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MECHANICAL CONNECTOR WITH CABLE RETENTION FEATURE

Abstract

A fiber optic connector includes a body portion and a coupling portion configured to be coupled with the body portion. The body portion is configured to receive a fiber optic cable, and the coupling portion is configured to radially compress a portion of the body portion onto an outer jacket of a fiber optic cable to clamp the outer jacket and to prevent relative axial movement between the fiber optic cable and the connector when the coupling portion is coupled with the body portion so as to mechanically couple the body portion with the fiber optic cable without having to use a crimping tool.

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Background/Summary

CROSS-REFERENCE TO RELATED APPLICATION [0001] This application is a continuation of U.S. Nonprovisional application Ser. No. 18/109,698 filed on Feb. 14, 2023, pending, which is a continuation of U.S. Nonprovisional application Ser. No. 17/118,600 filed Dec. 10, 2020, now U.S. Pat. No. 11,579,380, which claims the benefit of U.S. Provisional Application No. 62/945,966, filed Dec. 10, 2019, expired, the disclosures of which are hereby incorporated by reference herein in their entireties.

TECHNICAL FIELD

[0002] The present invention relates generally to connectors for coupling a fiber optic cable to a fiber optic connector. More particularly, the present invention relates to mechanical connectors that are configured to be secured to a fiber optic cable via compression and to be coupled with a fiber optic connector.

BACKGROUND

[0003] Fiber optical communication systems typically use a network of fiber optic cables to transmit large volumes of data. Typical fiber optic connectors include a ferrule that supports an end portion of an optical fiber. When two fiber optic connectors are interconnected, end faces of the ferrules, on each connector, directly oppose one another. Thus, the optical fibers, which are supported by each ferrule, are also directly opposed to each other. Furthermore, springs in each connector bias the optical fibers towards each other when the connectors are in this interconnected state. An optical signal can then be transmitted from one optical fiber to the other optical fiber.

[0004] Conventional fiber optical connectors are either fastened to a Kevlar strengthening member that is included in the fiber optic cable or crimped onto a crimp ring through the use of a crimp tool. Attaching the connector to the Kevlar strengthening member creates a relatively weak connection that is easy to bend. Further, some types of fiber optic cable, such as Miniflex® fiber cable, contains less Kevlar than other standard jumper cord, which could result in a less reliable connection under load.

[0005] Crimp-type fiber optic connectors are not convenient because they require every installer to carry a specialized tool for crimping the connector onto the cable. Also, use of a crimping tool can lead to a poor connection due to potential installer error.

[0006] It may be desirable to provide a connector that overcomes one or more of the aforementioned disadvantages of conventional fiber optics connectors. For example, it may be desirable to provide a connector configured to couple a fiber optic cable with a fiber optic connector with increased connection strength and where the risk of craft error is reduced.

SUMMARY

[0007] According to various aspects of the present disclosure, a connector includes a body including a threaded portion and a cap configured to be threadedly coupled with the threaded portion of the body. The body is configured to receive a fiber optic cable therein, an inner surface of the body includes an annularly-extending ridge that protrudes radially inward, the body is

configured to be radially compressed on a jacket of the fiber optic cable when the cap is threadedly coupled with the body, and the annularly-extending ridge is configured to engage a circumferential groove in the fiber optic cable to prevent relative axial movement between the fiber optic cable and the connector. The body includes a forward portion and a rearward portion, the threaded portion being between the forward and rearward portions and including threads on an external surface of the body, the forward portion being configured to be coupled with a fiber optic connector sub-assembly, the rearward portion of the body including a plurality of fingers that extend from a tubular wall of the rearward portion in a rearward direction away from the threaded and forward portions. The forward portion of the cap includes internal threads that are sized and arranged to be threadedly coupled with the threads on the external surface of the body, the rearward portion of the cap includes a tapered inside diameter portion that tapers radially inward in the rearward direction from the internal threads, and the tapered inside diameter portion is configured to engage and radially compress the plurality of fingers toward the outer jacket of the fiber optic cable when the cap is threadedly coupled with the body such that the fiber optic cable is gripped by the body.

