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(12) **United States Design Patent**
Fangrow, Jr.

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(54) **MEDICAL CONNECTOR**
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CA (US)

3,334,860 A 8/1967 Bolton, Jr.
3,352,531 A 11/1967 Kilmarx
3,354,881 A 11/1967 Bloch
3,385,301 A 5/1968 Harautuneian
3,502,097 A 3/1970 Muller

(Continued)

(73) Assignee: **ICU Medical, Inc.**, San Clemente, CA
(US)

FOREIGN PATENT DOCUMENTS

(**) Term: **14 Years**

CA 1105959 7/1981

(Continued)

(21) Appl. No.: **29/376,647**

OTHER PUBLICATIONS

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Capless Backcheck Valve, Sep. 3, 1993.

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Related U.S. Application Data

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(51) **LOC (9) Cl.** **24-02**

(52) **U.S. Cl.** **D24/129**

(58) **Field of Classification Search** D24/127-129;
604/905, 533, 535, 167.03, 167.04, 247-248,
604/167.06, 249, 403, 256, 5
See application file for complete search history.

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Bear, LLP

(57) **CLAIM**

The ornamental design for a medical connector, as shown and
described.

(56) **References Cited**

DESCRIPTION

U.S. PATENT DOCUMENTS

274,447 A 3/1883 Kennish
1,578,517 A 3/1926 Hein
1,923,501 A 8/1933 Perry
2,210,098 A 8/1940 Ravenscroft
2,289,677 A 7/1942 Perelson
2,577,780 A 12/1951 Lockhart
2,756,282 A 7/1956 Deane
2,756,740 A 7/1956 Deane
2,809,665 A 10/1957 Crowe
2,847,995 A 8/1958 Adams
2,999,499 A 9/1961 Willet
3,134,380 A 5/1964 Armao
3,135,261 A 6/1964 Carroll
3,171,412 A 3/1965 Willet
3,176,021 A 3/1965 Volungis et al.
3,191,655 A 6/1965 McCord
3,193,154 A 7/1965 Bross

FIG. 1 is a top perspective view of a medical connector
embodying my new design.

FIG. 2 is a bottom perspective view of the medical connector
of FIG. 1.

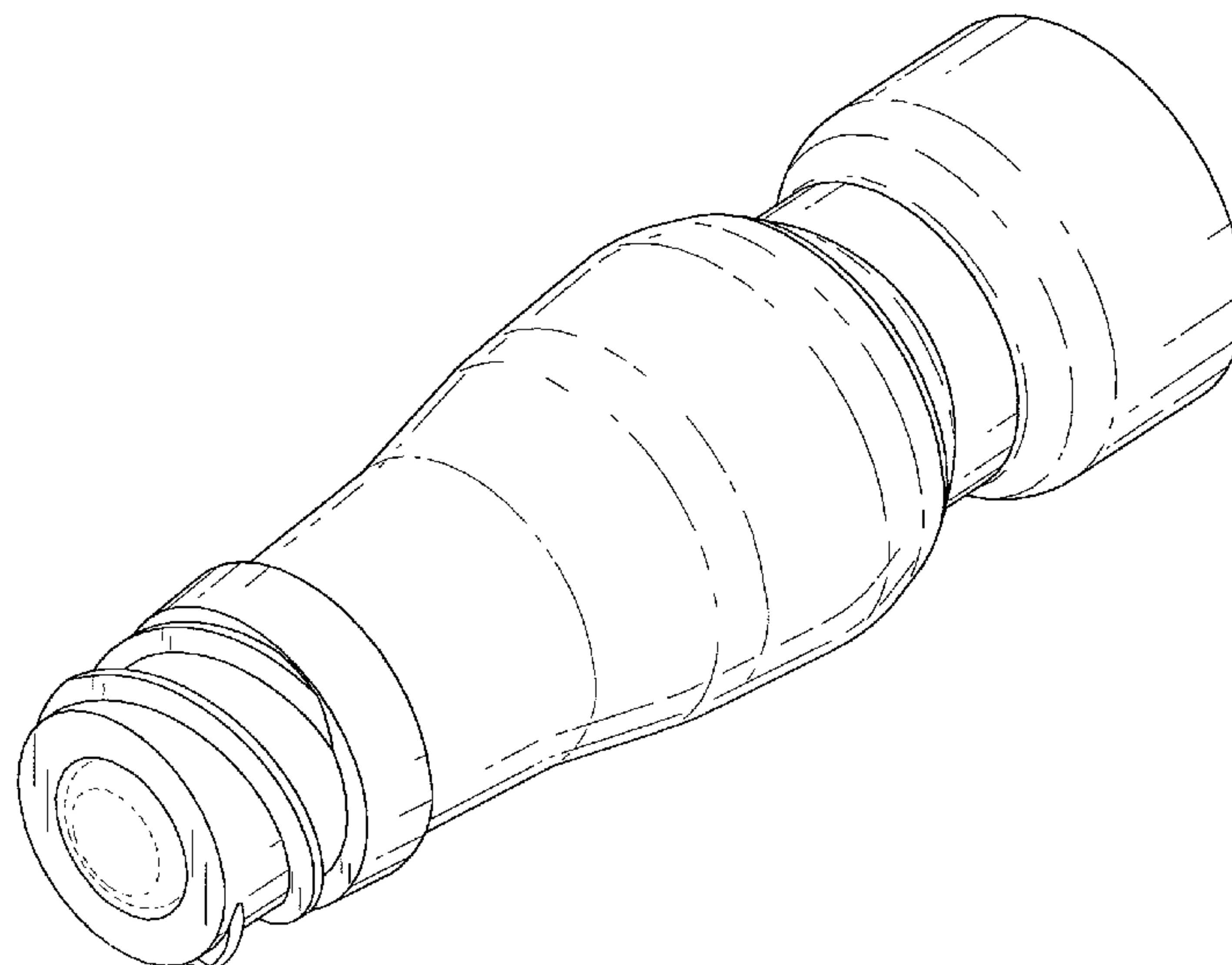
FIG. 3 is a right side view of the medical connector of FIG. 1,
the left side view being a mirror image thereof.

