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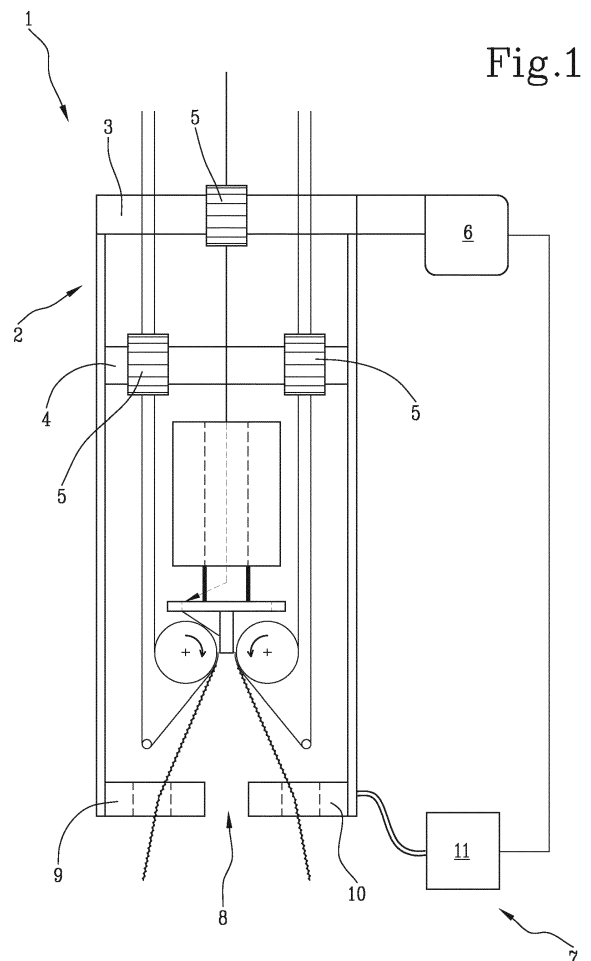
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(54) **A CONTROL APPARATUS FOR A MACHINE FOR THE PRODUCTION OF CHENILLE**

(57) Described is a command and control apparatus (1) for a spinning machine for the production of chenille yarn comprising feeding means (2) configured for feeding a plurality of threads to a machine for the production of chenille yarn. The feeding means (2) comprise at least a first roller (3) and a second roller (4) for feeding, respectively, at least one fancy thread and a pair of binding threads to the machine for the production of chenille yarn. The apparatus (1) also comprises command and control means (7) configured for detecting at least one property of at least one chenille yarn at the outlet from the machine for the production of chenille yarn and for modifying by feedback at least one operating parameter of the feeding means (2) as a function of the property detected.



Description

[0001] This invention relates to a command and control apparatus for a spinning machine for the production of chenille yarn.

[0002] These machines comprise automatic systems equipped with one or more feeding units on which are positioned a plurality of reels from which the threads for the production of chenille yarn are unwound.

[0003] As is known, each unit for forming chenille yarn comprises a gauge on which is wound one or more threads, called fancy threads, an underlying blade (tangential or circular) for cutting the fancy thread into small pieces and a device for pulling the binding threads.

[0004] In particular, there are two pulling devices positioned on one side and the other of the blade for cutting.

[0005] The pulling device comprises a pair of wheels and counter-wheels configured to guarantee the feeding of the binding wires (also called supporting wires) which hold the pieces of fancy thread for the subsequent twisting and winding on the collection spindle.

[0006] The twisting is generated by the rotation of the collection spindle and is necessary both to form the final yarn and to retain the pieces of fancy thread.

[0007] It is known that the quality of the chenille yarn produced is closely linked to the precision and uniformity of the production process.

[0008] In particular, the constant and uniform distribution of the fancy thread in the chenille yarn are fundamental parameters for the quality of the product.

[0009] Disadvantageously, the friction due to the constant passage of the threads on the sliding guides defined by the gauge causes a gradual wear of the gauge which causes a consequent variation in the characteristics of the final yarn.

[0010] In particular, this problem results in a continuous deterioration of the quality of the chenille yarn.

[0011] Currently, the assessment of the quality of the yarn is performed by expert operators who, when necessary, intervene on the machine for the production of chenille in such a way as to return the production in line with the initial characteristics of the yarn.