[0008] In some aspects, the connector includes a crimp sleeve. A jacket of the fiber optic cable is received between the body and the crimp sleeve. The crimp sleeve includes an elongated tubular member terminating at a forward flanged head portion, and the flanged head portion includes a first flange portion rearward of a second flange portion, each of the first and second flange portions including an annular flange, with the second flange portion having a greater outer dimension than the first flange portion, the first flange portion including at least one flattened region on its outer surface. The tubular wall of the rearward portion of the body includes an annular notch configured to receive the first flange portion of the crimp sleeve, and the notch includes one or more flattened regions sized and arranged to receive the one or more flattened regions of the first flange portion of the crimp sleeve such that the crimp sleeve does not rotate relative to the body when the first flange portion is received by the notch.

[0009] According to various aspects of the present disclosure, a connector includes a body including a threaded portion, and a cap configured to be threadedly coupled with the threaded portion of the body. The body is configured to receive a fiber optic cable therein, an inner surface of the body includes an annularly-extending ridge that protrudes radially inward, the body is configured to be radially compressed on a jacket of the fiber optic cable when the cap is threadedly coupled with the body, the annularly-extending ridge is configured to engage a circumferential groove in the fiber optic cable to prevent relative axial movement between the fiber optic cable and the connector, the rearward portion of the cap includes a tapered inside diameter portion that tapers radially inward in the rearward direction from the internal threads, and the tapered inside diameter portion is configured to engage and radially compress the plurality of fingers toward the outer jacket of the fiber optic cable when the cap is threadedly coupled with the body such that the fiber optic cable is gripped by the body.

[0010] In various aspects, the body includes a forward portion and a rearward portion, the threaded portion being between the forward and rearward portions and including threads on an external surface of the body, the forward portion being configured to be coupled with a fiber optic connector sub-assembly, the rearward portion of the body including a plurality of fingers that extend from a tubular wall of the rearward portion in a rearward direction away from the threaded and forward portions. The forward portion of the cap includes internal threads that are sized and arranged to be threadedly coupled with the threads on the external surface of the body.

[0011] In some aspects, the connector includes a crimp sleeve. A jacket of the fiber optic cable is received between the body and the crimp sleeve. The crimp sleeve includes an elongated tubular member terminating at a forward flanged head portion, and the flanged head portion includes a first flange portion rearward of a second flange portion, each of the first and second flange portions including an annular flange, with the second flange portion having a greater outer dimension than the first flange portion, the first flange portion including at least one flattened region on its outer

surface. The tubular wall of the rearward portion of the body includes an annular notch configured to receive the first flange portion of the crimp sleeve, and the notch includes one or more flattened regions sized and arranged to receive the one or more flattened regions of the first flange portion of the crimp sleeve such that the crimp sleeve does not rotate relative to the body when the first flange portion is received by the notch.

[0012] According to various embodiments of the disclosure, a connector includes a body and a cap configured to be threadedly coupled with the body. The body is configured to receive a fiber optic cable therein and to be coupled with a sub-assembly of a fiber optic connector, an inner surface of the body includes an annularly-extending ridge that protrudes radially inward, and the body is configured to be radially compressed on a jacket of the fiber optic cable when the cap is threadedly coupled with the body.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] FIG. 1 is an exploded perspective view of an exemplary connector in accordance with various aspects of the disclosure.

[0014] FIGS. 2A-2D are perspective, side, side cross-sectional (along line II-II), and end views, respectively, of the body of the exemplary connector of FIG. 1.

[0015] FIGS. 3A-3D are perspective, side, side cross-sectional (along line III-III), and end views, respectively, of the cap of the exemplary connector of FIG. 1.

[0016] FIGS. 4A-4D are perspective, side, side cross-sectional (along line IV-IV), and end views, respectively, of the crimp sleeve of the exemplary connector of FIG. 1.

[0017] FIG. 5 is a side cross-sectional view of the exemplary connector of FIG. 1 assembled with a fiber optic cable.

[0018] FIG. 6 is an exploded perspective view of another exemplary connector in accordance with various aspects of the disclosure.

[0019] FIGS. 7A-7D are perspective, side, side cross-sectional (along line VII-VII), and end views, respectively, of the body of the exemplary connector of FIG. 6.

[0020] FIG. 7E is an enlarged perspective view of a portion of the body of the exemplary connector of FIG. 6.

