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(54) **METHOD FOR SENSING AND COUNTING WINDINGS BEING DRAWN OFF A DRUM, AS WELL
AS A DEVICE FOR CARRYING OUT SAID METHOD**

VERFAHREN ZUM FÜHLEN UND ZÄHLEN VON WICKLUNGEN EINER SPEICHERTROMMEL UND
VORRICHTUNG ZUR HERSTELLUNG DES VERFAHRENS

PROCEDE DE DETECTION ET COMPTAGE DES SPIRES EXTRAITES D'UNE BOBINE, ET
DISPOSITIF ASSOCIE

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EP-A- 0 286 584 **EP-A- 0 286 590**
DE-A- 3 904 807

EP 1 266 057 B1

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Description

[0001] The invention relates to a method for sensing and counting the successive windings being drawn off a supply drum in a yarn-preparing device, wherein said windings are sensed by a detection unit including at least two sensors disposed one after the other, each comprising a light transmitter and a light receiver, which are arranged in such a manner with respect to each other that the windings being drawn off pass through the light beam between the transmitter and the receiver of each sensor, wherein a pulse is generated whenever the light beam is interrupted, after which the successive pulses are evaluated as one winding being drawn off.

[0002] A method of the above-described kind as well as a device for carrying out the same are disclosed in US patent no. 4,852,617.

[0003] With this prior art device the yarn is passed through a ring disposed after the drum, in which a pair of sensors are mounted, for the purpose of sensing and counting the windings being drawn off the supply drum. Each sensor comprises a light transmitter and receiver, which are arranged in such a manner that the light beam between the transmitter and the receiver is interrupted by the yarn windings being drawn off, which graze the inside of the ring. In this manner the light beam between the transmitter and the receiver of each sensor is interrupted once by every winding that is drawn off, which thus results in two interruption pulses for each winding that is drawn off. Said pulses are supplied to a first evaluator, which counts the two successive pulses as one winding being drawn off.

[0004] With this prior art device the yarn windings being drawn off graze the inside of the ring, whereby the windings are intended to remove any dirt that may have deposited on the inside of the ring. In practice it has become apparent, however, that after some time soiling of one sensor, or of both, may nevertheless occur. This leads to a reduction of the intensity of the incident light on the receiver in question caused by said soiling, as a consequence of which the pulse that is produced upon interruption of the light beam becomes too small to ensure a reliable measurement. This means that it is already necessary to stop the machine when one of the two sensors has become soiled, which sensor must then be cleaned. In practice it has furthermore become apparent that the two sensors hardly ever exhibit the same degree of soiling, so that when one of the two sensors has become soiled to such an extent that it is no longer possible to generate reliable pulses, the other sensor is not soiled at all, or only to a small extent, so that said other sensor continues to deliver pulses of a usable strength.

[0005] The present invention is based on the insight that the pulses that are generated by the unsoiled sensor still provide a correct indication for every winding that is drawn off.

[0006] The object of the invention is to provide a meth-

od, using the above-mentioned insight, wherein the intervals between sensor cleaning operations can be much longer than with the prior art device.

[0007] In order to accomplish that objective, the method according to the invention is characterized in that the intensity of the light which the receiver receives from the transmitter is determined for each sensor, and if the light intensity at one of said receivers falls below a specific preset value, the pulses from the sensor in question are no longer taken into account in the evaluation, and the pulses from the other sensor(s) are evaluated as one winding being drawn off.

[0008] With the method according to the invention the intensity of the incident light is measured at each receiver, and if said light intensity at one of the sensors falls below a predetermined value, the machine is not stopped, but the pulses from the sensor in question are no longer taken into account in the evaluation and each of the pulses from the other sensor are evaluated as one winding being drawn off. In this manner it is not necessary to stop the machine, but it can continue to operate until the moment that also the light intensity at the initially unsoiled sensor has decreased to such an extent that a reliable measurement of pulses is no longer possible, at which point the machine must be stopped in order for the two sensors to be cleaned. In this manner the intervals between periods of standstill of the machine for cleaning of the sensors are much longer than with the prior art device.

[0009] The determination of the light intensities at the two sensors, the comparison thereof with a preset threshold value, as well as the decision to evaluate either on the basis of the pulses from both sensors or only on the basis of the pulses from an unsoiled sensor can be entirely software-implemented.

