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(54) **Procedure for the controlled transformation and application of fibers in situ in civil and road constructions**

Verfahren zur kontrollierten Umwandlung und Verwendung von Fasern in situ in Tief- und Strassenbau

Procédé de transformation contrôlée et d'application de fibres in situ dans les constructions civiles et routières

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Description

The object of the present invention comprises a procedure for the controlled in situ transformation and application of fibres in civil and road constructions.

BACKGROUND OF THE INVENTION

These fibres are manufactured in large fibre-producing plants which are remote from the construction sites and mixing stations, and from where they are served in bags, the form in which they arrive there. Once there, the mixture is made manually in the mixing station by one or more operators who constantly feed the station from the bags of manufactured fibres or by pouring them manually into dispensing devices.

This method of working has a significant drawback in that operators have to be used permanently for the job of feeding the fibres, said operators, as competent as they might be, never achieving a totally homogeneous product, and furthermore the manufacture of the raw fibre in factories which are remote from the construction site implies a lack of control over the product for those responsible since they find themselves having to place orders according to the current stocks and the standard sizes of fibres used by said stations.

DESCRIPTION OF THE INVENTION

The present invention as defined in claim 1 substantially improves the procedures for the incorporation of fibres in road and civil construction stations which are currently used.

In particular, said procedure enables the fibre to be manufactured on site, personalizing its properties according to the requirements at every moment such that it is possible to vary said properties at any time in an exceptionally simple way. Furthermore, it makes it possible to continuously feed the mixing station automatically without the intervention of any personnel, ensuring a perfectly homogeneous product at all times.

There is an accompanying drawing to illustrate the procedure of the present invention.

DESCRIPTION OF A PREFERRED EMBODIMENT

The novel procedure for the controlled transformation and application of fibres in civil and road constructions comprises three phases. The first of these consists of unwinding the ball of raw fibre to produce a continuous strand or sheet of material of uniform tension. The second phase consists of cutting the band of material into segments of a certain length depending on the properties of the material with which said segments are to be mixed. The third phase consists of transportation to the mixing station and dispensing the product in the volume required.

In the first phase, a continuous band 1 unwound from a ball of raw material 2 enters a turret 3 by means of a foot with an input guide 4, said guide being provided with a plurality of rollers or pulleys, whose function is to neutralize the overpressures and distensions produced during the unwinding of the fibre, as well as a knot detector 13 which brings the entire process to a halt if any irregularity in the strand of material is located.

Following this the second phase begins in which the band of material, now at a constant tension, enters a guide 5 which introduces the material into the cutting station which comprises a cylinder provided on its peripheral edge with a plurality of blades 6 and over which the band of material winds such that two effects are produced, the first of these being one of traction whilst the blades and fibres are in contact and as a result of which the entire strand of fibre advances and the ball of raw material is unwound, the second effect comprising the final cutting of the fibre into segments of a certain length. All of this is possible since the cutting action of the blades is progressive rather than an instantaneous sectioning.

The volume of fibre cut is determined by the speed with which the cutting cylinder rotates and the tension of the continuous strand of material, the weight of the strand being constant along its entire length, this length depending on the distance between the blades.

Once the fibre has been cut into segments of a convenient length the last phase of the process is begun, wherein the fibre is conveyed to the construction sites own mixing station 7 by means of a tube 8 provided with flexible zones 9 for making bends and avoiding obstacles and through which the material runs, driven pneumatically by an impulsion gang 10. The volume dispensed is determined by means of the cutting speed and the pneumatic pressure in the tube, said pressure always being in accordance with the volume of the product which is cut in the previous phase.

All of the mechanical elements are situated on a travelling platform 11 which is also provided with a control panel 12 for controlling the entire process. Said panel may be provided on a transportable console in order that it may be transferred to a specific part of the site where the rest of the controls for other machines and processes are situated so that a single person can control them all simultaneously.

The details of realization of the invention may be subject to slight changes providing they do not alter the basic concept outlined in the above description.

Claims

1. A procedure for the controlled in situ transformation and application of fibres in civil and road constructions, characterized in that a continuous band (1) is unwound from a ball of raw material (2), said band enters a turret (3) which absorbs any overtensions and distensions produced as the fibre is unwound

and which is provided with a knot detector (13) which brings the entire process to a halt if any irregularity in the strand of material is located, the band of material, now at a constant tension, then enters a cutting station (6) consisting of a cylinder provided with a plurality of blades on its peripheral edge and over which cylinder the band of material winds such that two effects are produced, the first of these being one of traction by friction whilst the blades and fibres are in contact, and the second comprising the final cutting of the fibre which, once cut into segments of a convenient length, is finally conveyed to the mixing station (7) by means of an articulated tube (8) through which the material runs, driven pneumatically by an impulsion gang (10).

