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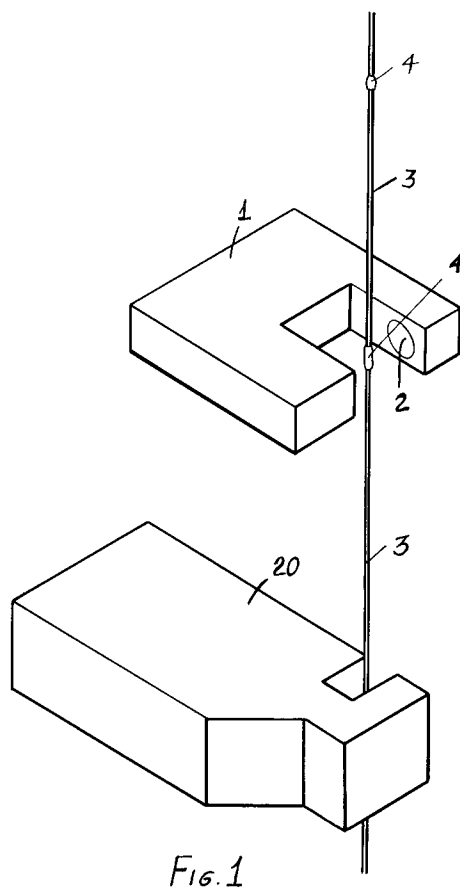
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I-20122 Milano (IT)(54) **Electronic apparatus for controlling the interlacings of yarns in a continuous-yarn spinning process.**

(57) The present invention relates to an electronic apparatus for controlling the interlacings (4) of yarns in a continuous-yarn spinning process, characterized in that it comprises a detecting assembly for detecting the interlacings (4) on the yarns, and being operatively connected to a driving assembly (15) for driving a cutter (20) unit provided for cutting the yarn if the latter has interlacings which do not correspond to the preset values.

*Fig. 1***EP 0 572 756 A1**

BACKGROUND OF THE INVENTION

The present invention relates to an electronic apparatus for controlling the interlacing of yarns in a continuous yarn spinning process.

As is known, in the continuous yarn spinning operations performed in the textile industry, for some types of products, there is performed a so-called interlacing operation, which allows to eliminate the much more expensive twisting operation.

More specifically, this interlacing operation is performed in order to bind or tie to one another the yarn forming filaments and is performed by blowing pressurized air onto the yarn, with a preset flow-rate, so as to improve the processing characteristics of the working yarns, and so as to increase the strength thereof.

At present, this type of process is controlled by a valve, which is in turn adjusted by an electronic type of transducer and locating device, adapted to provide a preset pressure, usually of 0.1 bar, which has been found to provide the better results.

The above mentioned system, which allows to obtain a very good adjustment of the pressure, is however not adapted to monitor the number of interlacings or knots performed on the yarn.

Actually, in this system it is not possible to count the knots per metre of the yarn being processed, which is very disadvantageous, since the quality of the fabric obtained from the yarn, and the aspect thereof, depend on the evenness of the knot number per metre.

In fact, a variation of the number of knots per metre can cause variations in the produced fabric, which, in some cases, can be very deleterious.

SUMMARY OF THE INVENTION

Accordingly, the aim of the present invention is to solve the above mentioned problems by providing an electronic apparatus for controlling the interlacings of yarn, in a continuous yarn spinning process, which allows to precisely monitor the evenness of the knot distribution through the yarn, while allowing an operator to eliminate easily possible deviations of the knot number from a preset value thereof.

Within the scope of the above mentioned aim, a main object of the present invention is to provide such an electronic apparatus allowing to easily and quickly preset a given number of knots to be formed on a metre of yarn, so as to obtain a knotted yarn having the required characteristics.

Another object of the present invention is to provide such an electronic apparatus which is very reliable and safe in operation and which, moreover, can be easily made starting from easily available elements and materials and which, furthermore, is

very advantageous from a mere economic standpoint.

According to one aspect of the present invention, the above mentioned aim and objects, as well as yet other objects, which will become more apparent hereinafter, are achieved by an electronic apparatus for controlling the interlacings of yarns, in a continuous-yarn spinning process, characterized in that said apparatus comprises a detecting assembly for detecting the interlacings on the yarns, said detecting assembly being operatively connected to a driving assembly for driving a cutter unit adapted to cut the yarn if said yarn has interlacings or knots which do not correspond to preset values.

