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(54) **CONVEYOR DRIVE FABRIC DYEING MACHINE EQUIPPED WITH SEAM DETECTOR**

(57) Disclosed is a conveyor drive fabric dyeing machine including a seam detector (10) arranged therein to detect, record, display, and output a signal indicating fabric circulation time of the previous cycle of circulation and achieving the following effects: (I) providing control of synchronization and correction of the speeds of a conveyor (2) and the circulation of the fabric (3); (II) providing control of synchronization and correction of the speeds of a fabric roller (4) and the circulation of the fabric (3);

and (III) providing control of synchronization and correction of the speeds of the fabric (3) and the conveyor (2) and the fabric roller (4). The conveyor drive fabric dyeing machine uses the functions of the seam detector (10) to achieve monitoring and recording the synchronization between the conveyor (2) and the fabric roller (4) and the circulation speed of the fabric (3) and to conduct control of instantaneous correction in order to maintain smooth operation of the fabric (3).

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## Description

### (a) Technical Field of the Invention

**[0001]** The present invention generally relates to a conveyor drive fabric dyeing machine equipped with a seam detector, which is a conveyor drive fabric dyeing machine that is capable of monitoring and recording synchronized operations of a conveyor and a fabric roller and a circulation speed of fabric and for detecting if the fabric roller and the conveyor are in synchronization with the circulation speed of the fabric and for conducting a control operation for instantaneous correction.

### (b) Description of the Prior Art

**[0002]** A conventional seam detector is used to detect, record, and display and output signals indicating circulation time of fabric and the number of cycles of fabric circulation and to automatically shut down after automatically identifying a fabric seam in order to save the time necessary for searching for the fabric seam.

### SUMMARY OF THE INVENTION

**[0003]** An object of the present invention is to improve and maintain synchronization of the operational speeds of fabric, a conveyor, and a fabric roller. In a fabric treatment process, it is often that variation of actual time of circulation of fabric occurs due to incorrect input of fabric data, such as length, fabric weight, or fabric areal weight, as well as physical or chemical variation occurring in a dyeing bath of a machine body due to factors such as temperature change and additions of dye liquid and chemical agents. This would lead to errors in synchronization control of fabric and thus causing unsmooth operations, such as jamming and entangling of fabric.

**[0004]** To overcome such problems, the present invention uses actual circulation time of fabric that is detected by a fabric seam detector to conduct instantaneous adjustment and correction of speeds of a conveyor and a fabric roller in order to maintain synchronized operations of the fabric, the conveyor, and the fabric roller.

**[0005]** The technical solution of the present invention is to arrange a fabric seam detector at a suitable location in a conveyor drive fabric dyeing machine in order to use fabric circulation time detected by the fabric seam detector to allow a computer or a programmable logic controller (PLC) to conduct control or correction of the speeds of the conveyor and the fabric roller in order to achieve precise control of speed-synchronized operations of the fabric and the conveyor and the fabric roller.

**[0006]** The foregoing objectives and summary provide only a brief introduction to the present invention. To fully appreciate these and other objects of the present invention as well as the invention itself, all of which will become apparent to those skilled in the art, the following detailed description of the invention and the claims should be read

in conjunction with the accompanying drawings. Throughout the specification and drawings identical reference numerals refer to identical or similar parts.

**[0007]** Many other advantages and features of the present invention will become manifest to those versed in the art upon making reference to the detailed description and the accompanying sheets of drawings in which a preferred structural embodiment incorporating the principles of the present invention is shown by way of illustrative example.

### BRIEF DESCRIPTION OF THE DRAWINGS

**[0008]** FIG 1 is a schematic view showing a conveyor drive fabric dyeing machine equipped with a seam detector according to the present invention.

### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

**[0009]** The following descriptions are exemplary embodiments only, and are not intended to limit the scope, applicability or configuration of the invention in any way. Rather, the following description provides a convenient illustration for implementing exemplary embodiments of the invention. Various changes to the described embodiments may be made in the function and arrangement of the elements described without departing from the scope of the invention as set forth in the appended claims.

