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Malloy et al.

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(54) **CABLE CONNECTOR HAVING A BIASING ELEMENT**

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(52) **U.S. Cl.** **439/578; 439/584**

(58) **Field of Classification Search** **439/578, 439/583, 584, 585**

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

1,734,506 A	11/1929	Walter
2,258,737 A	10/1941	Browne
2,394,351 A	2/1946	Wurzburger
2,460,304 A	2/1949	McGee et al.
2,544,654 A	3/1951	Brown
2,544,764 A	3/1951	Parkes
2,549,647 A	4/1951	Turenne
2,694,187 A	11/1954	Nash
2,728,895 A	12/1955	Quackenbush et al.
2,754,487 A	7/1956	Carr et al.

(Continued)

FOREIGN PATENT DOCUMENTS

CA 2096710 11/1994

(Continued)

OTHER PUBLICATIONS

Notice of Allowance for U.S. Appl. No. 12/568,179, mail date Mar. 21, 2011, 10 pages.

(Continued)

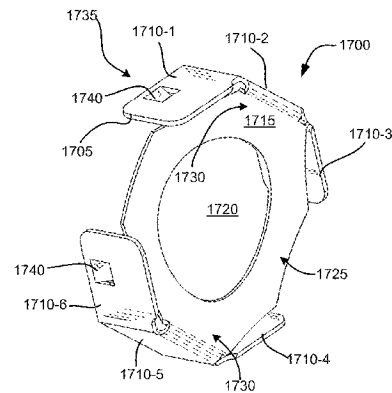
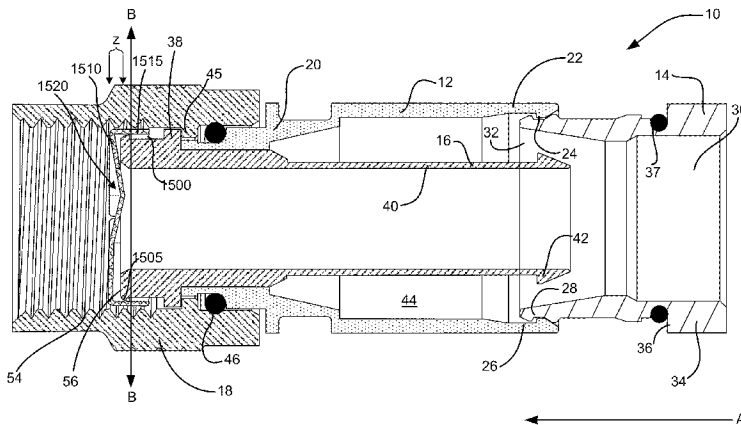
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(57) **ABSTRACT**

A coaxial cable connector for coupling a coaxial cable to a mating connector includes a connector body having a forward end and a rearward cable receiving end for receiving a cable. A nut is rotatably coupled to the forward end of the connector body. An annular post is disposed within the connector body, the post having a forward flanged base portion disposed within a rearward extent of the nut, the forward flanged base portion having a forward face. A biasing element is attached to the forward flanged base portion of the post and includes a deflectable portion extending outwardly in a forward direction beyond the forward face of the post shoulder portion.

