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(12) # EUROPEAN PATENT SPECIFICATION

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Description

This invention relates to the roller drafting of fibres.

The purpose of any drawing operation, whether for natural or synthetic material, is to reduce the weight of the material being fed into the machine whilst at the same time parallelising the fibres. Basically this is done by means of two sets of rollers with a bed of pinned fallers between them. The material, fed through the first set of rollers, known as the feed rollers, is penetrated by the pins of the fallers which move in the same direction as the material. The second set of rollers, i.e., delivery rollers, through which the material passes on leaving the fallers run at a greater speed than that of the first set thus drafting the material and reducing its weight. However, with some natural materials and flax, in particular, the delivery rollers perform a dual function. As well as the drafting of the material, the fibres themselves are actually sub-divided or split so as to create finer fibers and to increase the number of fibres in the cross-section, which in turn, means that when the spinning stage is eventually reached a finer and stronger yarn can be produced. In order, therefore, to accomplish this splitting operation it has been common practice to use a hard wooden pressing roller against a steel driving roller.

It has always been recognised that there is an inherent drawback with wooden rollers in that the surface becomes uneven with dents, scratches, etc., with the result that they require to be turned on a lathe to restore the smooth surface and this has to be done about every two or three days. However, if the machine speed is increased to give the higher production rates now required, the wooden roller becomes disfigured after only about ten or fifteen minutes which is unacceptable. If a rubber pressing roller is used then if the rubber is soft enough to draft the material it does not sub-divide it, and with hard rubber not enough traction is created between it and the bottom roller and the flax slips without drafting or delivering the sliver.

In accordance with the invention a drawing frame for drafting has at least one roller positioned downstream of the nip of the drafting rollers, the downstream roller is a splitting roller acting with a co-operating roller under sufficient pressure to split the fibres after they have been drafted by the drafting rollers.

Apparatus in accordance with the invention thus allows the material to be merely drafted without splitting or with only partial splitting at the nip of the drafting rollers, whilst splitting or further splitting of the fibres is carried out downstream of the nip of the drafting rollers.

One advantage of such an arrangement is that the heavy pressure originally required on the wooden roller in order to effect both drafting and splitting is either no longer necessary or it may be more evenly distributed and the "life" of the roller may be extended to an acceptable span. The drafting rollers may now be of rubber since it is no longer required to split the fibre or of any other suitable material.

A production rate of 80 to 100 metres per minute may be possible using a drawing frame in accordance with this invention.

The invention will now be further described by way of example with reference to the accompanying sketch drawings in which:—

Figure 1 is a diagrammatic illustration of the rollers of one embodiment of drawing frame in accordance with the invention, and

Figure 2 is a perspective view of a different embodiment in accordance with the invention.

Figure 3 is a view similar to Figure 1 but of a still different embodiment.

Referring to Figure 1 a sliver 2 of flax which may be about 25,4 cm (10 inches) wide is fed between a set of three feed rollers 4 so as to enter the frame at for example, a weight of about 150 grams per metre. The sliver then passes through a standard faller bed 6 and the sliver then passes between the nip of two drafting or delivery rollers 8, 8'. The lower roller 8' is a steel driven roller and the surface of the upper pressing roller 8 is of rubber, having a shore hardness of 75 on the A scale.

The rollers 8, 8' are rotated at about ten times the speed of the feed rollers 4 to produce a draft of ten.

The lower roller 8' is a steel driven roller and the upper pressing roller 8 is of rubber.

The sliver is then fed in a relaxed condition without further drafting to a further pair of "splitting" rollers 10, 10' located downstream of the delivery rollers 8. The lower splitting roller 10' is driven and the upper roller 10 may be wooden or may be of a very hard rubber or plastic or Tufnol or indeed iron or steel. Alternatively it has been found that it may even be of the same rubber as the drafting roller. The fibres are split as they pass between the splitting rollers and the sliver of weight of about 15 grams per metre is fed into a standard can 12.

Referring to Figure 2, the arrangement of rollers is similar to that of Figure 1 but only two of the standard fallers 6 being shown for the sake of clarity. The set of splitting rollers however comprises three rollers 10, namely, two lower driven rollers 10' and 10'', and a single top or pressing roller 10, which is cradled between the two bottom rollers to create two nips so that the splitting action is enhanced and/or the life of the top roller 10 may be extended due to the reduction in pressure applied to it and/or by the better distribution of the pressure between the top roller and the bottom roller 2.

Referring to Figure 3 the feed rollers 4 are omitted for clarity. An additional roller 8'' is positioned downstream of the bottom drafting roller 8' with a pressing roller 8 cradled between them. The material is drafted between the nip of the bottom drafting roller 8' and the pressing roller 8 and then splitting is effected between the nip of the additional bottom roller 8'' and the

pressing roller 8. Any suitable pressure arrangement, as diagrammatically illustrated, in which load is applied through a pivoted arm 14, may be employed. By alternating the direction of pull on the pressing roller, as illustrated by the alternative position of the arm 14, shown in dash lines, concentration of load towards either of the bottom rollers, or equally between the two, may be effected.

