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Batsch

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[54] **TWISTING DEVICES FOR FILAMENTS**

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[30] **Foreign Application Priority Data**

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[52] **U.S. Cl.** **57/77.4,** 57/77.45

[51] **Int. Cl.** **D02g 1/02**

[58] **Field of Search** ..... 57/34 R, 77.3–77.45

[56] **References Cited**

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Primary Examiner—Donald E. Watkins

Attorney, Agent, or Firm—Michael S. Striker

[57] **ABSTRACT**

The device comprises at least one rotary ring against which the filament must be applied so as to be driven in rotation by the inner edge of the rotary ring to undergo twisting. This rotary ring is driven by a single drive roller and the rotary ring comprises an outer edge of magnetic material. It is supported on said single drive roller by a fixed support roller and by a magnetic device inserted between the fixed support roller and the single drive roller.

8 Claims, 5 Drawing Figures

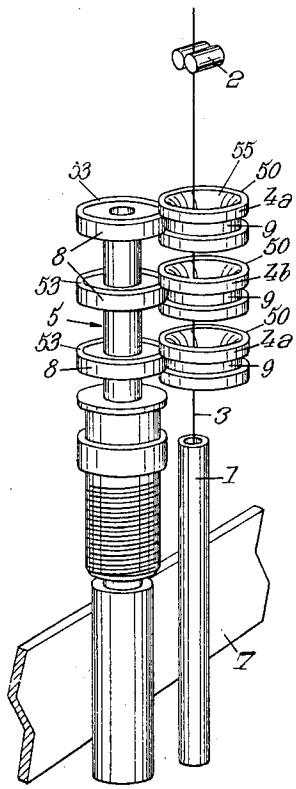

Fig. 1.

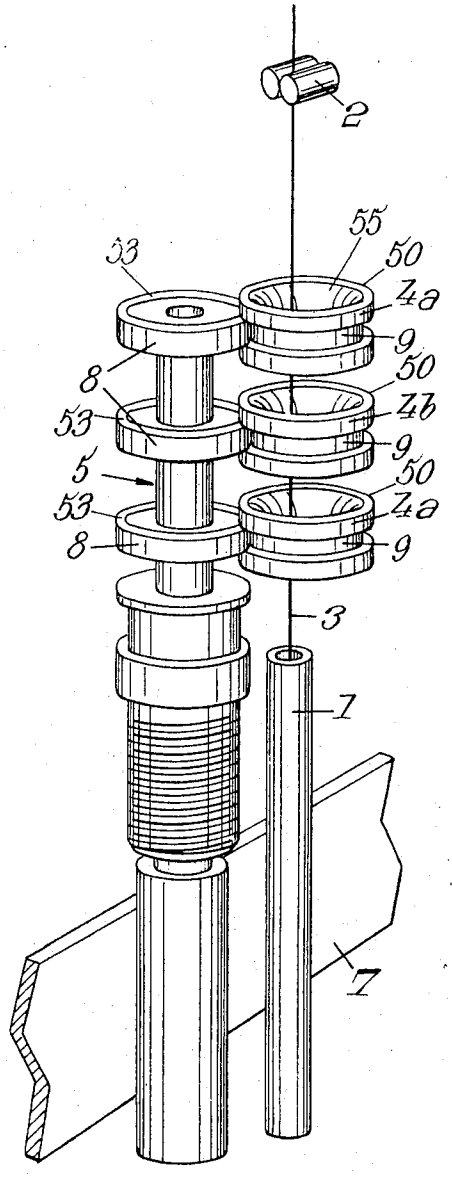
2
55
50
4a
9
53
8
50
4b
9
5
53
50
4a
8
9
3
1
7

Fig. 2.

