

Jan. 5, 1971

S. F. BERT
END CONNECTOR

3,551,966

Filed April 1, 1969

2 Sheets-Sheet 1

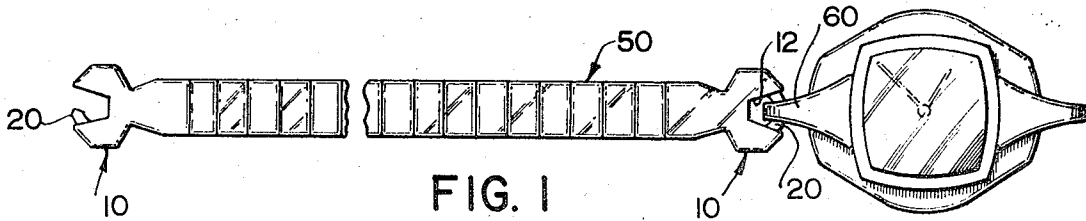


FIG. 1

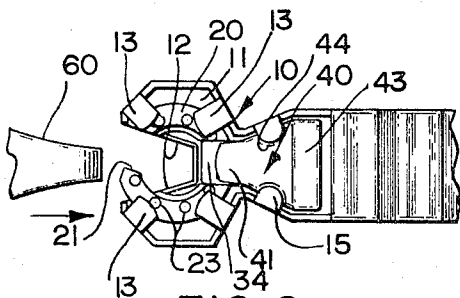


FIG. 2

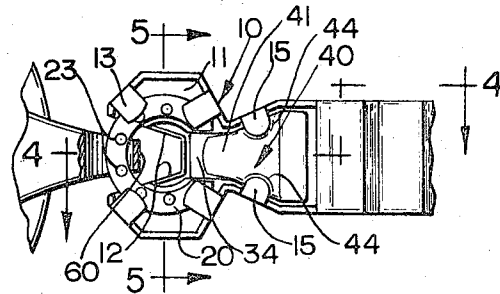


FIG. 3

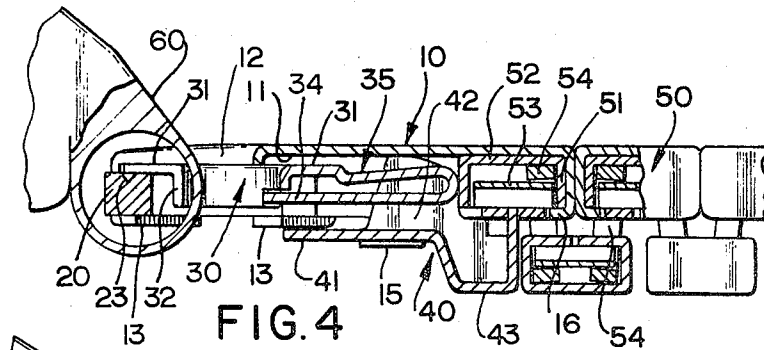


FIG. 4

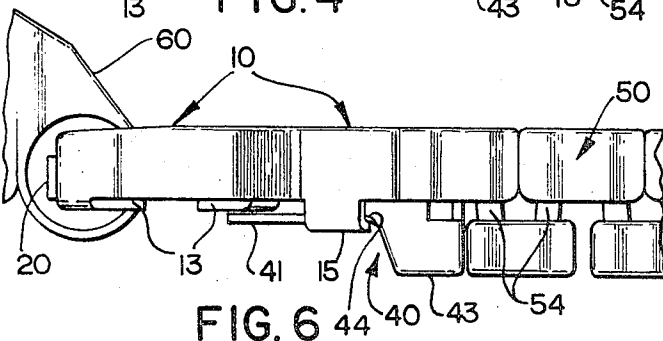


FIG. 6

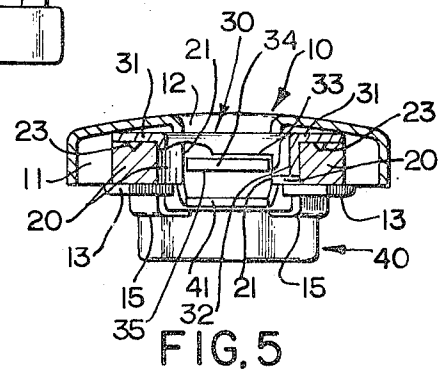
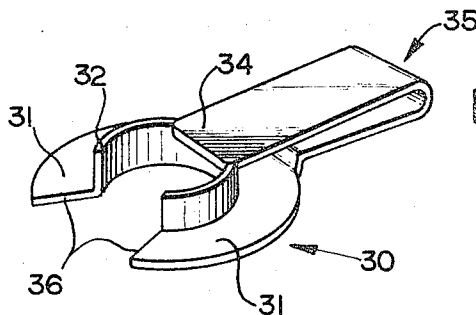


FIG. 7



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2 Sheets-Sheet 2

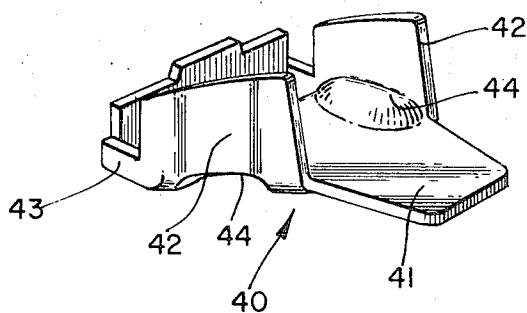


FIG. 8

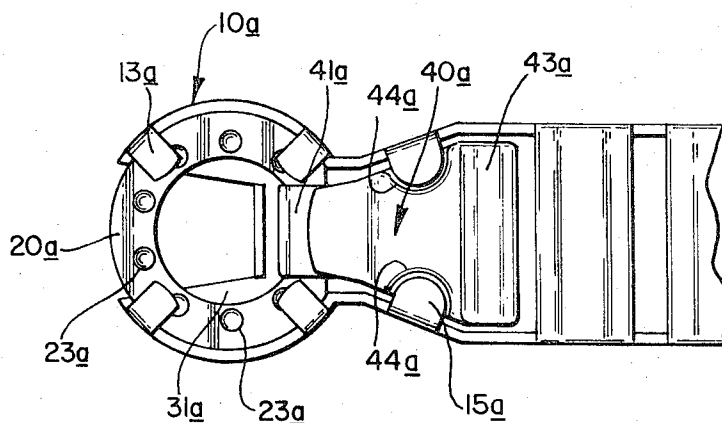


FIG. 9

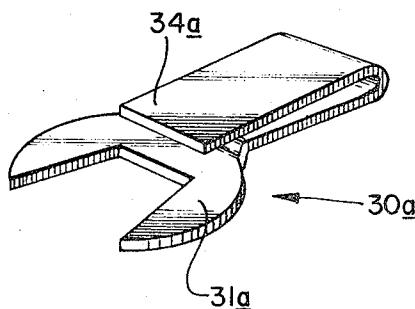


FIG. 10

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3,551,966

END CONNECTOR

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U.S. Cl. 24-265

11 Claims

ABSTRACT OF THE DISCLOSURE

An end connector adapted for use with a wrist watch or similar article having a bail, the connector having a link with a cavity in its lower side, an open ended channel in the top and end walls of the link capable of receiving a bail, a split ring movable about its axis in the cavity, the ends of the ring which are adjacent to the split being spaced apart to form a gap capable of receiving a watch bail when in substantial registry with the channel, and resilient stop means which is automatically urged into the passage of the ring when the ring is moved about its axis to a position in which the gap is out of registry with the channel, whereby a watch bail extending through the opening in the ring is held in the connector when the stop means is positioned in the gap.

BACKGROUND OF THE INVENTION

Most ladies wrist watches have a single bail at each end and they are attached to a watch strap or bracelet by means of an end connector which includes an element adapted to extend through the central opening in the bail.

Bender Pat. 2,680,274 of June 8, 1954 discloses an end connector construction which is now in common use. It includes an end link having a cavity in its lower side and a C-shaped connecting element secured in the cavity in such a way that it may be rotated downwardly so as to expose the gap formed by the ends of the C. In use one arm of the C-shaped element is inserted through the central opening in the bail of the watch and the C-shaped element is rotated upwardly to closed position wherein the bail extends through openings in the end and top walls of the link with the arm of the C-shaped element still passing through the central opening in the bail. The C-shaped element is retained in this closed position by tabs which are bent inwardly from the side or end walls of the link to engage the bottom surface of the C-shaped element.

