



(22) Date de dépôt/Filing Date: 1993/03/10

(41) Mise à la disp. pub./Open to Public Insp.: 1993/10/01

(45) Date de délivrance/Issue Date: 2004/02/17

(30) Priorité/Priority: 1992/03/31 (07/860,892) US

(51) Cl.Int.⁵/Int.Cl.⁵ A47J 43/046

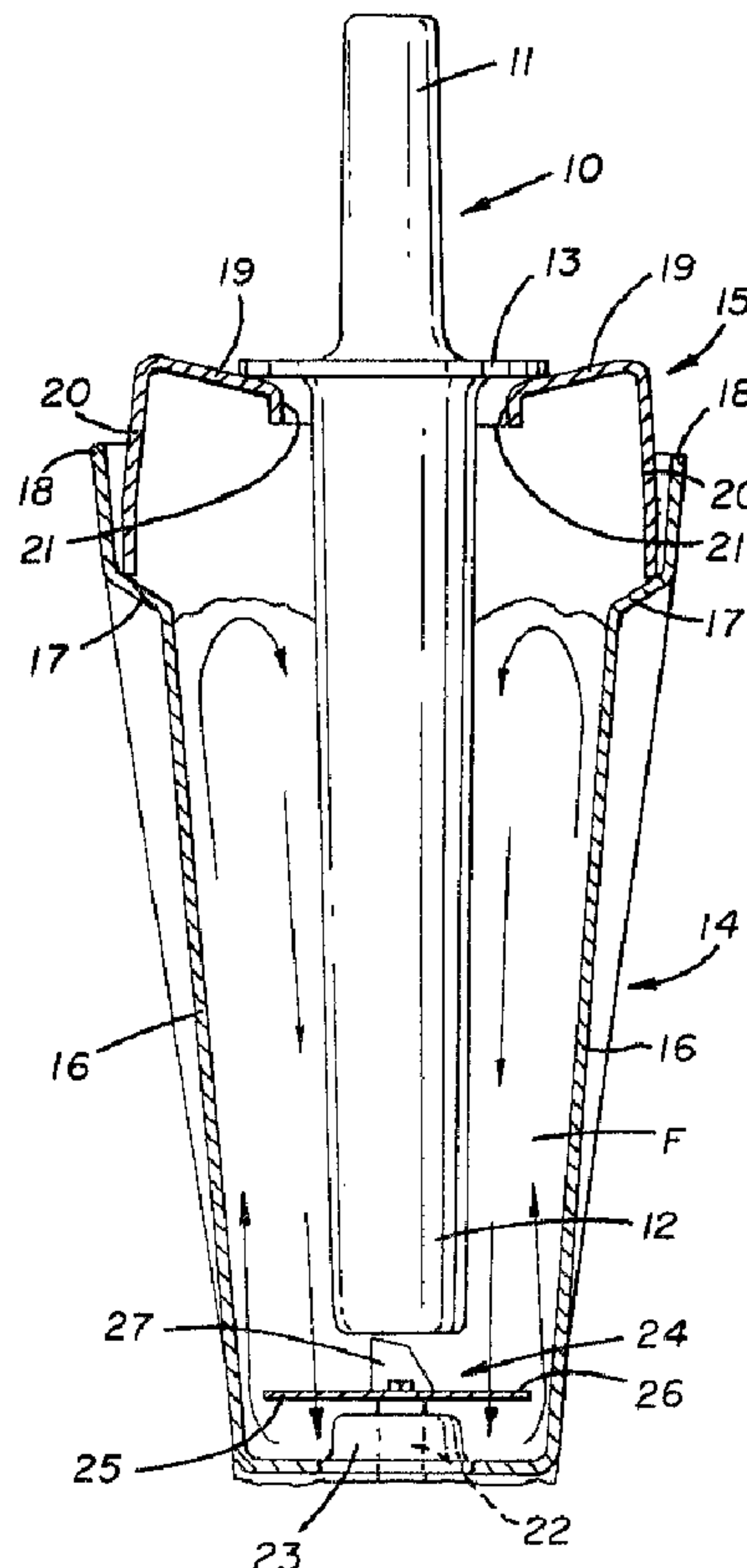
(72) Inventeurs/Inventors:
JENNETT, DAVID, US;
BOOZER, RICHARD D., US;
BARNARD, JOHN K., US;
BYRNE, JACK M., US