The pressing roller may be of wood or any other suitable material including rubber.

Instead of a single broad sliver being fed through the machine a plurality (e.g. four) of narrower slivers may be fed in, side by side, and delivered into the same number of cans from standard coiler heads at the front.

Claims

1. A drafting frame for drafting of textile fibres, having feed means and a pair of drafting rollers positioned downstream of the feed means, characterised in that at least one additional "splitting" roller is positioned downstream of the nip of the drafting rollers, the "splitting" roller acting with a co-operating roller under sufficient pressure to split the fibres after they have been drafted by the drafting rollers.

2. A drafting frame as claimed in Claim 1 wherein the surface of the "splitting" roller is of rubber.

3. A drafting frame as claimed in either of the preceding claims wherein a pair of 'splitting' rollers are provided separate from, and downstream of, the pair of drafting rollers.

4. A drawing frame as claimed in Claim 3 wherein a third "splitting" roller is positioned adjacent the lower splitting roller of the said pair also co-operating with the top "splitting" roller of the said pair, the top roller providing a relatively upstream nip with one lower splitting roller and a relatively downstream nip with the second lower splitting roller.

5. A drawing frame as claimed in either of claims 1 or 2 in which the splitting roller is positioned immediately downstream of the lower drafting roller of the said pair of drafting rollers, to co-operate with the top drafting or pressing roller, the pressing roller providing a relatively upstream nip with the lower drafting roller and a relatively downstream nip with the splitting roller.

6. A drawing frame as claimed in Claim 6 in which the load applied by the upper pressing roller on the lower drafting roller and the splitting roller may be adjusted both in size and in direction.

Patentansprüche

1. Ein Streckrahmen zum Verstrecken von Textilfasern, umfassend Zuführungsvorrichtungen und zwei Streckrollen, die hinter den Zuführungsvorrichtungen angeordnet sind, dadurch gekennzeichnet, daß zumindest eine zusätzliche "Trenn"-Rolle hinter dem Spalt der Strecktollen vorgesehen ist, wobei die "Trenn"-Rolle in Verbindung mit einer damit zusammenwirkenden Rolle unter ausreichendem Druck dafür sorgt, daß die Fasern, nachdem sie mit Hilfe der Streckrollen verstreckt wurden, getrennt werden können.

2. Ein Streckrahmen gemäß Anspruch 1, wobei die 'Trenn"-Rolle aus Gummi besteht.

3. Ein Streckrahmen gemäß irgendeinem der vorstehenden Ansprüche, wobei zwei "Trenn"-Rollen hinter den beiden Streckrollen und getrennt davon vorgesehen sind.

4. Ein Streckrahmen gemäß Anspruch 3, wobei eine dritte "Trenn"-Rolle direkt neben der unteren der beiden genannten "Trenn"-Rollen angeordnet ist und ebenfalls mit der obersten der beiden genannten "Trenn"-Rollen zusammenwirkt, und wobei die oberste Rolle für einen relativ vorne angeordneten Spalt im Zusammenwirken mit einer unteren "Trenn"-Rolle und einen relativ hinten angeordneten Spalt im Zusammenwirken mit der zweiten unteren "Trenn"-Rolle sorgt.

5. Ein Streckrahmen gemäß Anspruch 1 oder 2, wobei die "Trenn"-Rolle direkt hinter der unteren der genannten beiden Streckrollen angeordnet ist, um so mit der oberen Streck- oder Andruckrolle zusammenwirken zu können, und wobei die Andruckrolle für einen relativ vorne angeordneten Spalt im Zusammenwirken mit der unteren Streckrolle und einen relativ hinten angeordneten Spalt im Zusammenwirken mit der "Trenn"-Rolle sorgt.

6. Ein Streckrahmen gemäß Anspruch 6, wobei die von der oberen Andruckrolle auf die untere Streckrolle und die "Trenn"-Rolle ausgeübte Belastung sowohl in ihrer Größenordnung als auch in ihrer Richtung eingestellt werden kann.

Revendications

1. Banc d'étirage pour l'étirage de fibres textiles, comprenant des moyens d'alimentation et une paire de rouleaux d'étirage positionnés en aval des moyens d'alimentation, caractérisé en ce qu'au moins un rouleau supplémentaire "de séparation" est positionné en aval de la ligne de contact des rouleaux d'étirage, le rouleau "de séparation" servant avec un rouleau coopérant sous une pression suffisante pour séparer les fibres après qu'elles aient été étirées par les rouleaux d'étirage.

