

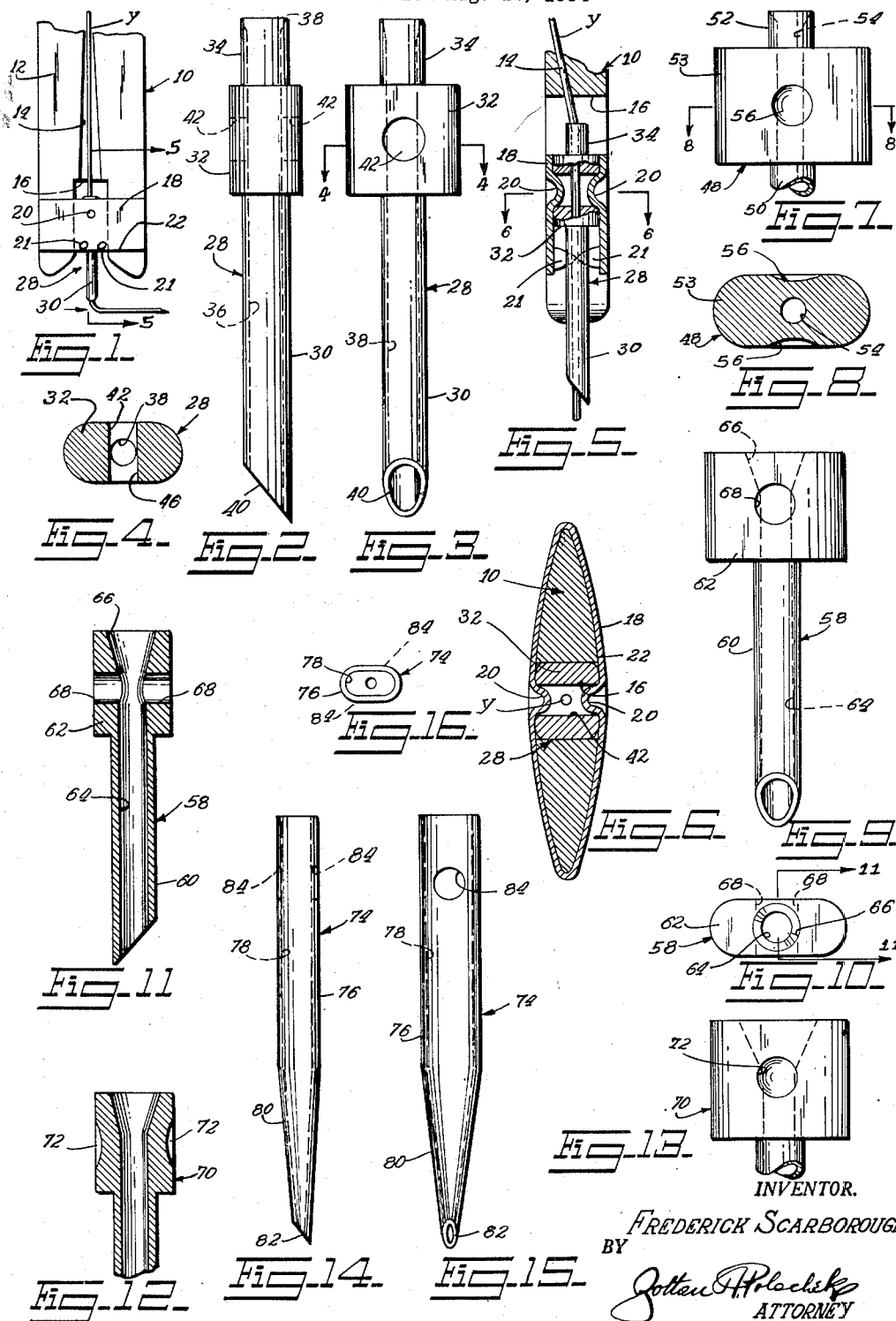
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YARN CARRIER TUBE FOR KNITTING MACHINES

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YARN CARRIER TUBE FOR KNITTING MACHINES

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9 Claims. (Cl. 66—126)

This invention relates to a safety yarn carrier tube, adapted to be mounted on the feed finger of a knitting machine of either the full-fashioned or the circular type, such as is used for knitting hosiery.

The principal object of the invention is to prevent damage to intricate gauge parts of the knitting machine sinkers, needles, etc., when the yarn carrier tube comes into contact with the sinkers, which contact is due to displacement caused by maladjustment or by catch-bar miss. The carrier tube, according to the invention, will swing like a pendulum to either right or left when this contact occurs, away from the sinkers, thereby avoiding further damage to these parts or to the tubes themselves.