[0021] FIGS. 8A-8D are perspective, side, side cross-sectional (along line VIII- VIII), and end views, respectively, of the cap of the exemplary connector of FIG. 6.

[0022] FIG. 9 is an exploded perspective view of the exemplary connector of FIG. 6 assembled with a fiber optic cable and a fiber optic connector.

[0023] FIG. 10 is a side cross-sectional view of the exemplary connector of FIG. 6 assembled with a fiber optic cable and a fiber optic connector.

DETAILED DESCRIPTION OF EMBODIMENTS

[0024] FIGS. 1-5 illustrate an exemplary connector **100** in accordance with various aspects of the disclosure. The connector **100** is configured for use with a fiber optic cable **190**, such as, for example, a Miniflex® fiber cable, as illustrated in FIG. 5. Of course, the connector **100** may be used with any fiber optic cable.

[0025] Referring to FIG. 1, the connector **100** includes a body **110**, a cap **140**, and a crimp sleeve **170**. The body **110** is configured to be coupled with a fiber optic connector sub-assembly, such as, for example, the fiber optic connector sub-assembly **682** illustrated in FIGS. 9 and 10. The fiber optic connector sub-assembly **682** may be a sub-assembly of a Subscriber Connector (SC connector), a Lucent Connector (LC connector), a Straight Tip Connector (ST connector), or the like.

[0026] Referring now to FIGS. 2A-2D, the body **110** includes a forward portion **112**, a rearward

portion **114**, and a threaded portion **116** between the forward and rearward portions **112**, **114**. The forward portion **112** is configured to be coupled with the fiber optic connector subassembly, as described in more detail below. The threaded portion **116** includes threads **130** on an external surface **132**. The rearward portion **114** includes a plurality of fingers **120** that extend from a tubular wall portion **122** of the rearward portion **114** in a rearward direction away from the threaded and forward portions **116**, **112**.

[0027] In the embodiment illustrated in FIGS. 1-5, the plurality of fingers **120** are defined by keyhole-shaped cutouts **128** at a rearward end of the rearward portion **114** of the body **110**. Although the embodiment of FIGS. 1-5 includes a rearward portion **114** having four fingers **120**, it should be understood that in some embodiments the rearward portion **114** may include two fingers or three fingers or more than four fingers. One or more of the plurality of fingers **120** may include an annularly-extending ridge **124** that protrudes radially inward from an inner surface **126** of the one or more fingers **120**.

[0028] Referring now to FIGS. 3A-3D, the cap **140** includes a forward portion **142** and a rearward portion **144**. The forward portion **142** includes internal threads **146** (FIG. 3C) and an exterior surface that may include one or more gripping features **148**, for example, raised ribs, grooves, knurls, and/or the like. The rearward portion **144** may include an outer surface **158** having one or more barbs **160** configured to receive and to help retain a boot **192**, as illustrated in and described with respect to FIG. 5. The internal threads **146** are sized and arranged to be threadedly coupled with the threads **130** on the external surface **132** of the body **110**.

[0029] Referring to FIGS. 4A-4D, the crimp sleeve **170** includes an elongated tubular member **172** terminating at a forward flanged head portion **174**. In the embodiment shown in FIGS. 4A-4C, the flanged head portion **174** includes a first flange portion **176** rearward of a second flange portion **178**. Each of the first and second flange portions **176**, **178** includes an annular flange, with the second flange portion **178** having a greater outer dimension in a radial direction than the first flange portion **176**. Also, the first flange portion **176** includes at least one flattened region **180** on its outer surface. The illustrated embodiment includes two flattened regions **180** but may include one flattened region or more than two flattened regions in some embodiments.