[0010] The method according to the invention can be carried out, for example, by using a winding detection unit comprising only two sensors arranged one after the other, but it is also possible to carry out the method by using a detection unit comprising several sensors arranged after each other. When a first sensor becomes soiled, said sensor can be turned off and further counting can take place on the basis of the pulses from the other sensors. When subsequently another sensor becomes soiled, said sensor can also be turned off and further counting can take place on the basis of the pulses from the remaining unsoiled sensors. All this until all sensors have reached a degree of soiling at which it is no longer possible to generate reliable pulses. After that the machine has to be stopped for cleaning the sensors.

[0011] When in another embodiment of the method according to the invention, wherein the pulses from the sensors can be supplied to a first evaluator, in which the successive pulses are detected as one winding being drawn off, the light intensity at one of the receivers falls below a predetermined threshold value, the pulses from the other receiver(s) are supplied to a further evaluator, in which said pulses are detected as one winding being

drawn off.

[0012] In another embodiment of the method according to the invention, the intensity of the light received by the receiver is measured at each sensor, wherein the excitation value of a transmitter is increased when the light intensity at the associated receiver decreases, and when a specific excitation value is exceeded, evaluation of the pulses from the sensor in question is discontinued.

[0013] The invention furthermore relates to a device which is suitable for carrying out the method according to the invention, which device comprises a yarn-preparing device comprising a supply drum, onto which a plurality of yarn windings can be wound, which are subsequently drawn off to be fed to a weaving machine, wherein a winding detection unit is disposed on or directly after the supply drum, which detection unit comprises at least two sensors arranged one after the other, which each include a light transmitter and a light receiver which are arranged in such a manner that the windings being drawn off interrupt the light beam between the transmitter and the receiver of each sensor, wherein a pulse is generated with each interruption, said device comprising a first evaluator, which is connected to each of the sensors via signal lines and in which successive pulses can be counted as one winding being drawn off. Said device is characterized in that it comprises at least one further evaluator, wherein the device furthermore comprises comparators for measuring and comparing the intensity of the incident light on the receivers with a threshold value, wherein control means are furthermore provided for turning off said further evaluator if the light intensity is higher than the threshold value at all sensors, and to process the pulses generated by all sensors in said first evaluator, and to turn off said first evaluator if the light intensity at at least one of the sensors is below the threshold value, and to process the pulses generated by the other sensors in said further evaluator.

[0014] Another embodiment of said device is characterized in that switches are connected in the signal lines between said sensors and said evaluators, which switches can be opened and closed by said control means. In another embodiment, said comparators are connected to an electronic control device, which is capable of turning the evaluators on or off.

[0015] The invention will now be explained in more detail with reference to the drawing.

Figure 1 is a schematic view of a weaving apparatus, where in only those parts of the weaving apparatus are shown that are necessary for a proper understanding of the present invention.

Figures 2 and 3 are schematic elevations of a winding counter as used in the weaving apparatus of Figure 1.

[0016] Figure 1 schematically shows those parts of a weaving apparatus that are needed for a clear under-

standing of the present invention, wherein numeral 1 indicates a yarn bobbin, from which the yarn 2 leaves towards a winding arm 3, which is rotated, in a manner which is not shown, and by means of which a number of windings 4 are wound onto a supply drum 5. From said supply drum 5 the yarn 2 goes to an injector 6, which feeds the yarn to the shed 7 of a weaving machine. Yarn 2 is carried from supply drum 5 past a winding counter 8, which is ring-shaped in this embodiment. Winding counter 8 is made in the form of a ring of a transparent material, as is shown in Figures 2 and 3. Mounted in ring 9 are a pair of sensors, each comprising a light transmitter 10 and a light receiver 11, and a light transmitter 12 and a receiver 13, respectively. The light beam between transmitter 10 and receiver 11 is indicated by numeral 14, whilst the other light beam between transmitter 12 and receiver 13 is indicated by numeral 15. Said light beams 14 and 15 will be interrupted in succession by each of the windings being drawn off, with a pulse being generated in receivers 11 and 13, respectively. Light receivers 11 and 13 are connected to amplifiers 18 and 19, and also to comparators 20 and 21, via signal lines 16 and 17. Amplifiers 18 and 19 are in turn connected to a first evaluator 24 and to a second and third evaluator 25 and 26, respectively, via signal lines 22, 23. Comparators 20 and 21 are connected to an electronic control device 29 via signal lines 27 and 28, respectively, which control device is connected to evaluators 24, 25 and 26 via signal lines. Evaluators 24, 25 and 26 are each connected, via a signal line, to a signal line 30 which is connected to the further control device of the weaving machine.

