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United States Patent [19]

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Nepsund et al.

[45] Date of Patent: ****Jan. 26, 1999**

[54] FILTER SLEEVE

0 208 515 7/1986 European Pat. Off. .
0 212 082 3/1987 European Pat. Off. .
2 380 058 2/1978 France .
35 13 062 A1 10/1986 Germany .

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(List continued on next page.)

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OTHER PUBLICATIONS

[**] Term: **14 Years**

“Nonwovens in Filtration/Separation”, paper presented by Clarke E. Rodman and Edward C. Homonoff, Allied Aftermarket Division, Allied Signal Corporation, Nonwoven Fabrics Forum, Jun. 21–23, 1988, Clemson University, Clemson, S.C.

[21] Appl. No.: **56,894**

U.S. Patent Application Ser. No. 07/560,723, entitled “Filter Insert for Air Filters Used in a Dust-Filled Environment”.

[22] Filed: **Jul. 11, 1996**

[51] LOC (6) Cl. **23-04**

Primary Examiner—Lisa Lichtenstein

[52] U.S. Cl. **D23/365; D2/894**

Attorney, Agent, or Firm—Merchant, Gould, Smith, Edell, Welter & Schmidt, P.A.

[58] Field of Search D23/365; D2/865, D2/894; 2/171, 181, DIG. 11

[57] CLAIM

[56] References Cited

The ornamental design for a filter sleeve, as shown and described.

U.S. PATENT DOCUMENTS

- 2,598,673 6/1952 Brixius .
- 2,918,138 12/1959 Lewis .
- 2,966,960 1/1961 Rochlin .
- 3,290,870 12/1966 Jensen .
- 3,298,149 1/1967 Sobeck .
- 3,384,241 5/1968 Nostrand .
- 3,386,583 6/1968 Merten .
- 3,417,870 12/1968 Bray .
- 3,488,928 1/1970 Tarala .
- 3,552,553 1/1971 Reading .
- 3,672,130 6/1972 Sullivan et al. .
- 3,680,659 8/1972 Kasten .
- 3,802,160 4/1974 Foltz .
- 3,822,531 7/1974 Wisnewski et al. .
- 3,878,014 4/1975 Melead .
- 3,918,945 11/1975 Holloway et al. .
- 4,012,211 3/1977 Goetz .
- 4,074,985 2/1978 Willas .
- 4,086,070 4/1978 Argo et al. .

(List continued on next page.)

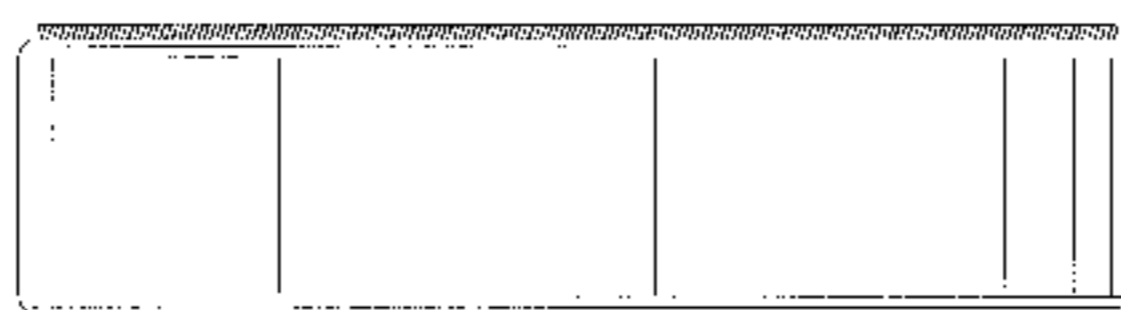
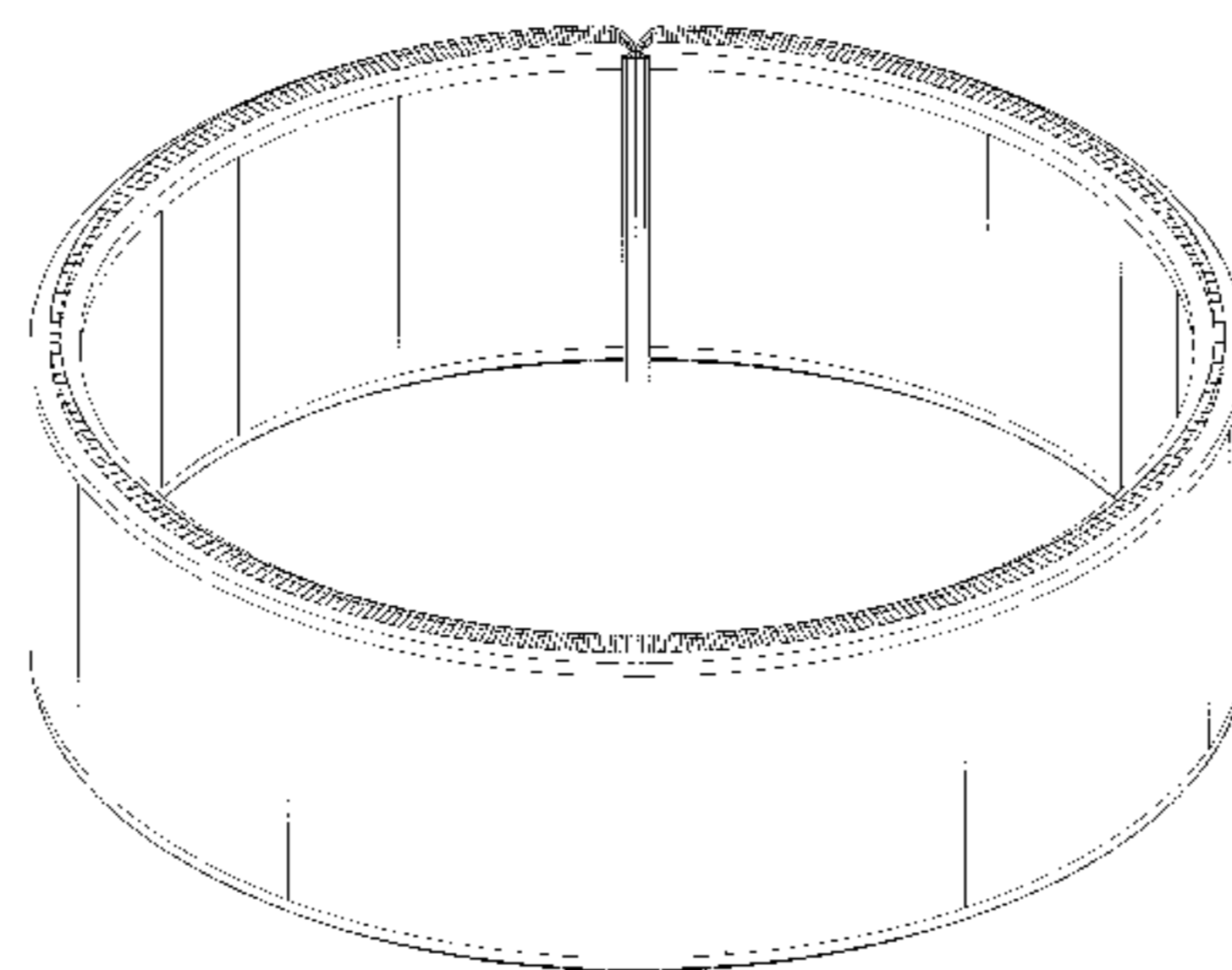
DESCRIPTION

