US00D435563S

United States Patent [19]

Murao et al.

[11] **Patent Number: Des. 435,563**

[45] **Date of Patent: ** Dec. 26, 2000**

[54] **PISTON FOR COMPRESSORS EMPLOYED IN AUTOMOBILE AIR-CONDITIONERS**

[75] Inventors: **Kazushige Murao**; **Takayuki Kato**; **Masato Takamatsu**; **Fuminobu Enokijima**; **Hiroshi Kamishima**, all of Kariya, Japan

[73] Assignee: **Kabushiki Kaisha Toyoda Jidoshokki Seisakusho**, Kariya, Japan

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

[21] Appl. No.: **29/109,283**

[22] Filed: **Aug. 12, 1999**

[30] **Foreign Application Priority Data**

Feb. 16, 1999	[JP]	Japan	11-3550
Feb. 16, 1999	[JP]	Japan	11-3551
Feb. 16, 1999	[JP]	Japan	11-3552
Feb. 16, 1999	[JP]	Japan	11-3553
Feb. 16, 1999	[JP]	Japan	11-3554
Feb. 16, 1999	[JP]	Japan	11-3556

[51] **LOC (7) Cl.** **15-02**
[52] **U.S. Cl.** **D15/9**
[58] **Field of Search** ..... D15/7–9; 417/545, 417/222.1, 209, 266, 273, 269; 91/505; 92/71, 165 R; 74/60

[56] **References Cited**

U.S. PATENT DOCUMENTS

D. 402,295	12/1998	Kayukawa et al.	D15/9
D. 417,225	11/1999	Kinura et al.	D15/5
D. 417,876	12/1999	Kayukawa et al.	D15/9
5,461,967	10/1995	Burkett et al.	97/71
5,490,767	2/1996	Kanou et al.	417/222.1

FOREIGN PATENT DOCUMENTS

07189900	7/1995	Japan .
9-203378	8/1997	Japan .

Primary Examiner—Ralf Seifert
Attorney, Agent, or Firm—Morgan & Finnegan, L.L.P.

[57] **CLAIM**

The ornamental design for a piston for compressors employed in automobile air-conditioners, as shown and described.

DESCRIPTION

FIG. **1** is a front elevational view showing a piston for compressors employed in automobile air-conditioners according to a first embodiment of the present invention;

FIG. **2** is a rear elevational view showing the piston of FIG. **1**;

FIG. **3** is a top plan view showing the piston of FIG. **1**;

FIG. **4** is a bottom plan view showing the piston of FIG. **1**;

FIG. **5** is a right side elevational view showing the piston of FIG. **1**, the left side view being a mirror image thereof;

FIG. **6** is a cross-sectional view taken along line **6—6** of FIG. **1**;

FIG. **7** is a cross-sectional view taken along line **7—7** of FIG. **5**;

FIG. **8** is a cross-sectional view taken along line **8—8** of FIG. **5**;

FIG. **9** is a perspective view showing the piston of FIG. **1**;

FIG. **10** is a front elevational view showing a piston for compressors employed in automobile air-conditioners according to a second embodiment of the present invention;

FIG. **11** is a rear elevational view showing the piston of FIG. **10**;

FIG. **12** is a top plan view showing the piston of FIG. **10**;

FIG. **13** is a bottom plan view showing the piston of FIG. **10**;

FIG. **14** is a right side elevational view showing the piston of FIG. **10**, the left side view being a mirror image thereof;

FIG. **15** is a cross-sectional view taken along line **15—15** of FIG. **10**;

FIG. **16** is a cross-sectional view taken along line **16—16** of FIG. **14**;

FIG. **17** is a cross-sectional view taken along line **17—17** of FIG. **14**;

FIG. **18** is a perspective view showing the piston of FIG. **10**;

FIG. **19** is a front elevational view showing a piston for compressors employed in automobile air-conditioners according to a third embodiment of the present invention;

FIG. **20** is a rear elevational view showing the piston of FIG. **19**;

FIG. **21** is a top plan view showing the piston of FIG. **19**;

FIG. **22** is a bottom plan view showing the piston of FIG. **19**;

FIG. **23** is a right side elevational view showing the piston of FIG. **19**, the left side view being a mirror image thereof;

FIG. **24** is a cross-sectional view taken along line **24—24** of FIG. **19**;

FIG. **25** is a cross-sectional view taken along line **25—25** of FIG. **23**;

FIG. **26** is a cross-sectional view taken along line **26—26** of FIG. **23**;

FIG. **27** is a perspective view showing the piston of FIG. **19**; and,

FIG. **28** is a cross-sectional view showing a piston according to the present invention employed in a compressor.

The broken lines in FIG. **28** are shown for illustrative purposes only and form no part of the claimed design.

