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JOINING TEXTILE YARNS AND
CORRESPONDING DEVICE**(30) **Foreign Application Priority Data**

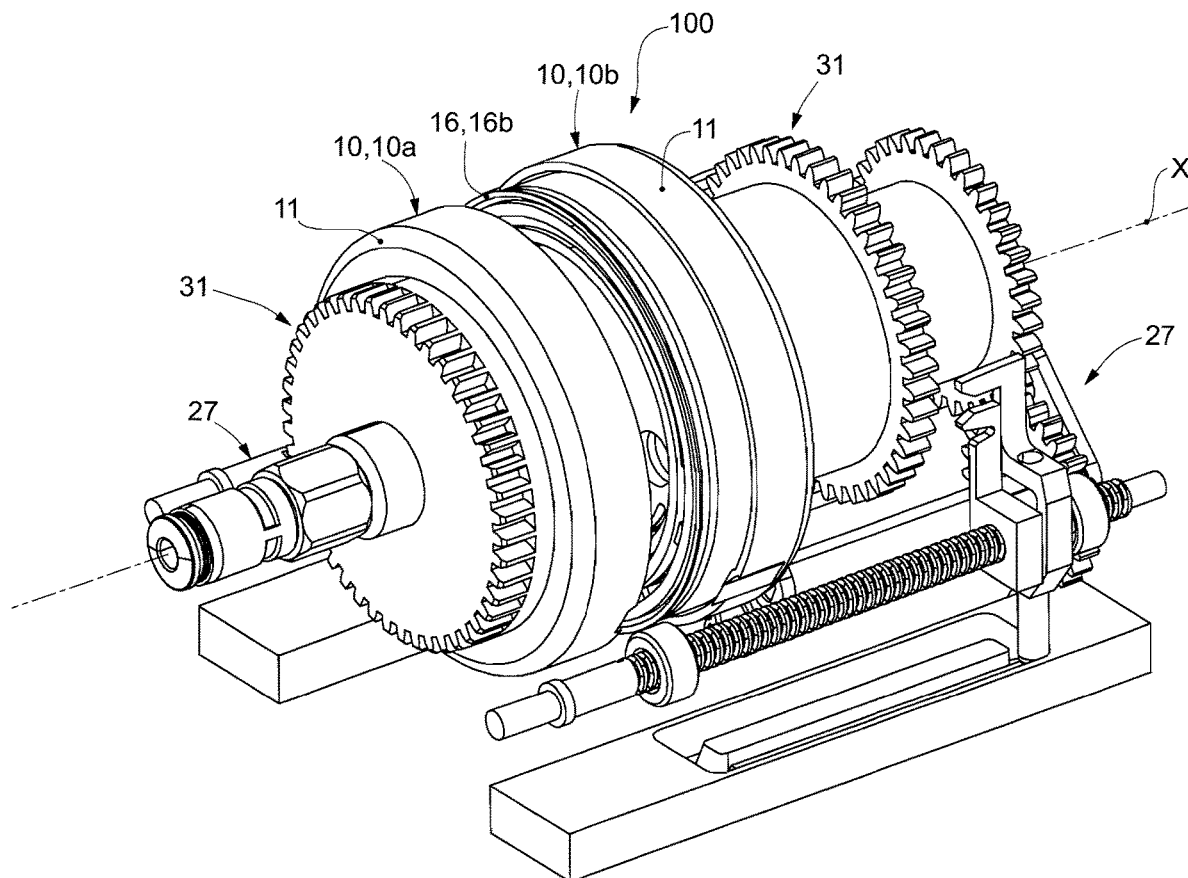
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(IT); **Gianni MOTTOLA**, Sacile (IT)(51) **Int. Cl.**
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(2013.01); **B65H 2601/324** (2013.01)(73) Assignee: **HAYABUSA S.R.L.**, Preseglie (IT)(57) **ABSTRACT**(21) Appl. No.: **17/766,653**

A device for joining two ends of two textile yarns by means of decomposition and subsequent re-composition of the twists of said ends to make up a single yarn including two components disposed opposite each other so as to make two respective joining elements face each other, between which the two ends of the two textile yarns to be joined are interposed.

