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(54) **A method for spinning-in on a spinning machine, particularly on an air-jet spinning machine or an open-end spinning machine**

(57) The invention relates to a method for spinning-in on a spinning machine, particularly on an air-jet spinning machine or an open-end spinning machine, containing a plurality of spinning units (11 to 34), provided with individual drives, which are divided into groups (1 to 3), where the spinning units (11 to 34) of each group (1 to 3) are supplied by common power supply (10 to 30), whereby the spinning machine is equipped with at least one service device (5), capable of moving along the row of the spinning units (11 to 34) and of spinning-in of each of them. The principle of this method than consists in that

during the process of sequential spinning-in of the spinning units (11 to 34) of respective serviced group (1 to 3) the actual load of the power supply (10 to 30) of individual groups (1 to 3) of spinning units (11 to 34) is monitored and after achieving or exceeding a predetermined value of its load the spinning-in process of the respective group (1 to 3) of the spinning units (11 to 34) is interrupted and the spinning-in of another group (1 to 3) of the spinning units (11 to 34) is started, the current load of the power supply (10 to 30) of which is lower than the predetermined value.

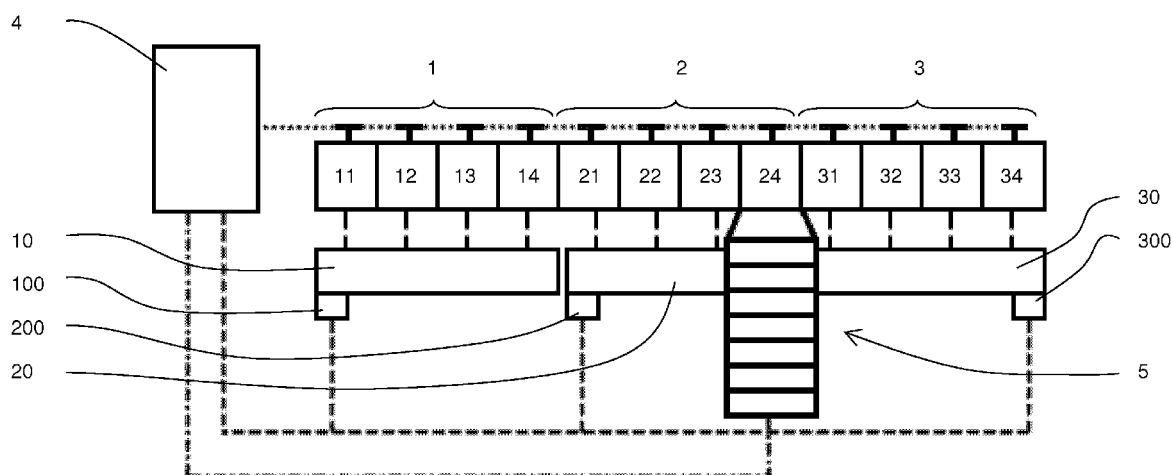


Fig. 1

Description

Technical field

[0001] The invention relates to a method for spinning-in on a spinning machine, particularly on an air-jet spinning machine or an open-end spinning machine, containing a plurality of spinning units arranged next to each other and provided with individual drives.

Background art

[0002] During the start-up of a spinning machine all its spinning units are spun-in successively in the order in which these units are arranged next to each other. Owing to the fact that the power requirement of each of them is during spinning-in, especially when running-in a new spinning machine or when starting a spinning machine after a long-term shutdown, by more than 30% higher than in steady-state and that the neighbouring spinning units of one spinning group are connected to common power supply, it is necessary to design the power supplies of the spinning machines for this increased load. Consequently, these power supplies, after achieving steady-state of spinning and after reducing the power requirements of all the spinning units, are not loaded in an optimum manner and their operation is not efficient. In addition, the installation of power supplies with higher output puts not only demands on their cooling and the space required for the built-up area, but also increases both purchase costs and operating expenses of the spinning machines as such.