FIG. 4 is a top plan view of the medical connector of FIG. 1;
and,

FIG. 5 is a bottom plan view of the medical connector of FIG.
1.

The broken lines shown in the Figures are included for the
purpose of illustrating portions of the article and form no part
of the claimed design.

1 Claim, 3 Drawing Sheets



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| U.S. PATENT DOCUMENTS | | | | | |
|-----------------------|-----|----------------------------------|-----------|-----|-------------------------------------|
| 3,534,771 | A | 10/1970 Eyerdam et al. | 4,607,868 | A | 8/1986 Harvey et al. |
| 3,570,484 | A | 3/1971 Steer et al. | 4,610,469 | A | 9/1986 Wolff-Mooij |
| 3,630,199 | A | 12/1971 Gangarosa | 4,617,012 | A | 10/1986 Vaillancourt |
| 3,648,684 | A | 3/1972 Barnwell et al. | 4,619,640 | A | 10/1986 Poholsky et al. |
| 3,659,602 | A | 5/1972 Cloyd | 4,623,068 | A | 11/1986 Brown et al. |
| 3,717,174 | A | 2/1973 Dewall | 4,645,494 | A | 2/1987 Lee et al. |
| 3,726,282 | A | 4/1973 Patel | 4,666,429 | A | 5/1987 Stone |
| 3,788,519 | A | 1/1974 Mengel | 4,673,400 | A | 6/1987 Martin |
| 3,830,241 | A | 8/1974 Dye et al. | 4,676,228 | A | 6/1987 Krasner et al. |
| 3,831,629 | A | 8/1974 Mackal et al. | 4,683,916 | A | 8/1987 Raines |
| 3,852,385 | A | 12/1974 Huggins | 4,706,487 | A | 11/1987 Bandou et al. |
| 3,861,388 | A | 1/1975 Vaughn | 4,710,168 | A | 12/1987 Schwab et al. |
| 3,889,675 | A | 6/1975 Stewart | 4,725,267 | A | 2/1988 Vaillancourt |
| 3,896,853 | A | 7/1975 Bernhard | 4,730,635 | A | 3/1988 Linden |
| 3,965,910 | A | 6/1976 Fischer | 4,752,292 | A | 6/1988 Lopez et al. |
| 3,974,832 | A | 8/1976 Kruck | D296,592 | S * | 7/1988 Wellenstam D24/129 |
| 3,976,063 | A | 8/1976 Henneman et al. | 4,759,756 | A | 7/1988 Forman et al. |
| 3,976,073 | A | 8/1976 Quick et al. | 4,775,369 | A | 10/1988 Schwartz |
| 3,977,403 | A | 8/1976 Patel | 4,778,447 | A | 10/1988 Velde et al. |
| 3,986,508 | A | 10/1976 Barrington | 4,778,453 | A | 10/1988 Lopez |
| 3,993,063 | A | 11/1976 Larrabee | 4,781,702 | A | 11/1988 Herrli |
| 3,994,293 | A | 11/1976 Ferro | 4,804,015 | A | 2/1989 Albinsson |
| 4,005,710 | A | 2/1977 Zeddies et al. | D300,177 | S * | 3/1989 Bellotti et al. D24/129 |
| 4,019,512 | A | 4/1977 Tenczar | 4,810,241 | A | 3/1989 Rogers |
| 4,022,205 | A | 5/1977 Tenczar | 4,813,938 | A | 3/1989 Raulerson |
| 4,040,420 | A | 8/1977 Speer | 4,819,684 | A | 4/1989 Zaugg et al. |
| 4,076,285 | A | 2/1978 Martinez | 4,832,214 | A | 5/1989 Schrader et al. |
| 4,079,738 | A | 3/1978 Dunn et al. | 4,834,664 | A | 5/1989 Lin |
| 4,080,965 | A | 3/1978 Phillips | 4,834,716 | A | 5/1989 Ogle, II |
| 4,121,585 | A | 10/1978 Becker, Jr. | D303,013 | S * | 8/1989 Konopka D24/129 |
| 4,128,098 | A | 12/1978 Bloom et al. | 4,871,356 | A | 10/1989 Haindl et al. |
| 4,133,441 | A | 1/1979 Mittleman et al. | 4,874,377 | A | 10/1989 Newgard et al. |
| 4,143,853 | A | 3/1979 Abramson | 4,878,897 | A | 11/1989 Katzin |
| 4,149,535 | A | 4/1979 Volder | 4,880,414 | A | 11/1989 Whipple |
| 4,161,949 | A | 7/1979 Thanawalla | 4,889,527 | A | 12/1989 Herrli |
| 4,186,775 | A | 2/1980 Muroi | 4,915,687 | A | 4/1990 Sivert |