To remove the bail the tabs are bent outwardly, the C-shaped element is rotated downwardly thereby to expose the gap of the C-shaped element and then the bail is slid outwardly through the gap.

The end link is commonly made of very thin gold filled or stainless steel material and frequently the tabs break off either when they are bent outwardly during removal of the bail or when they are subsequently rebent inwardly during attachment of the bail of another watch. This necessitates replacement of the entire end connector.

Another disadvantage of the C-shaped end connector construction is that if the bail of the watch is too large to be loosely received in either the opening of the top wall or the opening of the end wall of the link, when the jeweler rotates the C-shaped element to closed position he either distorts the wall of the link adjacent to the opening or he cannot rotate the C-shaped element to completely closed position. In the latter case when the jeweler bends the tabs inwardly they are either distorted or weakened or they do not securely retain the C-shaped element in closed position because the C-shaped element is not completely received in the cavity.

Domler Pat. 2,525,066 discloses an end connector construction which includes a link with a cavity in its lower

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side, an open ended channel in the top and end walls of the link capable of receiving a watch bail, a split ring movable about its axis in the cavity, the ends of the ring which are adjacent to the split being spaced apart to form a gap 22 capable of receiving a watch bail when in substantial registry with the channel, and a lip 26 said to be bendable by a tool into the gap of the ring when the ring is moved about its axis to a position in which the gap is beneath the lip and also said to be bendable out of the gap to permit rotation of the ring and release of the watch bail.

To the best of the applicant's knowledge and belief the Domler end connector has not met with any commercial acceptance. One disadvantage of the Domler construction is the difficulty, if not the impossibility, of bending the lip 26 into and out of the gap of the ring.

BRIEF SUMMARY OF THE INVENTION

One object of the invention is to provide a durable end connector for use with a wrist watch or similar article having a bail.

Another object is to provide such an end connector in which it is unnecessary to bend, weaken or permanently deform any tab, lip or other part of the mechanism during insertion or removal of a bail.

A further object is to provide such an end connector, the outline of which when viewed from the top may be provided with a variety of aesthetic appearances without detracting from the operation of the device.

Still another object is to provide such an end connector which is easy to operate by an unskilled person in attaching it to a bail.

A further object is to provide an end connector which intrinsically prohibits the attachment thereto of a bail which is too large to be accommodated by the end connector.

Another object is to provide such an end connector with means for automatically locking the connecting element in closed position.

Another object is to provide such an end connector which can be attached and removed from a bail an unlimited number of times without impairing the integrity or operation of the connector.

A still further object is to provide such an end connector which includes means for preventing deformation of the automatic locking means.

A further object is to provide such an end connector with means which retards movement of the connecting element from open to closed positions and vice versa, thereby facilitating its attachment to a bail.

Another object is to provide such an end connector which includes means for aiding movement of the connecting element from open to closed positions and vice versa.

Still other objects are to provide such an end connector which is economical to manufacture and easy to operate by an unskilled person.

Further objects and advantages of the invention will be apparent to persons skilled in the art from the accompanying drawings and the following description.

In general, the invention comprises an end connector comprising a link with a cavity in its lower side, the link having an open ended channel in its top and end walls capable of receiving a bail of a wrist watch or of a similar article, a split ring movable about its axis in the cavity, the ends of the ring which are adjacent to the split being spaced apart to form a gap capable of receiving the bail when in substantial registry with the open ended channel, and resilient stop means which is automatically urged into the gap when the ring is moved about its axis to a position in which the gap is out of registry with the channel, so that the bail extending

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through the central opening in the ring is held in the end connector when the stop means is positioned in the gap.

In a preferred embodiment the ring is substantially rectangular in cross section, the stop means is a U-shaped flat spring with its opening facing the axis of the ring and arcuate guide means project into the central opening of the ring for guiding it during movement about its axis.