1 Claim, 10 Drawing Sheets

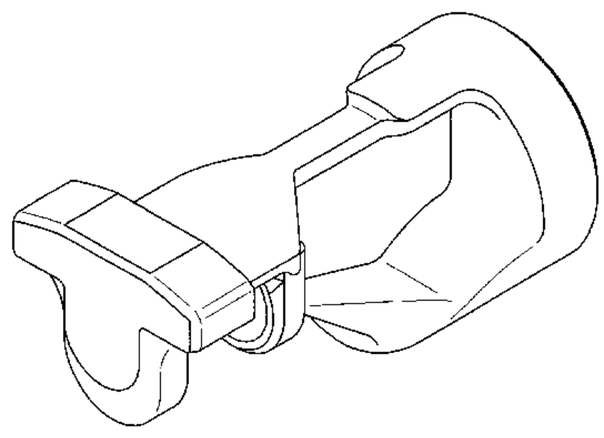


Fig.1

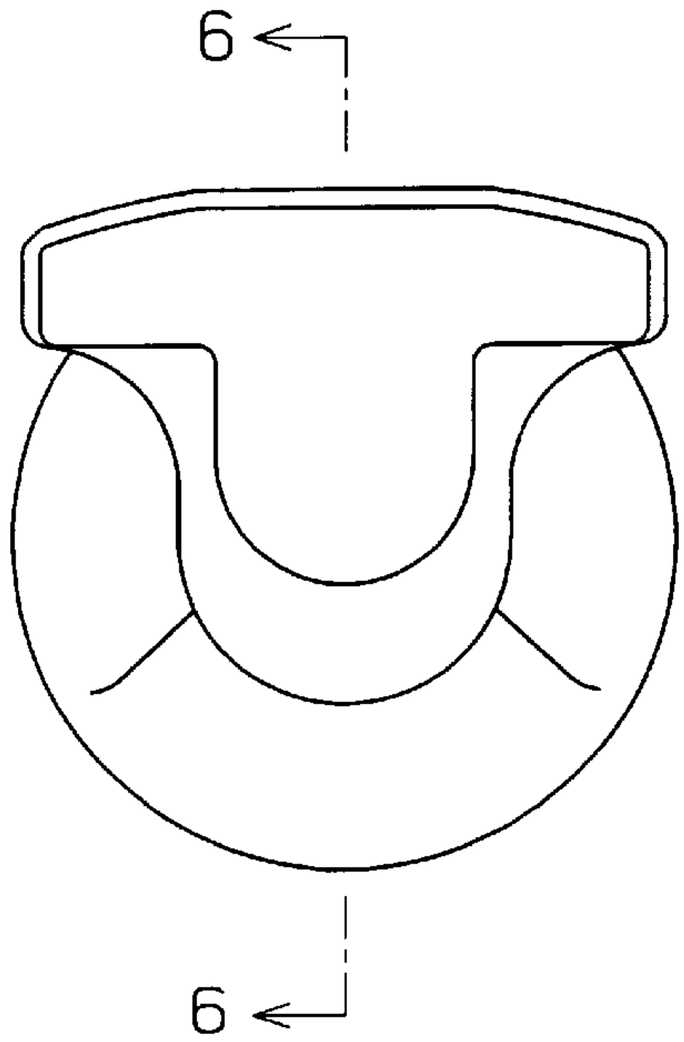


Fig.2

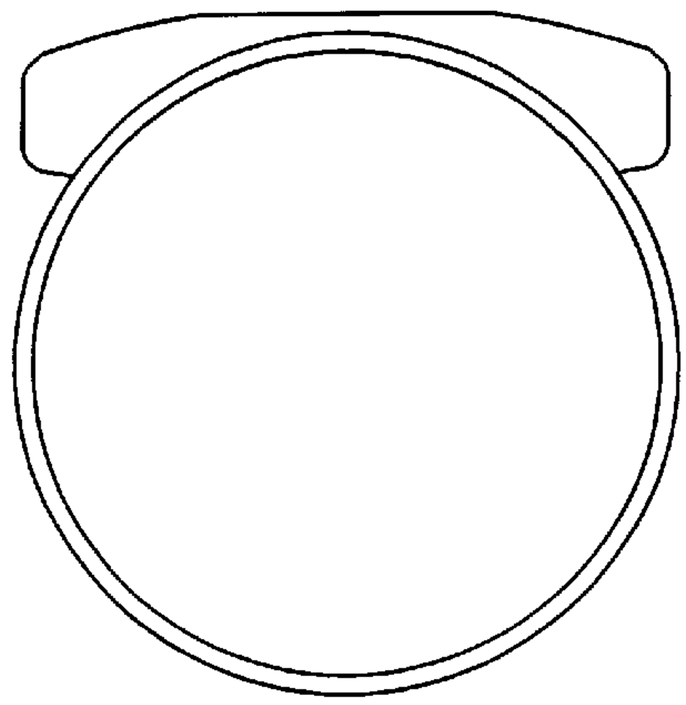


Fig.3

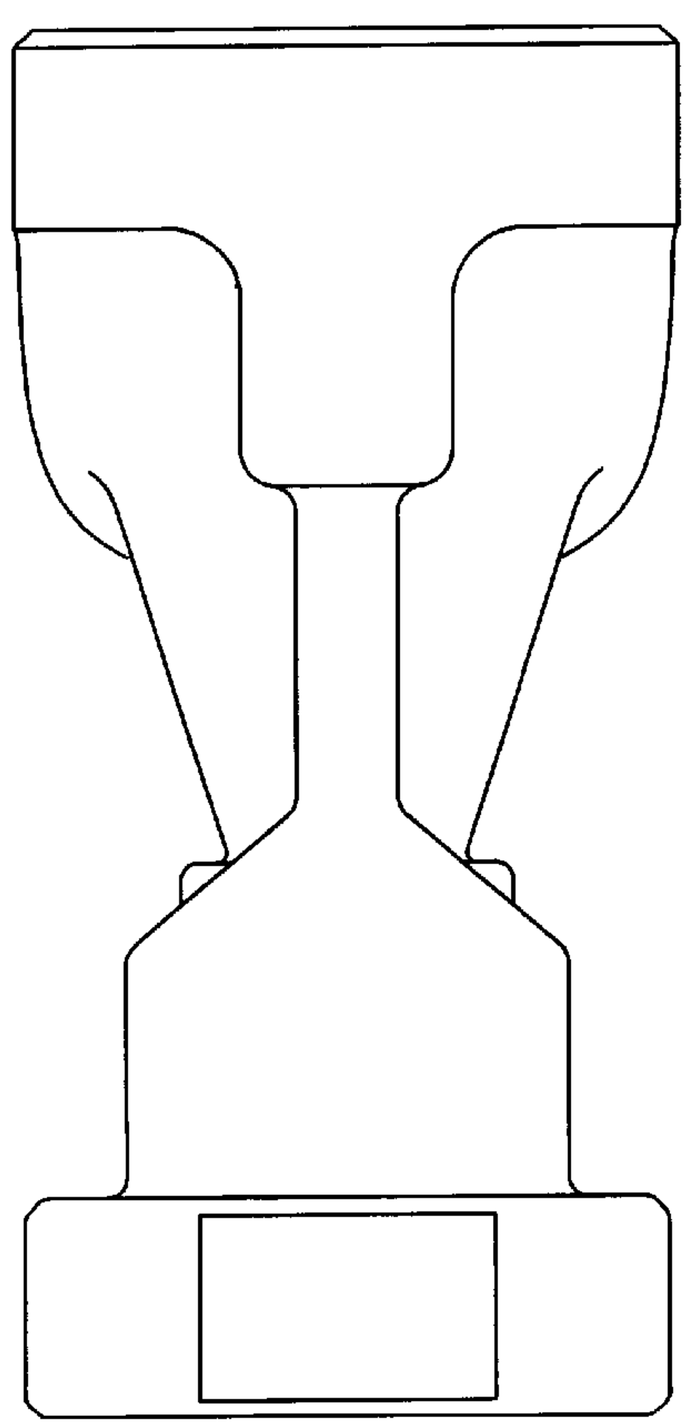