| 4,187,846 | A | 2/1980 Lolachi et al. | 4,917,668 | A | 4/1990 Haindl |
| 4,191,183 | A | 3/1980 Mendelson | 4,919,167 | A | 4/1990 Maska |
| 4,198,983 | A | 4/1980 Becker et al. | 4,928,212 | A | 5/1990 Benavides |
| 4,200,096 | A | 4/1980 Charvin | 4,943,896 | A | 7/1990 Johnson |
| 4,214,779 | A | 7/1980 Losell | 4,946,445 | A | 8/1990 Lynn |
| 4,219,912 | A | 9/1980 Adams | 4,963,133 | A | 10/1990 Whipple |
| 4,243,034 | A | 1/1981 Brandt | 4,964,855 | A | 10/1990 Todd et al. |
| 4,257,416 | A | 3/1981 Prager | 4,966,199 | A | 10/1990 Ruschke |
| D259,278 | S * | 5/1981 McCaw et al. D24/129 | 4,969,883 | A | 11/1990 Gilbert et al. |
| 4,294,249 | A | 10/1981 Sheehan et al. | D314,050 | S * | 1/1991 Sone D24/129 |
| 4,294,250 | A * | 10/1981 Dennehey 604/403 | 4,985,399 | A | 1/1991 Matsuda et al. |
| 4,296,949 | A | 10/1981 Muetterties et al. | 4,987,181 | A | 1/1991 Bichon et al. |
| 4,306,705 | A | 12/1981 Svensson | 4,991,413 | A | 2/1991 Arnaldo |
| 4,324,239 | A | 4/1982 Gordon et al. | 4,991,629 | A | 2/1991 Ernesto et al. |
| 4,328,802 | A | 5/1982 Curley et al. | 4,998,713 | A | 3/1991 Vaillancourt |
| 4,329,987 | A | 5/1982 Rogers et al. | 4,998,927 | A | 3/1991 Vaillancourt |
| 4,334,551 | A | 6/1982 Pfister | 5,006,114 | A | 4/1991 Rogerts et al. |
| 4,338,933 | A | 7/1982 Bayard et al. | 5,009,490 | A | 4/1991 Kouno et al. |
| 4,342,315 | A | 8/1982 Jackson | 5,018,532 | A | 5/1991 Ethridge, III |
| 4,346,703 | A | 8/1982 Dennehey et al. | 5,024,657 | A | 6/1991 Needham et al. |
| 4,362,156 | A | 12/1982 Feller, Jr. et al. | 5,031,675 | A | 7/1991 Lindgren |
| 4,387,879 | A | 6/1983 Tauschinski | 5,041,087 | A | 8/1991 Loo et al. |
| RE31,315 | E | 7/1983 Jenkins et al. | 5,046,456 | A | 9/1991 Heyman et al. |
| 4,392,851 | A | 7/1983 Elias | 5,049,128 | A | 9/1991 Duquette |
| 4,405,163 | A | 9/1983 Voges et al. | D321,250 | S | 10/1991 Jepson et al. |
| 4,405,312 | A | 9/1983 Gross et al. | D321,251 | S | 10/1991 Jepson et al. |
| 4,411,662 | A | 10/1983 Pearson | 5,061,253 | A | 10/1991 Yoshida |
| 4,417,890 | A | 11/1983 Dennehey et al. | 5,064,416 | A | 11/1991 Newgard |
| 4,421,296 | A | 12/1983 Stephens | 5,065,783 | A | 11/1991 Ogle, II |
| 4,429,856 | A | 2/1984 Jackson | 5,071,411 | A | 12/1991 Hillstead |
| 4,432,759 | A | 2/1984 Gross et al. | 5,098,385 | A | 3/1992 Walsh |
| 4,432,765 | A | 2/1984 Oscarsson | 5,098,405 | A | 3/1992 Peterson et al. |
| 4,439,188 | A | 3/1984 Dennehey et al. | 5,098,406 | A | 3/1992 Sawyer |
| 4,439,193 | A | 3/1984 Larkin | 5,100,394 | A | 3/1992 Dudar et al. |
| 4,449,693 | A | 5/1984 Gereg | 5,108,380 | A | 4/1992 Heritze et al. |
| 4,457,749 | A | 7/1984 Bellotti et al. | 5,114,408 | A | 5/1992 Fleischhaker et al. |
| 4,483,368 | A | 11/1984 Panthofer | 5,116,361 | A | 5/1992 Kim et al. |
| 4,508,367 | A | 4/1985 Oreopoulos et al. | 5,122,123 | A | 6/1992 Vaillancourt |
| 4,511,359 | A | 4/1985 Vaillancourt | 5,125,915 | A | 6/1992 Berry et al. |
| 4,512,766 | A | 4/1985 Vaillancourt | 5,135,489 | A | 8/1992 Jepson et al. |
| 4,564,054 | A | 1/1986 Gustavsson | 5,137,524 | A | 8/1992 Lynn et al. |
| 4,592,356 | A | 6/1986 Gutierrez | 5,147,333 | A | 9/1992 Raines |
| | | | 5,154,703 | A | 10/1992 Bonaldo |