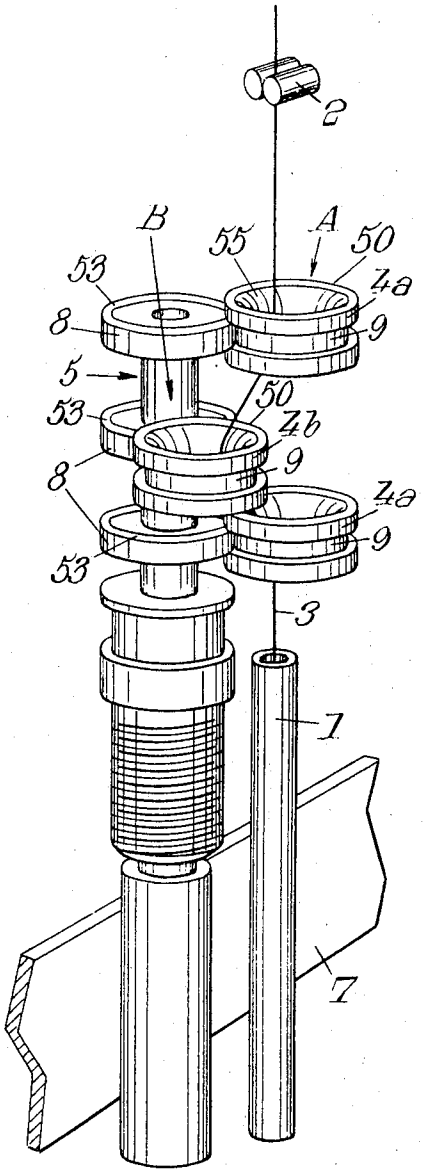
2
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Fig. 3.

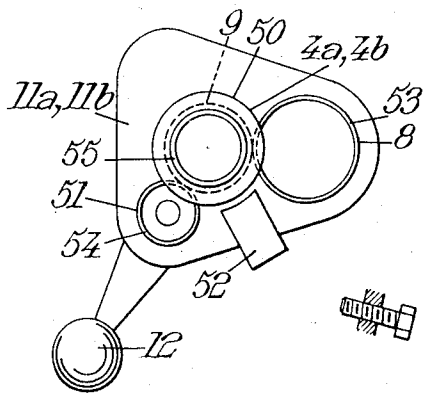


Fig. 4.

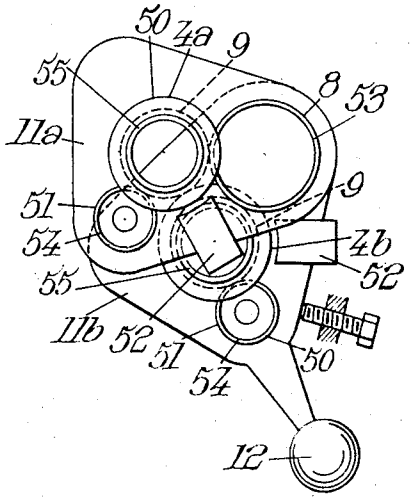
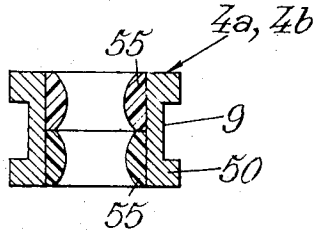


Fig. 5.



TWISTING DEVICES FOR FILAMENTS

BACKGROUND OF THE INVENTION

The invention relates to twisting devices for filaments (that is to say for fine threads) especially for textile filaments. More particularly the invention relates to such devices comprising a rotary ring against which the filament must be applied so as to be driven in rotation by the inner edge of the rotary ring in order to undergo twisting.

It has already been proposed, in my copending patent application Ser. No. 183,503 filed Sept. 24, 1971, to drive such rotary rings by a single drive roller against which the rotary ring is kept supported. In the last-mentioned application it was indicated that the rotary rings could be held against the single drive roller by means of two rollers of which one was mounted elastically.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide an improvement to replace this support mechanism using two rollers by a mechanism, which enables practically vibration free operation.

It is another object of the invention to provide an improved device which enables very easy changing of the rotary ring and enables rapid adaptation of the type of rotary ring to the nature of the filament to be processed.

It is yet another object of the present invention to provide an improved device in which a single rotary ring may be used.

Other objects and advantages will become apparent from the description which follows.

The twisting device according to the invention is characterised by the fact that the rotary ring comprises an outer edge of magnetic material, and by the fact that it is held supported on the single drive roller by a fixed support roller and by a magnetic device arranged between the fixed support roller and the single drive roller, this magnetic device being preferably arranged to draw said rotary ring against the single drive roller and the fixed support roller.

