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㉓ Improved toilet bowl plunger.

㉔ The plunger includes an elongated knurled handle (12), a base sealing member (16) having a central aperture extending therethrough, and a multi-pleated bellows (14) preferably releasably connected to the bottom of the handle and preferably permanently connected to the top (36) of the base sealing member. Preferably, the bellows and base sealing member are generally cylindrical and of rubber, plastic or the like. They may be integral. The sealing member (16) may have an upper bowl sealing rim (38) with a collapsible top (36) wall adapted to receive the bellows, and a small diameter lower sealing ring (42), with depending skirt (32). Preferably, the transverse bellows pleats (26) increase in diameter from the bellows top (30) to bottom (32) and may be arranged in sets for improved seating. The handle top (18) can be removable and the handle can contain a central cavity (56) extending longitudinally therethrough, which cavity can, if desired, be threaded to receive a garden hose (60). Thus, the handle top when unscrewed can act as a vacuum relief valve. The handle top can also include a padded transverse grip. The device is highly efficient and durable and is adapted for use in a variety of applications.

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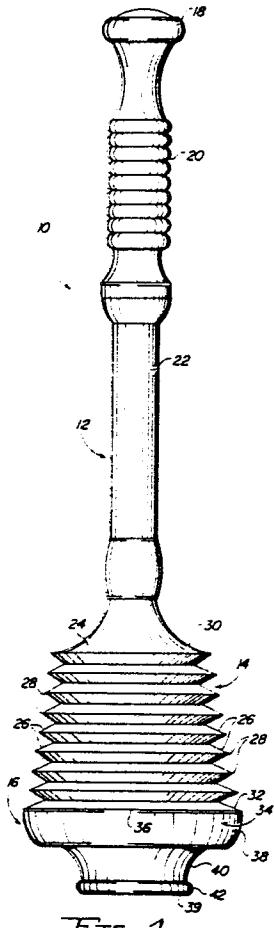


FIG. 1

## IMPROVED TOILET BOWL PLUNGER

### BACKGROUND OF THE INVENTION

### FIELD OF THE INVENTION

The present invention generally relates to plumbing helpers and, more particularly, to an improved toilet bowl and drain plunger.

### PRIOR ART

Conventional drain and toilet bowl plungers generally comprise a resilient rubber, smooth walled bell shaped plunger portion and a cylindrical handle connected to the upper end thereof. See, for example, U. S. Patent Nos. 2,496,525; 2,066,773; and 2,042,372. Such devices parallel rubber vacuum pumps used for other purposes, such as the pump of U. S. Patent No. 2,463,458. More exotically shaped bell drain plungers are illustrated in U. S. Patent Nos. 2,188,960 and 2,844,826.

Conventional drain and toilet bowl plungers are generally characterized by being difficult to use. Thus, the rubber bell is initially very difficult to compress, then suddenly collapses. This causes a sudden shock on or surge to the drain and may loosen plumbing connections. Moreover, the rubber rim of the bell does not fit a toilet bowl properly to provide an effective seal, but slips around in the bowl, so that strong controlled pressure and vacuum cannot be exerted on the toilet drain to clear it of a blockage. While conventional plungers are generally better adapted for use in kitchen sinks, drain tubs and the like, they are seriously deficient for use with toilets, as pointed out above.

Accordingly, there remains a need for an improved toilet drain blockage removing device which allows a smoothly controlled amount of pressure and vacuum to be exerted on the toilet drain, so as to protect the drain from damage, and which is easy and efficient to use. The device preferably should be durable and have readily replaceable parts. The seal exerted by the device should be improved over conventional plungers to provide quicker better drain clearing results. Such device should be capable of being made in a variety of efficient configurations at low cost from readily available materials.

### SUMMARY OF THE INVENTION

The improved drain clearing plunger of the present invention satisfies all the foregoing needs.

5 The plunger comprises an elongated plunger handle a first flexible, resilient base sealing member having a central aperture extending vertically therethrough; a bottom lying in a substantially horizontal plane and extending radially from said central aperture, and a side portion connected to and extending upwardly from the periphery of the bottom. The plunger further includes a flexible, resilient, collapsible, multi-pleated bellows having its upper end connected to the bottom end of the handle, the 10 pleats of the bellows being generally transverse thereof; and a thin walled collapsible top lying in a substantially horizontal plane and connected at its outer periphery to the top of the side portion. The bellows are connected at its lower end to said collapsible top so that compression of the bellows 15 results in the nesting of the lower end of the bellows into the nesting area.