[0012] These adjustments include, for example, the replacement and cleaning of the devices of the production machine.

[0013] Moreover, these adjustments may include a modification of the parameters relative to the feeding speed of the fancy thread and/or the binding wires to the device which carries out the binding of the above-mentioned threads.

[0014] The most recently designed spinning machines for the production of chenille yarn may comprise optical sensors designed to inspect the yarn to determine the presence of zones with a low concentration of fancy thread or zones with an excessive concentration of fancy yarn.

[0015] In particular, these sensors assess the volume of the yarn (the quantity of light which the yarn lets pass)

and recognise the average concentration of the fancy thread in such a way as to indicate the presence of zones of the yarn with low concentration or high concentration, so that an operator acts on the machine to correct these imperfections.

[0016] Disadvantageously, the above-mentioned sensors are not able to assess the effectiveness of the positioning the fancy threads relative to the binding threads.

[0017] Therefore, although they are able to determine the low or high concentration of the fancy threads they are unable to recognise the correctness in the positioning and therefore the quality of the yarn.

[0018] The technical purpose of the invention is therefore to provide a command and control apparatus for a spinning machine for the production of chenille yarn which is able to overcome the drawbacks of the prior art.

[0019] The aim of this invention is therefore to provide a command and control apparatus for a spinning machine for the production of chenille yarn which allows the quality of the chenille yarn and the accuracy in the process for the production of the yarn to be increased.

[0020] The technical purpose and the aim specified are substantially achieved by a command and control apparatus for a spinning machine for the production of chenille yarn comprising the technical features described in one or more of the appended claims.

[0021] The dependent claims correspond to possible embodiments of the invention.

[0022] Further features and advantages of this invention are more apparent in the non-limiting description below, with reference to a preferred, non-limiting, embodiment of a command and control apparatus for a spinning machine for the production of chenille yarn, as illustrated in the accompanying drawings, in which:

- Figure 1 shows a schematic representation of a command and control apparatus for a spinning machine for the production of chenille yarn according to the invention.

[0023] With reference to the accompanying drawings, the numeral 1 generically denotes a command and control apparatus for a spinning machine for the production of chenille yarn, hereinafter indicated for simplicity of description as apparatus 1.

[0024] The apparatus 1 comprises feed means 2 configured for feeding a plurality of threads to a spinning machine for the production of chenille yarn.

[0025] As illustrated in the accompanying drawing, the feeding means 2 comprise at least a first roller 3 and a second roller 4 for feeding, respectively, at least a fancy thread and a pair of binding threads to the spinning machine for the production of chenille yarn.

[0026] Preferably, the feed rollers are made of metal and/or have a diameter of between 30 mm and 75 mm.

[0027] The rollers rotate about a respective axis of rotation causing a movement of the thread towards the machine for making the chenille. Advantageously, each roll-

er may comprise at least one retaining element, preferably a presser roller 5, operatively associated with a respective counter-rotating roller of the machine for producing chenille yarn, configured to promote the above-mentioned movement of the thread.

[0028] In other words, the thread can be fed to the machine for producing chenille thanks to the pulling action generated by a presser roller 5 and by a respective counter-rotating roller.

[0029] In this way, the apparatus 1 allows the feeding of the thread to the machine for the production of chenille to be adjusted according to the specifications of the production process.

[0030] According to a possible embodiment and as illustrated in the accompanying drawing, the apparatus 1 is configured as a double-line apparatus and the second roller 4 is configured for feeding at least two pairs of binding threads to the spinning machine for the production of chenille yarn in such a way as to obtain two chenille yarns.

[0031] In particular, the second roller 4 may have two presser rollers 5 each of which configured to promote the movement of a pair of binding threads to the machine for the production of chenille.

[0032] According to a further possible embodiment not illustrated in the accompanying drawings, the feeding means 2 comprise a third feeding roller (not illustrated in the accompanying drawing). In particular, the second and third feeding rollers are configured for feeding a respective pair of binding threads to the spinning machine for the production of chenille yarn in such a way as to obtain two chenille yarns.

[0033] According to further possible embodiments, the apparatus 1 may comprise a different number of feeding rollers without altering the inventive concept which forms the basis of the invention.

[0034] Advantageously, each roller may be associated with a respective electric drive 6.

