US 20050167443A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2005/0167443 A1

Sanfilippo et al. (43) Pub. Date: Aug. 4, 2005

(54) HANDHELD CONDIMENT DISPENSER

(76) Inventors: **James J. Sanfilippo**, Barrington Hills, IL (US); **John E. Sanfilippo**, Barrington Hills, IL (US); **Javier Soria**, Northlake, IL (US); **Koon Wong**, Wheeling, IL (US)

Correspondence Address:
CARDINAL LAW GROUP
Suite 2000
1603 Orrington Avenue
Evanston, IL 60201 (US)

(21) Appl. No.: **11/031,243**

(22) Filed: **Jan. 6, 2005**

Related U.S. Application Data

(60) Provisional application No. 60/534,581, filed on Jan. 6, 2004. Provisional application No. 60/534,644, filed on Jan. 7, 2004. Provisional application No. 60/545,122, filed on Feb. 17, 2004.

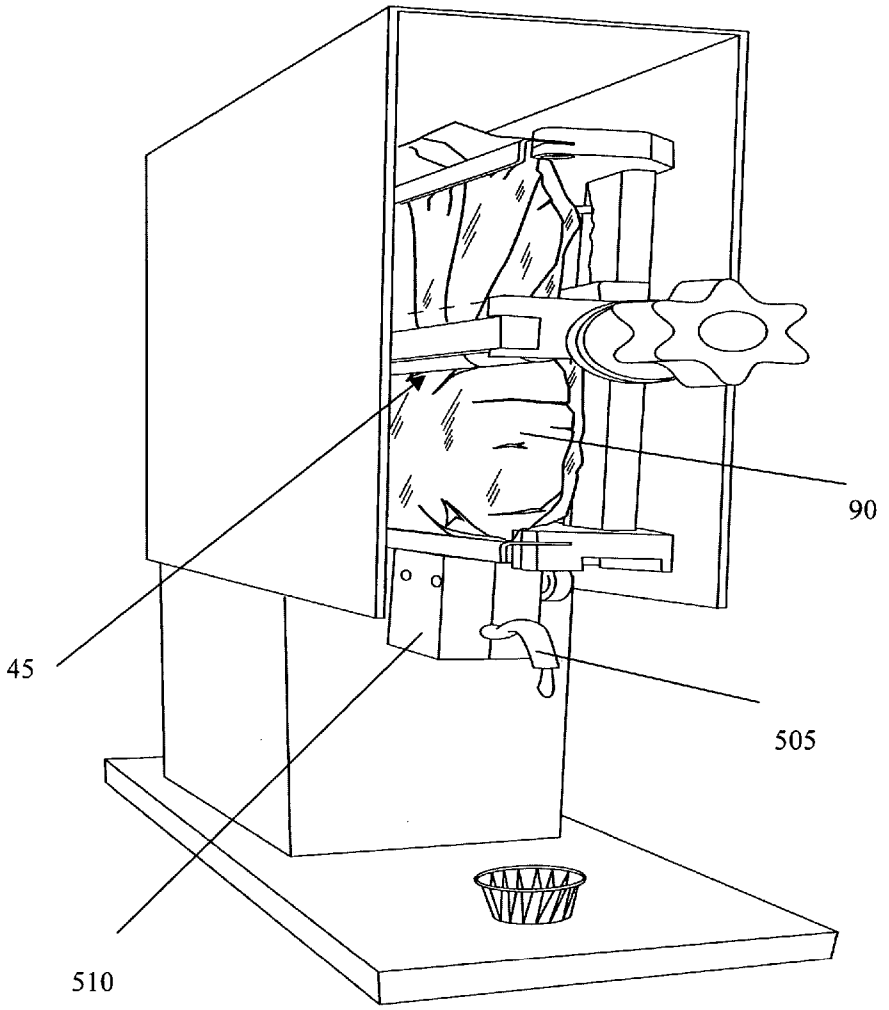
Publication Classification

(51) **Int. Cl.**[7] **B65D 35/28**

(52) **U.S. Cl.** **222/105**

(57) **ABSTRACT**

A dispenser includes a container including a containment portion and a handle portion; and a pump assembly received in the containment portion. The assembly includes a rod including a first knife blade receptacle, a cylinder including a second knife blade, a piston movable within the cylinder having a first knife blade and a valve having second knife blade receptacle. When the valve is open, the first knife blade engages with the first knife blade receptacle, and when the valve is closed the second knife blade engages with the second knife blade receptacle.



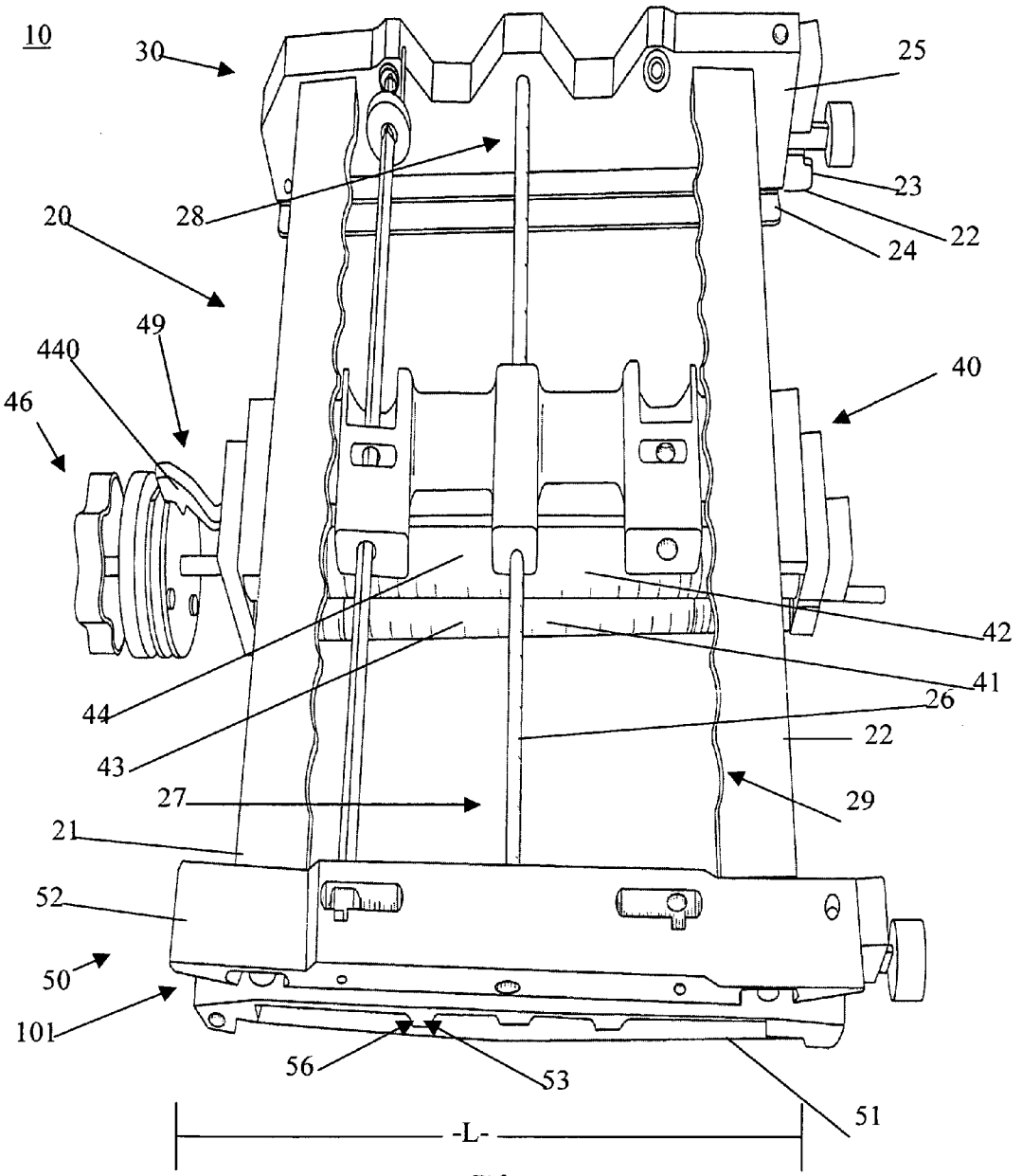

10
30
25
28
23
20
22
24
49
440
40
46
42
41
44
26
22
43
27
29
21
52
50
101
56
53
51
-L-

FIG. 1

FIG. 1A

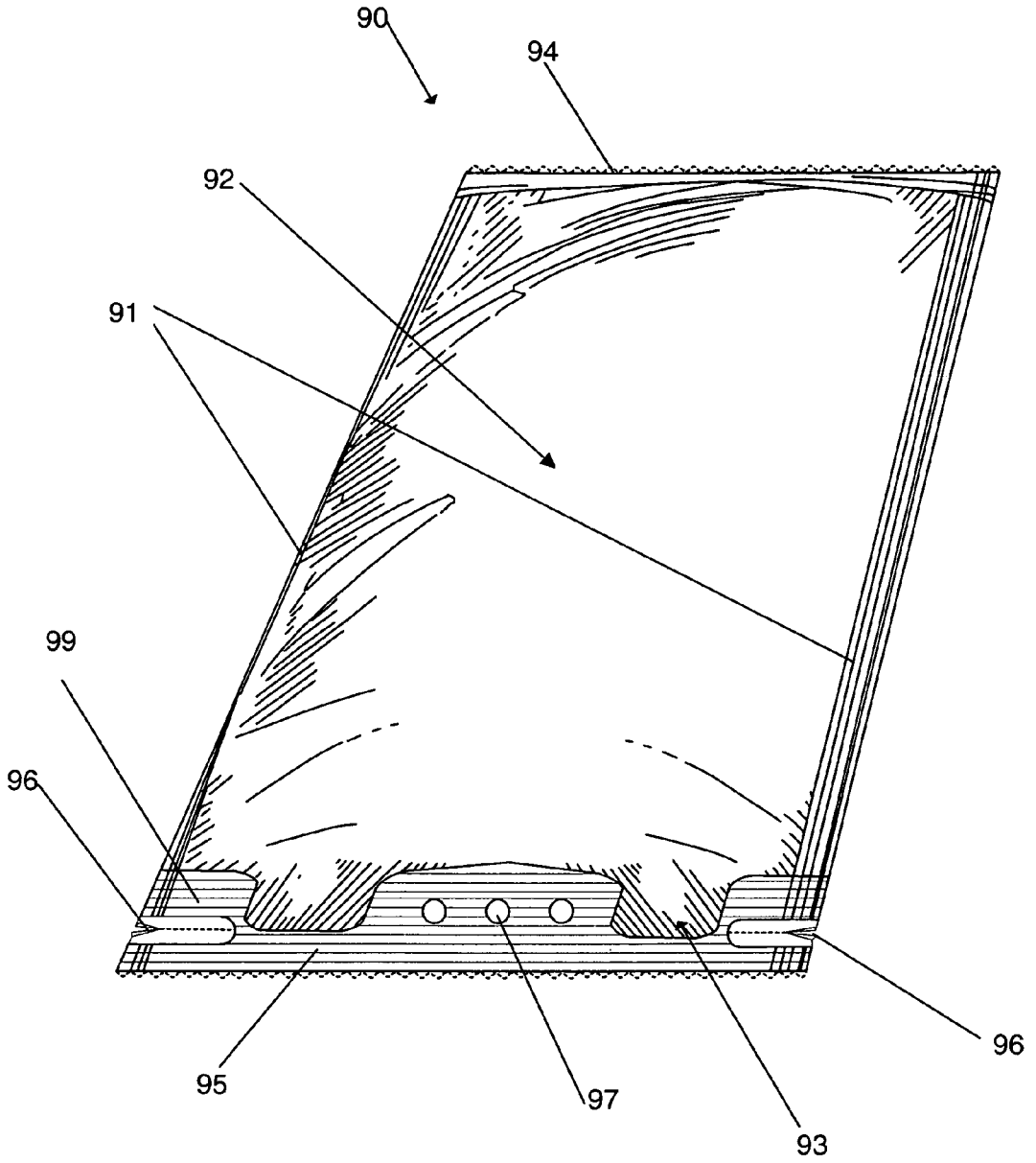
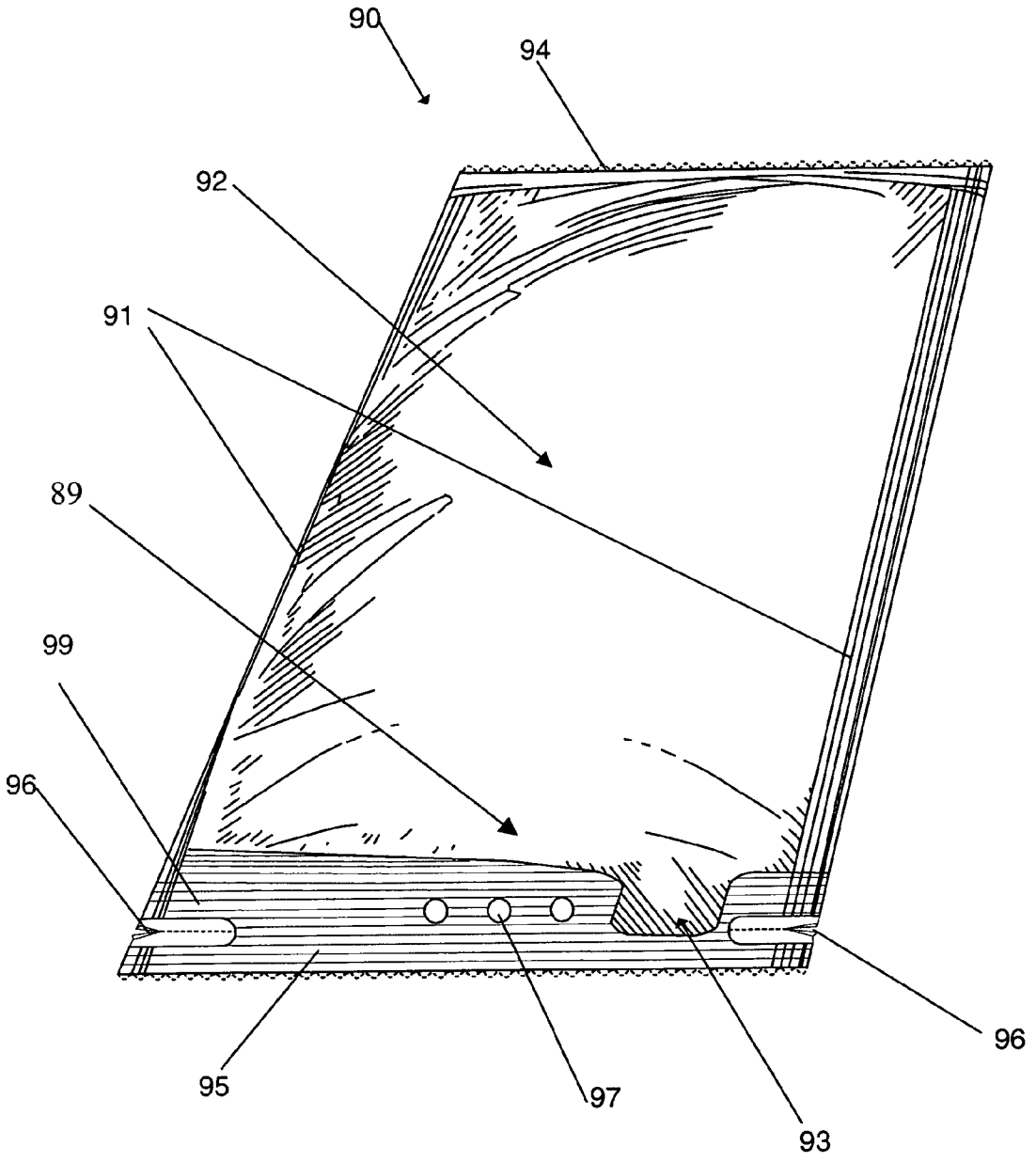