Fig.4

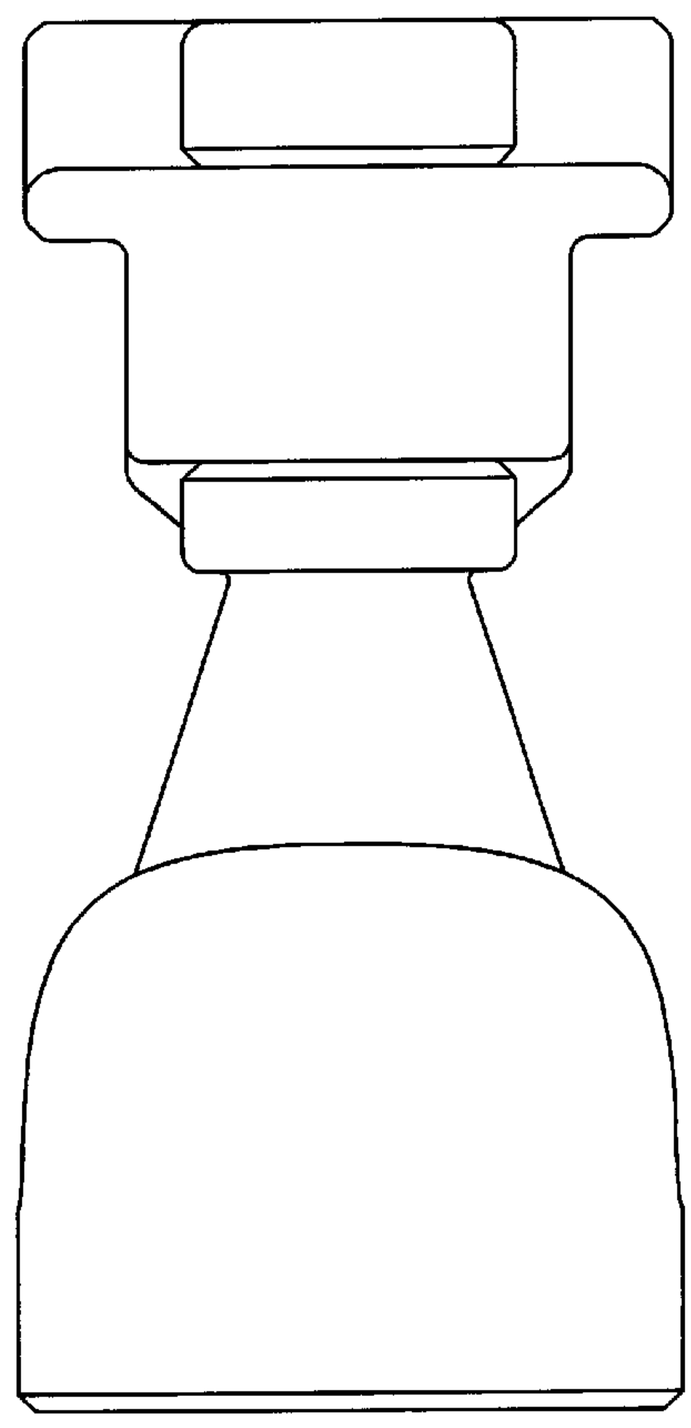


Fig.5

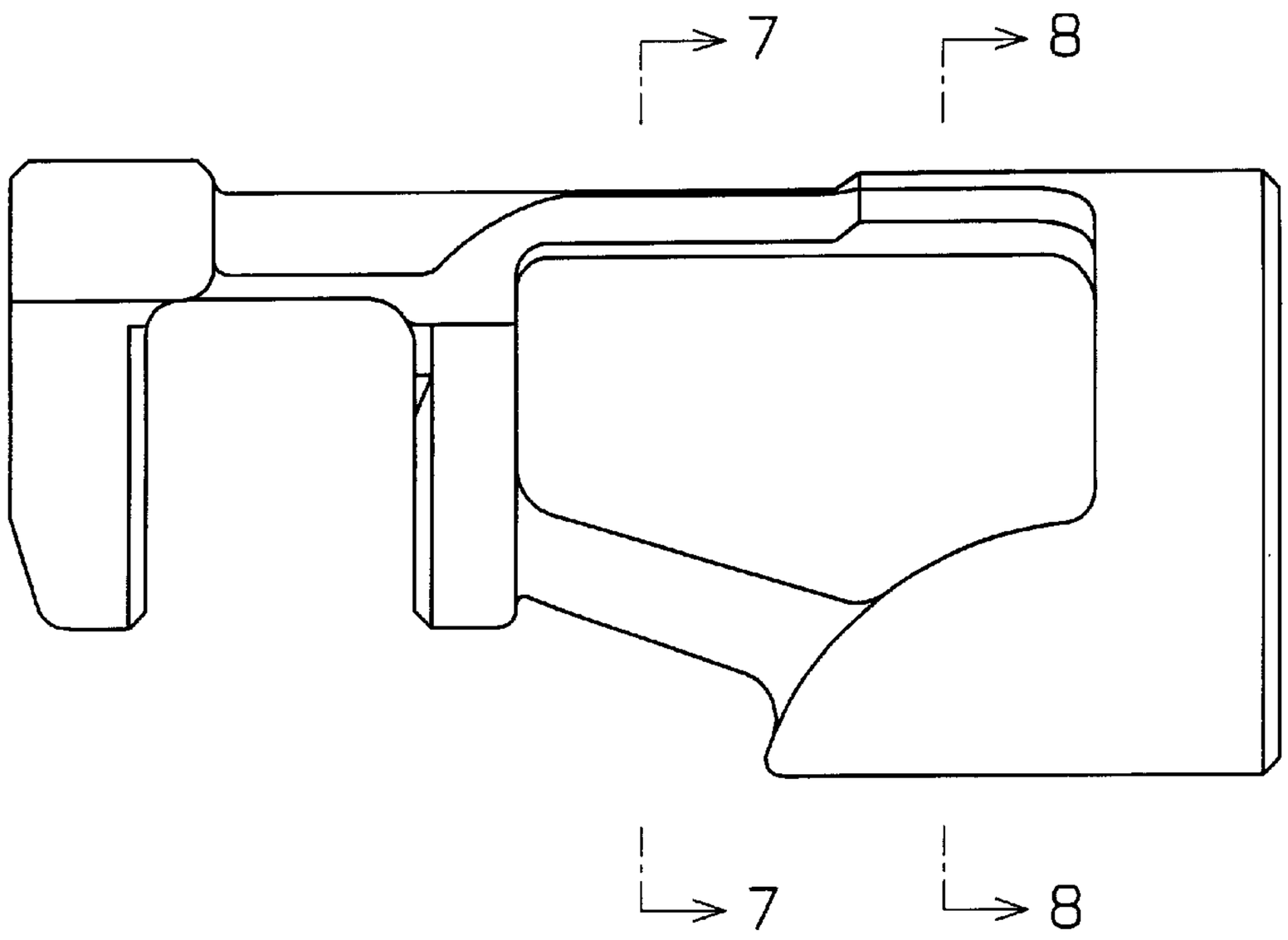


Fig.6

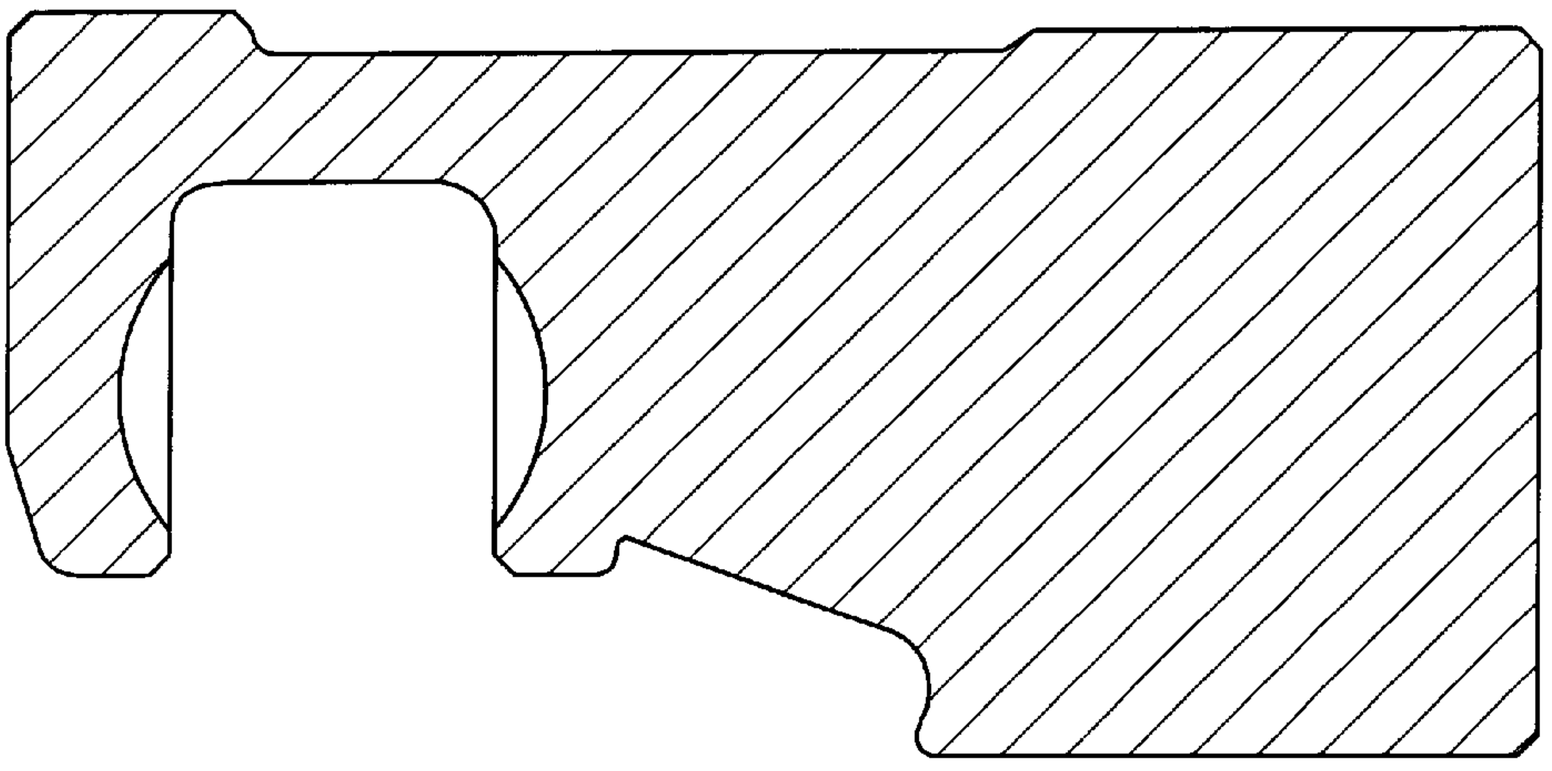


Fig.7

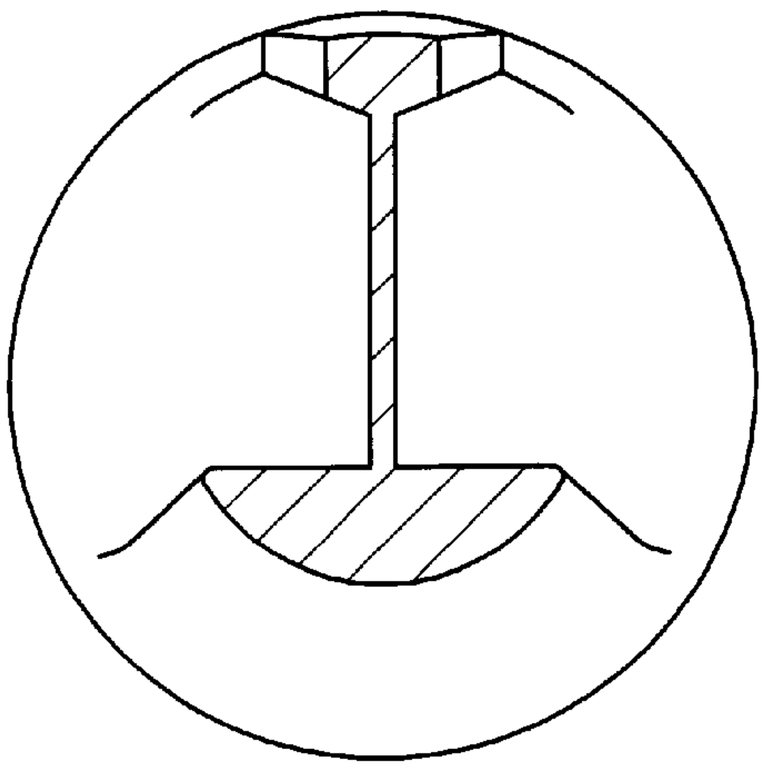


Fig.8