FIG. 1 is a perspective view of a filter sleeve;
 FIG. 2 is a top plan view of FIG. 1, the bottom view being a mirror image;
 FIG. 3 is a front side view of FIG. 1;
 FIG. 4 is a back side view of FIG. 1;
 FIG. 5 is a perspective view of a second embodiment of a filter sleeve; different surfaces of the filter sleeve being indicated to contrast in appearance;
 FIG. 6 is a top plan view of FIG. 5, the bottom plan view being a mirror image thereof;
 FIG. 7 is a front side view of FIG. 5;
 FIG. 8 is a back side view of FIG. 5;
 FIG. 9 is a perspective view of a third embodiment of a filter sleeve, an outer surface of the sleeve being lined to indicate blue color;
 FIG. 10 is a top plan view of FIG. 9, the bottom plan view being a mirror image thereof;
 FIG. 11 is a front side view of FIG. 9; and,
 FIG. 12 is a back side view of FIG. 9.

FOREIGN PATENT DOCUMENTS

- 0 001 407 4/1979 European Pat. Off. .
- 0 083 789 7/1983 European Pat. Off. .

1 Claim, 9 Drawing Sheets



U.S. PATENT DOCUMENTS

4,089,783 5/1978 Holyoak .
4,101,423 7/1978 Merrill et al. .
4,102,785 7/1978 Head et al. .
4,104,170 8/1978 Nedza .
4,160,684 7/1979 Berger, Jr. .
4,211,543 7/1980 Tokar et al. .
4,233,042 11/1980 Tao .
4,243,397 1/1981 Tokar et al. .
4,259,096 3/1981 Nakamura et al. .
4,314,832 2/1982 Fox .
4,322,230 3/1982 Schoen et al. .
4,402,830 9/1983 Pall .
4,452,619 6/1984 Wright et al. .
4,594,162 6/1986 Berger .
4,619,674 10/1986 Erdmannsdorfer .
4,629,483 12/1986 Stanton .
4,647,373 3/1987 Tokar et al. .
4,676,807 6/1987 Miller et al. .
4,695,300 9/1987 Takagi .
4,720,292 1/1988 Engel et al. .
4,758,460 7/1988 Spicer et al. .
4,759,782 7/1988 Miller et al. .
4,783,271 11/1988 Silverwater .
4,878,929 11/1989 Tofslund et al. .
4,886,599 12/1989 Bachmann et al. .
4,976,759 12/1990 Foltz .

5,082,476 1/1992 Kahlbaugh et al. .
5,122,270 6/1992 Ruger et al. .
5,129,923 7/1992 Hunter et al. .
5,171,342 12/1992 Trefz .
5,238,474 8/1993 Kahlbaugh et al. .
5,252,207 10/1993 Miller et al. .
5,279,731 1/1994 Cook et al. .
5,290,330 3/1994 Tepper et al. .
5,306,321 4/1994 Osendorf .
5,364,456 11/1994 Kahlbaugh et al. .
5,415,676 5/1995 Tokar et al. .
5,423,892 6/1995 Kahlbaugh et al. .
5,454,858 10/1995 Tokar et al. .
5,468,382 11/1995 Cook et al. .
5,476,585 12/1995 Mills .

FOREIGN PATENT DOCUMENTS

630886 12/1961 Italy .
900450 7/1962 United Kingdom .
1 460 925 6/1977 United Kingdom .
2 101 902 1/1983 United Kingdom .
2 152 399 8/1985 United Kingdom .
2 197 802 6/1988 United Kingdom .
WO 84/0345 9/1984 WIPO .
WO 89/07484 8/1989 WIPO .
WO 92/06767 4/1992 WIPO .