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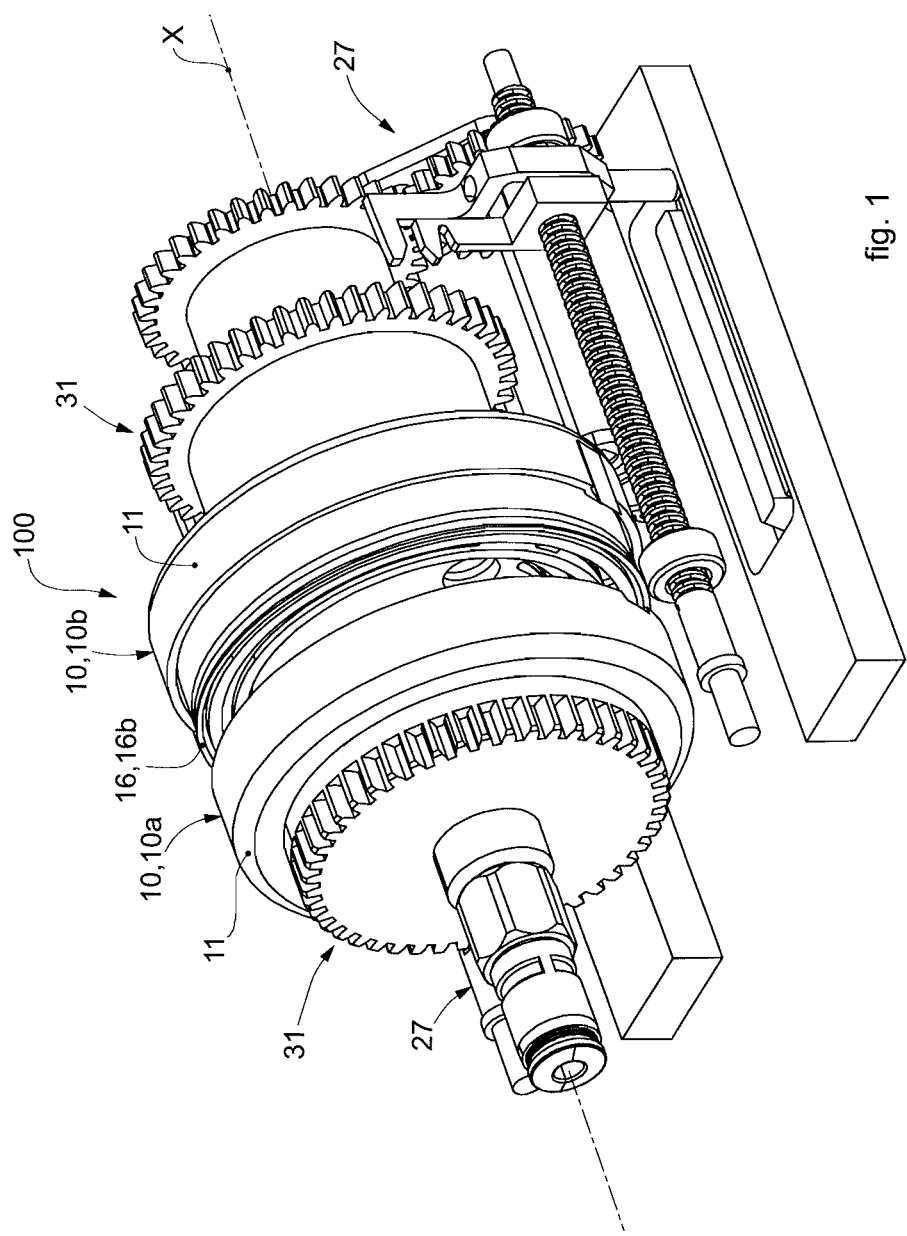
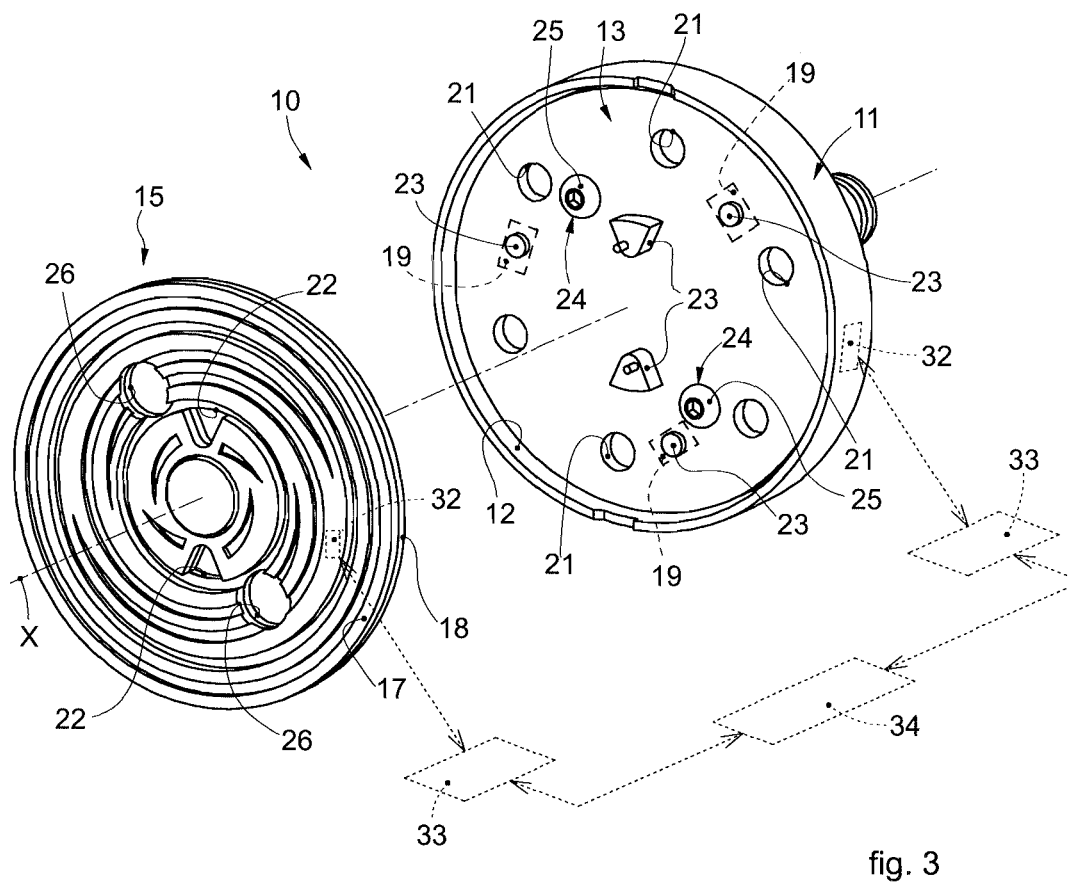