[0017] The operation of the device is as follows. Light beams 14 and 15 will be interrupted in succession by each winding that is drawn off the supply drum. Interruption pulses are generated thereby, which pulses are supplied by receivers 11 and 13, via signal lines 16 and 17, to amplifiers 18 and 19. Comparators 20 and 21 measure the intensity of the incident light on receivers 11 and 13. When the intensity of said light exceeds a predetermined value, which means that transmitters 10 and 12 and receivers 11 and 13 are only soiled to a small degree, if at all, a signal will be generated in control device 29, which signal will activate evaluator 24 and render devices 25 and 26 inactive. The interruption signals from receivers 11 and 13 will then be fed to evaluator 24 via amplifiers 18 and 19, respectively, and be processed therein, which means that the two successive pulses from receivers 11 and 13 will be counted by evaluator 24 as one winding being drawn off. A signal corresponding thereto is fed to signal line 30 by evaluator 24. When one of the two sensors, for example sensor 10, 11 becomes soiled, the intensity of the incident light on receiver 11 will fall below a predetermined value, which is signalled by comparator 20. Said comparator 20 will then generate a signal and transmit it to control device 29, in response to which said control device will deactivate evaluators 24 and 25 and activate evaluator

26. The next interruption pulses generated by receiver 11 will no longer be processed, therefore, whilst further control is based on the interruption pulses from receiver 13, which are now processed in evaluator 26, which means that each of said pulses will now be counted as one winding being drawn off. In this manner the evaluator can now count the windings being drawn off with two active sensors, and when one of said sensors becomes soiled, the evaluator can continue to operate on the basis of the interruption pulses from the other sensor. In this manner the intervals between sensor cleaning operations are considerably extended, which benefits the efficiency of the apparatus considerably.

[0018] Although comparators 20 and 21 only measure the intensity of the incident light on receivers 11 and 13 and compare it with a threshold value in the above-described example, it is also possible to have the comparators deliver a signal to exciters 33 and 34 via signal lines 31 and 32 first when a decrease of the light intensity is detected, as a result of which a higher excitation value will be used for the light transmitters 10 or 13, causing the light intensity to increase, and not to consider said signal as a signal that indicates that the soiling of the sensor in question has reached a value at which the aforesaid control action is to be initiated until the excitation value exceeds a predetermined level.

[0019] In Figure 2, the winding counter comprises diametrically opposed transmitters 10, 12 and receivers 11, 13, wherein light beams 14 and 15, respectively, pass through the space within the ring. It is also possible, as is schematically indicated in Figure 3, to dispose a reflective body 35 within said ring, whereby transmitter 10 and receiver 11 can be positioned closer together and the light from transmitter 10 is reflected from reflective body 35 to receiver 12. The same takes place with receiver 13 and transmitter 12. Also in this case receivers 11 and 13 are connected to a similar control device as in Figure 2 via signal lines 16 and 17.

[0020] Although the invention has so far been discussed by means of a winding device in the form of a ring with sensors mounted therein, the invention can be used just as advantageously with winding counters wherein the sensors are disposed one after another in axial direction.

[0021] In the embodiment according to Figure 2, the interruption pulses from receivers 11 and 13 are fed to evaluators 24, 25 and 26 via signal lines 16 and 17 and amplifiers 18 and 19 in every situation, whereby said evaluators are activated or deactivated by the control device in question in dependence on the degree of soiling of one sensor, or both. Under certain circumstances it is also possible to place an interruption switch in each of the signal lines to the evaluators, which switches are suitably actuated by control device 29.

[0022] In the above-discussed example, two further evaluators 25 and 26 are present for counting the pulses from one of the sensors 10, 11 and 12, 13 under certain circumstances. It is also possible to use only one of said

evaluators, and in case of soiling of one of the sensors feed the pulses from the other sensors to said one evaluator, which will then count each of the pulses being supplied as a winding being drawn off.

[0023] The data from comparators 20 and 21 can also be supplied to a display panel (not shown), on which the state of soiling of the sensors is indicated. On the basis thereof a manual change-over can be effected from the situation in which the pulses from both sensors are counted to a situation in which only the pulses from the unsoiled sensor are counted.

