

01-6752

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF FLORIDA

CIV - GOLD

JOHN MEZZALINGUA ASSOCIATES,)
INC., d/b/a PPC)

Plaintiff,)

vs.)

THOMAS & BETTS CORPORATION,)

Defendant.)

Case No. MAGISTRATE JUDGE
SIMONTON

DEMAND FOR JURY TRIAL

ALBANY COUNTY CLERK
OFFICE
MAY 11 2001 10:30 AM
9

COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff, John Mezzalingua Associates, Inc., d/b/a PPC, for its complaint against
defendant Thomas & Betts Corporation, states as follows:

PARTIES

1. Plaintiff John Mezzalingua Associates, Inc., doing business as PPC (hereinafter
"PPC"), is a corporation organized and existing under the laws of the State of New York, with
its principal place of business at 6176 E. Malloy Rd., in East Syracuse, New York.

2. Upon information and belief, defendant Thomas & Betts Corporation
(hereinafter "Thomas & Betts"), is a corporation organized and existing under the laws of the
State of Tennessee, with its principal place of business at 8155 T and B Boulevard, Memphis,
Tennessee.

JURISDICTION AND VENUE

3. This is a civil action for patent infringement which arises under the patent laws
of the United States, 35 U.S.C. § 100 *et. seq.* This Court has jurisdiction under Title 28
U.S.C. §§ 1331 and 1338(a).

4. Venue is proper in this district under Title 28 U.S.C. § 1400(b), because defendant resides in the Southern District of Florida and has committed acts of infringement in this district.

COUNT I
Infringement of U.S. Patent No. 5,470,257

5. Plaintiff repeats and realleges each and every allegation of paragraphs 1-4, as though fully set forth herein.

6. Plaintiff is the owner by assignment of U.S. Patent No. 5,470,257 (hereinafter “’257 Patent”), which was duly and lawfully issued by the United States Patent and Trademark Office on November 28, 1995, and is entitled “RADIAL COMPRESSION TYPE COAXIAL CABLE END CONNECTOR.” A true and correct copy of the ‘257 patent is attached as Exhibit A and made a part hereof.

7. Defendant Thomas & Betts is engaged in the manufacture and sale of a coaxial connector known as the LRC Snap-N-Seal One-Piece Drop Connector (hereinafter “Snap-N-Seal one-piece connector”).

8. Defendant has infringed, and continues to infringe, the ‘257 patent under 35 U.S.C. § 271(a) by making, using, offering for sale, and/or selling the Snap-N-Seal one-piece connector within the United States and within this judicial district in competition with PPC.

9. Defendant’s acts of infringement of the ‘257 patent have been willful.

10. As a result of defendant’s acts of infringement, plaintiff has suffered grievous and irreparable damage for which plaintiff has no adequate remedy at law. Should defendant continue to infringe the ‘257 patent, plaintiff will suffer further substantial and irreparable injury for which it has no adequate remedy at law.

11. Upon information and belief, defendant will continue its acts of infringement of the '257 patent unless restrained and enjoined by this Court.

COUNT II
Infringement of U.S. Patent No. 5,632,651

12. Plaintiff repeats and realleges each and every allegation of the paragraphs 1-11 as though fully set forth herein.

13. Plaintiff is the owner by assignment of U.S. Patent No. 5,632,651 (hereinafter "'651 Patent"), which was duly and legally issued by the United States Patent and Trademark Office on May 27, 1997, and is entitled "RADIAL COMPRESSION TYPE COAXIAL CABLE END CONNECTOR." A true and correct copy of the '651 patent is attached hereto as Exhibit B and made a part hereof.

14. Defendant has infringed and continues to infringe the '651 patent under 35 U.S.C. § 271(a) by its making, using, offering for sale, and selling its Snap-N-Seal one-piece connector.

15. Defendant's infringement has been willful.

16. As a result of defendant's acts of infringement of the '651 patent, plaintiff has suffered grievous and irreparable damage for which plaintiff has no adequate remedy at law. Should defendant continue to infringe the '651 patent, plaintiff will suffer further substantial and irreparable injury for which it will have no adequate remedy at law.

17. Upon information and belief, defendant will continue its acts of infringement of the '651 patent unless restrained and enjoined by this Court.

PRAYER FOR RELIEF

WHEREFORE, plaintiff respectfully requests that this Court:

A. Enter judgment for plaintiff that U.S. Patent No. 5,470,257 is valid, enforceable and infringed by defendant.

B. Enter judgment for plaintiff that U.S. Patent No. 5,632,651 is valid, enforceable and infringed by defendant.

C. Issue a preliminary and permanent injunction restraining defendant, its officers, directors, employees, agents, subsidiaries, licensees, servants, successors and assigns, and any and all persons acting in privity or in concert or participation with defendant from continued infringement, direct or contributory or active inducement of infringement by others, of U.S. Patent No. 5,470,257.

D. Issue a preliminary and permanent injunction restraining defendant, its officers, directors, employees, agents, subsidiaries, licensees, servants, successors and assigns, and any and all persons acting in privity or in concert or participation with defendant from continued infringement, direct or contributory or active inducement of infringement by others, of U.S. Patent No. 5,632,651.

E. Award plaintiff damages sustained by reason of defendant's infringement of U.S. Patent No. 5,470,257, such damages to be trebled in accordance with the Patent Act, 35 U.S.C. § 284, and assessed against defendant.

F. Award plaintiff damages sustained by reason of defendant's infringement of U.S. Patent No. 5,632,651, such damages to be trebled in accordance with the Patent Act, 35 U.S.C. § 284, and assessed against defendant.

G. Award plaintiff its costs and disbursements incurred in this action, including attorneys' fees, and pre-judgment interest and post-judgment interest at the maximum rate allowed by law, and pursuant to the Patent Act, 35 U.S.C. § 285; and

H. Grant plaintiff such other and further relief as this Court may deem just and proper.


JURY DEMAND

Pursuant to Rule 38 of the Federal Rules of Civil Procedure, plaintiff demands a trial by jury on all issues triable by jury.

Date: May 4, 2001

Respectfully submitted,

McDERMOTT, WILL & EMERY

By: 

Steven E. Siff

Florida Bar No. 352330

e-mail: ssiff@mwe.com

Bryan T. West

Florida Bar No. 0083526

e-mail: bwest@mwe.com

201 South Biscayne Boulevard

Miami, Florida 33131

Telephone: (305) 358-3500

Facsimile: (305) 347-6500

Attorneys for Plaintiff,

JOHN MEZZALINGUA ASSOCIATES,

INC., d/b/a PPC

Of Counsel:

Kenneth J. Jurek

Rosanne J. Faraci

McDERMOTT, WILL & EMERY

227 West Monroe Street

Chicago, Illinois 60606

Telephone: (312) 372-2000

Facsimile: (312) 984-7700

EXHIBIT A



United States Patent [19]

[11] **Patent Number:** 5,470,257

Szegda

[45] **Date of Patent:** Nov. 28, 1995

[54] **RADIAL COMPRESSION TYPE COAXIAL CABLE END CONNECTOR**

5,083,943 1/1992 Tarrant 439/583
5,295,864 3/1994 Birch et al. 439/578

[75] **Inventor:** Andrew Szegda, Canastota, N.Y.

Primary Examiner—David L. Pirlot
Assistant Examiner—Jill DeMello
Attorney, Agent, or Firm—Samuels, Gauthier & Stevens

[73] **Assignee:** John Mezzalingua Assoc. Inc., Manlius, N.Y.

[57] **ABSTRACT**

[21] **Appl. No.:** 304,562

A radial compression type coaxial cable end connector has a connector body comprising a tubular inner post extending from a front end to a rear end, and an outer collar surrounding and fixed relative to the inner post at a location disposed rearwardly of the front post end. The outer collar cooperates in a radially spaced relationship with the inner post to define an annular chamber with a rear opening. A fastener at the front end of the inner post serves to attach the end connector to a system component. A tubular locking member protrudes axially into the annular chamber through its rear opening. The tubular locking member is integrally coupled to the connector body and is displaceable axially between an open position accommodating insertion of the tubular inner post into a prepared cable end, with an annular outer portion of the cable being received in the annular chamber, and a clamped position fixing the annular cable portion within the chamber.

[22] **Filed:** Sep. 12, 1994

[51] **Int. Cl.⁶** H01R 17/04

[52] **U.S. Cl.** 439/578; 439/389

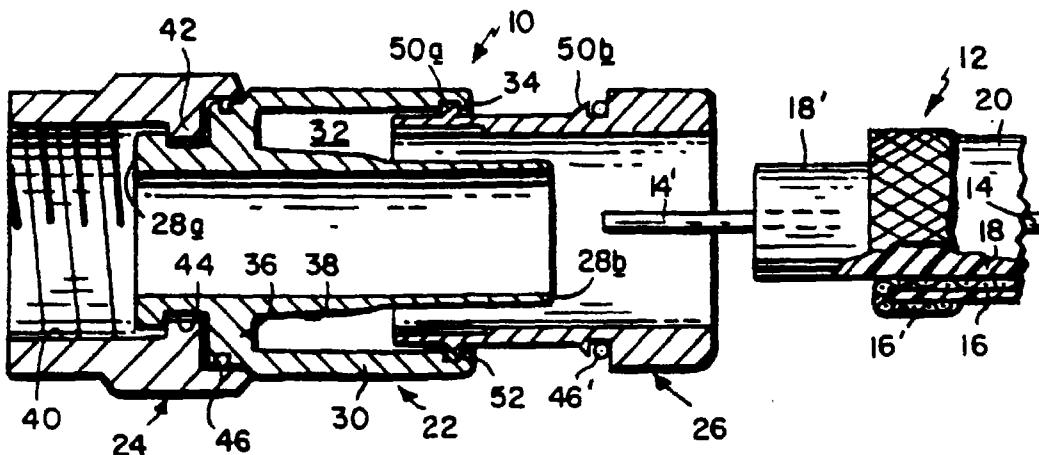
[58] **Field of Search** 439/578-582, 439/583-585, 389

[56] **References Cited**

U.S. PATENT DOCUMENTS

4,408,822	10/1983	Nikitas	339/117 R
4,444,453	4/1984	Kirby et al.	339/177
4,575,274	3/1986	Hayward	439/584
4,583,811	4/1986	McMills	439/584
4,614,390	9/1986	Baker	339/61 R
4,834,675	5/1989	Samchisen	439/578
5,024,606	6/1991	Ming-Hwa	439/578
5,073,129	12/1991	Szegda	439/585