[0035] In this way, the apparatus 1 allows an accurate adjustment of the feeding of the threads to the spinning machine for the production of chenille yarn. In other words, the apparatus 1 comprises at least one electric drive 6 configured to move the above-mentioned feeding rollers.

[0036] The system 1 comprises command and control means 7 configured for detecting at least one property of at least one chenille yarn at the outfeed from the spinning machine for the production of chenille yarn.

[0037] The command and control means 7 are also designed to modify by feedback at least one operating parameter of the feeding means 2 as a function of the above-mentioned property detected.

[0038] In other words, the command and control means 7 assess the properties of the chenille yarn obtained by the binding between the binding threads and the fancy thread, and can modify, correct and/or determine the operating parameters of the feeding means 2 in such a way as to obtain a chenille yarn with predetermined characteristics.

[0039] In particular, the command and control means 7 are configured for detecting at least one property of each of the chenille yarns at the outfeed from the machine and for modifying and/or correcting by feedback at least one operating parameter of the respective roller as a function of the property detected.

[0040] Preferably, the command and control means 7 are configured for comparing the property detected with a value or a range of reference values and for implementing a correction of at least one operating parameter of the feeding means 2 when the property detected is different from the reference value or outside the range of reference values. Preferably, the command and control means 7 are configured for adjusting the speed of rotation of at least one of the rollers.

[0041] In other words, at least one of the above-mentioned operating parameters may be the speed of rotation of at least one of the rollers. Advantageously, the command and control means 7 may be active on each drive 6 for setting a value of the speed of rotation of the respective roller.

[0042] In particular, a variation in the speed of rotation of the roller (and therefore in the speed of feeding the thread to the machine for the production of chenille) causes a variation in the properties of the yarn at the outfeed from the machine.

[0043] In accordance with a possible embodiment of the invention, each drive can be controlled independently.

[0044] The command and control means 7 may be configured to detect a plurality of properties of the chenille yarn.

[0045] By way of a non-limiting example, the command and control means 7 can measure the concentration of the fancy thread in the chenille yarn and/or determine the mutual positioning of the threads making up the yarn. Advantageously, the command and control means 7 may be configured for measuring a dimension of a fancy thread of the chenille yarn at the outfeed from the machine.

[0046] In other words, the above-mentioned property detected by the command and control means 7 may be a value of the diameter of at least a portion of a fancy thread of the chenille yarn.

[0047] In this way, the apparatus 1 allows an accurate control of the properties of the yarn.

[0048] Preferably, the command and control means 7 comprise at least one detection unit 8 selected between: optical sensors, preferably a photocell, and/or infrared sensors, and/or acoustic sensors, and/or electromagnetic sensors.

[0049] According to a possible embodiment and as illustrated in the accompanying drawing, the command and control means 7 comprise a first photocell 9 and a second photocell 10 each of which is configured to detect the properties of a respective chenille yarn.

[0050] The photocells 9, 10 generate a signal representing the above-mentioned property and send the sig-

nal to a command and control unit 11 of the above-mentioned command and control means 7.

[0051] In other words, the command and control means 7 may comprise a command and control unit 11 designed to receive and decode at least the above-mentioned signal and configured for modifying at least one operating parameter of the feeding means 2 as a function of that signal.

[0052] In accordance with possible further embodiments, the apparatus 1 may comprise a different number of photocells and/or alternative detection units without altering the inventive concept which forms the basis of the invention.

[0053] According to another aspect, the invention relates to a method for producing chenille.

[0054] The method comprises a step of feeding a plurality of threads to a spinning machine for the production of chenille yarn.

[0055] In particular, the above-mentioned plurality of threads comprises at least one fancy thread and a pair of binding threads.

[0056] The method also comprises a step of producing at least one chenille yarn by combining the fancy thread with the binding threads.

[0057] In accordance with a possible embodiment of the method, the plurality of threads may comprise a fancy thread and two pairs of binding threads and the production step comprises the production of two chenille yarns.

[0058] The method comprises a step of detecting at least one property of at least one chenille yarn.

[0059] Preferably, the property detected is at least a diameter of at least one portion of a fancy thread of a chenille yarn.

[0060] In other words, the method may comprise a step of measuring the diameter of the fancy threads of the chenille yarn at the outfeed from the machine for the production of chenille.

[0061] Advantageously, the detection step may comprise a sub-step of detecting a measurement of the concentration of the chenille yarn.