FIG. 1B



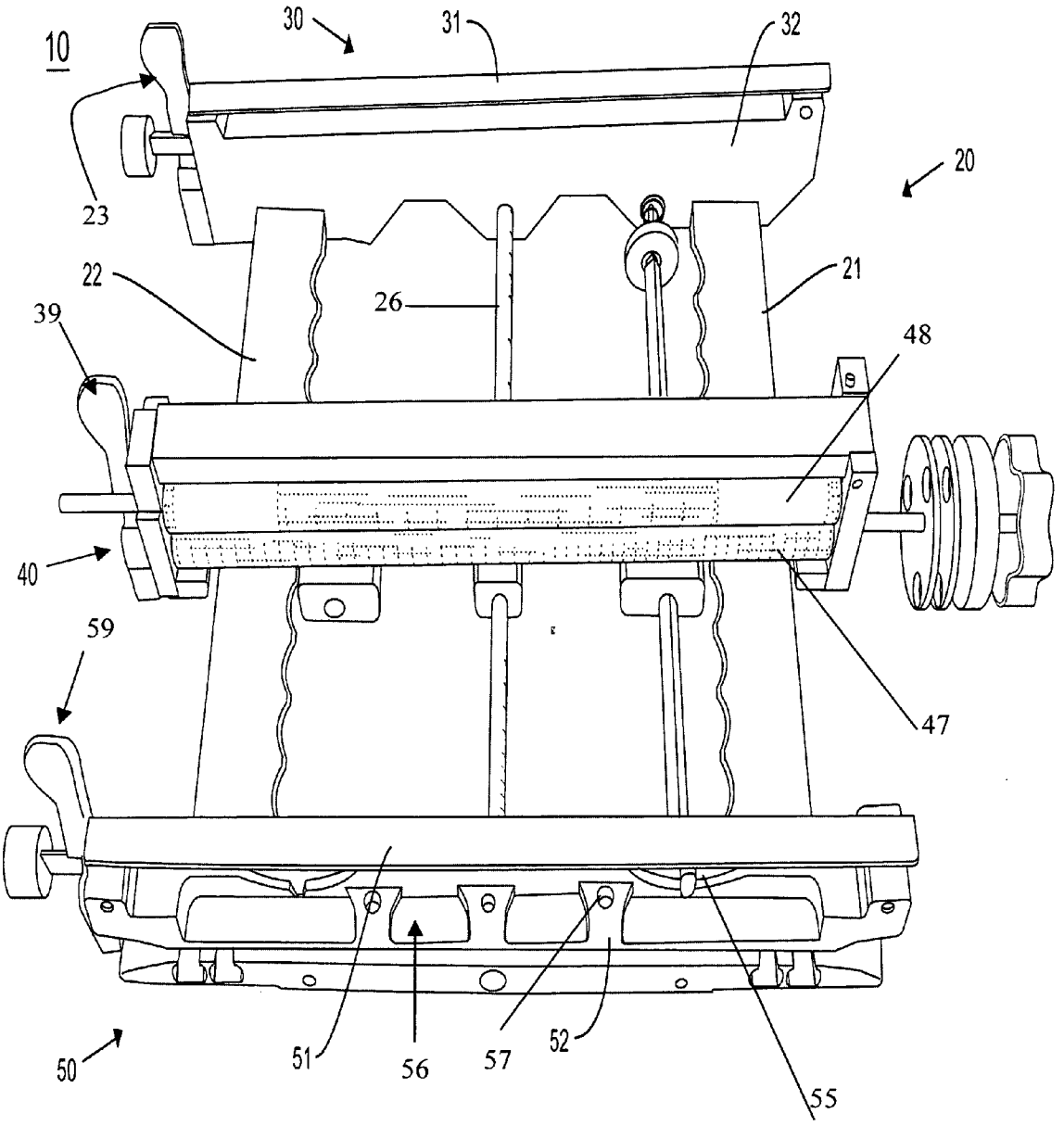


FIG. 2A

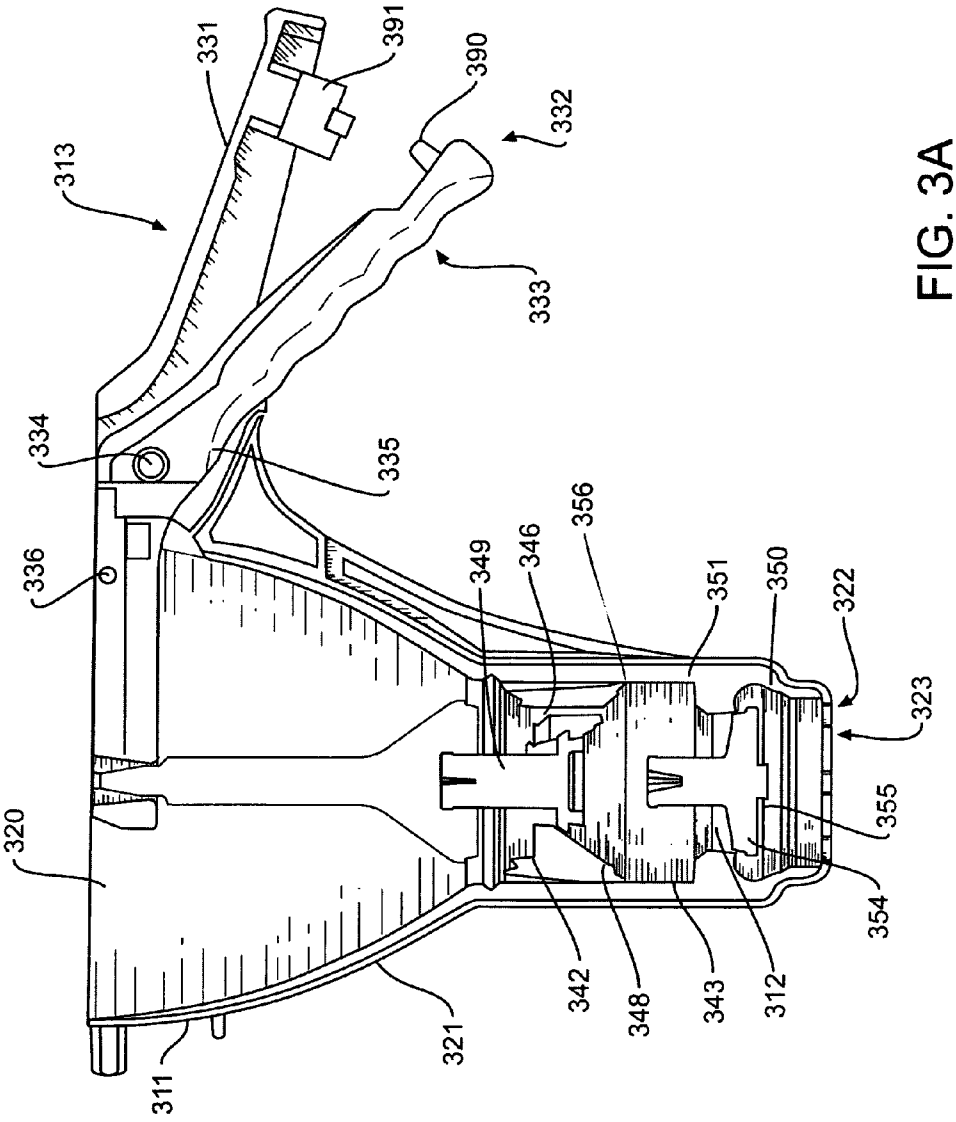


FIG. 3A