One end of the flat spring is automatically urged into the gap of the ring when the ring is rotated to a position in which the gap is opposite this end of the spring. Further rotation of the ring is prevented until this end of the spring is deflected out of the gap for example by using the point of a pin or the point of another instrument.

The connector also may include an element which is positioned beneath the flat spring and which limits the movement of the end of the spring in a direction away from the ring, thereby preventing overdeflection of the spring when its end is moved outwardly of the gap.

When the ring is rotated from its closed to its open position, the end of the spring is urged against the bottom surface of the ring and it retards such movement of the ring which is desirable to facilitate positioning the ring so that its gap is in substantial registry with the open ended channel in the end and top walls of the link.

Preferably the lower surface of the ring includes a plurality of spaced cavities each of which is adapted to receive the point of an instrument for use in moving the ring about its axis to open and closed positions.

Use of arcuate guide means projecting into the central opening of the ring for guiding it during its movement about its axis permits the use of a variety of outlines for the link when viewed from the top and consequently links may be provided with a variety of aesthetic appearances. This guide means acting against the interior of the ring also strengthens the connector and serves to resist forces tending to pull the ring in a direction outwardly of the end wall of the link.

The arcuate guide means may also be provided with a slot located adjacent to the end of the spring so that the bottom of the slot functions to limit the movement of the end of the spring too far into the gap of the ring.

The ring is held in the link by spaced lugs bent inwardly from the side wall of the link. In use of the connector it is never necessary to bend or otherwise alter these lugs.

In another embodiment the central arcuate guide means is omitted and the side wall of the link is made circular when viewed from the top. In this embodiment the side wall of the link guides the ring during its movement about its axis.

While the split ring is substantially rectangular in cross section in the preferred embodiment, it may have a circular or other cross sectional shape without departing from the scope of the invention as defined in certain of the claims.

While the stop means is a U-shaped flat spring in the preferred embodiment it may be in the form of a simple flat spring or in the form of another type of resilient element without departing from the scope of the invention as defined in certain of the claims.

It will be apparent to persons skilled in the art that the above mentioned elements combine in a novel manner to accomplish the foregoing advantages.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings:

FIG. 1 is an enlarged plan view showing an assembly of wrist watch and bracelet having one end of the bracelet attached to the watch with an end connector embodying this invention;

FIG. 2 is an enlarged plan view looking at the bottom of one of the end connectors of FIG. 1, the ring being shown in open position;

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FIG. 3 is a view like FIG. 2 showing the ring in closed position and the watch bail extending through the central opening of the ring and the channel of the top wall of the link;

FIG. 4 is an enlarged section taken on the line 4—4 of FIG. 3 but with the connector and bracelet inverted;

FIG. 5 is an enlarged section taken on the line 5—5 of FIG. 3 but with the connector and bracelet inverted;

FIG. 6 is an enlarged side elevation of one of the end connectors and several links of a watch bracelet;

FIG. 7 is an enlarged perspective of the combined resilient stop means and the arcuate guide means for the ring;

FIG. 8 is an enlarged perspective view of the element which serves to prevent the end of the resilient stop means from being deflected too far outwardly of the gap of the ring;

FIG. 9 is an enlarged plan view looking at the bottom of another embodiment of the invention; and

FIG. 10 is a perspective view of the resilient stop means of the embodiment of FIG. 9.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The end connector shown in FIGS. 1 to 8 of the drawings consists of four parts, the link 10, the split ring 20, the combined resilient stop means and arcuate guide means for the ring (30, FIG. 7) and means (40, FIG. 8) for limiting the movement of the resilient means in a direction away from the ring.

While the end connector is shown attached to an expansible watch bracelet 50 of the type shown in United States Pat. 2,689,450, issued Sept. 21, 1954 to Stiegele, it may be used with all other types of expansible bracelets as well as with nonexpansible watch bracelets and straps.

The link 10 forms the ornamental surface of the end connector which is exposed to view when the watch and bracelet are worn. It is commonly made of either gold filled or stainless steel stock. The link is provided with a cavity 11 in its bottom which is capable of receiving the combined resilient stop means and arcuate guide means 30 and the split ring 20.