### DRAWINGS

Figure 1 is a schematic side elevation of a first preferred embodiment of the improved toilet bowl plunger of the present invention, shown in the 20 relaxed uncompressed state;

Figure 2 is a somewhat enlarged schematic fragmentary side elevation of the bellows and base sealing member of the plunger of Figure 1, shown with the bellows compressed (collapsed);

25 Figure 3 is a schematic fragmentary side elevation, partly broken away, of a second preferred embodiment of the bellows and base member of the improved plunger of the present invention;

Figure 4 is a schematic fragmentary side elevation of a third preferred embodiment of the improved plunger of the present invention;

30 Figure 5 is a schematic fragmentary side elevation of a fourth preferred embodiment of the bellows and base member of the improved plunger of the present invention;

Figure 6 is a schematic fragmentary side elevation, partly broken away, of a modified version 45 of the top of the handle of the improved plunger of the present invention; and

50 Figure 7 is a schematic side elevation of a fifth preferred embodiment of the improved plunger of the present invention.

Figure 8 is a schematic cutaway side elevation of a sixth preferred embodiment of the improved plunger of the present invention.

#### DETAILED DESCRIPTION

##### FIGURES 1 and 2.

Now referring more particularly to Figures 1 and 2 of the drawings, a first preferred embodiment of the improved toilet bowl plunger of the present invention schematically depicted therein. Thus, plunger 10 is shown which comprises an elongated generally cylindrical handle 12, to the bottom end of which is connected, preferably releasably; a bellows 14, in turn connected, preferably integrally, at its lower end to a base sealing member 16.

Handle 12 may be of wood, ceramic, metal, plastic, rubber or the like and preferably has a top cap 18, a knurled grip 20, a decorative surface 22 and a flared base 24. Alternatively, portion 24 may be the upper end of bellows 14.

Bellows 14 is generally cylindrical and hollow, is made of resilient, flexible rubber or plastic, preferably blow molded, and includes a plurality of transverse pleats 26 with sharply angled outer peripheries 28. Pleats 26 gradually and uniformly increase in diameter from the top 30 of bellows 14 to the bottom 32 thereof to facilitate easy and controlled collapsing and nesting of bellows 14 and more ready control of the extent of pressure and vacuum applied by bellows 14 to a toilet drain during operation of plunger 10. Bottom 32 is integrally connected to the upper portion 34 of member 16, which upper portion 34 includes a thin walled collapsible top 36 and a peripheral sealing rim 38. Member 16 is hollow, with an open bottom 39.

When, as shown in Figure 2, bellows 14 is collapsed (compressed) so that its bottom 32 forces down top 36, rim 38 is deflected outwardly to more effectively seal plunger 10 against a toilet bowl into which plunger 10 may be inserted. The lower portion 40 of member 16 is sloped to a narrow bottom wear-resistant sealing ring 42 defining open bottom 39. Portion 40 is designed to fit down into the narrow bottom end or drain portion of a toilet bowl, with ring 42 seated therein in sealing engagement therewith for optional transfer of pressure and suction thereto and therefore optional drain block clearing efficiency.

On the down or compression stroke of handle 12, bellows 14 progressively exerts air pressure against such drain, while on the up stroke of handle 12 suction is exerted by bellows 14 on such drain to dislodge any obstruction. Efficient easily controlled pressure and suction are accomplished by the use of plunger 10 due to the seals effected by

the shape of plunger 10 and the engagement of ring 42 and rim 38 with the toilet walls and to the nature of bellows 14. Plunger 10 can also be used to dislodge blocks in kitchen sinks, drain tubes, bath tubs, etc., with improved efficiency.

##### FIGURE 3.

Figure 3 schematically depicts a modified form of the bellows and base member of the improved plunger of the present invention. Thus, bellows 14a and base member 16a are shown. Components thereof similar to those of Figure 1 bear the same numerals, but are succeeded by the letter "a". Bellows 14a differs from bellow 14 only in that pleats 26a thereof have curved or rounded outer peripheries 28 in contrast to the sharply angled pleats 26. Pleats 26a are uniformly thin walled. In addition, portion 24a has a squared off configuration. So also does rim 38a, in contrast to the rounded contours of rim 38. Bellows 14a and base member 16a are otherwise identical to bellows 14 and base member 16 and can be used with handle 12 to provide the present improved plunger.