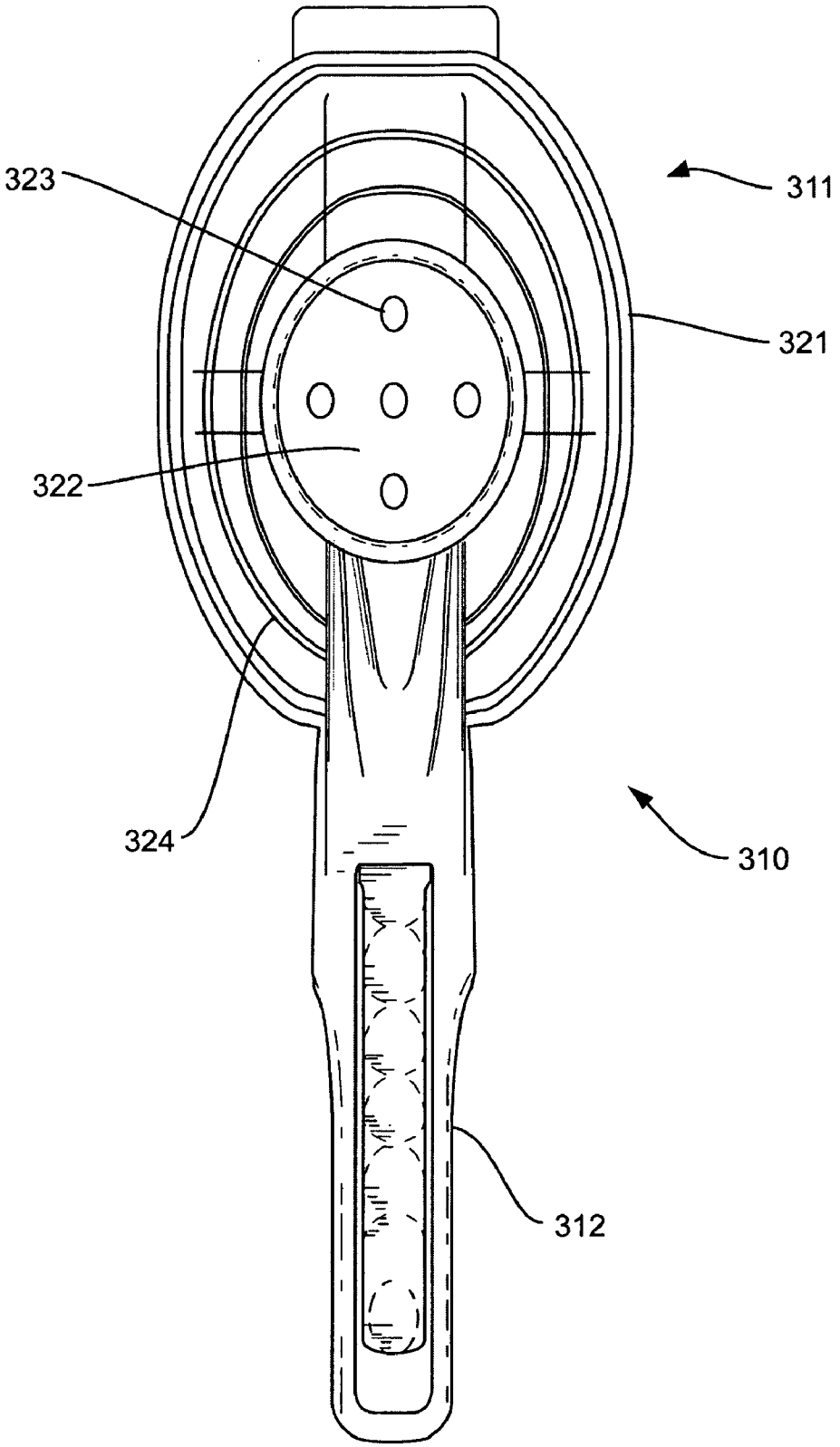


FIG. 3B

FIG. 4

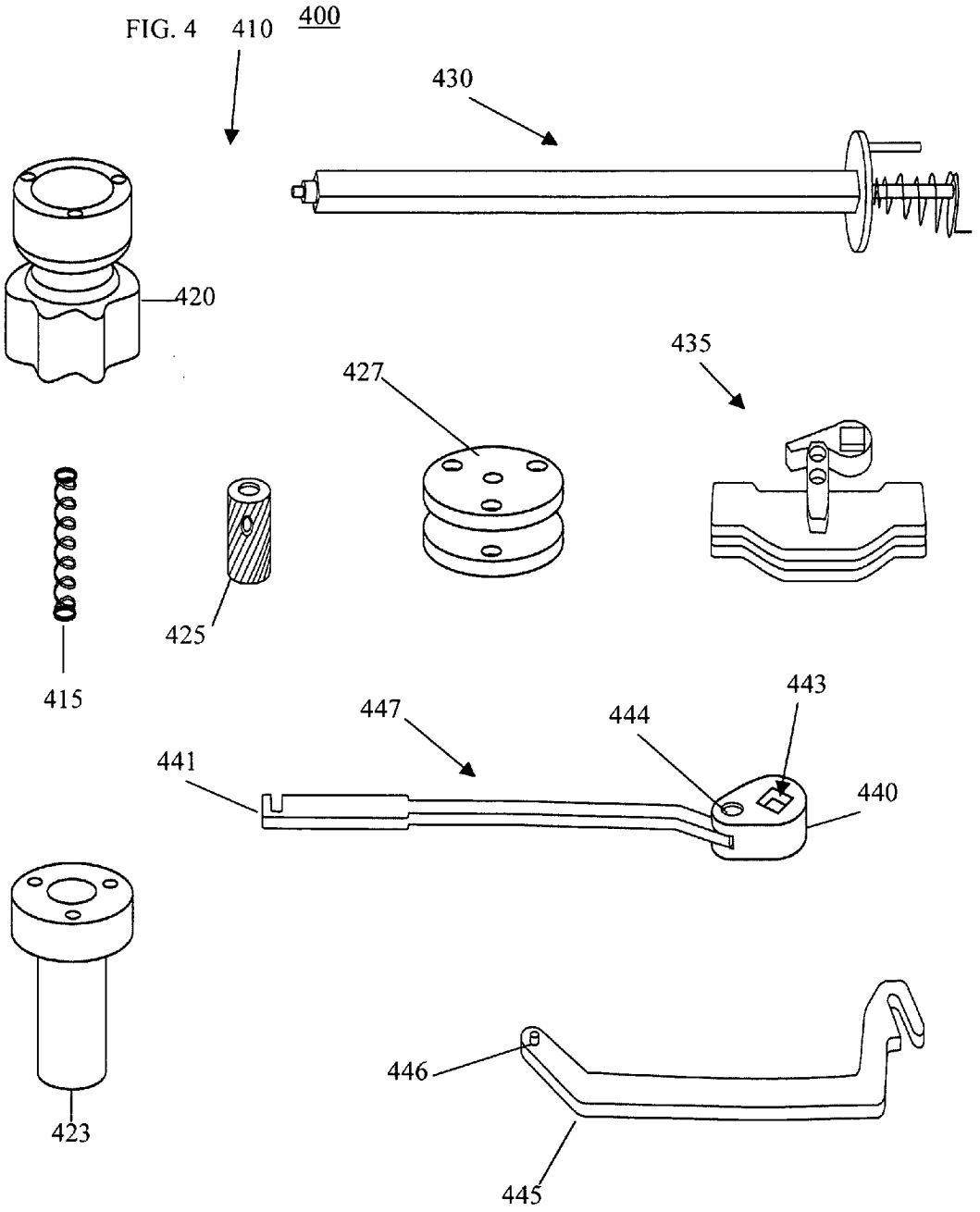
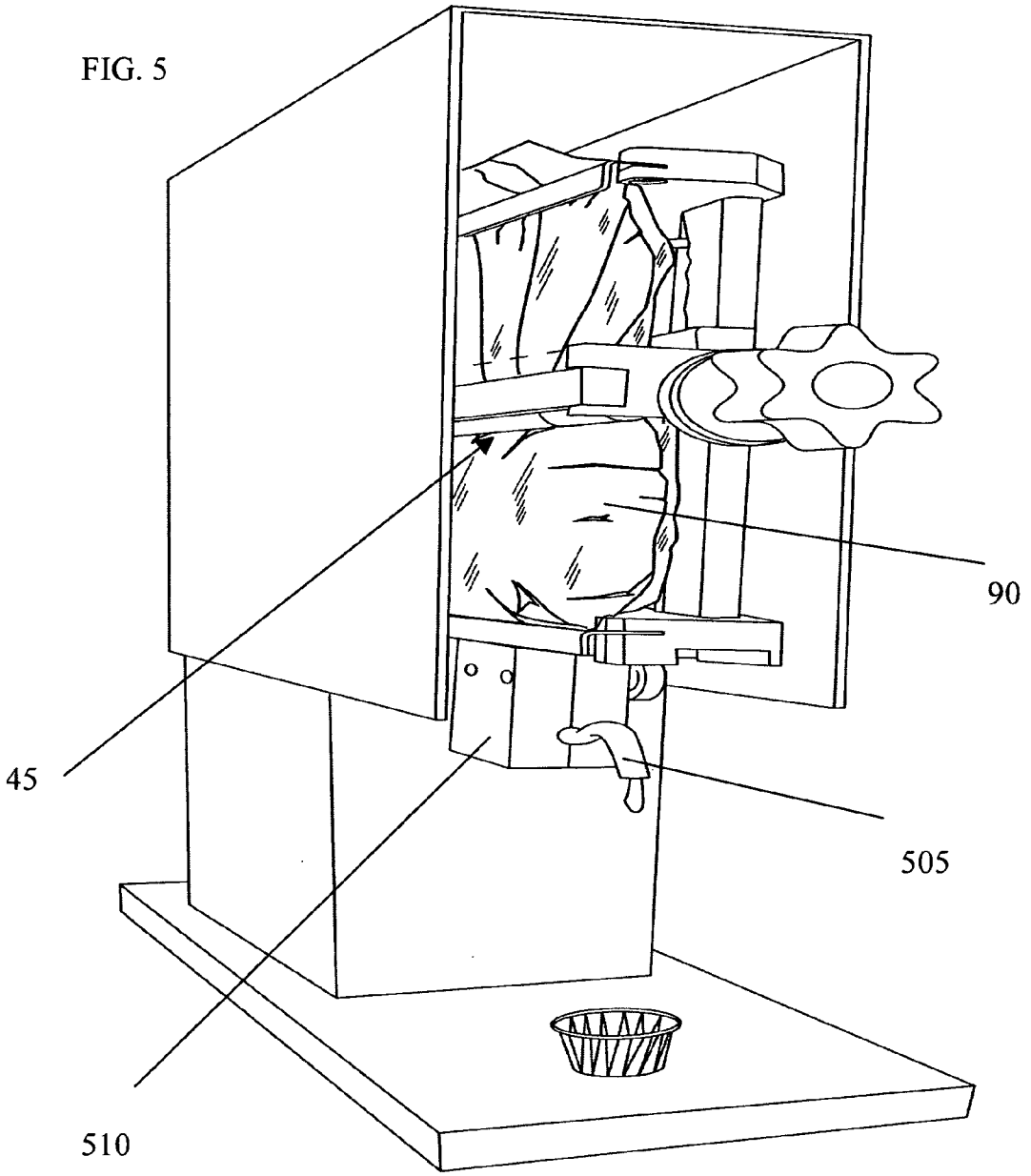