BRIEF DESCRIPTION OF THE DRAWINGS

Further characteristics and advantages of the invention will become more apparent hereinafter from the following detailed disclosure of a preferred, though not exclusive, embodiment of an electronic apparatus for controlling the interlacings of yarns, in a continuous yarn spinning process, which is illustrated, by way of an indicative, but not limitative example, in the accompanying drawings, where:

Figure 1 is a schematic perspective view illustrating the detecting assembly and the cutter unit acting on the yarns;

and

Figure 2 is a schematic block diagram of the subject apparatus.

DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference to the figures of the accompanying drawings, the electronic apparatus for controlling the interlacings of yarns, in a continuous yarn spinning process, according to the present invention, comprises, for each yarn, a detecting assembly, generally indicated at the reference number 1, which comprises an optical sensor 2 adapted to emit a light beam, therethrough a yarn 3 is caused to pass, so as to control or monitor the interlacings or knots 4 formed on the yarn.

The optical sensor is integrated in an electronic apparatus, which comprises a central control unit 10, to which the process information are sent, said process information being managed by a signal conditioning system and being combined with other data in an assembly 11 provided for detecting the operating parameters of the machine.

These operating parameters will comprise the operating speed of the textile machine, the produced fabric metres, the starting speed and the stop procedure, as well as the actuated head num-

ber and other information.

The central unit 10 comprises a microprocessor adapted to program the optimum knot/metre rate and also operating as a data concentrating unit.

The central unit 10 is connected to an information storing assembly 12 which is designed for storing all of the information coming from the several head assemblies to supply these information to the central unit 10.

To the storing assembly 12 there is connected a signal conditioning assembly 13, provided for transmitting the data detected by the sensor and transform the knot signals into square waves, to be stored in the storing assembly 12.

To the storing assembly 12 there is moreover connected a driving assembly 15, which transforms the electronic signals into electric signals, provided for actuating the electromagnets of a cutter unit 20 adapted to cut the yarn if a deviation occurs from the preset optimum parameters.

Thus, during the knotting or interlacing process, the yarn is always controlled and, most importantly, it is continuously monitored that the number of knots per metres precisely correspond to the preset values, in order to prevent the supply of a yarn which does not have the required characteristics.

In fact, if the yarn does not meet the set requirements, the cutter unit 20 is automatically energized so as to cut the yarn and stop the textile machine.

From the above disclosure it should be apparent that the invention fully achieves the intended aim and objects.

In particular, the fact is to be pointed out that an electronic apparatus has been provided which is adapted to control the textile machine elements which elements were not controlled in prior textile machines of this type, the apparatus of the invention providing for controlling the number of knots, or interlacings, per metre, the evenness and good quality of the produced yarn.

The invention as disclosed is susceptible to several variations and modifications all of which will come within the scope of the inventive idea.

Moreover, all of the details can be replaced by other technically equivalent elements.

In practicing the invention, the used materials, as well as the contingent size and shape can be any depending on requirements.

Claims

1. An electronic apparatus for controlling the interlacings of yarns, in a continuous-yarn spinning process, characterized in that said apparatus comprises a detecting assembly for

detecting the interlacings on the yarns, said detecting assembly being operatively connected to a driving assembly for driving a cutter unit adapted to cut the yarn if said yarn has interlacings or knots which do not correspond to preset values.