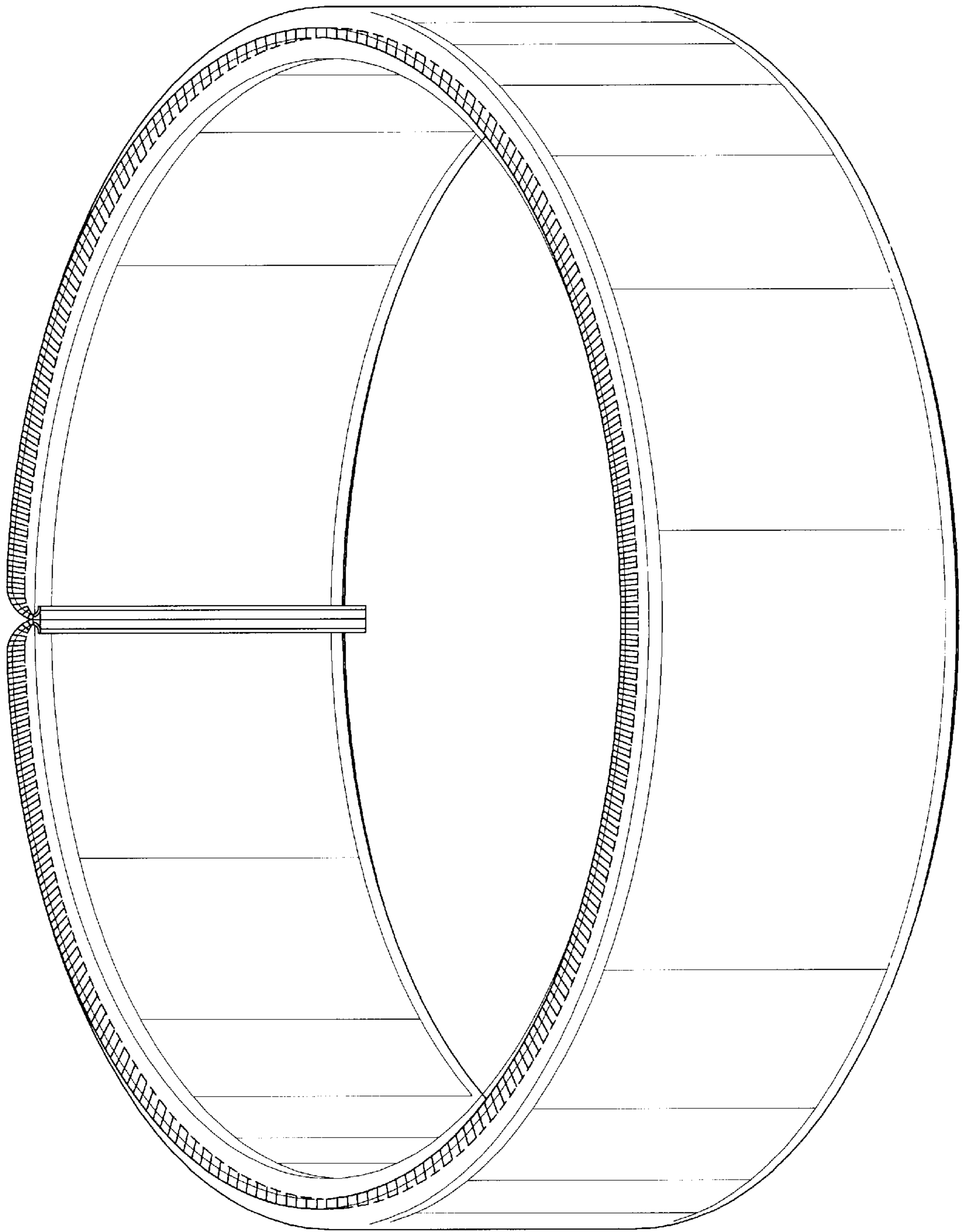


FIG. 1

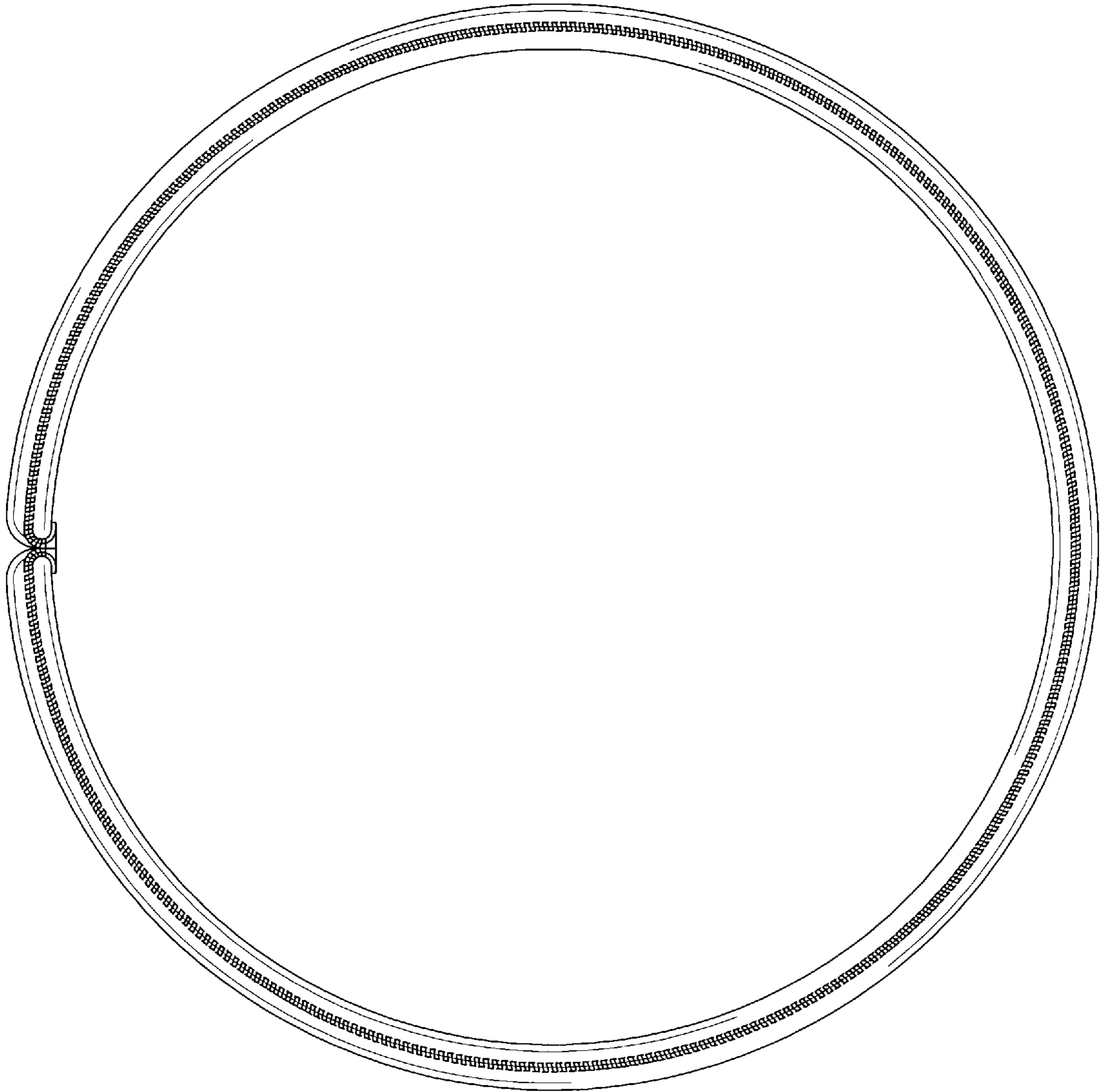