[0003] The aim of the invention is therefore to eliminate the disadvantages of the background art and to propose a method for spinning-in on a spinning machine, especially on an air-jet spinning machine or an open-end spinning machine, which would reduce the peak load of its power supplies and thus enable to use power supplies with lower output.

Principle of the invention

[0004] The goal of the invention is achieved by a method for spinning-in on a spinning machine, particularly on an air-jet spinning machine or an open-end spinning machine, containing plurality of spinning units arranged next to each other and provided with individual drives, which are divided into groups, wherein the spinning units of each group are supplied by common power supply, whereby the spinning machine is fitted with one service device, capable of moving along the row of spinning units and spinning-in of each of them. The principle of this method consists in the fact that during the process of sequential spinning-in the actual load of the power supplies for individual groups of spinning units is monitored and after achieving or exceeding a predetermined value, the spinning-in process of spinning units of given individual group is interrupted, whereupon the spinning-in of

spinning units of another group is started, in which the actual load of the power supply is lower than the predetermined value. In this manner, the peak performance of the whole spinning machine is reduced and is distributed into a longer time interval, which enables to design power supplies to lower nominal output, and so, having lower capacity, the power supplies can be physically smaller and therefore usually also more cheaper.

[0005] So as to carry out spinning-in, or at least so as to perform a predetermined number of attempts to spin-in by all the spinning units of the spinning machine, once the predetermined value of load on the serviced group of spinning units is achieved for the first time, the process of spinning-in starts on another, yet un-serviced group of spinning units, whereby after achieving or exceeding the predetermined value of load of the power supply of all the groups of the spinning units, the spinning-in of spinning units not yet spun-in of groups which have been serviced before is started.

[0006] Preferably, the predetermined value of the power supply load equals the sum of all the power requirements of all the spinning units of particular group during steady-state of spinning, or it is lower, or, by way of contrast, higher, namely up to the value of short-time overload capacity of the particular power supply.

Description of drawings

[0007] Fig. 1 schematically represents an example of embodiment of an open-end spinning machine on which the method for spinning-in according to the invention is applied.

Specific description

[0008] The method of spinning-in on a spinning machine according to the invention will be explained using simplified embodiment of an open-end spinning machine schematically shown in Fig. 1. This spinning machine contains a row of 12 identical spinning units **11** to **34**, each of which is provided with an not shown individual drive. These units **11** to **34** are divided into three groups **1, 2, 3** of four, whereby all the units **11** to **34** of each group **1, 2, 3** are supplied by common power supply **10, 20, 30**. Each power supply **10, 20, 30** is provided with monitoring device **100, 200, 300**, which monitors its load and/or temperature and/or output and/or supplied electrical current, or, as the case may be, another value which corresponds to its actual load. The monitoring devices **100, 200, 300** of all the power supplies **10, 20, 30** and all the spinning units **11** to **34** are connected to the control unit **4** of the spinning machine.

[0009] The open-end spinning machine is further provided with at least one automatic service device **5** for servicing the spinning units **11** to **34**, which is movably mounted along the row of these spinning units **11** to **34** and which can arrive to any of them. The automatic service device **5** is responsible for activities leading to the

spinning-in of the spinning units 11 to 34 during the start-up of the spinning machine or upon a yarn rupture in one of them, etc. However, apart from that, it performs also other functions periodically or irregularly - in case of need.

[0010] Due to the described connection, the control unit 4 of the spinning machine at any time point has information about the actual position of the service device 5, the state of spinning-in of each spinning unit 11 to 34 and the load of individual power supplies 10, 20, 30. On the basis of this information it then controls the movement and function of the service device 5 during the start-up, as well as during steady-state operation of the spinning machine.