21 Claims, 3 Drawing Sheets



U.S. Patent

Nov. 28, 1995

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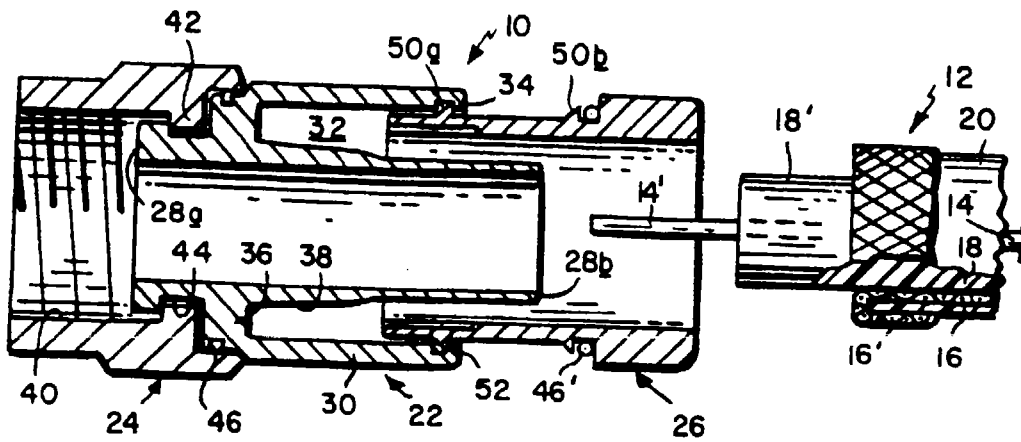


FIG. 1

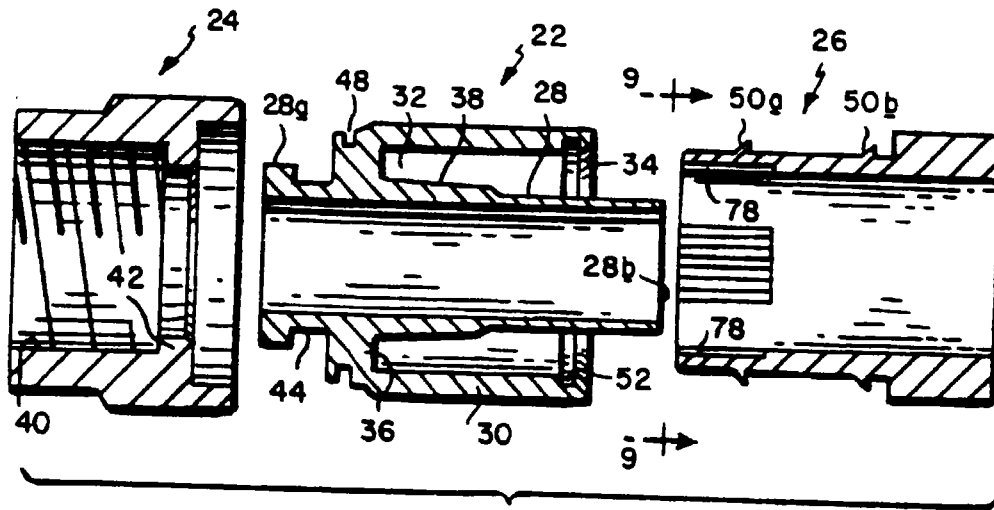


FIG. 2

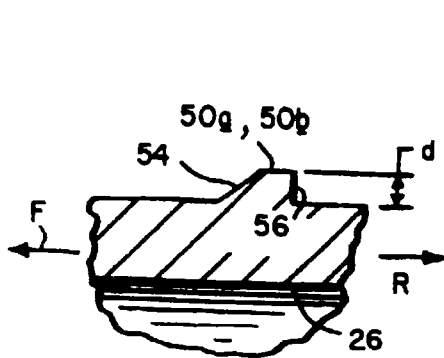


FIG. 3

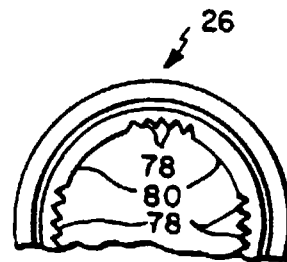


FIG. 9A

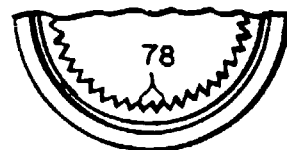


FIG. 9B

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post having a radially enlarged portion remote from said rear end and adjacent to said circular flange; fastener means at the front end of said inner post for attaching said end connector to said system component; and

a tubular locking member inseparably coupled to said connector body and protruding into said annular chamber through said rear opening, said locking member being movable axially relative to said connector body between first and second positions, said tubular locking member when in said first position protruding axially rearwardly from said connector body to accommodate insertion of the rear end of said inner post into an end of said cable with a central core portion of said cable being received in said inner post through said rear end and an outer annular portion of said cable being received between said locking member and said inner post into said annular chamber through said rear opening, and said tubular locking member when in said second position coacting with the radially enlarged portion of the outer surface of said inner post to grip the outer annular portion of said cable therebetween.

11. The end connector of claim 10 wherein said collar is spaced forwardly of said rear end.

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12. The end connector of claim 10 wherein said radially enlarged portion diverges forwardly towards said circular flange.

13. The end connector of claim 12 wherein said radially enlarged portion has a truncated conical configuration.

14. The end connector of claim 10 wherein said radially enlarged portion is externally convex.

15. The end connector of claim 10 wherein said radially enlarged portion is externally concave.

16. The end connector according to anyone of claims 10-15 wherein said radially enlarged portion is spaced from said circular flange by a circular groove in the outer surface of said inner post.

17. The end connector according to anyone of claims 10-15 wherein said radially enlarged portion and the portion of said locking member have coacting teeth adapted to grip the annular portion of said cable located therebetween.

18. The end connector of claim 10 wherein said circular flange is integral to said outer collar and press fitted onto said inner post.

19. The end connector of claim 10 wherein said circular flange is integral to both said outer collar and said inner post.

* * * * *

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fastener 24 may then be employed to attach the connector to a system component, typically a threaded port 63 or the like.

Axial advancement of the locking member 26 relative to the connector body 22 can be effected by an appropriately designed plier-like tool (not shown). Alternatively, as shown in FIG. 6, the locking member can be provided with a collar 64 having internal threads 65 arranged to coact in threaded engagement with external threads 66 on the collar 30 of the connector body. Rotation of the locking member 26 relative to the connector body 22 will thus result in an advancement of the locking member from its open position to its clamped position.

While the flared portion 38 of the inner post 28 is preferably configured as a truncated cone, other flared configurations might include an externally convex shape as shown at 68 in FIG. 7A, or an externally concave shape as shown at 70 in FIG. 7B.

As shown in FIG. 8, the flared portion might be provided additionally with teeth 72 pointing inwardly towards the inner end of the chamber 32. Additional teeth 74 could be provided on the inner surface of the locking member 26. Teeth 72 and 74 could be employed alternatively, or in concert.

Also, as shown in FIG. 8, the ramp-like surface of the flared conical portion could lead to a groove 76 directly adjacent to the circular flange 36. The end of the annular outer cable portion would be deformed into the groove 76 to thereby further promote axial holding power.

As can be further seen by a comparison of FIGS. 2 and 9A, the inner surface of the front end of the locking member 26 may be provided with longitudinally extending teeth 78. The teeth may be circumferentially separated into groups by partially cylindrical lands 80, or as shown in FIG. 9B, they may be arranged around the full interior circumference of the front end. The teeth 78 provide increased holding power and resist rotation of the cable in relation to the installed connector.

In all cases, the coaction of shoulder 50a with groove 52 serves to retain the connector body and locking member in an assembled state during storage, handling, and installation on a cable end. This eliminates any danger of the locking member being dropped or otherwise mishandled during assembly. The shoulder 50b coacts with groove 52 to retain the locking member in its final clamped position.

In light of the foregoing, it will now be appreciated by those skilled in the art that modifications may be made to the disclosed embodiments without departing from the spirit and scope of the invention as defined by the appended claims. For example, the extent of radial protrusion "d" of shoulder 50b can be increased as compared to that of shoulder 50a, thus providing greater holding power in the second clamped position. Also, the shoulders 50a, 50b can be provided with oppositely inclined surfaces, thus making it easier to disassemble the locking member from the connector body. The design of the fastener 24 can also be changed to suit differing applications.

I claim:

1. An end connector for connecting a coaxial cable to a system component, said end connector comprising:
a connector body comprising a tubular inner post extending from a front end to a rear end, and including an outer collar surrounding and fixed relative to said inner post at a location disposed rearwardly of said front end, said outer collar cooperating in a radially spaced relationship with said inner post to define an annular chamber with a rear opening;

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fastener means at the front end of said inner post for attaching said end connector to said system component; a tubular locking member; and

engagement means for inseparably coupling said locking member to said connector body at a first position partially inserted through said rear opening into said annular chamber and at which first position said locking member protrudes axially rearwardly from said connector body and overlaps and coacts in a radially spaced relationship with said inner post to accommodate insertion of the rear end of said inner post into an end of said cable, with a central core portion of said cable being received in said inner post through said rear end and an outer annular portion of said cable being received in said annular chamber through said rear opening and between said locking member and said inner post, said engagement means being yieldably releasable in response to an axially directed force to accommodate a further axial insertion of said locking member into said annular chamber to a second position at which said locking member coacts with said inner post to grip the outer annular portion of said cable therebetween.

2. The end connector of claim 1 wherein said engagement means releasably retains said locking member in said first position and accommodates movement of said locking member from said first position in one direction only to said second position.

3. The end connector of claim 2 further comprising second engagement means for fixing said locking member at said second position.

4. The end connector of claim 1 wherein said annular chamber is closed at a first end by a circular flange extending radially between said inner post and said outer collar.

5. The end connector of claim 4 wherein the outer surface of said inner post is configured with a flared portion located within said annular chamber, the maximum diameter of said flared portion being closer in proximity to said circular flange than to said rear end.

6. The end connector of claim 5 wherein said flared portion defined a truncated conical surface converging towards said rear end.

7. The end connector of claims 5 or 6 wherein said tubular locking member coacts in said second position with the flared portion of said inner post to grip the outer annular portion of said cable therebetween.