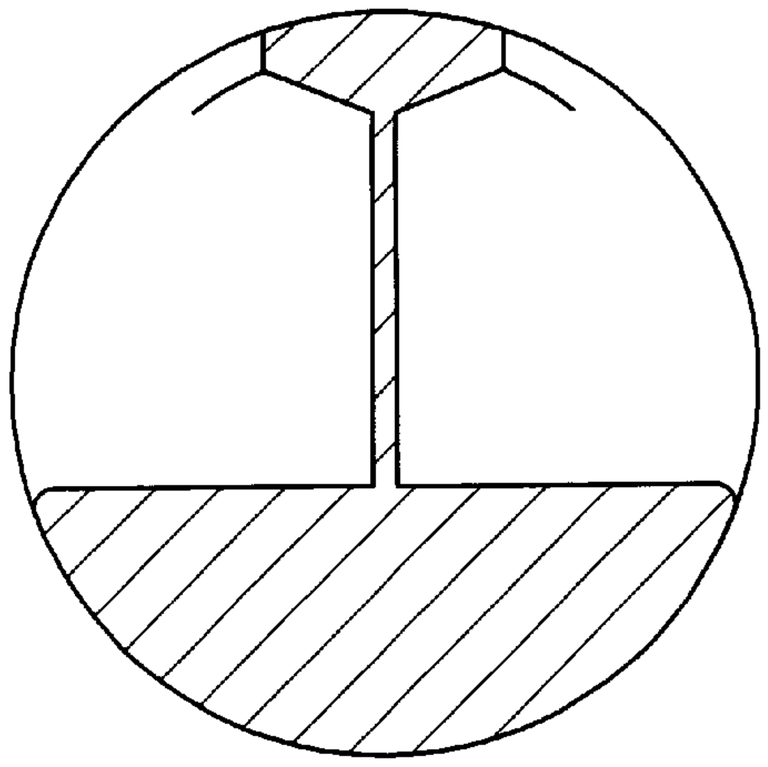


Fig.9

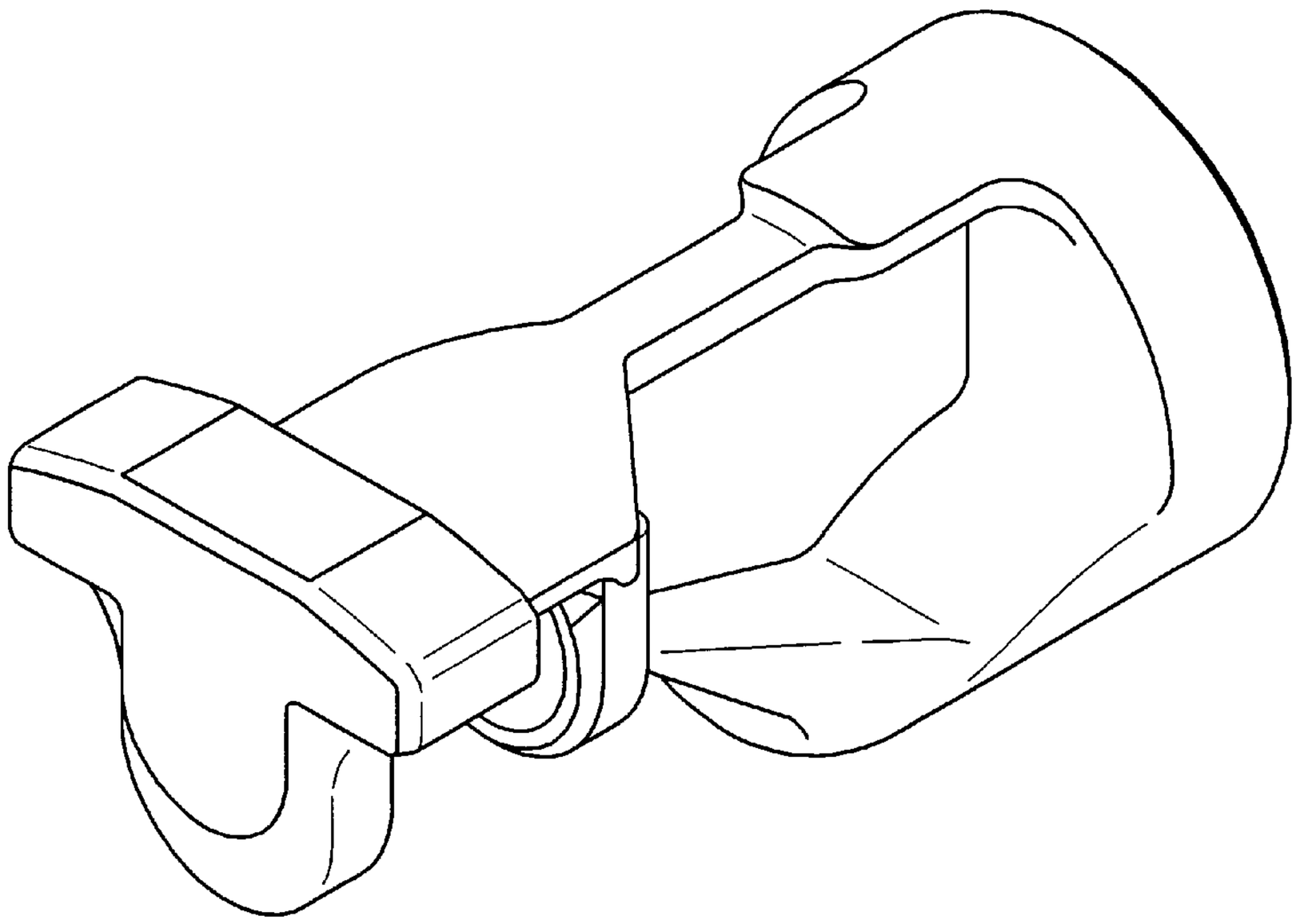


Fig.10

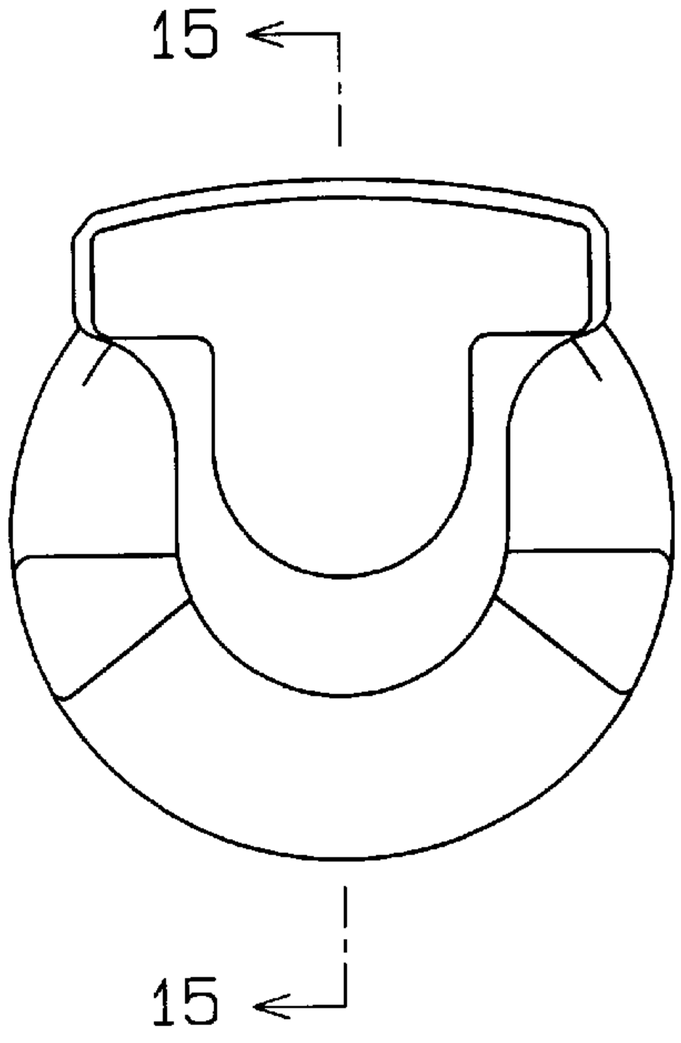


Fig.11

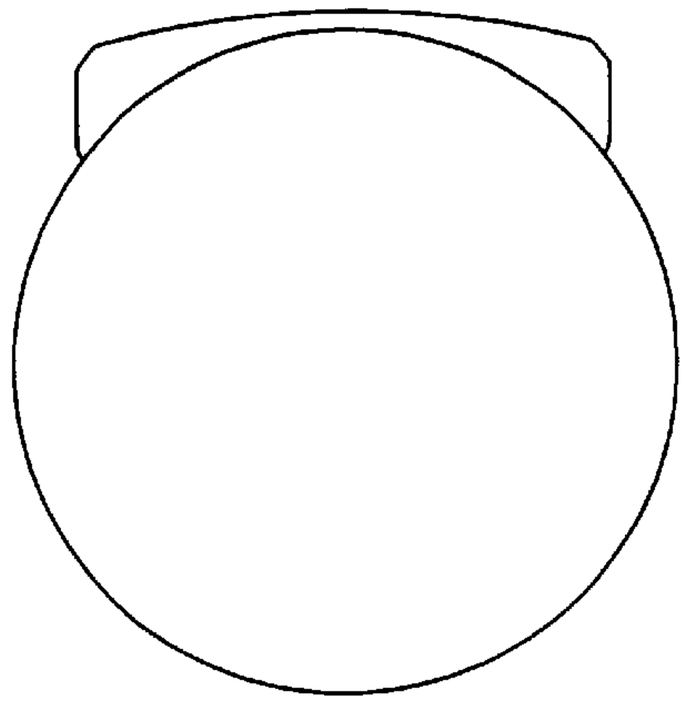


Fig.12