An open ended channel 12 is formed in the end and top walls of the link which is capable of loosely receiving the bail 60 of a watch as shown in FIGS. 1, 3 and 4.

The disc like portion 31 of the element 30 abuts the top wall of the cavity as shown in FIG. 5 and its arcuate flange 32 projects downwardly through the central opening in the split ring 20 and guides the ring during movement thereof about its axis. A slot 33 (FIG. 5) is formed in the flange 32 and this serves to limit movement of the free end 34 of the U-shaped flat spring 35 in a direction toward the portion 31.

The elements 10, 20 and 30 are retained in the cavity by four tabs 13 which are bent inwardly from the side wall of the link 10.

The ends of the ring which are adjacent the split form a gap 21 which is capable of receiving the bail of the watch when it is inserted through the gap as shown in FIG. 2. This gap is slightly wider than the free end 34 of the spring 35 as shown in FIG. 5. Cavities 23 are provided in the bottom surface of the ring 20 for a purpose which will be described later.

The gap 36 in the element 30 may be of substantially the same size as the gap 21 of the ring but preferably it is capable of receiving the bail of the watch when it is inserted through it even when one end of the ring is projecting into the gap 36 as shown in FIG. 2.

The means 40 for limiting the movement of the end 34 of the flat spring in a direction away from the ring consists of a forwardly extending tongue 41, side walls 42 and an extension element 43. The top wall of the element 40 is provided with a pair of cavities 44. This element is attached to the assembly by a pair of tabs 15

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which are bent inwardly from the side walls of the link 10 and extend into the cavities 44 as shown in FIGS. 2 and 3.

As best shown in FIGS. 4 and 5 the end connector is attached to the end link 52 of the bracelet 50 by tabs 16 which are bent inwardly from an end wall of the connector 10 and extend beneath the end wall 51 of the bracelet and link. This link contains a flat spring 53 and a pair of U-shaped connecting elements 54 of the types shown in Pat. 2,689,450.

Suitable means for connecting the end connector to bracelets of other types and to straps and cords will be apparent to persons skilled in the art.

It will be observed from FIG. 3 that there is a space in the cavity of the end connector link between the side wall of the link and the periphery of the split ring so that numerous outlines for end connectors may be used with this end connector.

DESCRIPTION OF THE SECOND EMBODIMENT

The second embodiment, shown in FIGS. 9 and 10, is like the first embodiment except that the outline of the end portion of the end connector is circular when viewed from the top and the element 31a is not provided with an arcuate guide means 32. In this embodiment the side wall 10a serves as the guide means for the ring when it is rotated about its axis.

OPERATION OF THE CONNECTOR

In operation, the split ring is rotated about its axis to the position of FIG. 2. This may be done by inserting the point of a sharp instrument such as a pin in one or more of the cavities 23. Since the end 34 of the flat spring is resiliently urged against the bottom surface of the ring during this rotary movement it retards movement of the spring and it will remain with one end projecting slightly into the end of the channel 12 of the link 10. Then the bail of the watch is inserted through the channel 12 and the gaps in the ring and the element 31 until it is located in the central opening in the ring and the part of the channel 12 which is in the top wall of the link.

Then with the end connector turned to a vertical position the projecting end of the ring serves as an abutment to prevent the bail from falling out of the connector. Using the point of the instrument working against the ring cavities 23 the ring is then rotated about its axis in a clockwise direction looking at FIG. 2. When the gap 21 of the ring reaches a position opposite the end 34 of the spring by its own resiliency the end of the spring automatically snaps into the gap in the ring to the position shown in FIG. 5 and serves to prevent further rotation of the ring thus securely retaining the watch bail in the connector. In this position the end of the flat spring preferably is spaced slightly below the end of the notch 33 of the element 32, but this notch functions to prevent or limit excessive movement of the end of the spring into the gap of the ring.

The arcuate element 32 serves to guide the ring during such movement about its axis.

To return the ring to open position the point of a tool, such as a common pin, is inserted between the lower surface of the element 31 and the upper surface of the end portion 34 of the spring and the end of the spring is deflected downwardly out of the gap of the ring until its surface engages the end portion 41 of the stop element 40. The point of the tool acting against one end of the gap in the ring may then be used to start rotation of the ring about its axis. As soon as the ring has been rotated a very short distance so its gap is out of registry with the end 34 of the spring the point of a tool may be removed and then used with one or more cavities 23 of the ring to rotate the ring to the position of FIG. 2. In that position the watch bail may be removed.