8. The end connector of claim 4 wherein the coaction of said tubular locking member with said inner post to grip the outer annular portion of said cable therebetween occurs at a location proximate to said circular flange and remote from the rear opening of said annular chamber.

9. The end connector of claim 1 wherein said engagement means comprises a circular groove on an interior surface of said collar, and a circular radial protrusion on an exterior surface of said locking member.

10. An integral end connector for connecting a coaxial cable to a system component, said end connector comprising:

a connector body having a tubular inner post extending from a front end to a rear end, with an outer collar surrounding and fixed relative to said inner post by means of a circular flange extending radially therebetween at a location disposed rearwardly of said front end, said collar cooperating in a radially spaced relationship with said post to define an annular chamber closed at the forward end by said circular flange and having a rear opening, the outer surface of said inner

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BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a longitudinal sectional view of one embodiment of an end connector according to the present invention, shown adjacent to the prepared end of a coaxial cable;

FIG. 2 is an exploded longitudinal sectional view of the major components of the end connector shown in FIG. 1;

FIG. 3 is an enlarged sectional view of a portion of the tubular locking member;

FIG. 4 is a longitudinal sectional view similar to FIG. 1, showing the end connector mounted on the prepared cable end, but prior to displacement of the locking member from the first open position to the second clamped position;

FIG. 5 is a view similar to FIG. 4, but showing the locking member advanced to its second clamped position;

FIG. 6 is a longitudinal sectional view of an alternative embodiment of an end connector in accordance with the present invention;

FIGS. 7A and 7B are partial sectional views showing differently configured flared portions of the connector body;

FIG. 8 is a partial sectional view showing toothed configurations on the clamping surfaces of the inner post and locking member;

FIG. 9A is a partial front end view of the locking member taken along line 9—9 of FIG. 2; and

FIG. 9B is a view similar to FIG. 9A showing a modified embodiment.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Referring initially to FIG. 1, an end connector in accordance with the present invention is generally depicted at 10 adjacent to the prepared end of a coaxial cable 12. Cable 12 is of a known type comprising an electrical inner conductor 14 surrounded by and spaced radially inwardly from an outer conductor 16 by a dielectric insulating sleeve 18. The outer conductor 16 can comprise a sheath of fine braided metallic strands, a metallic foil, or multiple layer combinations of either or both. A dielectric covering or jacket 20 surrounds the outer conductor 16 and comprises the outermost layer of the cable.

An end of the cable is prepared to receive the end connector 10 by selectively removing various layers to progressively expose an end 14' of the inner conductor, an end 18' of the insulating sleeve, and an end portion 16' of the outer conductor folded over the insulating jacket 20.

Referring additionally to FIG. 2, it will be seen that the end connector 10 includes a connector body 22, a cylindrical fastener 24 and a tubular locking member 26. The connector body 22 comprises a tubular inner post 28 extending from a front end 28a to a rear end 28b, and an outer cylindrical collar 30 surrounding and fixed relative to the inner post at a location disposed rearwardly of the front end 28a. The outer collar 30 cooperates in a radially spaced relationship with the inner post to define an annular chamber 32 accessible via a rear opening 34.

Preferably, the outer collar 30 and the inner post are formed integrally as a single piece, with an integral circular flange 36 extending radially therebetween to close off the inner end of annular chamber 32. Alternatively, the outer collar 30 and flange 36 can comprise a separate piece press fitted onto the outer surface of the inner post 28.

The outer surface of the inner post 28 is configured with a radially enlarged or flared portion 38 within the annular chamber 32 and at a location proximate to the circular flange

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36 and remote from the rear opening 34. Preferably, the flared portion defines a truncated conical surface with its maximum diameter closer in proximity to the circular flange 36 than to the rear opening 34.

The fastener 24 is internally threaded as at 40 and is provided with an inner circular shoulder 42 seated in a circular groove 44 in the outer surface of the post 28 at a location adjacent to the front end 28a. The fastener 24 and inner post 28 are relatively rotatable, with an optional O-ring seal 46 seated in a second groove 48 and serving as a moisture barrier.

The tubular locking member 26 protrudes axially through rear opening 34 into the annular chamber 32. Engagement means serve to integrally couple the locking member 26 to the connector body 22 for limited axial movement relative to both the inner post 28 and the outer collar 30 between a first "open" position as illustrated in FIG. 1, and a second "clamped" position as shown in FIG. 5. The engagement means preferably comprises first and second axially spaced radially protruding circular shoulders 50a, 50b on the locking member 26, each shoulder being configured and dimensioned to coact in a snap engagement with an internal groove 52 at the rear end of the outer collar 30.

As can be best seen in FIG. 3, the shoulders 50a, 50b protrude from the surface of the locking member by a radial distance "d", and are each provided with an inclined ramp-like front face 54 and a generally perpendicular rear face 56. The front faces 54 accommodate movement of the shoulders out of the groove 52 in a forward axial direction (arrow "F" in FIG. 3), whereas the rear faces 56 resist movement of the shoulders out of the groove 52 in a rearward axial direction (arrow "R" in FIG. 3).

When installing the end connector 10 on the prepared end of a coaxial cable, the rear end 28b of the inner post 28 is first inserted axially into the cable end. As shown in FIG. 4, the cable end is thus subdivided into a central core portion 58 comprising the inner conductor 14 and dielectric sleeve 18, and an outer annular portion 60 comprising the outer conductor 16 folded over the end of the outer dielectric jacket 20. The central core portion 58 is received in the inner post through its rear end 28b, and extends axially there-through to an extent permitting the exposed end 14' of the inner conductor to protrude beyond the fastener 24. At the same time the outer annular portion 60 is received between the locking member 26 and the inner post 28 into the annular chamber 32 through its rear opening 34. The flared portion 38 of the inner post 28 serves to radially expand the outer annular portion 60 of the cable into the annular chamber 32, thus presenting an outwardly flared truncated conical surface 62 lying in the path of the rearwardly retracted locking member 26, the latter being held in that position by the snap engagement of shoulder 50a in groove 52.

As shown in FIG. 5, the locking member 26 is then advanced axially, causing the shoulder 50a to disengage itself from groove 52, and resulting in the outwardly flared surface 62 of the outer annular cable portion 60 being slidably contacted and pressed inwardly by the locking member. As a result, the radially expanded annular outer portion of the cable is firmly clamped between the inner surface of the locking member 26 and the flared outer portion 38 of the inner post. Final locking in the clamped position occurs when the shoulder 50b coacts in snapped engagement with the groove 52. A second optional O-ring 46' is disposed rearwardly of the shoulder 50b and serves to provide a moisture barrier between the locking member 26 and the outer collar 30 of the connector body 22. The

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RADIAL COMPRESSION TYPE COAXIAL CABLE END CONNECTOR

This is a continuation of application Ser. No. 08/304,562 filed on Sep. 12, 1994, now U.S. Pat. No. 5,470,257.

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to coaxial cable end connectors of the type employed in the cable television industry.

2. Description of the Prior Art

The conventional coaxial cable typically consists of a centrally located inner electrical conductor surrounded by and spaced inwardly from an outer cylindrical electrical conductor. The inner and outer conductors are separated by a dielectric insulating sleeve, and the outer conductor is encased within a protective dielectric jacket. The outer conductor can comprise a sheath of fine braided metallic strands, a metallic foil, or multiple layer combinations of either or both.

Conventional coaxial cable end connectors typically include an inner cylindrical post adapted to be inserted into a suitably prepared end of the cable between the dielectric insulating sleeve and the outer conductor, an end portion of the latter having been exposed and folded back over the outer dielectric jacket. The inner conductor and the dielectric insulating sleeve thus comprise a central core portion of the cable received axially in the inner post, whereas the outer conductor and dielectric jacket comprise an annular outer portion of the cable surrounding the inner post.

The conventional coaxial cable end connector further includes an outer component designed to coact with the inner post in securely and sealingly clamping the annular outer portion of the cable therebetween. In "crimp type" end connectors, the outer component comprises a sleeve fixed in relation to and designed to be deformed radially inwardly towards the inner post. Typical examples of crimp type end connectors are described in U.S. Pat. No. 5,073,129 (Szegda) and U.S. Pat. No. 5,083,943 (Tarrant).

In the so-called "radial compression type" end connectors, the outer component comprises a substantially non-deformable sleeve adapted to be shifted axially with respect to the inner post into a clamped position coacting with the inner post to clamp the prepared cable end therebetween. Typical examples of radial compression type connectors are described in U.S. Pat. No. 3,498,647 (Schroder); U.S. Pat. No. 3,985,418 (Spinner); U.S. Pat. No. 4,059,330 (Shirey); U.S. Pat. No. 4,444,453 (Kilry et al); U.S. Pat. No. 4,676,577 (Szegda); and U.S. Pat. No. 5,024,606 (Yeh Ming-Hwa).

These radial compression type end connectors suffer from a common disadvantage in that prior to being mounted on the cable ends, the outer sleeve components are detached and separate from the inner posts. As such, the outer sleeve components are prone to being dropped or otherwise becoming misplaced or lost, particularly, as is often the case, when an installation is being made outdoors under less than ideal weather conditions.

In U.S. Pat. No. 4,834,675 (Samchisen), an attempt has been made at addressing this problem by detachably interconnecting the connector body and outer sleeve component in a parallel side-by-side relationship. This facilitates pre-installation handling and storage. However, during installation, the outer sleeve component must still be detached from the connector body and threaded onto the

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cable as a separate element. Thus, mishandling or loss of the outer sleeve component remains a serious problem during the critical installation phase.

U.S. Pat. No. 5,295,864 (Birch et al) discloses a radial compression type end connector with an integral outer sleeve component. Here, however, the outer sleeve component is shifted into its clamped position as a result of the connector being threaded onto an equipment port or the like. Prior to that time, the end connector is only loosely assembled on and is thus prone to being dislodged from the cable end. This again creates problems for the installer.

In light of the foregoing, an objective of the present invention is the provision of an improved radial compression type end connector wherein the outer sleeve component remains at all times integrally connected to the inner post, both prior to and during installation.

A companion objective of the present invention is the provision of an integrally assembled radial compression type end connector wherein the outer sleeve component is shiftable to a clamped position prior to and independently of the installation of the end connector on an equipment port or other like system component.

Still another objective of the present invention is the provision of a radial compression type end connector having improved holding power and pull resistance.

