July 7, 1942. E. A. FEUSTEL 2,289,256

YARN CARRIER

Filed Oct. 10, 1941

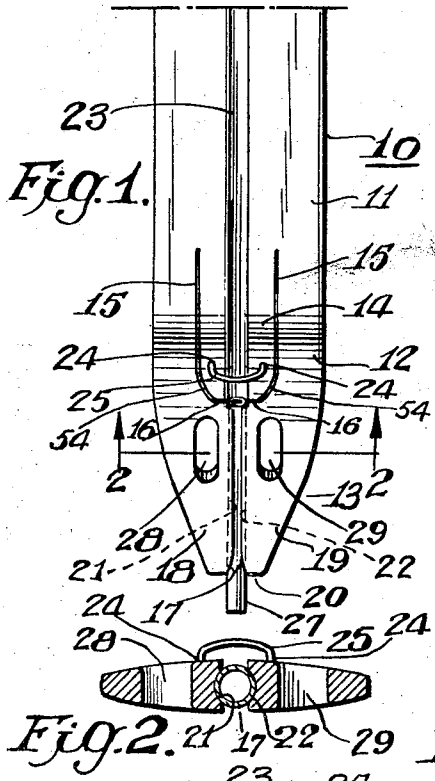


Fig. 1.

Fig. 2.

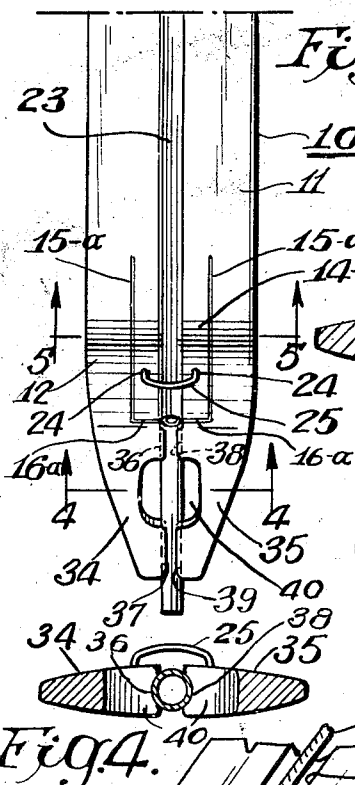


Fig. 3.

Fig. 4.



Fig. 5.

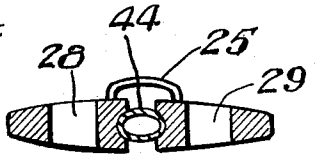


Fig. 9.

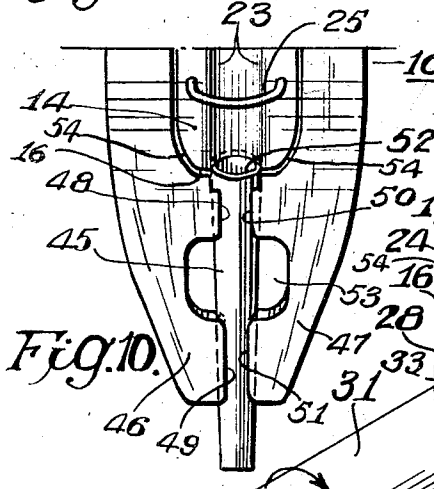


Fig. 10.

Fig. 6.

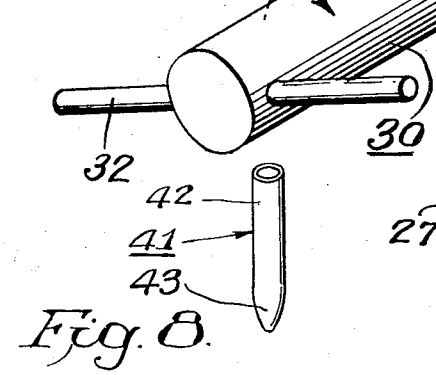


Fig. 8.