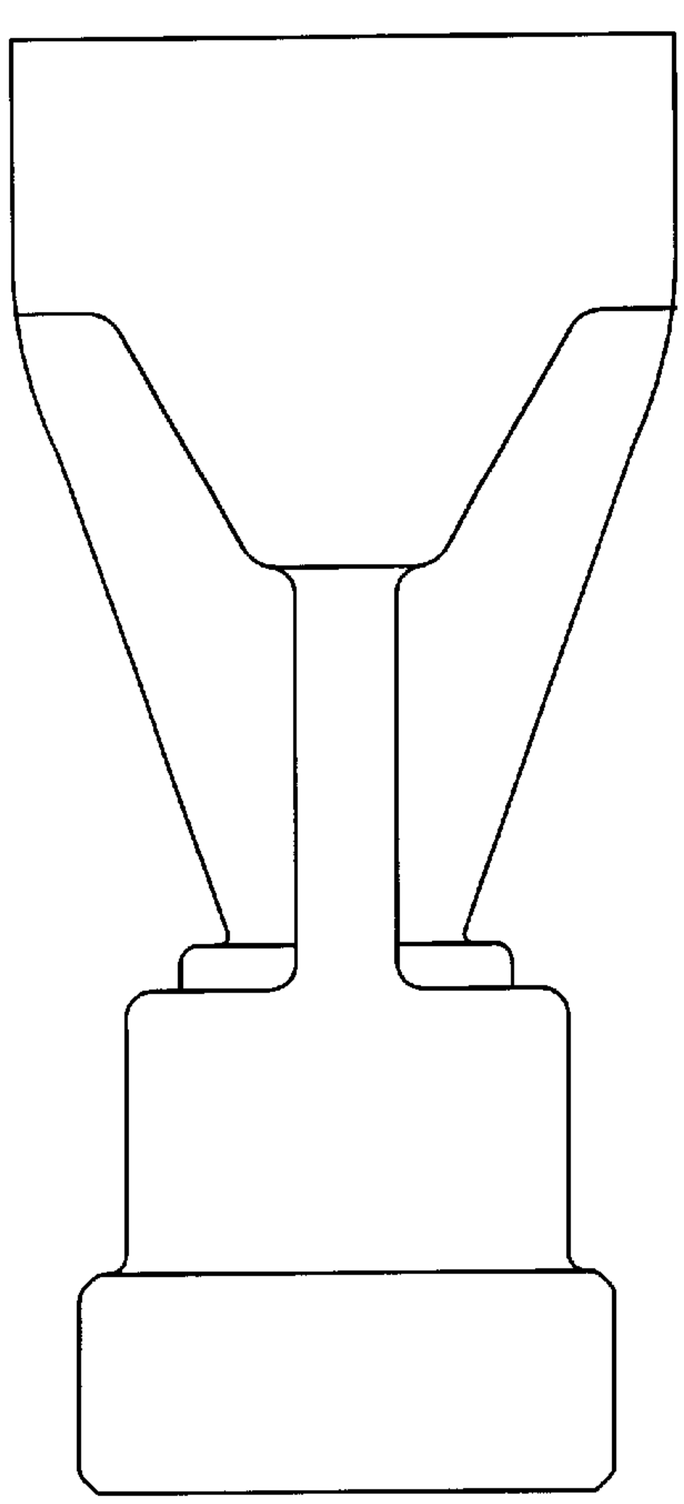


Fig.13

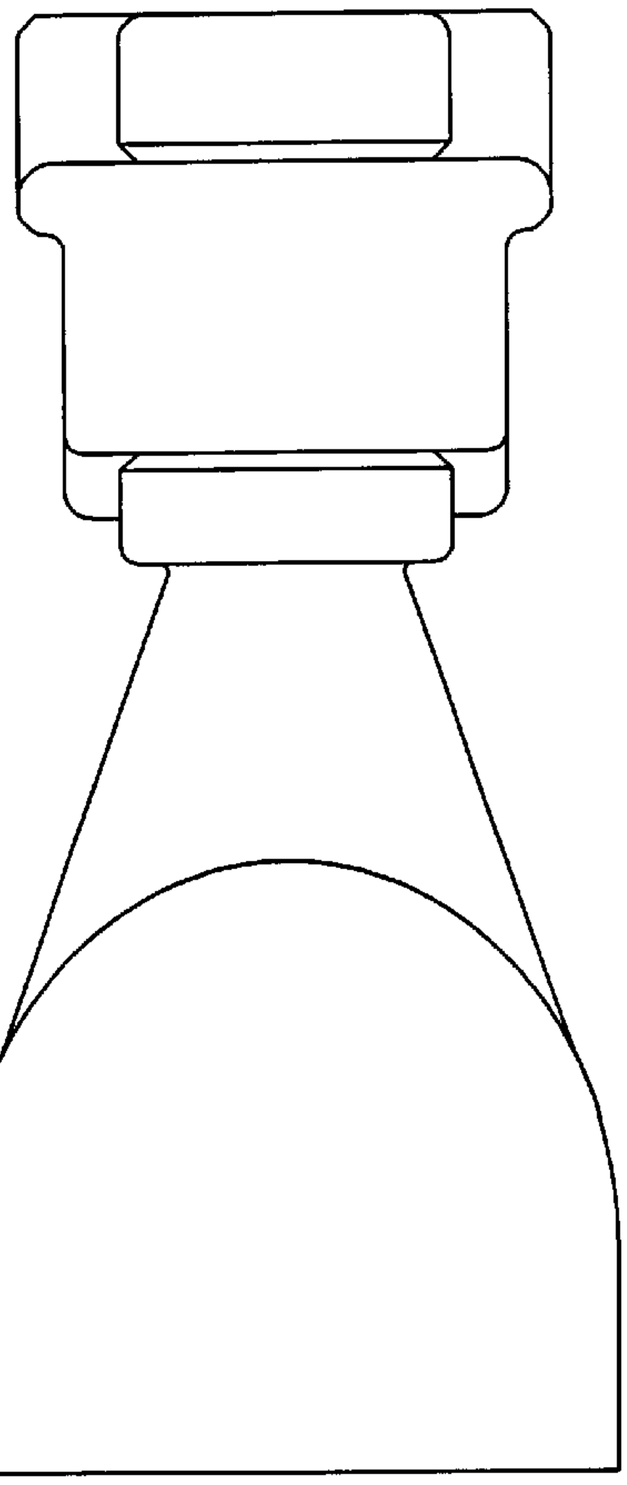


Fig.14

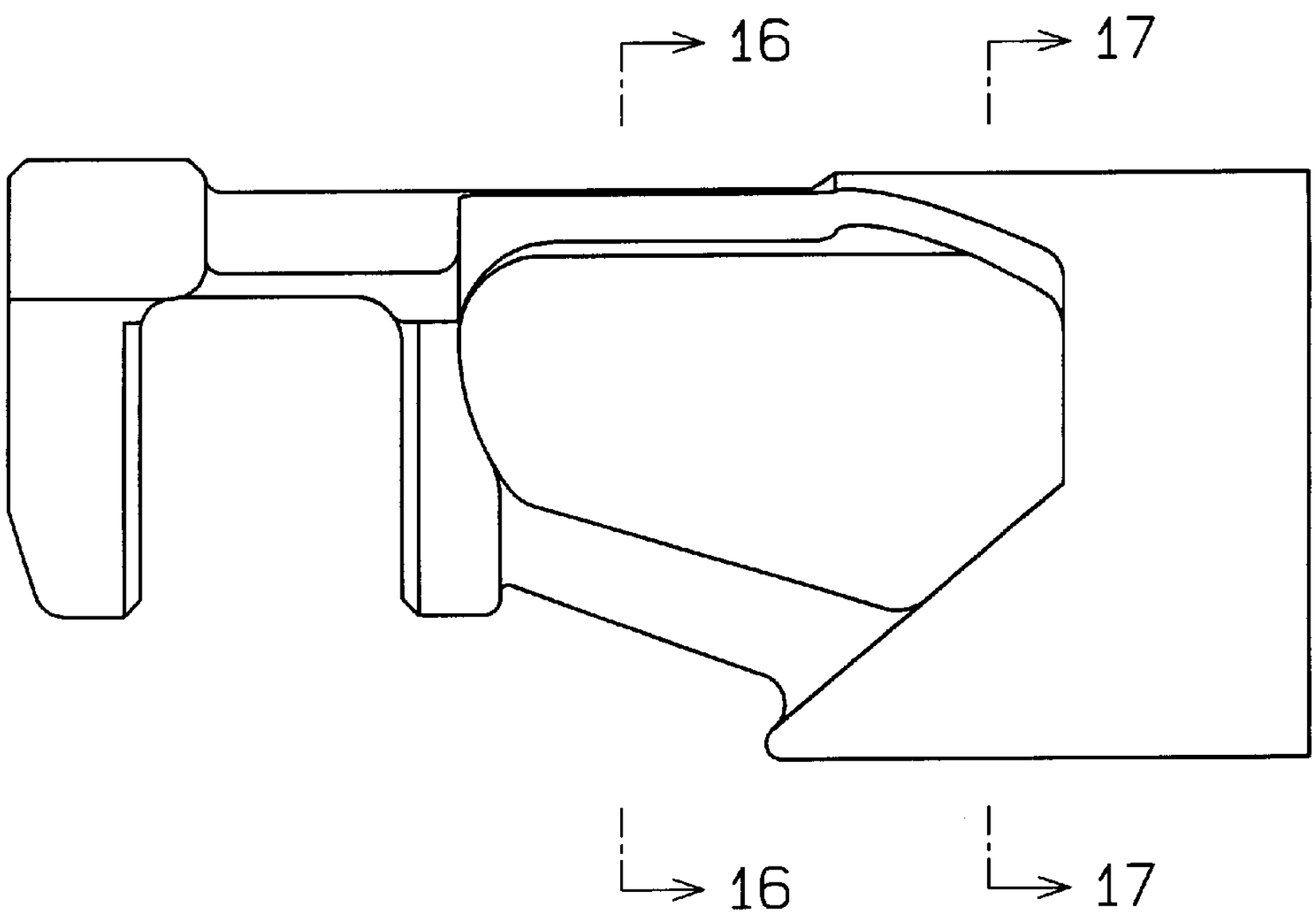


Fig.15

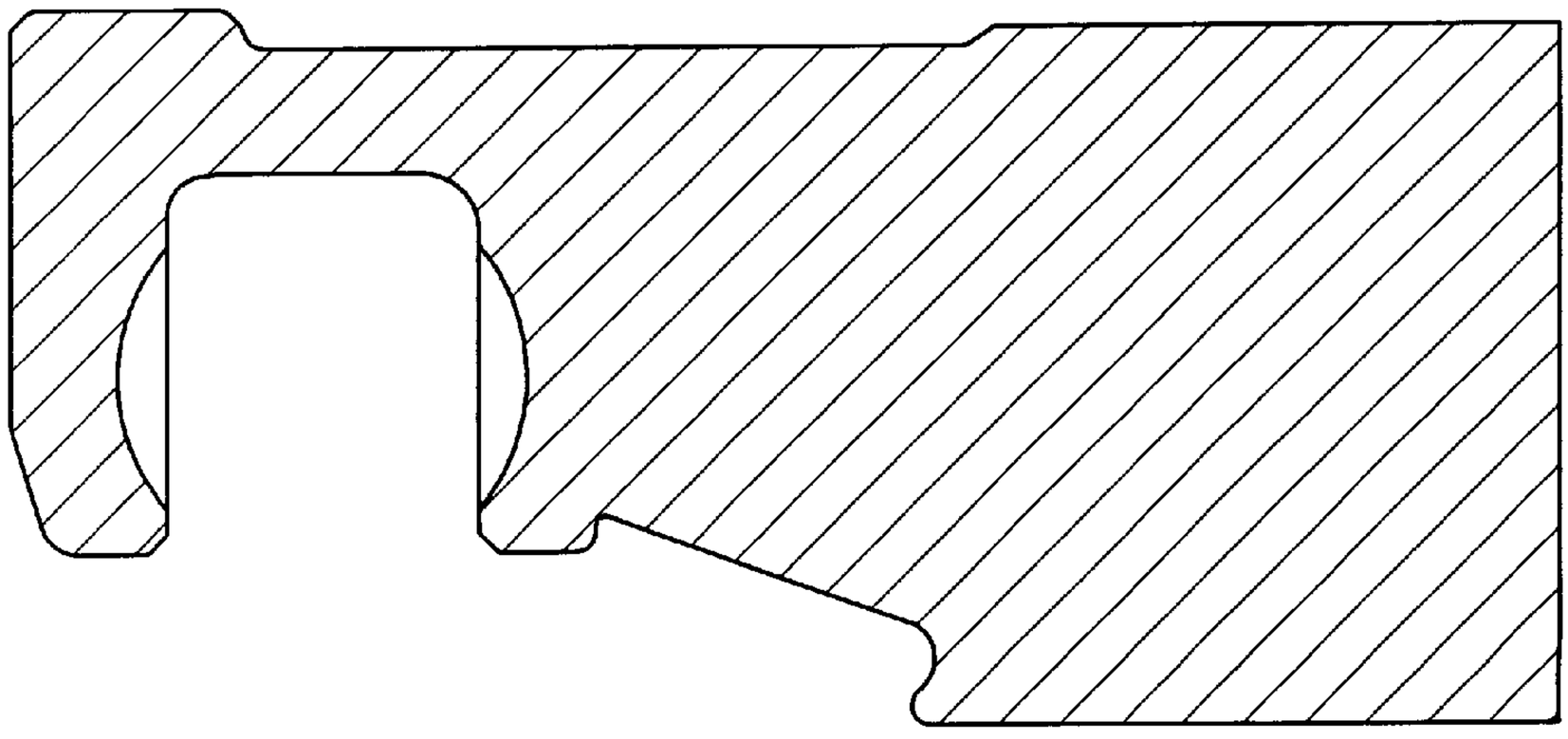


Fig.16