2. Banc d'étirage suivant la revendication 1, dans lequel la surface du rouleau "de séparation" est en caoutchouc.

3. Banc d'étirage suivant l'une ou l'autre des revendications précédentes, dans lequel il est prévu une paire de rouleaux "de séparation" distincts de et situés en aval de la paire de rouleaux d'étirage.

4. Banc d'étirage suivant la revendication 3, dans lequel un troisième rouleau "de séparation" est positionné à côté du rouleau de séparation inférieur de ladite paire coopérant également avec le rouleau de séparation supérieur de ladite paire, le rouleau supérieur présentant une ligne

de contact relativement en amont avec le premier rouleau de séparation inférieure et une ligne de contact relativement en aval avec le second rouleau de séparation inférieure.

5. Banc d'étirage suivant l'une ou l'autre des revendications 1 ou 2, dans lequel le rouleau de séparation est positionné immédiatement en aval du rouleau d'étirage inférieur de ladite paire de rouleaux d'étirage, pour coopérer avec le rouleau d'étirage ou de pression supérieur, le rouleau de pression présentant une ligne de contact relativement en amont avec le rouleau d'étirage inférieur et une ligne de contact relativement en aval avec le rouleau de séparation.

6. Banc d'étirage suivant la revendication 5, dans lequel la charge appliquée par le rouleau de pression supérieur sur le rouleau d'étirage inférieur et sur le rouleau de séparation peut être ajustée tant en grandeur qu'en direction.

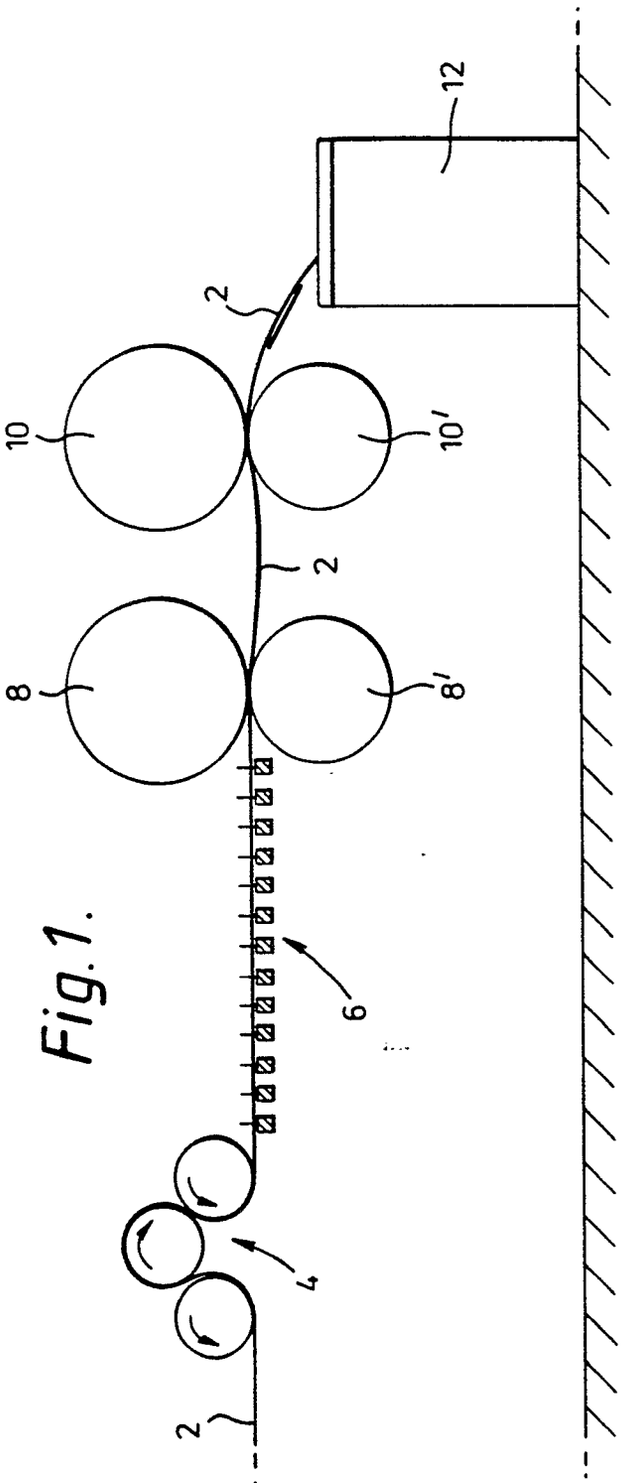

Fig. 1.