The invention consists, apart from this main feature, of certain other features which are preferably used at the same time and which will be more explicitly considered below.

DETAILED DESCRIPTION

The invention will in any case, be well understood by means of the detailed description which follows as well as of the accompanying drawings, which description and drawings relate to a preferred embodiment of the invention and do not of course comprise any limiting character.

In the drawings:

FIGS. 1 and 2 are partial diagrammatic views of a twisting device according to the invention shown in an inactive configuration in FIG. 1, and in an active configuration in FIG. 2.

FIGS. 3 and 4 are two end views respectively of the twisting device shown in FIG. 1 and of the twisting device shown in FIG. 2.

FIG. 5, lastly, is a cross-section on a larger scale of an important element of the twisting device shown in the preceding FIGS.

In FIGS. 1 to 4, there is shown a twisting device for a textile filament, this twisting device being inserted between a fixing device 1 and a delivery device 2 of a machine for the texturisation of this textile filament 3.

As indicated in the aforementioned patent application, this twisting device can comprise several rotary rings, denoted by the reference numeral 4 modified by an index *a* or *b* as explained below.

These rotary rings are driven in a rotary movement in the same direction and with the same speed, or with different speeds, and the filament 3 must be applied against the abovesaid rotary rings so as to be driven in rotation by their inner edge to undergo twisting.

These rotary rings are staggered along a rectilinear path which the filament follows in the absence of the twisting device, that is to say a rectilinear path extending from the delivery device 2 to the fixing device 1.

These rotary rings are distributed in two overlapping groups A and B, so that in following this rectilinear path there is alternately encountered a ring 4*a* of the group A and a ring 4*b* of the group B.

These two groups A and B can undergo relative displacement, in a direction perpendicular to the rectilinear path, in order to pass from an inactive configuration for which the rotary rings 4*a*, 4*b* of the two groups A and B surround with play the rectilinear path of the filament 3 (FIGS. 1 and 3), to an active configuration, in which the rotary rings 4*a*, 4*b* of the two groups A and B come into contact with the filament 3 and oblige it to follow a sinuous path for which the filament 3 is applied against said rotary rings 4*a*, 4*b* so as to be rotated by their inner edge to undergo the desired twisting (FIGS. 2 and 4).

The rings 4*a*, 4*b* of the two groups A and B are held supported on a single drive roller 5 driving said rings, and the relative displacement of the two groups A and B is effected by pivoting around the axis of this single drive roller 5; this single drive roller 5 is itself rotated by a tangential belt 7.

The two groups A and B are arranged so that when the two groups are in inactive configuration (FIGS. 1 and 3), the rings 4*a*, 4*b* of these two groups A and B are coaxial.

From a mechanical point of view, it is simpler to provide a fixed group of rings, group A, whilst the other group, the group B, is movable.

As regards the number of rotary rings included in such a device, it is advantageous to provide, for the fixed group A, at least two rotary rings 4*a*, and for the movable group B, at least one rotary ring 4*b*.

In FIGS. 1 to 4, there are shown a twisting device which comprises a fixed group A with two rotary rings 4*a* and a movable group B with a rotary ring 4*b*.

Each of the rotary rings 4*a*, 4*b* comprises an outer edge 50 of magnetic material, and it is held supported on the single drive roller 5 by a fixed support roller 51 and by a magnetic device 52, such as a permanent magnet, arranged between the fixed support roller 51 and the single drive roller 5.

This magnetic device 52 is arranged to attract the ring 4*a*, 4*b* concerned against the single drive roller 5 and the fixed support roller 51.

With respect to a given drive ring 4*a*, 4*b*, the angular separation (measured along its smallest value) existing between the fixed support roller 51 and the single drive roller 5 is less than 180°, the magnetic device 52 being arranged substantially in the middle of this angular sep-

aration; by way of example, there is shown in FIGS. 3 and 4 a twisting device for which the angular separation between the fixed support roller 51 and the single drive roller 5 is 120°, the axis of the magnetic device 52 being arranged on the bisector of this angle of 120°.