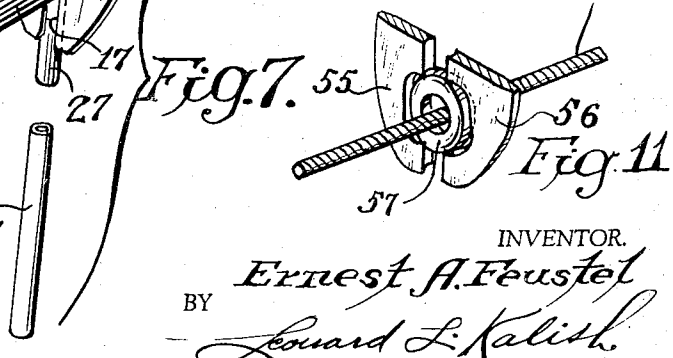


Fig. 7.

Fig. 11.

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2,289,256

YARN CARRIER

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Application October 10, 1941, Serial No. 414,403

12 Claims. Cl. 66—126)

The present invention relates to certain new and useful improvements in thread carriers of the general type shown in United States Patent No. 1,675,556 and in German Patent No. 643,290, wherein the thread-guide tube which gives the final guidance to the thread is held between spring jaws formed in the discharge end of the carrier.

The present application is a continuation-in-part of my application Serial No. 321,012, filed February 27, 1940, now Patent No. 2,275,848.

One of the objects of my present invention is to provide a thread carrier adapted for use particularly with full-fashioned knitting machines which will be more efficient and easier to maintain and more dependable in operation and which will enable a quick replacement of the thread-guide tube while the yarn carrier remains in place upon the machine; that is, the thread guide tube may be removed from the yarn carrier when it is worn or "cut" by the threads without loosening the carrier at its anchorage.

Another object of the present invention is to provide a yarn carrier and tube therefor which will be more efficient for full-fashioned knitting machines, particularly for knitting relatively fine-gauge silk hosiery, and which will also more accurately control the thread.

With the above and other objects in view, which will appear more fully from the following detailed description, appended claims, and accompanying drawing, the present invention consists of a yarn carrier having the discharge or pay-out end thereof bent at an obtuse angle to the main body of the carrier and having the discharge or lower end of the carrier split or bifurcated longitudinally into a pair of juxtaposed spring-arms terminating in tube-gripping jaws, adapted to hold a tube frictionally or otherwise and having a thread-guiding tongue-like portion or finger disposed intermediate said jaws generally at the bend of said carrier, so as to guide the thread or yarn over the bend generally within the confines of the carrier and so as to prevent the thread from interfering with the next adjacent carrier particularly in multi-carrier operation as commonly employed in full-fashioned knitting machines.

The present invention further consists of a certain novel construction in the tube-gripping jaws of the carrier and of a certain novel relationship between the jaws, the yarn-guide tube supported thereby, and the thread-guiding finger, whereby the tube may readily be inserted and withdrawn from said jaws and may firmly be held by said jaws with the inner end thereof in contact with the outermost end of the thread-guiding finger.

The present invention further consists of other novel features and details of construction, all of which will appear more fully from the following detailed description.

For the purpose of illustrating the invention, there are shown in the accompanying drawing forms thereof which are at present preferred, since the same have been found in practice to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which the invention consists can be variously arranged and organized and that the invention is not limited to the precise arrangements and organizations of the instrumentalities as herein shown and described.

Referring to the accompanying drawing in which like reference characters indicate like parts throughout:

Figure 1 represents a fragmentary plan view of one embodiment of the present invention.

Figure 2 represents a cross-sectional view generally along the line 2—2 of Figure 1.

Figure 3 represents a plan view similar to that of Figure 1 but showing a different embodiment of the present invention.

Figure 4 represents a cross-sectional view generally along the line 4—4 of Figure 3.

Figure 5 represents a cross-sectional view generally along the line 5—5 of Figure 3.