FIG. 5



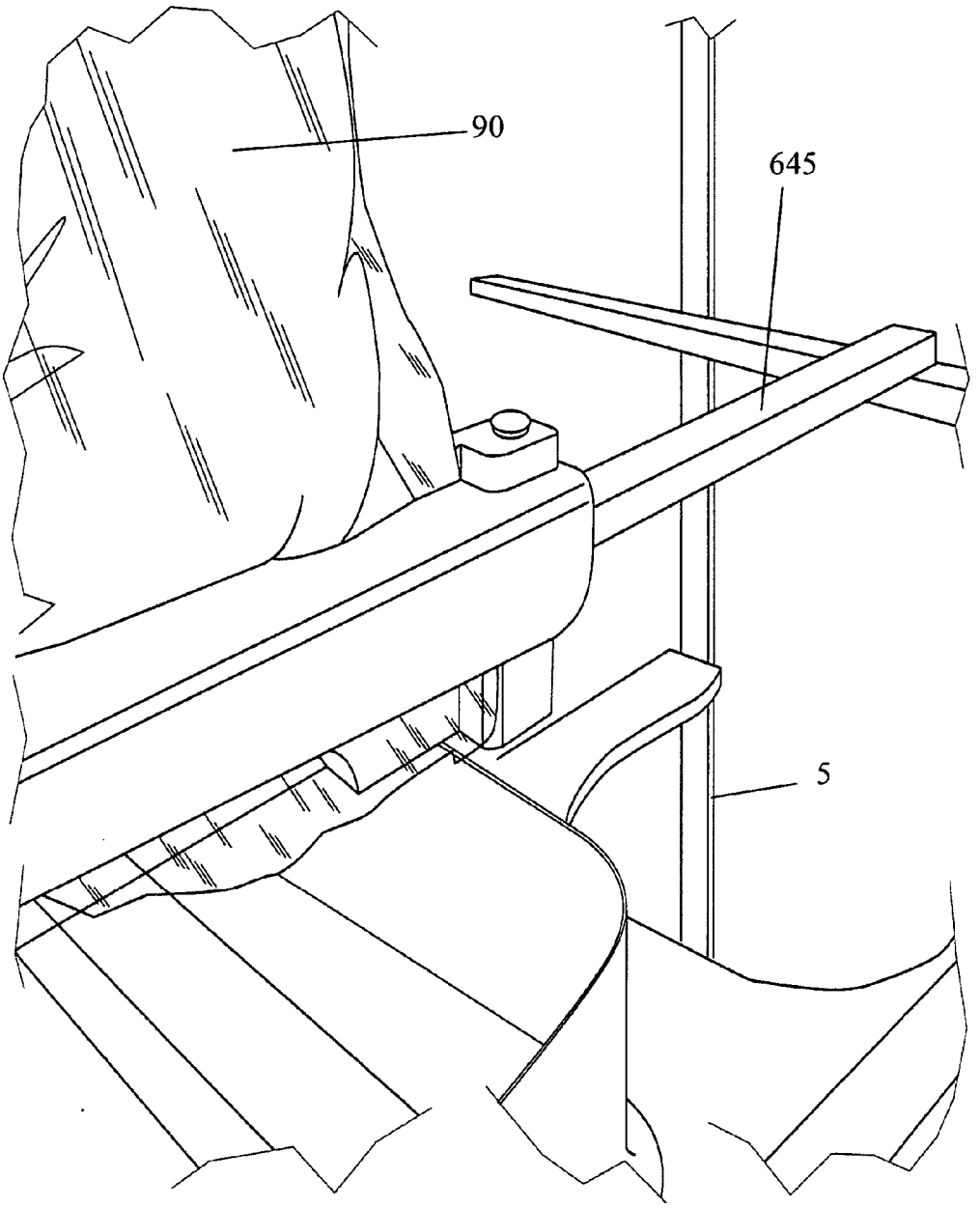


FIG. 6

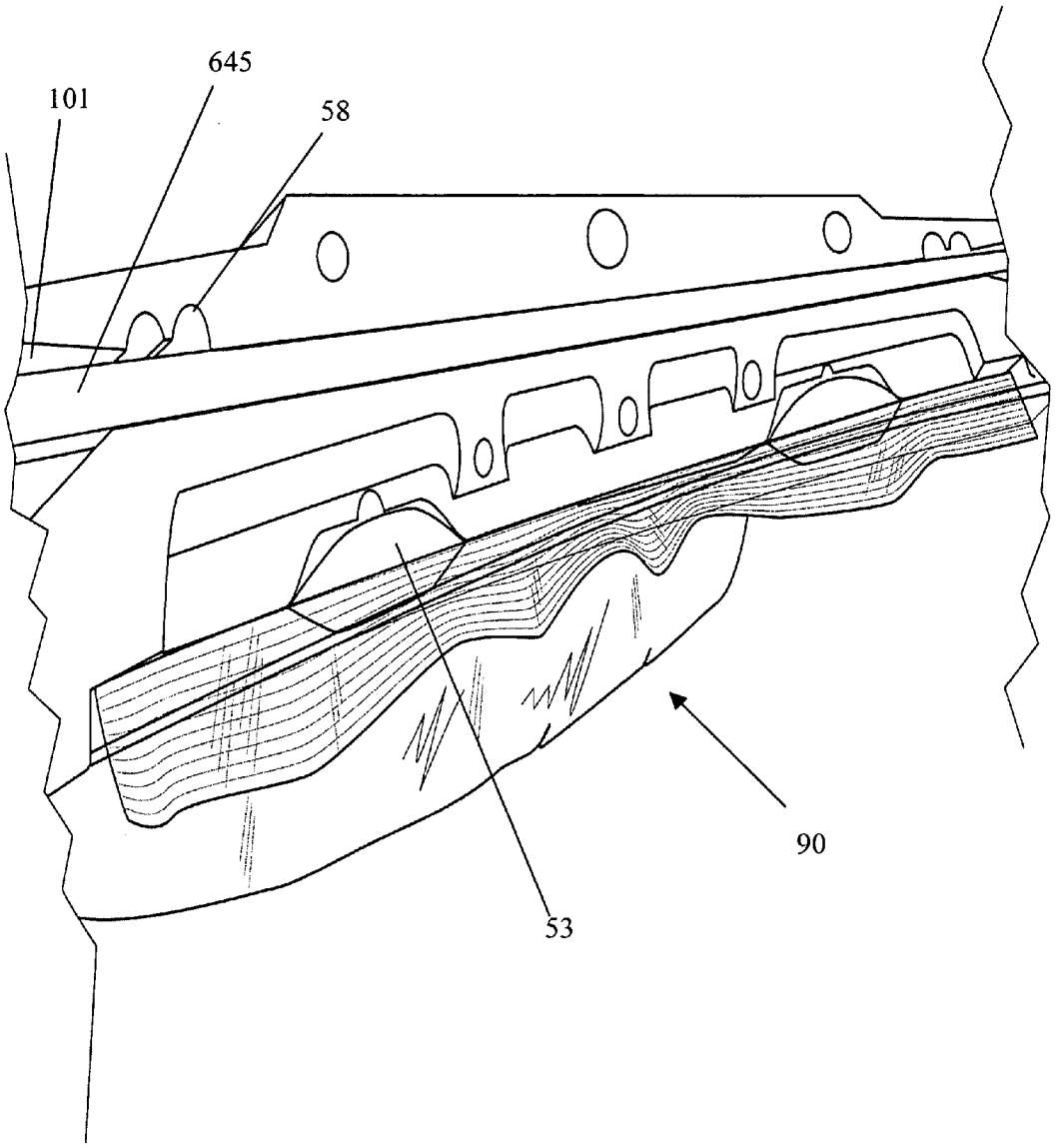


FIG. 7

REPLACEMENT SHEET

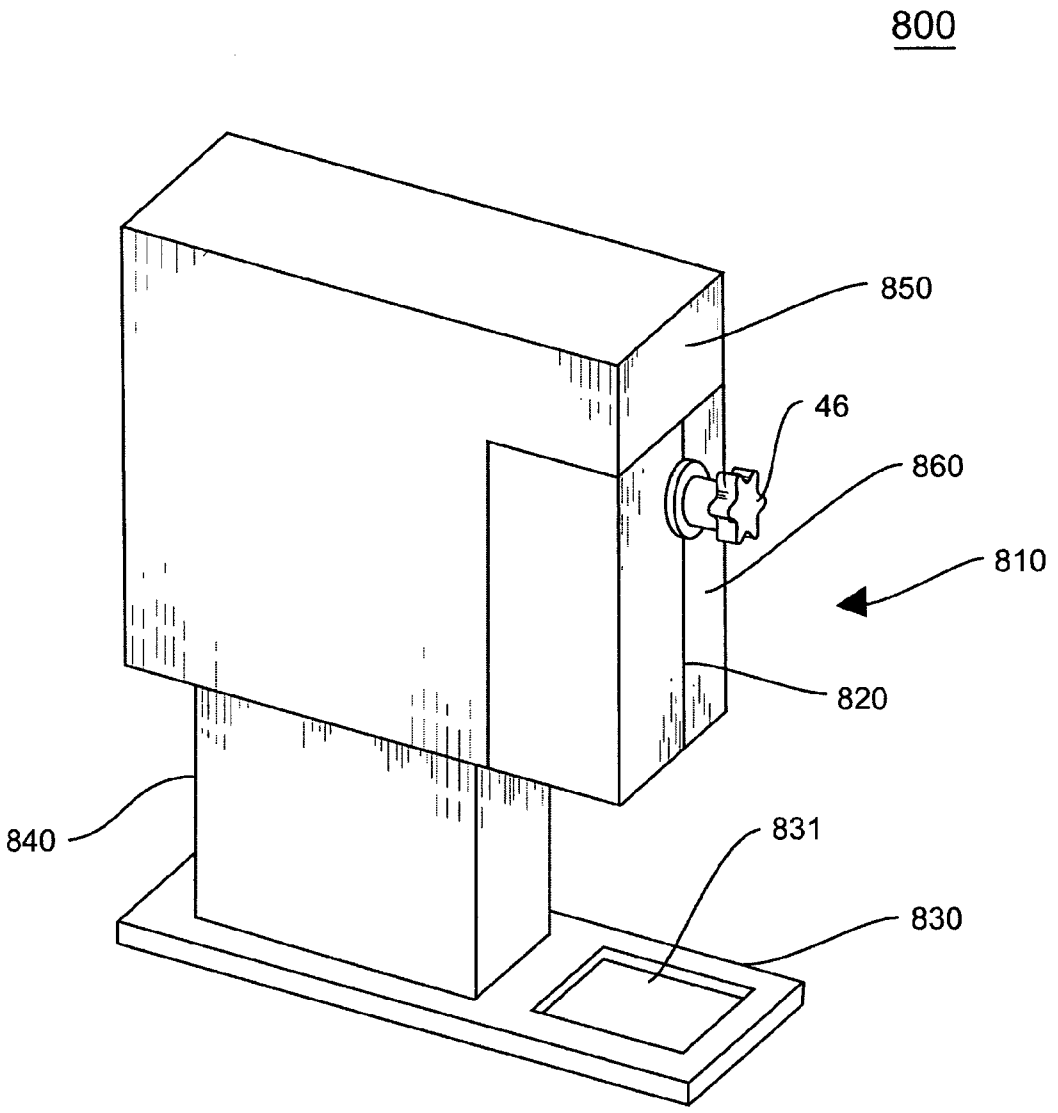


FIG. 8