[0030] Referring again to FIG. 2C, the tubular wall **122** of the rearward portion **114** of the body **110** includes a first inside diameter $d1$ adjacent the fingers **120**. The body **110** includes a flange portion **136** that extends radially inward from an inner surface of the tubular wall **122** of the rearward portion **114** and the threaded portion **116**. That is, the flange portion **136** extends axially from the rearward portion **114** into the threaded portion **116**. The flange portion **136** has a second inside diameter $d2$ that is smaller than the first inside diameter $d1$. A forward end of the flange portion **136** includes a notched portion **138** sized and arranged to receive the first flange portion **176** of the crimp sleeve **170**. That is, the notched portion **138** has a third inside diameter $d3$ that is larger than the second inside diameter $d2$, but smaller than the first inside diameter $d1$. The notched portion **138** includes one or more flattened regions **139** (the same number as the number of flattened regions **180** on the first flange portion **176** of the crimp sleeve **170**) sized and arranged to receive the one or more flattened regions **180** of the first flange portion **176** of the crimp sleeve **170** such that the crimp sleeve **170** cannot rotate relative to the body **110** when the first flange portion **176** is received by the notched portion **138**. The threaded portion **116** of the body **110** includes a fourth inside diameter $d4$ rearward of the inward flange **136** and the notched portion **138**. The fourth inside diameter $d4$ is greater than the second and third inside diameters $d2$, $d3$ and may be the same as, larger than, or smaller than the first inside diameter $d1$.

[0031] Referring now to FIG. 3C, the rearward portion **144** of the cap **140** includes a tapered inside diameter portion **150** that tapers radially inward in the rearward direction from the internal threads **146** to a middle region **152** of the rearward portion **144**. The inside diameter of the cap from the middle region **152** to the rearward end **154** of the rearward portion remains substantially constant, allowing for manufacturing tolerances that may lead to a small taper of, for example, about 1° . The

middle region **152** may include a rounded transition **156** between the tapered inside diameter portion **150** and the substantially constant diameter portion. As illustrated, the inner diameter of the portion of the cap **140** extending from the middle region **152** to the rearward end **154** of the rearward portion **144** is less than an outer diameter of the fingers **120**, such that the cap **140** is configured to compress the fingers **120** radially inward when the cap **140** is threadedly coupled with the body **110**.

[0032] In use, the elongated tubular member **172** of the crimp sleeve **170** is inserted into the forward portion **112** of the body **110** until the first flange portion **176** is received by the notch **138** of the inward flange **136** of the body **110**. The one or more flattened regions **180** of the first flange portion **176** of the crimp sleeve **170** are aligned with and received by the one or more flattened regions **139** of the inward flange **136** such that the crimp sleeve **170** cannot rotate relative to the body **110**. As shown in FIG. 5, the elongated tubular member **172** extends through the inward flange **136** and through the threaded and rearward portions **116**, **114** of the body **110**. In some aspects, the tubular member **172** may extend axially outward from the rearward portion **114** of the body **110**.

[0033] In order to attach the connector **100** with a fiber optic cable **190**, the boot **192** is slipped over an outer jacket **196** and an optical fiber **194** at an end **198** of the fiber optic cable **190** and moved over the fiber optic cable **190** in a direction away from the end **198**. Next, the cap **140** is slipped over the outer jacket **196** and the optical fiber **194** at the end **198** of the fiber optic cable **190** with the rearward portion **144** of the cap **140** nearer to the boot **192**, and the cap **140** is moved over the fiber optic cable **190** in the direction away from the end **198**. Then, an optical fiber **194** (not shown in FIG. 5) and the jacket **196** of the fiber optic cable **190** are fed into the rearward portion **114** of the body **110** and through the crimp sleeve **170** from the rear direction to the forward direction. The optical fiber **194** is fed out the forward portion **112** of the body **110** so that the fiber **194** can be terminated with the fiber optic sub-assembly **182**.

[0034] The end **198** of the outer jacket **196** of the fiber optic cable **190** is inserted into the rearward portion **114** of the body **110** to an axial position such that the axial groove **199'** of the outer jacket **196** of the fiber optic cable **190** that is nearest the end **198** is aligned with the one or more ridges **124** of the fingers **120** of the body **110**. It should be understood that the one or more ridges **124** may be spaced from the rearward end of the flange portion **136** by a distance that is substantially the same as a distance between successive grooves **199** in the outer jacket **196** such that the end **198** can be defined by a groove **199** and the one or more ridges **124** are aligned with the axial groove **199'** nearest the end **198**.

[0035] It should also be understood that the rearward portion **114** of the body **110** may have a length sized such that the inner surface of the rearward portion **114** may have a second annular ridge (not shown) extending radially inward and spaced from the one or more ridges **124** such that the second annular ridge and the one or more ridges **124** may engage two successive grooves **199** in the outer jacket **196** of the cable **190**.