Figure 6 represents a perspective view of a key which may be used to spread the spring jaws of the carrier to permit insertion and removal of the thread-guiding tube.

Figure 7 represents a perspective view of the embodiment shown in Figure 1, illustrating the manner in which the key is employed to spread the spring jaws to permit removal or insertion of the thread-guiding tube.

Figure 8 represents an elevational view of a yarn guide tube having a tapered tip which may be used in place of the fully cylindrical tube shown in Figure 7.

Figure 9 represents a cross-sectional view similar to that of Figure 2 but showing the use of a yarn-guide tube having an oval-shaped or elliptical cross-section.

Figure 10 represents a fragmentary plan view on an enlarged scale of another embodiment of the present invention in which the yarn-guide tube is tapered throughout its length and in which the tube-gripping surfaces of the spring-jaws are correspondingly tapered.

Figure 11 represents a fragmentary perspective view of another embodiment of the present invention in which spring jaws are employed to provide a four-point grip upon a yarn-guide ring.

Referring to the embodiment shown in Figures 1, 2 and 7, I may provide a yarn carrier designated generally by the numeral 10 having a main body portion 11 and having an upper anchorage portion (not shown) of conventional construction for removably affixing the carrier to the knitting machine.

The carrier 10 is bent generally in the zone 12, thereby to provide the lower or pay-out end 13 which is generally at an obtuse angle to the main body portion 11. While I prefer to make the bend 12 gradual, the arc of the bend may be varied from a small radius to a fairly large radius.

A central yarn-guide finger or tongue 14 is struck from the body portion 11 generally at the bend zone 12; said finger 14 being formed by slits having longitudinal portions 15 forming the sides of the finger and transverse portions 16 forming the outermost or lower end of the finger, the portions 15 and 16 being connected by smoothly-curved portions 54.

A generally central slot 17 extends outward from the outermost end of the finger 14 thereby to provide gripping jaws 18 and 19 at the lower or pay-out end 13 of the carrier 10.

The outer edges of the pay-out end 13 preferably converge to provide a relatively small lowermost and outermost tip 20.

The slits 15—16—54 and the slot 17 thus provide a separation of the spring-jaws 18 and 19 from each other and from the finger 14 for an appreciable distance beyond the bend zone 12 thereby to impart a high degree of resiliency and gripping power to said jaws 18 and 19.

The inner sides of the jaws 18 and 19 are made concave as at 21 and 22, respectively, thereby to provide a somewhat cylindrical gripping surface within said slot 17 as shown particularly in Figure 2; said concave edges or gripping surfaces 21 and 22 extending generally continuously from the outer end of the finger 14 to the lowermost tip 20 of the carrier.

A groove 23 extends downward upon the upper face of the body 11 and the finger 14 as shown in Figures 1 and 7. Said groove 23 is shallow at its uppermost end and gradually becomes deeper to provide its deepest portion at the extremity of the finger 14.

A pair of small openings 24 may be formed in said finger 14 on either side of said groove 23 and a relatively thin wire or staple 25 may be fastened therethrough more positively to retain the thread 26 upon the finger 14 and to prevent said thread 26 from becoming entangled with other juxtaposed carriers. Said wire 25 may be assembled either permanently or removably within the openings 24 as desired. However, the wire 25 and the openings 24 are not absolutely essential as the groove 23 and the thread-guide tube to be hereinafter described function satisfactorily to retain the thread 26 upon the yarn carrier 10 in most instances.

A generally cylindrical thread-guide tube 27 is adapted to be inserted within said slot 17 as shown in Figures 1 and 7.

