

(19)



Europäisches Patentamt

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Office européen des brevets



(11)

EP 0 314 631 B2

(12)

NEW EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the opposition decision:

14.08.2002 Bulletin 2002/33

(51) Int Cl.7: **D01H 9/18**

(45) Mention of the grant of the patent:

27.04.1994 Bulletin 1994/17

(21) Application number: **88830305.4**

(22) Date of filing: **19.07.1988**

(54) **Improved structure for supplying a spinning frame with full bobbins for replacing exhausted bobbin in a random way**

Einrichtung zur Versorgung einer Spinnmaschine mit vollen Spulen und zum Austausch der leeren Spulen nach einer Zufallsverteilung

Structure pour amener à un métier à filer des bobines pleines et pour remplacer les bobines vides arbitrairement

(84) Designated Contracting States:

AT BE CH DE ES FR GB GR LI

(56) References cited:

EP-A- 0 213 962 DE-A- 3 601 832

DE-U- 1 969 002 JP-U- 5 838 662

US-A- 3 828 682

(30) Priority: **13.10.1987 IT 2225787**

(43) Date of publication of application:

03.05.1989 Bulletin 1989/18

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• **PATENT ABSTRACTS OF JAPAN vol. 11, no. 262
(C-442) 2709 25 August 1987, & JP-A-6262932**

• **62 62932 (HOWA MACH LTD)**

• **PATENT ABSTRACTS OF JAPAN vol. 11, no. 53
(C-404) 2500 19 February 1987, & JP-A-61 215726
(TOYODA AUTOM LOOM WORKS LTD)**

• **PATENT ABSTRACTS OF JAPAN vol. 11, no. 30
(C-400) 2477 29 January 1987, & JP-A-61 201030
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EP 0 314 631 B2

Description

[0001] The invention relates to a bobbin supply system adapted to simplify the random replacing operation of completely exhausted bobbins to be replaced by completely full bobbins on a spinning frame.

[0002] This supply system comprises at least a first path (1) coming from a bobbin frame and adapted to transfer a bobbin assembly or train arranged near a second path (1') which extends on the perimeter of the parts constituting a spinning frame.

[0003] The mentioned first path is provided with a conveyor belt driven with a substantially intermittent motion, whereas the second path is provided with a conveyor belt having a substantially continuous motion, the system further comprising means for transferring individual bobbins (2) between the conveyor belts of the first and second paths (1, 1').

[0004] Such a system is conventionally called the set by set replacing system.

[0005] However, because of very different reasons, the bobbins of a given set do not exhaust at the same time or within a given short period of time.

[0006] Accordingly, this type of bobbin supplying system does not afford the possibility of exploiting in an optimal way the efficiency capabilities of the spinning frame, with a consequent increase of the operating cost.

[0007] Another system is to supply the bobbins to the spinning frame by sets or trains and. in this system. the bobbins are changed individually, that is upon sensing each single empty bobbin.

[0008] This second system, on the other hand, requires comparatively long operating times, which negatively affect the efficiency of the spinning frame.

[0009] The documents DE-A-3 601 832 and PATENT ABSTRACTS OF JAPAN Vol.11. No 262 (C-442) 2709 disclose a system for loading bobbins on and unloading bobbins from a spinning frame according to the pre-characterizing part of the main claim.

SUMMARY OF THE INVENTION

[0010] Accordingly, the task of the present invention is to overcome the above mentioned drawbacks by providing a spinning frame supplying system able of causing the spare full bobbins to be displaced in a continuous way along the front sections of the spinning frames.

[0011] Another object of the present invention is to provide a spinning frame supplying system which is adapted to greatly facilitate the replacing of empty bobbins by completely full bobbins.

[0012] Still another object of the present invention is to provide a bobbin supplying system which is very reliable in operation.

[0013] According to one aspect of the present invention the above mentioned objects, as well as yet other objects, which will become more apparent hereinafter, are achieved by a system for supplying spinning frames

with completely full bobbins, having the features of the characterizing part of the main claim.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] Further characteristics and advantages of the system for supplying spinning frames with full bobbins according to the present invention will become more apparent hereinafter from the following detailed description of a preferred embodiment of said system which is illustrated, by way of an indicative but not limitative example in the figures of the accompanying drawings. in which:

figure 1 is a schematic top view illustrating the supplying system according to the present invention; and
figure 2 is a cross-sectional view illustrating a spinning frame

DESCRIPTION OF THE PREFERRED EMBODIMENT

[0015] With reference to the drawing figures, the improved system for supplying spinning frames with full bobbins according to the present invention preferably comprises two supplying circuits or paths, indicated generally at the reference numbers 1 and 1' including two conveyor belts and adapted to take up all of the bobbins 2 formed on corresponding roving frames 3.