SUMMARY OF THE INVENTION

The radial compression type connector of the present invention has a connector body comprising an inner post extending from a front end to a rear end, and an outer collar surrounding and fixed relative to the inner post at a location disposed rearwardly of the front end. The outer collar cooperates in a radially spaced relationship with the inner post to define an annular chamber with a rear opening. A fastener on the front end of the tubular post serves to attach the end connector to an equipment port or other like system component. A tubular locking member protrudes axially into the annular chamber through its rear opening. The locking member and the connector body are integrally coupled in a manner accommodating limited axial movement of the locking member between a first "open" position and a second "clamped" position. When in the first position, the locking member accommodates insertion of the rear end of the inner post into an end of an appropriately prepared cable, with a central core portion of the cable being received in the inner post and an outer annular portion of the cable being received in the annular chamber. When shifted to the second position, the locking member coacts with the inner post to grip and firmly clamp the outer annular portion of the cable therebetween.

Preferably, integral coupling is effected by an interengagement of the locking member with the outer collar of the connector body. The interengagement between these components resists rearward axial withdrawal of the tubular locking member from its first position, and yieldably accommodates movement of the tubular locking member in a forward direction only from its first position to its second position where it is retained.

A large area of the annular outer cable portion is gripped between the inner post and the locking member, thus providing improved holding power and pull resistance without cutting or otherwise damaging the cable.

These and other objectives, features and advantages of the present invention will be described in greater detail with reference to the accompanying drawings, wherein:

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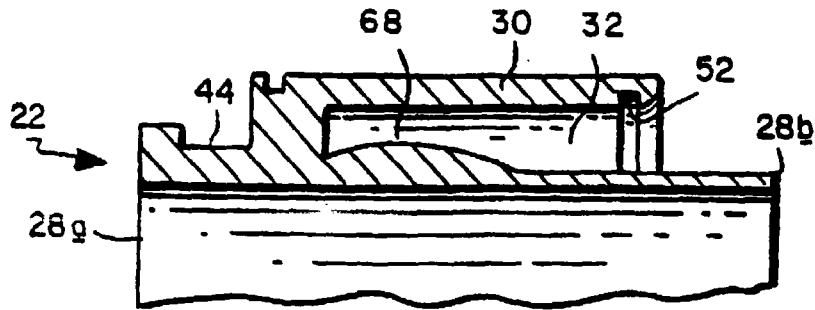


FIG. 7A

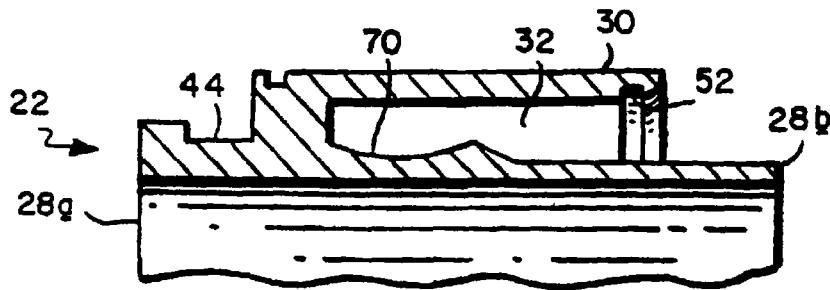


FIG. 7B

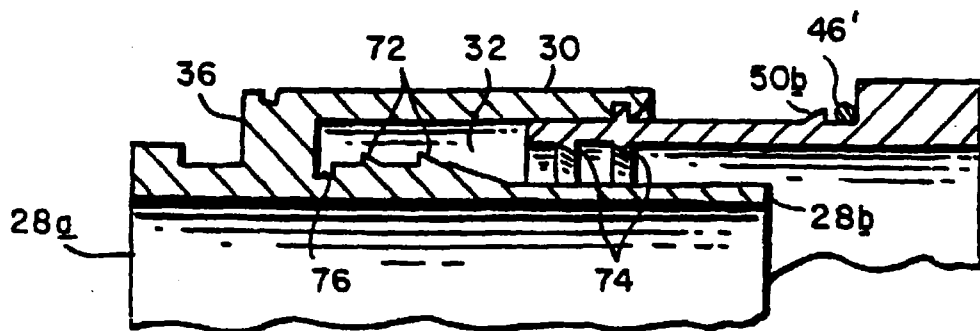


FIG. 8

U.S. Patent

May 27, 1997

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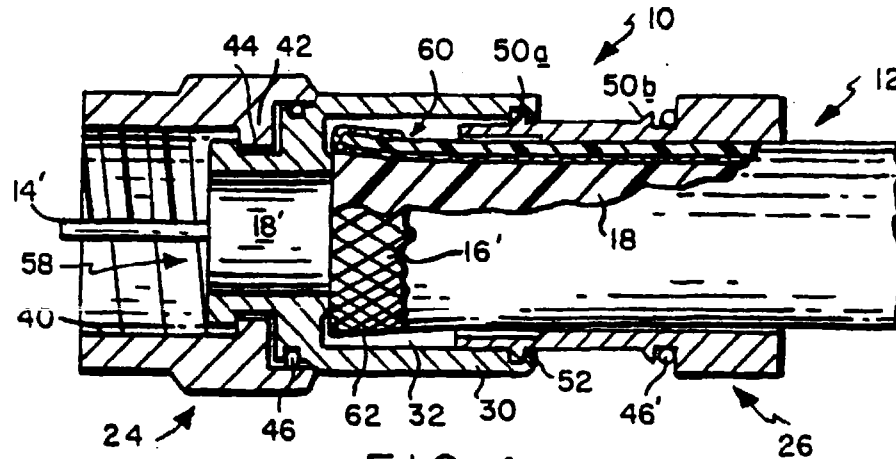


FIG. 4

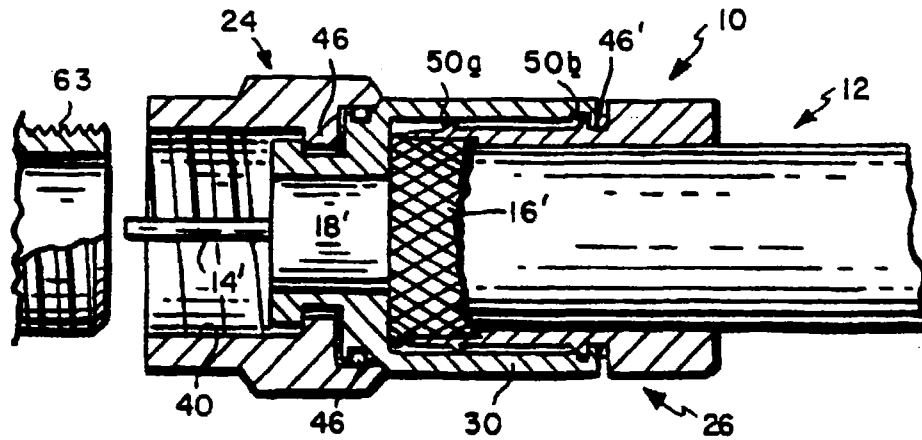


FIG. 5

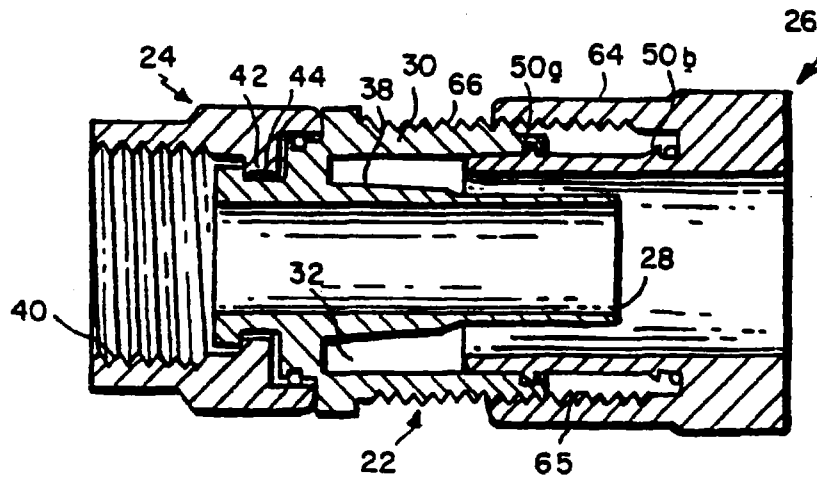


FIG. 6

U.S. Patent

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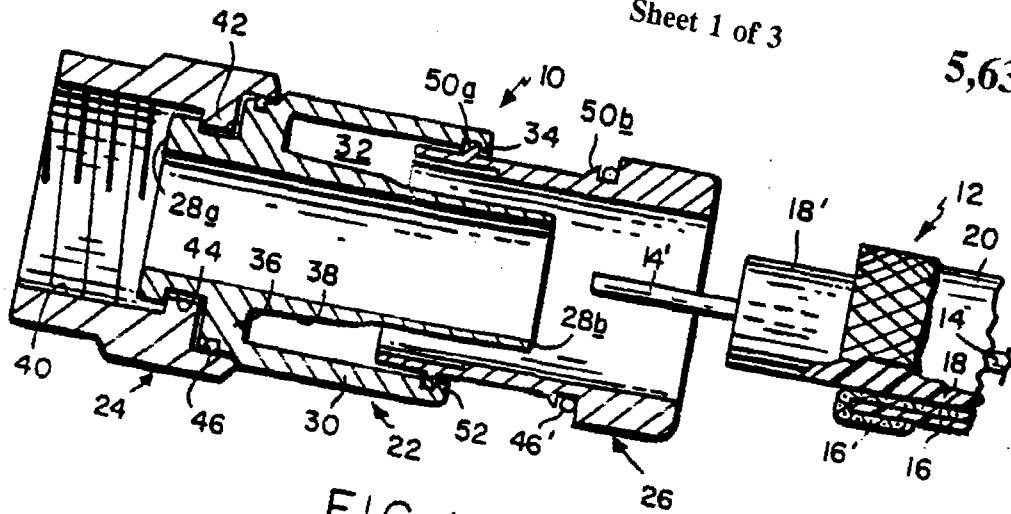