US D644,731 S

| | | | | | |
|-------------|---------|---------------------|--------------|---------|---------------------|
| 5,158,554 A | 10/1992 | Jepson et al. | 5,549,651 A | 8/1996 | Lynn |
| 5,163,922 A | 11/1992 | McElveen et al. | 5,555,908 A | 9/1996 | Edwards et al. |
| 5,167,238 A | 12/1992 | Newman | 5,556,388 A | 9/1996 | Johlin, Jr. |
| 5,167,636 A | 12/1992 | Clement | 5,562,632 A | 10/1996 | Davila et al. |
| 5,171,234 A | 12/1992 | Jepson et al. | 5,569,235 A | 10/1996 | Ross et al. |
| 5,180,761 A | 1/1993 | Shiao | 5,573,516 A | 11/1996 | Tyner |
| 5,188,620 A | 2/1993 | Jepson et al. | 5,577,706 A | 11/1996 | King |
| 5,190,067 A | 3/1993 | Paradis et al. | 5,578,059 A | 11/1996 | Patzer |
| 5,199,947 A | 4/1993 | Lopez et al. | 5,597,536 A | 1/1997 | Mayer |
| 5,201,717 A | 4/1993 | Wyatt et al. | 5,603,706 A | 2/1997 | Wyatt et al. |
| 5,201,722 A | 4/1993 | Moorehead et al. | 5,609,584 A | 3/1997 | Gettig et al. |
| 5,203,775 A | 4/1993 | Frank et al. | 5,616,129 A | 4/1997 | Mayer |
| 5,211,638 A | 5/1993 | Dudar et al. | 5,616,130 A | 4/1997 | Mayer |
| 5,215,538 A | 6/1993 | Larkin | 5,617,897 A | 4/1997 | Myers |
| 5,221,271 A | 6/1993 | Nicholson et al. | 5,620,424 A | 4/1997 | Abramson |
| 5,224,515 A | 7/1993 | Foster et al. | 5,620,434 A | 4/1997 | Brony |
| 5,242,393 A | 9/1993 | Brimhall et al. | 5,624,414 A | 4/1997 | Boettger |
| 5,242,423 A | 9/1993 | Goodsir et al. | 5,632,735 A | 5/1997 | Wyatt et al. |
| 5,242,425 A | 9/1993 | White et al. | 5,639,810 A | 6/1997 | Smith, III et al. |
| 5,242,432 A | 9/1993 | DeFrank | 5,660,205 A | 8/1997 | Epstein |
| 5,251,873 A | 10/1993 | Atkinson et al. | 5,669,891 A | 9/1997 | Vaillancourt |
| 5,253,842 A | 10/1993 | Huebscher et al. | 5,674,206 A | 10/1997 | Allton et al. |
| 5,255,676 A | 10/1993 | Russo | 5,676,346 A | 10/1997 | Leinsing |
| 5,256,155 A | 10/1993 | Yerlikaya et al. | 5,685,866 A | 11/1997 | Lopez |
| 5,267,966 A | 12/1993 | Paul | 5,690,865 A | 11/1997 | Kindt-Larsen et al. |
| 5,269,771 A | 12/1993 | Thomas et al. | 5,694,686 A | 12/1997 | Lopez |
| 5,273,533 A | 12/1993 | Bonaldo | 5,695,466 A | 12/1997 | Lopez et al. |
| 5,280,876 A | 1/1994 | Atkins | 5,699,821 A | 12/1997 | Paradis |
| 5,284,475 A | 2/1994 | Mackal | 5,700,248 A | 12/1997 | Lopez |
| 5,290,254 A | 3/1994 | Vaillancourt | 5,728,751 A | 3/1998 | Patnaik |
| 5,292,308 A | 3/1994 | Ryan | 5,730,418 A | 3/1998 | Feith et al. |
| 5,293,902 A | 3/1994 | Lapierie | 5,738,663 A | 4/1998 | Lopez |
| 5,295,657 A | 3/1994 | Atkinson | 5,749,861 A | 5/1998 | Guala et al. |
| 5,295,658 A | 3/1994 | Atkinson et al. | 5,769,825 A | 6/1998 | Lynn |
| 5,301,686 A | 4/1994 | Newman | 5,775,671 A | 7/1998 | Cote, Sr. |
| 5,306,265 A | 4/1994 | Ragazzi | 5,776,113 A | 7/1998 | Daugherty et al. |
| 5,312,083 A | 5/1994 | Ekman | 5,782,816 A | 7/1998 | Werschmidt et al. |
| 5,312,377 A | 5/1994 | Dalhon | 5,788,215 A | 8/1998 | Ryan |
| 5,322,518 A | 6/1994 | Schneider | 5,797,897 A | 8/1998 | Jepson et al. |
| 5,324,270 A | 6/1994 | Kayon et al. | 5,806,551 A | 9/1998 | Meloul et al. |
| 5,342,316 A | 8/1994 | Wallace | 5,806,831 A | 9/1998 | Paradis |
| 5,344,414 A | 9/1994 | Lopez et al. | 5,807,348 A | 9/1998 | Zinger et al. |
| 5,348,542 A | 9/1994 | Ellis | 5,820,601 A | 10/1998 | Mayer |
| 5,353,837 A | 10/1994 | Faust | 5,833,213 A | 11/1998 | Ryan |
| 5,356,396 A | 10/1994 | Wyatt et al. | 5,836,923 A | 11/1998 | Mayer |
| 5,360,413 A | 11/1994 | Leason et al. | 5,839,715 A | 11/1998 | Leinsing |
| 5,380,306 A | 1/1995 | Brinon | 5,846,233 A | 12/1998 | Lilley et al. |
| 5,389,086 A | 2/1995 | Attermeier et al. | 5,865,807 A | 2/1999 | Blake, III |
| 5,395,348 A | 3/1995 | Ryan | 5,873,862 A | 2/1999 | Lopez |
| 5,398,530 A | 3/1995 | Derman | 5,882,348 A | 3/1999 | Winterton et al. |
| 5,401,245 A | 3/1995 | Haining | 5,899,888 A | 5/1999 | Jepson et al. |
| 5,402,826 A | 4/1995 | Molnar et al. | 5,911,710 A | 6/1999 | Barry et al. |
| 5,402,982 A | 4/1995 | Atkinson et al. | 5,928,204 A | 7/1999 | Lopez |
| 5,407,437 A | 4/1995 | Heimreid | 5,947,954 A | 9/1999 | Bonaldo |
| 5,409,471 A | 4/1995 | Atkinson et al. | 5,954,313 A | 9/1999 | Ryan |
| 5,411,483 A | 5/1995 | Loomas et al. | 5,957,898 A | 9/1999 | Jepson et al. |
| 5,411,499 A | 5/1995 | Dudar et al. | 5,967,490 A | 10/1999 | Pike |
| 5,417,673 A | 5/1995 | Gordon | 5,979,868 A | 11/1999 | Wu et al. |
| 5,439,451 A | 8/1995 | Collinson et al. | 5,984,902 A | 11/1999 | Mooreead |
| 5,439,452 A | 8/1995 | McCarty | 6,009,902 A | 1/2000 | Troiani et al. |
| 5,441,487 A | 8/1995 | Vedder | 6,029,946 A | 2/2000 | Doyle |
| 5,442,941 A | 8/1995 | Kahonen et al. | 6,036,171 A | 3/2000 | Weinheimer et al. |
| 5,456,676 A | 10/1995 | Nelson et al. | 6,039,302 A | 3/2000 | Cote, Sr. et al. |
| 5,470,319 A | 11/1995 | Mayer | 6,048,335 A | 4/2000 | Mayer |
| 5,474,544 A | 12/1995 | Lynn | 6,050,978 A | 4/2000 | Orr et al. |
| 5,480,393 A | 1/1996 | Bommarito | 6,063,062 A | 5/2000 | Paradis |
| 5,487,731 A | 1/1996 | Denton | 6,079,432 A | 6/2000 | Paradis |
| 5,501,426 A | 3/1996 | Atkinson et al. | 6,089,541 A | 7/2000 | Weinheimer et al. |
| 5,509,433 A | 4/1996 | Paradis | 6,113,068 A | 9/2000 | Ryan |
| 5,514,116 A | 5/1996 | Vaillancourt et al. | 6,116,571 A | 9/2000 | Hettinger |
| 5,520,665 A | 5/1996 | Fleetwood | 6,117,114 A | 9/2000 | Paradis |
| 5,522,804 A | 6/1996 | Lynn | 6,142,446 A | 11/2000 | Leinsing |
| 5,533,708 A | 7/1996 | Atkinson et al. | 6,152,900 A | 11/2000 | Mayer |
| 5,533,996 A | 7/1996 | Murphey et al. | 6,162,206 A | 12/2000 | Bindokas et al. |
| 5,535,771 A | 7/1996 | Purdy et al. | 6,162,251 A | 12/2000 | Kredovski |
| 5,535,785 A | 7/1996 | Werge et al. | 6,170,800 B1 | 1/2001 | Meloul et al. |
| 5,540,661 A | 7/1996 | Tomisaka et al. | 6,171,287 B1 | 1/2001 | Lynn et al. |
| 5,549,566 A | 8/1996 | Elias et al. | 6,177,037 B1 | 1/2001 | Mayer |
| 5,549,577 A | 8/1996 | Siegel et al. | 6,183,448 B1 | 2/2001 | Mayer |