**[0010]** As shown in FIG 1, the present invention provides a fabric dyeing machine equipped with a seam detector, which comprises a machine body 1 in which a conveyor 2 is arranged for conveying fabric 3 from a rear end of the machine body 1 to a front end. The fabric 3 is then driven by a fabric roller 4 to move into a nozzle 5 and a dyeing tube 12. Dye liquid 6 is pressurized by a pump 7 and is subjected to temperature control by a heat exchanger 8 to be then jetted from the nozzle 5 to induce a dyeing effect on the fabric and also to drive the fabric 3 to enter a fabric guide tube 11 to subsequently fall down to the conveyor 2 for being further conveyed to the front end of the machine body. As such, a cycle of circulation motion that is conducted in the form of a loop is completed. A seam detector 10 is arranged to detect and output circulation time of the fabric 3, with which a computer or a programmable logic controller (PLC) of a control box 9 carry out an operation of control or correction of the speeds of the conveyor 2 and the fabric roller 4 so as to achieve precise control of speed-synchronized operations of the fabric 3 and the conveyor 2 and the fabric roller 4.

**[0011]** It will be understood that each of the elements described above, or two or more together may also find a useful application in other types of methods differing from the type described above.

**[0012]** While certain novel features of this invention have been shown and described and are pointed out in the annexed claim, it is not intended to be limited to the

details above, since it will be understood that various omissions, modifications, substitutions and changes in the forms and details of the device illustrated and in its operation can be made by those skilled in the art without departing in any way from the spirit of the present invention. 5

## Claims

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1. A conveyor drive fabric dyeing machine equipped with a seam detector, which comprises a conveyor (2) arranged in a machine body (1) of a fabric dyeing machine for conveying fabric (3) from a rear end of the machine body (1) to a front end without being driven by a driving force induced by liquid or air, a seam detector (10) being arranged at a suitable location in the fabric dyeing machine, wherein the seam detector (10) detects, records, displays, and outputs signals indicating a fabric seam and circulation time of the fabric (3), wherein based on the circuit time, a computer or a programmable controller instantaneously controls or corrects speeds of the conveyor (2) and a fabric roller (4) so as to achieve precise control of speed-synchronized operation of the fabric (3) and the conveyor (2) and the fabric roller (4). 15 20 25

## Amended claims in accordance with Rule 137(2) EPC. 30

1. A conveyor drive fabric dyeing machine equipped with a seam detector, which comprises a conveyor (2) arranged in a machine body (1) of a fabric dyeing machine for conveying fabric (3) in the machine body (1) to have the fabric (3) further driven by a fabric roller (4) into a nozzle (5) and a dyeing tube (12) so that the fabric (3) is transported by the conveyor (2) and also driven by the fabric roller (4), a seam detector (10) being arranged at a suitable location in the fabric dyeing machine, wherein the seam detector (10) detects, records, displays, and outputs signals indicating a fabric seam and circulation time of the fabric (3), **characterized in that** based on the circulation time of the fabric (3), a computer or a programmable controller instantaneously controls or corrects speeds of the conveyor (2) and the fabric roller (4) so as to achieve precise control of speed-synchronized operation of the fabric (3) and the conveyor (2) and the fabric roller (4). 35 40 45 50