FIG. 1

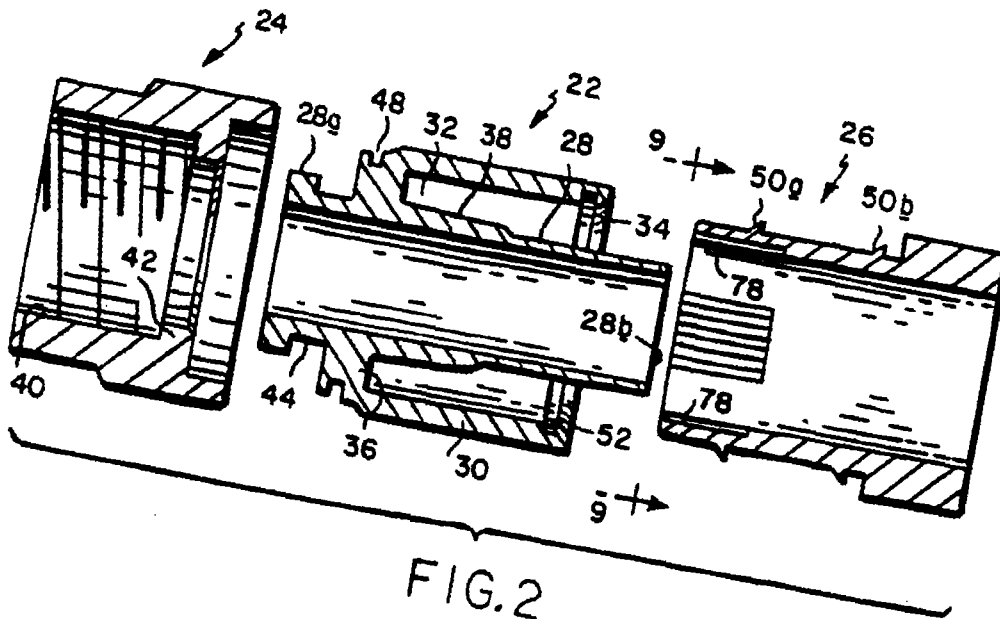


FIG. 2

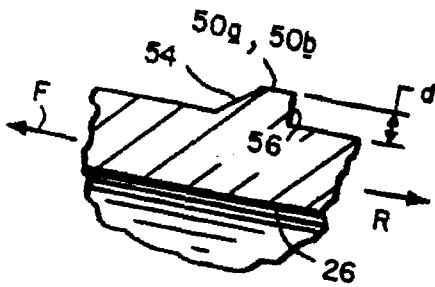


FIG. 3

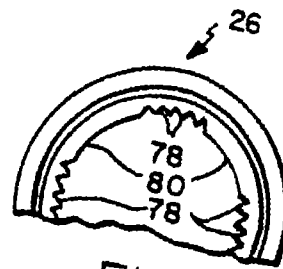


FIG. 9A

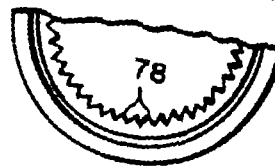
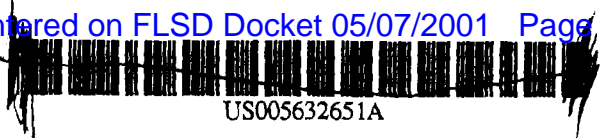


FIG. 9B



US005632651A

United States Patent [19]
Szegda

[11] **Patent Number:** 5,632,651
 [45] **Date of Patent:** May 27, 1997

- [54] **RADIAL COMPRESSION TYPE COAXIAL CABLE END CONNECTOR**
- [75] **Inventor:** Andrew Szegda, Canastota, N.Y.
- [73] **Assignee:** John Mezzalingua Assoc. Inc., Manlius, N.Y.
- [21] **Appl. No.:** 562,844
- [22] **Filed:** Nov. 27, 1995

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Related U.S. Application Data

- [63] Continuation of Ser. No. 304,562, Sep. 12, 1994, Pat. No. 5,470,257.
- [51] **Int. Cl.⁶** H01R 9/05
- [52] **U.S. Cl.** 439/578
- [58] **Field of Search** 439/578-585, 439/836

(List continued on next page.)

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Primary Examiner—David L. Pirlot
Assistant Examiner—Brian J. Biggi
Attorney, Agent, or Firm—Samuels, Gauthier, Stevens & Reppert

[57] **ABSTRACT**

A radial compression type coaxial cable end connector has a connector body comprising a tubular inner post extending from a front end to a rear end, and an outer collar surrounding and fixed relative to the inner post at a location disposed rearwardly of the front post end. The outer collar cooperates in a radially spaced relationship with the inner post to define an annular chamber with a rear opening. A fastener at the front end of the inner post serves to attach the end connector to a system component. A tubular locking member protrudes axially into the annular chamber through its rear opening. The tubular locking member is integrally coupled to the connector body and is displaceable axially between an open position accommodating insertion of the tubular inner post into a prepared cable end, with an annular outer portion of the cable being received in the annular chamber, and a clamped position fixing the annular cable portion within the chamber.

19 Claims, 3 Drawing Sheets

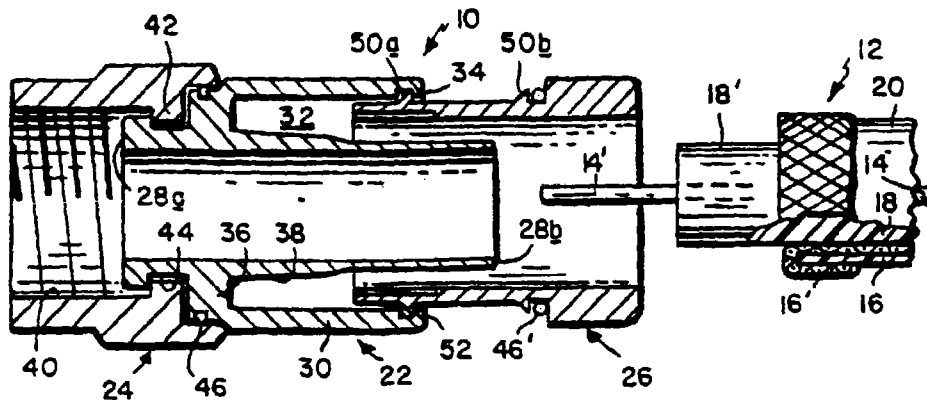


EXHIBIT B

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groove in resisting movement of said collar in an opposite rearward direction.

12. An integral end connector for connecting a coaxial cable to a system component, said end connector comprising:

a connector body having a tubular inner post extending from a front end to a rear end, with an outer collar surrounding and fixed relative to said inner post by means of a circular flange extending radially therebetween at a location disposed rearwardly of said front end, said collar cooperating in a radially spaced relationship with said post to define an annular chamber closed at the forward end by said circular flange and having a rear opening, the outer surface of said inner post having a radially enlarged portion remote from said rear end and adjacent to said circular flange;

fastener means at the front end of said inner post for attaching said end connector to said system component;

a tubular locking member protruding into said annular chamber through said rear opening; and

engagement means circumscribing the interior of said outer collar and the exterior of said locking member, said engagement means coacting in circular interengagement to inseparably couple said locking member to said connector body at a first position and to accommodate limited axial movement of said locking member relative to said connector body between said first position and a second position, said tubular locking member when in said first position accommodating insertion of the rear end of said inner post into an end of said cable, with a central core portion of said cable being received in said inner post through said rear end

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and an outer annular portion of said cable being received between said locking member and said inner post into said annular chamber through said rear opening, and said tubular locking member when in said second position coacting with the radially enlarged portion of the outer surface of said inner post to grip the outer annular portion of said cable therebetween.

13. The end connector of claim 12 wherein said collar is spaced forwardly of said rear end.

14. The end connector of claim 12 wherein said radially enlarged portion diverges forwardly towards said circular flange.

15. The end connector of claim 14 wherein said radially enlarged portion has a truncated conical configuration.

16. The end connector of claim 12 wherein said radially enlarged portion is externally convex.

17. The end connector of claim 13 wherein said radially enlarged portion is externally concave.

18. The end connector according to anyone of claims 12-17 wherein said radially enlarged portion is spaced from said circular flange by a circular groove in the outer surface of said inner post.

19. The end connector according to anyone of claims 12-18 wherein said radially enlarged portion and the portion of said locking member have coacting teeth adapted to grip the annular portion of said cable located therebetween.

20. The end connector of claim 12 wherein said circular flange is integral to said outer collar and press fitted onto said inner post.

21. The end connector of claim 12 wherein said circular flange is integral to both said outer collar and said inner post.

* * * * *

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Axial advancement of the locking member 26 relative to the connector body 22 can be effected by an appropriately designed plier-like tool (not shown). Alternatively, as shown in FIG. 6, the locking member can be provided with a collar 64 having internal threads 65 arranged to coact in threaded engagement with external threads 66 on the collar 30 of the connector body. Rotation of the locking member 26 relative to the connector body 22 will thus result in an advancement of the locking member from its open position to its clamped position.

While the flared portion 38 of the inner post 28 is preferably configured as a truncated cone, other flared configurations might include an externally convex shape as shown at 68 in FIG. 7A, or an externally concave shape as shown at 70 in FIG. 7B.

As shown in FIG. 8, the flared portion might be provided additionally with teeth 72 pointing inwardly towards the inner end of the chamber 32. Additional teeth 74 could be provided on the inner surface of the locking member 26. Teeth 72 and 74 could be employed alternatively, or in concert.

Also, as shown in FIG. 8, the ramp-like surface of the flared conical portion could lead to a groove 76 directly adjacent to the circular flange 36. The end of the annular outer cable portion would be deformed into the groove 76 to thereby further promote axial holding power to the installed connector.

As can be further seen by a comparison of FIG. 2 and 9A, the inner surface of the front end of the locking member 26 may be provided with longitudinally extending teeth 78. The teeth may be circumferentially separated into groups by partially cylindrical lands 80, or as shown in FIG. 9B, they may be arranged around the full interior circumference of the front end. The teeth 78 provide increased holding power and resist rotation of the cable in relation to the installed connector.

In all cases, the coaction of shoulder 50a with groove 52 serves to retain the connector body and locking member in an assembled state during storage, handling, and installation on a cable end. This eliminates any danger of the locking member being dropped or otherwise mishandled during assembly. The shoulder 50b coacts with groove 52 to retain the locking member in its final clamped position.

