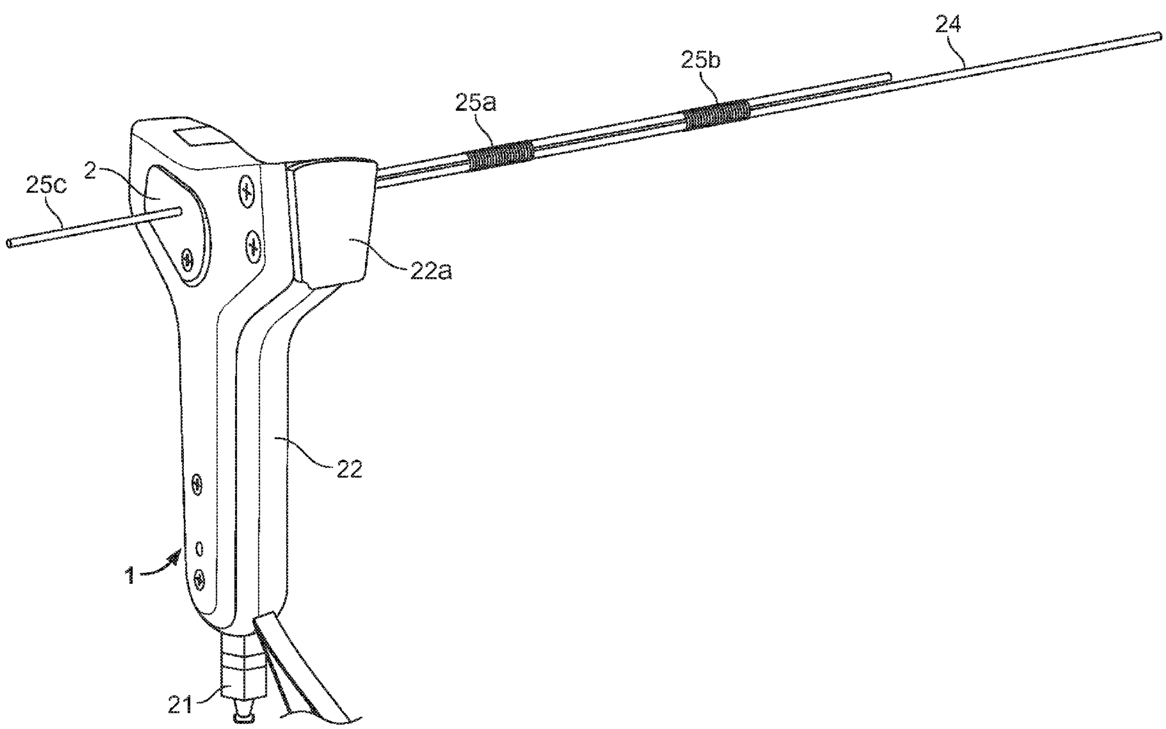
(57) **ABSTRACT**

A fibre splicer (**1**) is disclosed that includes a splicing chamber (**2**) for receiving fibres to be spliced having an opening of in a side thereof, a chamber pad (**3**) for selectively sealing the opening of the splicing chamber (**2**) and a valve (**9**). The valve (**9**) has an unobstructed fluid pathway there-through, the valve (**9**) extending from the chamber (**2**) and being reconfigurable between a first configuration prohibiting fluid flow along the pathway and a second configuration permitting fluid flow along the pathway.