9 Claims, 18 Drawing Sheets



U.S. PATENT DOCUMENTS							
2,757,351	A	7/1956	Klostermann	4,012,105	A	3/1977	Biddle
2,761,110	A	8/1956	Edlen et al.	4,017,139	A	4/1977	Nelson
2,762,025	A *	9/1956	Melcher 439/580	4,046,451	A	9/1977	Juds et al.
2,805,399	A	9/1957	Leeper	4,051,447	A	9/1977	Heckman, Jr. et al.
2,870,420	A	1/1959	Malek	4,053,200	A	10/1977	Pugner
2,983,893	A	5/1961	Jackson	4,059,330	A	11/1977	Shirey
2,999,701	A	9/1961	Blair et al.	4,093,335	A	6/1978	Schwartz et al.
3,040,288	A	6/1962	Edlen et al.	4,126,372	A	11/1978	Hashimoto et al.
3,184,706	A	5/1965	Atkins	4,131,332	A	12/1978	Hogendobler et al.
3,196,382	A	7/1965	Morello, Jr.	4,150,250	A	4/1979	Lundeberg
3,206,540	A	9/1965	Cohen	4,156,554	A	5/1979	Aujla
3,245,027	A	4/1966	Ziegler, Jr.	4,165,911	A	8/1979	Laudig
3,275,913	A	9/1966	Blanchard et al.	4,168,921	A	9/1979	Blanchard
3,275,970	A	9/1966	Johanson et al.	4,172,385	A	10/1979	Cristensen
3,292,136	A	12/1966	Somerset	4,173,385	A	11/1979	Fenn et al.
3,295,076	A	12/1966	Kraus	4,187,481	A	2/1980	Boutros
3,297,979	A	1/1967	O'Keefe et al.	4,191,408	A	3/1980	Acker
3,320,575	A	5/1967	Brown et al.	4,225,162	A	9/1980	Dola
3,336,562	A	8/1967	McCormick et al.	4,227,765	A	10/1980	Neumann et al.
3,350,677	A	10/1967	Daum	4,235,461	A	11/1980	Normark
3,355,698	A	11/1967	Keller	4,250,348	A	2/1981	Kitagawa
3,373,243	A	3/1968	Janowiak et al.	4,255,011	A	3/1981	Davis et al.
3,384,703	A	5/1968	Forney, Jr. et al.	4,258,943	A	3/1981	Vogt et al.
3,406,373	A	10/1968	Forney, Jr. et al.	4,280,749	A	7/1981	Hemmer
3,448,430	A	6/1969	Kelly	4,339,166	A	7/1982	Dayton
3,465,281	A	9/1969	Florer	4,346,958	A	8/1982	Blanchard
3,467,940	A	9/1969	Wallo	4,354,721	A	10/1982	Luzzi
3,475,545	A	10/1969	Stark et al.	4,358,174	A	11/1982	Dreyer
3,498,647	A	3/1970	Schroder	4,373,767	A	2/1983	Cairns
3,526,871	A	9/1970	Hobart	4,400,050	A	8/1983	Hayward
3,533,051	A	10/1970	Ziegler, Jr.	4,406,483	A	9/1983	Perlman
3,537,065	A	10/1970	Winston	4,407,529	A	10/1983	Holman
3,538,464	A	11/1970	Walsh	4,408,821	A	10/1983	Forney, Jr.
3,544,705	A	12/1970	Winston	4,408,822	A	10/1983	Nikitas
3,551,882	A	12/1970	O'Keefe	4,421,377	A	12/1983	Spinner
3,564,487	A	2/1971	Upstone et al.	4,426,127	A *	1/1984	Kubota 439/607.17
3,573,677	A	4/1971	Detar	4,444,453	A	4/1984	Kirby et al.