[0036] Next, the cap **140** is moved along the fiber optic cable **190** in the forward direction toward the body **110** until the internal threads **146** of the cap **140** begin to engage the external threads **130** of the body **110**. The cap **140** is then rotated relative to the body **110**. As the cap **140** is rotated relative to the body **110** to threadedly couple the cap **140** with the body **110**. As the cap **140** is rotated relative to the body **110**, the tapered inside diameter portion **150** of the **140** cap engages and radially compresses the fingers **120** of the body **110** onto the outer jacket **196** adjacent the end **198** of the fiber optic cable **190**. The one or more ridges **124** of the fingers **120** are configured to be received by the circumferential groove **199'** in the cable **190**, as shown in FIG. 5, to prevent relative axial movement between the fiber optic cable **190** and the connector **100**, for example, under a load condition.

[0037] If the fiber optic cable **190** is not a grooved cable or if the annularly-extending ridges **124** on the fingers **120** do not align with a groove **199**, the annularly-extending ridges **124** can still dig

into the outer jacket **196** to help retain the fiber optic cable **190** in the connector **100** under a load condition. The cap **140** is rotated relative to the body **110** until the cap **140** and body **110** are tightened to one another by the threaded connection. After the cap **140** and the body **110** are tightened to one another, the boot **192** is moved along the cable **190** in the forward direction over the rearward portion **144** of the cap **140** and into engagement with the one or more barbs **160** on the outer surface of the cap **140** such that the boot **192** is retained by the cap **140**.

[0038] The optical fiber **194** that is fed out the forward portion **612** of the body **610** is cut and terminated with the fiber optic connector sub-assembly **182** (FIGS. **9** and **10**) as would be understood by persons skilled in the art. Such cutting and termination may occur in the field, thus resulting in a field-terminated fiber optic connector. The fiber optic connector sub-assembly **182** is coupled with an outer housing **184** (FIGS. **9** and **10**) that is configured to be coupled with a fiber optic port of, for example, a bulkhead adapter, a splitter, or the like. The outer housing **184** may be configured as an SC connector, an LC connector, an ST connector, or the like. For example, the housing may be configured as a Belden® SC connector, LC connector, ST connector, or the like [0039] FIGS. **6-10** illustrate another exemplary connector **600** in accordance with various aspects of the disclosure. The connector **600** is configured for use with a fiber optic cable **190**, such as, for example, a Miniflex® fiber cable, as illustrated in FIGS. **9** and **10**. Of course, the connector **600** may be used with any fiber optic cable.

[0040] Referring to FIG. **6**, the connector **600** includes a body **610** and a cap **640**. The body **610** is configured to be coupled with a fiber optic connector sub-assembly **682**, as described in more detail below with reference to FIGS. **9** and **10**. The fiber optic connector sub-assembly **682** may be a sub-assembly of an SC connector, an LC connector, an ST connector, or the like.

[0041] Referring now to FIGS. **7A-7D**, the body **610** includes a forward portion **612**, a rearward portion **614**, and a threaded portion **616** between the forward and rearward portions **612**, **614**. The forward portion **612** is configured to be coupled with the fiber optic connector sub-assembly **682**, as described in more detail below. The threaded portion **616** includes threads **630** on an external surface **632**. The rearward portion **614** includes a plurality of fingers **620** that extend from a tubular wall **622** of the rearward portion **614** in a rearward direction away from the threaded and forward portions **616**, **612**.

[0042] In the embodiment illustrated in FIGS. **6-10**, the plurality of fingers **620** are defined by V-shaped cutouts **628** at a rearward end of the rearward portion **614** of the body **610**. Although the embodiment of FIGS. **6-10** includes a rearward portion **614** having three fingers **620**, it should be understood that in some embodiments the rearward portion **614** may include two fingers or more than three fingers. One or more of the fingers **620** may include an annularly-extending ridge **624** that protrudes radially inward from an inner surface **626** of the one or more fingers **620**. As shown in FIG. **7E**, one or more of the plurality of fingers **620** may include axial ribs **625** extending radially inward from the inner surface **626**. In some embodiments, the ribs **625** may be arranged in a non-axial direction, for example, in a helical configuration.