[0024] Although the invention has been discussed in the foregoing by means of a device comprising a winding detection unit including two sensors disposed one after another, the invention can be implemented in a similar manner by using a detection device including several sensors, for example three, disposed one after another.

Claims

1. A method for sensing and counting the successive windings being drawn off a supply drum (5) in a yarn-preparing device, wherein said windings are sensed by a detection unit including at least two sensors (10-13) disposed one after the other, each comprising a light transmitter (10, 12) and a light receiver (11, 13), which are arranged in such a manner with respect to each other that the windings being drawn off pass through the light beam (14, 15) between the transmitter (10, 12) and the receiver (11, 13) of each sensor, wherein a pulse is generated whenever the light beam (14, 15) is interrupted, after which the successive pulses are evaluated as one winding being drawn off, **characterized in that** the intensity of the light which the receiver (11, 13) receives from the transmitter (10, 12) is determined for each sensor, and if the light intensity at one of said receivers falls below a specific preset value, the pulses from the sensor in question are no longer taken into account in the evaluation, and the pulses from the other sensor(s) are evaluated as one winding being drawn off.
2. A method according to claim 1, wherein the pulses from the sensors (10-13) can be supplied to a first evaluator (24), in which the successive pulses are detected as one winding being drawn off, **characterized in that** when the light intensity at one of the receivers (11, 13) falls below a predetermined threshold value, the pulses from the other receiver (s) (11, 13) are supplied to a further evaluator (25, 26), in which said pulses are detected as one winding being drawn off.
3. A method according to claim 1 or 2, **characterized in that** the intensity of the light received by the re-

ceiver (11, 13) is measured at each sensor, wherein the excitation value of a transmitter (10, 12) is increased when the light intensity at the associated receiver decreases, and that evaluation of the pulses from the sensor in question is discontinued when a specific excitation value is exceeded.

4. A device suitable for carrying out the method according to claim 1, 2 or 3, comprising a yarn-preparing device comprising a supply drum (5), onto which a plurality of yarn windings can be wound, which are drawn off said supply drum (5) to be fed to a weaving machine, wherein a winding detection unit is disposed on or directly after the supply drum (5), which detection unit comprises at least two sensors (10-13) arranged one after the other, which each include a light transmitter (10, 12) and a light receiver (11, 13) which are arranged in such a manner that the windings being drawn off interrupt the light beam between the transmitter and the receiver of each sensor, with a pulse being generated, wherein the device furthermore comprises a first evaluator (24), which is connected to each of the sensors via signal lines (22, 23) and in which successive pulses can be counted as one winding being drawn off, **characterized in that** said device comprises at least one further evaluator (25, 26), wherein the device furthermore comprises comparators (20, 21) for measuring and comparing the intensity of the incident light on the receivers with a threshold value, wherein control means (29) are furthermore provided for turning off said further evaluator (25, 26) if the light intensity is higher than the threshold value at all sensors (10-13), and to process the pulses generated by all sensors in said first evaluator (24), and to turn off said first evaluator (24) if the light intensity at at least one of the sensors is below the threshold value, and to process the pulses generated by the other sensors in said further evaluator (25, 26).
5. A device according to claim 4, **characterized in that** switches are connected in the signal lines between said sensors and said evaluators, which switches can be opened and closed by said control means (29).
6. A device according to claim 4, **characterized in that** said comparators (20, 21) are connected to an electronic control device (29), which is capable of turning the evaluators on or off.
7. A device according to claim 4, 5 or 6, **characterized in that** said comparators are connected to a display panel, on which it can be indicated whether the light intensity at said sensors (10-13) is below or above said preset threshold value.