FIG. 2

FIG. 3

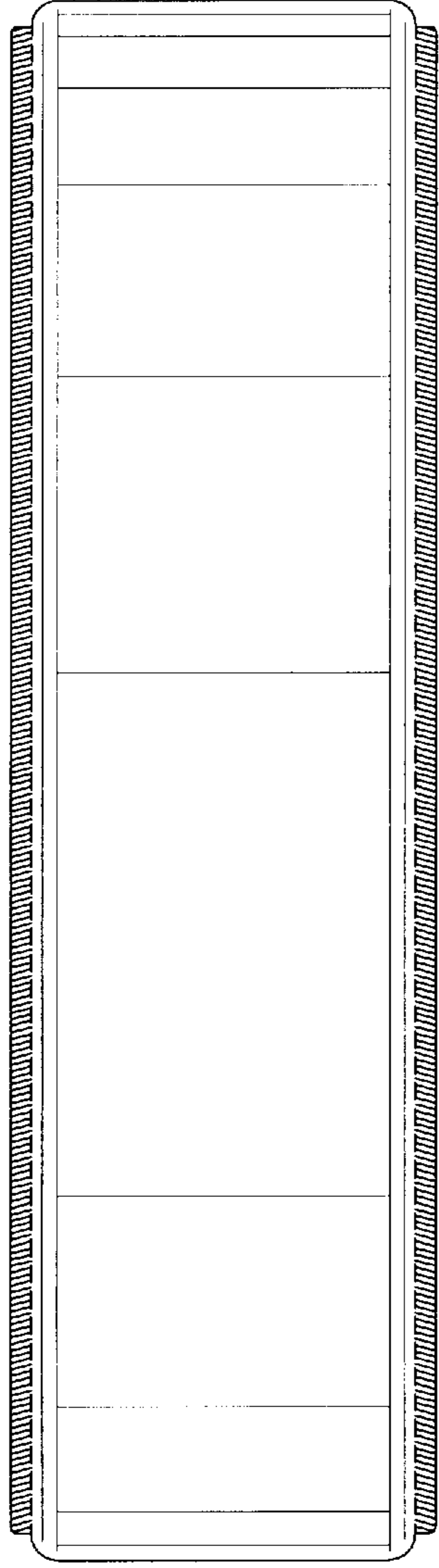
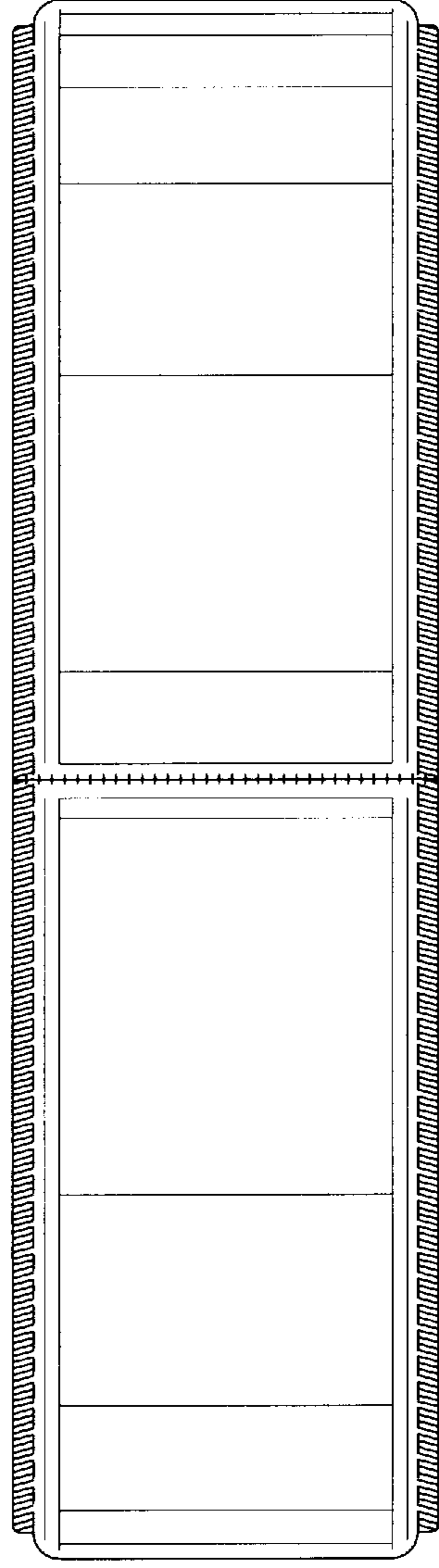