In light of the foregoing, it will now be appreciated by those skilled in the art that modifications may be made to the disclosed embodiments without departing from the spirit and scope of the invention as defined by the appended claims. For example, the extent of radial protrusion "d" of shoulder 50b can be increased as compared to that of shoulder 50a, thus providing greater holding power in the second clamped position. Also, the shoulders 50a, 50b can be provided with oppositely inclined surfaces, thus making it easier to disassemble the locking member from the connector body. The design of the fastener 24 can also be changed to suit differing applications.

I claim:

1. An end connector for connecting a coaxial cable to a system component, said end connector comprising:

a connector body comprising a tubular inner post extending from a front end to a rear end, and including an outer collar surrounding and fixed relative to said inner post at a location disposed rearwardly of said front end, said outer collar cooperating in a radially spaced relationship with said inner post to define an annular chamber with a rear opening;

fastener means at the front end of said inner post for

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attaching said end connector to said system component; a tubular locking member protruding axially into said annular chamber through said rear opening; and

engagement means circumscribing the interior of said outer collar and the exterior of said locking member, said engagement means coacting in circular interengagement to inseparably couple said locking member to said connector body at a first position and to accommodate limited axial movement of said locking member relative to said connector body between said first position and a second position, said locking member coacting in a first radially spaced relationship with said inner post when in said first position to accommodate insertion of the rear end of said inner post into an end of said cable, with a central core portion of said cable being received in said inner post through said rear end and an outer annular portion of said cable being received in said annular chamber through said rear opening and between said locking member and said inner post, and said locking member coacting in a second radially spaced relationship with said inner post when in said second position to grip the outer annular portion of said cable therebetween.

2. The end connector of claim 1 wherein said engagement means additionally coacts to yieldably resist axial dislocation of said locking member from said first and second positions.

3. The end connector of claim 2 wherein said engagement means additionally coacts to releasably retain said locking member in said first position and to accommodate movement of said locking member from said first position in one direction only to said second position.

4. The end connector of claim 3 wherein said engagement means additionally coacts to fix said locking member at said second position.

5. The end connector of claim 1 wherein said annular chamber is closed at a first end by a circular flange extending radially between said inner post and said outer collar.

6. The end connector of claim 5 wherein the outer surface of said inner post is configured with a flared portion located within said annular chamber, the maximum diameter of said flared portion being closer in proximity to said circular flange than to said rear end.

7. The end connector of claim 6 wherein said flared portion defines a truncated conical surface converging towards said rear end.

8. The end connector of claims 6 or 7 wherein said tubular locking member coacts in said second position with the flared portion of said inner post to grip the outer annular portion of said cable therebetween.

9. The end connector of claim 5 wherein the coaction of said tubular locking member with said inner post to grip the outer annular portion of said cable therebetween occurs at a location proximate to said circular flange and remote from the rear opening of said annular chamber.

10. The end connector of claim 1 wherein said engagement means comprises a circular groove on an interior surface of said collar, and axially spaced circular shoulders on an exterior surface of said locking member, said circular shoulders being configured and dimensioned for snap engagement with said circular groove.

11. The end connector of claim 10 wherein said circular shoulders are defined by at least two surfaces, one of said surfaces being configured to coact with said groove in accommodating movement of said locking member in a forward direction towards said second position, and the other of said surfaces being configured to coact with said

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shown adjacent to the prepared end of a coaxial cable;

FIG. 2 is an exploded longitudinal sectional view of the major components of the end connector shown in FIG. 1;

FIG. 3 is an enlarged sectional view of a portion of the tubular locking member;

FIG. 4 is a longitudinal sectional view similar to FIG. 1, showing the end connector mounted on the prepared cable end, but prior to displacement of the locking member from the first open position to the second clamped position;

FIG. 5 is a view similar to FIG. 4, but showing the locking member advanced to its second clamped position;

FIG. 6 is a longitudinal sectional view of an alternative embodiment of an end connector in accordance with the present invention;

FIGS. 7A and 7B are partial sectional views showing differently configured flared portions of the connector body;

FIG. 8 is a partial sectional view showing toothed configurations on the clamping surfaces of the inner post and locking member;

FIG. 9A is a partial front end view of the locking member taken along line 9—9 of FIG. 2; and

FIG. 9B is a view similar to FIG. 9A showing a modified embodiment.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Referring initially to FIG. 1, an end connector in accordance with the present invention is generally depicted at 10 adjacent to the prepared end of a coaxial cable 12. Cable 12 is of a known type comprising an electrical inner conductor 14 surrounded by and spaced radially inwardly from an outer conductor 16 by a dielectric insulating sleeve 18. The outer conductor 16 can comprise a sheath of fine braided metallic strands, a metallic foil, or multiple layer combinations of either or both. A dielectric covering or jacket 20 surrounds the outer conductor 16 and comprises the outermost layer of the cable.

An end of the cable is prepared to receive the end connector 10 by selectively removing various layers to progressively expose an end 14' of the inner conductor, an end 18' of the insulating sleeve, and an end portion 16' of the outer conductor folded over the insulating jacket 20.

Referring additionally to FIG. 2, it will be seen that the end connector 10 includes a connector body 22, a cylindrical fastener 24 and a tubular locking member 26. The connector body 22 comprises a tubular inner post 28 extending from a front end 28a to a rear end 28b, and an outer cylindrical collar 30 surrounding and fixed relative to the inner post at a location disposed rearwardly of the front end 28a. The outer collar 30 cooperates in a radially spaced relationship with the inner post to define an annular chamber 32 accessible via a rear opening 34.

Preferably, the outer collar 30 and the inner post are formed integrally as a single piece, with an integral circular flange 36 extending radially therebetween to close off the inner end of annular chamber 32. Alternatively, the outer collar 30 and flange 36 can comprise a separate piece press fitted onto the outer surface of the inner post 28.

The outer surface of the inner post 28 is configured with a radially enlarged or flared portion 38 within the annular chamber 32 and at a location proximate to the circular flange 36 and remote from the rear opening 34. Preferably, the flared portion defines a truncated conical surface with its

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maximum diameter closer in proximity to the circular flange 36 than to the rear opening 34.

The fastener 24 is internally threaded as at 40 and is provided with an inner circular shoulder 42 seated in a circular groove 44 in the outer surface of the post 28 at a location adjacent to the front end 28a. The fastener 24 and inner post 28 are relatively rotatable, with an optional O-ring seal 46 seated in a second groove 48 and serving as a moisture barrier.

The tubular locking member 26 protrudes axially through rear opening 34 into the annular chamber 32. Engagement means serve to integrally couple the locking member 26 to the connector body 22 for limited axial movement relative to both the inner post 28 and the outer collar 30 between a first "open" position as illustrated in FIG. 1, and a second "clamped" position as shown in FIG. 5. The engagement means preferably comprises first and second axially spaced radially protruding circular shoulders 50a, 50b on the locking member 26, each shoulder being configured and dimensioned to coact in a snap engagement with an internal groove 52 at the rear end of the outer collar 30.

As can be best seen in FIG. 3, the shoulders 50a, 50b protrude from the surface of the locking member by a radial distance "d", and are each provided with an inclined ramp-like front face 54 and a generally perpendicular rear face 56. The front faces 54 accommodate movement of the shoulders out of the groove 52 in a forward axial direction (arrow "F" in FIG. 3), whereas the rear faces 56 resist movement of the shoulders out of the groove 52 in a rearward axial direction (arrow "R" in FIG. 3).

When installing the end connector 10 on the prepared end of a coaxial cable, the rear end 28b of the inner post 28 is first inserted axially into the cable end. As shown in FIG. 4, the cable end is thus subdivided into a central core portion 58 comprising the inner conductor 14 and dielectric sleeve 18, and an outer annular portion 60 comprising the outer conductor 16 folded over the end of the outer dielectric jacket 20. The central core portion 58 is received in the inner post through its rear end 28b, and extends axially there-through to an extent permitting the exposed end 14' of the inner conductor to protrude beyond the fastener 24. At the same time the outer annular portion 60 is received between the locking member 26 and the inner post 28 into the annular chamber 32 through its rear opening 34. The flared portion 38 of the inner post 28 serves to radially expand the outer annular portion 60 of the cable into the annular chamber 32, thus presenting an outwardly flared truncated conical surface 62 lying in the path of the rearwardly retracted locking member 26, the latter being held in that position by the snap engagement of shoulder 50a in groove 52.

As shown in FIG. 5, the locking member 26 is then advanced axially, causing the shoulder 50a to disengage itself from groove 52, and resulting in the outwardly flared surface 62 of the outer annular cable portion 60 being slidably contacted and pressed inwardly by the locking member. As a result, the radially expanded annular outer portion of the cable is firmly clamped between the inner surface of the locking member 26 and the flared outer portion 38 of the inner post. Final locking in the clamped position occurs when the shoulder 50b coacts in snapped engagement with the groove 52. A second optional O-ring 46' is disposed rearwardly of the shoulder 50b and serves to provide a moisture barrier between the locking member 26 and the outer collar 30 of the connector body 22. The fastener 24 may then be employed to attach the connector to a system component, typically a threaded port 63 or the like.

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RADIAL COMPRESSION TYPE COAXIAL CABLE END CONNECTOR

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to coaxial cable end connectors of the type employed in the cable television industry.

2. Description of the Prior Art

The conventional coaxial cable typically consists of a centrally located inner electrical conductor surrounded by and spaced inwardly from an outer cylindrical electrical conductor. The inner and outer conductors are separated by a dielectric insulating sleeve, and the outer conductor is encased within a protective dielectric jacket. The outer conductor can comprise a sheath of fine braided metallic strands, a metallic foil, or multiple layer combinations of either or both.

Conventional coaxial cable end connectors typically include an inner cylindrical post adapted to be inserted into a suitably prepared end of the cable between the dielectric insulating sleeve and the outer conductor, an end portion of the latter having been exposed and folded back over the outer dielectric jacket. The inner conductor and the dielectric insulating sleeve thus comprise a central core portion of the cable received axially in the inner post, whereas the outer conductor and dielectric jacket comprise an annular outer portion of the cable surrounding the inner post.

The conventional coaxial cable end connector further includes an outer component designed to coact with the inner post in securely and sealingly clamping the annular outer portion of the cable therebetween. In "crimp type" end connectors, the outer component comprises a sleeve fixed in relation to and designed to be deformed radially inwardly towards the inner post. Typical examples of crimp type end connectors are described in U.S. Pat. Nos. 5,073,129 (Szegda) and 5,083,943 (Tarrant).