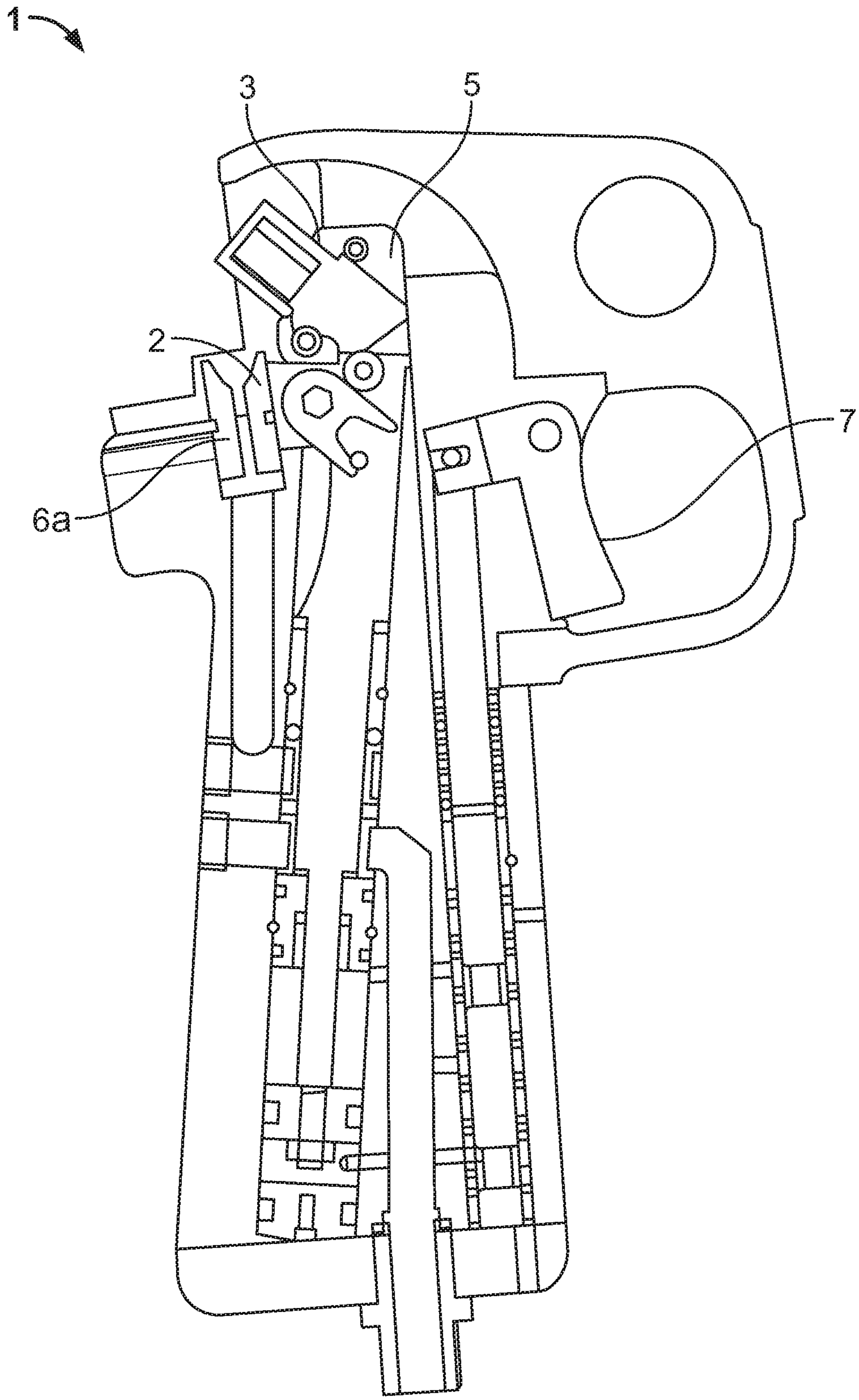


FIG. 1

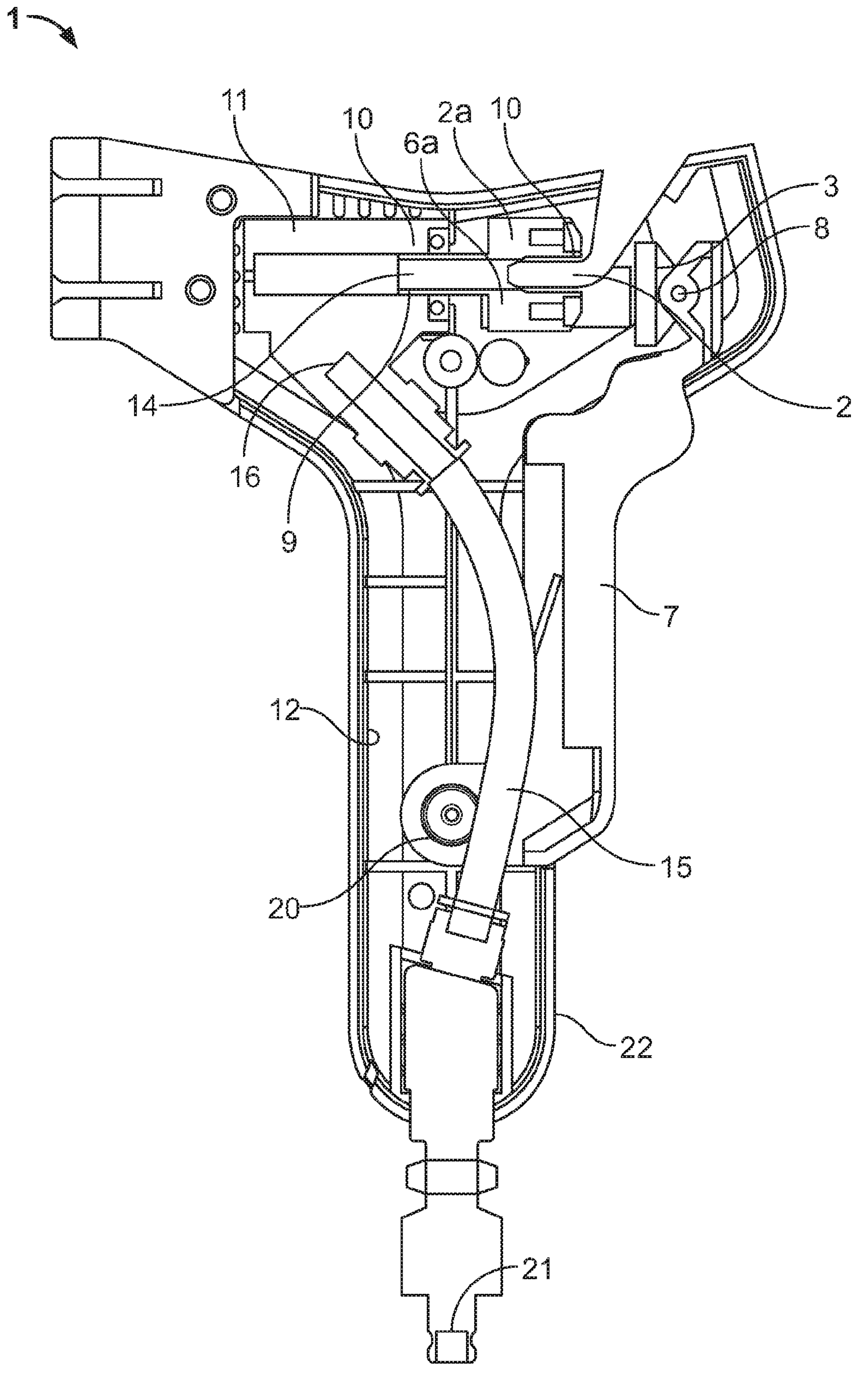


FIG. 2

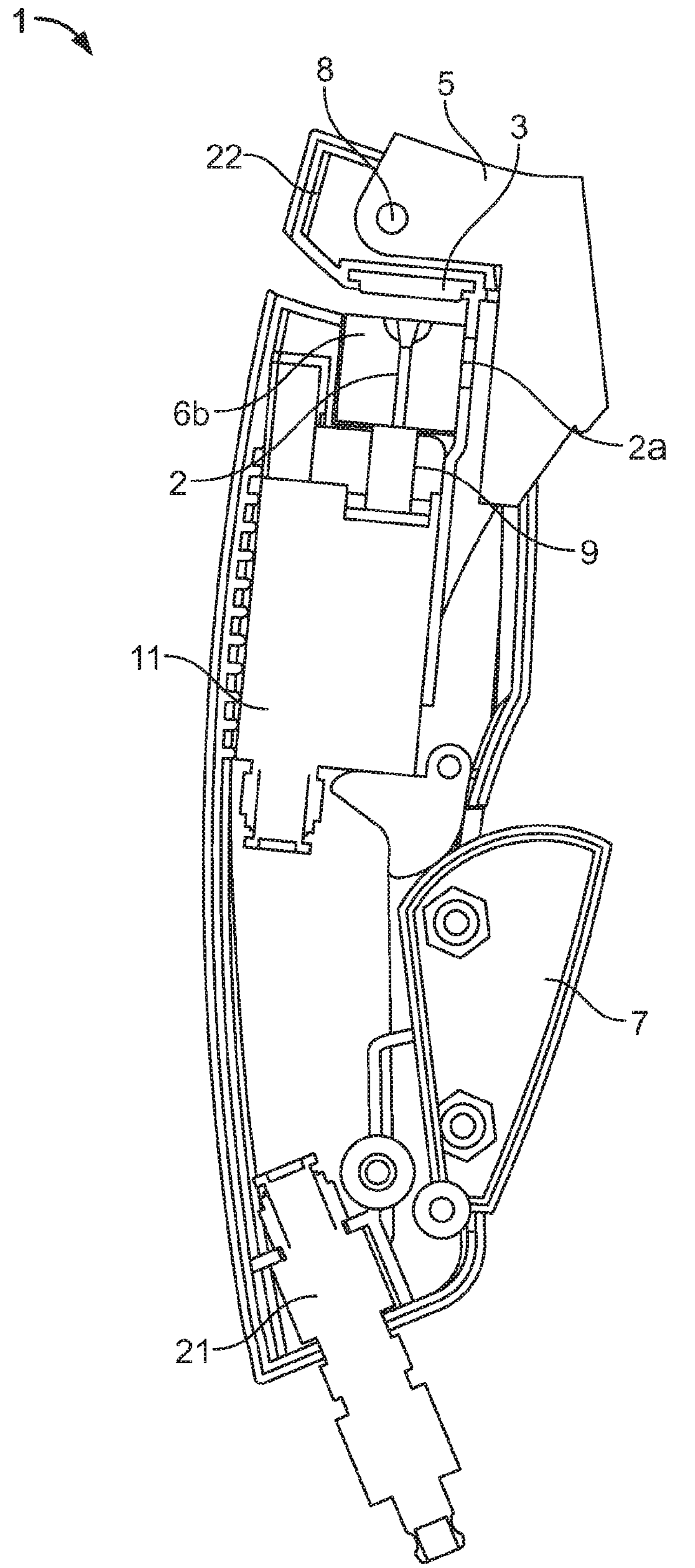


FIG. 3

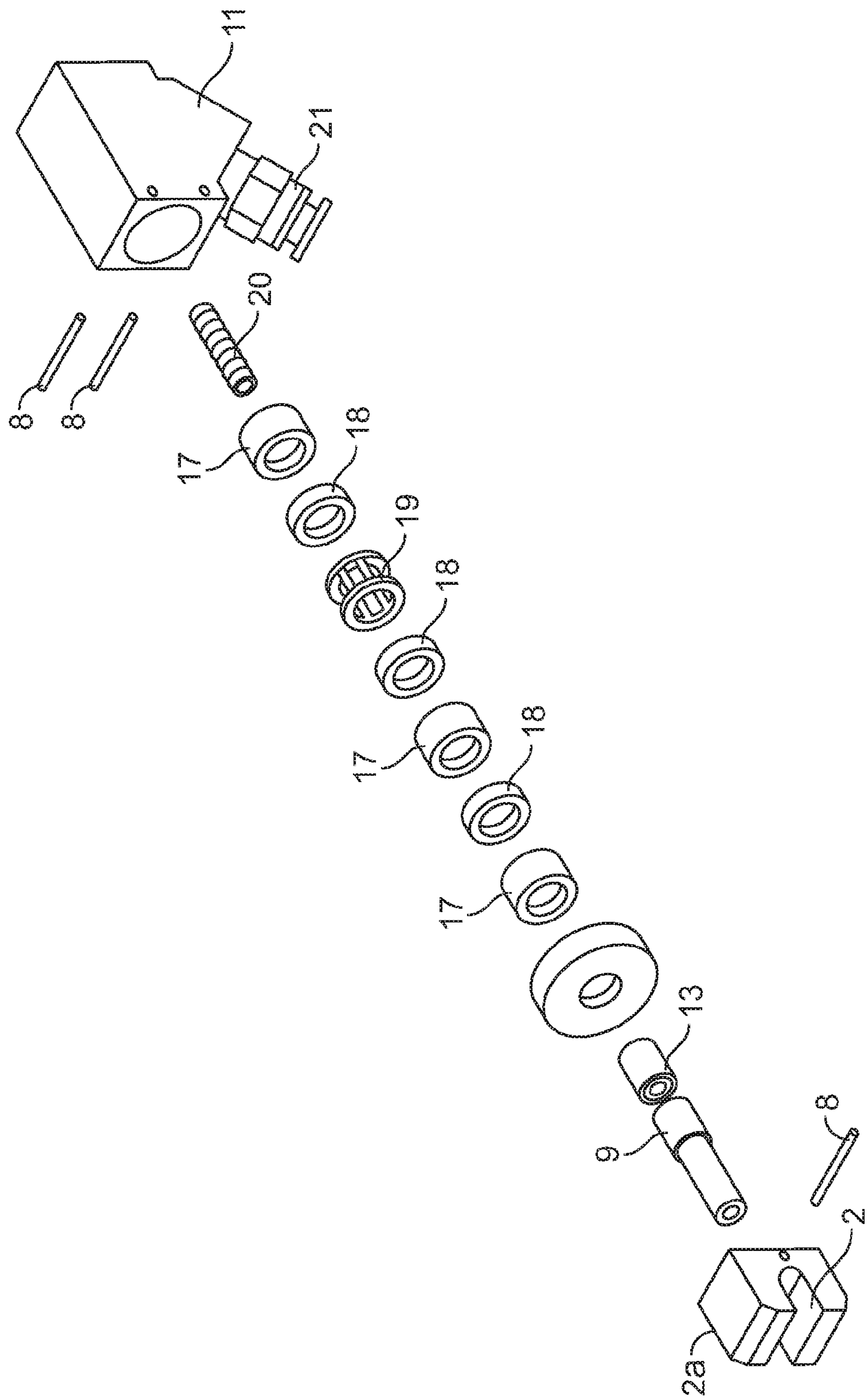


