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[54] **TEXTILE MACHINE**
10 Claims, 4 Drawing Figs.

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 [51] Int. Cl. B65h 75/30
 [50] Field of Search 242/46.6,
 46.2, 46.21, 46.3, 46.4, 46.5, 68.1, 68.2, 72;
 57/129, 130

ABSTRACT: A textile machine includes mounting means and a bobbin-tube holder arrangement which is carried by the mounting means. The bobbin-tube holder means includes a hub having an outer cylindrical surface which is provided with at least one circumferential groove, and an annular clamping member located in the groove and having a portion which conically diverges axially of the groove and also radially outwardly thereof so that, when a bobbin tube is telescoped over the hub it deflects the portion which consists of elastically yieldably material and is thus releasably held and centered relative to the hub.

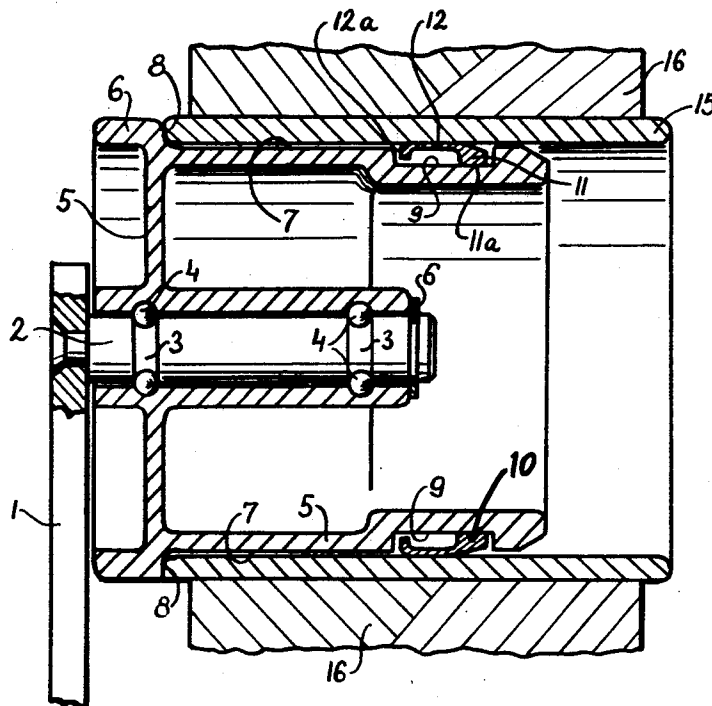


Fig. 1

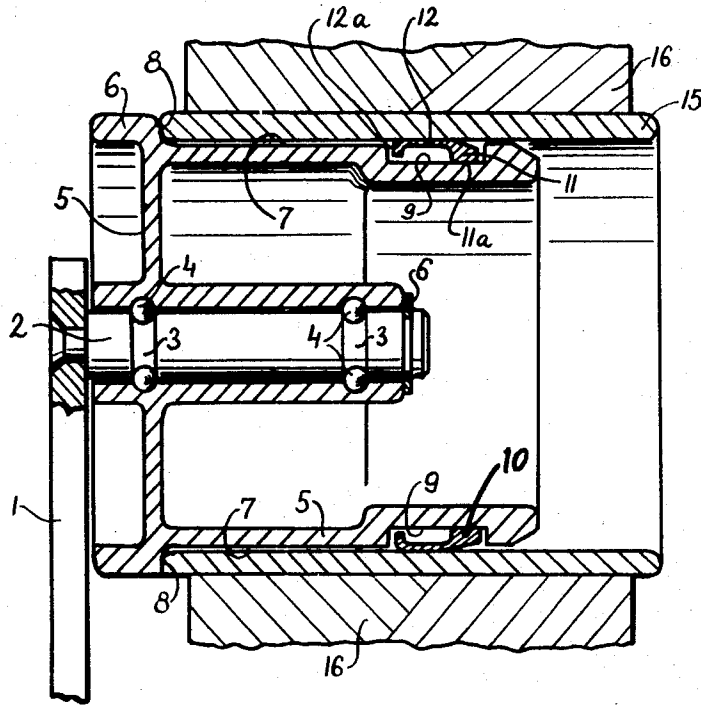


Fig. 2

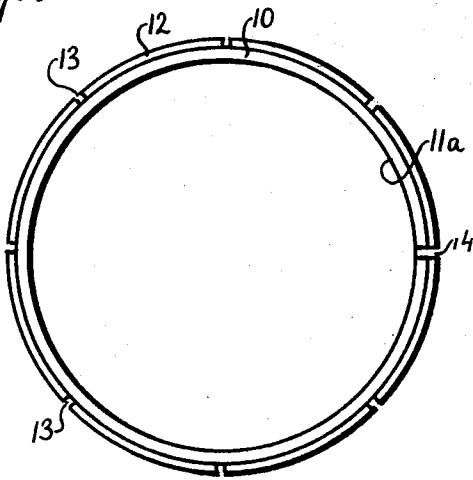


Fig. 3

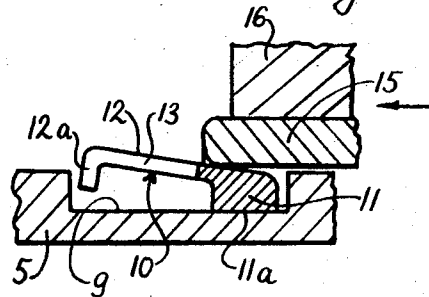
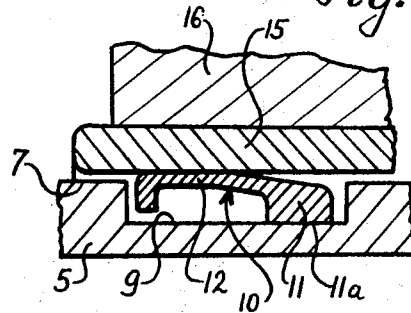


Fig. 4



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TEXTILE MACHINE

BACKGROUND OF THE INVENTION

The present invention relates generally to textile machines, and more particularly to an arrangement in a textile machine for securing bobbin tubes on a supporting hub.

It is known that in textile machines filamentary material, such as thread, yarn or the like, is supplied wound on bobbin tubes from which it is withdrawn. In other applications, the bobbin tubes may be supplied empty and the filamentary material has then to be wound onto the bobbin tube to form a filamentary package. In either case the bobbin tube must be mounted turnable and is usually secured on rotatable carrier bars. Such mounting must be effected releasably because the bobbin tube must be removed once it is fully wound or once the filamentary material is fully unwound from it. The means for effecting such releasably securing which is known in the prior art are of diverse types, but integral resilient flat-centering rings or rings of circular cross section are used most widely.

This type of connection is, however, possessed of some disadvantages. Firstly, a considerable force is required to telescope the bobbin tube over the holder provided with this type of securing means, and a similar force is required to remove it. This is the result of the fact that the arm on which the hub for the bobbin tube is secured is usually deflected and therefore deformable to some extent so that the force required for donning and doffing of the bobbin tube must be of a magnitude to effect the requisite operation after the deflection of the arm has first taken place. Also, where silver is wound onto a spool or bobbin of significant diameter, it can be very easily distorted and the package consisting of the sliver would onto the bobbin tube or spool must therefore be handled carefully with the result that it is not possible under these circumstances to simply consider the requisite force for donning and doffing, but also to take into account the effect this may have on the package. This is difficult to take into consideration with the prior art devices because the aforementioned force must be exerted under all circumstances in order to effect donning and doffing.

SUMMARY OF THE INVENTION

It is, accordingly, a general object of the present invention to overcome the aforementioned disadvantages.

A more particular object of the present invention is to provide for simple and relatively gentle donning and doffing of the bobbin tube with respect to the bobbin-tube holder.

A further object of the invention is to provide an arrangement of the type under discussion wherein the wear on the various elements involved is reduced.