Patentansprüche

1. Verfahren zum Erfassen und Zählen der aufeinander folgenden Wicklungen, welche in einer Garnfertigungsvorrichtung von einer Versorgungstrommel (5) gezogen werden, wobei die Wicklungen durch eine Erfassungseinheit erfasst werden, welche mindestens zwei Sensoren (10-13) aufweist, die hintereinander angeordnet sind, wobei jeder einen Lichtsender (10, 12) und einen Lichtempfänger (11, 13) umfasst, welche in solch einer Weise bezüglich einander angeordnet sind, dass die Wicklungen, welche abgezogen werden, durch den Lichtstrahl (14, 15) zwischen dem Sender (10, 12) und dem Empfänger (11, 13) jedes Sensors verlaufen, wobei ein Puls erzeugt wird, wann immer der Lichtstrahl (14, 15) unterbrochen wird, wobei danach die aufeinander folgenden Pulse ausgewertet werden, wenn eine Wicklungen abgewickelt wird, **dadurch gekennzeichnet, dass** die Intensität des Lichts, welche der Empfänger (11, 13) von dem Sender (10, 12) empfängt für jeden Sensor bestimmt wird, und wenn die Lichtintensität bei einem der Empfänger unter einen bestimmten voreingestellten Wert fällt, die Pulse des fraglichen Sensors bei der Auswertung nicht länger berücksichtigt werden und die Pulse von dem/den anderen Sensor(en) ausgewertet werden, wenn eine Wicklung abgewickelt wird.
2. Verfahren nach Anspruch 1, wobei die Pulse von den Sensoren (10-13) einer Auswerteeinrichtung (24) zugeführt werden können, in welcher die aufeinander folgenden Pulse erfasst werden, wenn eine Wicklung abgewickelt wird, **dadurch gekennzeichnet, dass**, wenn die Lichtintensität bei einem der Empfänger (11, 13) unter einen vorbestimmten Schwellenwert fällt, die Pulse von den/dem anderen Empfänger(n) (11, 13) einer weiteren Auswerteeinrichtung (25, 26) zugeführt werden, in welcher die Pulse erfasst werden, wenn eine Wicklung abgewickelt wird.
3. Verfahren nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** die Intensität des Lichtes, welche durch den Empfänger (11, 13) aufgenommen wird, bei jedem Sensor gemessen wird, wobei der Erregungswert eines Senders (10, 12) erhöht wird, wenn die Lichtintensität bei dem zugeordneten Empfänger abfällt, und dass eine Auswertung der Pulse von dem fraglichen Sensor unterbrochen wird, wenn ein bestimmter Erregungswert überschritten wird.
4. Zum Ausführen des Verfahrens nach Anspruch 1, 2 oder 3 geeignete Vorrichtung, welche eine Garnfertigungsvorrichtung umfasst, die eine Versorgungstrommel (5) umfasst, auf welcher eine Mehrzahl von Garnwicklungen aufgewickelt sein kann,

welche von der Versorgungstrommel (5) abgewickelt werden, um einer Webmaschine zugeführt zu werden, wobei eine Wicklungserfassungseinheit auf oder direkt nach der Versorgungstrommel (5) angeordnet ist, wobei die Erfassungseinheit mindestens zwei Sensoren (10-13) umfasst, welche hintereinander angeordnet sind, welcher jeder einen Lichtsender (10, 12) und einen Lichtempfänger (11, 13) aufweist, welche in solch einer Weise angeordnet sind, dass die Wicklungen, welche abgewickelt werden, den Lichtstrahl zwischen dem Sender und dem Empfänger jedes Sensors unterbrechen, wobei ein Puls erzeugt wird, wobei die Vorrichtung weiter eine erste Auswerteeinrichtung (24) umfasst, welche mit jedem der Sensoren über Signalleitungen (22, 23) verbunden ist und in welcher aufeinander folgende Pulse gezählt werden können, wenn eine Wicklung abgewickelt wird, **dadurch gekennzeichnet, dass** die Vorrichtung mindestens eine weitere Auswerteeinrichtung (25, 26) umfasst, wobei die Vorrichtung weiter Vergleicher (20, 21) zum Messen und Vergleichen der Intensität des einfallenden Lichts auf dem Empfänger mit einem Schwellenwert umfasst, wobei weiterhin Steuermittel (29) vorhanden sind, um die weitere Auswerteeinrichtung (25, 26) abzuschalten, wenn die Lichtintensität höher als der Schwellenwert bei allen Sensoren (10-13) ist, und um die von allen Sensoren erzeugten Pulse in der ersten Auswerteeinrichtung (24) zu verarbeiten, und um die erste Auswerteeinrichtung (24) abzuschalten, wenn die Lichtintensität bei mindestens einem der Sensoren unterhalb des Schwellenwertes liegt, und um die durch die anderen Sensoren erzeugten Pulse in der weiteren Auswerteeinrichtung (25, 26) zu verarbeiten.