[0016] More specifically each said circuit or path comprises a first portion 4 associated with the corresponding roving frame and a second portion 5 adapted to transfer the full bobbin sets, sent from either roving frame to a third common portion 6 so as to reach a switching device 7.

[0017] The mentioned third portion 6 adjoins a portion of a further circuit or path 8 which perimetricaly extends with respect to the spinning frames 9 and defines. through a switching device 10. two further portions 11 meeting, through corresponding switching devices 12. with the mentioned first portions 4.

[0018] At the adjoining portions of the first and second circuits or paths there are moreover provided an interexchanging apparatus 13, of a type, in example, as disclosed in EP 0124 662, and a sensor 14 which will be discussed in a more detailed way hereinafter.

[0019] More specifically the conveyor belt 15. defining the path 8 and carrying both full and empty bobbins of a type, in example, as disclosed in EP 0 124 662, is provided with a continuous motion and is stopped as the sensor 14 detects, near the apparatus 13, the presence of an empty bobbin, while a bobbin train coming from the path 1 or from the path 1' is arranged on a side of the mentioned apparatus 13.

[0020] The operation of replacing an empty bobbin by a full bobbin, in particular, is very easy.

[0021] In fact as an empty bobbin is sensed by the sensor 14, the operation of the path 8 will be interrupted

(this path has a substantially continuous movement) so as to arrange an empty tube on a side of the apparatus 13, which will exchange this empty tube with a full bobbin, by supplying the bobbin to the path 8 and the empty tube to the path or circuit 1.

[0022] As the train arranged in a rest condition at a side of the mentioned apparatus 13 exclusively comprises empty tubes, the operation of said train will be started again so as to locate at said side another full bobbin train.

[0023] The empty tube train, in turn, will be sent, through the switching device 10, to the roving frame for forming new full bobbins.

[0024] In this connection it should be pointed out that the branches of the path 8 preferably laterally extend in an alternate way, one of these branches being sufficient to supply two adjoining spinning frames.

[0025] From the above disclosure it should be apparent that the invention fully achieves the intended objects.

Claims

1. A system for supplying a spinning frame (9) with full bobbins (2) and transferring empty bobbins or tubes from a spinning frame to a roving frame, comprising conveyor path means for transferring full bobbins from a roving frame (3) to said spinning frame (9), **characterised in that** said conveyor path means comprises two first bobbin supplying paths (1, 1') coming from said roving frame (3) and supplied by said roving frame (3) with a plurality of full bobbins (2) to be transferred to a second path (8), driving means for driving said first and second paths and an interexchanging apparatus (13) arranged between adjoining portions of said first and second paths for transferring bobbins between said first (1, 1') and second (8) paths, said first paths (1, 1') including first conveyor belts and said second path including a second conveyor belt ; **in that** said driving means drive said first conveyor belts of said paths (1, 1') with an intermittent motion and said conveyor belt of second path (8) with a substantially continuous motion, a portion of said second conveyor belt of said second path (8) perimetricaly extending with respect to said spinning frames (9) ; **in that** a third path (6) is provided , said third path being common to said first paths (1, 1') and adjoining said second path (8) ; **in that** said interexchanging apparatus operates to exchange an empty bobbin with a full bobbin by supplying the full bobbin to said second path (8) and an empty bobbin to said common path (6) and that branches of the second path (8) laterally extend in an alternate way, one of these branches supplying two adjoining spinning frames (9); **and in that** said first paths (1, 1') are adapted to take

up all the bobbins (2) formed by a corresponding moving frame (3) each of said first paths comprising a first portion (4) and a second portion (5) to transfer said bobbins to said third common path (6), through a switching device (7).

2. A system according to Claim 1, **characterised in that** said third path (6) is split, through a further switching device (10), into two converging portions (11), said converging portions (11) converging, through corresponding other switching devices (12), into said first portion (4).
3. A system according to Claim 1, **characterised in that** said system further comprises bobbin sensor means (14) controlling the driving means of said second path (8).