(73) Propriétaire/Owner:
VITA-MIX CORPORATION, US

(74) Agent: GOWLING LAFLEUR HENDERSON LLP

(54) Titre : PLONGEUR POUR PREVENIR LA FORMATION D'UN ESPACE MORT DANS UN MELANGEUR

(54) Title: PLUNGER FOR PREVENTING A DEAD AIR SPACE IN A BLENDER



(57) Abrégé/Abstract:

An accessory (10) for a blender includes a generally cylindrical handle portion (11), a generally cylindrical plunger portion (12), and an enlarged circular stop disk portion (13) between the handle portion (11) and the plunger portion (12). The plunger portion (12) is received within a pitcher portion (14) of the blender through an aperture (21) in the cover (15) of the blender. A mixing

(57) **Abrégé(suite)/Abstract(continued):**

blade assembly (24) is positioned near the bottom of the pitcher portion (14) and the length of the plunger portion (12) is such that when the stop disk portion (13) rests on the cover (15), the bottom of the plunger portion (12) is just above the mixing blade assembly (24). An air channel defining member, shown in the form of a bearing housing (23) of the mixing blade assembly (24), would normally cause an air channel to be formed in the fluid (F) in the blender ultimately forming an air pocket around the mixing blade assembly (24). However, the plunger portion (12), which is preferably of a diameter approximating that of the bearing housing (23), prevents the formation of the air channel and ultimately any air pocket.

ABSTRACT OF THE DISCLOSURE

An accessory (10) for a blender includes a generally cylindrical handle portion (11), a generally cylindrical plunger portion (12), and an enlarged circular stop disk portion (13) between the handle portion (11) and the plunger portion (12). The plunger portion (12) is received within a pitcher portion (14) of the blender through an aperture (21) in the cover (15) of the blender. A mixing blade assembly (24) is positioned near the bottom of the pitcher portion (14) and the length of the plunger portion (12) is such that when the stop disk portion (13) rests on the cover (15), the bottom of the plunger portion (12) is just above the mixing blade assembly (24). An air channel defining member, shown in the form of a bearing housing (23) of the mixing blade assembly (24), would normally cause an air channel to be formed in the fluid (F) in the blender ultimately forming an air pocket around the mixing blade assembly (24). However, the plunger portion (12), which is preferably of a diameter approximating that of the bearing housing (23), prevents the formation of the air channel and ultimately any air pocket.

PLUNGER FOR PREVENTING A DEAD AIR
SPACE IN A BLENDER

TECHNICAL FIELD

5 The present invention relates to an accessory for
use with a blender. More particularly, the present
invention relates to a device which can be inserted into a
high speed liquid food blender which prohibits the
formation of a dead space or air pocket often formed in
10 such blenders around the mixing blades, which dead space
prohibits proper mixing.

BACKGROUND ART

15 High speed liquid food blenders most often
utilize propeller-like blades to pulverize and otherwise
mix the food being processed. In normal operation the food
is circulated down to and past the blades for processing,
and as long as the circulation pattern is consistent and
uniform, efficient pulverization and mixing takes place.

20 However, particularly when mixing thicker, more
viscous liquids, a channel of air is often formed extending
from above the blades to the top of the blender, much as in
a whirlpool effect. As the channel of air is drawn to the
blades, an air bubble or dead air space is eventually
25 formed around the blades which prohibits the food being
processed from contacting the blades and thereby rendering
the blades ineffective to mix the food. Presently, this
can only be corrected by manually stirring the food to
disperse the air pocket away from the blades. However, the
30 air pocket will usually readily reappear thus making the
blending process not only inefficient but also bothersome
to the user.