FIG. 4

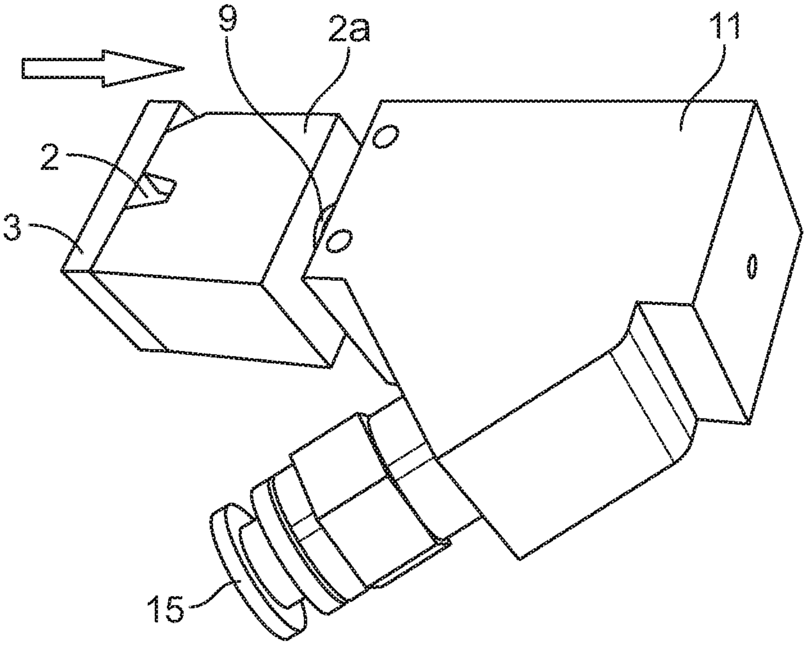


FIG. 5

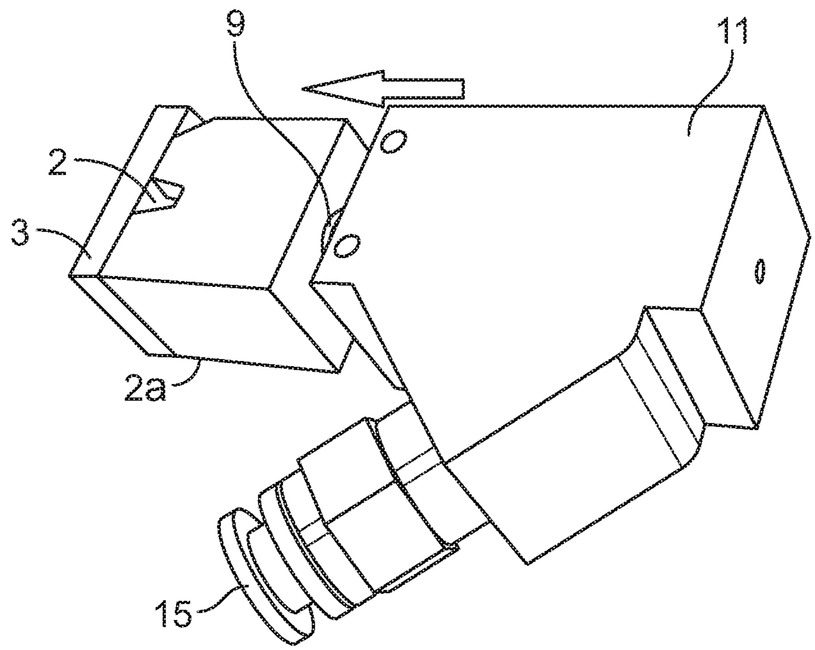


FIG. 6

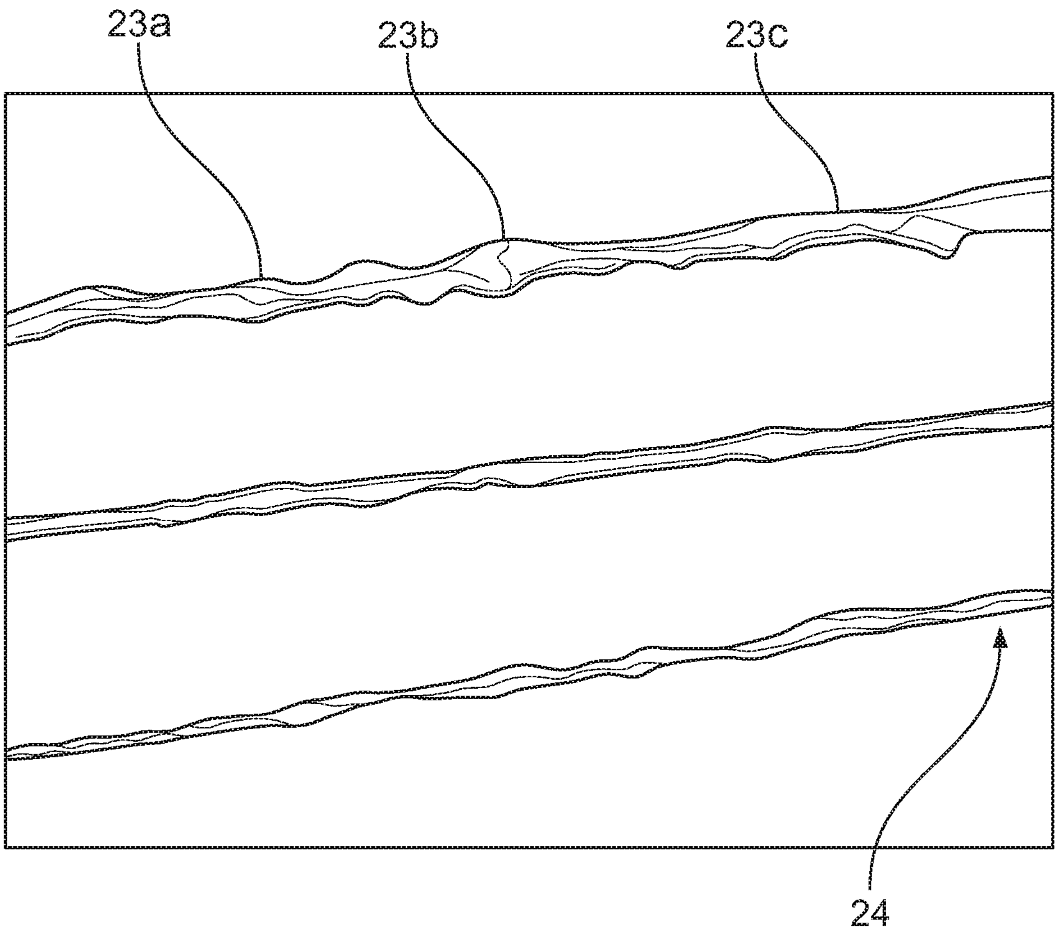


FIG. 7

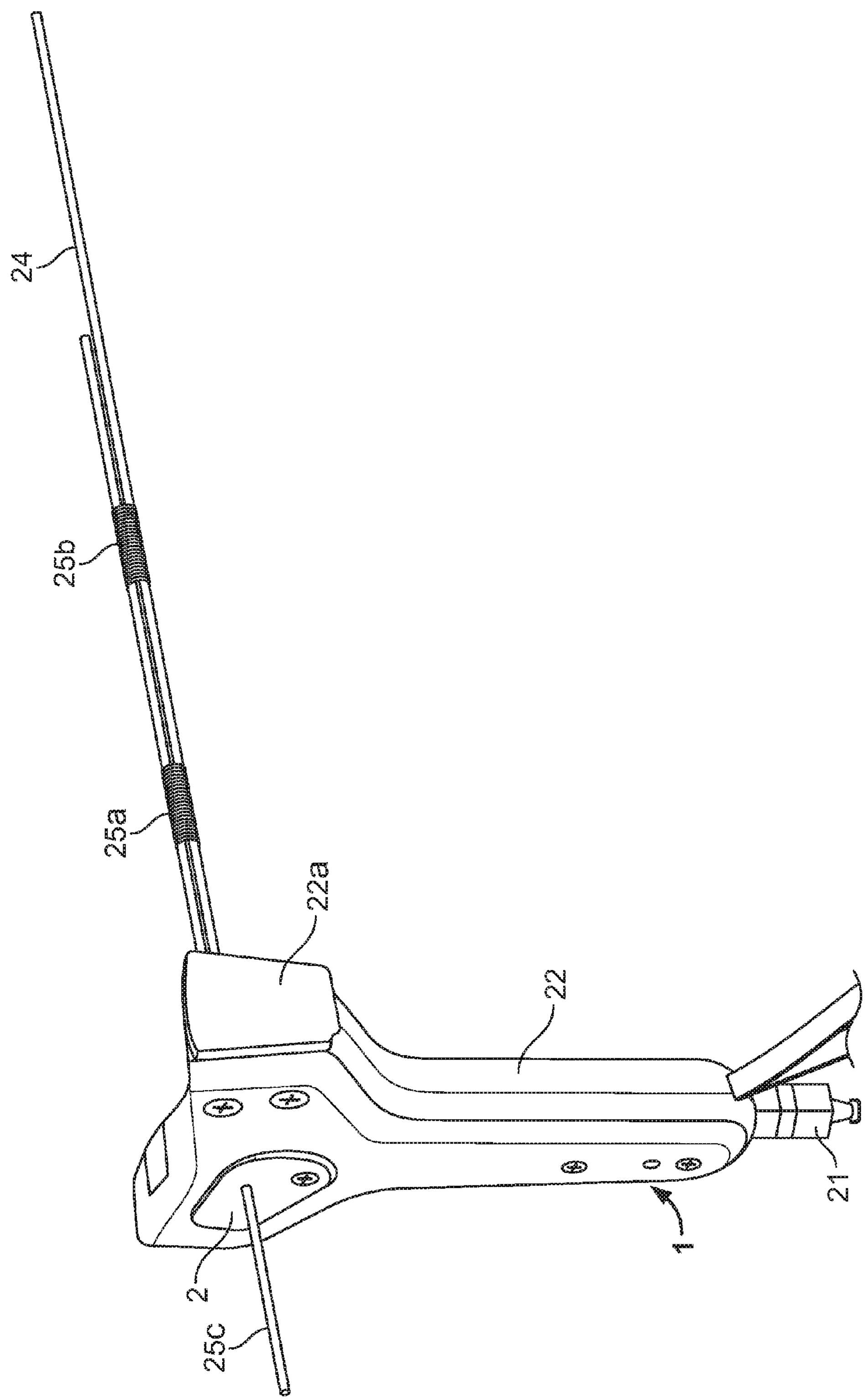


FIG. 8

A FIBRE SPLICER AND METHOD FOR SPLICING FIBRES

[0001] This invention relates to a fibre splicer and a method for splicing fibres, in particular for carbon fibres.