3,579,155	A	5/1971	Tuchto	4,456,323	A	6/1984	Pitcher et al.
3,591,208	A	7/1971	Nicolaus	4,462,653	A	7/1984	Flederbach et al.
3,594,694	A	7/1971	Clark	4,464,000	A	8/1984	Werth et al.
3,613,050	A	10/1971	Andrews	4,484,792	A	11/1984	Tengler et al.
3,629,792	A	12/1971	Dorrell	4,515,427	A	5/1985	Smit
3,633,150	A	1/1972	Swartz	4,533,191	A	8/1985	Blackwood
3,633,944	A	1/1972	Hamburg	4,540,231	A	9/1985	Forney, Jr.
3,644,874	A	2/1972	Hutter	4,545,633	A	10/1985	McGeary
3,646,502	A	2/1972	Hutter et al.	4,545,637	A	10/1985	Bosshard et al.
3,663,926	A	5/1972	Brandt	4,557,546	A	12/1985	Dreyer
3,668,612	A	6/1972	Nepovim	4,575,274	A	3/1986	Hayward
3,669,472	A	6/1972	Nadsady	4,583,811	A	4/1986	McMills
3,671,922	A	6/1972	Zerlin et al.	4,588,246	A	5/1986	Schildkraut et al.
3,684,321	A	8/1972	Hundhausen et al.	4,593,964	A	6/1986	Forney, Jr. et al.
3,686,623	A	8/1972	Nijman	4,596,434	A	6/1986	Saba et al.
3,694,792	A	9/1972	Wallo	4,596,435	A	6/1986	Bickford
3,710,005	A	1/1973	French	4,597,620	A	7/1986	Lindner et al.
3,721,869	A	3/1973	Paoli	4,598,961	A	7/1986	Cohen
3,743,979	A	7/1973	Schor	4,600,263	A	7/1986	DeChamp et al.
3,745,514	A	7/1973	Brishka	4,613,119	A	9/1986	Hardtke
3,778,535	A	12/1973	Forney, Jr.	4,614,390	A	9/1986	Baker
3,781,762	A	12/1973	Quackenbush	4,632,487	A	12/1986	Wargula
3,808,580	A	4/1974	Johnson	4,640,572	A	2/1987	Conlon
3,836,700	A	9/1974	Niemeyer	4,645,281	A	2/1987	Burger
3,845,453	A	10/1974	Hemmer	4,650,228	A	3/1987	McMills et al.
3,846,738	A	11/1974	Nepovim	4,655,159	A	4/1987	McMills
3,854,003	A	12/1974	Duret	4,660,921	A	4/1987	Hauver
3,870,978	A	3/1975	Dreyer	4,668,043	A	5/1987	Saba et al.
3,879,102	A	4/1975	Horak	4,674,818	A	6/1987	McMills et al.
3,907,399	A	9/1975	Spinner	4,676,577	A	6/1987	Szegda
3,910,673	A	10/1975	Stokes	4,682,832	A	7/1987	Punako et al.
3,915,539	A	10/1975	Collins	4,688,876	A	8/1987	Morelli
3,936,132	A	2/1976	Hutter	4,688,878	A	8/1987	Cohen et al.
3,953,097	A	4/1976	Graham	4,691,976	A	9/1987	Cowen
3,953,098	A	4/1976	Avery et al.	4,703,987	A	11/1987	Gallusser et al.
3,961,294	A	6/1976	Hollyday	4,703,988	A	11/1987	Raux et al.
3,963,320	A	6/1976	Spinner	4,717,355	A	1/1988	Mattis
3,972,013	A	7/1976	Shapiro	4,738,009	A	4/1988	Down et al.
3,976,352	A	8/1976	Spinner	4,746,305	A	5/1988	Nomura
				4,747,786	A	5/1988	Hayashi et al.