In order to permit the insertion and removal of the tube 27, a pair of elongated openings 28 and 29 may be provided in said jaws 18 and 19 respectively, generally adjacent to the inner edges 21 and 22 thereof. A suitable key designated generally by the numeral 30 may be provided, having a cylindrical body portion 31 and a handle 32 and having a pair of diametrically opposed prongs 33 extending from the end of said body 31. Said prongs 33 are so disposed relative to each other that they may be inserted into the elongated openings 28 and 29, as shown in Figure 7; one of the prongs being placed at the outer end of the opening 28 and the other of the prongs being placed at the inner end of the opening 29. When the key 30 is roated clock-wise from the position shown in Figure 7, the prongs 33 will move to positions at the center of the slots 28 and 29 and in so doing will spread the jaws 18 and 19 apart. When said jaws 18 and 19 are spread apart, the slot 17 necessarily becomes larger, and thus, the thread-guide tube 27 which has a slightly greater outside diameter than the normal diameter of the slot 17 between the concave edges 21 and 22, may be inserted within said slot 17. The key 30 is then further rotated in either direction so that the prongs 33 are again at opposite ends of their respective elongated openings 28 and 29, thereby to permit the jaws 18 and 19 to move together by reason of their inherent resiliency to grip the thread-guide tube 27 firmly between the concave edges 21 and 22. The key 30 may then be removed from the yarn carrier.

While in Figure 7 the key is shown as having been inserted with one of the prongs 33 in the outer end of the elongated opening 28 and with the other of the prongs 33 in the inner end of the elongated opening 29, it is, of course, equally possible to insert the key with the prongs reversed; that is, with one of the prongs at the inner end of the opening 28 and the other at the outer end of the opening 29. The only requirement for the insertion of the key is that the prongs 33 shall originally occupy diagonal positions with respect to the ends of the slots 28 and 29 and shall then be moved to generally-central positions within the slots 28 and 29 by rotation of the key 30, thereby to spread said gripping jaws 18 and 19 apart.

As shown particularly in Figures 1 and 7, the thread-guide tube 27 is made in the form of a smooth cylinder, either end of which may serve as the outermost tip from which the thread 26 is finally paid out. Said tube 27 is inserted from the lower end or tip 20 of the carrier 10 and is inserted as far as possible to the position shown in Figure 1 in which the innermost end of the tube 27 is positioned against the outermost edge of the thread-guide finger 14. In this way, the tube 27 is held firmly against movement; its inner end abutting the finger 14 and the cylindrical walls being gripped by the concave edges 21 and 22 of the jaws 18 and 19 respectively.

The thread 26 is passed over the upper surface of the body 11 and is positioned within the groove 23 within the wire 25 and is drawn through the thread-guide tube 27 from which it passes to the knitting machine needle in the conventional manner well known to those skilled in the art. As shown in Figures 5 and 7, the groove 23 is deep enough to permit the thread 26 to lie generally flush with the upper surface of the carrier 10 and to prevent said thread 26 from becoming entangled with other carriers or with other parts of the knitting machine.

The yarn carrier 10 may be thinned at its outer peripheral edges particularly in the lower or pay-out end 13 thereof to provide the generally oval-shaped cross-section shown in Figures 2, 4 and 5.

I have found that by making said yarn carriers with thinned edges, they can more readily pass each other in the close proximity in which they are placed with respect to each other in the knitting machine. As is well known to those skilled in the art, yarn carriers as used in present-type knitting machines are reciprocated side-wise with their paths of travel overlapping those of adjacent carriers. Since very little clearance is provided between adjacent and overlapping carriers, it has frequently been found that adjacent carriers may strike each other and may even jam if their alignment is not entirely accurate. I have found that by making the carriers with thinned peripheral edges, adjacent carriers more readily clear each other and slide past each other where contact does occur therebetween and thus, the possibility of damage to or jamming of the carriers is greatly reduced.

In Figures 3 and 4 I have shown a different embodiment of the present invention designated generally by the reference character 10—*a*.

Said carrier 10—*a* is provided with a body portion 11, a bent zone 12, a thread-guide finger or tongue 14—*a*, openings 24 and a wire 25, which are similar to those of the carrier 10 shown in Figures 1, 2 and 7.