A swinging tube for the purpose stated is not new per se, one being shown, for example, in U. S. Patent No. 2,555,920, dated June 5, 1951. However, it is proposed to improve upon the construction shown in said patent by providing a structure which will be practical to use, and will be adapted for commercial production.

The present invention has another important object, the provision of a tube that is adapted to be normally securely held in place in the feed finger, in proper position for operation of the machine. In carrying out the invention, it is proposed to so design the tube as to insure its being automatically set in a proper position of rotary adjustment, when inserted in the bore provided therefor in the feed finger head.

A further important object is to provide the tube with holes or recesses particularly shaped to receive indentations in a spring plate bridge and/or set screws or equivalent means whereby the tube may be firmly anchored in position in the head of the feed finger.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings forming a material part of this disclosure:

Fig. 1 is a fragmentary front elevational view of a yarn carrier or feed finger equipped with a yarn carrier tube formed in accordance with the invention.

Fig. 2 is an enlarged elevational view of the tube per se.

Fig. 3 is an elevational view of the tube as seen from the left of Fig. 2.

Fig. 4 is a sectional view on line 4—4 of Fig. 3.

Fig. 5 is an enlarged sectional view on line 5—5 of Fig. 1.

Fig. 6 is a sectional view on line 6—6 of Fig. 5.

Fig. 7 is a fragmentary side elevational view of a modified tube.

Fig. 8 is a sectional view on line 8—8 of Fig. 7.

Fig. 9 is an elevational view of another modified tube.

Fig. 10 is a top plan view of the tube of Fig. 9.

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Fig. 11 is a sectional view on line 11—11 of Fig. 10.

Fig. 12 is a fragmentary sectional view like Fig. 11 of another modification.

Fig. 13 is a view similar to Fig. 7 showing the tube of Fig. 12.

Fig. 14 is an elevational view of a fourth modification.

Fig. 15 is an elevational view of the tube of Fig. 14, as seen from the left of Fig. 14.

Fig. 16 is a top plan view of the tube of Fig. 14.

The reference numeral 10 has been applied generally to a feed finger of a full-fashioned knitting machine, the illustrated feed finger including an arm 12 having a longitudinal guideway 14. A longitudinal slot 16 communicates at its upper end with the guideway 14 and at its lower end, opens downwardly upon the lower end of the arm 12. Intermediate the ends of the slot, an endless band 18 of spring material is circumposed about the arm, and is formed with opposed, inwardly struck, rounded upper lugs 20, one at each side of the band or bridge. Also formed in the band are diametrically opposed pairs of inwardly struck lower lugs 21. There are two of these on each side of the band, the lugs of each pair being disposed side by side (Fig. 1) and being aligned transversely of the band or bridge with the corresponding lugs 21 at the other side of the band or bridge.

The band 18 is seated snugly within a shallow, circumferential groove 22 formed in the arm 12, which groove is disposed intermediate the ends of slot 16 and is interrupted at diametrically opposite locations by said slot.

The safety yarn carrier tube has been generally designated 28, and is mounted in slot 16, in engagement with the spring plate bridge or band 18.

The tube 28 is formed with a constant diameter, cylindrically shaped tubular member 30 integral at its upper end with a collar 32 of oblong cross section.

Formed upon the upper end of the collar is a tubular extension 34 coaxially aligned with the tubular member 30. An axial bore 36 extends through the tubular member 30, head 32, and extension 34, said bore merging into a flared bore portion 38 within the extension 34 to provide a guideway for yarn Y entering the tube. At its other end, the tube is beveled as at 40.

Formed in opposite sides of the collar 32 are openings 42, said openings being coaxially aligned and communicating at their inner ends with the tube bore.

In use, the yarn carrier tube is inserted in slot 16, with lugs 20 engaging in openings 42 and lugs 21 engaging the lower portion of the tube at opposite sides thereof to normally hold the same against swinging about the horizontal axis defined by lugs 20. The tube will thus be vertically supported under normal operating conditions. When, however, an obstruction resulting from maladjustment or catch-bar miss is encountered, the lugs 21 are adapted to be spread apart by pressure from the tube, and the tube is thereby released for swinging on lugs 20 to clear the sinkers.

In Figs. 7 and 8, a modified tube 48 is shown, having a tubular member 50 and extension 52 projecting in opposite directions from a collar 53, said tube 48 having a bore 54. In all respects, this tube is similar to that of the first form, with the exception that instead of openings 42, the collar has circular, shallow depressions 56 in its opposite sides in which the lugs 20 are adapted to engage.