[0043] Referring now to FIGS. **8A-8D**, the cap **640** includes a forward portion **642** and a rearward portion **644**. The forward portion **642** includes internal threads **646** (FIG. **8C**) and an exterior surface that may include one or more gripping features **648**, for example, raised ribs, grooves, knurls, and/or the like. The rearward portion **644** may include an outer surface **658** having one or more barbs **660** configured to receive and to help retain a boot **692**, as shown in FIGS. **9** and **10** below. The internal threads **646** are sized and arranged to be threadedly coupled with the threads **630** on the external surface **632** of the body **610**.

[0044] Referring again to FIG. **7C**, the tubular wall **622** of the rearward portion **614** of the body **610** includes a first inside diameter **d1'** adjacent the fingers **620**. The body **610** includes a flange portion **636** that extends radially inward from an inner surface of the tubular wall **622** of the rearward portion **614** and the threaded portion **616**. That is, the flange portion **636** extends axially from the rearward portion **614** into the threaded portion **616**. The flange portion **636** has a second

inside diameter d2' that is smaller than the first inside diameter d1'. A rearward end of the flange portion **636** defines a stop portion **638** configured to prevent the jacket **196** of the fiber optic cable **190** from moving through the flanged portion **636** of the body **610** in a rear to forward direction. The threaded portion **616** of the body **610** includes a fourth inside diameter d4' rearward of the inward flange **636**. The fourth inside diameter d4' is greater than the second inside diameter d2' and may be the same as, larger than, or smaller than the first inside diameter d1'.

[0045] Referring now to FIG. **8C**, the rearward portion **644** of the cap **640** includes a tapered inside diameter portion **650** that tapers radially inward in the rearward direction from the internal threads **646** to a middle region **652** of the rearward portion **644**. The inside diameter of the cap from the middle region **652** to the rearward end **654** of the rearward portion remains substantially constant, allowing for manufacturing tolerances that may lead to a small taper of, for example, about 1°. The middle region **652** may include a rounded transition **656** between the tapered inside diameter portion **650** and the substantially constant diameter portion. As illustrated, the inner diameter of the portion of the cap **640** extending from the middle region **652** to the rearward end **654** of the rearward portion **644** is less than an outer diameter of the fingers **620**, such that the cap **640** is configured to compress the fingers **620** radially inward when the cap **640** is threadedly coupled with the body **610**.

[0046] In use, in order to attach the connector **600** with the fiber optic cable **190**, the boot **692** is slipped over the outer jacket **196** and the optical fiber **194** at the end **198** of the fiber optic cable **190** and moved over the fiber optic cable **190** in a direction away from the end **198**. Next, the cap **640** is slipped over the outer jacket **196** and the optical fiber **194** at the end **198** of the fiber optic cable **190** with the rearward portion **644** of the cap **640** nearer to the boot **692**, and the cap **640** is moved over the fiber optic cable **190** in the direction away from the end **198**. Then, the optical fiber **194** and the jacket **196** of the fiber optic cable **190** are fed into the rearward portion **614** of the body **610**. The optical fiber **194** is fed out the forward portion **612** of the body **610** so that the fiber **194** can be terminated with the fiber optic connector sub-assembly **182**.

[0047] The end **198** of the outer jacket **196** of fiber optic cable **190** is inserted into the rearward portion **614** of the body **610** to an axial position such that an axial groove **199'** of outer jacket **196** of the fiber optic cable **190** that is nearest the end **198** is aligned with the one or more ridges **624** of the fingers **620** of the body **610**. It should be understood that the one or more ridges **624** may be spaced from the stop portion **638** by a distance that is substantially the same as a distance between successive grooves **199** in the outer jacket **196** such that the end **198** can be defined by a groove **199** and the one or more ridges **624** are aligned with the axial groove **199'** nearest the end **198**.

[0048] It should also be understood that the rearward portion **614** of the body **610** may have a length sized such that the inner surface of the rearward portion **614** may have a second annular ridge (not shown) extending radially inward and spaced from the one or more ridges **624** such that the second annular ridge and the one or more ridges **624** may engage two successive grooves **199** in the outer jacket **196** of the cable **190**.