The thread-guide finger 14—*a*, instead of being formed with smoothly-curved corners as is the finger 14 shown in Figures 1 and 7, is formed with right-angled corners; the longitudinal slits 15—*a* intersecting generally perpendicularly with the transverse slit 16—*a*.

However, instead of providing the jaws 18 and 19 with continuous concave inner gripping edges or surfaces as shown in the embodiment of Figures 1, 2 and 7, the embodiment of Figures 3 and 4 is provided with the gripping jaws 34 and 35. Said gripping jaws 34 and 35 have upper and lower gripping edges; the jaw 34 being provided with an upper concave inner gripping edge 36 and a similar lower concave inner gripping edge 37, while the jaw 35 is similarly provided with an upper concave inner gripping edge 38 opposed to the edge 36 and a lower concave inner gripping edge 39 opposed to the gripping edge 37. Thus, intermediate the gripping edges 36 and 38 and 37 and 39 respectively, there are provided generally cylindrical channels somewhat similar in configuration to the slot 17 shown in Figure 2.

Intermediate the upper and lower gripping edges thereof, the jaws 34 and 35 are separated from each other to provide a generally rectangular key opening 40 therebetween.

A thread-guide tube 27 identical to that shown in Figures 1, 2 and 7 may be inserted within the yarn carrier 10—*a* in a manner similar to that employed in connection with the embodiment shown in Figure 7. Thus, the prongs 33 of the key 30 may be inserted diagonally within the rectangular opening 40 and the key may then be turned to bring the prongs 33 to positions directly opposite each other, thereby spreading the jaws 34 and 35 apart somewhat. The thread-guide tube 27 may then be inserted between the upper and lower gripping edges of said jaws 34 and 35; the innermost end of the tube 27 being poistioned against the outer edge of the finger 14. The key 30 is then rotated in either direction again to move the prongs 33 to a diagonal position, thus permitting the jaws 34 and 35 to close by reason of their natural resiliency, thereby to grip the tube 27 at upper and lower portions thereof. The key 30 may then be removed.

The thread 26 may then be positioned within the groove 23, the wire 25, and the tube 27 in the same manner as described hereinabove with respect to Figure 7.

Thus, in the embodiment shown in Figures 3 and 4, the thread-guide tube 27, instead of being gripped continuously along the greatest portion of its axial extent, is gripped only at upper and lower portions thereof. It has been found that this embodiment may sometimes be preferred since it affords a firmer grip upon the thread-guide tube, that is, the gripping force of the gripping jaws is concentrated at relatively smaller areas of contact with the tube 27 and, therefore, said gripping force is intensified at these points of contact and the tube is held more firmly and is less likely to become loose upon continued use of the carrier.

As can readily be seen, the yarn carrier of my present invention affords a high degree of gripping force by reason of the relatively long lines of bifurcation which give a high degree of resiliency to the gripping jaws. At the same time, the yarn carrier of my present invention provides a support for the thread at the bend zone of the carrier and prevents fraying or tearing or weakening of the thread which would otherwise occur if said thread were not so supported; as, for example, if no finger 14 were provided and the thread were therefore to assume a sharply angled configuration between the innermost end of the thread-guide tube 27 and the upper surface of the body 11.

The yarn carrier is preferably made of steel but may be made of any other suitable form-retaining material having the necessary resiliency.

The concave gripping edges 21 and 22 of Figures 1 and 2, or 36, 37, 38 and 39 of Figures 3 and 4 may be provided with transverse or annular corrugations or with fine screw-threads to give a firmer grip upon the thread-guide tube 27.

While, in the drawing, a single thread-guide tube 27 is shown, I may provide the yarn carrier of my present invention with a plurality of thread-guide tubes having different internal diameters so that each yarn carrier may be used interchangeably with different size or different gauge machines by merely employing the proper size yarn-guide tube.