DISCLOSURE OF THE INVENTION

35 It is thus a primary object of the present
invention to provide a plunger accessory for a blender
which prevents the formation of a dead air space around the

mixing blades of the blender.

It is another object of the present invention to provide a plunger accessory, as above, which cannot interfere with the blades of the blender while eliminating
5 the dead air space.

It is a further object of the present invention to provide a plunger accessory, as above, which can be utilized to prevent the dead air space without the constant attention of the user.

10 It is an additional object of the present invention to provide a plunger accessory, as above, which can also be used to stir the food material being processed.

These and other objects of the present invention, as well as the advantages thereof over existing prior art
15 forms, which will become apparent from the description to follow, are accomplished by the improvements hereinafter described and claimed.

In general, the blender accessory according to the present invention includes a plunger portion having a
20 stop member positioned near the top thereof. The plunger is received through an opening in the cover of a blender and into the blender pitcher therebelow. The stop member rests on the cover and the plunger is of a predetermined length so that the bottom thereof is just above a mixing
25 blade assembly positioned near the bottom of the pitcher. The blade assembly has an air channel defining member, such as a bearing housing, and the size of the plunger approximates that of the bearing housing to close off the air channel and thereby prevent the formation of an air
30 pocket which would otherwise be formed as the blade assembly mixes the fluid food in the pitcher.

A preferred exemplary plunger accessory for a blender incorporating the concepts of the present invention is shown by way of example in the accompanying drawings
35 without attempting to show all the various forms and modifications in which the invention might be embodied, the invention being measured by the appended claims and not by

the details of the specification.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective view of a plunger
5 accessory for a blender constructed in accordance with the
concepts of the present invention.

Fig. 2 is a sectional view of a portion of a
blender showing the plunger accessory in use therein.

10 PREFERRED EMBODIMENT FOR CARRYING OUT THE INVENTION

A plunger accessory for a blender is indicated
generally by the numeral 10 and is shown as including a
generally cylindrical handle portion 11, and a generally
cylindrical plunger portion 12 separated by an enlarged
15 generally circular shoulder or stop member 13. As will
hereinafter become evident, plunger portion 12 need not be
cylindrical but rather could take on any suitable geometric
shape. Moreover, while stop member 13 is shown as being a
generally circular disk, it could be of any other
20 configuration which performs the stop function, to be
hereinafter described, the disk shape being preferred
because that shape enables stop member 13 to perform the
additional function of closing the top of the blender.

Plunger 10 can be formed of any suitable rigid
25 material, such as plastic, and handle 11 and plunger
portion 12 may be tapered, as shown, to facilitate the
molding process. Handle 11 may be of any desired length
convenient for facile gripping by the user; however, as
will be hereinafter described, the length of plunger
30 portion 12 should be such that when positioned in a
blender, such as shown in Fig. 2, the bottom thereof will
not interfere with the blender blades.

With reference to Fig. 2, some of the components
of a typical blender are shown therein which include a
35 pitcher portion generally indicated by the numeral 14 which
holds the fluid F to be mixed, and a cover portion
generally indicated by the numeral 15. Pitcher 14 can be

of any conventional configuration and is shown as having tapered cylindrical side walls 16 and an upper shoulder 17 extending outwardly to form an enlarged upper lip 18.

Similarly, cover 15 can be of any conventional

5 configuration and is shown as including a top portion 19 having a skirt 20 extending downwardly therefrom. The bottom of skirt 20 rests on the upper shoulder 17 of pitcher 14 to close the top of pitcher 14. Top portion 19 of cover 15 is provided with a central aperture 21 which,
10 if desired, may be closed by a dome plug (not shown) for certain applications of the blender.

A motor driven shaft 22 extends upwardly through a bearing housing 23 into the bottom of pitcher 14 and carries a mixing blade assembly generally indicated by the
15 numeral 24. Blade assembly 24 can be of any conventional configuration with the blade assembly 24 shown including four circumferentially spaced propeller-like blades, only two being shown as numerals 25 and 26. At least some of the blades may be provided with upturned blade members,
20 such as member 27 shown in Fig. 2.