FIG. 4



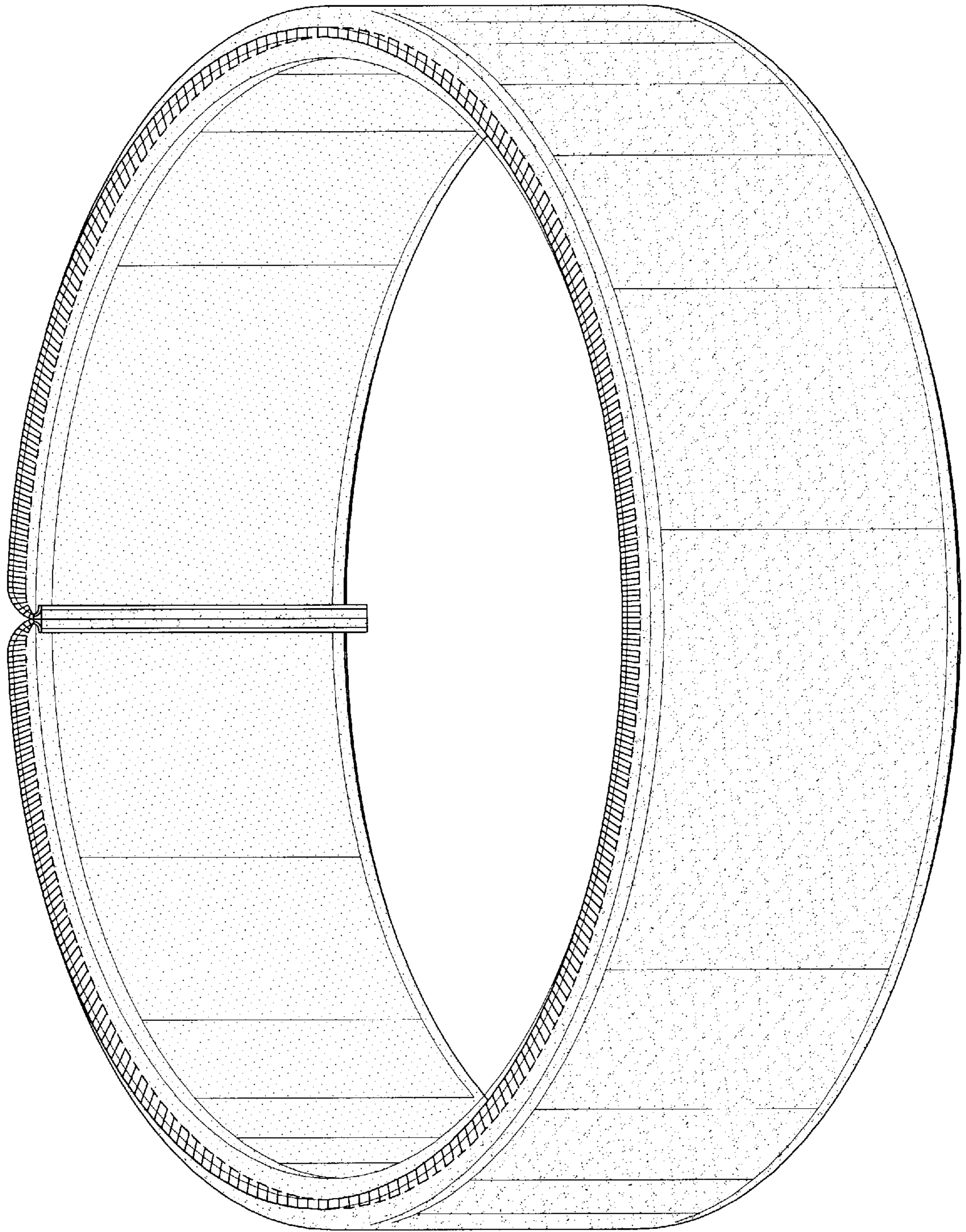


FIG. 5

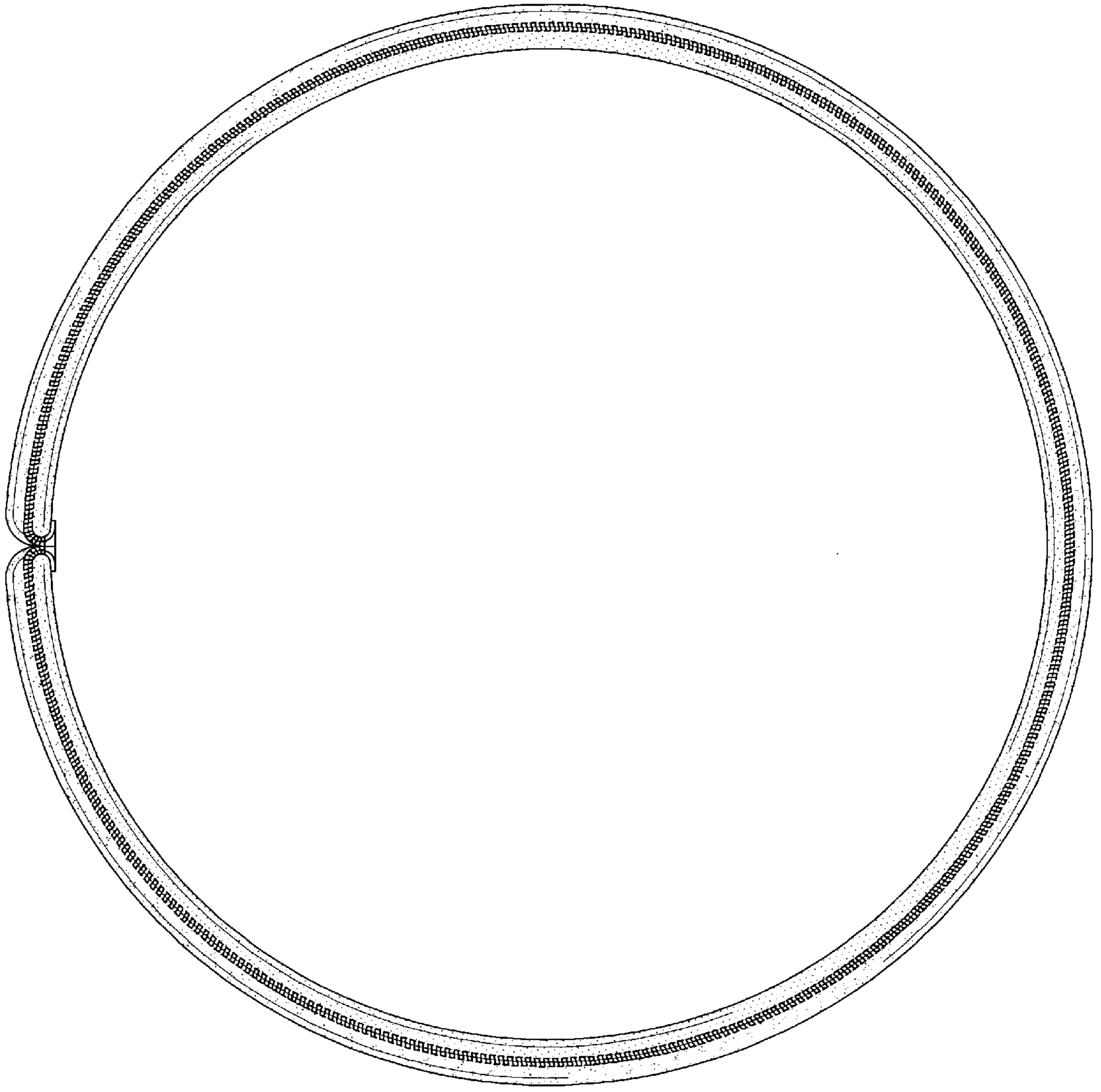