Thus, in old-type yarn-carriers, a single carrier could hold only a single size yarn-guide finger and could therefore be used only on a single gauge machine and with a single gauge thread. In the past, therefore, it was necessary to use different yarn carriers on different gauge machines, and such carriers could not be used interchangeably. As a result of my present invention, it is possible to employ a single yarn carrier on many different size machines, as, for example, on 39, 42, 45, 48, 51, 54 and 57 gauge machines, by merely inserting the appropriate size yarn-guide tube.

While the yarn-guide tube 27 shown in Figures 1, 2, 3, 4 and 7 is cylindrical throughout, it is possible to employ a yarn-guide tube 41 shown in Figure 8 which has a generally cylindrical body portion 42 and a tapered outermost tip 43 from which the thread is paid out.

I may also provide a yarn-guide tube which has an oval cross-section in place of the circular cross-section shown in Figures 2 and 4. Thus, in Figure 9, I have shown a cross-sectional view

similar to that of Figure 2 but in which a yarn-guide tube 44 is provided having a generally oval-shaped or elliptical cross-section; the major axis of the ellipse being generally in the plane of the carrier and the minor axis of the ellipse being generally transverse of the carrier. Where such an oval-shaped tube 44 is used it may also be provided with a tapered tip as shown in Figure 8, and said tip may have its outer end of the same general configuration as the body portion of the tube, or said outer end may be circular in cross-section, or said outer tip may be oval-shaped or elliptical in cross-section with the major and minor axes reversed with respect to those of the body portion of the tube; that is, with the major axis transverse of the carrier and with the minor axis generally in the plane of the carrier.

Another embodiment of the present invention is shown in Figure 10 in which the yarn carrier is designated generally by the numeral 10—*b*. Yarn carrier 10—*b* is generally of the same construction as carrier 10—*a* except that it employs a thread-guide tube 45 which is tapered throughout its entire length; that is, the tube 45, instead of being fully cylindrical (as is the tube 27) or with a cylindrical body portion and a tapered tip (as is the tube 41) is made conical, preferably with a slight uniform taper throughout its entire axial dimension.

Carrier 10—*b* is provided with spring-jaws 46 and 47. Said spring-jaws 46 and 47 are provided with upper and lower concave tube-gripping surfaces; the jaw 46 having the upper gripping surface 48 and the lower gripping surface 49, and the jaw 47 having the upper gripping surface 50 and the lower gripping surface 51. A generally rectangular key opening 53 is provided in said spring-jaws 46 and 47 intermediate the upper and lower tube-gripping surfaces thereof.

Gripping surfaces 48, 49, 50 and 51 are formed with a slight taper corresponding to the taper of the thread-guide tube 45 so that when said tube 45 is inserted within the carrier 10—*b* with its inner wider end 52 abutting the thread-guide finger 14, the gripping surfaces of the spring-jaws will grip the upper and lower portions of the tube 45 accurately and with more or less uniform pressure. That is, a relatively larger conical clearance is maintained between the upper gripping surfaces 48 and 50 while a relatively smaller conical clearance is maintained between the lower gripping surfaces 49 and 51.

By reason of the downward taper of the tube 45 and of the gripping surfaces of the spring-jaws 46 and 47, said tube 45 is held more firmly against downward and outward displacement or slipping than is the case with the cylindrical tubes and gripping surfaces employed in carriers 10 and 10—*a*. While the degree of taper of the tube 45 may be varied, said tube is preferably made with a relatively small degree of taper; the taper being exaggerated in Figure 10 merely for the purpose of clearer illustration.

It is also possible to have a relatively slight degree of taper upon the main, gripped portion of the thread-guide tube and to have a greater degree of taper upon the tip or pay-out end corresponding generally to the tip 43 shown in Figure 8.