In the so-called "radial compression type" end connectors, the outer component comprises a substantially non-deformable sleeve adapted to be shifted axially with respect to the inner post into a clamped position coacting with the inner post to clamp the prepared cable end therebetween. Typical examples of radial compression type connectors are described in U.S. Pat. Nos. 3,498,647 (Schroder); 3,985,418 (Spinner); 4,059,330 (Shirey); 4,444,453 (Kilry et al); 4,676,577 (Szegda); and 5,024,606 (Yeh Ming-Hwa).

These radial compression type end connectors suffer from a common disadvantage in that prior to being mounted on the cable ends, the outer sleeve components are detached and separate from the inner posts. As such, the outer sleeve components are prone to being dropped or otherwise becoming misplaced or lost, particularly, as is often the case, when an installation is being made outdoors under less than ideal weather conditions.

In U.S. Pat. No. 4,834,675 (Samchisen), an attempt has been made at addressing this problem by detachably interconnecting the connector body and outer sleeve component in a parallel side-by-side relationship. This facilitates pre-installation handling and storage. However, during installation, the outer sleeve component must still be detached from the connector body and threaded onto the cable as a separate element. Thus, mishandling or loss of the outer sleeve component remains a serious problem during the critical installation phase.

U.S. Pat. No. 5,295,864 (Birch et al) discloses a radial compression type end connector with an integral outer

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sleeve component. Here, however, the outer sleeve component is shifted into its clamped position as a result of the connector being threaded onto an equipment port or the like. Prior to that time, the end connector is only loosely assembled on and is thus prone to being dislodged from the cable end. This again creates problems for the installer.

In light of the foregoing, an objective of the present invention is the provision of an improved radial compression type end connector wherein the outer sleeve component remains at all times integrally connected to the inner post, both prior to and during installation.

A companion objective of the present invention is the provision of an integrally assembled radial compression type end connector wherein the outer sleeve component is shiftable to a clamped position prior to and independently of the installation of the end connector on an equipment port or other like system component.

Still another objective of the present invention is the provision of a radial compression type end connector having improved holding power and pull resistance.

SUMMARY OF THE INVENTION

The radial compression type connector of the present invention has a connector body comprising an inner post extending from a front end to a rear end, and an outer collar surrounding and fixed relative to the inner post at a location disposed rearwardly of the front end. The outer collar cooperates in a radially spaced relationship with the inner post to define an annular chamber with a rear opening. A fastener on the front end of the tubular post serves to attach the end connector to an equipment port or other like system component. A tubular locking member protrudes axially into the annular chamber through its rear opening. The locking member and the connector body are integrally coupled in a manner accommodating limited axial movement of the locking member between a first "open" position and a second "clamped" position. When in the first position, the locking member accommodates insertion of the rear end of the inner post into an end of an appropriately prepared cable, with a central core portion of the cable being received in the inner post and an outer annular portion of the cable being received in the annular chamber. When shifted to the second position, the locking member coacts with the inner post to grip and firmly clamp the outer annular portion of the cable therebetween.

Preferably, integral coupling is effected by an interengagement of the locking member with the outer collar of the connector body. The interengagement between these components resists rearward axial withdrawal of the tubular locking member from its first position, and yieldably accommodates movement of the tubular locking member in a forward direction only from its first position to its second position where it is retained.

A large area of the annular outer cable portion is gripped between the inner post and the locking member, thus providing improved holding power and pull resistance without cutting or otherwise damaging the cable.

These and other objectives, features and advantages of the present invention will be described in greater detail with reference to the accompanying drawings, wherein:

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a longitudinal sectional view of one embodiment of an end connector according to the present invention,

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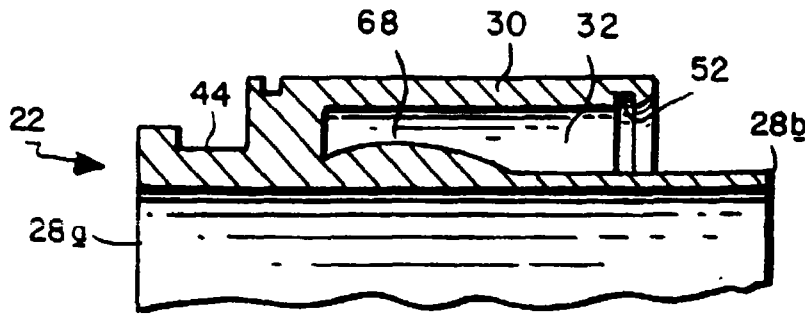


FIG. 7A

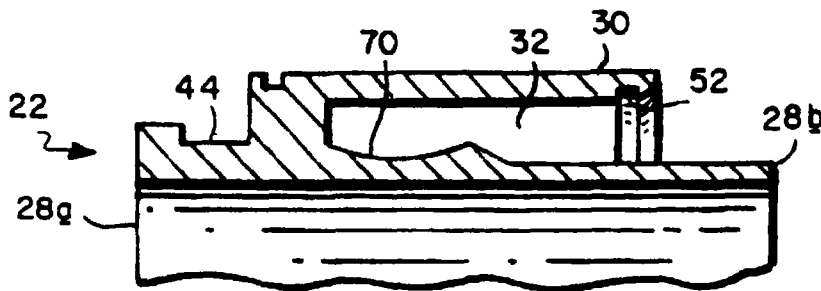


FIG. 7B

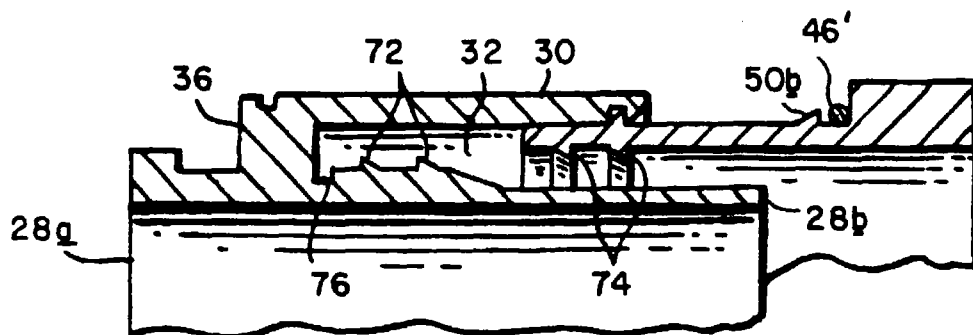


FIG. 8

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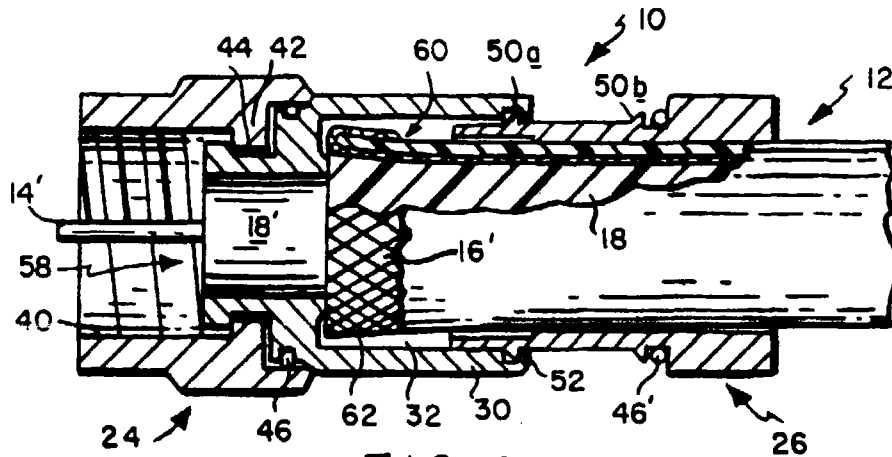


FIG. 4

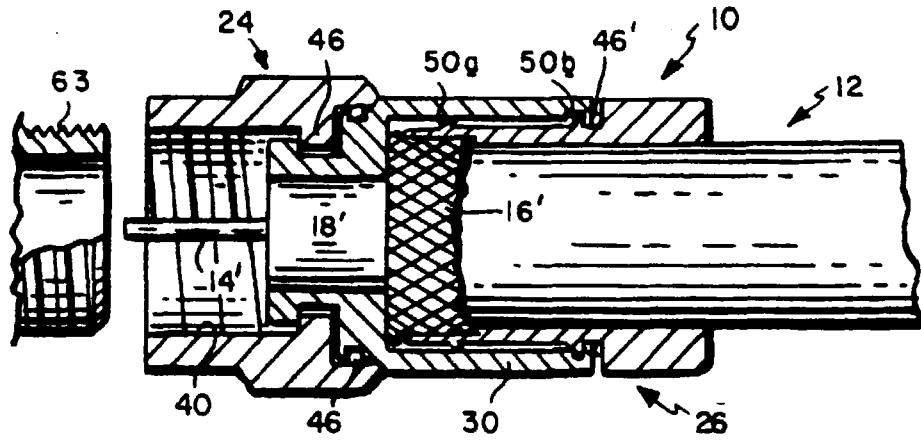


FIG. 5

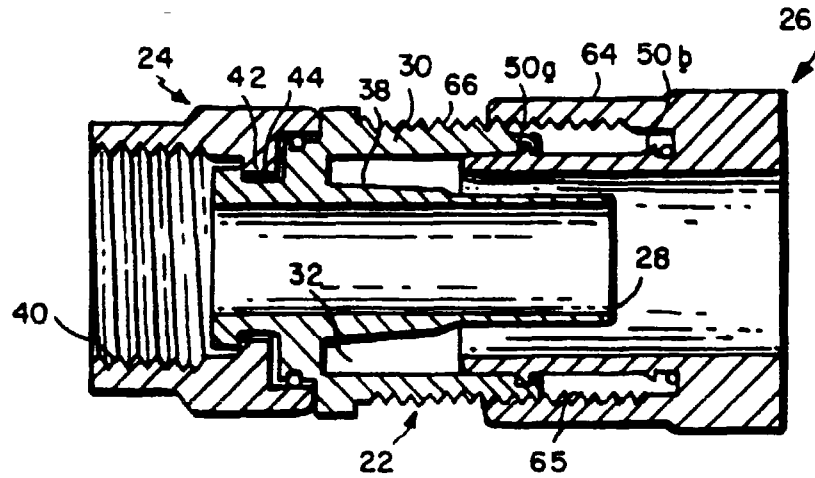


FIG. 6

CIVIL COVER SHEET

The JS-44 civil cover sheet and the information contained herein neither replace nor supplement the filing and service of pleadings or other papers as required by law, except as provided by local rules of court. This form, approved by the Judicial Conference of the United States in September 1974, is required for the filing of the cover sheet with the civil docket sheet. (SEE INSTRUCTIONS ON THE REVERSE OF THE FORM.)