US D644,731 S

Page 5

| | | | |
|----|----------------|---------|--|
| GB | 2 019 219 B | 10/1979 | Saechtling Tworzywa Sztuczne, WN-T Warszawa, 1999, vol. V Edition, pp. 224-225. |
| GB | 2 034 185 A | 6/1980 | Ultrasite™ Systems , “How It Works”, at least as early as Mar. 24, 2008. |
| WO | WO 86/01712 | 3/1986 | International Search Report issued Oct. 5, 2010 to international application No. PCT/2010/028743. |
| WO | WO 86/03416 | 6/1986 | PASV Valve Connector Brochure. |
| WO | WO 92/20736 | 11/1992 | LifeShield TKO Anti-Reflux Device Brochure. |
| WO | WO 97/31676 A2 | 9/1997 | Nexus Medical Nexus TKO. |
| WO | WO 98/26835 | 6/1998 | “Faulding Inc. receives FDA permission to market patented Safe-Connect Valve”, dated Dec. 2, 1996. |
| WO | WO 03/018104 | 3/2003 | MicroClave Connector Brochure. The MicroClave was available before Mar. 25, 2008. |
| WO | WO 03/086528 | 10/2003 | MEDI-4955 Liquid Silicone Rubber from NuSil Silicone Technology, dated Dec. 17, 2010. |
| WO | WO 2005/011799 | 2/2005 | |
| WO | WO 2005/115521 | 12/2005 | |
| WO | WO 2006/013433 | 2/2006 | |
| WO | WO 2006/062912 | 6/2006 | |
| WO | WO 2008/048777 | 4/2008 | |
| WO | WO 2010/111546 | 9/2010 | |

OTHER PUBLICATIONS

F.D.A. 510(k) Summary of Safety and Effectiveness, Nov. 17, 1997.