REPLACEMENT SHEET

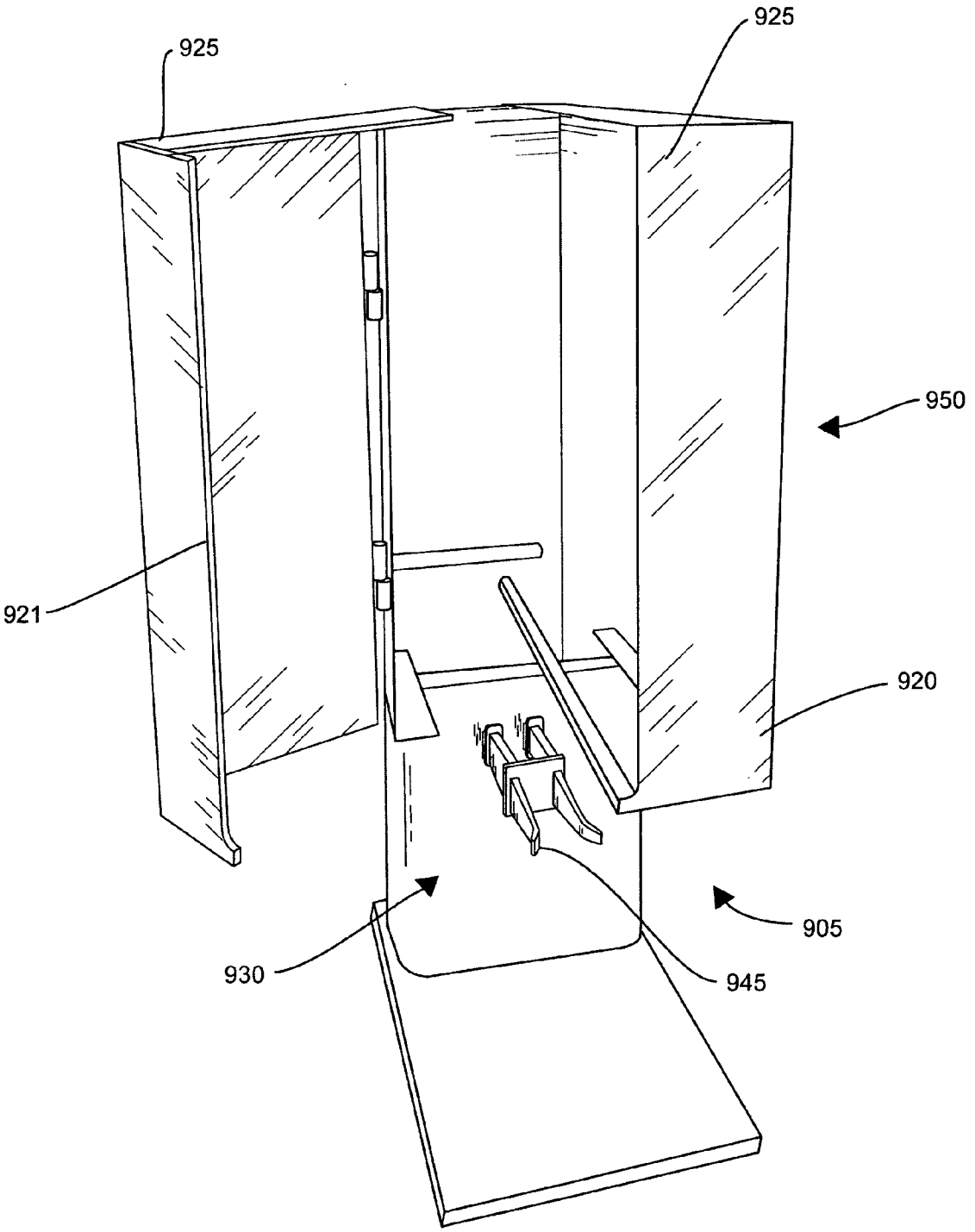


FIG. 9

REPLACEMENT SHEET

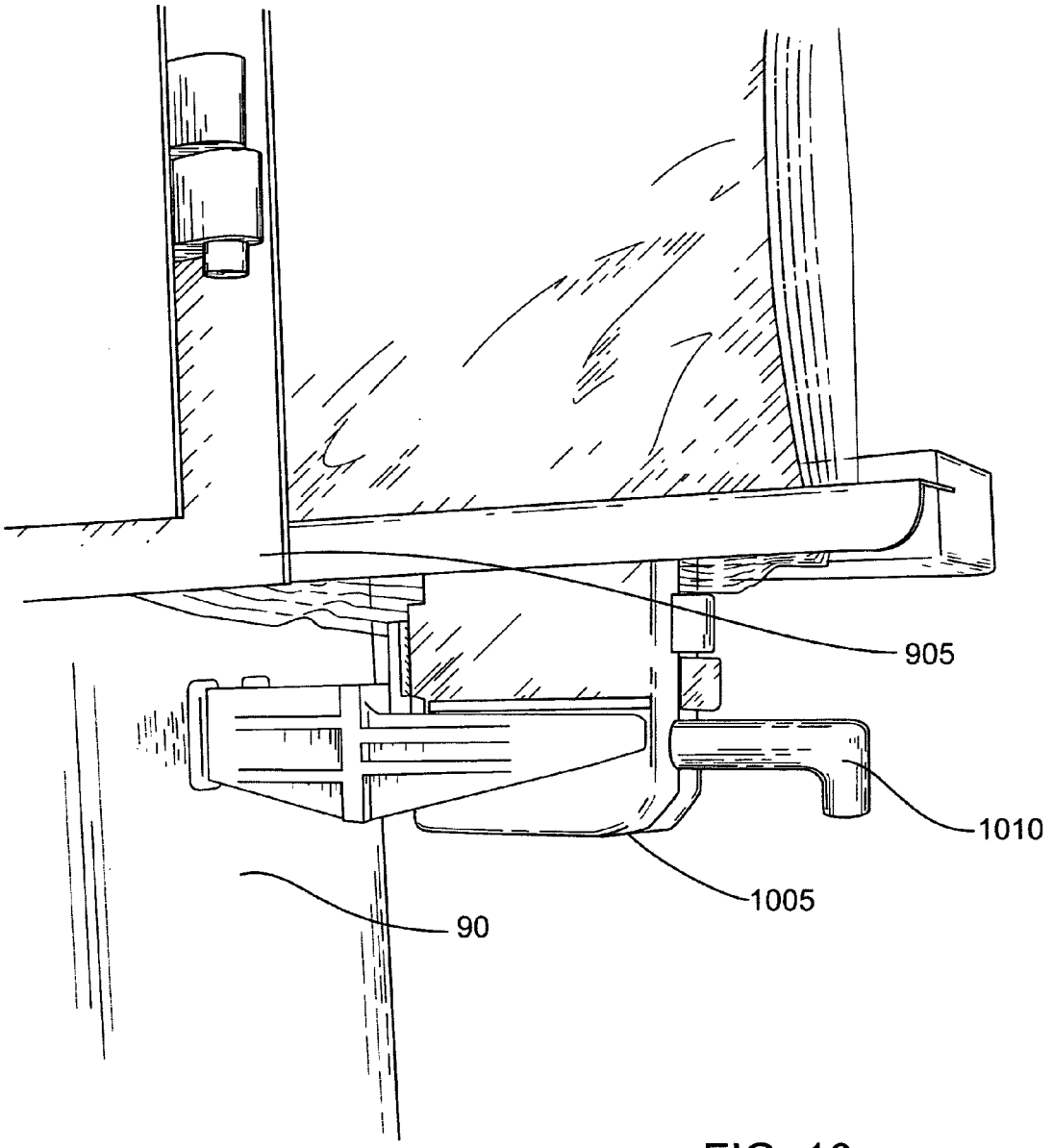


FIG. 10

REPLACEMENT SHEET

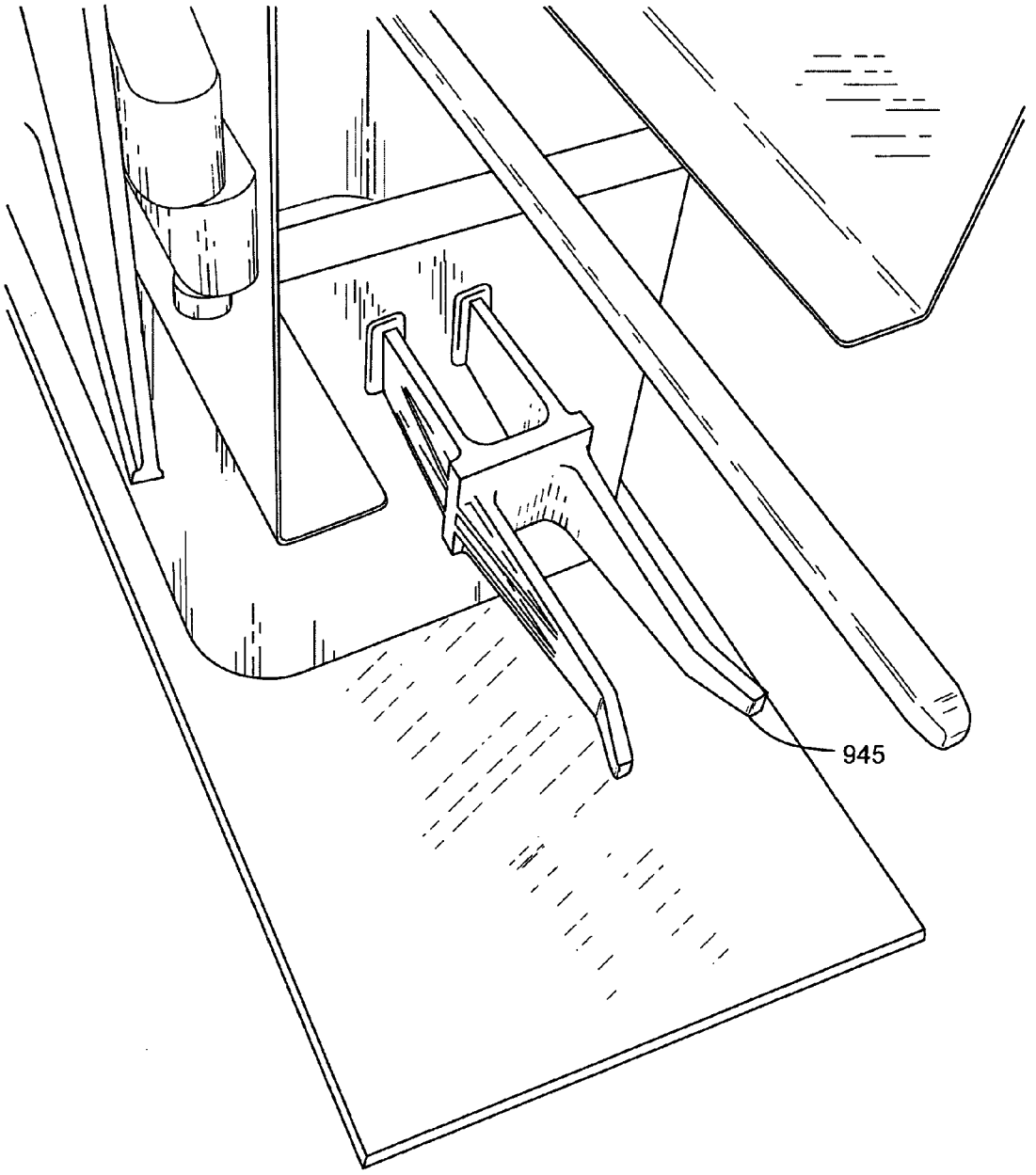