01-6752

I (a) PLAINTIFFS

JOHN MEZZALINGUA ASSOCIATES, INC., d/b/a PPC

QUAY - 4 PM 3:29
CLERK U.S. DIST. CT.
S.D. OF FLA - MIA

DEFENDANTS

THOMAS & BETTS CORPORATION

CIV - GOLD
MAGISTRATE JUDGE
SHELBY STANTON

(b) COUNTY OF RESIDENCE OF FIRST LISTED PLAINTIFF Onondage
(EXCEPT IN U.S. PLAINTIFF CASES)

COUNTY OF RESIDENCE OF FIRST LISTED DEFENDANT Shelby
(IN U.S. PLAINTIFF CASES ONLY)

NOTE: IN LAND CONDEMNATION CASES, USE THE LOCATION OF THE TRACT OF LAND INVOLVED

(c) ATTORNEYS (FIRM NAME, ADDRESS, AND TELEPHONE NUMBER)

McDermott, Will & Emery
201 S. Biscayne Blvd., 22nd Floor
Miami, FL 33131; (305) 358-3500

ATTORNEYS (IF KNOWN)

(d) CIRCLE COUNTY WHERE ACTION AROSE:

DADE, MONROE, BROWARD PALM BEACH, MARTIN, ST. LUCIE, INDIAN RIVER, OKEECHOBEE, HIGHLANDS

II. BASIS OF JURISDICTION (PLACE AN X IN ONE BOX ONLY)

- 1 U.S. Government Plaintiff
- 3 Federal Question (U.S. Government Not a Party)
- 2 U.S. Government Defendant
- 4 Diversity (Indicate Citizenship of Parties in Item III)

III. CITIZENSHIP OF PRINCIPAL PARTIES (PLACE AN X IN ONE BOX FOR PLAINTIFF AND ONE BOX FOR DEFENDANT)

	PTF	DEF		PTF	DEF
Citizen of This State	<input type="checkbox"/> 1	<input type="checkbox"/> 1	Incorporated or Principal Place of Business in This State	<input type="checkbox"/> 4	<input type="checkbox"/> 4
Citizen of Another State	<input type="checkbox"/> 2	<input type="checkbox"/> 2	Incorporated and Principal Place of Business in Another State	<input type="checkbox"/> 5	<input type="checkbox"/> 5
Citizen or Subject of a Foreign Country	<input type="checkbox"/> 3	<input type="checkbox"/> 3	Foreign Nation	<input type="checkbox"/> 6	<input type="checkbox"/> 6

IV. CAUSE OF ACTION (CITE THE U.S. CIVIL STATUTE UNDER WHICH YOU ARE FILING AND WRITE A BRIEF STATEMENT OF CAUSE. DO NOT CITE JURISDICTIONAL STATUTES UNLESS DIVERSITY)

IVa. 5 days estimated (for both sides) to try entire case.

V. NATURE OF SUIT (PLACE AN X IN ONE BOX ONLY)

A CONTRACT	A TORTS	B FORFEITURE/PENALTY	A BANKRUPTCY	A OTHER STATUTES
<input type="checkbox"/> 110 Insurance <input type="checkbox"/> 120 Marine <input type="checkbox"/> 130 Miller Act <input type="checkbox"/> 140 Negotiable Instrument <input type="checkbox"/> 150 Recovery of Overpayment & Enforcement of Judgment <input type="checkbox"/> 151 Medicare Act <input type="checkbox"/> 152 Recovery of Defaulted Student Loans (Excl. Veterans) <input type="checkbox"/> 153 Recovery of Overpayment of Veteran's Benefits <input type="checkbox"/> 160 Stockholders' Suits <input type="checkbox"/> 190 Other Contract <input type="checkbox"/> 195 Contract Product Liability	PERSONAL INJURY <input type="checkbox"/> 310 Airplane <input type="checkbox"/> 315 Airplane Product Liability <input type="checkbox"/> 320 Assault, Libel & Slander <input type="checkbox"/> 330 Federal Employers Liability <input type="checkbox"/> 340 Marine <input type="checkbox"/> 345 Marine Product Liability <input type="checkbox"/> 350 Motor Vehicle <input type="checkbox"/> 355 Motor Vehicle Product Liability <input type="checkbox"/> 360 Other Personal Injury PERSONAL PROPERTY <input type="checkbox"/> 370 Other Fraud <input type="checkbox"/> 371 Trench in Landing <input type="checkbox"/> 380 Other Personal Property Damage <input type="checkbox"/> 385 Property Damage Product Liability	<input type="checkbox"/> 610 Agriculture <input type="checkbox"/> 620 Other Food & Drug <input type="checkbox"/> 625 Drug Related Seizure of Property 21 USC 861 <input type="checkbox"/> 630 Liquor Laws <input type="checkbox"/> 640 R.R. & Truck <input type="checkbox"/> 650 Airline Regs <input type="checkbox"/> 660 Occupational Safety/Health <input type="checkbox"/> 690 Other	<input type="checkbox"/> 422 Appeal 28 USC 158 <input type="checkbox"/> 423 Withdrawal 28 USC 167 PROPERTY RIGHTS <input type="checkbox"/> 820 Copyrights <input type="checkbox"/> 830 Patent <input type="checkbox"/> 840 Trademark LABOR <input type="checkbox"/> 710 Fair Labor Standards Act <input type="checkbox"/> 720 Labor/Mgmt. Relations <input type="checkbox"/> 730 Labor/Mgmt. Reporting & Disclosure Act <input type="checkbox"/> 740 Railway Labor Act <input type="checkbox"/> 790 Other Labor Litigation <input type="checkbox"/> 791 Empl. Ret. Inc. Security Act	<input type="checkbox"/> 400 State Reapportionment <input type="checkbox"/> 410 Arbitration <input type="checkbox"/> 430 Banks and Banking <input type="checkbox"/> 450 Commerce/KCC Rates/etc <input type="checkbox"/> 460 Deportation <input type="checkbox"/> 470 Racketeer Influenced and Corrupt Organizations <input type="checkbox"/> 810 Selective Service <input type="checkbox"/> 850 Securities/Commodities/Exchange <input type="checkbox"/> 875 Customer Challenge 12 USC 3410 <input type="checkbox"/> 891 Agricultural Acts <input type="checkbox"/> 892 Economic Stabilization Act <input type="checkbox"/> 893 Environmental Matters <input type="checkbox"/> 894 Energy Allocation Act <input type="checkbox"/> 895 Freedom of Information Act <input type="checkbox"/> 900 Appeal of Fee Determination Under Equal Access to Justice <input type="checkbox"/> 950 Constitutionality of State Statutes <input checked="" type="checkbox"/> 890 Other Statutory Actions A OR B
A REAL PROPERTY	A CIVIL RIGHTS	B PRISONER PETITIONS	B SOCIAL SECURITY	A FEDERAL TAX SUITS
<input type="checkbox"/> 210 Land Condemnation <input type="checkbox"/> 220 Foreclosure <input type="checkbox"/> 230 Rent Lease & Ejectment <input type="checkbox"/> 240 Torts to Land <input type="checkbox"/> 245 Tort Product Liability <input type="checkbox"/> 290 All Other Real Property	<input type="checkbox"/> 441 Voting <input type="checkbox"/> 442 Employment <input type="checkbox"/> 443 Housing/Accommodations <input type="checkbox"/> 444 Welfare <input type="checkbox"/> 440 Other Civil Rights	<input type="checkbox"/> 510 Motions to Vacate Sentence Habeas Corpus <input type="checkbox"/> 530 General <input type="checkbox"/> 535 Death Penalty <input type="checkbox"/> 540 Mandamus & Other <input type="checkbox"/> 560 Civil Rights A OR B	<input type="checkbox"/> 861 HRA (1366B) <input type="checkbox"/> 862 Black Lung (922) <input type="checkbox"/> 863 DMC/DMMW (405(g)) <input type="checkbox"/> 864 SSID Title XVI <input type="checkbox"/> 865 RSI (405(g))	<input type="checkbox"/> 870 Taxes (U.S. Plaintiff or Defendant) <input type="checkbox"/> 871 IRS - Third Party 26 USC 706

VI. ORIGIN

- 1 Original Proceeding
- 2 Removed from State Court
- 3 Remanded from Appellate Court
- 4 Refiled
- 5 Transferred from another district (specify)
- 6 Multidistrict Litigation
- 7 Appeal to District Judge from Magistrate Judgment

VII. REQUESTED IN COMPLAINT:

CHECK IF THIS IS A CLASS ACTION UNDER F.R.C.P. 23 DEMAND \$ _____ Check YES only if demanded in complaint: JURY DEMAND: YES NO

VIII. RELATED CASE(S) IF ANY (See instructions):

JUDGE _____ DOCKET NUMBER _____

DATE 5/3/01

SIGNATURE OF ATTORNEY OF RECORD
Steven E. Siff

Steven E. Siff

RECEIVED FROM RECEIPT ONLY: Receipt No. 841243 Amount: \$12,000

AO 120 (Rev. 2/97)

TO: Commissioner of Patents and Trademarks Arlington, VA 22202	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
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In Compliance with 35 § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court _____ on the following Patents or Trademarks:

DOCKET NO. <i>Gold</i> 01-6752-4	DATE FILED 5/4/01	U.S. DISTRICT COURT U.S. D.C., Southern District of Florida
PLAINTIFF John Mezzalingua Associates, Inc. DBA PPC		DEFENDANT Thomas + Betts Corporation
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1 5,470,257	11/28/95	Plaintiff
2 5,632,651	5/27/97	Plaintiff
3		
4		
5		

In the above-entitled case, the following patent(s) have been included:

DATE INCLUDED	INCLUDED BY		
	<input type="checkbox"/> Amendment	<input type="checkbox"/> Answer	<input type="checkbox"/> Cross Bill
	<input type="checkbox"/> Other Pleading		
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK	
1			
2			
3			
4			
5			

In the above-entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE
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