* cited by examiner

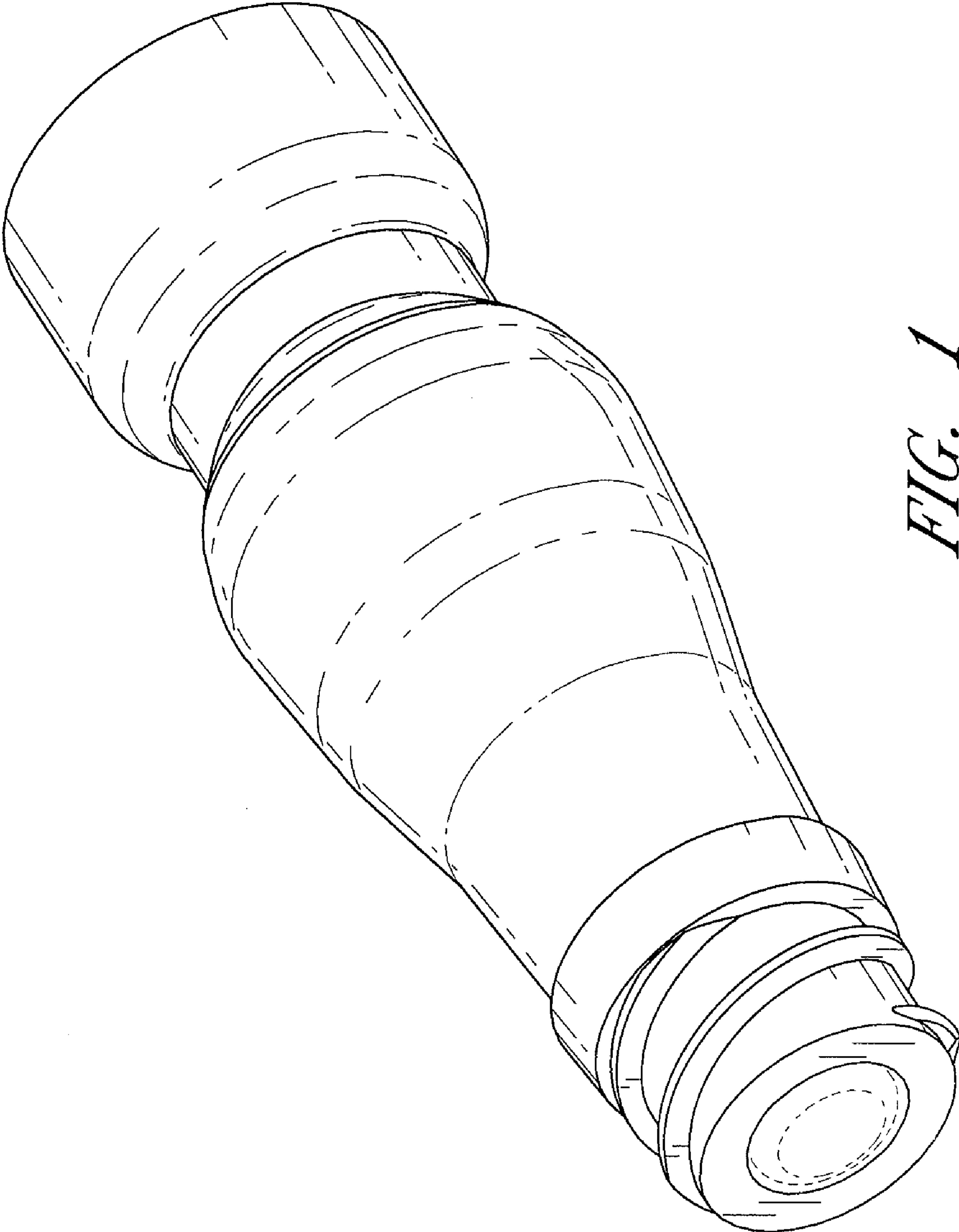


FIG. 1