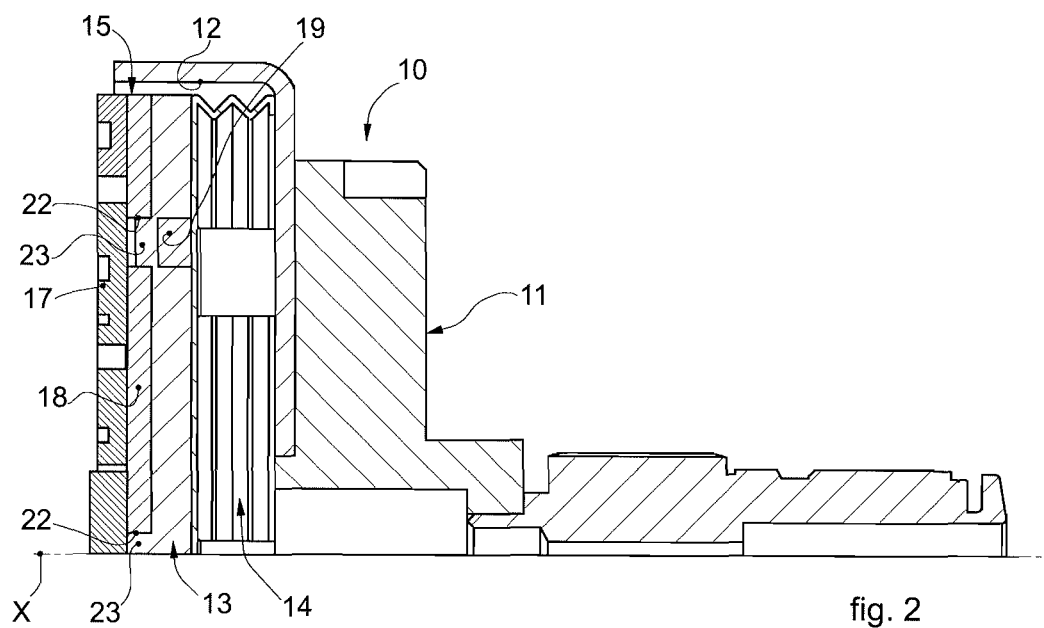
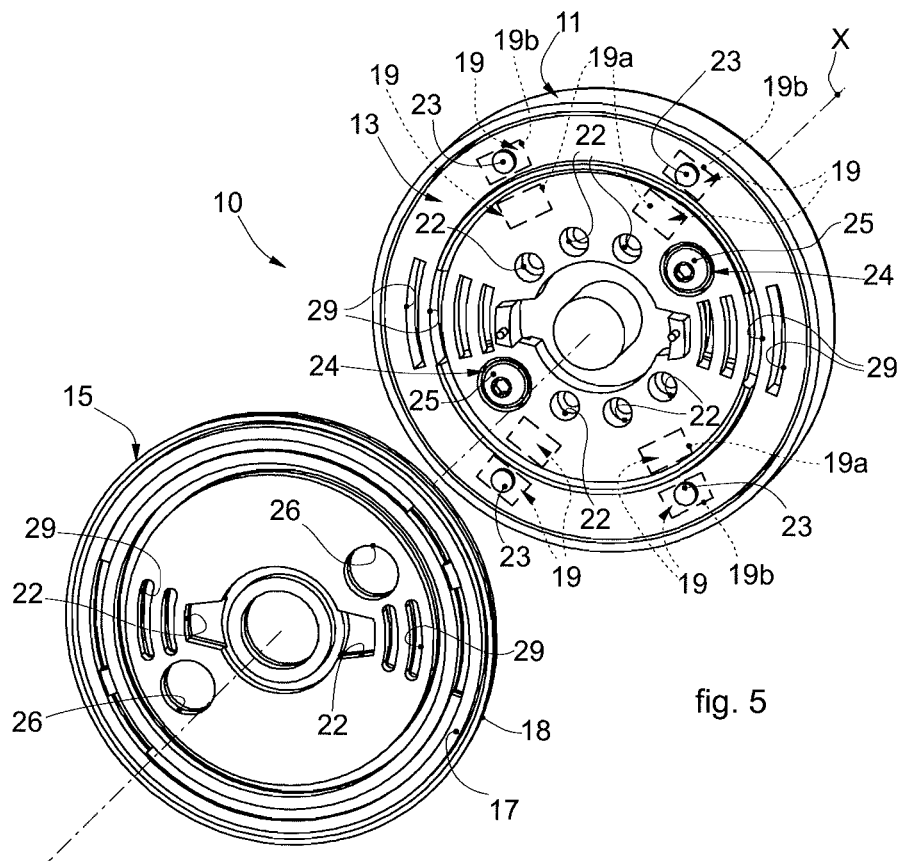
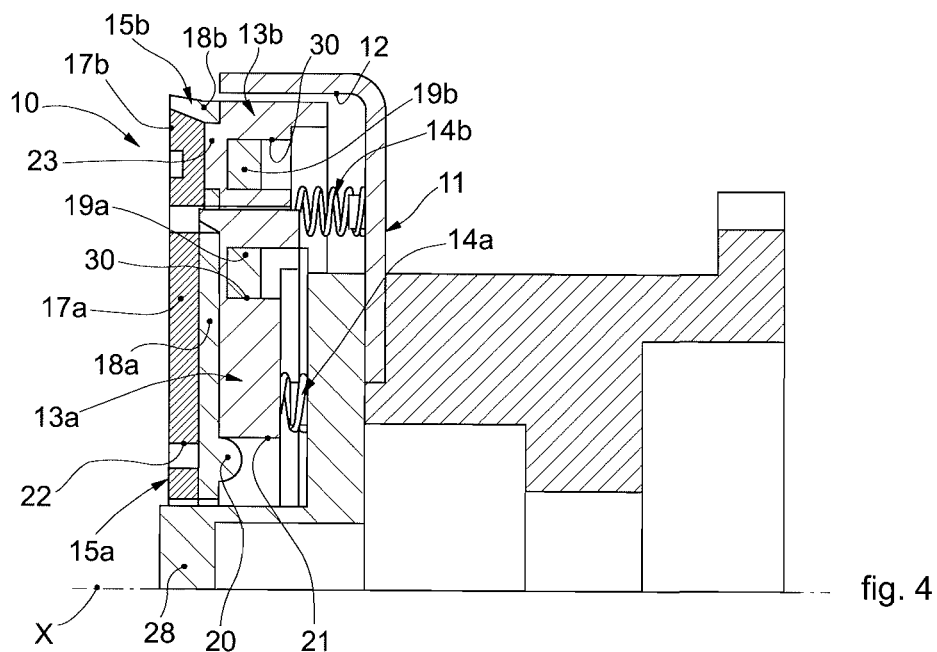