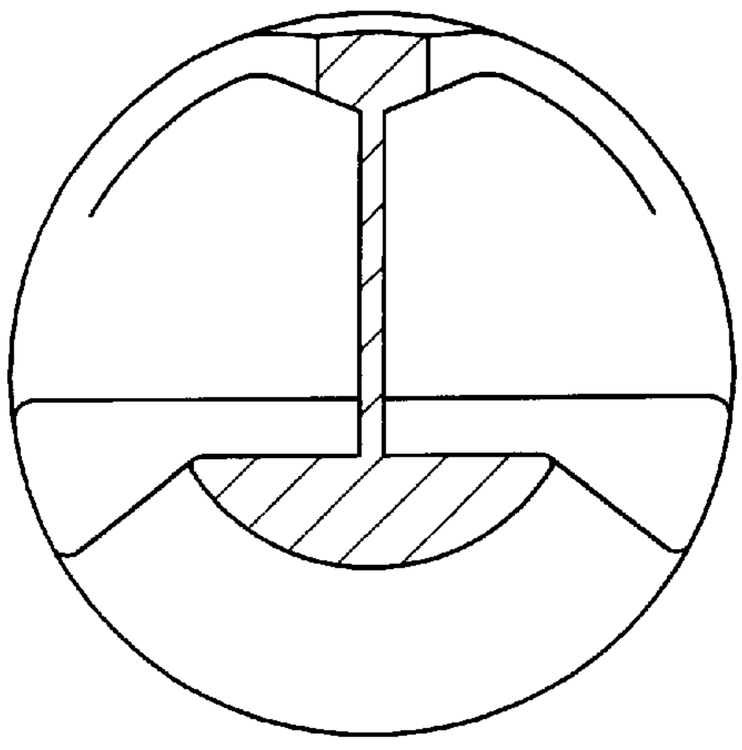


Fig.17

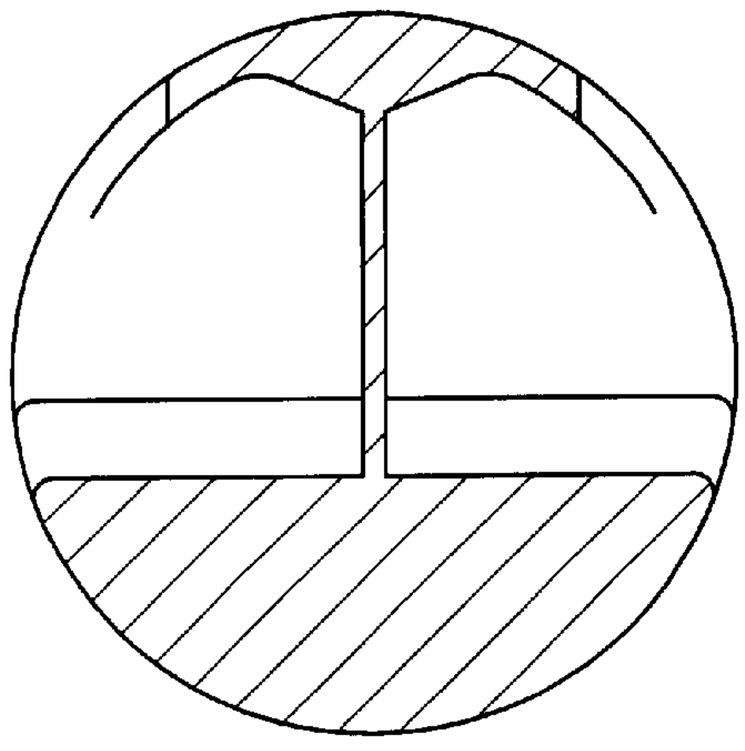


Fig.18

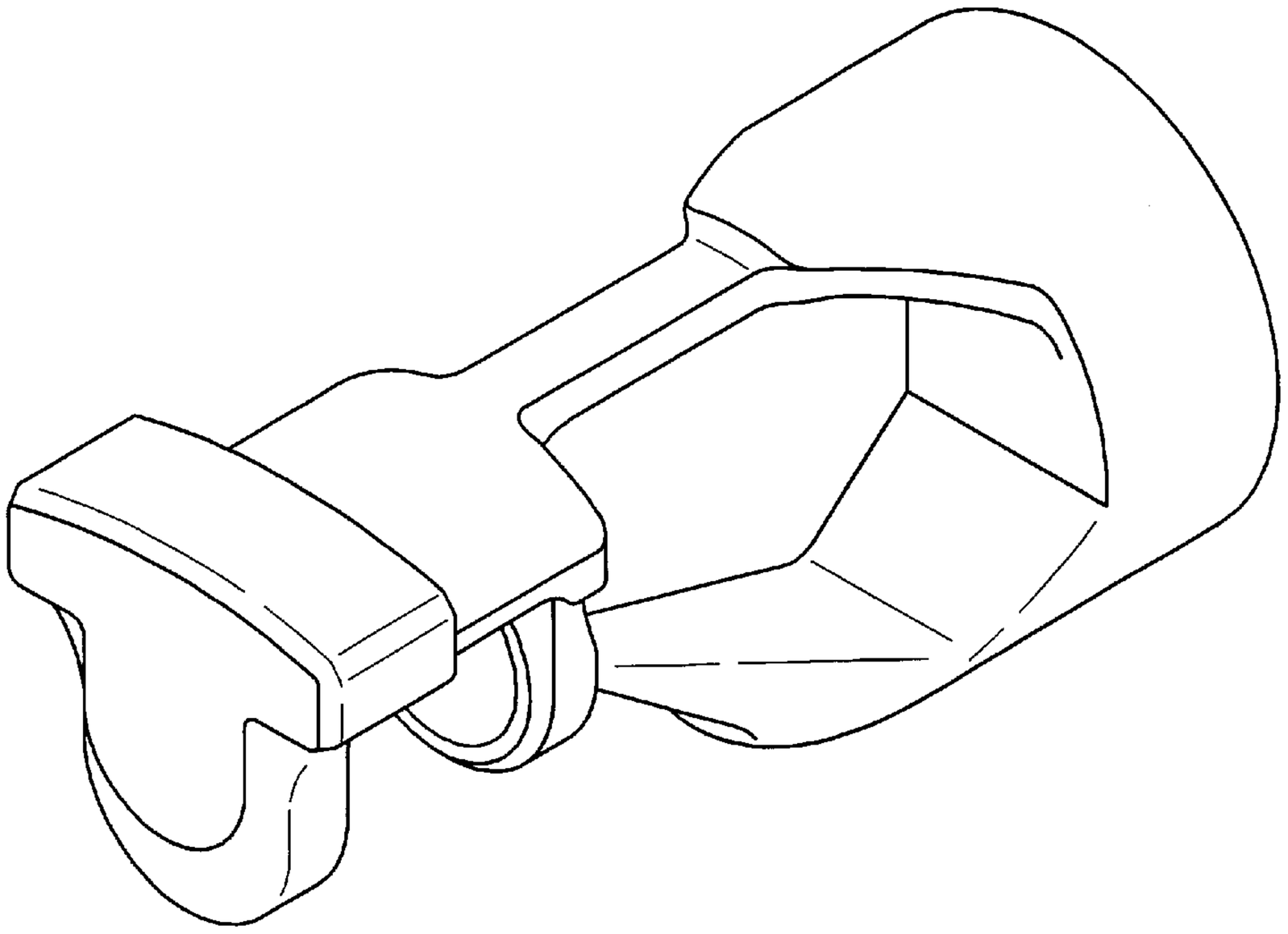


FIG. 19

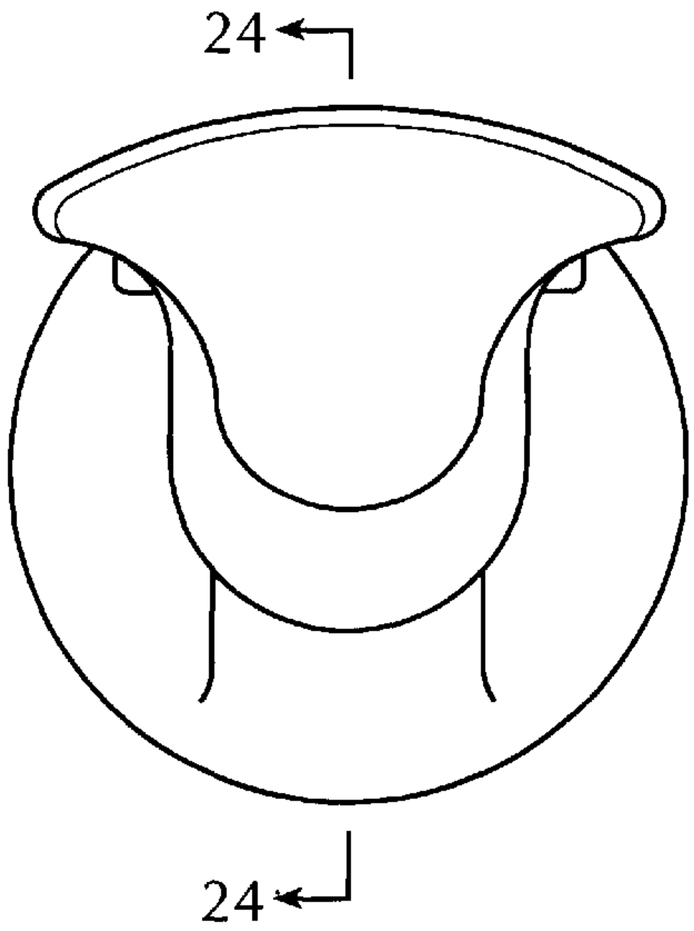


FIG. 20

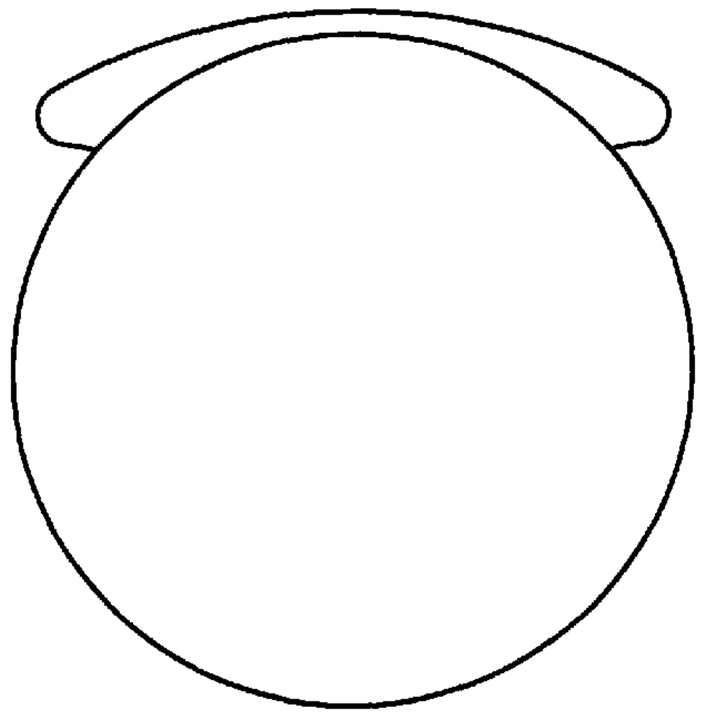