In accordance with the above objects, and others which will become apparent hereafter, one feature of our invention resides in the provision, in a textile machine, of mounting means and bobbin-tube holder means which is carried by the mounting means. The bobbin-tube holder means includes a hub having an outer cylindrical surface which is provided with at least one circumferential groove, and an annular clamping member having a first portion which is located in the groove and a second portion integral with the first portion and conically diverging in axially direction thereof as well as radially outwardly of the groove. At least the second portion, but preferably both portions, consist of elastically deflectable material, such as an elastomeric material, a polyamide or a suitable metallic material, so that when a bobbin tube is telescoped over the hub, the second portion will be elastically deflected in radially inward direction and will hold the bobbin tube in centered position relative to the hub.

The wear, particularly on the clamping member, can be reduced by, in accordance with a further consideration of the invention, having the free marginal zone of the second portion, that is that zone which is remote from the first portion, bent inwardly into the circumferential groove.

The novel features which are considered as characteristic for the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawing.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is an axial section through an arrangement embodying the invention;

FIG. 2 is an axial elevation of the clamping member shown in the arrangement of FIG. 1;

FIG. 3 is a fragmentary sectioned detailed view of the embodiment of FIG. 1, showing the clamping member just prior to mounting of a bobbin tube; and

FIG. 4 is a view similar to FIG. 3 but showing the clamping member after the bobbin tube has been mounted.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Discussing now the drawing in detail, and firstly FIG. 1 thereof, it will be seen that we have illustrated a portion of an arm 1 which may be pivotable and which constitutes a part of the conventional arrangement in a textile machine for winding or unwinding of filamentary material. Fixedly secured to the arm 1 is a pin 2 provided—in the illustrated embodiment—with two axially spaced outer circumferential grooves 3 each of which receives a plurality of bearing balls 4. A hub 5 of the configuration illustrated in FIG. 1 surrounds and is mounted on the pin 2 for free rotation about the axis defined by the same, being supported by the bearing balls 4 in the manner illustrated. Suitable securing means, here illustrated as a ring 6, prevents accidental axial shifting of the hub 5 with respect to the pin 2. The mounting of the hub 5 for rotation with respect to the pin 2, and the securing of the hub 5 against axial movement, have been shown there only for purposes of information inasmuch as they do not constitute a part of the invention and are expedient to those well known in the art.

At the left-hand end of the outer circumferential surface of the hub 5, there is provided a stop shoulder 8 against which a bobbin tube 15, telescoped over the cylindrical mounting portion 7 of the hub 5, abuts. The bobbin tube 15 carries a package 16 of filamentary material.

The outer circumferential surface of the cylindrical mounting portion 7 is provided with at least one circumferential groove 9, here shown as being located adjacent the right-hand of the hub 5. A clamping member 10 is received in the groove 9 and is of annular configuration, as shown in the axial end view of the clamping member which is illustrated in FIG. 2. In accordance with the present invention, the clamping member 10 consists of two portions 11 and 12. The portion 11 is the base for engagement portion whose inner cylindrical surface 11a abuts against the bottom wall of the groove 9, as shown most clearly in FIGS. 3 and 4. The portion 12 is cylindrical with the portion 11 and diverges from the latter axially as well as radially outwardly so that it has a substantially conical configuration, as clearly shown in FIG. 3 which illustrates the member 10 in undeflected condition. The portion 12 extends outwardly of the groove 9, as also shown in FIG. 3, and the entire member 10, or at least the portion 12 thereof, is made of a resiliently deflectable material, such as rubber, a polymeric material in general, a polyamide or a suitable metallic material. The portion 12 is provided with axially extending notches 13 circumferentially spaced as shown in FIG. 2 to enhance its ability to be deflected inwardly into the groove 9. The free marginal zone 12a of the portion 12 is preferably although not necessarily bent inwardly into the groove 9 which serves to reduce the wear on this zone.

In the illustrated embodiment, the member 10 is circumferentially discontinuous by being provided with a discontinuity in form of a slit 14 which serves to facilitate the introduction of the member 10 into the groove 9.