fig. 1





IMPROVEMENTS TO A DEVICE FOR JOINING TEXTILE YARNS AND CORRESPONDING DEVICE

FIELD OF THE INVENTION

[0001] Embodiments described here concern improvements to a device for joining textile yarns.

[0002] The present invention also concerns a device for joining textile yarns adopting these improvements. In particular, the device is used to carry out the stable joining of the ends of two textile yarns by means of the total or partial decomposition of the twists of a terminal segment defined by both the textile yarns, and the re-composition of the yarn with said combined ends.

BACKGROUND OF THE INVENTION

[0003] Joining devices are known, which eliminate the twists present in the terminal parts of two textile yarns, couple them and reconstitute the twists so as to create a single continuous yarn without interruptions, of the desired length, and without significant variations in the size of the area where there is the join.

[0004] In particular, joining devices are known, which decompose and re-compose the twist by means of two counter-rotating components coupled together in which the ends of the yarns to be joined are inserted.

[0005] For example, U.S. Pat. No. 4,637,205 is known which provides a joining device, using two counter-rotating components facing each other, between which the ends of two yarns to be joined are interposed, positioned axially and adjacent and also opposite. These components are configured to rotate at the desired distance from each other, and in relation to the interposed textile yarns, in opposite directions, and to exert a desired pressure, one toward the other, to first eliminate the twists and then to align the fibers of the two ends, subsequently inverting the directions of rotation, in order to re-compose a single yarn by twisting together the combined and effectively parallelized fibers of the two textile yarns to be combined.

[0006] These components have specialized joining elements, suitable to cooperate with each other during the decomposition and re-composition steps of the two ends of the yarns so as to create a single and continuous yarn.

[0007] During use, the joining elements are subject to a great deal of wear and have to be replaced frequently.

[0008] However, according to the current technology, this replacement is complicated and difficult in the known devices in question.

[0009] Furthermore, in order to stabilize the position of the opposite joining elements, known joining devices use a large number of elements which interact in various ways with the joining elements, making it difficult to disassemble and reassemble them, and therefore to replace them.

[0010] It should be noted that the opposite joining elements, which cooperate directly with the yarns, are made of soft material which has the ability to drag on the fibers of the yarns.

[0011] The joining element of each known component, as described for example in U.S. Pat. No. 4,637,205, is typically firmly screwed, by means of a plurality of screws, to a plate below. The plate is connected to a frame by means of

springs so as to selectively and elastically assume, during use, a plurality of axial positions in relation to the other facing joining element.

[0012] Consequently, in order to remove the joining elements, at least the plurality of screws have to be removed so as to detach them from the plate below, and then these operations have to be repeated in reverse, so as to install the new joining element.

[0013] Apart from the time required for correct disassembly or assembly, there is the risk of damaging the integrity of the joining elements and/or the joining devices.

[0014] Furthermore, the replacement of the gasket requires the intervention of a specialized operator who knows the joining device in detail in order not to change its layout.

[0015] Consequently, the maintenance operations are burdensome in terms of time and cost, also entailing a long downtime of the device and a consequent reduction in the productivity of the machine on which the device is installed.

[0016] Another device for joining yarns, which however also has the problems as above, is described in document DE-A-102005051935.

[0017] There is therefore a need to perfect these devices for joining textile yarns and a corresponding device for joining textile yarns which can overcome at least one of the disadvantages of the state of the art.

[0018] In particular, one purpose of the present invention is to provide a device for joining textile yarns which has reduced maintenance times and maintenance operations without the risk of damaging the integrity of the joining elements or of interacting with the layout of the device.

[0019] Another purpose of the present invention is to provide a component of a device for joining textile yarns which is easily applicable to known joining devices and which allows simple, easy and fast maintenance.

[0020] The Applicant has devised, tested and embodied the present invention to overcome the shortcomings of the state of the art and to obtain these and other purposes and advantages.

SUMMARY OF THE INVENTION

[0021] The present invention is set forth and characterized in the independent claims. The dependent claims describe other characteristics of the present invention or variants to the main inventive idea.

[0022] In accordance with the above purposes, the present invention concerns a component of a device for joining two ends of two textile yarns, by means of decomposition and subsequent re-composition of the twists of such ends, in order to make up a single yarn.

[0023] According to the invention, the component as above comprises:

[0024] a frame having a housing seating;

[0025] at least one support plate housed in the housing seating;

[0026] spring means located between the frame and the support plate;

[0027] at least one joining element having a shape mating with the housing seating and disposed above the support plate.

[0028] According to one aspect of the invention, the joining element and the support plate are selectively connected to each other by means of connection means of the magnetic type.

[0029] Advantageously, the magnetic connection between the gasket and the support plate makes it possible to considerably simplify the replacement of the joining element without the intervention of a specialized operator and without the aid of dedicated tools.

[0030] According to one embodiment, the component as above comprises reciprocal positioning means between the support plane and the joining element, such means being configured to guarantee the correct positioning of the joining element on the support plane.

[0031] Consequently, with the invention, the replacement of the joining element can occur in complete safety without the risk of damaging the integrity of the component and/or of the joining element.

[0032] According to one embodiment, the connection means of the magnetic type comprise at least one magnet and at least one ferromagnetic element, both disposed mating on the joining element and on the support plate.