FIG. 21

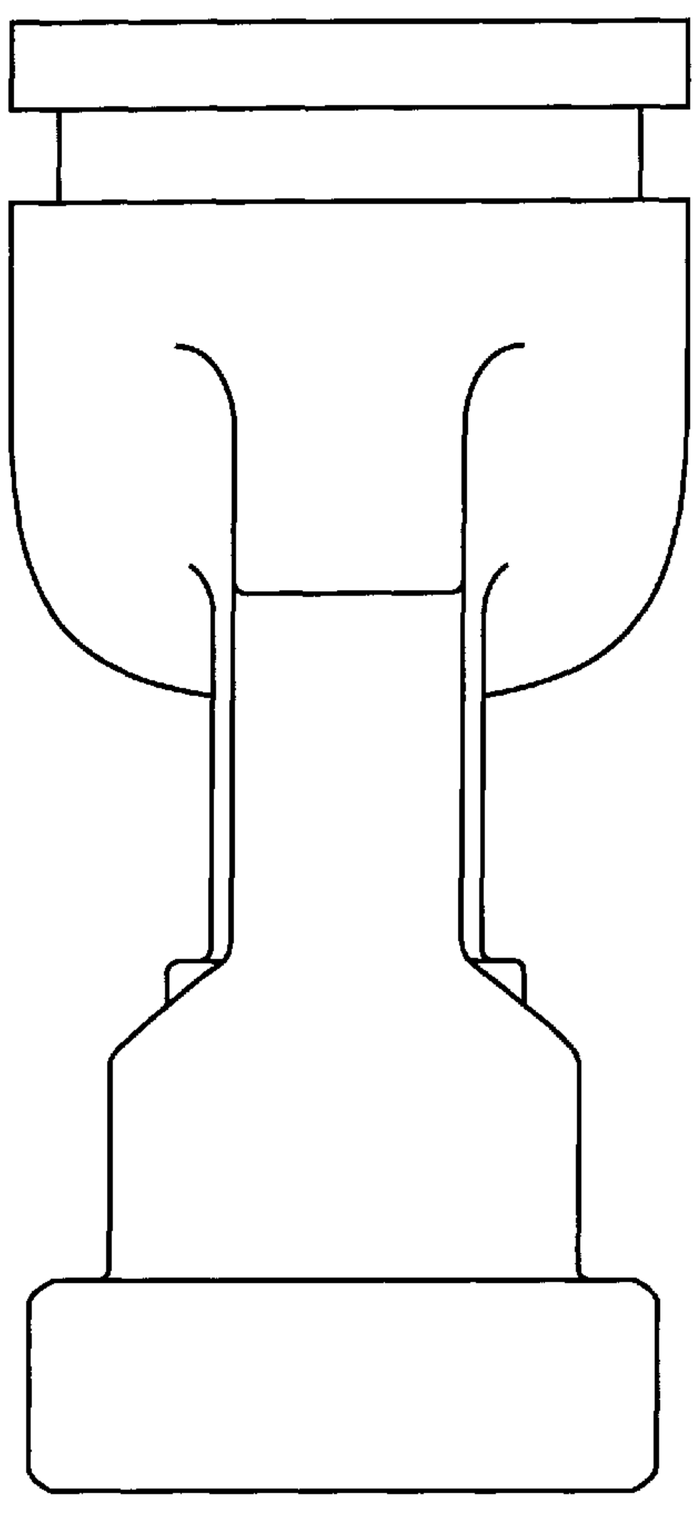


FIG. 22

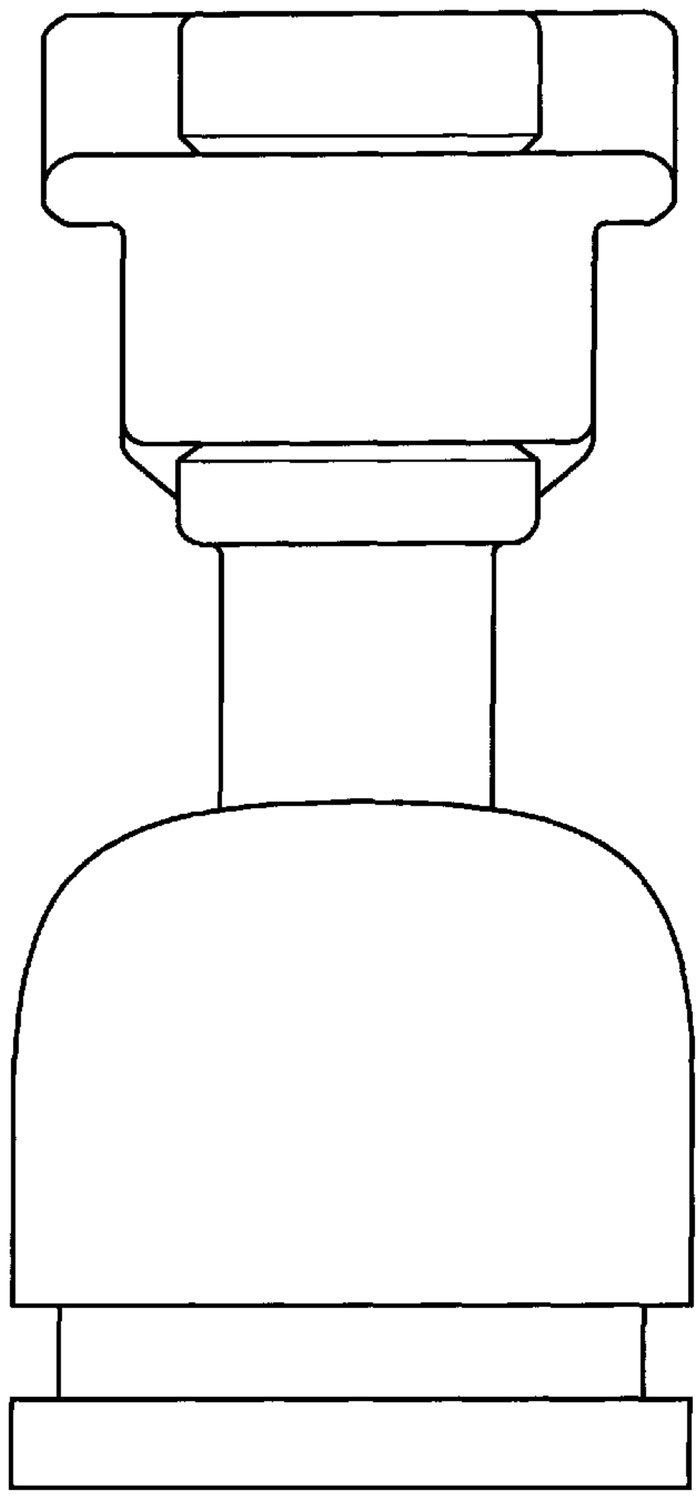


FIG. 23

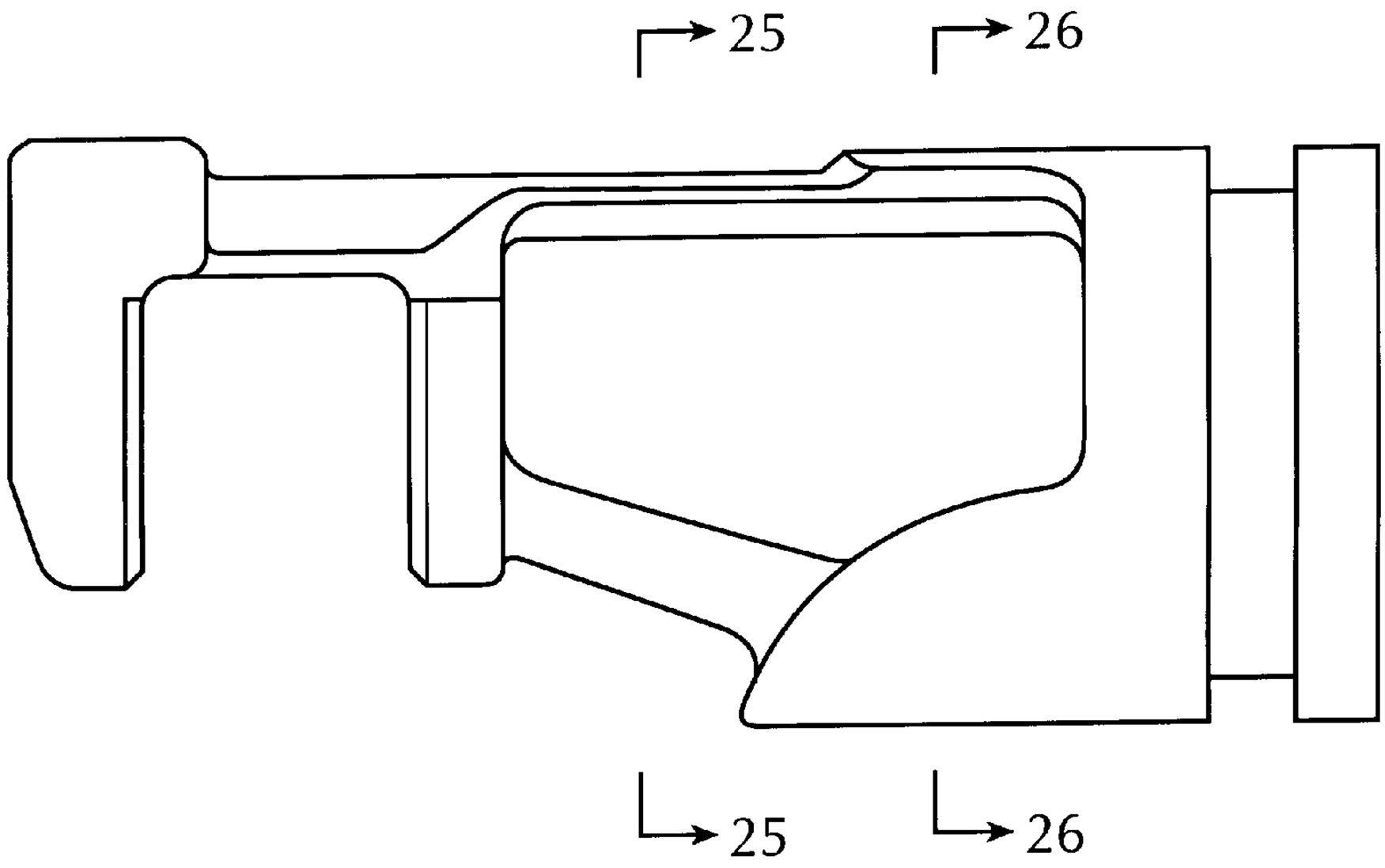


FIG. 24

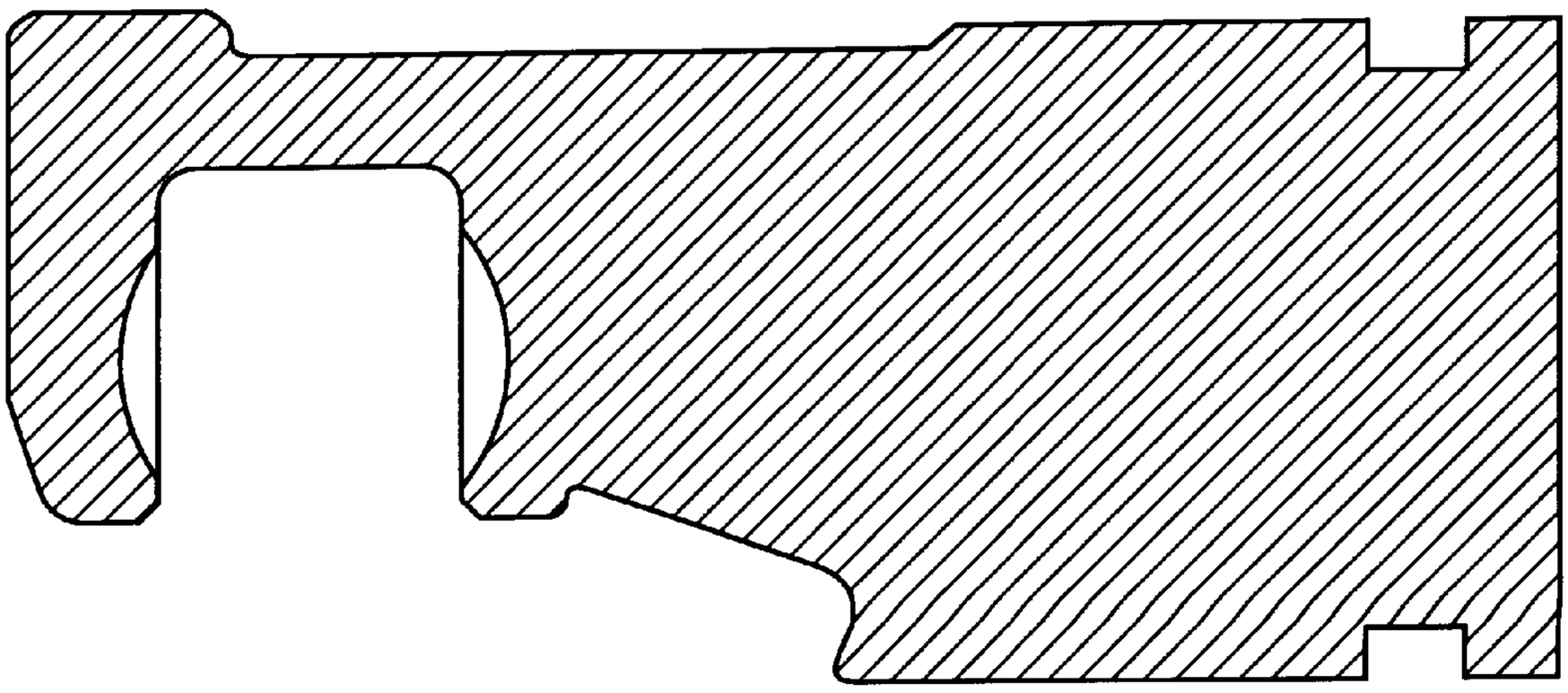