In operation, with pitcher 14 filled with fluid material F to be processed and with cover 15 in place, the motor (not shown) is actuated to rotate mixing blades 24. As such, the fluid is drawn between the propeller-like
25 blades and circulates back up to the upper surface. In the absence of the plunger accessory 10, and in particular when processing viscous fluids, such action may tend to form an air channel extending from the blades to the top of the fluid much like a whirlpool. Eventually, an air pocket
30 will form around the blades which renders the blades ineffective for a total blending of the fluid. The air channel which forms above the blades is usually of a size dictated by the air channel forming member of the blade assembly. For the particular blade assembly shown, bearing
35 housing 23 dictates the size of the air channel which is thus of a diameter of approximately the size of bearing housing 23. For other types of mixing blades, such as ones

having a central hub from which the blades extend, the size of the air channel is dictated by that hub and is thus usually of a diameter of the central hub.

Plunger accessory 10 prevents the deleterious formation of such an air channel and thereby prohibits the ultimate formation of an air pocket around the blades. As shown in Fig. 2, plunger portion 12 of accessory 10 is inserted through cover aperture 21 with stop disk 13 resting on cover top portion 19. This not only closes cover 15 but also limits the downward extent of plunger portion 12. As such, plunger portion 12 is designed to be of a length so as to be positioned just above the mixing blade assembly 24 when positioned in the blender. Thus, the length of plunger portion 12 is dictated by the size of the blender being employed.

The diameter of at least the bottom of plunger portion 12 is also important to carrying out the advantages of the present invention. Basically, it is preferably of a size approximately equal to the air channel defining parameter of the blender. Thus, for the blender shown in Fig. 2, it is designed to be of a size approximately equal to the size of bearing housing 23. In actual practice, it has been found that if the size of the bottom of plunger portion 12 is $\pm 25\%$ of the size of the air channel defining member, neither the channel nor the eventual air pocket will be able to be formed. Thus, as shown in Fig. 2, when the blender is operating the fluid is properly circulated along the side of plunger 12, through the blades, around the outer tips of the blades, and back to the top as shown by the arrows. Thus, the potential for forming the deleterious air pocket around and above the mixing blade is eliminated.

Plunger accessory 10 can also be utilized by the user as a stirring mechanism. If additional stirring is desired, one need only grasp handle portion 11 and oscillate plunger accessory 10 to move plunger portion 12 from side to side within pitcher 14 to create the

additional stirring desired.

It should thus be appreciated that a plunger
accessory constructed and utilized as described herein
accomplishes the objects of the present invention and
5 otherwise substantially improves the fluid food blending
and processing art.

-7-

CLAIMS:

1. An accessory for preventing the formation of an air pocket in a fluid processing blender; the blender being of the type having a fluid containing pitcher portion, a cover resting on top of the pitcher portion and having an opening therein, and a blade assembly including an air channel defining member positioned near the bottom of the pitcher portion; the accessory comprising a plunger portion received in the pitcher portion through the opening in the cover; and a stop member positioned at the top of said plunger portion and adapted to rest on the cover; said plunger portion tapering from a larger diameter adjacent to said stop member to a smaller diameter adjacent to the blade assembly and being of a length such that the bottom thereof is positioned just above the blade assembly and is of a diameter approximating the diameter of the air channel defining member to prevent the formation of an air pocket around the blade assembly.

2. An accessory according to claim 1 further comprising a handle portion on the side of said stop member opposite to said plunger portion.

3. An accessory according to claim 2 wherein said handle portion is generally cylindrical and is of a smaller diameter than said plunger portion.

4. An accessory according to claim 1 wherein said stop member is generally disk shaped and is larger in diameter than said plunger portion.

5. An accessory according to claim 1 wherein the diameter of the bottom of said plunger portion is plus or minus twenty-five percent of the diameter of the air channel defining member.

6. An accessory according to claim 1 wherein the air channel defining member is a bearing housing for the blade assembly.