The fixed support rollers 51 and the magnetic devices 52 are then borne by a fixed support 11*a*, when it relates to holding the two rings 4*a* of the fixed group A, and by a movable support 11*b*, when it relates to holding the ring 4*b* of the movable group B.

The movable support 11b is pivotally mounted around the axis of the single drive roller 5 and bears a manipulating member 12.

From the constructional point of view and as shown in FIGS. 1 and 4, the single drive roller 5 comprises drive discs 8 cooperating respectively with the two rings 4*a* of the fixed group A and with the ring 4b of the movable group B.

To this end, each of the abovesaid rings 4*a*, 4*b* comprises a groove 9 formed in the outer edge 50 and in which the corresponding drive disc 8 becomes positioned.

Considering that the outer edge 50 of each ring 4*a*, 4*b* is generally constituted by a metallic, hence relatively rigid material, the drive discs 8 and the fixed support rollers 51 are provided with an outer edge, 53 and 54 respectively, constituted of a flexible material enabling the rotation of the rotary rings 4*a*, 4*b*.

This outer edge 53 and 54, can advantageously be constituted by a material such as that known under the trademark "VULKOLLAN."

As for the rotary ring 4*a*, 4*b*, it comprises on the inside, one or several rings 55 with a rounded inner edge and constituted by a flexible or rigid material enabling the driving of the textile filament 3 (FIG. 5).

This or these rings 55 can advantageously be constituted by a material such as that known under the trademark "VULKOLLAN."

Finally, due to this solution of a magnetic device to hold each rotary ring supported against the corresponding drive disc of the single drive roller,

on one hand, the operation of the twisting device is effected without any mechanical vibration,

and on the other hand, it is possible to change the rotary rings much more easily, in particular to adapt them to the nature of the filament to be processed, these rotary rings being very accessible since they are no longer wedged between the machanical elements.

As is self-evident and as emerges already from the foregoing, the invention is in no way limited to those types of application and embodiments which have been more especially envisaged; it encompasses, on the contrary, all modifications.

I claim:

1. Twisting device for textile filaments, comprising at least one rotary ring against which the filament must be applied so as to be driven in rotation by the inner edge of the rotary ring to undergo twisting, said rotary ring being driven by a single drive roller, said rotary ring comprising an outer edge of magnetic material and being held supported on said single drive roller by a fixed support roller and by a magnetic device inserted between the fixed support roller and the single drive roller.

2. Device according to claim **1**, wherein the magnetic device is arranged to draw the rotary ring against the single drive roller and the fixed support roller.

3. Twisting device for filaments, comprising several rotary rings against which the filament must be applied so as to be rotated by the inner edge of said rotary rings to undergo twisting, these rotary rings being staggered along a rectilinear path and distributed into two overlapping groups so that in following said rectilinear path there is alternately encountered a ring of one group and a ring of the other group, these two groups being able to undergo relative displacement in a direction perpendicular or substantially perpendicular to said rectilinear path, this relative displacement being effected by pivoting around the axis of a single drive roller against which the rotary rings of the two groups are kept supported, each rotary ring comprising an outer edge of magnetic material, and being held supported on the single drive roller by a fixed support roller and by a magnetic device arranged between the fixed support roller and the single drive roller.

4. Device according to claim **3**, wherein the magnetic device is arranged to draw the rotary ring concerned against the single drive roller and the fixed support roller.

5. Device according to claim **1**, wherein the magnetic device is constituted by a permanent magnet.

6. Device according to claim **1**, wherein the rotary rings form a fixed group (A) and a movable group (B) and the single drive roller comprises drive discs cooperating respectively with the rotary rings which each comprise a groove formed in the outer edge and in which the corresponding drive disc becomes positioned, the one or more fixed support rollers and the one or more magnetic devices being carried by a fixed support when it relates to a rotary ring of the fixed group (A) and by a movable support when it relates to a rotary ring of the movable group (B).

7. Device according to claim **1**, wherein the one or more drive discs and the one or more fixed support rollers are provided with an outer edge constituted of flexible material enabling the driving of the rotary rings in rotation.

8. Device according to claim **1**, wherein each rotary ring comprises on the inside one or several rings with a rounded inside edge and constituted of a flexible or rigid material enabling the driving of the filament.

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