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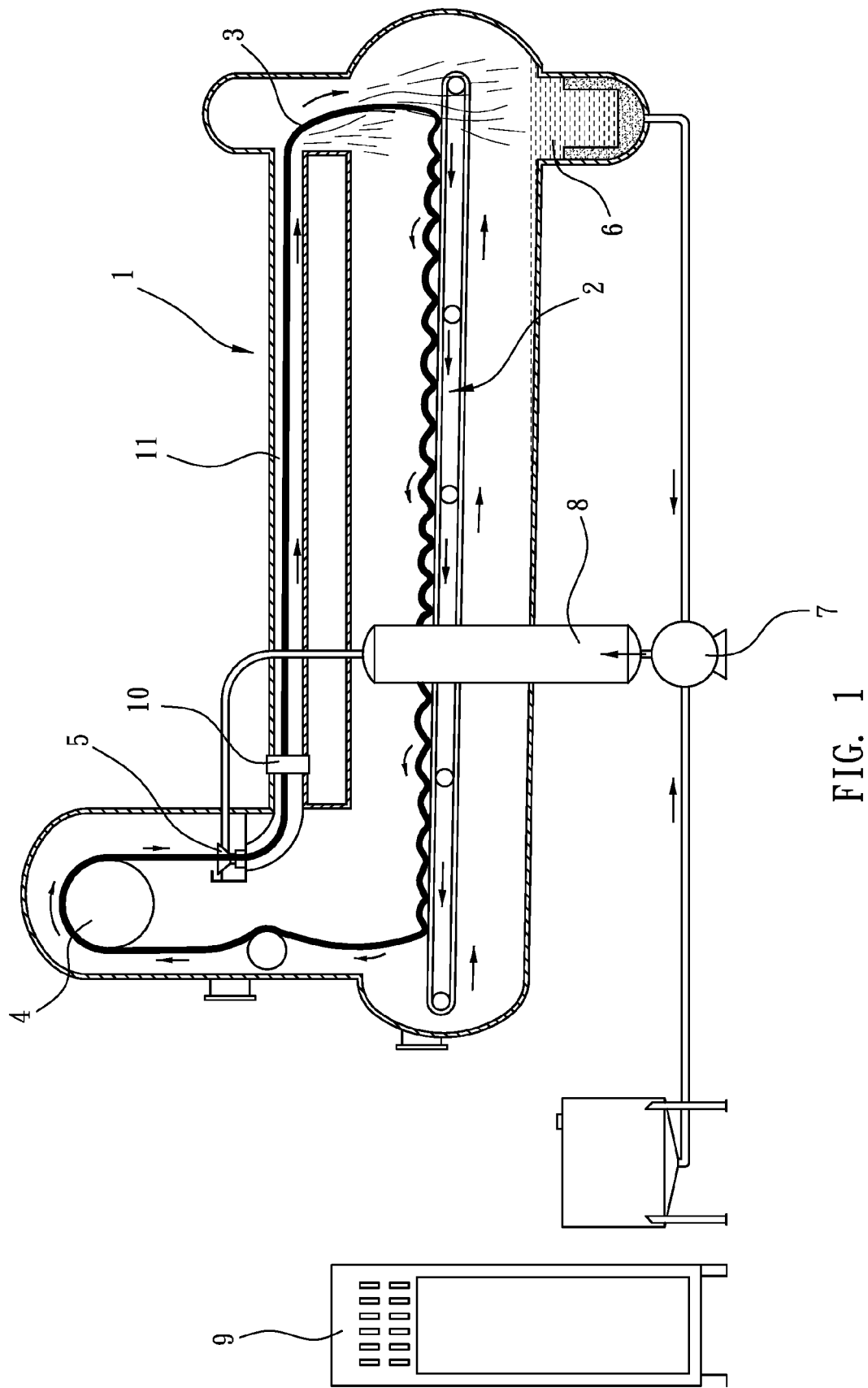


FIG. 1



## EUROPEAN SEARCH REPORT

Application Number  
EP 15 16 3624

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| DOCUMENTS CONSIDERED TO BE RELEVANT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                             |                                  |                                                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------------------------------------------------------|
| Category                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Citation of document with indication, where appropriate, of relevant passages                                                                               | Relevant to claim                | CLASSIFICATION OF THE APPLICATION (IPC)               |
| X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | DE 20 2014 104073 U1 (CHANG CHI LUNG [TW])<br>9 September 2014 (2014-09-09)<br>* paragraphs [0010] - [0011] *<br>-----                                      | 1                                | INV.<br>D06B3/24<br>D06B3/28<br>D06B23/00<br>D06B3/36 |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                             |                                  | D06B                                                  |
| Place of search                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                             | Date of completion of the search | Examiner                                              |
| Munich                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                             | 29 June 2015                     | Bichi, Marco                                          |
| CATEGORY OF CITED DOCUMENTS<br>X : particularly relevant if taken alone<br>Y : particularly relevant if combined with another document of the same category<br>A : technological background<br>O : non-written disclosure<br>P : intermediate document<br>T : theory or principle underlying the invention<br>E : earlier patent document, but published on, or after the filing date<br>D : document cited in the application<br>L : document cited for other reasons<br>& : member of the same patent family, corresponding document |                                                                                                                                                             |                                  |                                                       |

EPO FORM 1503 03/82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT  
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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
The members are as contained in the European Patent Office EDP file on  
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29-06-2015

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