7. An accessory for preventing the formation of an air pocket in a fluid processing blender; the blender being of the type having a fluid containing pitcher portion, the pitcher portion including a shoulder, a cover having a top portion and a

-8-

downwardly directed skirt resting on the shoulder, the cover having an opening therein, and a blade assembly including an air channel defining member positioned near the bottom of the pitcher portion; the accessory comprising a plunger portion received in the pitcher portion through the opening in the cover; and a stop member positioned at the top of said plunger portion and resting on the top portion of the cover; said plunger portion being of a length such that the bottom thereof is positioned just above the blade assembly and is of a diameter approximating the diameter of the air channel defining member to prevent the formation of an air pocket around the blade assembly.

8. An air pocket eliminating accessory for a blender having a blade assembly with an air channel defining member, the accessory comprising a handle portion, a plunger portion being generally cylindrical and tapering from a larger diameter adjacent to said stop member to a smaller diameter approximating the diameter of the air channel defining member, and a stop member between said handle portion and said plunger portion, said plunger portion being received within the blender a distance as predetermined by the position of said stop member.

9. An air pocket eliminating accessory according to claim 8 wherein the diameter of said plunger portion is plus or minus twenty-five percent of the diameter of the air channel defining member.

10. An air pocket eliminating accessory according to claim 8 wherein said stop member is located so as to position the bottom of said plunger portion adjacent to the blade assembly.

11. An air pocket eliminating accessory according to claim 8 wherein the blender includes a fluid containing pitcher and a cover for closing the top of the pitcher, the cover having an opening therein through which said plunger portion may be inserted, and said stop member being a generally circular disk of a larger diameter than said plunger portion so that when said plunger portion is within the pitcher, said stop member rests on the cover.