2. A procedure for the controlled transformation and application of fibres in situ in civil and road constructions according to the previous claim, characterized in that the length of the segments of fibre cut is determined as a function of the distance between the blades situated on the cylinder, the production volume being determined by regulating the speed of rotation of said blade-carrying cylinder and the tension at which the continuous strand of fibre is supplied, said strand being of constant weight along its entire length.

3. A procedure for the controlled transformation and application of fibres in situ in civil and road constructions according to the previous claims, characterized in that the dispensing of the amount of fibres poured into the mixing station is determined by means of the cutting speed and the pneumatic pressure maintained inside the tube, said pressure being in accordance with the volume of the product delivered by the cutting station.

4. A procedure for the controlled transformation and application of fibres in situ in civil and road constructions according to the previous claims, characterized in that all the mechanical elements are situated on a travelling platform (11) which is also provided with a transportable control panel (12) for controlling the entire process.

Patentansprüche

1. Ein Verfahren für die kontrollierte in situ Transformation und Anwendung von Fasern bei Zivil- und Strassenkonstruktionen, charakterisiert dadurch, dass ein kontinuierliches Band (1) welches von einer Rohmaterialrolle (2) abgewickelt wird, wobei sich das genannte Band in einen Turm (3) begibt, welcher die Überspannungen und die Ausdehnungen die während der Abwicklung erzeugt werden absorbiert und welcher mit einem Knotendetektor (13) versehen ist, welcher den ganzen Prozess zum Halten bringt, sollte irgendeine Unregelmässigkeit im Materialstrang aufkommen, wobei der Materialstrang, jetzt konstant gespannt, dann in die Schneidestation (6) geleitet wird, welche aus einem Zylinder mit einer Vielfalt von Klingen auf der peripherischen Kante versehen besteht, über welchen Zylinder das Materialband gewunden wird, wobei zwei sich zwei Effekte ergeben. Der erste ist Traktion durch Friktion währenddem die Klingen und Fasern Kontakt haben miteinander, und der zweite umfasst der Endschnitt der Faser, welche, nachdem sie in Segmente von passender Länge geschnitten wurde, endlich durch einen beweglichen Schlauch (8) in welchem sich die Faser befindet, von einer pneumatisch getriebener Impulsgruppe (10) zur Mischungsstation (7) transportiert wird.

2. Ein Verfahren für die kontrollierte Transformation und Anwendung von Fasern in situ bei Zivil- und Strassenkonstruktion laut des vorhergehenden Anspruchs, charakterisiert dadurch, dass die Länge des Segments des Faserschnitts festgelegt ist als Funktion der Distanz zwischen den Klingen die sich am Zylinder befinden, wobei das Produktionsvolumen festgelegt wird, indem man die Geschwindigkeit der Rotation des genannten klingentragenden Zylinders und die Spannung bei welcher der kontinuierlieche Faserstrand geliefert wird, reguliert, und wobei der genannte Strang der ganzen Länge nach ein konstantes Gewicht hat.

3. Ein Verfahren für die kontrollierte Transformation und Anwendung von Fasern in situ bei Zivil- und Strassenkonstruktion laut der vorhergehenden Ansprüche, charakterisiert dadurch, dass die Austeilung der Fasermenge in die Mischungsstation durch die Schneidegeschwindigkeit und den pneumatischen Druck der innerhalb des Schlauches aufrecht erhalten ist, festgelegt wird und dieser Druck mit dem Volumen des von der Schneidestation abgegebenen Produkts übereinstimmt.

4. Ein Verfahren für die kontrollierte Transformation und Anwendung von Fasern in situ bei Zivil- und Strassenkonstruktion laut der vorhergehenden Ansprüche, charakterisiert dadurch, dass sich alle mechanische Elemente auf einer beweglichen Plattform (11) befinden, welche auch mit einer tragbaren Kontrolltafel (12) für die Kontrolle des ganzen Prozesses ausgestattet ist.