The operation of the embodiment of FIGS. 9 and 10 is the same as the operation of the first embodiment except

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that rotation of the ring about its axis is guided by the side wall of the link rather than by the arcuate member 32 and no stop means is provided for limiting the movement of the end of the flat spring too far towards the element 31a.

Since it is unnecessary to open the tabs 13, 15 after the connector is initially assembled a bail of a watch or other article may be attached and removed from the connector an unlimited number of times without impairing the integrity or operation of the connector.

The end connector is easy to operate by an unskilled person in attaching it to a bail because it is provided with means for automatically locking the ring in closed position.

The end connector also intrinsically prohibits the attachment thereto of a bail which is too large to be accommodated by the open ended channel and gaps of the ring and of elements 31 or 31a.

The end connector also includes means for preventing deformation of the automatic locking means and means for retarding movement of the ring from open to closed positions and vice versa, thereby facilitating its attachment to a bail and means for aiding movement of the connecting element from open to closed positions and vice versa.

The end connector is economical to manufacture and assemble.

In the first embodiment the outline of the end connector when viewed from the top may be provided with a variety of aesthetic appearances without detracting from the operation of the device, and the arcuate guide means 32 which is rigid serves to prevent deforming of the side wall of the link when the ring is pulled towards the end of the channel of the link as the watch and bracelet are slipped on and off the wrist of the wearer thus making a stronger construction than the second embodiment.

While two desirable embodiments of the invention have been shown in the drawings it is to be understood that this disclosure is for the purpose of illustration only and various changes in shape, proportion and arrangement of parts as well as the substitution of equivalent elements from those shown and described herein may be made without departing from the spirit and scope of the invention as set forth in the appended claims.

I claim:

1. An end connector adapted for use with a wrist watch or other article having a bail, said connector comprising:

a link,

means forming a cavity in the bottom of said link,

means forming an open ended channel in said link capable of receiving a bail,

a split ring movable about its axis in said cavity, the ends of said ring which are adjacent the split being spaced apart to form a gap capable of receiving a bail when in substantial registry with said channel, and

resilient stop means which is automatically urged into said gap when the ring is moved about its axis to a position in which said gap is out of registry with said channel,

whereby the bail extending through the central opening in the ring is held in the end connector when said stop means is positioned in said gap.

2. The end connector of claim 1 wherein the stop means comprises a flat spring.

3. The end connector of claim 1 wherein the stop means comprises a flat spring having an end portion which is urged against a surface of said ring except when said end portion is positioned in said ring gap, whereby said spring retards movement of the ring about its axis.

4. The end connector of claim 1 wherein the stop means comprises a flat spring one end of which is urged in a direction towards said ring and the connector also comprises means for limiting the movement of said one end of the spring in a direction away from said ring, thereby

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to prevent overdeflection of the spring when said one end is moved outwardly of said ring gap.

5. The end connector of claim 1 wherein said stop means comprises a U-shaped spring with its open end facing the axis of the ring.

6. The end connector of claim 1 wherein a portion of the stop means resiliently engages a surface of the ring except when the stop means is positioned in said ring gap.

7. The end connector of claim 6 wherein the stop means comprises a U-shaped spring at least one leg of which resiliently engages a surface of the ring except when said leg is positioned in said ring gap.

8. The end connector of claim 6 wherein said ring is substantially rectangular in cross section.

9. The end connector of claim 1 wherein said ring is substantially rectangular in cross section and one surface includes a plurality of spaced cavities each of which is adapted to receive the point of an instrument for use in moving the ring about its axis.

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10. The end connector of claim 1 which also comprises arcuate guide means projecting into the central opening of the ring for guiding the ring during movement thereof about its axis.

11. The end connector of claim 10 wherein said guide means comprises a slot located adjacent to said stop means, the bottom of said slot functioning to limit the movement of the stop means into the gap of the ring.

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U.S. Cl. X.R.

24—232, 241