[0002] Pneumatic splicing is a well-known technique used to combine two parts of separate and distinct fibres together and can be used instead of a traditional knot. Yarn ends are inserted and overlapped in a chamber into which an air blast is introduced, entangling the filaments. Pneumatic splicing can be carried out in a relatively short splicing time and on a wide range of yarn types.

[0003] It is of particular use in the textile industry where it is desirable to minimise the downtime of equipment which results when bobbins containing fibres, for example synthetic yarn, are depleted/exhausted and have to be replaced. Therefore, the use of a splice improves the efficiency, and profitability, of the manufacturing process of a material, ultimately by increasing the throughput of the fibre so as to maximise the output of the material to be manufactured.

[0004] A splicer has three main elements including i) a splicing chamber having a blast port, ii) a closing member for closing and sealing the chamber and iii) commonly a means of cutting the unwanted loose ends of the two fibres to provide a neat splice that can be used in material manufacturing components. These elements enable insertion of the fibres which are to be spliced into the chamber. The chamber is then subsequently closed and sealed by the closing member prior to compressed air being inserted into the chamber. In splicers which are fitted with cutters, the cutting of undesired fibres may occur prior to, during or subsequent to the compressed air being introduced into the chamber, depending on the properties of the fibres to be spliced.

[0005] Ultimately, obtaining a good seal between the closing member and the ends of the chamber is essential since, in order to provide a robust splice, the fibres to be spliced must not escape the chamber on application of the pressurised air. Also this is important since the shape of the internal surfaces of the closed chamber influences the quality and form of the splice.

[0006] In commercial splicers the physical relationship between the splicing chamber and the closing member, for example a closure pad, is extremely important to ensure a suitable closing action is achieved and seal is obtained. For example, in FIG. **1** a known splicer **1** is shown. The longitudinal axis of the chamber **2** of the splicer **1** is substantially vertical and the closure pad **3** is at a 45 degree angle therefrom in its open position. When the pad **3** is in the open position the fibres to be spliced can be inserted in the channel **4** of the chamber. The closure pad **3** must then be moved into a closed position so as to seal the entrance to the chamber **2**. This arrangement requires a complex mechanical linkage **5** to be implemented so as to ensure that the pad **3** seals the chamber **2** satisfactorily. Such an arrangement does not permit the depth of the chamber **2** to be changed without having a detrimental effect on the sealing properties between the pad **3** and the walls of the chamber **2**, unless significant modifications were made to the mechanical linkage **5**.

[0007] It is usual for three air supplies to be applied to a splicer. The first air supply actuates the closing member, whereby the air moves the closing member until it makes contact with the splicing chamber. The second air supply feeds the splicing chamber itself so as to cause splicing of the fibres contained therein, and the third air supply drives the cutting means. The three air supplies provide a complicated actuation arrangement that can be prone to technical faults.

[0008] Common though it is in the textile business, pneumatic splicing is by no means universal; there are certain materials which over the years have posed technical problems. So while the technique is firmly-established in some sectors, it has shown poor or no penetration in others. Some problem areas include monofilaments, low filament numbers and coarse filaments, high twist levels, artificial grass and brittle filaments (such as glass and carbon). The main problem with using current splicing techniques to splice brittle filaments arises from the suitability of the air pressure used to produce the splice. For example, if the air pressure is too low the intermingling of the fibres is not enough to get the necessary splice strength and therefore splice quality. However, if the pressure is too high the fibres to be spliced will be destroyed, also providing a weak splice or no splice at all. Brittle fibres such as carbon fibres are particularly prone to such damage.

[0009] The present invention is derived from the realisation that there exists a need to provide a simplified splicer offering more versatility to fibres of differing thickness and materials, whilst maintaining the desired sealing effect as an air blast is performed to form the splice. The splicer must also be ergonomically friendly to the operator and must be resilient to damage.

[0010] According to the invention there is provided a fibre splicer including: a splicing chamber for receiving fibres to be spliced having an opening of in a side thereof; a chamber pad for selectively sealing the opening of the splicing chamber; and a valve having an unobstructed fluid pathway there-through, the valve extending from the chamber and being reconfigurable between a first configuration prohibiting fluid flow along the pathway and a second configuration permitting fluid flow along the pathway. This arrangement provides a simplified system for providing an air blast within the chamber. The simplified system is also cheaper to fabricate and lighter for the user, since it minimises the use of bulky mechanical parts. The airflow is unobstructed air flow which means the air resistance is lower and the blast can be reliably provided.

[0011] Preferably, wherein the pathway extends from an air supply to the interior of the splicing chamber so as to provide an air blast.

[0012] Desirably, wherein the pathway extends along the longitudinal axis of the valve. The pathway therefor utilises the hollow nature of the valve and removes the need to provide a separate airflow path and valve control system.

[0013] Beneficially, wherein the valve is moveable. This movement switches between the states of the valve.

[0014] Preferably, wherein the pathway extends from a valve inlet to a valve outlet which is spaced apart from the valve inlet along the longitudinal axis of the valve. The arrangement of the inlet and outlet ensures that the air is permitted to flow within the interior of the valve-in an unobstructed manner. In the prior art of FIG. **1**, the air must flow around the piston which is clearly undesirable.

[0015] Further preferably, wherein the chamber is moveable. The chamber is therefore not stationary as is known in the prior art, but movement of the chamber causes the valve to be switched from its closed to open state. This also ensures that the blast does not occur until the pad has made contact with the chamber ensuring that the chamber is sealed so as to provide an optimal splicing performance.

[0016] Desirably, wherein the chamber and the valve are an integral unit. This ensures that movement of the chamber effects movement of the valve enabling the valve to be switched from the closed to the open state.

[0017] Preferably, wherein the valve extends from a side of the chamber opposing the chamber opening. This ensures that the air outlet of the valve is arranged to optimise the blast for the given splicing chamber.

[0018] Desirably, wherein the relative movement between the chamber and the pad is linear. This prevents the need to provide bulky mechanical equipment which is used for the more common arcuate movement of the pad.

[0019] Beneficially, wherein the pad has two independent motions, the first motion being pivotable about a first axis and the second motion being pivotable about a second axis offset from the first axis. This ensures that an optimum sealing effect is achieved and enables the cleaning of the pad and side wall of the chamber so as to ensure the optimal sealing effect is maintained on subsequent use of the splicer.

[0020] Preferably, wherein the pad is arrangeable to seal the side opening of the splicing chamber. This ensures the air blast provides the desired splice quality, by physically optimising the air flow within the chamber and physical process of the splice.