FIG. 6

FIG. 7

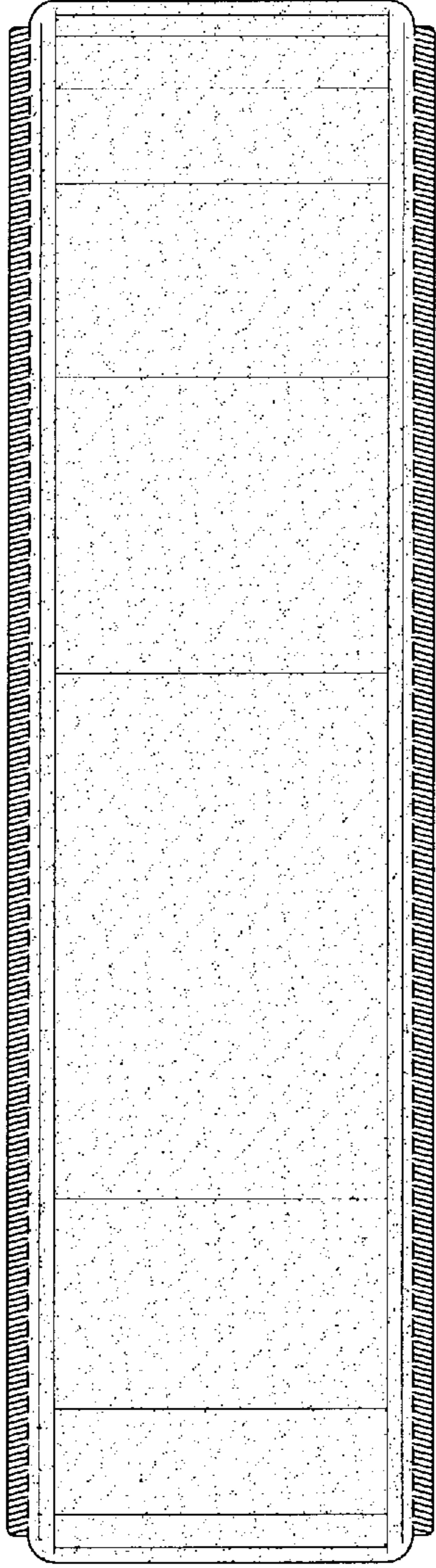
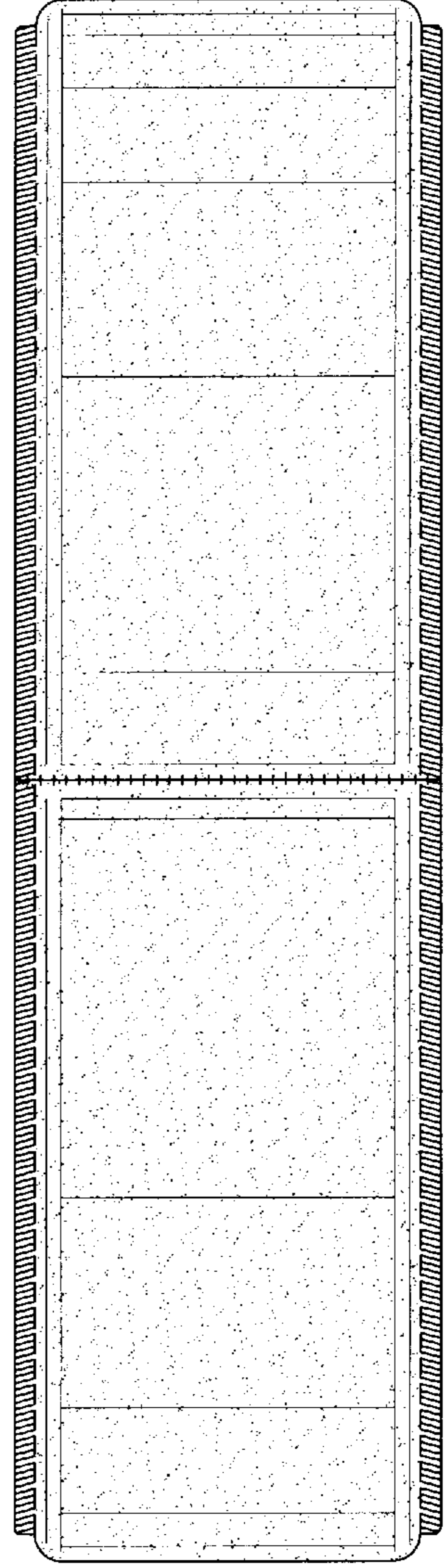