[0049] Next, the cap **640** is moved along the fiber optic cable **190** in the forward direction toward the body **610** until the internal threads **646** of the cap **640** begin to engage the external threads **630** of the body **610**. The cap **640** is then rotated relative to the body **610** to threadedly couple the cap **640** with the body **610**. As the cap **640** is rotated relative to the body **610**, the tapered inside diameter portion **650** of the cap **640** engages and radially compresses the fingers **620** of the body **610** onto the outer jacket **196** adjacent the end **198** of the fiber optic cable **190**. The one or more ridges **624** of the fingers **620** are configured to be received by the circumferential groove **199'** in the cable **190**, as shown in FIGS. **9** and **10**, to prevent relative axial movement between the fiber optic cable **190** and the connector **600**, for example, under a load condition.

[0050] If the fiber optic cable **190** is not a grooved cable or if the annularly- extending ridges **624** on the fingers **620** do not align with a groove **199**, the annularly- extending ridges **624** can still dig into the outer jacket **196** to help retain the fiber optic cable **190** in the connector **600** under a load

condition. The cap **640** is rotated relative to the body **610** until the cap **640** and body **610** are tightened to one another by the threaded connection. After the cap **640** and the body **610** are tightened to one another, the boot **692** is moved along the cable **190** in the forward direction over the rearward portion **644** of the cap **640** and into engagement with the one or more barbs **660** on the outer surface of the cap **640** such that the boot **692** is retained by the cap **640**.

[0051] The optical fiber **194** that is fed out the forward portion **612** of the body **610** is cut and terminated with the fiber optic connector sub-assembly **182** as would be understood by persons skilled in the art. Such cutting and termination may occur in the field, thus resulting in a field-terminated fiber optic connector. The fiber optic connector sub-assembly **182** is coupled with an outer housing **184** that is configured to be coupled with a fiber optic port of, for example, a bulkhead adapter, a splitter, or the like. The outer housing **184** may be configured as an SC connector, an LC connector, an ST connector, or the like. For example, the housing may be configured as a Belden® SC connector, LC connector, ST connector, or the like.

[0052] It should be appreciated that the fiber optic connector sub-assembly **182** may be coupled with an end of the forward portion **112**, **612** of the body **110**, **610** of the connector **100**, **600** by any known or conventional means. For example, as shown in FIG. **9**, the forward end **112**, **612** may include a forward-extending flange configured to be received between a pair of flange walls of the sub-assembly **182**. The forward-extending flange may include a forward end having an enlarged transverse dimension such that a notch of the forward-extending flange received the flange walls of the sub-assembly **182** to prevent relative axial movement between the body **112**, **612** and the sub-assembly **182**. The body **112**, **612** may also include one or more openings in the forward portion configured to receive corresponding projections extending outward from the sub-assembly. The forward portion **112**, **612** may also include structures that prevent relative rotation between the body **110**, **610** and the outer housing **184**.

[0053] Although the illustrative embodiments of the present invention have been described herein with reference to the accompanying drawings, it is to be understood that the invention is not limited to those precise embodiments, and that various other changes and modifications may be effected therein by one skilled in the art without departing from the scope or spirit of the invention.

[0054] Various changes to the foregoing described and shown structures will now be evident to those skilled in the art. Accordingly, the particularly disclosed scope of the invention is set forth in the following claims.

Claims

1.-29. (canceled)

30. A fiber optic connector configured to be mechanically coupled with a fiber optic cable without having to use a crimping tool comprising: a body portion including a coupler engaging body portion that is configured to engage a fiber optic cable, and an inner body surface portion that is configured to axially engage a fiber optic cable so as to prevent relative axial movement between the fiber optic cable and the connector; a coupling portion including a body engaging coupler portion that is configured to be coupled with the coupler engaging body portion; wherein the body portion includes a rearwardly extending biasing portion; and wherein the coupling portion includes a coupler-to-cable engagement portion that is configured to engage and radially compress the rearwardly extending biasing portion onto an outer jacket of a fiber optic cable so as to clamp the outer jacket such that the inner body surface portion engages the fiber optic cable when the coupling portion is coupled with the coupler engaging body portion so as to mechanically couple the body portion with the fiber optic cable without having to use a crimping tool.

31. The fiber optic connector of claim 30, wherein the coupler engaging body portion comprises a threaded portion, and the body engaging coupler portion comprises a threaded portion; and wherein the threaded portion of the coupler engagement body portion is configured to be threadedly coupled

with the threaded portion of the body engaging coupler portion.