It will be appreciated, as has already been suggested before, that more than one of the grooves 9 can be provided on the hub 5; in this case they will be axially spaced from one another and will each receive one of the members 10. This is necessary if the hub 5 and the bobbin tube 15 to be mounted thereon are longer than shown in the drawing and/or if the weight of the package 16 and the bobbin tube 15 should make this necessary or desirable.

FIG. 3 shows the arrangement prior to securing of a bobbin tube 15 with package 16 thereto, the bobbin tube 15 just being telescoped over the hub 5 in the direction of the arrow in FIG. 3. FIG. 4, on the other hand, shows the bobbin tube telescoped over the hub 5 to the extent that it already covers and deflects the portion 12 and it will be seen that, as the bobbin tube 15 is moved in the direction of the arrow of FIG. 3, the portion 12 is inwardly deflected into the groove and thus engages the inner circumferential surface of the bobbin tube 15 under pressure resulting from the tendency of the portion 12 to counteract the inverted deflection and to resume its undistorted and undeflected position shown in FIG. 3. This serves to effect a temporary clamping of the bobbin tube 15 on the hub 5 and at the same time to send the bobbin tube 15 on the hub 5. Removal of the bobbin tube 15 is effected by reversing the direction of movement, that is by moving the bobbin tube 15 in the direction opposite the arrow of FIG. 3 and a new bobbin tube can then be substituted for the one which has been withdrawn. The device is evidently suitable both for applications where the bobbin tube 15 already carries the package 16 of filamentary material which is then to be withdrawn from the bobbin tube 15 so that the latter is removed in empty condition, as well as for applications where the bobbin tube 15 is placed onto the hub 5 in empty condition and the filamentary material is to be wound onto the bobbin tube 15 so as to form the package 16 thereon.

It will be understood that each of the elements described above, or two or more together, may also find a useful application in other types of constructions differing from the types described above.

While the invention has been illustrated and described as embodied in a bobbin-tube holder arrangement for a textile machine, it is not intended to be limited to the details shown, since various modifications and structural changes may be made without departing in any way from the spirit of the present invention.

What we claim as new and desired to be protected by Let-

ters Patent is set forth in the appended

1. In a textile machine, a combination comprising mounting means; a bobbin-tube holder means carried by said mounting means and including a hub having an outer cylindrical surface provided with at least one circumferential groove of a first axial length, and an annular clamping member in said groove and having a second axial length at most approaching said first axial length, said clamping member including a first portion located in said groove and a second portion integral with said first portion conically diverging axially thereof and radially outwardly of said groove, at least said second portion consisting of elastically deflectable material so that, when a bobbin tube is telescoped over said hub, said second portion will be elastically deflected in direction radially inwardly of said groove and hold said bobbin tube in centered position relative to said hub.

2. In a textile machine as defined in claim 1, wherein said resiliently deflectable material is elastomeric.

3. In a textile machine as defined in claim 1, wherein said resiliently deflectable material is polyamide.

4. In a textile machine as defined in claim 1, wherein said resiliently deflectable material is a metallic material.

5. In a textile machine as defined in claim 1, said annular clamping member being provided with a circumferential discontinuity so as to facilitate its introduction into said groove.

6. In a textile machine as defined in claim 1, said second portion being provided with a plurality of circumferentially spaced axial incisions to thereby enhance its elastic deflectability.

7. In a textile machine as defined in claim 1, wherein said second portion has a free marginal zone axially spaced from said first portion and extending radially inwardly into said groove.

8. In a textile machine as defined in claim 1, said first portion having an inner cylindrical abutment surface surrounding and abutting against the bottom wall of said groove.

9. In a textile machine as defined in claim 1, wherein said hub is provided with a radial shoulder remote from said groove and constituting an abutment for a bobbin tube telescoped over said hub.

10. In a textile machine as defined in claim 1; and further comprising antifriction bearing means freely rotatably mounting said hub on said mounting means.

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