4,761,146	A	8/1988	Sohoel	5,470,257	A	11/1995	Szegda
4,772,222	A	9/1988	Laudig et al.	5,490,033	A	2/1996	Cronin
4,777,669	A	10/1988	Rogus	5,494,454	A	2/1996	Johnsen
4,789,355	A	12/1988	Lee	5,496,076	A	3/1996	Lin
4,793,821	A	12/1988	Fowler et al.	5,501,616	A	3/1996	Holliday
4,806,116	A	2/1989	Ackerman	5,525,076	A	6/1996	Down
4,808,128	A	2/1989	Werth	5,542,861	A	8/1996	Anhalt et al.
4,813,886	A	3/1989	Roos et al.	5,548,088	A	8/1996	Gray et al.
4,820,185	A	4/1989	Moulin	5,550,521	A	8/1996	Bernaude et al.
4,824,400	A	4/1989	Spinner	5,571,028	A	11/1996	Szegda
4,834,675	A	5/1989	Samchisen	5,586,910	A	12/1996	Del Negro et al.
4,854,893	A	8/1989	Morris	5,595,502	A	1/1997	Allison
4,857,014	A	8/1989	Alf et al.	5,598,132	A	1/1997	Stabile
4,869,679	A	9/1989	Szegda	5,607,325	A	3/1997	Toma
4,874,331	A	10/1989	Iverson	5,620,339	A	4/1997	Gray et al.
4,878,697	A	11/1989	Henry	5,632,651	A	5/1997	Szegda
4,892,275	A	1/1990	Szegda	5,651,699	A	7/1997	Holliday
4,902,246	A	2/1990	Samchisen	5,653,605	A	8/1997	Woehl et al.
4,906,207	A	3/1990	Banning et al.	5,667,405	A	9/1997	Holliday
4,915,651	A	4/1990	Bout	5,683,263	A	11/1997	Hsu
4,923,412	A	5/1990	Morris	5,690,503	A	11/1997	Konda et al.
4,925,403	A	5/1990	Zorzy	5,695,365	A	12/1997	Kennedy et al.
4,927,385	A	5/1990	Cheng	5,702,262	A	12/1997	Brown et al.
4,929,188	A	5/1990	Lionetto et al.	5,702,263	A	12/1997	Baumann et al.
4,941,846	A	7/1990	Guimond et al.	5,769,652	A	6/1998	Wider
4,952,174	A	8/1990	Sucht et al.	5,775,927	A	7/1998	Wider
4,957,456	A	9/1990	Olson et al.	5,879,191	A	3/1999	Burris
4,973,265	A	11/1990	Heeren	5,882,226	A	3/1999	Bell et al.
4,979,911	A	12/1990	Spencer	5,956,365	A	9/1999	Haissig
4,990,104	A	2/1991	Schieferly	5,967,852	A	10/1999	Follingstad et al.
4,990,105	A	2/1991	Karlovich	5,975,949	A	11/1999	Holliday et al.
4,990,106	A	2/1991	Szegda	5,975,951	A	11/1999	Burris et al.
4,992,061	A	2/1991	Brush, Jr. et al.	5,997,350	A	12/1999	Burris et al.
5,002,503	A	3/1991	Campbell et al.	6,019,636	A	2/2000	Langham
5,007,861	A	4/1991	Stirling	6,032,358	A	3/2000	Wild
5,021,010	A	6/1991	Wright	6,042,422	A	3/2000	Youtsey
5,024,606	A	6/1991	Ming-Hwa	6,089,903	A	7/2000	Stafford Gray et al.
5,037,328	A	8/1991	Karlovich	6,089,912	A	7/2000	Tallis et al.
5,062,804	A	11/1991	Jamet et al.	6,089,913	A	7/2000	Holliday
5,066,248	A	11/1991	Gaver, Jr. et al.	6,106,314	A	8/2000	McLean et al.
5,073,129	A	12/1991	Szegda	6,123,581	A	9/2000	Stabile et al.
5,083,943	A	1/1992	Tarrant	6,146,197	A	11/2000	Holliday et al.
5,100,341	A	3/1992	Czyz et al.	6,153,830	A	11/2000	Montena
5,120,260	A	6/1992	Jackson	6,168,211	B1	1/2001	Schorn-Gilson
5,127,853	A	7/1992	McMills et al.	6,210,222	B1	4/2001	Langham et al.
5,131,862	A	7/1992	Gershfeld	6,217,383	B1	4/2001	Holland et al.
5,141,451	A	8/1992	Down	RE37,153	E	5/2001	Henszey et al.
5,154,636	A	10/1992	Vaccaro et al.	6,241,553	B1	6/2001	Hsia
5,161,993	A	11/1992	Leibfried, Jr.	6,261,126	B1	7/2001	Stirling
5,192,219	A	3/1993	Fowler et al.	6,344,736	B1	2/2002	Kerrigan et al.
5,195,906	A	3/1993	Szegda	6,358,077	B1	3/2002	Young
5,205,761	A	4/1993	Nilsson	6,390,825	B1	5/2002	Handley et al.
5,207,602	A	5/1993	McMills et al.	D458,904	S	6/2002	Montena
5,217,391	A	6/1993	Fisher, Jr.	D460,739	S	7/2002	Fox
5,217,393	A	6/1993	Del Negro et al.	D460,740	S	7/2002	Montena
5,269,701	A	12/1993	Leibfried, Jr.	D460,946	S	7/2002	Montena
5,280,254	A	1/1994	Hunter et al.	D460,947	S	7/2002	Montena
5,281,167	A	1/1994	Le et al.	D460,948	S	7/2002	Montena
5,283,853	A	2/1994	Szegda	D461,166	S	8/2002	Montena
5,284,449	A	2/1994	Vaccaro	D461,167	S	8/2002	Montena
5,316,494	A	5/1994	Flanagan et al.	D461,778	S	8/2002	Fox
5,316,499	A	5/1994	Scannelli et al.	D462,058	S	8/2002	Montena
5,318,459	A	6/1994	Shields	D462,060	S	8/2002	Fox
5,338,225	A	8/1994	Jacobsen et al.	D462,327	S	9/2002	Montena
5,342,218	A	8/1994	McMills et al.	6,478,618	B2	11/2002	Wong
5,354,217	A	10/1994	Gabel et al.	6,491,546	B1	12/2002	Perry
5,371,819	A	12/1994	Szegda	D468,696	S	1/2003	Montena
5,371,821	A	12/1994	Szegda	6,558,194	B2	5/2003	Montena
5,371,827	A	12/1994	Szegda	6,561,841	B2	5/2003	Norwood et al.
5,393,244	A	2/1995	Szegda	6,619,876	B2	9/2003	Vaitkus et al.
5,409,398	A	4/1995	Chadbourne et al.	6,621,386	B2	9/2003	Drackner et al.
5,417,588	A	5/1995	Olson et al.	6,692,285	B2	2/2004	Islam
5,431,583	A	7/1995	Szegda	6,712,631	B1	3/2004	Youtsey
5,435,745	A	7/1995	Booth	6,716,062	B1	4/2004	Palinkas et al.
5,444,810	A	8/1995	Szegda	6,733,337	B2*	5/2004	Kodaira 439/578
5,455,548	A	10/1995	Grandchamp et al.	6,767,248	B1	7/2004	Hung
5,456,611	A	10/1995	Henry et al.	6,805,584	B1	10/2004	Chen