FIG. 8



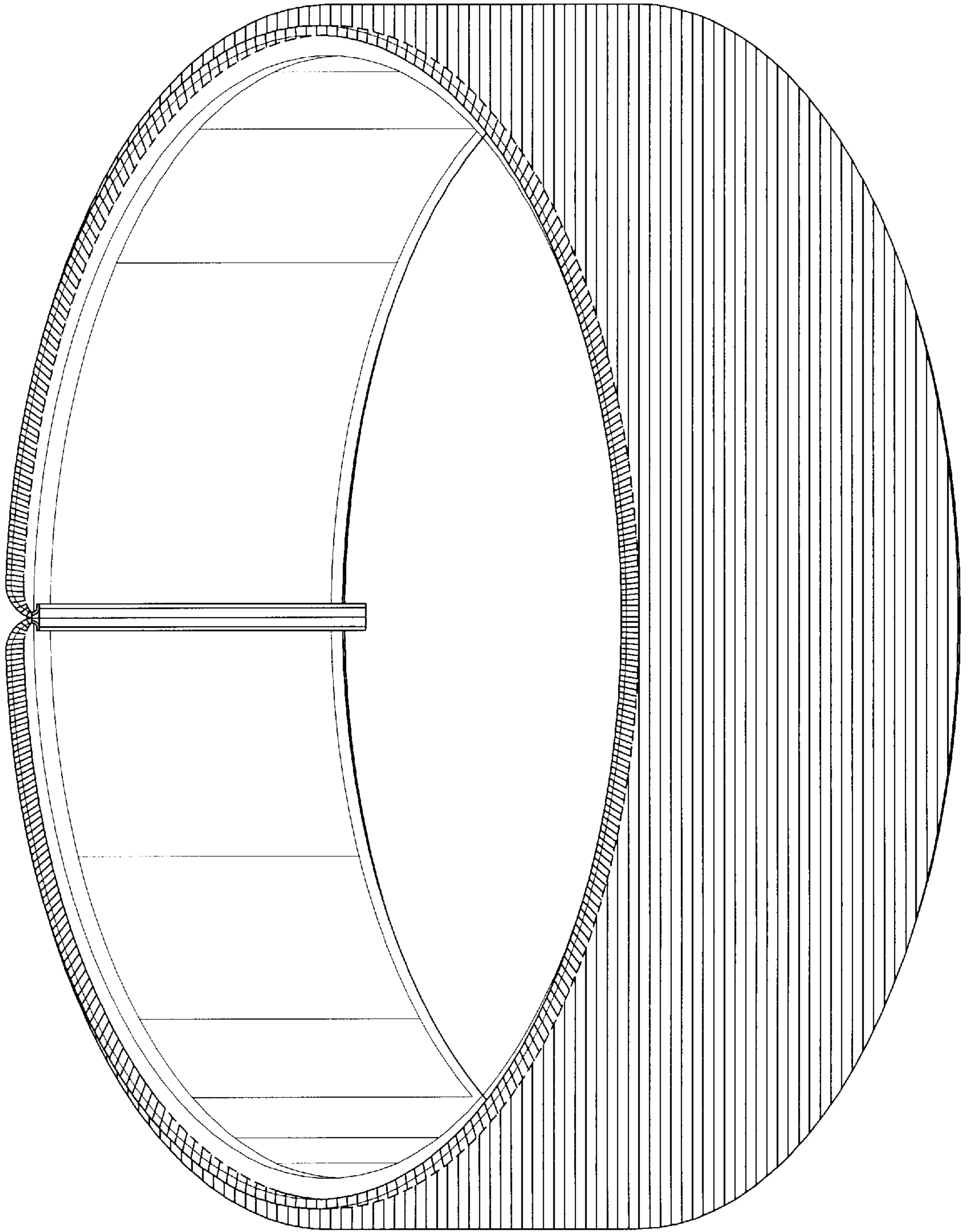


FIG. 9

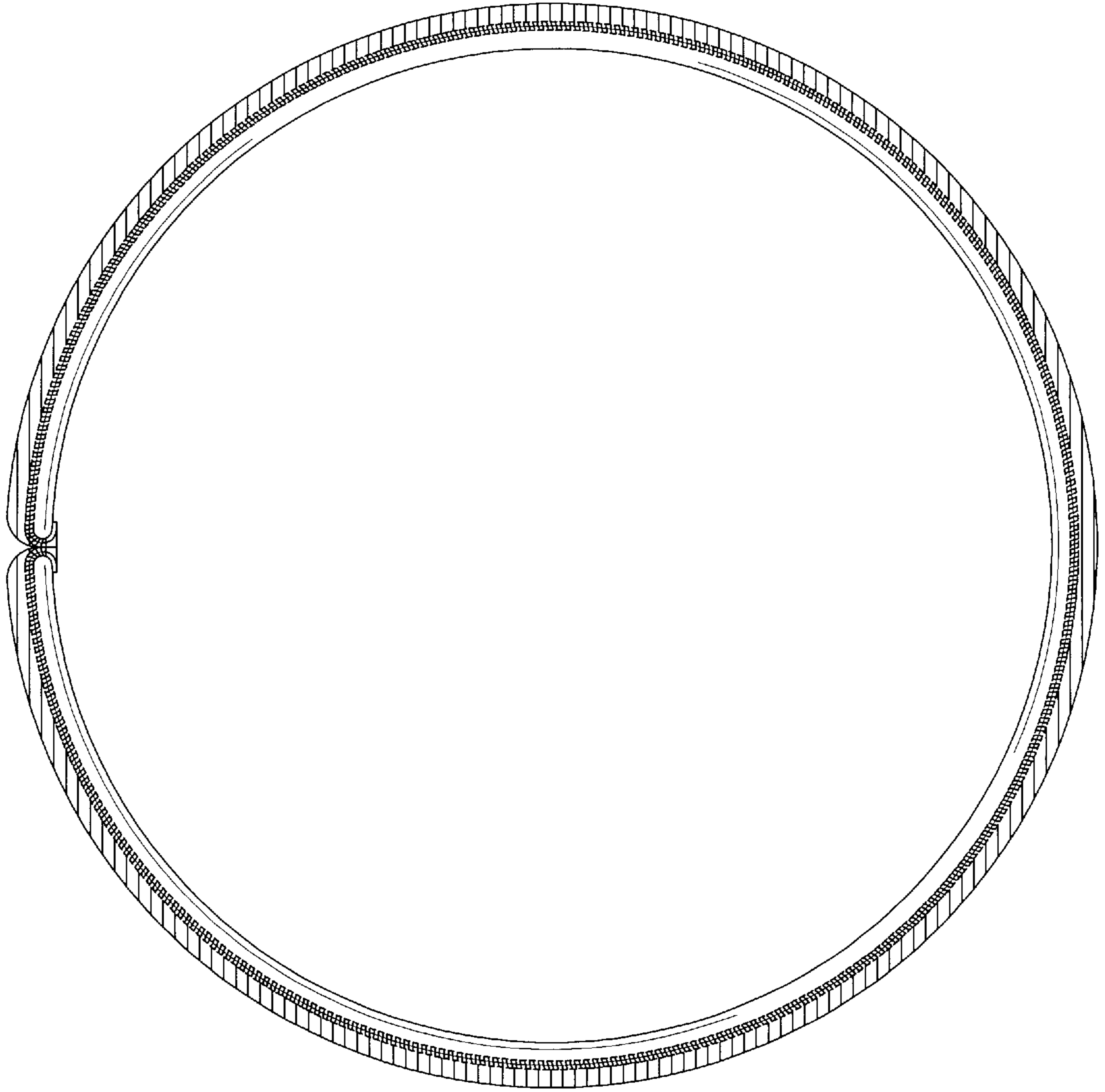