FIG. 25

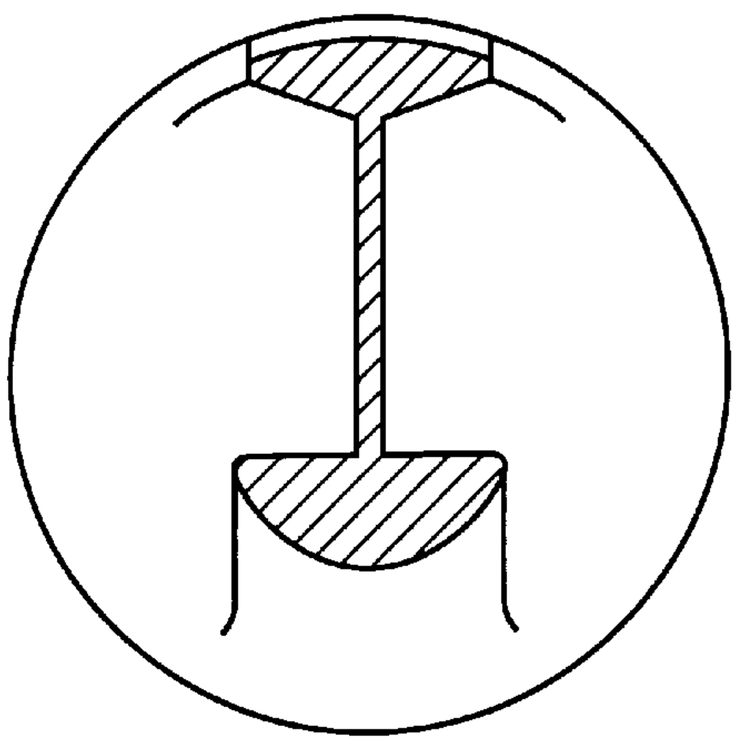


FIG. 26

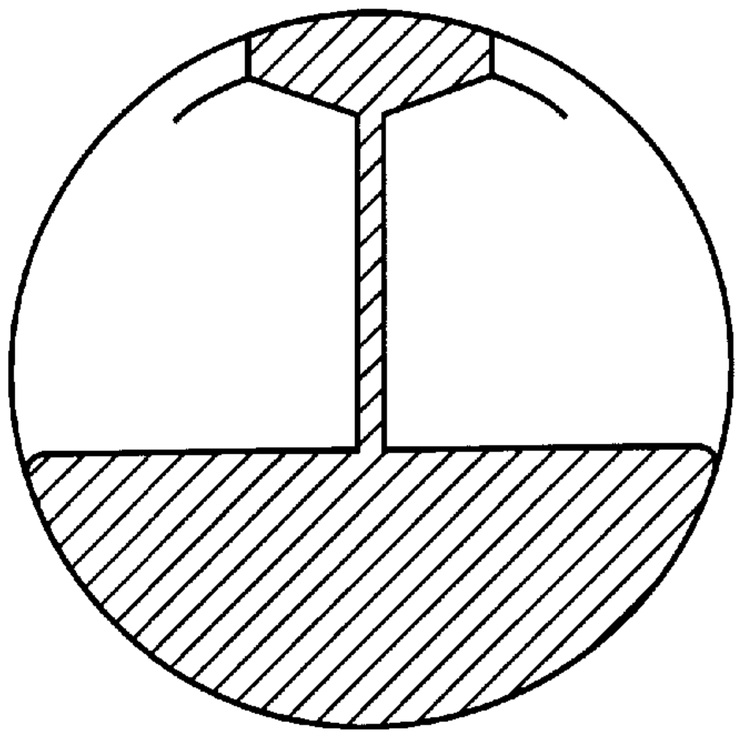
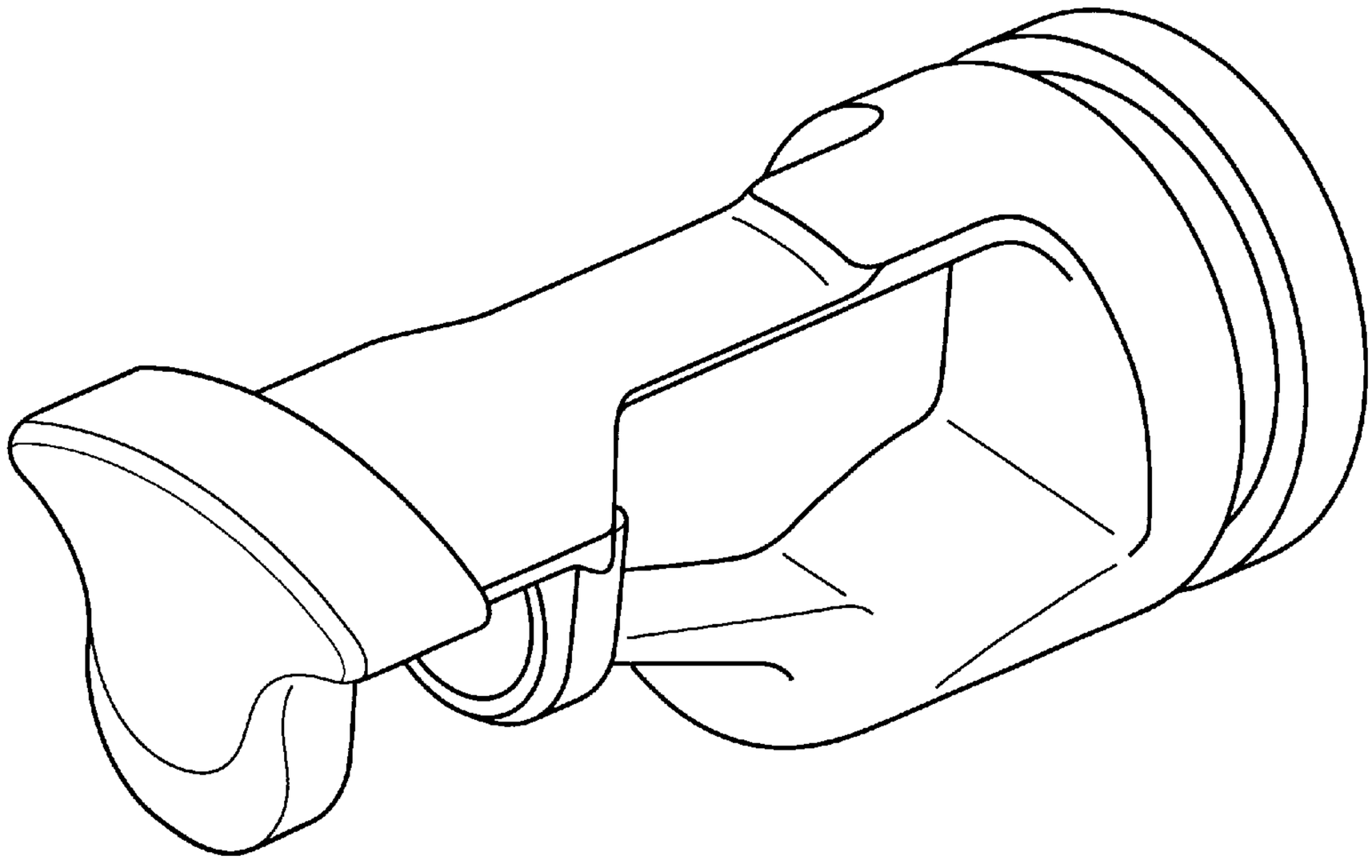


FIG. 27



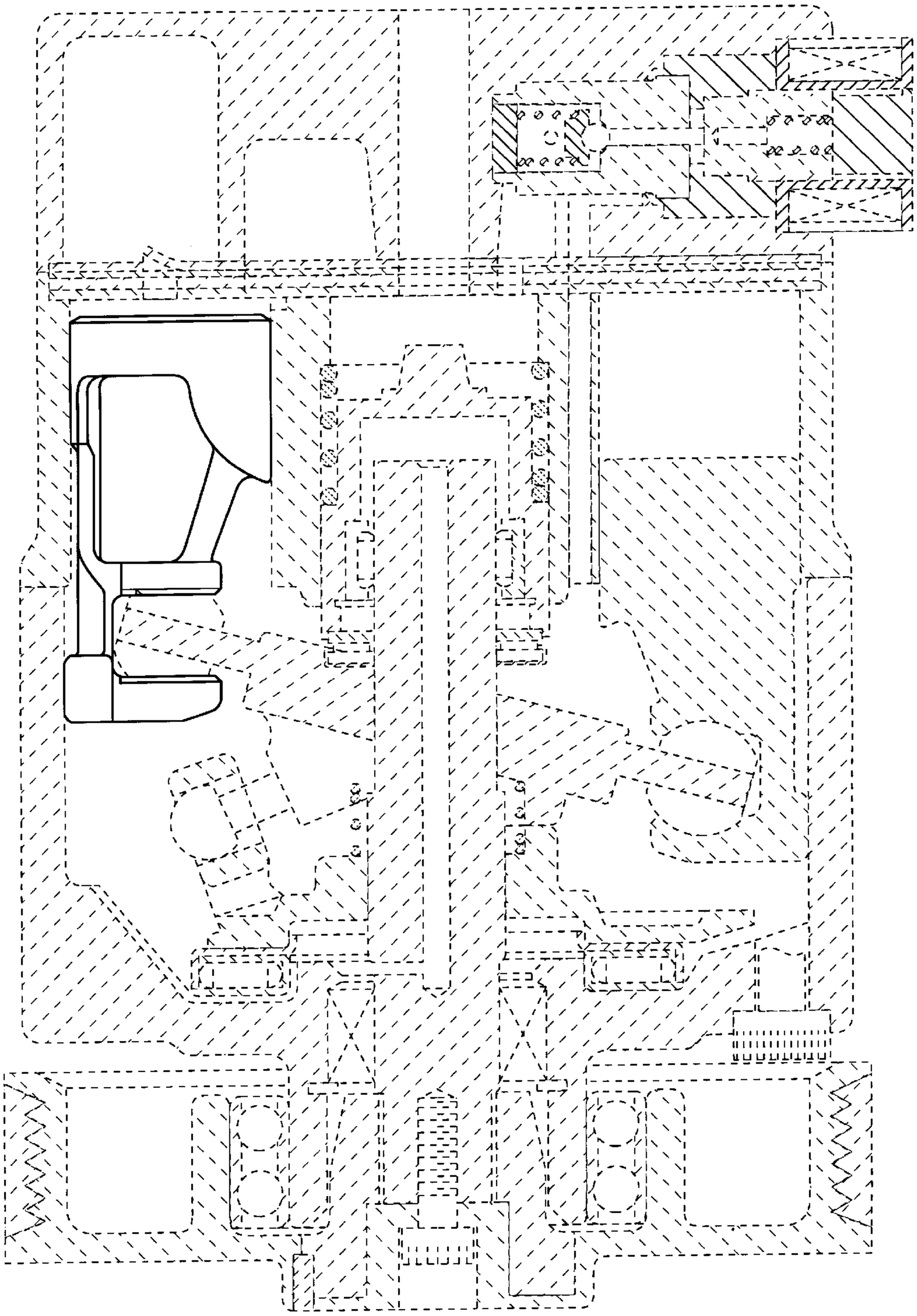


FIG. 28