6,848,940	B2	2/2005	Montena		DE	2 261 973	12/1972
6,910,910	B2	6/2005	Cairns		DE	32 11 008 A1	10/1983
6,921,283	B2	7/2005	Zahlit et al.		DE	102289	7/1987
6,939,169	B2	9/2005	Islam et al.		DE	41 28 551 A1	3/1992
7,114,990	B2	10/2006	Bence et al.		EP	0 072 104	2/1983
7,189,097	B2*	3/2007	Benham	439/352	EP	0 116 157	8/1984
7,192,308	B2	3/2007	Rodrigues et al.		EP	0 167 738	1/1986
7,473,128	B2	1/2009	Montena		EP	0 265 276 B1	4/1988
7,566,236	B2	7/2009	Malloy et al.		FR	2 232 846	6/1974
7,587,244	B2*	9/2009	Olbertz	607/37	FR	2 234 680	6/1974
7,753,705	B2*	7/2010	Montena	439/277	FR	2 462 798	2/1980
7,828,595	B2	11/2010	Mathews		FR	4 494 508	5/1982
7,833,053	B2	11/2010	Mathews		FR	2 524 722	10/1983
2002/0013088	A1	1/2002	Rodrigues et al.		GB	589697	3/1945
2004/0048514	A1	3/2004	Kodaira		GB	1087228	10/1967
2004/0077215	A1	4/2004	Palinkas et al.		GB	1 270 846	4/1972
2004/0102089	A1	5/2004	Chee		GB	2 019 665 A	10/1979
2004/0224552	A1	11/2004	Hagmann et al.		GB	2 079 549 A	1/1982
2004/0229504	A1	11/2004	Liu		GB	2 331 634 A	5/1999
2005/0042919	A1	2/2005	Montena		JP	03071571	3/1991
2005/0164553	A1	7/2005	Montena		JP	03-280369	12/1991
2005/0208827	A1	9/2005	Burris et al.		JP	10-228948	8/1998
2006/0110977	A1	5/2006	Mathews		JP	2002075556	3/2002
2008/0102696	A1*	5/2008	Montena	439/578	WO	WO 93/24973	12/1993
2008/0113554	A1	5/2008	Montena		WO	WO 96/08854	3/1996
2008/0311790	A1*	12/2008	Malloy et al.	439/583	WO	WO 01/86756 A1	11/2001
2010/0081321	A1	4/2010	Malloy et al.				
2010/0081322	A1*	4/2010	Malloy et al.	439/578			