##### FIGURE 4

A third preferred embodiment of the improved plunger of the invention is schematically depicted in Figure 4. Thus, plunger 10b is shown. Components thereof similar to those of plunger 10 (Figure 1) bear the same numerals, but are succeeded by the letter "b". Thus, plunger 10b includes handle 12b, bellows 14b and base member 16b. Handle 12b includes cap 18b which extends transversely of handle 12b and bears padding 50 to enable hand pressure to be exerted more efficiently on bellows 14b.

It will be noted that bellows 14b is identical to bellows 14 and that rim 38b is squared off in the manner of rim 38a. In addition, ring 42b has an annular, depending, resilient, flexible skirt 52 of rubber, plastic or the like depending therefrom, which skirt 52 aids in sealing plunger 10b to a toilet bowl drain. Thus, when bellows 14b is compressed, skirt 52 expands outwardly, directly contacting the toilet bowl surface defining the drain and thereby improving the seal effected by ring 42b. Thus, plunger 10b is more efficient than conventional plungers.

FIGURE 5

A fourth preferred embodiment of the bellows and base member portion of the improved plunger of the present invention are schematically depicted in Figure 5. Thus, bellows 14a and base member 16c are shown. Components thereof similar to those of bellows 14 and base member 24 bear the same numerals, but are succeeded by the letter "c". It will be noted that base member 16c is identical to base member 16 and that bellows 14c is identical to bellows 14, except that pleats 26c thereof are arranged in three sets 26c, 26c2 and 26c3 of increasing diameter, with the pleats 26c within each set substantially identical. This arrangement of pleats 26c further facilitates proper sequential collapsing or compression of bellows 14c and proper rebound of bellows 14c during use of the present plunger. Components 14c and 16c can be used with handle 12.

FIGURE 6.

In Figure 6 a modification of handle 12 of plunger 10 is shown. Thus, a portion of handle 12d is depicted schematically. Handle 12d is identical to handle 12 except that its cap 18d is threadably receivable in a central threaded cavity 56 extending the length of handle 12d into communication with the bellows thereof (not shown). Handle 12d can be substituted for handle 12. Cavity 56 is dimensioned to threadably receive the metal connector 58 of a garden hose 60, so that water under pressure can be delivered via hose 60 through handle 12d, and the associated bellows and hose member (not shown) to a toilet drain or other drain being worked on, for improved obstacle clearing efficiency.

It will be understood that with cap 18d (instead of hose 60) screwed tightly in place in cavity 56, air pressure can be fully applied by plunger 10. If it is desired to remove that pressure or the resulting suction, for example, in order to free plunger 10 from sealing engagement with a toilet, or to somewhat reduce the pressure or suction, in order to better control the forces delivered through the plunger, cap 18d can be unscrewed to expose bleed-off groove 62 thereof. Accordingly, the modifications of Figure 6 are useful in the improved plunger of the invention.

FIGURE 7.

A fifth preferred embodiment of the improved plunger of the present invention is schematically depicted in Figure 7. Thus, plunger 10e is shown. Components thereof similar to those of Figure 1

bear the same numerals, but are succeeded by the letter "e". Thus, plunger 10e has handle 12e releasably secured, as by a screw 64, to bellows 14e. Bellows 14e is bee hive-shaped and includes rounded pleats 26e. That member is similar to member 16, except that it includes an internal reinforcing ring 42e and a lower skirt 52e which slopes down and inwardly. All other components are the same as in plunger 10, and plunger 10e functions similarly thereof.

FIGURE 8

A sixth preferred embodiment of the improved plunger of the invention is schematically depicted in Figure 8, with portions thereof cutaway to more clearly show the interior of the plunger. Components thereof similar to those of plunger 10 (Figure 1) bear the same numerals, but are succeeded by the letter "f". Thus, plunger 10f includes 12f, bellows 14f and base member 16f.

Plunger 10f is shown in an operative position with handle 12f having been removed downwardly to compress bellows 14f and collapse rim portion 38f. Plunger 10f is shown in use on a flat surface 41 having a drain 43 terminating at flat surface 41. Plunger 10f has a rim 45 extending inwardly from ring 42f which provides an additional sealing surface around drain 43.