2. An electronic apparatus according to Claim 1, characterized in that said detecting assembly is of an optical type.

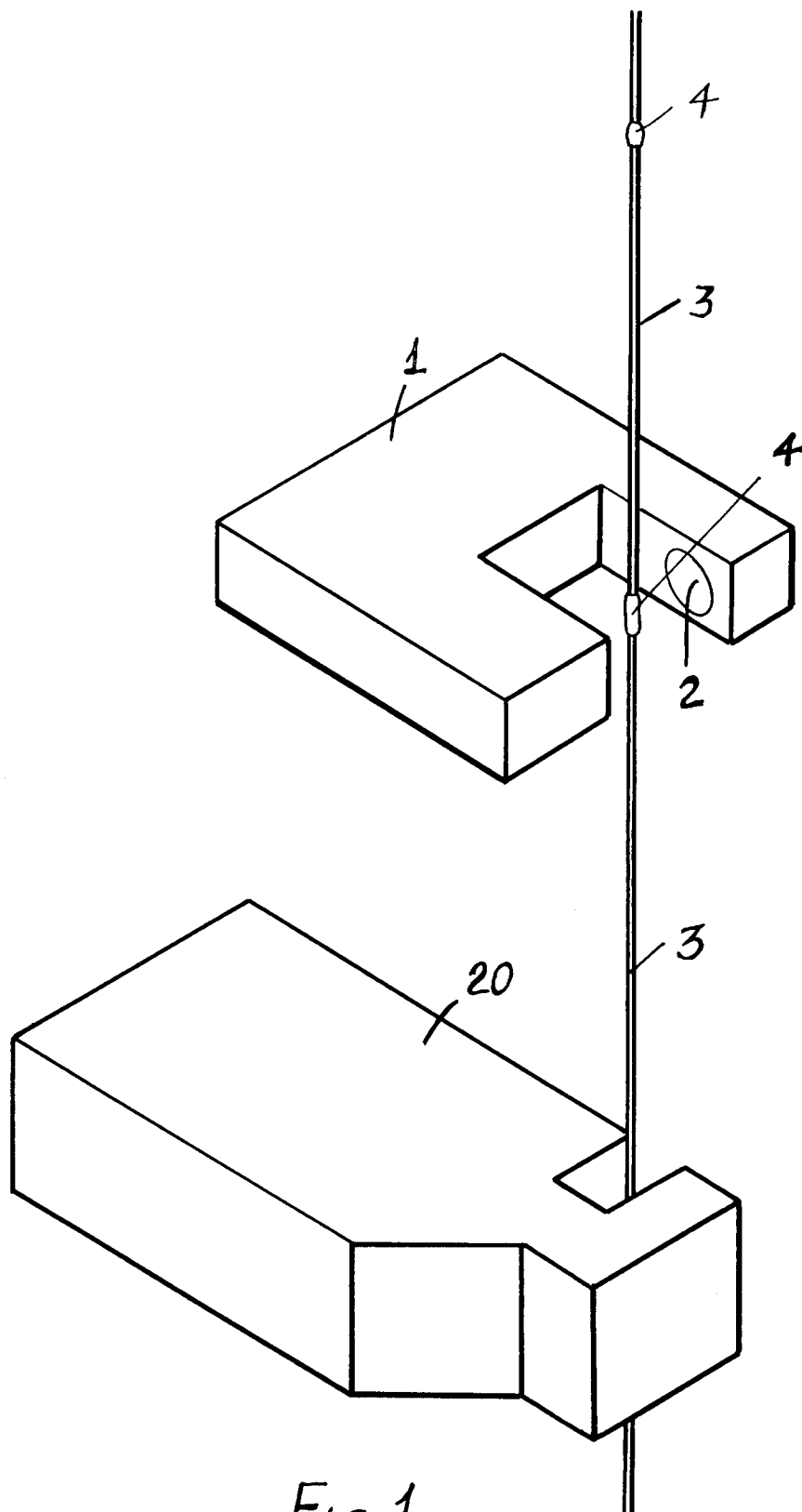
3. An electronic apparatus according to Claims 1 and 2, characterized in that said apparatus further comprises an electronic central control unit including a microprocessor designed for programming the optimum value of the number of knots per metre and to operate as a data concentrating unit.

4. An electronic apparatus according to one or more of the preceding claims, characterized in that to said central control unit there is connected a detecting assembly for detecting the operating parameters of the textile machine such as the operating speed thereof and the number of metres of fabric being made, the starting speed and the actuated working head number.

5. An electronic apparatus according to one or more of the preceding claims, characterized in that said control central unit is connected to a storing assembly for storing information sent by said working heads, to supply said information to said central control unit, said storing assembly being connected to a signal conditioning assembly for conditioning the signals detected by said detecting assembly.

6. An electronic apparatus according to one or more of the preceding claims, characterized in that said signal conditioning assembly is adapted to transform the knot presence signals into square waves to be stored in said storing assembly.

7. An electronic apparatus according to one or more of the preceding claims, characterized in that said driving assembly, connected to said storing assembly, is adapted to energize a plurality of electromagnets driving blade means of said cutter unit.