5. Vorrichtung nach Anspruch 4, **dadurch gekennzeichnet, dass** Schalter in den Signalleitungen zwischen den Sensoren und den Auswerteeinrichtungen eingebunden sind, wobei die Schalter durch die Steuermittel (29) geöffnet und geschlossen werden können.

6. Vorrichtung nach Anspruch 4, **dadurch gekennzeichnet, dass** die Vergleicher (20, 21) mit einer elektronischen Steuervorrichtung (29) verbunden sind, welche geeignet ist, um die Auswerteeinrichtungen an- oder auszuschalten.

7. Vorrichtung nach Anspruch 4, 5 oder 6, **dadurch gekennzeichnet, dass** die Vergleicher mit einer Anzeigekonzole verbunden sind, auf welcher angezeigt werden kann, ob die Lichtintensität bei den Sensoren (10-13) unter oder über dem voreingestellten Schwellenwert liegt.

Revendications

1. Procédé pour détecter et compter les spires extraites d'une bobine d'alimentation (5) dans un dispositif de préparation de fil, selon lequel lesdites spires sont détectées par une unité de détection comprenant au moins deux capteurs (10-13) disposés l'un derrière l'autre, chacun comprenant un émetteur de lumière (10,12) et un récepteur de lumière (11,13), qui sont disposés l'un par rapport à l'autre de telle manière que les spires extraites traversent le faisceau de lumière (14,15) entre l'émetteur (10,12) et le récepteur (11,13) de chaque capteur, de sorte qu'une impulsion est produite chaque fois que le faisceau de lumière (14,15) est interrompu, à la suite de quoi les impulsions successives sont évaluées comme étant une spire extraite, **caractérisé en ce que** l'intensité de la lumière que le récepteur (11,13) reçoit de l'émetteur (10, 12) est déterminée pour chaque capteur et, si l'intensité de lumière au niveau de l'un desdits récepteurs tombe au-dessous d'une valeur prédéterminée spécifique, les impulsions délivrées par le capteur en question ne sont plus prises en compte dans l'évaluation, et les impulsions du ou des autres capteurs sont évaluées en tant que spire qui est extraite.
2. Procédé selon la revendication 1, selon lequel les impulsions délivrées par les capteurs (10-13) peuvent être envoyées à un premier dispositif d'évaluation (24), dans lequel les impulsions successives sont détectées sous la forme d'une spire qui est extraite, **caractérisé en ce que** lorsque l'intensité de la lumière dans l'un des récepteurs (11,13) tombe au-dessous d'une valeur de seuil prédéterminée, des impulsions provenant du ou des autres récepteurs (11,13) sont envoyées à un autre dispositif d'évaluation (25,26), dans lequel lesdites impulsions sont détectées comme étant une spire qui est extraite.
3. Procédé selon la revendication 1 ou 2, **caractérisé en ce que** l'intensité de la lumière reçue par le récepteur (11,13) est mesurée dans chaque capteur, la valeur d'excitation d'un émetteur (10,12) étant accrue lorsque l'intensité de la lumière dans le récepteur associé diminue, et **en ce que** l'évaluation des impulsions délivrées par le capteur en question est discontinuée lorsqu'une valeur d'excitation spécifique est dépassée.
4. Dispositif provenant pour la mise en oeuvre du procédé selon la revendication 1, 2 ou 3, comprenant un dispositif de préparation de fil comprenant une bobine d'alimentation (5), sur lequel peuvent être enroulées une pluralité de spires d'un fil, qui sont extraites de ladite bobine d'alimentation (5) pour être envoyées à un métier à tisser, selon lequel une

unité de détection de spires est disposée sur le ou
directement en aval du tambour d'alimentation (5),
laquelle unité de détection comprend au moins
deux capteurs disposés l'un derrière l'autre, qui
comprennent chacun un émetteur de lumière 5
(10,12) et un récepteur de lumière (11,13), qui sont
disposés de telle sorte que les spires extraites in-
terrompent le faisceau de lumière entre l'émetteur
et le récepteur de chaque capteur, avec production 10
d'une impulsion, et dans lequel le dispositif com-
prend en outre un premier dispositif d'évaluation
(24), qui est raccordé à chacun des capteurs par
l'intermédiaire de lignes de transmission de signaux
(22, 23) et dans lequel des impulsions successives 15
peuvent être comptées sous la forme d'une spire
qui est extraite, **caractérisé en ce que** ledit dispo-
sitif comprend au moins un autre dispositif d'éva-
luation (25,26), le dispositif comprenant en outre
des comparateurs (20,21) pour mesurer et compa- 20
rer l'intensité de la lumière incidente qui atteint le
récepteur avec une valeur de seuil, et des moyens
de commande (29) sont en outre prévus pour dé-
brancher ledit autre dispositif d'évaluation (25,26)
si l'intensité de la lumière est supérieure à la valeur 25
de seuil dans tous les