FIG. 10

FIG. 11

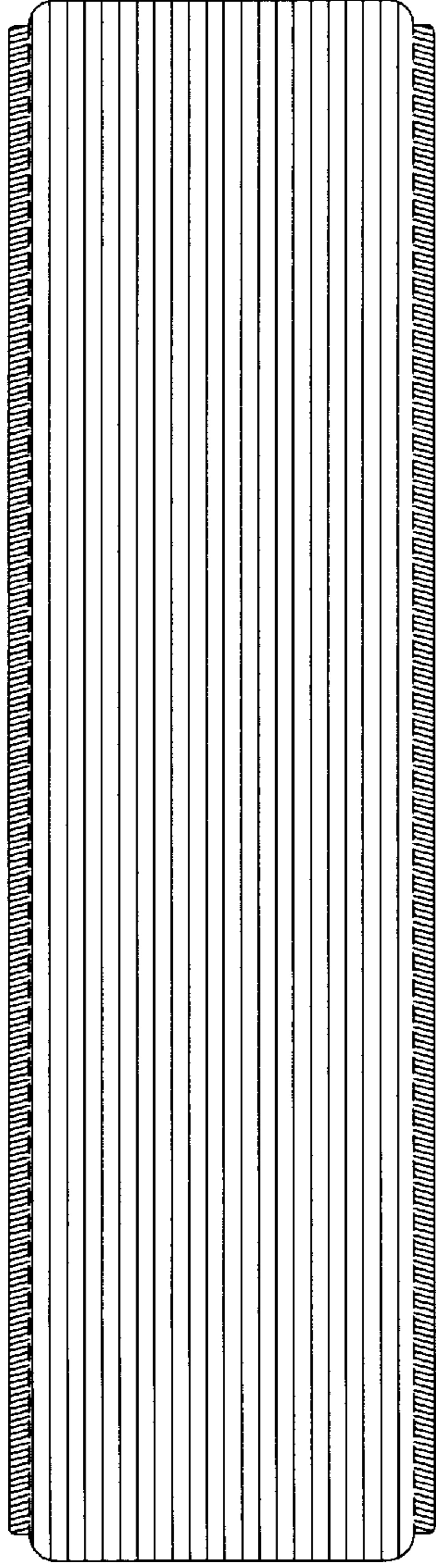


FIG. 12