Plunger 10f has been designed to be especially applicable on flat surface drains. If the ordinary plunger is collapsed over a flat surface drain opening with the funnel extended, the plunger has a tendency to wobble all over the place, thereby uncovering the drain opening. Accordingly, presently available plungers generally require a tucking under of their funnels by hand when covering a flat drain, which is quite unsanitary. If the plunger were to be subsequently used in a toilet or other recessed drain, the funnel would then be required to be pulled outward, again resulting in an unsanitary operation. Applicant's plunger 10f avoids these problems by providing a plunger capable of effecting a double seal (via rim 45 and rim 38f) about a drain 43 on a flat surface 41 application without employing one's hands, and upon removal from drain 43, is ready for use in a toilet or other recessed drain.

Various other modifications, changes, alterations and additions can be made in the improved plunger of the present invention, its components and parameters. All such modifications, changes, alterations and additions as are within the scope of the appended claims form part of the present invention.

## Claims

1. An improved drain clearing plunger, said plunger comprising:
  - (a) an elongated plunger handle;
  - (b) a first flexible, resilient base sealing member having
    - (1) a central aperture extending vertically therethrough;
    - (2) a bottom lying in a substantially horizontal plane and extending radially from said central aperture; and
    - (3) a side portion connected to and extending upwardly from the periphery of said bottom;
    - (c) a flexible, resilient, collapsible, multi-pleated bellows having its upper end connected to the bottom end of said handle, the pleats of said bellows being generally transverse thereof; and
    - (d) a thin walled collapsible top lying in a substantially horizontal plane and connected at its outer periphery to the top of said side portion;
    - (e) said bellows being connected at its lower end to said collapsible top,
    - (f) whereby compression of said bellows results in the nesting of the lower end of said bellows into said nesting area.
2. The improved plunger of claim 1 wherein said bellows and base sealing member are unitary and wherein said handle is releasably secured thereto.
3. The improved plunger of claim 1 wherein said bellow pleats increase in diameter from about the top of said bellows to about the bottom thereof for improved bellows collapsibility.
4. The improved plunger of claim 1 wherein said bellows has a bee-hive-like configuration and wherein the wall thickness of said pleats is substantially uniform.
5. The improved plunger of claim 1 wherein said handle includes a removable top and a central cavity extending longitudinally therethrough to said bellows and wherein the upper end of said cavity is threaded and dimensioned to threadably receive the threaded end of a garden hose.
6. The improved plunger of claim 5 wherein said handle has relief valve means extending to said handle cavity.
7. The improved plunger of claim 6, including an inwardly directed inner sealing rim connected to the bottom of said base sealing member to provide a further sealing function.
8. The improved plunger of any one of the preceding claims wherein said plunger is adapted to be placed about a drain terminating in a flat surface and is capable of providing a plurality of sealing areas about said drain.

9. The improved plunger of claim 1, including a second, resilient base sealing member having a smaller circumference than the circumference of said first sealing member; and a flexible, resilient transition member disposed between and interconnecting said first and second sealing members.