FIG. 11

REPLACEMENT SHEET

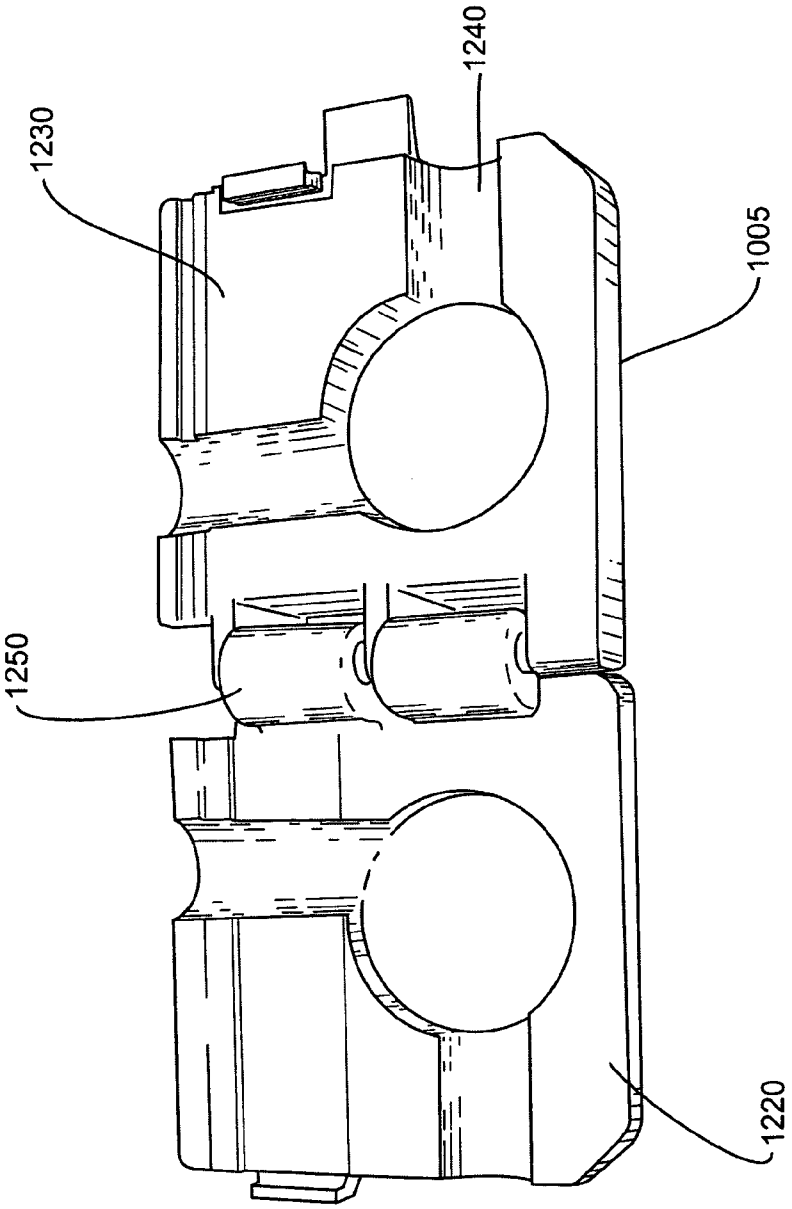


FIG. 12

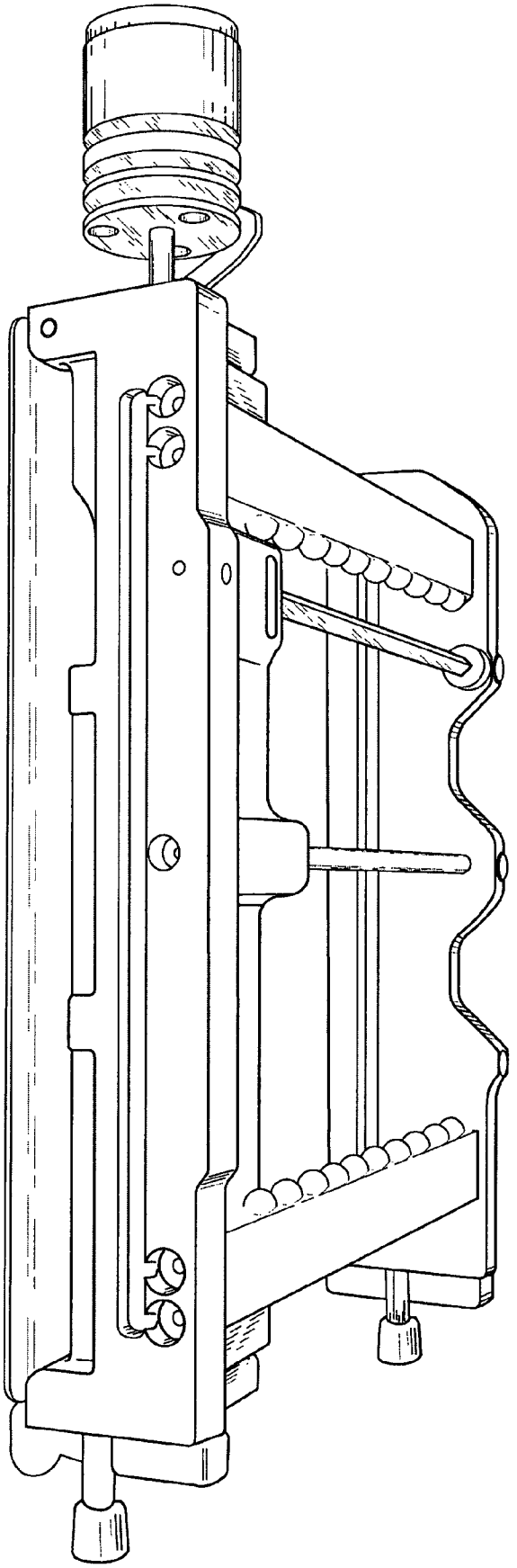
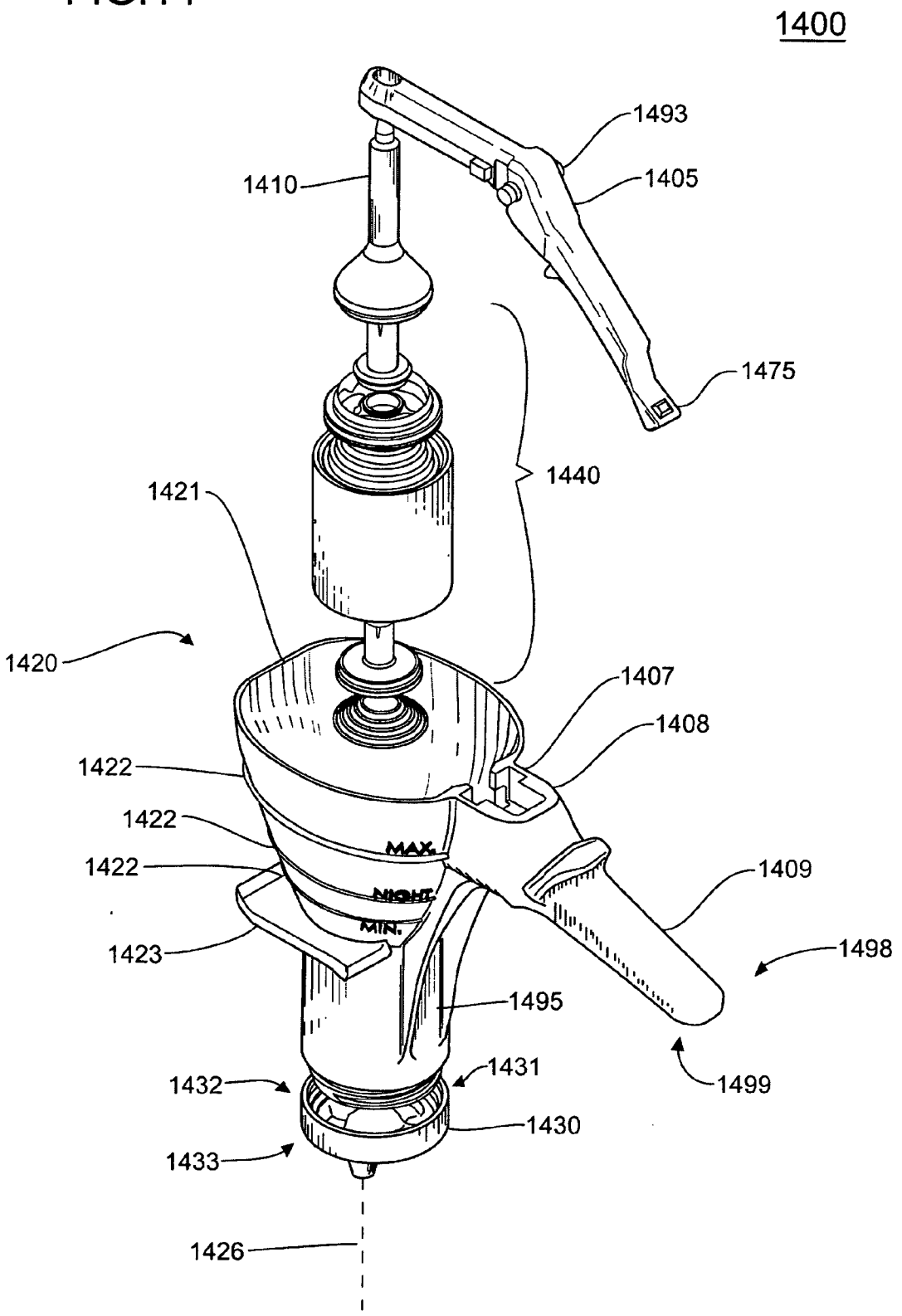