In Figs. 9—11, another modification is shown, designated generally at 58. In this form, there is no tubular extension. Instead, there is simply a tubular member 60 integral at its upper end with a collar 62 of oblong cross section. An axial bore 64 of the tube merges into a flared guide recess 66 sunk into the upper end of the collar. The collar is formed with openings 68 extending

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inwardly from opposite sides thereof into communication with the bore.

The tube 58 is mounted in the same manner as the other tubes hereinbefore described.

In Figs. 11 and 12, another modification is shown, designated generally by the reference numeral 70. This tube is identical to that of Figs. 9-11, except for having depressions 72 instead of openings 68.

In Figs. 14-16 there is shown a fifth modification designated generally at 74. In this form the collar is eliminated, and instead, the tubular member 76 is of oblong cross section from its upper end to a location slightly below its midlength point. An axial bore 78 is of a complementary cross section and is continued through a tapered lower end portion 80 of the tube, having a beveled end 82.

Formed in the upper end portion of the tubular member are diametrically opposed openings 84 which are adapted to receive the lugs 20.

In all forms of the invention, the tube is characterized by two important features which act in concert to effect an automatic setting of the tube in a proper position, and to firmly anchor the tube against rotation under all circumstances despite heavy strains which would be imposed thereupon during operation of the machine. These features are the diametrically opposed openings or recesses in which lugs 20 engage, and the noncircular cross-sectional shape of the head-engaging portion of the tube. At the same time, of course, the tube may be readily replaced when necessary, by releasing spring pressure of the steel band to disengage the lugs which support the carrier tube in normal position.

While I have illustrated and described the preferred embodiments of my invention, it is to be understood that I do not limit myself to the precise constructions herein disclosed and the right is reserved to all changes and modifications coming within the scope of the invention as defined in the appended claims.

Having thus described my invention, what I claim as new, and desire to secure by United States Letters Patent is:

1. A yarn carrier for a full-fashioned knitting machine having a feed finger arm comprising a yarn carrier tube extending through said feed finger, opposed recesses on said carrier tube, and an endless band extending around said feed finger arm, said endless band including opposed extensions seated in said recesses.

2. A yarn carrier for a full-fashioned knitting machine having a feed finger arm comprising a yarn carrier tube extending through said feed finger, opposed recesses on said carrier tube, and an endless band extending around said feed finger arm, said endless band including opposed extensions seated in said recesses, said carrier tube including a non-circular collar on the upper end thereof.

3. A yarn carrier for a full-fashioned knitting machine having a feed finger arm comprising a yarn carrier tube extending through said feed finger, opposed recesses on

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said carrier tube, and an endless band extending around said feed finger arm, said endless band including opposed extensions seated in said recesses, said carrier tube including a non-circular collar on the upper end thereof, said recesses comprising opposed openings forming a transverse bore.

4. A yarn carrier for a full-fashioned knitting machine having a feed finger arm comprising a yarn carrier tube extending through said feed finger, opposed recesses on said carrier tube, and an endless band extending around said feed finger arm, said endless band including opposed extensions seated in said recesses, said carrier tube including a non-circular collar on the upper end thereof, said recesses comprising circular, shallow depressions.

5. A yarn carrier for a full-fashioned knitting machine having a feed finger arm comprising a yarn carrier tube extending through said feed finger, opposed recesses on said carrier tube, and an endless band extending around said feed finger arm, said endless band including opposed extensions seated in said recesses, said carrier tube including a non-circular collar on the upper end thereof, said collar including a tubular extension coaxially aligned with said carrier tube.

6. A yarn carrier for a full-fashioned knitting machine having a feed finger arm comprising a yarn carrier tube extending through said feed finger, opposed recesses on said carrier tube, and an endless band extending around said feed finger arm, said endless band including opposed extensions seated in said recesses, said carrier tube including a non-circular collar on the upper end thereof, said collar including a flared outlet communicating with said carrier tube.

7. The combination of claim 3, wherein said collar includes a tubular extension coaxially aligned with said carrier tube.

8. The combination of claim 4, wherein said collar includes a flared opening extending from the upper end of the carrier tube to the upper outlet end of the collar.

9. A yarn carrier for a full-fashioned knitting machine having a feed finger arm comprising a yarn carrier tube extending through said feed finger arm, opposed recesses on said carrier tube, and an endless band extending around said feed finger arm, said endless band including opposed extensions seated in said recesses, said carrier tube including a non-circular collar on the upper end thereof, said recesses comprising opposed openings forming a transverse bore, wherein said collar includes a flared opening extending from the upper end of the carrier tube to the upper outlet end of the collar.

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