32. The fiber optic connector of claim 30, further comprising a sleeve portion configured to be insertingly and non-rotatingly received by the body portion.

33. The fiber optic connector of claim 32, wherein the sleeve portion comprises an elongated tubular portion terminating at a forward flanged head portion, and the flanged head portion includes a first flange portion rearward of a second flange portion; wherein each of the first and second flange portions includes an annular flange, the second flange portion has a greater outer dimension than the first flange portion, and the first flange portion includes at least one flattened portion on its outer surface; and wherein the body portion includes an annular notch portion configured to receive the first flange portion of the sleeve portion, and the notch portion includes one or more flattened portions configured to receive the one or more flattened portions of the first flange portion of the sleeve portion such that the sleeve portion does not rotate relative to the body portion when the first flange portion is received by the notch portion.

34. The fiber optic connector of claim 30, further comprising: a connector sub-assembly configured to be coupled with the connector sub-assembly; and a connector housing configured to be coupled with the connector sub-assembly.

35. The fiber optic connector of claim 34, wherein the fiber optic connector housing comprises an SC connector, an LC connector, or an ST connector.

36. A fiber optic connector assembly comprising: a fiber optic cable having a circumferential groove; wherein the fiber optic connector of claim 30 is configured to be coupled with the fiber optic cable; wherein an inner surface portion of the body portion includes an annularly-extending ridge that protrudes radially inward; and wherein the annularly-extending ridge is configured to engage the circumferential groove in the fiber optic cable to prevent relative axial movement between the fiber optic cable and the connector.

37. A fiber optic connector configured to be mechanically coupled with a fiber optic cable without having to use a crimping tool comprising: a body portion including a coupler engaging body portion that is configured to radially engage a connector engaging cable portion of an optical fiber cable so as to restrict relative axial movement between the fiber optic cable and the connector during operation of the connector; a coupling portion including a body engaging coupler portion that is configured to be coupled with the coupler engaging body portion; and wherein the coupling portion includes a body portion compression portion that is configured to radially compress the cable engaging body portion onto the connector engaging cable portion of the optical fiber cable so as to clamp the outer jacket such that a portion of the cable engaging body portion is received in the connector engaging cable portion when the coupling portion is coupled with the coupler engaging body portion so as to mechanically couple the body portion with the fiber optic cable without having to use a crimping tool.

38. The fiber optic connector of claim 37, wherein the coupler engaging body portion comprises a threaded portion, and the body engaging coupler portion comprises a threaded portion; and wherein the threaded portion of the coupler engagement body portion is configured to be threadedly coupled with the threaded portion of the body engaging coupler portion.

39. The fiber optic connector of claim 37, further comprising a sleeve portion configured to be insertingly and non-rotatingly received by the body portion.

40. The fiber optic connector of claim 39, wherein the sleeve portion comprises an elongated tubular portion terminating at a forward flanged head portion, and the flanged head portion includes a first flange portion rearward of a second flange portion; wherein each of the first and second flange portions includes an annular flange, the second flange portion has a greater outer dimension than the first flange portion, and the first flange portion includes at least one flattened portion on its outer surface; and wherein the tubular wall of the rearward portion of the body portion includes an annular notch portion configured to receive the first flange portion of the sleeve portion, and the notch portion includes one or more flattened portions configured to receive the one

or more flattened portions of the first flange portion of the sleeve portion such that the sleeve portion does not rotate relative to the body portion when the first flange portion is received by the notch portion.

41. The fiber optic connector of claim 37, further comprising: a connector sub-assembly configured to be coupled with the connector sub- assembly; and a connector housing configured to be coupled with the connector sub-assembly.

42. The fiber optic connector of claim 41, wherein the fiber optic connector housing comprises an SC connector, an LC connector, or an ST connector.

43. A fiber optic connector assembly comprising: a fiber optic cable having a circumferential groove; wherein the fiber optic connector of claim 37 is configured to be coupled with the fiber optic cable; wherein an inner surface portion of the body portion includes an annularly- extending ridge that protrudes radially inward; and wherein the annularly-extending ridge is configured to engage the circumferential groove in the fiber optic cable to prevent relative axial movement between the fiber optic cable and the connector.