FIG. 13

REPLACEMENT SHEET

FIG.14



REPLACEMENT SHEET

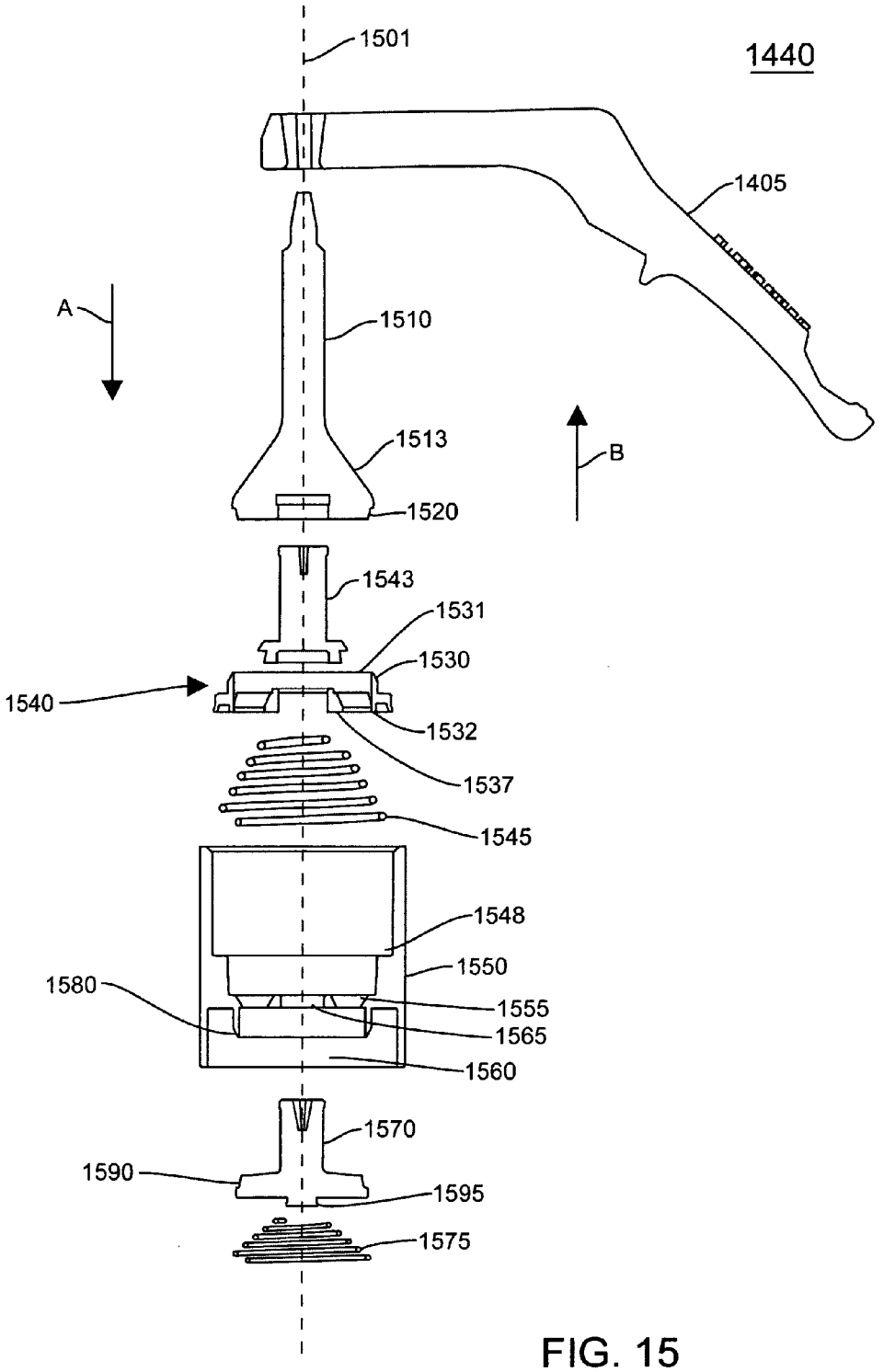


FIG. 15

REPLACEMENT SHEET

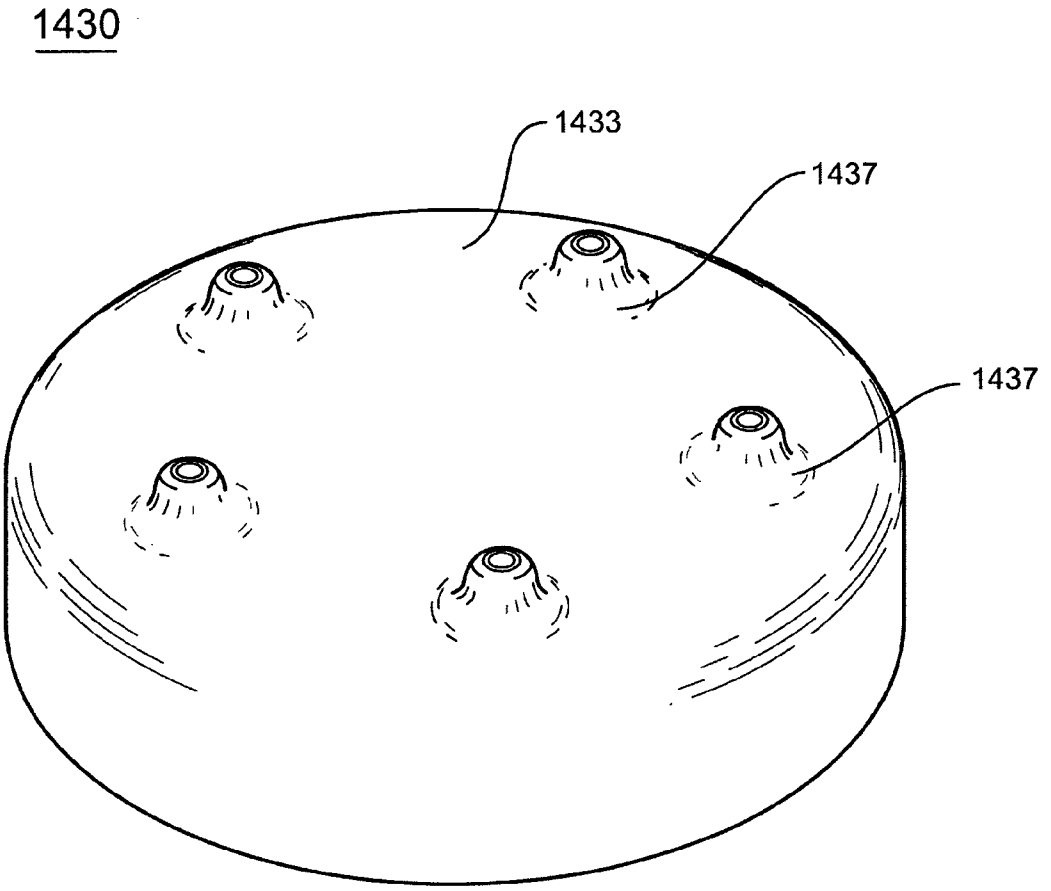


FIG. 16A

REPLACEMENT SHEET

1430

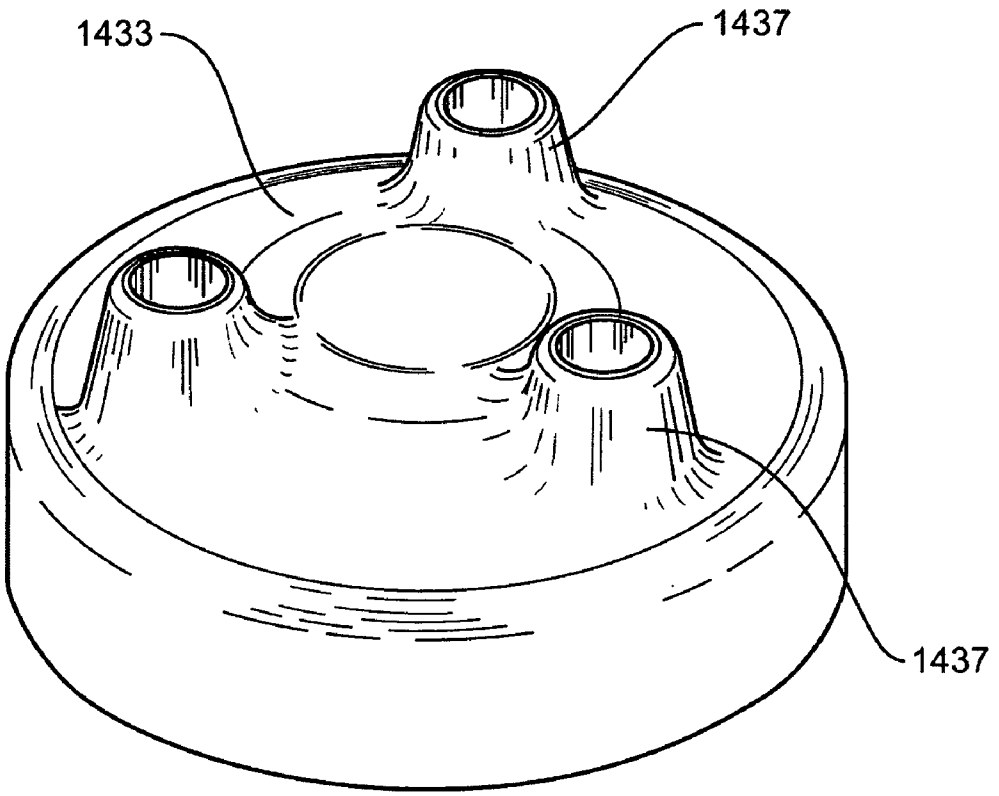


FIG. 16B

REPLACEMENT SHEET

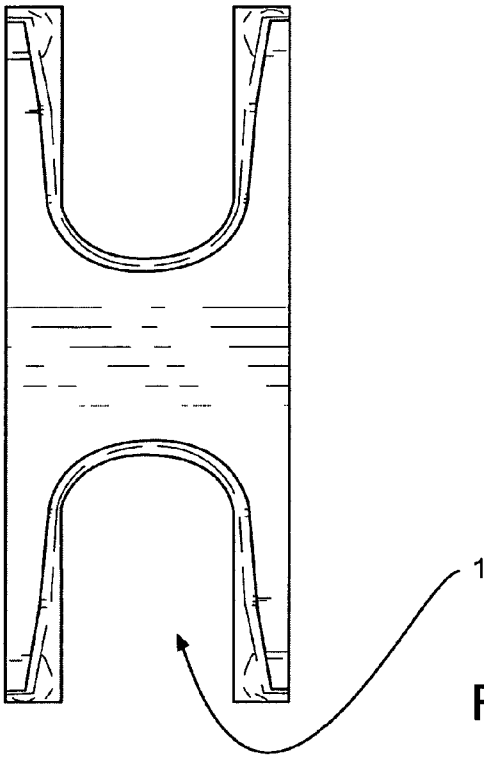


FIG. 16C

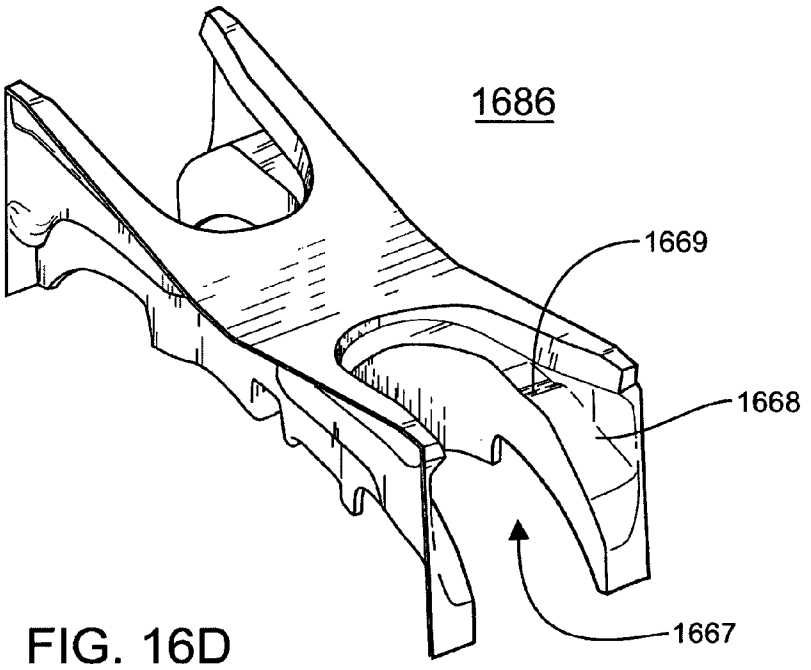
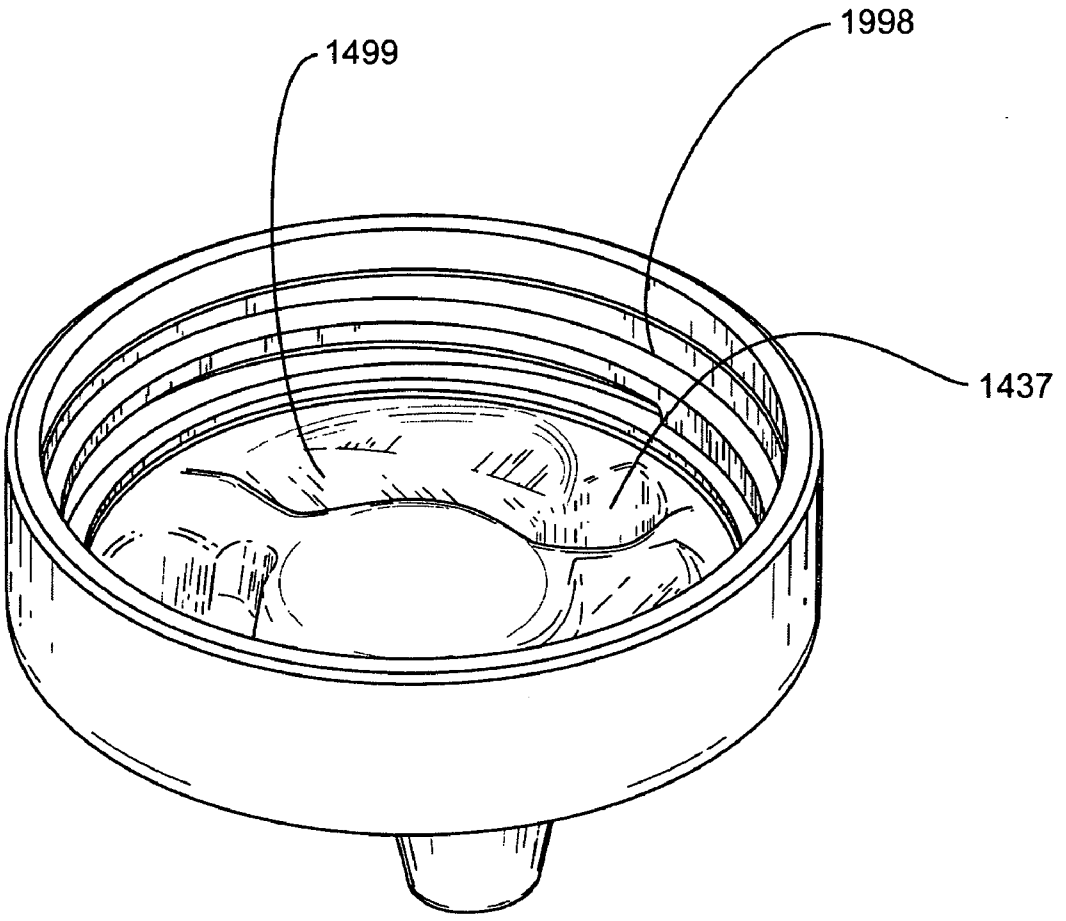