Revendications

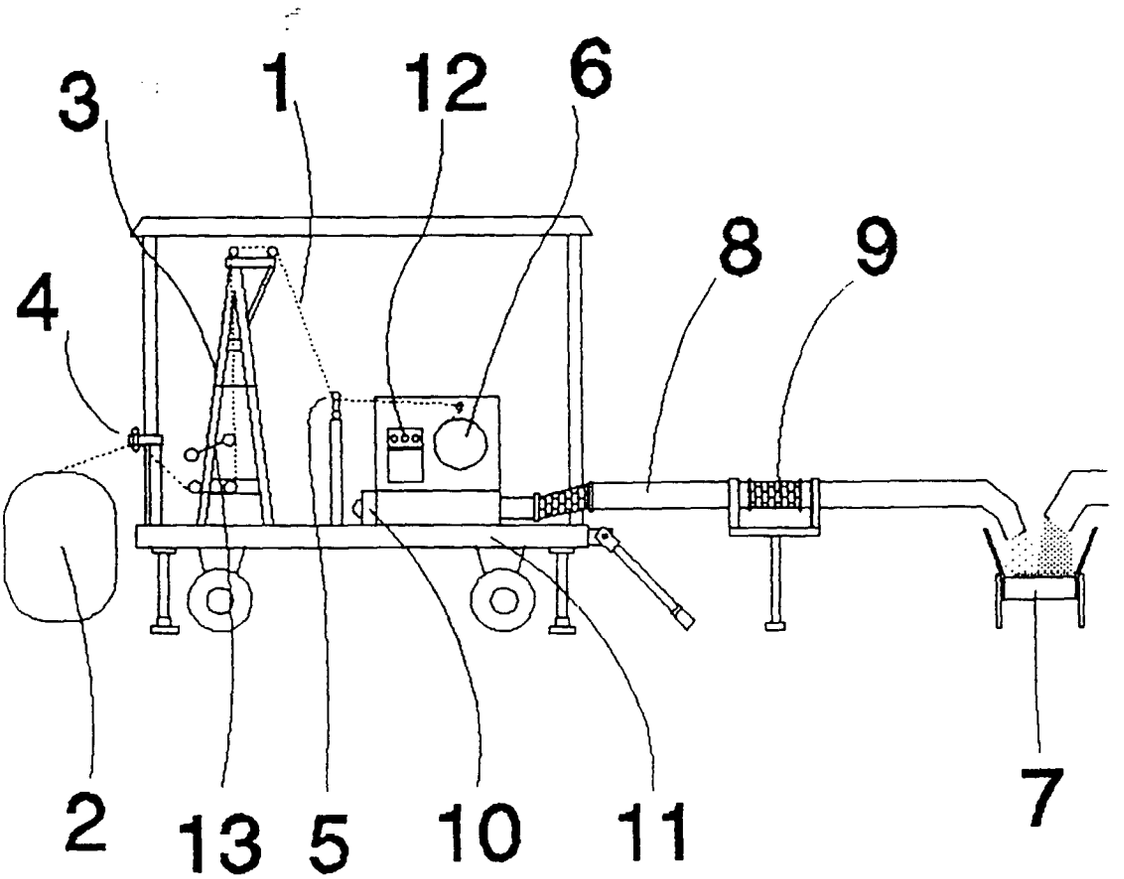
1. Une procédure pour la transformation et l'application contrôlées in situ de fibres dans les constructions civiles et de routes caractérisées par une ban-

de continue (1) qui se déroule d'une pelote de matière première (2); cette bande entre dans un porte-outil (3) qui absorbe toutes surtensions et distensions au fur et à mesure du déroulement de la fibre et qui est pourvue d'un détecteur de noeuds (13) lequel provoque l'arrêt de tout le procès si une irrégularité quelconque dans le brin du matériau est repérée. La bande de matériel, maintenant à tension constante, entre ensuite dans une station de coupe (6) consistant en un cylindre pourvu d'une multitude de lames sur son bord périphérique et sur lequel la bande de matériel s'enroule de telle sorte que deux effets se produisent; le premier d'entre eux étant la traction par friction pendant que les lames et les fibres sont en contact et le deuxième comprenant la coupe finale de la fibre laquelle, une fois coupée en segments d'une longueur adéquate, est finalement convoyée jusqu'à la station de mélange (7) au moyen d'un tube articulé (8) au travers duquel le matériel est acheminé, entraîné pneumatiquement par une bande d'impulsion (10).

2. Un procédé pour la transformation et l'application contrôlées de fibres in situ dans les constructions civiles et de routes conformément à la revendication précédente, caractérisé par le fait que la longueur des segments de fibre coupée est déterminée en fonction de la distance entre les lames situées sur le cylindre, le volume de production étant déterminé par la régulation de la vitesse de rotation de ce cylindre porte-lames et par la tension à laquelle le brin continu de fibre est fourni; ce brin a un poids constant tout au long de sa longueur totale.

3. Une procédure pour la transformation et l'application contrôlées de fibres in situ dans les constructions civiles et de routes conformément aux revendications précédentes, caractérisée par le fait que la distribution des fibres versées dans la station de mélange est déterminée moyennant la vitesse de coupe et la pression pneumatique maintenue à l'intérieur du tube, cette pression étant conforme au volume du produit fourni par la station de coupe.

4. Une procédure pour la transformation et l'application contrôlées de fibres in situ dans les constructions civiles et de routes conformément aux revendications précédentes, caractérisée par le fait que tous les éléments mécaniques sont situés sur une plate-forme mobile (11), laquelle est également pourvue d'un panneau de contrôle transportable (12) pour le contrôle de tout le procès.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