[0033] The at least one magnet and the at least one ferromagnetic element can be directly applied mating on the joining element and on the support plate.

[0034] According to one variant, the at least one magnet and the at least one ferromagnetic element can be applied by using auxiliary connection elements such as, but not limited to, insertion seatings, glues, stud-type pins or suchlike.

[0035] The at least one magnet and the at least one ferromagnetic element can possibly be made in a single body with such auxiliary connection elements.

[0036] According to one embodiment, the connection means as above comprise at least one magnet provided on the support plate, suitable to cooperate with at least one ferromagnetic element provided in the joining element.

[0037] According to one variant, the positions of the at least one magnet and/or of the at least one ferromagnetic element can be totally or partly inverted.

[0038] In particular, the joining element is associated at the lower part with the ferromagnetic element able to interact with the magnet/s present in the housing seating.

[0039] This component can also comprise an RFID recognition system provided with at least one electronic label applied at least on such joining element and/or on such housing seating, and at least one data reader cooperating with such electronic label. This recognition system could also be applied to other elements of the component and/or of the joining device.

[0040] The present invention also concerns, preferentially, a joining element for a component of a device for joining textile yarns comprising at least one ferromagnetic element disposed substantially planar, which occupies at least part of the housing seating.

[0041] According to the invention, the joining element comprises an external layer overlapping and integral with the ferromagnetic element.

[0042] Advantageously, these ferromagnetic elements make such joining elements easy to replace and/or quick to interchange in the joining component, also thanks to the presence of the reciprocal positioning means.

[0043] Some embodiments in accordance with the present invention provide a spare kit of coordinated joining elements and/or support plates.

[0044] Such kit is advantageously provided at least with a plurality of joining elements that differ from each other in materials and/or sizes, and with a plurality of support plates mating with the respective joining elements, wherein such

joining elements and the respective support plates have respective connection means of the magnetic type.

[0045] In particular, such joining elements and the respective support plates are interchangeable in the housing seating of the frame of the joining component.

[0046] Advantageously, the kit allows to supply the user with a series of possible joining elements that differ from each other and are interchangeable with each other, and respective support plates suitable to be used in the joining component as above for different applications according to, for example, the type of yarn to be joined.

[0047] Such kit, thanks to the connection means of the magnetic type, therefore allows to adapt a joining device to the user's needs in order to easily and quickly interchange the joining elements according to the type of textile yarns to be joined, optimizing the joining thereof and at the same time guaranteeing a greater flexibility of the joining device and a consequent longer useful life thereof.

[0048] The present invention also concerns a device for joining two ends of two textile yarns by means of decomposition and subsequent re-composition of the twists of the ends to make up a single yarn.

[0049] According to the invention, the device as above comprises two components, as described above, disposed opposite each other so as to make the two respective joining elements face each other, wherein the components are able to be selectively moved toward and away from each other along a work axis, perpendicular to both joining elements, and rotatable with respect to each other and with respect to the work axis.

[0050] This device, since it is provided with two joining components as described above, allows to simplify and significantly accelerate the maintenance operations of the joining elements compared to known devices, consequently reducing the costs and times related to such maintenance, as well as preventing the risk of malfunction of the joining device following such maintenance.

[0051] The present invention also concerns a method for replacing a joining element in a component of joining devices as described above, the method comprising:

[0052] exerting a pressure on the joining element to be replaced, with respect to the support plate, to overcome the magnetic attraction force in order to separate the joining element from the support plate;

[0053] removing the joining element to be replaced;

[0054] positioning a new joining element on the support plate in order to establish a new and correct magnetic connection between the joining element and the support plate.

[0055] In particular, the positioning step also comprises centering and positioning the joining element on the support plate using the reciprocal positioning means.

[0056] Advantageously, thanks to the magnetic connection and to the reciprocal positioning means, this replacement method is simple and quick to perform, simplifying current maintenance operations.

BRIEF DESCRIPTION OF THE DRAWINGS

[0057] These and other aspects, characteristics and advantages of the present invention will become apparent from the following description of some embodiments, given as a non-restrictive example with reference to the attached drawings wherein:

[0058] FIG. 1 is a perspective view of a device for joining textile yarns in accordance with the present invention;

[0059] FIG. 2 is a section view of a component for joining textile yarns in accordance with the present invention;

[0060] FIG. 3 is an exploded view of the joining component of FIG. 2;

[0061] FIG. 4 is a section view of another embodiment of the component for joining textile yarns in accordance with the present invention;

[0062] FIG. 5 is an exploded view of the joining component of FIG. 4.

[0063] To facilitate comprehension, the same reference numbers have been used, where possible, to identify identical common elements in the drawings. It is understood that elements and characteristics of one embodiment can conveniently be incorporated into other embodiments without further clarifications.

DETAILED DESCRIPTION OF SOME EMBODIMENTS

[0064] We will now refer in detail to the possible embodiments of the invention, of which one or more examples are shown in the attached drawings. Each example is supplied by way of illustration of the invention and shall not be understood as a limitation thereof.

[0065] Before describing these embodiments, we must also clarify that the present description is not limited in its application to details of the construction and disposition of the components as described in the following description using the attached drawings. The present description can provide other embodiments and can be obtained or executed in various other ways. We must also clarify that the phraseology and terminology used here is for the purposes of description only, and cannot be considered as limitative.

[0066] With reference to FIG. 1, there is shown, as a non-restrictive example, a device 100 for joining textile yarns, for joining two ends of two textile yarns by means of decomposition of the twists of the fibers of said ends to make up a single yarn by combining and twisting together the decomposed fibers of said two ends.

[0067] This joining device 100 comprises two counter-rotating components 10 disposed opposite each other.