[0062] The method comprises a step of modifying by feedback at least one operating parameter of the feeding step as a function of the property detected.

[0063] Preferably, the operating parameter is a speed of rotation of a roller associated with the fancy thread and/or the binding threads.

[0064] In particular, the step of modifying by feedback may comprise a step of comparing the at least one property detected with a value or a range of reference values and a further sub-step of correcting the above-mentioned operating parameter when the property detected is different from a reference value or outside the range of reference values.

[0065] It should be noted, therefore, that the invention achieves the preset aim thanks to a command and control apparatus for a spinning machine for the production of chenille yarn which is able to increase the quality of the chenille yarn by controlling by feedback the parameters

for feeding the threads as a function of the properties of the yarn at the outfeed from the spinning machine for the production of chenille yarn.

[0066] Advantageously, the command and control apparatus makes it possible to detect the mutual positioning of the threads which make up the yarn and the concentration of the fancy thread in the chenille yarn. Advantageously, also, the command and control apparatus makes it possible to assess the dimensions of the fancy thread which makes up the chenille yarn.

[0067] Moreover, the command and control apparatus allows the feeding speed of the threads to the spinning machine for the production of chenille yarn to be adjusted.

[0068] Advantageously, the command and control apparatus according to the invention makes it possible to simultaneously assess the properties of a plurality of chenille yarns.

Claims

1. A command and control apparatus (1) for a spinning machine for the production of chenille yarn comprising:

- feeding means (2) configured for supplying a plurality of threads to a spinning machine for the production of chenille yarn, said feeding means (2) comprising at least a first roller (3) and a second roller (4) for feeding, respectively, at least a fancy thread and a pair of binding threads to said spinning machine for the production of chenille yarn;

- command and control means (7) configured for detecting at least one property of at least one chenille yarn at the outlet from said spinning machine for the production of chenille yarn and for modifying by feedback at least one operating parameter of said feeding means (2) as a function of the property detected.

2. The command and control apparatus according to claim 1, configured as double line apparatus and wherein said second roller (4) is configured for feeding at least two pairs of binding threads to the machine for the production of chenille in such a way as to obtain two chenille yarns; wherein said command and control means (7) are configured for detecting at least one property of each of the chenille yarns at the outlet from the machine and for modifying by feedback at least one operating parameter of the feeding means (2) as a function of the property detected.

3. The command and control apparatus according to claim 1, configured as double line apparatus and also comprising a third roller, wherein each of the second and third roller is configured for feeding a respective