[0021] Desirably, wherein the valve is slideable between the first configuration and second configuration and vice versa to effect and opened and closed state of the valve.

[0022] Beneficially, wherein the chamber is moveable with respect to a fixed pad. The chamber is always moved to enable switching of the valve, but the pad could be fixed in a stationary position. Alternatively, prior to the pad making contact with the chamber block, the pad is moving whilst the chamber block remains stationary.

[0023] Preferably, wherein movement of the chamber relative to an air supply within a main valve body creates corresponding movement of the valve relative to the air supply within the main valve body. This enables the open state of the valve to be realised.

[0024] Preferably, wherein at least one cutter is positioned adjacent a first external side edge of the chamber and at least one cutter is positioned adjacent a second external side edge of the chamber which opposes the first side edge. This can be a blade and the user can make contact of the undesired ends of the splice with the blade to cause the cutting of the ends.

[0025] Desirably, wherein there are included at least a first and second splicing chamber arranged side-by-side so as to provide at least two splices side by side. This enables one splicer to provide a multiple side-by-side splice, which is required for high count yarns.

[0026] In a further embodiment of the invention there is provided a fibre splicer assembly having at least two of the above-mentioned fibre splicers arranged side by side so as to provide at least two splices side by side. Preferably, wherein the at least two splicers are spaced apart.

[0027] Beneficially, wherein at least one cutter is positioned at the respective remote ends of the fibre splicer assembly. This ensures that only the loose ends at the end of the multiple splice are removed.

[0028] In a further aspect of the invention there is provided a splicer having a valve having an unobstructed pathway there-through and extending from the chamber, including inserting fibres to be spliced within a chamber via an opening; making contact between a chamber pad with a chamber side so as to seal the opening of the chamber; configuring the valve from a first configuration wherein fluid is prohibited from passing along the pathway to a second configuration permitting fluid flow along the pathway so as to provide fluid to the interior of the chamber.

[0029] Preferably, wherein the valve is configured between the first and second states by sliding the valve with respect to an air port located in a main valve block.

[0030] Desirably, wherein the chamber is moved linearly to effect linear movement on the valve to which it is connected.

[0031] Beneficially, the method including permitting air to enter the chamber on motion of the chamber relative to a main valve block.

[0032] Whilst the invention has been disclosed above it extends to any inventive combination of the features set out above, or in the following description, drawings or claims.

[0033] The invention will now be described, by way of example only, with reference to the accompanying drawings in which:—

[0034] FIG. **1** is a channel and pad arrangement known in the art;

[0035] FIG. **2** is a cross section of a first embodiment of the invention;

[0036] FIG. **3** is a cross-section of a second embodiment of the invention;

[0037] FIG. **4** shows an exploded view of the main valve block and the valve;

[0038] FIG. **5** is a schematic of the invention in a first embodiment;

[0039] FIG. **6** is a schematic of the invention in a second embodiment;

[0040] FIG. **7** is a perspective view of fibres having the 3-spliced arrangement; and

[0041] FIG. **8** is a perspective view of the splicer when used to create the 3-spliced arrangement of FIG. **7**.

[0042] Referring firstly to FIG. **2**, there is shown a splicer **1** having a splicing chamber block **2*a*** for receiving fibres to be spliced within a chamber **2**, or splicing groove, therein. The splicing chamber **2** has an entry channel **4** located in one side edge of the chamber block **2*a*** that enables the insertion of fibres within the chamber **2** in the usual way. Two opposing ends **6*a***, **6*b*** of the chamber **2** are open so as to permit the fibres to extend either side of the chamber **2**. A chamber pad **3** selectively seals the entrance or opening to the channel **4** of the splicing chamber block **2*a***, so as to seal the splicing chamber **2** with the fibres contained therein.

[0043] The chamber pad **3** moves between a first open position so as to enable placement of the fibres in the chamber **2** by a user and a second closed position whereby the pad **3** makes contact with the chamber block **2*a*** so as to seal it. The pad **3**, which is mounted near the end of a trigger **7**, has a complex arcuate motion. The centre of rotation of the trigger **7** is at some distance from the pad **3**, so that when the splicer **1** is operated, the pad **3** first moves in an arc of relatively large radius. The pad **3** is also free to rotate about a steel pin **8** fixed to the trigger **7**, so that the pad **3** has a second short-radius arcuate motion. When the pad **3** reaches the chamber block **2*a*** it can rotate slightly on that short radius, thereby aligning itself with the surface of the chamber block **2*a***. These two independent motions of the pad **3** produce a satisfactory seal between the pad **3** and the chamber block **2***a*, and satisfactory alignment for the pad **3** to push the chamber block **2***a* in the desired direction. This arrangement requires a less bulky mechanism compared to those used for conventional arcuately moveable pads.

[0044] The movement of the pad **3** is actuated by the mechanical trigger **7**. This removes the need for dedicated drillings to be applied for supplying the pad **3** with air. The combination of the arcuate motions of the trigger arm ?a and the closure pad **3**, and the linear motion of the chamber result in a modest brushing of the closure pad **3** against the surface of the chamber block **2***a*. This wiping action, which occurs with each use of the splicer **1**, has the effect of cleaning the surfaces of the pad **3** and the chamber block **2***a*, maintaining a good air seal when in the closed state.

[0045] Alternatively, as shown in FIG. **3**, the pad **3** may remain fixed and the trigger **7** may actuate the channel block **2***a* itself. In this arrangement the chamber **2** moves linearly with a main valve block **11** such that the first open position is provided, enabling placement of the fibres in the chamber **2** by a user, and a second closed position is provided whereby the main chamber block **2***a* comes into contact with the stationary pad **3** thereby sealing the entrance to the chamber **2**. The chamber **2**, which is horizontally mounted, and the main valve block **11** may subsequently be moved between the closed position and the open position after the splice has been created. The relative linear movement between the pad **3** and the chamber block **2***a* requires a less bulky mechanism compared to those used for arcuately moveable pads. The relative linear movement of the pad **3** and chamber block **2***a* also allows for the chamber **2** to be constructed at any depth whilst maintaining the required seal there-between when the pad **3** is in the closed position. Therefore, the arrangement can easily accommodate bigger yarns by deepening the chamber **2** without having to modify the pad and trigger mechanism. The position of the chamber block **2***a* in relation to a handle **12** and the main valve block **11** also ensures that the chamber size can be increased without having a detrimental effect on the weight or balance of the splicer **1** (whereby the centre of mass is ultimately determined by the centre of mass of the splicer). This ensures easy operation of the splicer **1** regardless of its size. Therefore, the splicer **1** is extremely versatile and user friendly.

[0046] The trigger **7** is suitable for right and left handed operation and offers reduced RSI and operator fatigue compared to some other known actuation means.

[0047] An elongate valve **9** extends from a side of the chamber **2**, for example the side of the chamber **2** opposing the channel **4** entrance or opening, however the valve **9** may alternatively extend from a side wall thereof. The valve **9** is tube like and is reconfigurable between a first configuration prohibiting air from entering the chamber **2** and a second configuration permitting air to enter the chamber **2** via the interior of the valve **9** i.e. it is a spool valve. The blast of compressed air is transferred from a valve inlet **13** which is a hole drilled or otherwise formed in the side wall of the valve **9** to a valve outlet **14** which is spaced apart from the valve inlet **13** along the longitudinal axis of the valve **9**. The valve outlet **14** is located at a cross-sectional end of the valve **9**. Therefore, the valve has an unobstructed fluid pathway there-through, the valve extending from the chamber and being reconfigurable between a first configuration prohibiting fluid flow along the pathway and a second configuration permitting fluid flow along the pathway.