OTHER PUBLICATIONS

Office Action for U.S. Appl. No. 12/568,149, mail date May 12, 2011, 8 pages.

Statement of Substance of Interview, Terminal Disclaimer and Statement Under 37 CFR 3.73(b) for U.S. Appl. No. 12/568,179, filed Jun. 30, 2011, 5 pages.

* cited by examiner

FOREIGN PATENT DOCUMENTS

DE	47931	10/1888
DE	1 117 687	11/1961
DE	1 515 398	11/1962
DE	1 191 880	4/1965
DE	2 221 936	5/1972
DE	2 225 764	5/1972

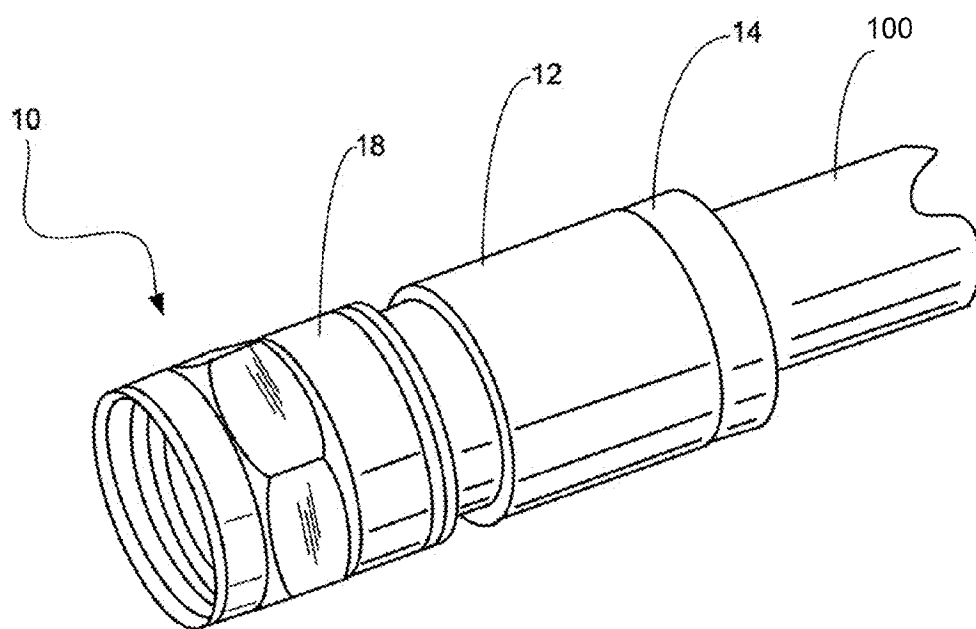


FIG. 1

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