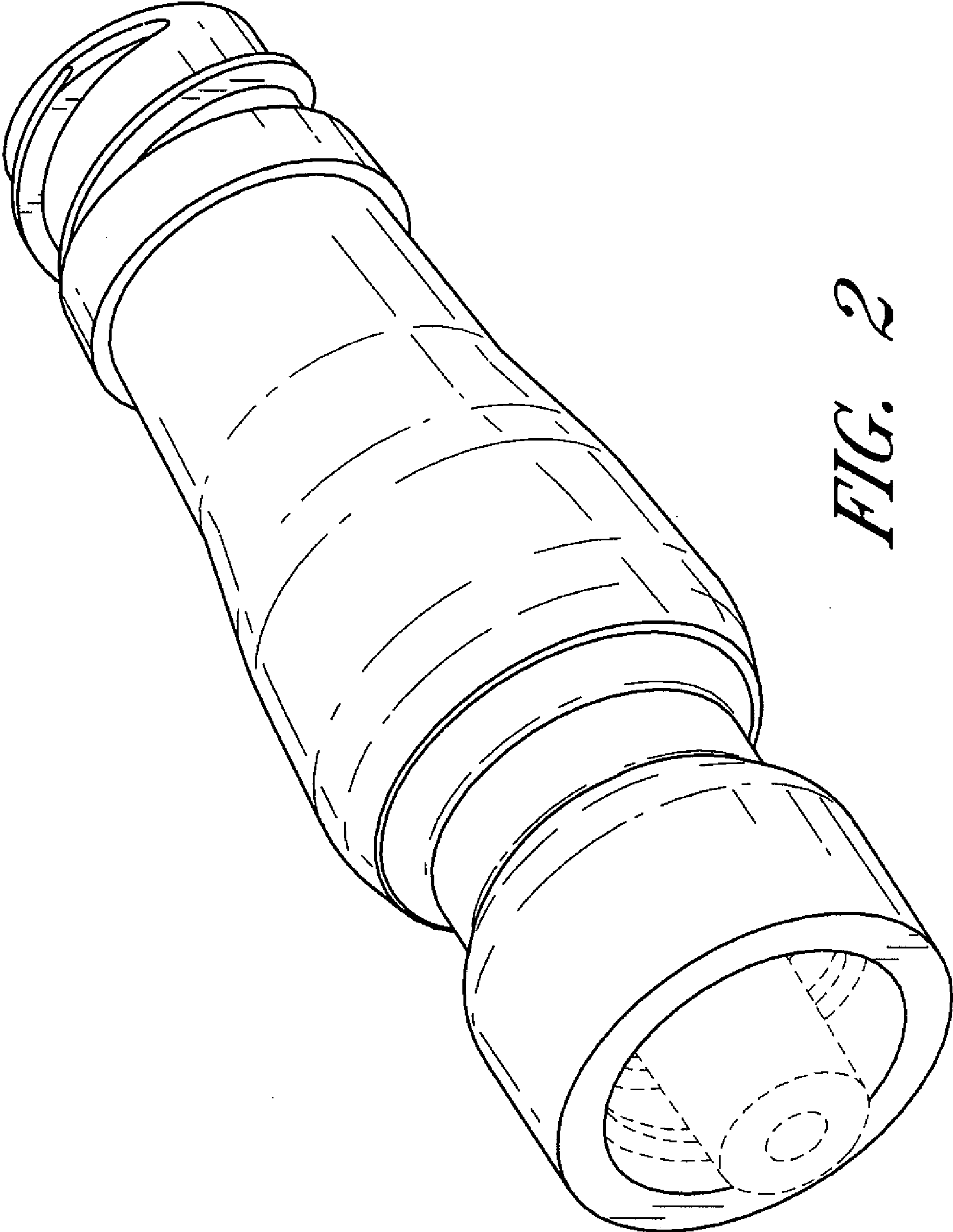


FIG. 2

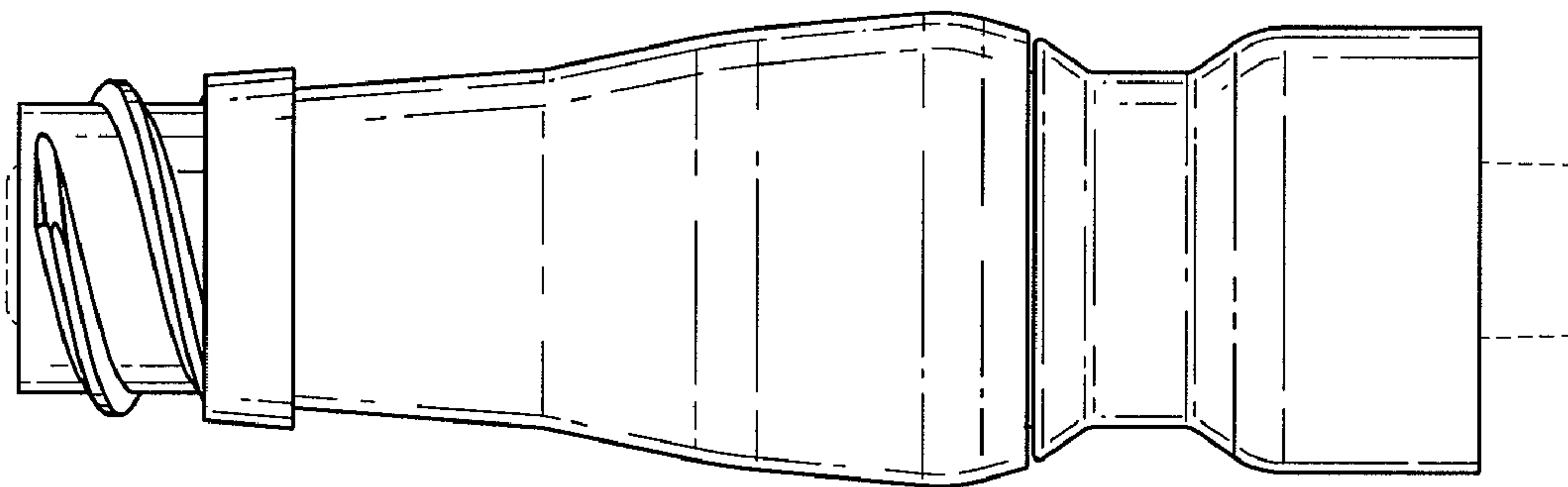


FIG. 3