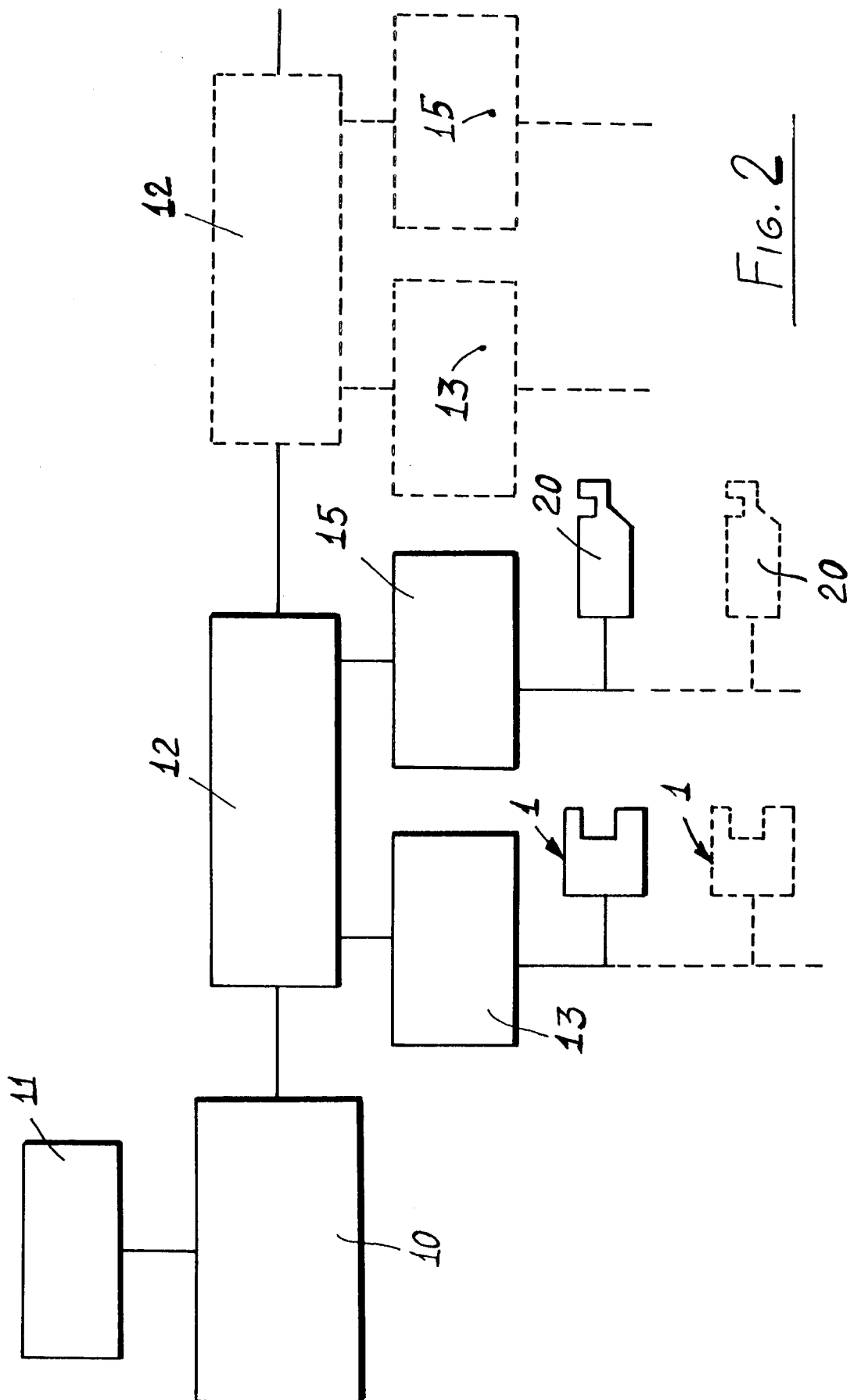


FIG. 2



European Patent
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EUROPEAN SEARCH REPORT

Application Number

EP 92 83 0482

DOCUMENTS CONSIDERED TO BE RELEVANT		
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim
X	DE-A-2 152 295 (SHIMADZU SEISAKUSHO) * page 10, paragraph 2 - page 12, paragraph 1 * * page 14, paragraph 1 * ---	1, 2, 7
X	GB-A-2 193 978 (JOHN L. BRIERLEY) * the whole document * ---	1, 7
X	EP-A-0 419 827 (MASCHINENFABRIK RIETER) * the whole document * -----	1
The present search report has been drawn up for all claims		
Place of search THE HAGUE		Date of completion of the search 13 SEPTEMBER 1993
Examiner RAYBOULD B.D.J.		
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		

TECHNICAL FIELDS
SEARCHED (Int. Cl.5)

B65H
D01H