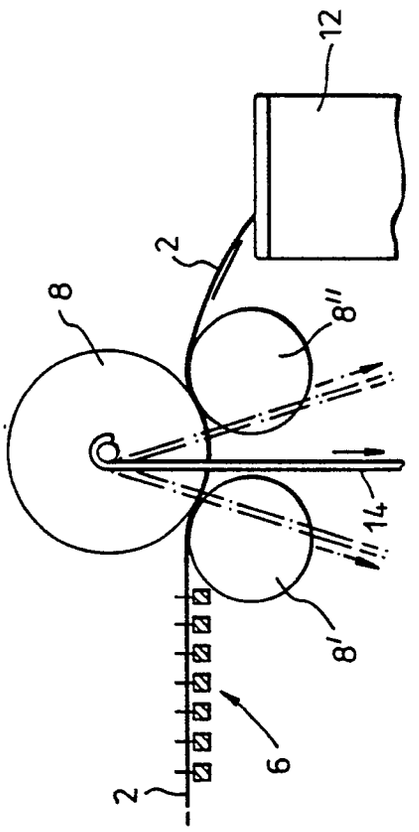

Fig. 3.

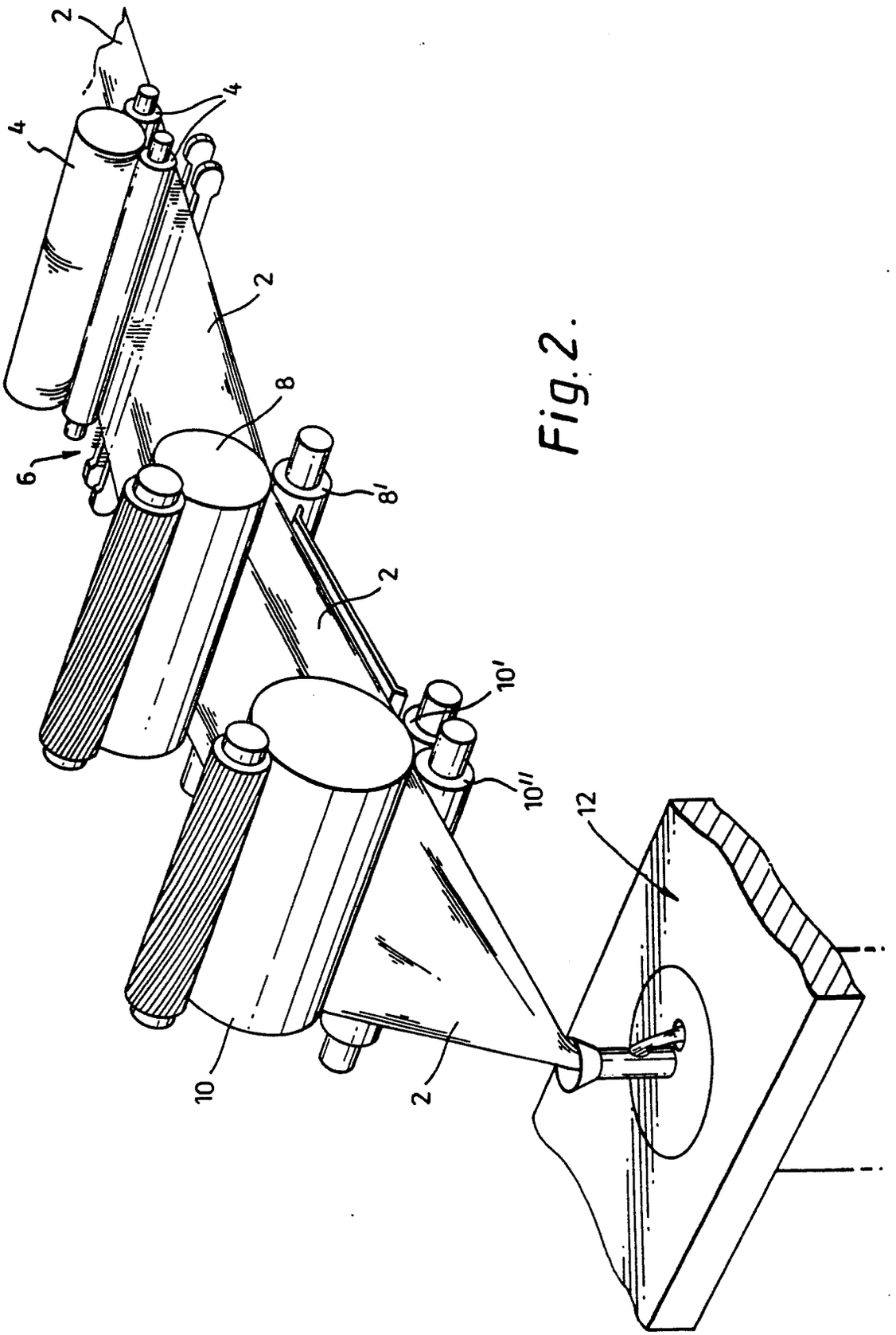

Fig.2.