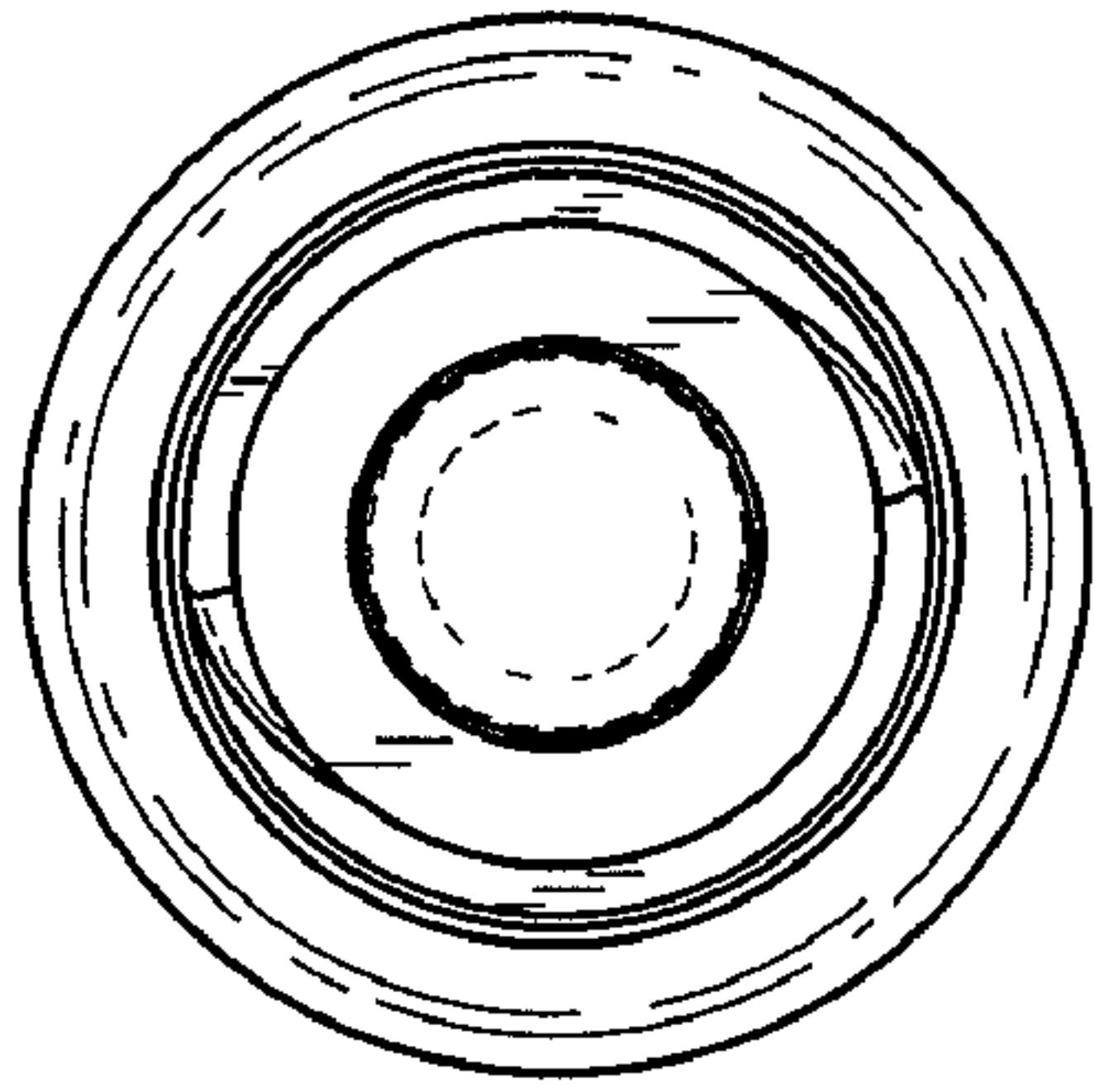


FIG. 4

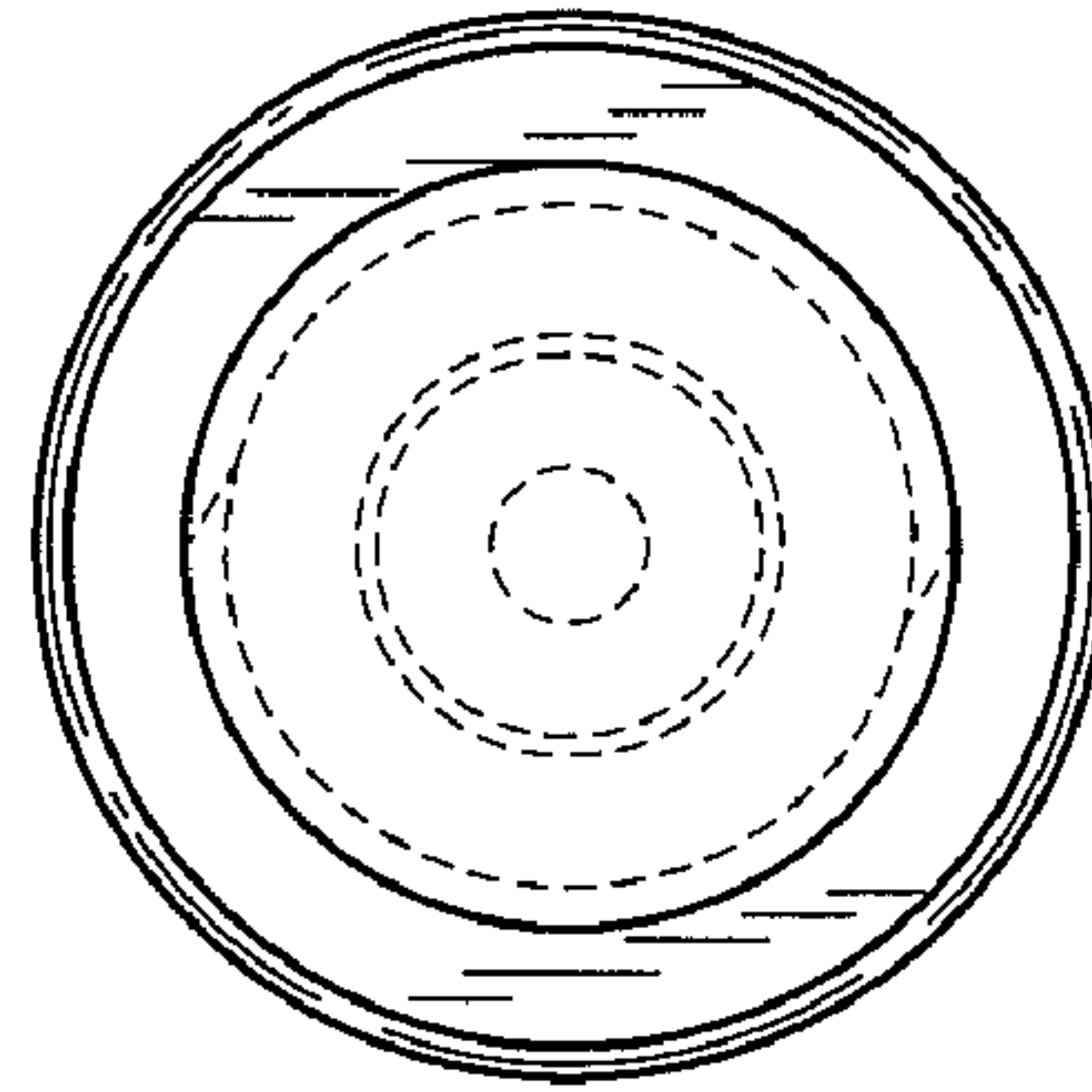


FIG. 5