[0068] In particular, the two components 10 can be selectively moved toward and away from each other, by means of movement means 27, along a work axis X perpendicular to both the joining elements 15, and rotated with respect to each other, by means of drive means 31, along the work axis X.

[0069] Such drive means 31 can be, for example, but not limited to, toothed wheels or belts configured to allow the relative rotation of the two respective components 10.

[0070] The movement means 27 can be, for example, but not limited to, toothed wheel, worm screw or piston mechanisms.

[0071] Between the two components 10, during use, there are interposed two ends of two textile yarns which are to be joined.

[0072] In particular, the two components 10 of the device 100 join the two yarn ends by means of a known technique of decomposition of the fibers of the two ends and subsequent combination and twisting of the fibers of the two ends with each other in order to create a continuous yarn. This known technique is widely described, for example but not limited to, in U.S. Pat. No. 4,637,205.

[0073] FIGS. 2-5 show an improvement of a component 10 of the device 100 for joining textile yarns obtained by doubling two single yarns.

[0074] The component 10 comprises a frame 11 having a housing seating 12.

[0075] In particular, such housing seating 12 can be substantially cylindrical.

[0076] The housing seating 12 can be of another shape according to possible special usage requirements.

[0077] The component 10 comprises at least one support plate 13 housed in the housing seating 12.

[0078] According to one embodiment, the support plate 13 is connected to the base of the housing seating 12 by means of spring means 14.

[0079] In particular, the support plate 13 is selectively mobile inside the housing seating 12 along the work axis X.

[0080] According to one possible embodiment, the support plate 13 is mobile from the inside of the housing seating 12 to the outside of the latter, along a desired path.

[0081] The support plate 13 can be made, for example but not limited to, of plastic material.

[0082] The component 10 comprises at least one joining element 15 having a shape mating with the housing seating 12 and disposed above the support plate 13.

[0083] Such joining element 15 can be, for example but not limited to, discoidal or annular.

[0084] With reference to FIGS. 4-5, the joining element 15 and the support plate 13 can be drilled centrally, this in order to define a passage for a centering pin 28 integral with the frame 11.

[0085] In this way, it is possible to constrain the axial sliding of the joining element 15 and of the support plate 13 inside the housing seating 12.

[0086] There can also be other reference means for the correct centering of the joint 15 and/or of the support plate 13 inside the housing seating 12.

[0087] According to one embodiment, the joining element 15 and the support plate 13 are selectively connected to each other by means of connection means 16 of the magnetic type.

[0088] According to one variant, the connection means 16 can comprise at least one magnet 19 and at least one respective ferromagnetic element 18, both disposed mating on the joining element 15 and on the support plate 13 in order to connect them together by magnetic attraction.

[0089] The at least one magnet 19 can have an annular or discoidal shape.

[0090] According to one embodiment, the connection means 16 can provide a plurality of magnets 19. The magnets 19 can be disposed angularly distanced from each other along a circumference or in a radial pattern.

[0091] The magnets 19 can also be disposed circumferentially following a repetitive pattern.

[0092] These configurations and shapes of the magnets 19 are, advantageously, such as to guarantee the correct and best connection of the magnetic type with the at least one ferromagnetic element 18, as a function of the disposition and shape of the latter, and vice versa.

[0093] In particular, the at least one ferromagnetic element 18 can have a shape mating with the at least one magnet 19.

[0094] Advantageously, the ferromagnetic element 18 can be a discoidal plate mating in shape with the housing seating 12, so as to facilitate the coupling operations. In fact, in this case, since it is not necessary to respect a preferential

assembly, it is possible to exactly overlap the at least one ferromagnetic element 18 with the at least one magnet 19.

[0095] According to one embodiment, the at least one magnet 19 is provided on the joining element 15 and the at least one ferromagnetic element 18 is provided on the support plate 13.

[0096] According to a preferred embodiment, the at least one magnet 19 is provided on the support plate 13 and the at least one ferromagnetic element 18 is provided on the joining element 15.

[0097] These configurations depend on the type of device 100 on which such support plate 13 and such joining element 15 are installed.

[0098] The connection means 16 can comprise auxiliary connection elements that cooperate with the at least one magnet 19 and/or with the at least one ferromagnetic element 18.

[0099] Such auxiliary connection elements can be associated with the support plate 13 and/or with the joining element 15 for installing and/or removing the at least one magnet 19 and/or the at least one ferromagnetic element 18.

[0100] Such auxiliary connection elements can comprise, for example but not limited to, orientation and centering stud-type pins (not shown), insertion seatings 30 or similar and comparable elements such as to allow the mating coupling between the at least one magnet 19 and the at least one ferromagnetic element 18 with the support plate 13 and/or the joining element 15.

[0101] In particular, the magnets 19 can be configured to be interlocked into said corresponding insertion seatings 30. For example, the stud-type pins as above can promote the centering of the magnets 19 in the respective insertion seatings 30.

[0102] According to one possible variant, the magnets 19 are provided with a protruding peg to promote the centering of the magnets 19 in the corresponding insertion seating 30.

[0103] The magnets 19 can have a shape, for example but not limited to a T- or L-shape, suitable to be inserted sliding in a corresponding insertion seating 30.

[0104] In particular, the magnets 19 can be screwed or bayonet-connected in a corresponding insertion seating 30.

[0105] These auxiliary connection elements can also comprise glues or suitable resins to allow to glue the magnets 19 to the support plate 13 and/or to the joining element 15.

[0106] According to one possible embodiment, the magnets 19 can be embedded, preferably partly embedded so as to not diminish their magnetic action, in the material that makes up the support plate 13 or possibly in the joining element 15.

[0107] It should be noted that the at least one ferromagnetic element 18 can cooperate with the auxiliary connection elements as above, in a manner similar to what described above for the magnets 19.