30

35

40

45

50

55

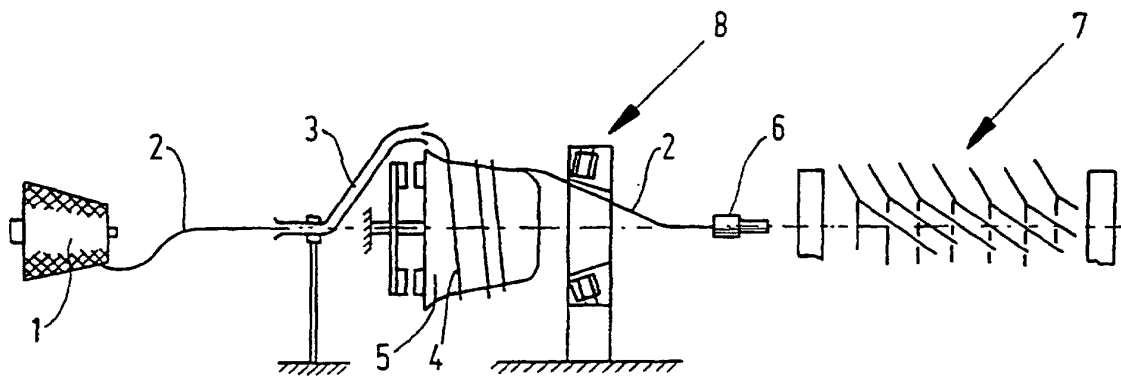


FIG. 1