[0048] The direct fluid pathway passes along the interior of the valve **9** such that compressed air can flow into the chamber **2**. The valve **9** is cylindrical, but may be formed of any elongate hollow member having a square or other shaped cross-section if desired.

[0049] The valve **9** is slideable between the first configuration and second configuration and vice versa so as to permit the closed and open states of the valve **9** respectively.

[0050] The compressed air introduced to the chamber **2** is highly turbulent, and the violent small-scale disturbances radically disrupt the arrangement of the fibres in the splicing chamber. Those fibres which happen to lie across the outlet of the valve are separated by the direct blast. Those which lie elsewhere in the chamber are subjected to a pattern of vortices downstream of the entry point, which produce twisting and intermingling. Ultimately the intermingling of the fibres, causing inter-filament friction, makes a strong joint as a result.

[0051] FIG. **4** shows a main valve block **11** arranged to surround part of an air feed tube **15** and one end of the valve **9**. An air port **16** is arranged in the main valve block **11** to communicate air between the air feed tube **15** and the valve **9** when the valve **9** is in the open state. The air port **16** is blocked when the valve **9** is in the closed state, whereby the closed state is the biased state of the valve **9**. An O-ring **17**, spacer **18** and perforated shell assembly is used to surround the valve **9** within the main valve block **11** and a resilient member **20**, for example a spring is used to maintain the valve **11** in its biased, closed state. When the splicing chamber block **2***a* and valve **9** are moved towards the main splicing block **11**, the spring **20** is compressed and the valve **9** reaches the predetermined position whereby the geometry of the system of O-rings **17**, spacers **18** and the perforated shell **19** permits air to pass through the valve inlet **13**. The other part of the air feed tube **15** extends through the handle **12** of the splicer **1** and is terminated at the distal end of the handle **12** by a connector **21** suitable for connection to a compressed air supply (not shown). The air feed tube **15** therefore supplies the air blast to the chamber **2** via the air port **16**, valve inlet **13** and valve outlet **14** when the valve **9** is in the open state. The trigger **7** is used to actuate the splicing action. Both the handle **12** and the trigger **7** have been arranged to be ergonomic for the user. The valve **9** is arranged to be freely mounted in the main valve block **11**. This enables the chamber **2** to be rotated if desired (which is suitable depending on whether the operator is right or left handed.)

[0052] The chamber block **2***a* and the valve **9** are an integral unit so that movement of the chamber block **2***a* relative to the main valve block **11** is required so as to create a corresponding movement of the valve **9** relative to the main valve block **11** in a first direction, causing the valve **9** to switch between the closed to the open state with subsequent movement of the valve **9** relative to the main valve block **11** in a second direction opposing the first direction to recover the closed state. The open state can be achieved by alignment of the valve inlet **13** with a corresponding air port **16** located in the valve main block **11** from which the compressed air escapes. Because of this arrangement, the chamber block **2***a* is required to be moveable so as to enable actuation of the valve **9** from the closed state whereby passage of air there-through is prohibited to the opened state whereby the compressed air is permitted to pass from the valve inlet **13** to the valve outlet **14** and hence into the chamber **2** so as to cause intermingling of the fibres contained therein.

[0053] A cutter element (nor shown), for example a blade, is positioned adjacent one external side edge **6***a* of the chamber block **2***a* and at least one cutter (not shown) is positioned adjacent a second side edge **6***b* of the chamber block **2***a* which opposes the first side edge **6***a*. This enables the waste ends of the fibres to be cut of prior to removing the spliced joint from the splicing tool **1**. This provides the neatest possible splice thereby forming a smooth joint which is suitable for use in many different industrial applications e.g. on yarns in the textile industry or carpet fibres. In an alternative form of the splicer **1**, it may be operated without any integral cutters. In this arrangement the trimming is performed after splicing, using a suitable device such as scissors. This method is of particular use when the yarns to be joined are very big, or very tough; in those circumstances, integral knives may prove unreliable. Clearly the relative timing of blast and cut can be altered whereby an early cut, a standard cut or a late cut may be applied as necessary.

[0054] The simple construction of the splicer **1** ensures that the simplest fasteners e.g. pins can be utilised rather than screws and provides a splicer that is lighter and cheaper to fabricate compared to those of similar functional capability.

[0055] The splicer mechanics is protected in a replaceable housing **22**.

[0056] Therefore, in the case that the splicer **1** is exposed to a knock or other external excess force the inwards of the splicer **1** are shielded by the outer housing **22** which can be replaced on damage. The housing **22** is made from a plastic material, but another cheaply producible and shock absorbent material may instead be implemented for protecting the splicing unit contained therein. The housing is formed of two parts having a simple snap fit structure and is secured together by a fixing means, for example screws. The housing **22** includes an attachment means (not shown) to enable the splicer **1** to be secured to a hook or other storage receiving means for enabling the splicer **1** to be stored away when not in use. Alternatively, the splicer **1** could be fixed to a rig via a fixing means (not shown) enabling a larger fixed splicing arrangement to be provided.

[0057] In use as shown in FIG. **5**, the trigger **7** is pressed which causes a cam (not shown) to provide movement of the closure pad **3**, until the pad **3** aligns itself automatically and strikes an external side edge **6***a* of the chamber block **2***a* which contains the opening. The chamber block **2***a* is then caused by the force applied by the closure pad **3** to move linearly towards the main valve body **11**, in a backwards direction, causing the sliding valve **9** to move inside the main valve block **11**. At a predetermined point in its motion, the hollow valve **9** changes to its opened state whereby compressed air is passed from the air feed tube **15**, through the air inlet **13** of the valve, through the interior of the valve **9** to the air outlet **14** where the air is expelled from the interior of the valve **9** into the sealed chamber **2** causing the splicing action to commence. The fibres contained within the sealed chamber **2** are therefore exposed to a blast of compressed air. In this first embodiment the main valve block **11** remains stationary during the splicing operation and the trigger **7** ultimately causes the pad **3** to move so as to make contact with the chamber block **2***a* and cause the valve **9** to slide inside the main valve block **11** initiating the open state. In the open state the inlet of the valve **9** is aligned with the air port **16** within the main valve block **11** causing air to pass there-between. The chamber block **2***a* movement ultimately opens the valve **9** and compressed air is provided to the chamber **2** via the hollow, valve interior.