[0108] In particular, the choice between such configurations as above depends on the type of material of the support plate 13 and of the joining element 15, on the type of ferromagnetic material that the ferromagnetic element 18 consists of, on the desired disposition of the magnets 19 and on their shape and size.

[0109] With reference to FIGS. 2-5, the at least one ferromagnetic element 18 is substantially planar, defining a base of ferromagnetic material associated with the joining element 15 and extending substantially over the entire surface of the latter facing toward the support plate 13.

[0110] This solution is advantageous since the magnets 19 are not removed from the housing seating 12 while the joining elements 15 can be made in series and easily interchanged inside the housing seating 12.

[0111] According to one embodiment, the component 10 comprises one or more of such magnets 19 integral with the support plate 13 and distributed on the support plate 13 in a manner coordinated with the ferromagnetic element 18. This solution allows to distribute the magnetic attraction force on the support plate 13 in cooperation with the substantially planar ferromagnetic element 18 of the joining element 15.

[0112] According to one embodiment, the joining element 15 comprises an external layer 17 overlapping and integral with the ferromagnetic element 18 or discoidal base plane.

[0113] According to one variant, the joining element 15 is made in a single body and the one or more ferromagnetic elements 18 are dispersed in the external layer 17.

[0114] Such external layer 17 can be made of a soft material, partly and elastically deformable.

[0115] Such external layer 17 can be, for example but not limited to, made of plastic material and/or rubber.

[0116] Such external layer 17 can be, for example but not limited to, a gasket layer.

[0117] The external layer 17 can be obtained by casting such material on the one or more ferromagnetic elements 18.

[0118] The external layer 17 can have a known spiral pattern, or with concentric semicircles and/or circles, suitable for un-twisting and twisting the fibers of the textile yarn.

[0119] The joining element 15 can have a plurality of through slots 29, which are known, suitable for the passage of suitable gripping grippers, possibly present between the joining element 15, the support plate 13 and the frame 11.

[0120] According to one embodiment, the component 10 comprises reciprocal positioning means 20, 21, 22, 23 between the support plane 13 and the joining element 15.

[0121] For example, the reciprocal positioning means 20, 21, 22, 23 can comprise one or more protruding portions 20 provided on the joining element 15 and facing toward the support plate 13, and corresponding positioning hollows 21 provided on the support plate 13, mating with said protruding portions 20.

[0122] According to one embodiment, the reciprocal positioning means 20, 21, 22, 23 also comprise, on the surface facing toward the support plate 13, one or more holes 22 provided on the joining element 15 and facing toward the support plate 13, and respective positioning protrusions 23 provided protruding on the support plane 13 mating with said holes 22.

[0123] These protruding portions 20 in cooperation with the positioning hollows 21, and/or these holes 22 in cooperation with the positioning protrusions 23 advantageously allow to center the joining element 15 on the support plate 13 in a correct and stable manner.

[0124] According to one embodiment, the component 10 comprises at least one guide pin 24 integral with the frame 11 and protruding from the base of the housing seating 12 toward the outside.

[0125] In particular, the guide pin 24 is through in the thickness of the support plate 13.

[0126] Such guide pin 24 can have an abutment head 25.

[0127] With reference to FIGS. 2-5, the support plate 13 is configured to slide along the guide pin 24 with respect to the frame 11 until it abuts against the abutment head 25.

[0128] The joining element 15 can have at least one through seating 26 mating in shape with the abutment head 25 so as to allow the free sliding of the support plate 13, integrally constrained to the joining element 15, along the guide pin 24.

[0129] In particular, with reference to FIGS. 3 and 5, the component 10 comprises two diametrically opposite guide pins 24 to better balance the sliding of the support plate 13.

[0130] According to one embodiment, the component 10 can comprise a plurality of support planes 13 mating with corresponding joining elements 15, wherein such support planes 13 are concentric with each other and mobile independently of each other.

[0131] In particular, with reference to FIGS. 4-5, the component 10 comprises:

[0132] an internal circular support plate 13a connected, by means of first connection means 16a of the magnetic type, to a mating circular joining element 15a;

[0133] an external annular support plate 13b connected, by means of second connection means 16b, to a mating external annular joining element 15b.

[0134] In particular, the external support plate 13b is concentric to the internal support plate 13a.

[0135] According to one embodiment, the external support plate 13b can be selectively moved with respect to the internal support plate 13a.

[0136] According to one embodiment, the internal support plate 13a and the external support plate 13b can be moved substantially axially, along the work axis X, to the housing seating 12.

[0137] With reference to FIG. 4, the internal support plate 13a is associated with first spring means 14a and the external support plate 13b is associated with second spring means 14b.

[0138] According to one embodiment, the second spring means 14b are independent from the first spring means 14a.

[0139] For example, but not limited to, the first connection means 16a can comprise a circular ferromagnetic element 18a integral with the external layer 17a of the circular joining element 15a, and one or more magnets 19a associated with the internal support plate 13a.

[0140] Furthermore, for example, but not limited to, the second connection means 16b can comprise an annular ferromagnetic element 18b integral with the external layer 17b of the annular joining element 15b, and one or more magnets 19b associated with the external support plate 13b.

[0141] With reference to FIG. 1, the joining device 100 comprises a first component 10a having a support plate 13 connected to a mating joining element 15 by means of the connection means 16, and a second component 10b having an internal support plate 13a and an external support plate 13b which are concentric with respect to each other and connected to mating joining elements 15a, 15b by means of the first connection means 16a and the second connection means 16b respectively.

[0142] According to one embodiment, a spare kit of joining elements 15 is provided with a plurality of joining elements 15 of different sizes and with different types of material constituting the external layer 17.

[0143] These joining elements 15 are, advantageously, interchangeable in the component 10 thanks to the connection means 16.