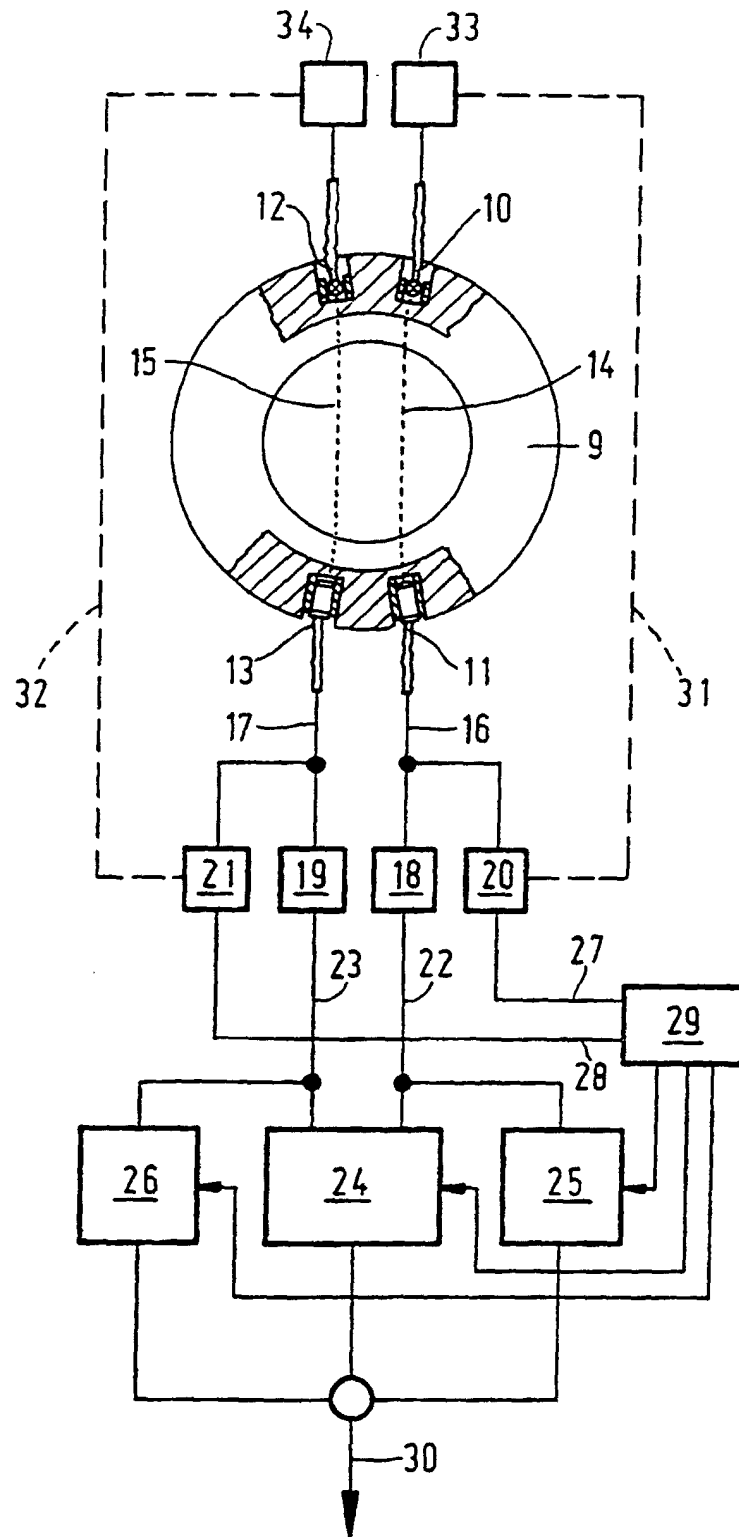


FIG. 2

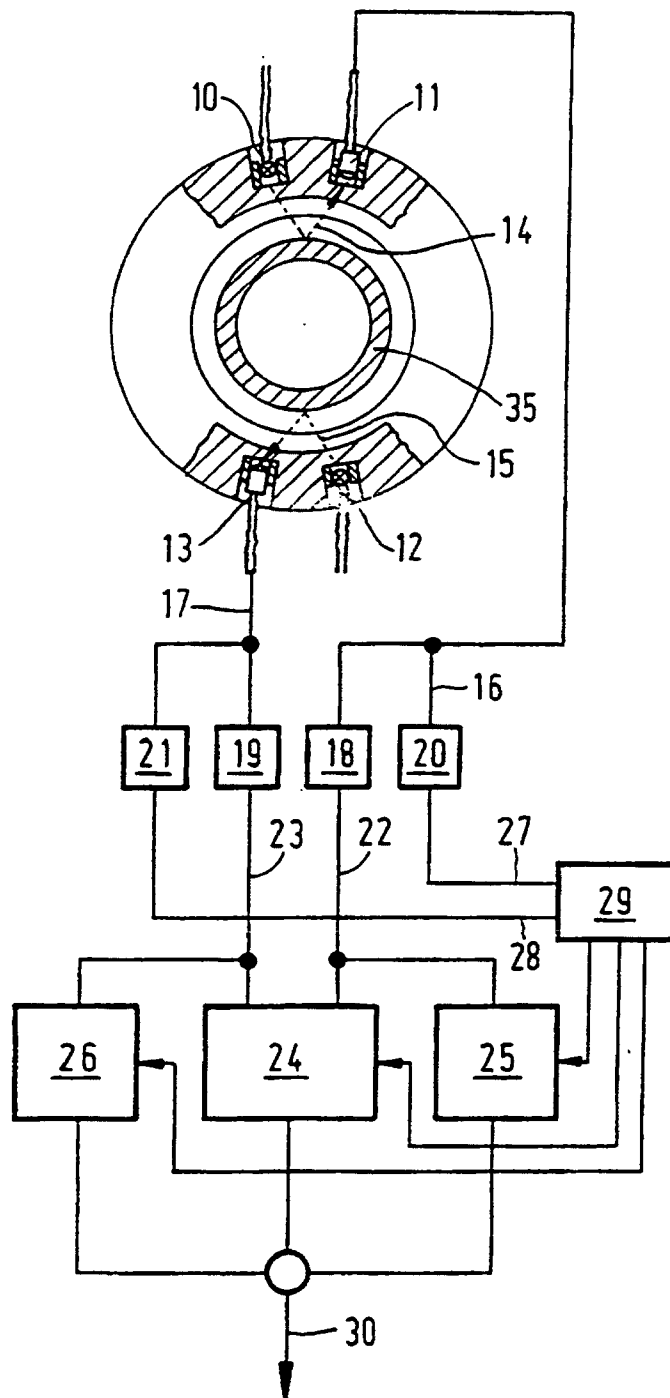


FIG. 3