10. The improved plunger of claim 9 wherein said second base sealing member includes a wear resistant sealing ring.

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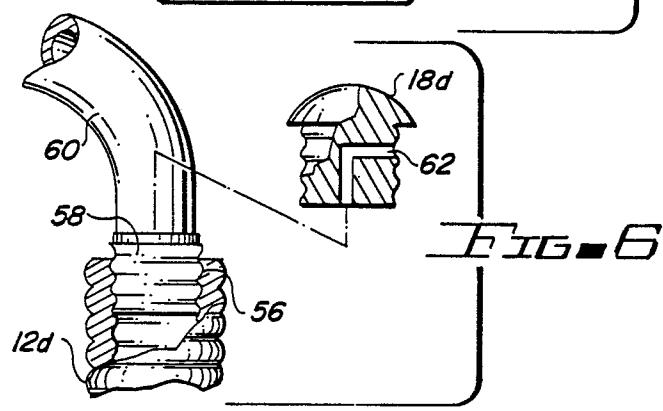
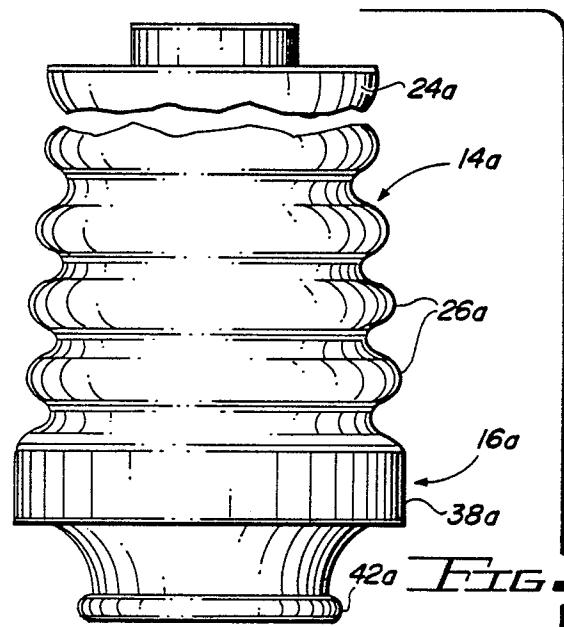
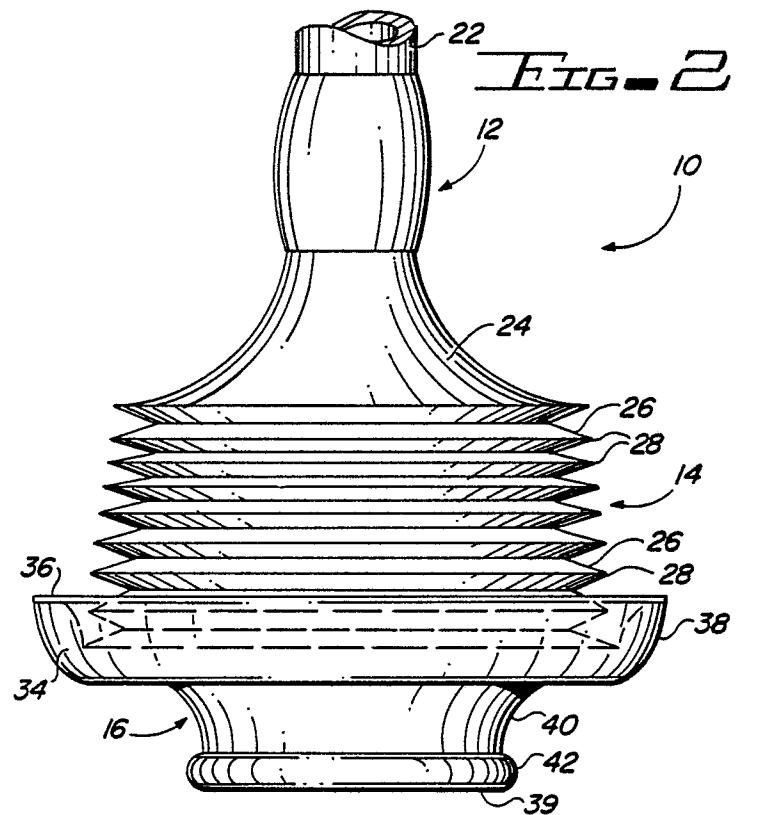
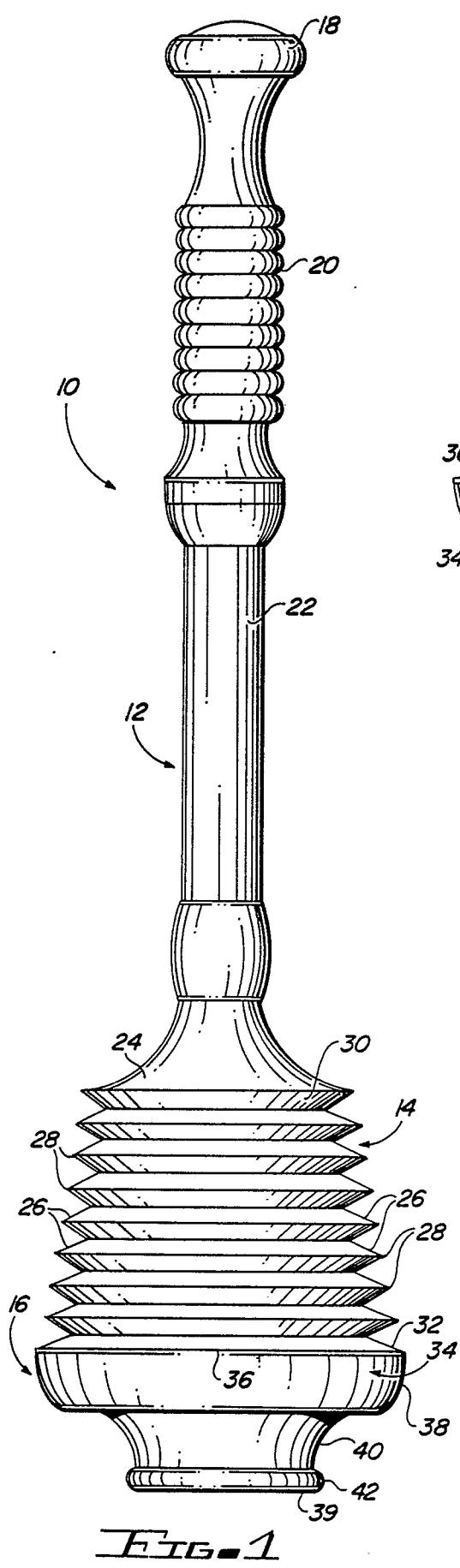
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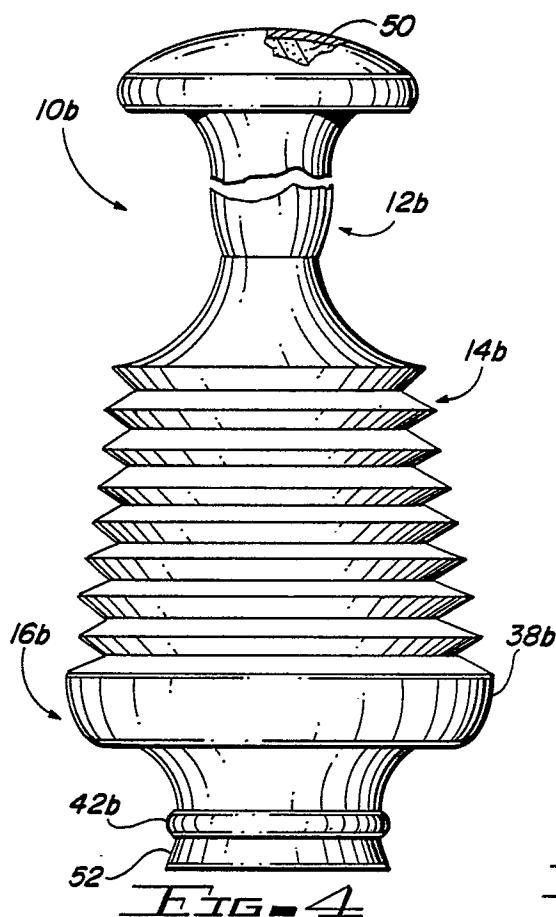