20 Patentansprüche

1. System zur Versorgung einer Spinnmaschine (9) mit vollen Spulen (2) und zum Überführen leerer Spulen oder Röhren von einer Spinnmaschine zu einer Vorspinnmaschine, mit einer Förderbahneinrichtung zum Überführen voller Spulen von einer Vorspinnmaschine (3) zu der Spinnmaschine (9), **dadurch gekennzeichnet, dass** die Förderbahneinrichtung zwei erste Spulenzufuhrbahnen (1, 1'), die von der Vorspinnmaschine (3) kommen und denen durch die Vorspinnmaschine (3) eine Mehrzahl auf eine zweite Bahn (8) zu überführender voller Spulen (2) zugeführt wird, eine Antriebseinrichtung zum Antreiben der ersten und zweiten Bahnen und eine Austauschvorrichtung (13) umfasst, die zur Überführung von Spulen zwischen den ersten (1, 1') und zweiten (8) Bahnen zwischen aneinander grenzenden Abschnitten der ersten und zweiten Bahnen angeordnet ist, wobei die ersten Bahnen (1, 1') erste Förderbänder umfassen und die zweite Bahn ein zweites Förderband umfasst; dass die Antriebseinrichtung die ersten Förderbänder der ersten Bahnen (1, 1') mit einer intermittierenden Bewegung und das Förderband der zweiten Bahn (8) mit einer im wesentlichen kontinuierlichen Bewegung antreibt, wobei sich ein Abschnitt des zweiten Förderbandes der zweiten Bahn (8) bezüglich der Spinnmaschinen (9) in Umfangsrichtung erstreckt; dass eine dritte Bahn (6) vorhanden ist, wobei die dritte Bahn gemeinsam mit den ersten Bahnen (1, 1') ausgebildet ist und an die zweite Bahn (8) angrenzt; dass die Austauschvorrichtung zum Austausch einer leeren Spule durch eine volle Spule dient, indem sie die volle Spule der zweiten Bahn (8) und eine leere Spule der gemeinsamen Bahn (6) zuführt, und dass sich Abzweigungen der zweiten Bahn (8) wechselweise zur Seite erstrecken, wobei eine der Abzweigungen zwei benachbarte

Spinnmaschinen (9) versorgt; und dass die ersten Bahnen (1, 1') dazu eingerichtet sind, alle Spulen (2) aufzunehmen, die durch eine entsprechende Vorspinnmaschine (3) gebildet werden, wobei jede der ersten Bahnen einen ersten Abschnitt (4) und einen zweiten Abschnitt (5) umfasst, um die Spulen durch eine Umschaltvorrichtung (7) zu der dritten gemeinsamen Bahn (6) zu überführen.

2. System nach Anspruch 1, **dadurch gekennzeichnet, dass** die dritte Bahn (6) durch eine weitere Umschaltvorrichtung (10) in zwei zusammenlaufende Abschnitte (11) geteilt ist, wobei die zusammenlaufenden Abschnitte (11) durch entsprechende weitere Umschaltvorrichtungen (12) in dem ersten Abschnitt (4) zusammenlaufen.
3. System nach Anspruch 1, **dadurch gekennzeichnet, dass** das System ferner eine Spulensensor-einrichtung (14) umfasst, die die Antriebseinrichtung der zweiten Bahn (8) steuert.

Revendications

1. Structure pour amener à un métier à filer (9) des bobines pleines (2) et pour transférer des bobines ou tubes vides d'un métier à filer à un banc à broches (3), comprenant des moyens de transport pour transférer les bobines pleines d'un banc à broches (3) audit métier à filer (9), **caractérisée en ce que** lesdits moyens de transport comprennent deux premières pistes (1, 1') d'alimentation des bobines, venant dudit banc à broches (3) et alimentée par ledit banc à broches (3) avec plusieurs bobines pleines (2) à être transférées dans une deuxième piste (8), des moyens de commande pour commander lesdites pistes première et deuxième et un dispositif (13) interchangeable arrangé entre des portions adjacentes desdites première et deuxième pistes pour transférer les bobines entre lesdites premières pistes (1, 1') et deuxième piste (8), lesdites premières pistes (1, 1') comprenant des premières bandes transporteuses et ladite deuxième piste comprenant une deuxième bande transporteuse, **en ce que** lesdits moyens de commande commandent lesdites premières bandes transporteuses desdites pistes (1, 1') par un mouvement intermittent et ladite bande transporteuse de la deuxième piste (8) par un mouvement essentiellement continu, une portion de ladite deuxième bande transporteuse de ladite deuxième piste (8) s'étendant périmétralement par rapport auxdits métiers à filer (9), **en ce qu'**une troisième piste (6) est prévue, ladite troisième piste étant commune auxdites premières pistes (1, 1') et adjacente à ladite deuxième piste (8), **en ce que** ledit dispositif interchangeable fait fonction d'échanger une bobine vide avec une bobine pleine

en alimentant ladite deuxième piste (8) avec la bobine pleine et ladite piste commune (6) avec une bobine vide et **en ce que** des embranchements de la deuxième piste (8) s'étendent latéralement de manière alternée, une de ces branches alimentant deux métiers à filer (9) adjacents, et **en ce que** lesdites premières pistes (1, 1') sont aptes à prélever toutes les bobines (2) formées par un banc à broches (3) correspondant, chacune desdites premières pistes comprenant une première portion (4) et une deuxième portion (5) pour transférer lesdites bobines à ladite troisième piste (6) commune, au moyen d'un dispositif commutateur (7).