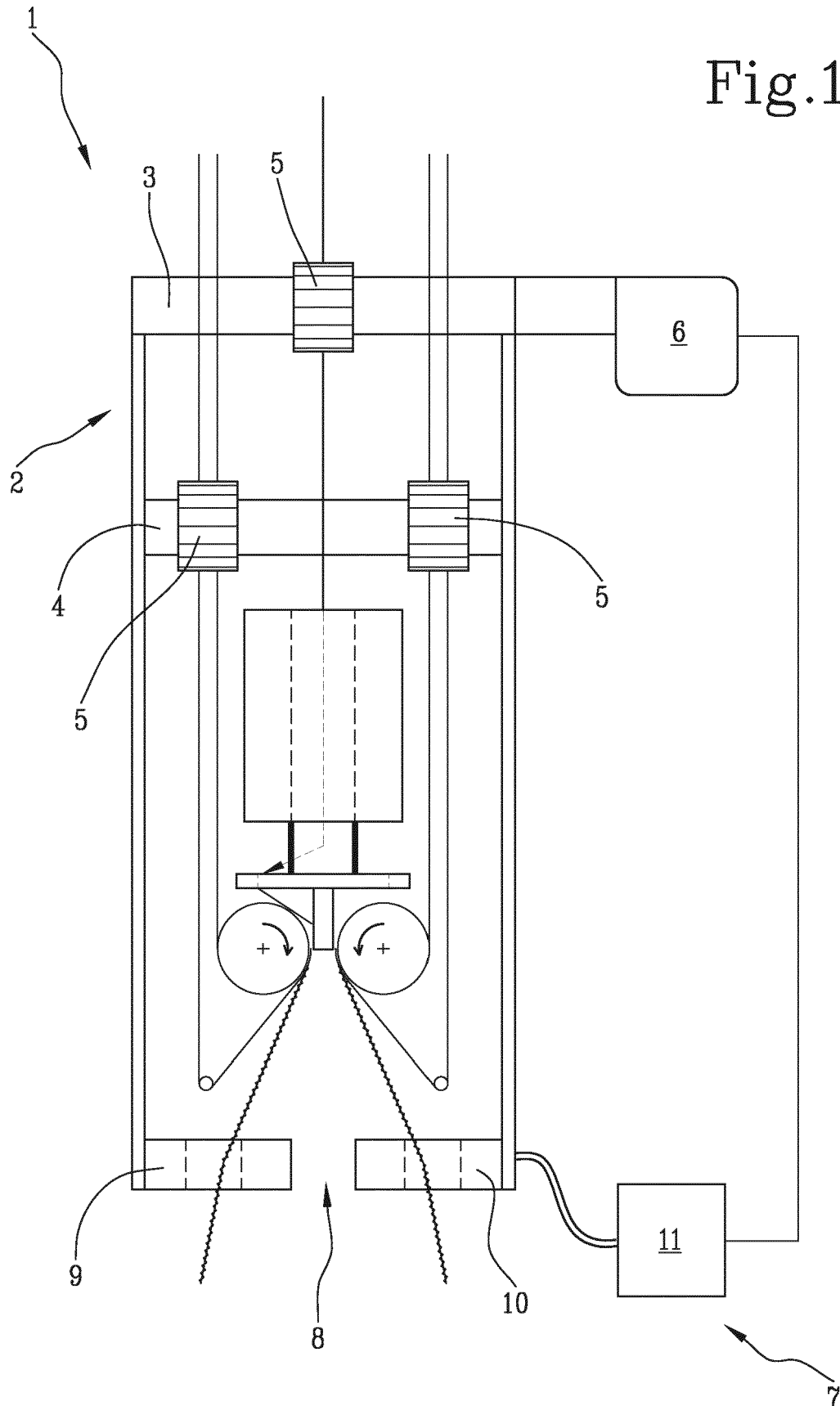
pair of binding threads to said spinning machine for the production of chenille yarn in such a way as to obtain two chenille yarns; wherein said command and control means (7) are configured for detecting at least one property of each of the chenille yarns at the outlet from the machine and for modifying by feedback at least one operating parameter of the respective roller as a function of the property detected.

4. The command and control apparatus according to any one of the preceding claims, wherein said at least one operating parameter comprises a speed of rotation of at least one of said rollers. 10
5. The command and control apparatus according to any one of the preceding claims, wherein each roller is associated with a respective electric drive (6) and wherein said command and control means (7) are acting on each drive (6) for setting a value of the speed of rotation of the respective roller, preferably each drive (6) being controlled independently. 15 20
6. The command and control apparatus according to any one of the preceding claims, wherein said at least one property detected comprises a diameter of at least one portion of a fancy thread of a chenille yarn at the outlet from the machine. 25
7. The command and control apparatus according to any one of the preceding claims, wherein said command and control means (7) comprise at least one detection unit (8) selected between: optical sensors, preferably a photocell, and/or infrared sensors, and/or acoustic sensors, and/or electromagnetic sensors. 30 35
8. The command and control apparatus according to any one of the preceding claims, wherein said command and control means (7) are configured to compare said at least one property detected with a value or a range of reference values and for implementing a correction of said at least one operating parameter when the detected property is different from the reference value or outside the range of reference values. 40 45
9. A method for making chenille yarn, comprising the following steps:
 - feeding a plurality of threads to a machine for the production of chenille, said plurality of threads comprising at least one fancy thread and a pair of binding threads; 50
 - making at least one chenille yarn by combining said fancy thread with said binding threads; 55
 - detecting at least one property of said at least one chenille yarn;
 - modifying by feedback at least one operating

parameter of said feeding step of as a function of the property detected.

10. The method according to claim 9, wherein said property detected is at least one diameter of at least one portion of a fancy thread of a chenille yarn and wherein said operating parameter is a speed of rotation of a roller associated with said fancy thread and/or said binding threads.

Fig.1





EUROPEAN SEARCH REPORT

Application Number
EP 20 15 8730

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			D02G D04D
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 3 June 2020	Examiner Van Beurden-Hopkins
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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