[0144] The device 100 as above can be provided with this spare kit so as to have available different joining elements

15, for example but not limited to, suitable to join yarns of different types or to replace worn joining elements 15.

[0145] According to one embodiment, this kit comprises one or more support plates 13 mating with the respective joining elements 15. This solution allows to adapt known joining devices with support plates 13 and joining elements 15 with a magnetic connection, simplifying the operations of adjustment of such known devices.

[0146] In particular, the kit as above is provided with one or more mating pairs of joining elements 15 for a joining device 100 having two components 10 cooperating as described above.

[0147] According to one embodiment, this kit comprises a pair of support plates 13 mating with each corresponding pair of joining elements 15.

[0148] This spare kit can also comprise one or more magnets 19 and/or one or more ferromagnetic elements 18 in order to possibly replace them, if necessary, in the one or more support plates 13 and/or in one or more joining elements 15.

[0149] The present component 10 can also be equipped with a recognition system which can be used for example for the joining elements 15 and/or for the housing seating 12, or other. This recognition system, see FIG. 3, can be an RFID system provided with an electronic label 32, such as a TAG, a transponder or other, containing information relating to the element on which it is applied, and a reader 33. As is known, the electronic label 32 will be equipped with an antenna which transmits data to the reader 33. This reader 33 can then be connected to a computer system 34 for data collection.

[0150] If, for example, the electronic label 32 is applied on the joining element 15, through this it will be possible to know the characteristic data of such joining element, therefore measurements, materials with which it is made, manufacturer, date of manufacture, functioning cycles to determine its wear, or other. For example, it could be useful to know the type of rubber with which the external layer 17 is made, in order to establish whether the type of rubber is suitable for the type of yarns which will be joined, or other.

[0151] This recognition system can also be used to verify the compatibility between the joining element 15 and the housing seating 12. In this case, the housing seating 12 will preferably also be equipped with the electronic label 32. The label 32 applied to the housing seating 12 can be useful to know the sizes of such housing seating, as well as the data relating to its manufacturing, usage times or other.

[0152] The position in which the electronic labels 32 are applied in FIG. 3 is purely illustrative. These electronic labels 32 can be applied in any appropriate position whatsoever on the joining element 15 and/or on the housing seating 12.

[0153] It is clear that modifications and/or additions of parts may be made to the component 10 of a device 100 for joining textile yarns and to the corresponding joining device 100 as described heretofore, without departing from the field and scope of the present invention as defined by the claims.

[0154] It is also clear that, although the present invention has been described with reference to some specific examples, a person of skill in the art shall certainly be able to achieve many other equivalent forms of component 10 and corresponding joining device 100, having the characteristics as set forth in the claims and hence all coming within the field of protection defined thereby.

[0155] In the following claims, the sole purpose of the references in brackets is to facilitate reading; they must not be considered as restrictive factors with regard to the field of protection claimed in the specific claims.

1. Component of a device for joining two ends of two textile yarns by means of decomposition and subsequent re-composition of the twists of said ends to make up a single yarn, said component comprising:

- a frame having a housing seating;
- at least one support plate housed in said housing seating;
- spring means located between the frame and the support plate;
- at least one joining element having a shape mating with the housing seating and disposed above the support plate;

wherein said joining element and said support plate are selectively connected to each other by means of connection means of the magnetic type.

2. Component as in claim 1, wherein it comprises reciprocal positioning means between the support plane and the joining element, said reciprocal positioning means being configured to guarantee the correct positioning of said joining element on said support plate.

3. Component as in claim 1, wherein said connection means comprise at least one magnet and at least one respective ferromagnetic element both disposed mating on said joining element and on said support plate to connect them together by magnetic attraction.

4. Component as in claim 3, wherein said at least one magnet is provided on said support plate and said at least one ferromagnetic element is provided on said joining element.

5. Component as in claim 3, wherein said at least one ferromagnetic element is substantially planar defining a base made of ferromagnetic material associated with said joining element and extending over substantially the whole surface of the latter facing toward the support plate.

6. Component as in claim 3, wherein it comprises one or more of said magnets integral with the support plate and distributed on said support plate in a manner coordinated with said ferromagnetic element.

7. Component as in claim 1, wherein it comprises:
an internal circular support plate connected, by means of first connection means of the magnetic type, to a mating circular joining element;

an external annular support plate connected, by means of second connection means, to a mating external annular joining element;

said external support plate being concentric to said internal support plate and selectively mobile with respect to said internal support plate.

8. Component as in claim 1, wherein it comprises an RFID recognition system provided with at least one electronic label applied at least on said joining element and/or on said housing seating, and at least one data reader cooperating with said electronic label.

9. Joining element for a component of a device for joining textile yarns comprising at least one ferromagnetic element disposed substantially planar and an external layer overlapping and integral with said ferromagnetic element.

10. Spare kit provided with at least a plurality of joining elements that differ from each other in materials and/or sizes, and with a plurality of support plates mating with said respective joining elements, said joining elements and said respective support plates having respective connection means of the magnetic type and being interchangeable in the housing seating of the frame of a component as in claim 1.

11. Device for joining two ends of two textile yarns by means of decomposition and subsequent re-composition of the twists of said ends to make up a single yarn, said device comprising two components as in claim 1, disposed opposite each other so as to make the two respective joining elements face each other, said components being able to be selectively moved toward and away from each other along a work axis, perpendicular to both joining elements, and being rotatable with respect to each other and with respect to said work axis.

12. Method for replacing a joining element in a component of a joining device as in claim 1, wherein said method comprises:

- exerting a pressure on the joining element to be replaced, with respect to the support plate, to overcome the magnetic attraction force in order to separate said joining element from said support plate;
- removing the joining element to be replaced;
- positioning a new joining element on the support plate in order to establish a new and correct magnetic connection between said joining element and said support plate.

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