While in Figure 10 there is shown the yarn carrier 10—*b* which is similar to 10—*a* except that the tube-gripping surfaces of the spring-jaws have been modified to accommodate a tube which is tapered throughout, it is also possible to modify the yarn carrier 10 of Figure 1 in the same way. That is, the concave gripping surfaces 21 and 22 of carrier 10 could be made with a slight downward or outward taper to accommodate the tapered thread-guide tube 45.

The relatively large key-opening shown in Figures 3 and 10 has the advantage of permitting greater visibility underneath the yarn carrier. That is, in present-day knitting machines, yarn carriers are positioned in groups of two or three or more, one directly above the other with very slight clearance therebetween. These carriers must be positioned accurately with respect to each other with the clearance correctly established. When carriers having the large key-openings shown in Figures 3 and 10 are employed, it is possible to observe the position of the carriers underneath and thus it is a much more simple operation to set the carriers at the proper clearance.

While the yarn carriers of the present invention have been described in connection with a knitting machine, their use with other types of textile machines is contemplated and is within the scope of the present invention. Thus, the yarn carriers of the present invention may be used equally well in spinning machines, for example.

The four-point grip of the divided spring-jaws shown in Figures 3 and 10 may be employed equally well to hold other guiding means. For example, as shown in Figure 11, spring-jaws 55 and 56 may be employed to provide a four-point grip upon a yarn-guide ring 57 through which the yarn or thread 26 passes in a plane generally perpendicular to the plane of the jaws 55 and 56.

The present invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof, and it is therefore desired that the present embodiments be considered in all respects as illustrative and not restrictive, reference being had to the appended claims rather than to the foregoing description to indicate the scope of the invention.

Having thus described the invention, what is hereby claimed as new and desired to be secured by Letters Patent is:

1. A yarn carrier having its discharge end bifurcated generally longitudinally to form juxtaposed tube-gripping spring-jaws, the portion of the carrier including said spring-jaws being bent into a plane different from that in which the rest of the carrier is disposed, and a yarn-guide finger generally in the zone of the bend and intermediate the bifurcated portion; said spring-jaws providing tube-gripping surfaces adjacent to said finger and adjacent to the discharge tip of said carrier.

2. A yarn carrier having a body portion and having a discharge end portion inclined at an angle to said body portion, said discharge end portion being formed integrally with said body portion and being connected therewith by a relatively small bend-zone, said discharge end portion having a pair of juxtaposed spring-jaws extending beyond said bend-zone, a yarn-guide finger disposed intermediate said spring-jaws generally at said bend-zone, and separated from at least one of said spring-jaws, said spring-jaws having opposed tube-gripping surfaces extending from said yarn-guide finger to the discharge end of said carrier.

3. A yarn carrier having a body portion and having a discharge end portion inclined at an angle to said body portion, said discharge end

portion being formed integrally with said body portion and being connected therewith by a relatively small bend-zone, said discharge end portion having a pair of juxtaposed spring-jaws extending beyond said bend-zone, a yarn-guide finger disposed intermediate said spring-jaws generally at said bend-zone, and separated from at least one of said spring-jaws, said spring-jaws providing juxtaposed tube-gripping surfaces adjacent to said finger and providing additional juxtaposed tube-gripping surfaces adjacent to the discharge end of said carrier.

4. A yarn carrier having its discharge end bifurcated generally longitudinally to form spring-jaws having opposed tube-gripping surfaces, the portion of the carrier including said spring-jaws being bent into a plane different from that in which the rest of the carrier is disposed, a yarn-guide finger generally in the zone of the bend and intermediate said spring-jaws, said finger extending to the tube-gripping surfaces of said spring-jaws, and means for permitting lateral separation of said spring-jaws.

5. A yarn carrier having its discharge end bifurcated generally longitudinally to form integral juxtaposed spring-jaws having opposed concave tube-gripping surfaces, a thread-guide tube removably held between said tube-gripping surfaces having a generally uniform cross-section substantially throughout the portion thereof gripped by said jaws, said spring-jaws having key recesses therein on either side of said tube, and adapted to receive a key-like device for spreading said spring-jaws apart to permit insertion or removal of said tube.