[0011] During the start-up of the spinning machine, especially during the start-up of a new spinning machine or a spinning machine after a long-term shutdown, when in none of the spinning units 11 to 34 of at least one group 1, 2, 3 spinning takes place, the service device 5 moves along the row of the spinning units 11 to 34 and sequentially carries out predetermined number of attempts to spin-in (usually 1 to 3) by each of them. When using the method according to the invention this proceeds till the moment when the total power requirement of all spun-in spinning units, e.g. 11 to 13 in particular group 1 does not achieve (and, as the case may be, does not exceed) the predetermined value of load of respective power supply 10. Preferably, such a predetermined value is the sum of the outputs of all the spinning units 11 to 34 connected to this power supply 10 to 30 in steady-state spinning, although it can also be a value which is lower or, by way of contrast, higher, namely up to the value of short-time overload capacity of the particular power supply 10 to 30. As for the output, that is determined by the maximum current of relevant components of the power supply 10 to 30, and as to the time, it is determined by the increase in the temperature of the power supply 10 to 30 or its components, whereby the value permitted (by the producer) must not be exceeded. At that moment the spinning-in of spinning units 11 to 14 of this group 1 is interrupted and the service device 5, regardless the actual state of spinning-in and the attempts to spin-in performed, moves to the nearest spinning unit 21 of the nearest group 2, in which the actual load of the power supply 20 is lower than the predetermined value - i.e. no attempt to spin-in has been carried out yet in it, or the actual load of the power supply 20 has dropped below the predetermined value as a result of achieving steady-state spinning in the spun-in spinning units 21 to 24 or as a result of interrupting the spinning in any of them. In this group 2 of the spinning units 21 to 24 the service device 5 proceeds in the same manner as in the first group 1 and sequentially spins-in its spinning units 21 to 24 not yet spun-in, or carries out the predetermined number of attempts to spin-in by its spinning units 21 to 24 not yet spun in. After achieving or exceeding the predetermined value of load of the power supply 10, 20, 30 in all groups 1, 2, 3 of the spinning units 11 to 34 for the first time, the service device 5 then returns to yet un-serviced spinning

units 11 to 34 or spinning units 11 to 34 not yet spun-in, which are supplied by the power supply 10, 20, 30, in which the load has decreased below the predetermined value, e.g. under the influence of achieving steady-state spinning or interrupting spinning, and carries out predetermined number of attempts to spin-in. Preferably, it moves in such a manner that always an spinning unit 11 to 34 not yet spun-in, which is nearest to the actual position of the service device 5, is serviced as a priority. During the movement of the service device 5 it is advantageous to use suitable mathematical model for optimization of its path and/or time of servicing the spinning units 11 to 34. In this manner, a predetermined number of attempts to spin-in is carried out sequentially by all the spinning units 11 to 34 of the spinning machine.

[0012] The advantages of this method consist especially in the fact that the peak power requirement of the whole spinning machine is during spinning-in reduced and distributed into longer time interval. This enables to design power supplies 10, 20, 30 for lower nominal output, which corresponds to the total power requirement of supplied spinning units 11 to 34 in steady-state spinning, and, as a result, these supplies 10, 20, 30 can have a lower capacity and can be even physically smaller, and therefore usually also cheaper. Another advantage is energy saving, which also plays a significant role. Moreover, the supplies designed in this manner 10, 20, 30 are optimally exploited during the whole operation of the spinning machine, or their performance equals or is nearing their nominal output, and so they work with greater efficiency. The method of spinning-in according to the invention can be applied to every spinning machine, which contains at least one row of spinning units 11 to 34 with individual drives.

[0013] Analogically, this procedure can also be applied to spinning machines which contain a plurality of rows of spinning units 11 to 34 and/or a plurality of attending devices 5, as well as to spinning machines, in which the process of spinning-in is carried out manually, whereby the current load of the power supplies 10, 20, 30, or possibility/impossibility of performing an attempt to spin-in of each spinning unit 11 to 34 and/or a group of spinning units 11 to 34 is signalled to the machine operator, for example by giving a visual and/or acoustic signal, or otherwise.