2. Structure selon la revendication 1, **caractérisée en ce que** ladite troisième piste (6) est séparée, au moyen d'un autre dispositif commutateur (10), dans deux portions convergentes (11), lesdites portions convergentes (11) s'étendant dans un sens convergent, au moyen des autres dispositifs commutateurs (12) correspondants, dans ladite première portion (4).
3. Structure selon la revendication 1, **caractérisée en ce que** ladite structure comprend en outre des moyens détecteurs (14) des bobines contrôlant les moyens de commande de ladite deuxième piste (8).

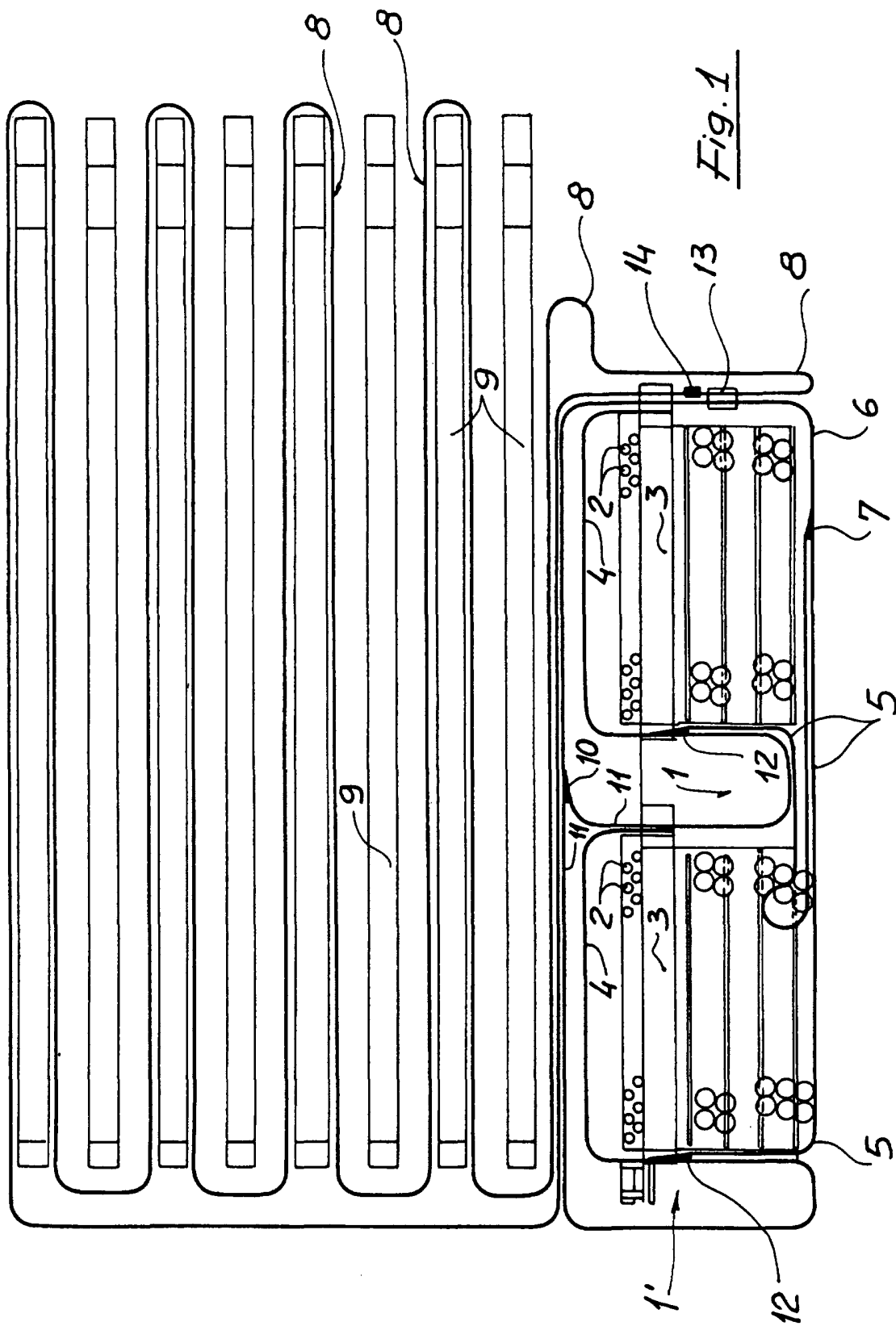


Fig. 2