[0058] In an alternative embodiment of the invention as shown in FIG. **6**, a user presses on the trigger **7** to drive the main valve block **11** and the chamber block **2***a* forward until the chamber block **2***a* makes contact with the fixed closure pad **3**. The chamber block **2***a* is then brought to a stop, while the main valve block **11** continues to be pushed in the direction of the pad **3**, in a forward motion, causing the valve **9** to be inserted deeper into the main valve block **11** so as to initiate the open state of the valve **9**. At a predetermined point in the forward motion of the valve body, compressed air is passed from the air port **16**, through the air inlet **13** of the valve **9**, through the valve **9** to the air outlet **14** where compressed air is expelled from the valve **9** into the sealed chamber **2**. The fibres contained within the sealed chamber **2** are therefore exposed to a blast of compressed air. Therefore, in this second embodiment the chamber block **2***a* and valve main block **11** are moveable with respect to a stationary pad **3** so as to force the valve **9** to slide into the open state.

[0059] Since standard air pressures used to produce the desired qualities of the splice are damaging to brittle fibres such as carbon and glass fibres, the air pressure used with such fibres has been significantly reduced, sometimes to as low as 3 bar. This enables the splice to be formed while causing very little filament damage. However, this provides a very weak splice and multiple side by side splices are required to provide the necessary strength of the splice. Three side by side splices **23***a*, **23***b*, **23***c* have been shown to provide a splice with the desired strength, whilst optimising cost and usability, as shown in FIG. **7**. Also when considering big yarns, longer splices are required that cannot be made with a single splicing chamber.

[0060] Therefore, a first, second and third splicers can be placed side by side so as to produce a splice assembly (not shown) enabling a first, second and third splice to be created in a single operation. The ends of the fibre to be spliced are overlapped across the entire splice assembly array. A multiple splice actuator is implemented to ensure the splicer assembly is operated simultaneously with a single trigger action applied by the user. The simplified nature of the splicer provided by the combined chamber and valve assembly, and the relative linear sliding movement of the pad and chamber enables a compact splicer assembly to be provided.

[0061] In the multiple splicer arrangement on a first and second cutter need to be positioned at the respective remote ends of the fibre splicer assembly.

[0062] As an alternative to using a splicing arrangement for performing three splices simultaneously, a single splicer **1** may be implemented at different longitudinal distances along the fibres **24** to be spliced, as shown in FIG. **8**. For example the splicer **1** can be operated in a first central position **25***a*, can then be moved towards the right of the central splice to a right hand splice region **25***b* and then can be finally moved left, past the central splice, to a left hand spliced region **25***c*. This may be desirable where the multiple splice assembly is too large and heavy to be a hand held device.

[0063] Various modifications to the principles described above would suggest themselves to the skilled person. For example, whilst it has been described to use three splicer units in an array, more (or less) units may be arranged side by side as desired and this may be optimised for a variety of fibre types whereby the air pressure and the number of adjacent splices can be tailored to the type of fibre to be spliced.

[0064] Since mass flow rate is a primary determinant of splicing performance, it may sometimes be advantageous to use a fluid with higher density than air; for example, compressed carbon dioxide may be used in appropriate circumstances.

[0065] Alternatively to a spool valve, a poppet valve may be implemented to select when the air flow is to be transferred internal to the chamber.

[0066] The pressures used in the splicer depend on the type of fibres used. For example for tough fibres such as nylon and polyester 6-7 bar is used for optimum results. However, for fairly brittle glass fibres of a fine glass yarn typically pressures of around 4 bar are suitable. For a heavier glass yarn tolerances of up to 6 bar can be reached without the yarns being too badly damaged. Carbon fibre is different again, whereby the heavy glass fibre yarns are generally made by multiplying up fine filaments. Therefore, the yarn must be treated with care with 5 bar being the absolute maximum pressure and 3-4 bar being the norm. These values, of course, are suitable for the splicing chamber of the application and may vary for a splicing chamber having a different shape or dimensions.

[0067] Alternatively to arranged multiple splicers side by side to form multiple side-by-side splices, a single splicer may be implemented having at least a first and second chamber contained therein. Further multiples of the chamber may be implemented as desired.

[0068] Instead of providing the cutter elements adjacent the first and second external side edge of the chamber block, they may be positioned external to the main housing of the splicer, or in an alternative position as desired.

What is claimed is:

1. A fibre splicer including:

a splicing chamber for receiving fibres to be spliced having an opening of in a side thereof;

a chamber pad for selectively sealing the opening of the splicing chamber; and

a valve having an unobstructed fluid pathway there-through, the valve extending from the chamber and being reconfigurable between a first configuration prohibiting fluid flow along the pathway and a second configuration permitting fluid flow along the pathway.

2. A fibre splicer according to claim **1**, wherein the pathway extends from an air supply to the interior of the splicing chamber.

3. A fibre splicer according to claim **1**, wherein the pathway extends along the longitudinal axis of the valve.

4. A fibre splicer according to claim **1**, wherein the valve is moveable.

5. A fibre splicer according to claim **1**, wherein the pathway extends from a valve inlet to a valve outlet which is spaced apart from the valve inlet along the longitudinal axis of the valve.

6. A fibre splicer according to claim **1**, wherein the chamber is moveable.

7. A fibre splicer according to claim **1**, wherein the chamber and the valve are an integral unit.

8. A fibre splicer according to claim **1**, wherein the valve extends from a side of the chamber opposing the chamber opening.

9. A fibre splicer according to claim **1**, wherein the relative movement between the chamber and the pad is linear.

10. A fibre splicer according to claim **1**, wherein the pad has two independent motions, the first motion being pivotable about a first axis and the second motion being pivotable about a second axis offset from the first axis.

11. A fibre splicer according to claim **1**, wherein the pad is arrangeable to seal the side opening of the splicing chamber.

12. A fibre splicer according to claim **1** wherein the valve is slideable between the first configuration and second configuration and vice versa.

13. A fibre splicer according to claim **1**, wherein the chamber is moveable with respect to a fixed pad.

14. A fibre splicer according to claim **13**, wherein movement of the chamber relative to an air supply within a main valve body creates corresponding movement of the valve relative to the air supply within the main valve body.

15. A fibre splicer according to claim **1**, wherein at least one cutter is positioned adjacent a first external side edge of the chamber and at least one cutter is positioned adjacent a second external side edge of the chamber which opposes the first side edge.

16. A fibre splicer according to claim **1**, wherein there are included at least a first and second splicing chamber arranged side-by-side so as to provide at least two splices side by side.

17. A fibre splicer assembly having at least two fibre splicers according to claim **1** arranged side by side so as to provide at least two splices side by side.

18. A fibre splicer assembly according to claim **17**, wherein the at least two splicers are spaced apart and/or wherein at least one cutter is positioned at the respective remote ends of the fibre splicer assembly.

19. (canceled)

20. A method of splicing fibres in a splicer having a valve having an unobstructed pathway there-through and extending from the chamber, including inserting fibres to be spliced within a chamber via an opening;

making contact between a chamber pad with a chamber side so as to seal the opening of the chamber;

configuring the valve from a first configuration wherein fluid is prohibited from passing along the pathway to a second configuration permitting fluid flow along the pathway so as to provide fluid to the interior of the chamber.

21. A method of splicing fibres according to claim **20**, wherein the valve is configured between the first and second states by sliding the valve with respect to an air port located in a main valve block and/or wherein the chamber is moved linearly to effect linear movement on the valve to which it is connected.

22. (canceled)

23. A method of splicing fibres according to claim **20**, including permitting air to enter the chamber on motion of the chamber relative to a main valve block.

24-25. (canceled)

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