Claims

1. A method for spinning-in on a spinning machine, particularly on an air-jet spinning machine or an open-end spinning machine, containing a plurality of spinning units (11 to 34), arranged next to each other and provided with individual drives, which are divided into groups (1 to 3), where the spinning units (11 to 34) of each group (1 to 3) are supplied by common power supply (10 to 30), whereby the spinning machine is equipped with at least one service device

(5), capable of moving along the row of the spinning units (11 to 34) and spinning-in of each of them, **characterized in that** the actual load of the power supplies (10 to 30) of individual groups (1 to 3) of spinning units is monitored (11 to 34) during the sequential process of spinning-in of spinning units (11 to 34) of respective serviced group (1 to 3) and after achieving or exceeding a predetermined value of the load, the process of spinning-in of the respective group (1 to 3) of spinning units (11 to 34) is interrupted and the spinning-in of another group (1 to 3) of spinning units (11 to 34) having an actual load of the power supply (10 to 30) lower than the predetermined value is started.

2. The method according to Claim 1, **characterized in that** after achieving the predetermined value of load in the serviced group (1 to 3) of spinning units (11 to 34) for the first time, the process of spinning-in starts in another yet un-serviced group (1 to 3) of spinning units (11 to 34) and the spinning-in of not yet spun-in spinning units (11 to 34) of previously serviced groups (1 to 3) is started only after achieving or exceeding the predetermined value of load of the power supply (10 to 30) in all the groups (1 to 3) of the spinning units (11 to 34).
3. The method according to Claim 1 or 2, **characterized in that** the predetermined value of load of the power supply (10 to 30) equals the sum of the power requirements of all the spinning units (11 to 34) of particular group (1 to 3) during steady-state spinning.
4. The method according to Claim 1 or 2, **characterized in that** the predetermined value of load of the power supply (10 to 30) is lower than the sum of the power requirements of all the spinning units (11 to 34) of a particular group (1 to 3) during steady-state spinning.
5. The method according to Claim 1 or 2, **characterized in that** the predetermined value of load of the power supply (10 to 30) equals the short-time overload capacity of the power supply (10 to 30).

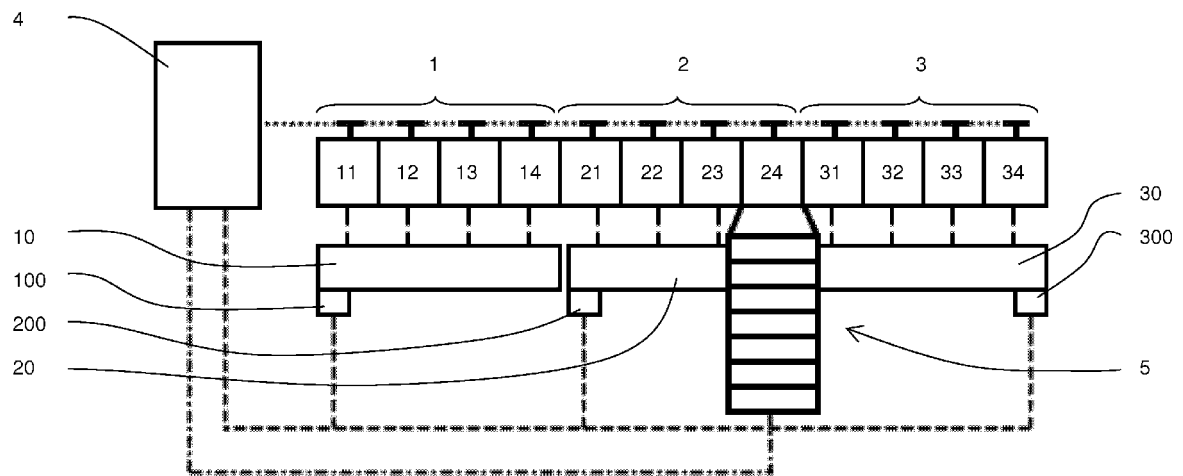


Fig. 1



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Place of search Munich		Date of completion of the search 27 May 2014	Examiner Humbert, Thomas
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