6. A yarn carrier having its discharge end bifurcated generally longitudinally to form integral juxtaposed spring-jaws having opposed tube-gripping surfaces, a yarn-guide finger intermediate said spring-jaws and extending to the inner end of said tube-gripping surfaces, a yarn-guide tube removably held between said tube-gripping surfaces with its inner end abutting against said yarn-guide finger, said spring jaws having key recesses therein on either side of said tube to permit spreading of said jaws for insertion and removal of said tube.

7. A yarn carrier having its discharge end bifurcated generally longitudinally to form juxtaposed spring-jaws having opposed tube-gripping surfaces, said discharge end having transversely tapered side edges thinned to not more than half the thickness of the body of the carrier, the portion of the carrier including said spring-jaws being bent into a plane different from that in which the rest of the carrier is disposed, said spring-jaws having key recesses formed therein adjacent said tube-gripping surfaces, and a yarn-guide finger disposed intermediate said spring-jaws generally in the bend zone thereof and being separated from at least one of said spring jaws.

8. A yarn carrier having its discharge end bifurcated generally longitudinally to form juxtaposed spring-jaws having opposed tube-gripping surfaces, the portion of the carrier including said spring-jaws being bent into a plane different from that in which the rest of the carrier is disposed, a yarn-guide finger generally in the zone of the bend, and intermediate said spring-jaws, said finger having a groove extending generally longitudinally thereon, and a retaining loop carried by said finger and spanning said groove.

9. A yarn carrier having its discharge end bifurcated generally longitudinally to form juxtaposed spring-jaws having opposed tube-gripping surfaces, the portion of the carrier including said spring-jaws being bent into a plane different from that in which the rest of the carrier is disposed, a yarn-guide finger generally in the zone of the bend, and intermediate said spring-jaws, said finger having a groove extending generally longitudinally thereon, a retaining loop carried by said finger and spanning said groove, and a yarn-guide tube removably held between said tube-gripping surfaces and having its inner end abutting said yarn-guide finger.

10. A yarn carrier having its discharge end bifurcated generally longitudinally to form juxtaposed spring-jaws having opposed tube-gripping surfaces, the portion of the carrier including said spring-jaws being bent into a plane different from that in which the rest of the carrier is disposed, a yarn-guide finger generally in the zone of the bend, and intermediate said spring-jaws, said finger having a groove extending generally longitudinally thereon, a retaining loop carried by said finger and spanning said groove, a yarn-guide tube removably held between said tube-gripping surfaces and having its inner end abutting said yarn-guide finger, and means carried by said spring-jaws laterally of said tube to permit spreading of said spring-jaws.

11. A yarn carrier having its discharge end bifurcated generally longitudinally to form juxtaposed spring-jaws, the portion of the carrier including said spring-jaws being bent into a plane different from that in which the rest of the carrier is disposed, a yarn-guide finger generally in the zone of the bend and intermediate said spring-jaws, a tapered yarn-guide tube removably gripped by said spring-jaws with its wider end abutting said yarn-guide finger, said spring-jaws having opposed concave tube-gripping surfaces adjacent to said yarn-guide finger and adjacent to the outer ends of said spring-jaws, said tube-gripping surfaces being tapered to conform to the juxtaposed portions of said tapered yarn-guide tube.

12. A yarn carrier having one end bifurcated generally longitudinally to form juxtaposed spring-jaws having opposed gripping surfaces, said spring-jaws having recessed intermediate portions thereby to provide a plurality of gripping surfaces upon each of said spring-jaws, and a yarn guide member removably held between said spring-jaws and gripped at more or less uniformly distributed points by said plurality of gripping surfaces, said recessed portions providing means permitting spreading of said spring-jaws for insertion and removal of said yarn-guide member.

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