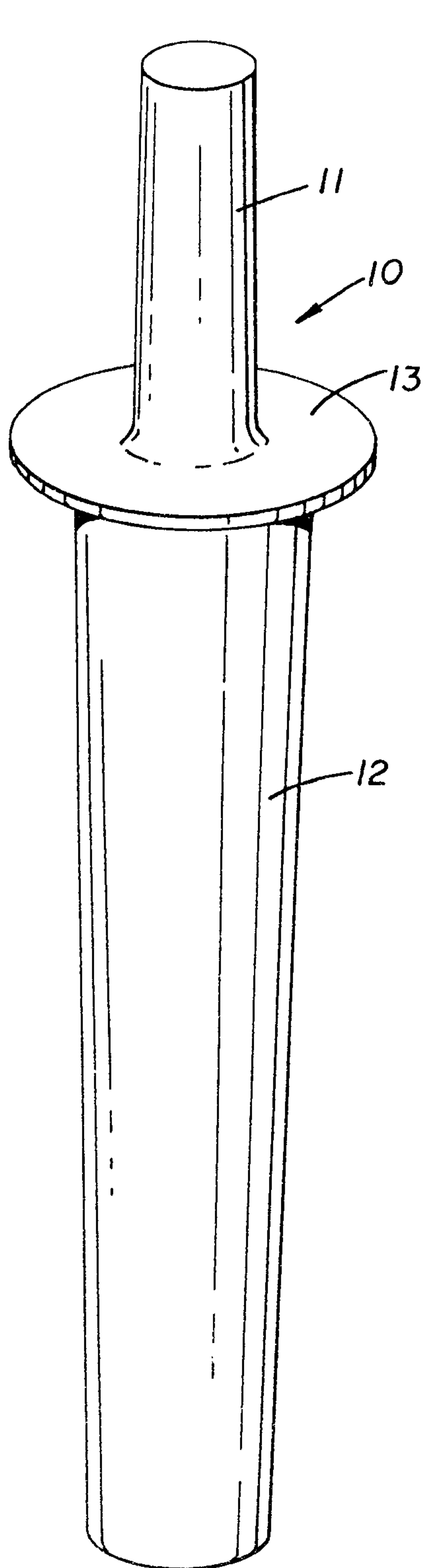


FIG. 1

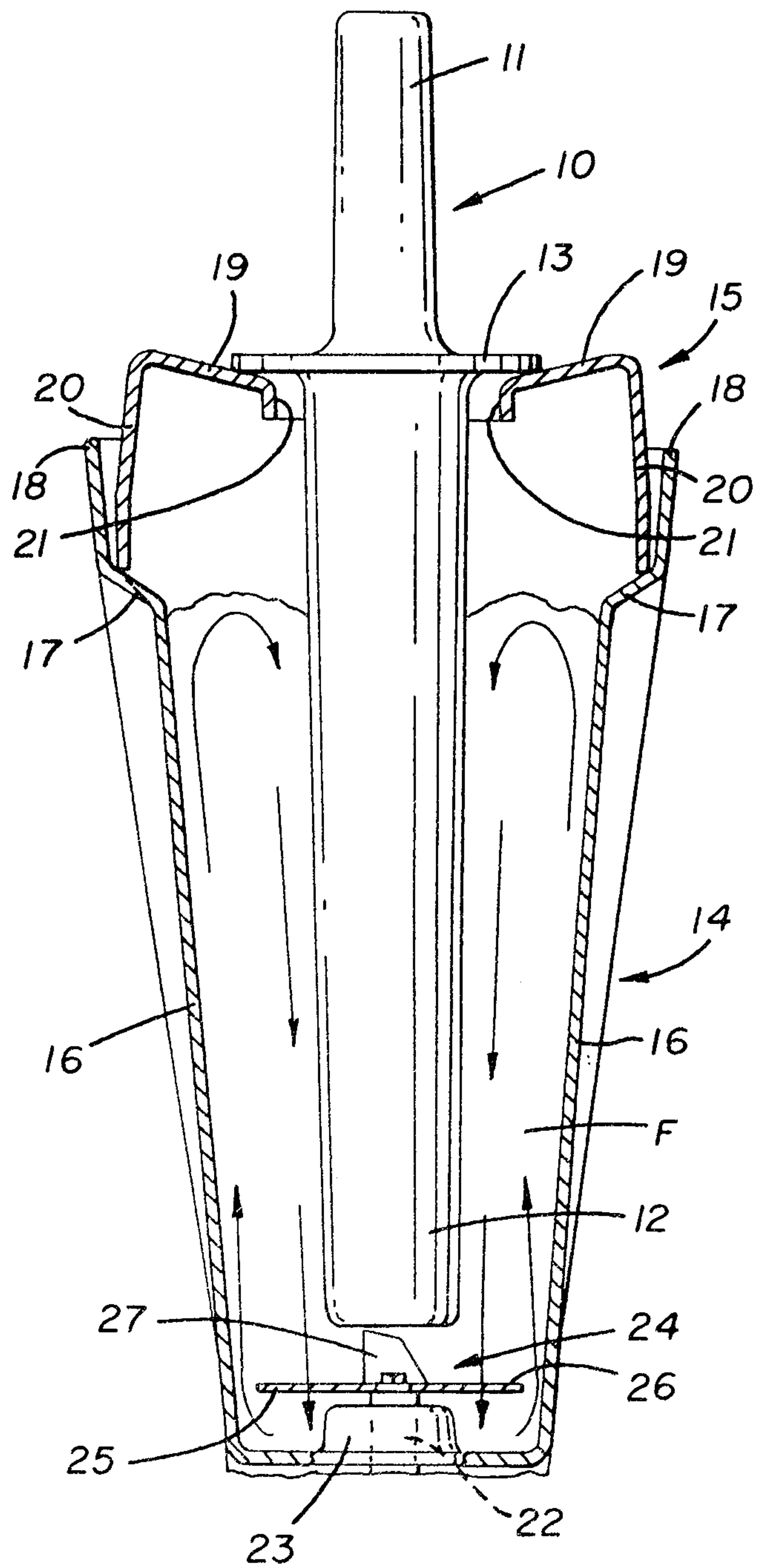


FIG. 2

Garrett Standard