FIG. 4

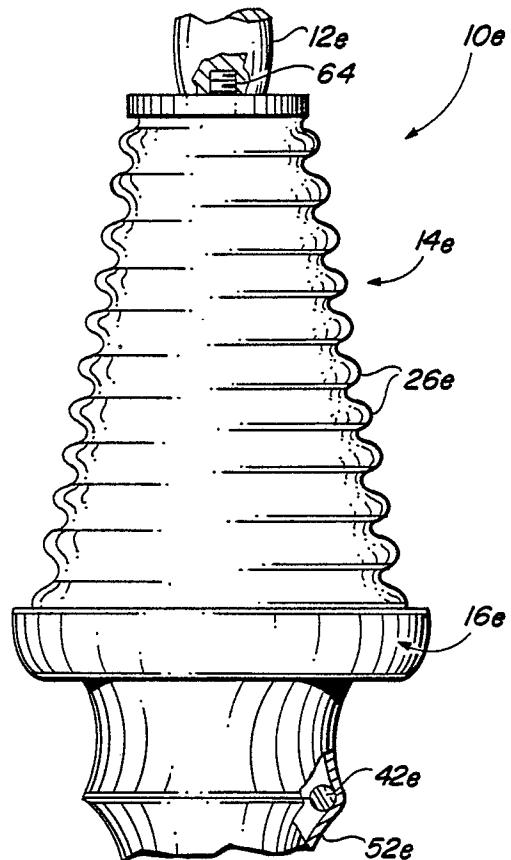


FIG. 7

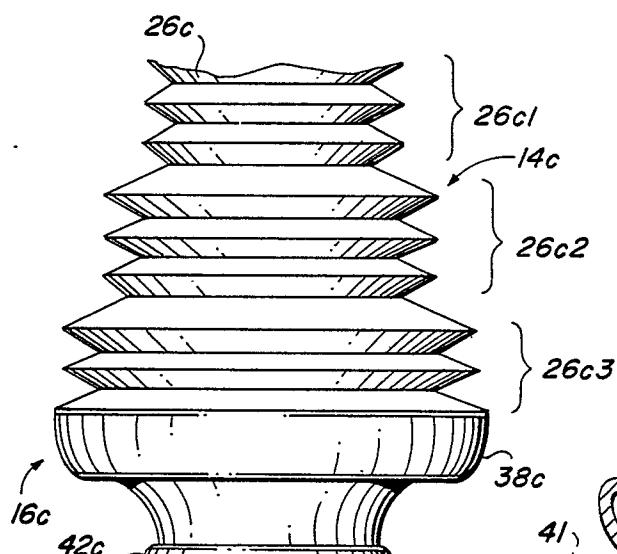


FIG. 5

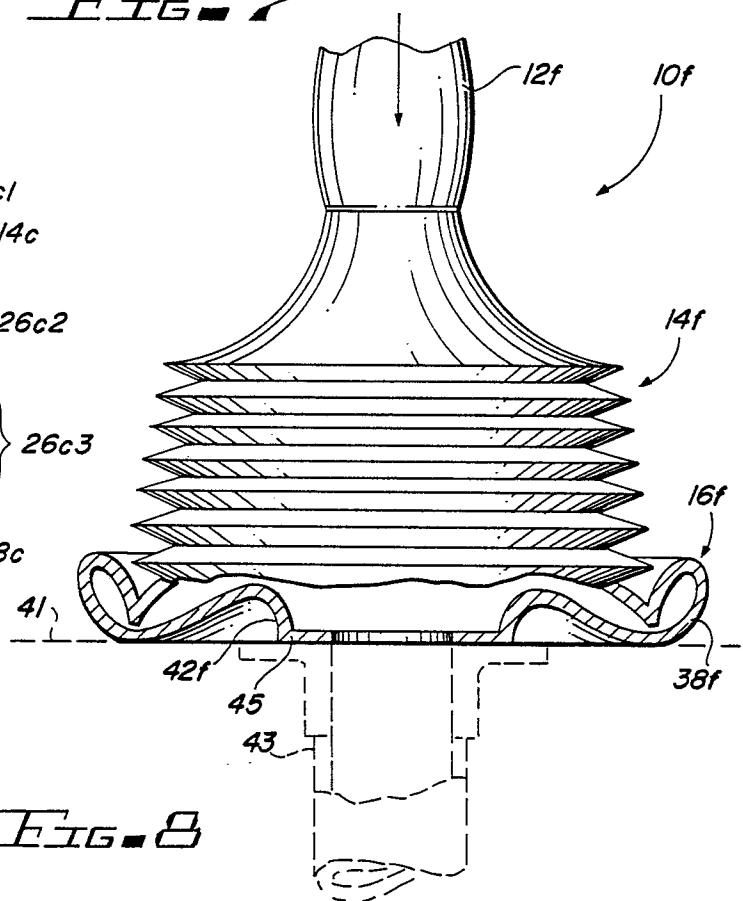


FIG. 8



EUROPEAN SEARCH REPORT

EP 86 10 1838

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 4)
Y	FR-A-1 602 039 (PARODI) * Page 7, lines 16-34; figure 8 *	1-5	E 03 C 1/308
Y	US-A-2 126 689 (POULIOT) * Figure 3 *	1-5	
Y	FR-A-2 540 943 (SCARELLA) * Pages 7-9; figures 1-3 *	2-5	
A	FR-A- 503 745 (GHIS-ALBERTI) * Whole document *	1,9	
A,D	US-A-2 844 826 (CHEITEN)  -----		TECHNICAL FIELDS SEARCHED (Int. Cl. 4)
			E 03 C F 04 B E 03 D
The present search report has been drawn up for all claims			
Place of search	Date of completion of the search	Examiner	
THE HAGUE	14-10-1986	HANNAART J.P.	
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