FIG. 16D

REPLACEMENT SHEET

1430

FIG. 16E



REPLACEMENT SHEET

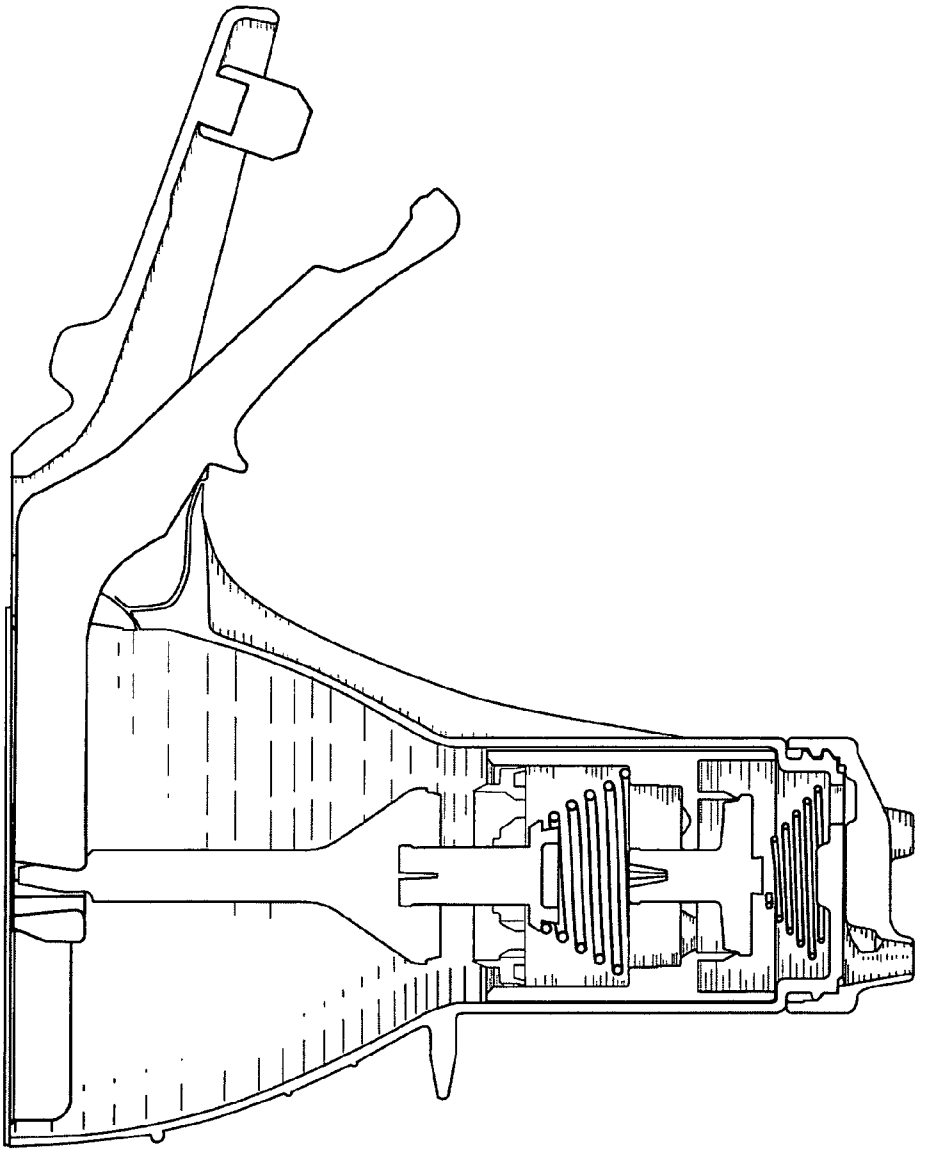


FIG. 17

REPLACEMENT SHEET

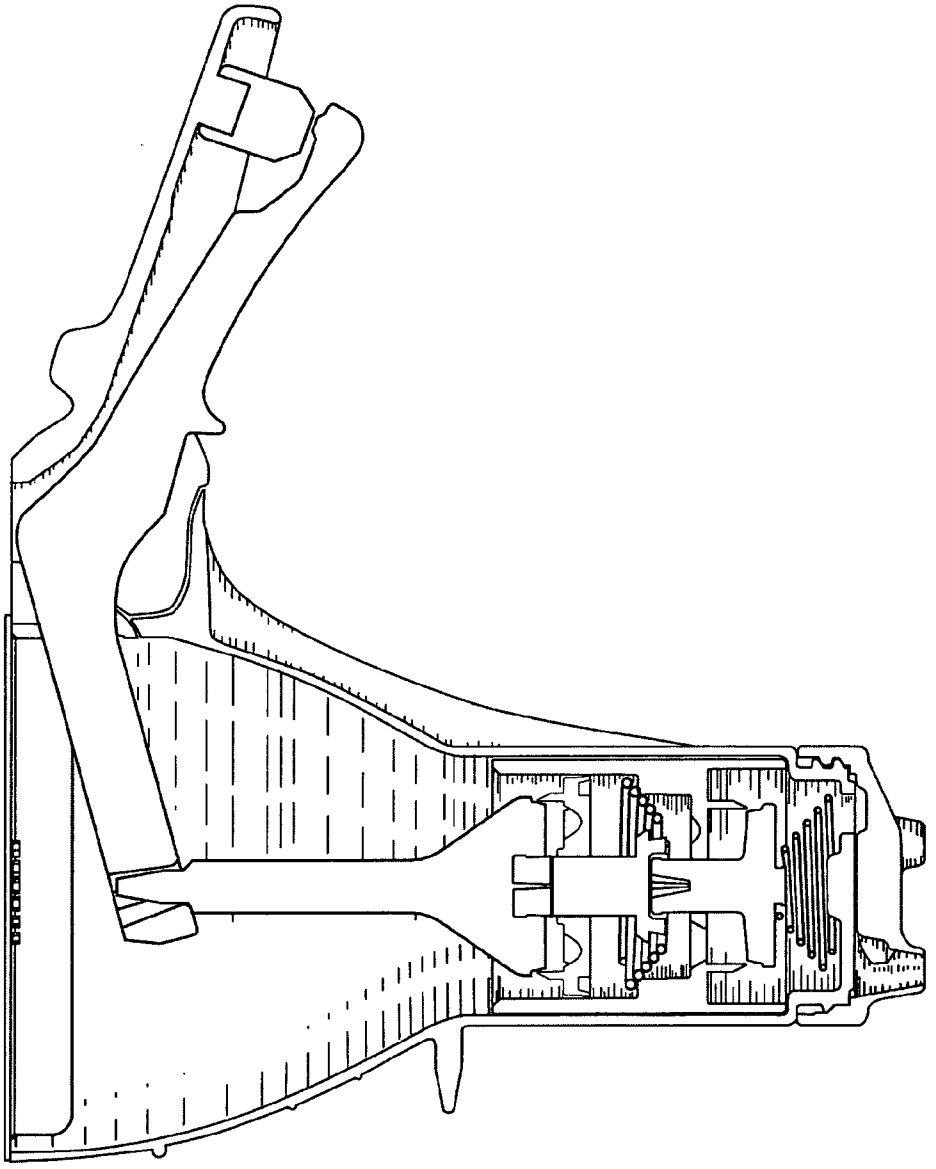


FIG. 18

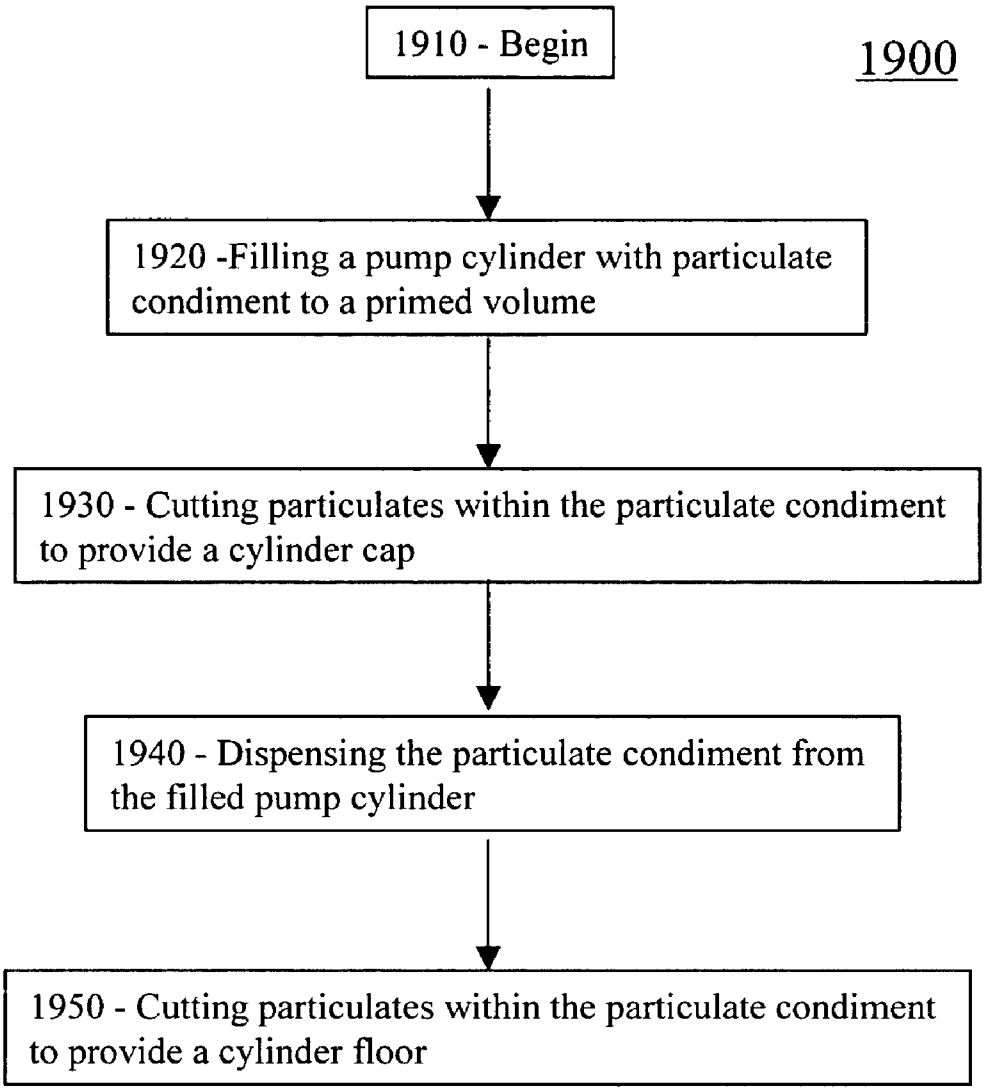

1910 - Begin
1900
1920 -Filling a pump cylinder with particulate condiment to a primed volume
1930 - Cutting particulates within the particulate condiment to provide a cylinder cap
1940 - Dispensing the particulate condiment from the filled pump cylinder
1950 - Cutting particulates within the particulate condiment to provide a cylinder floor

FIG. 19

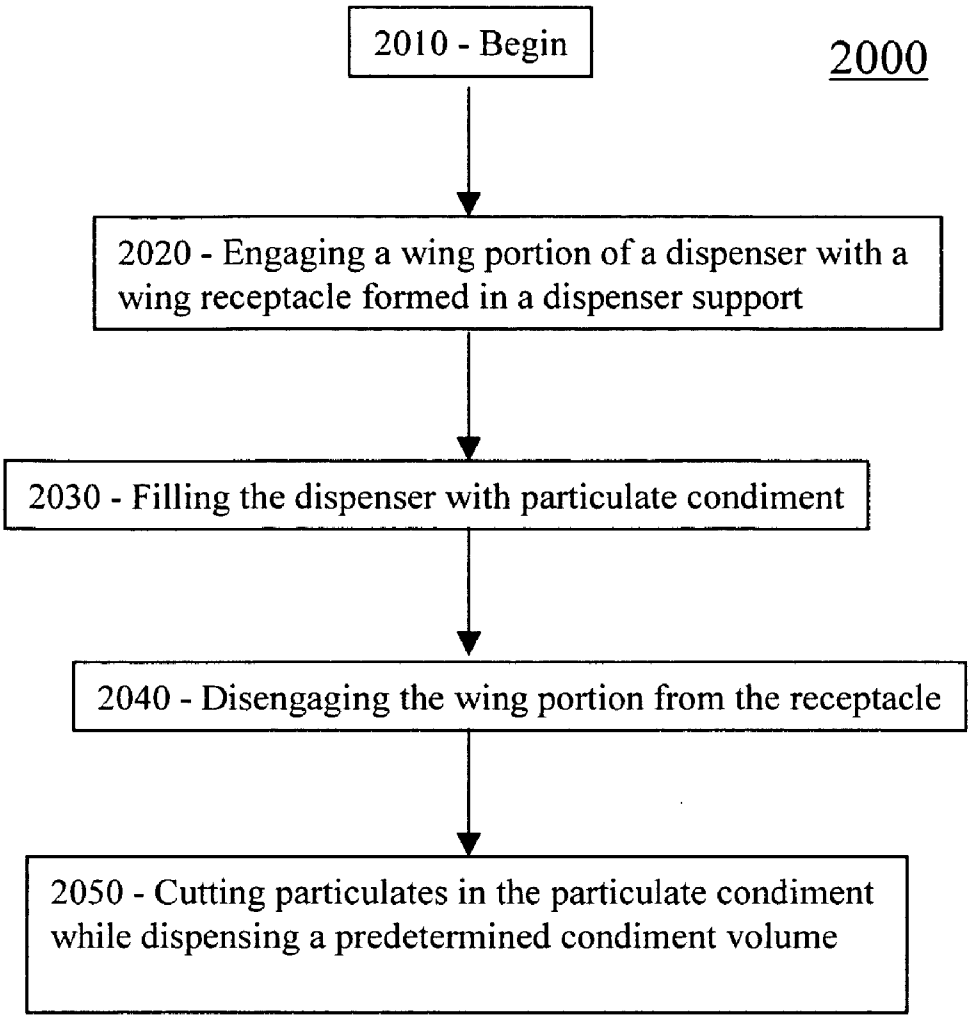
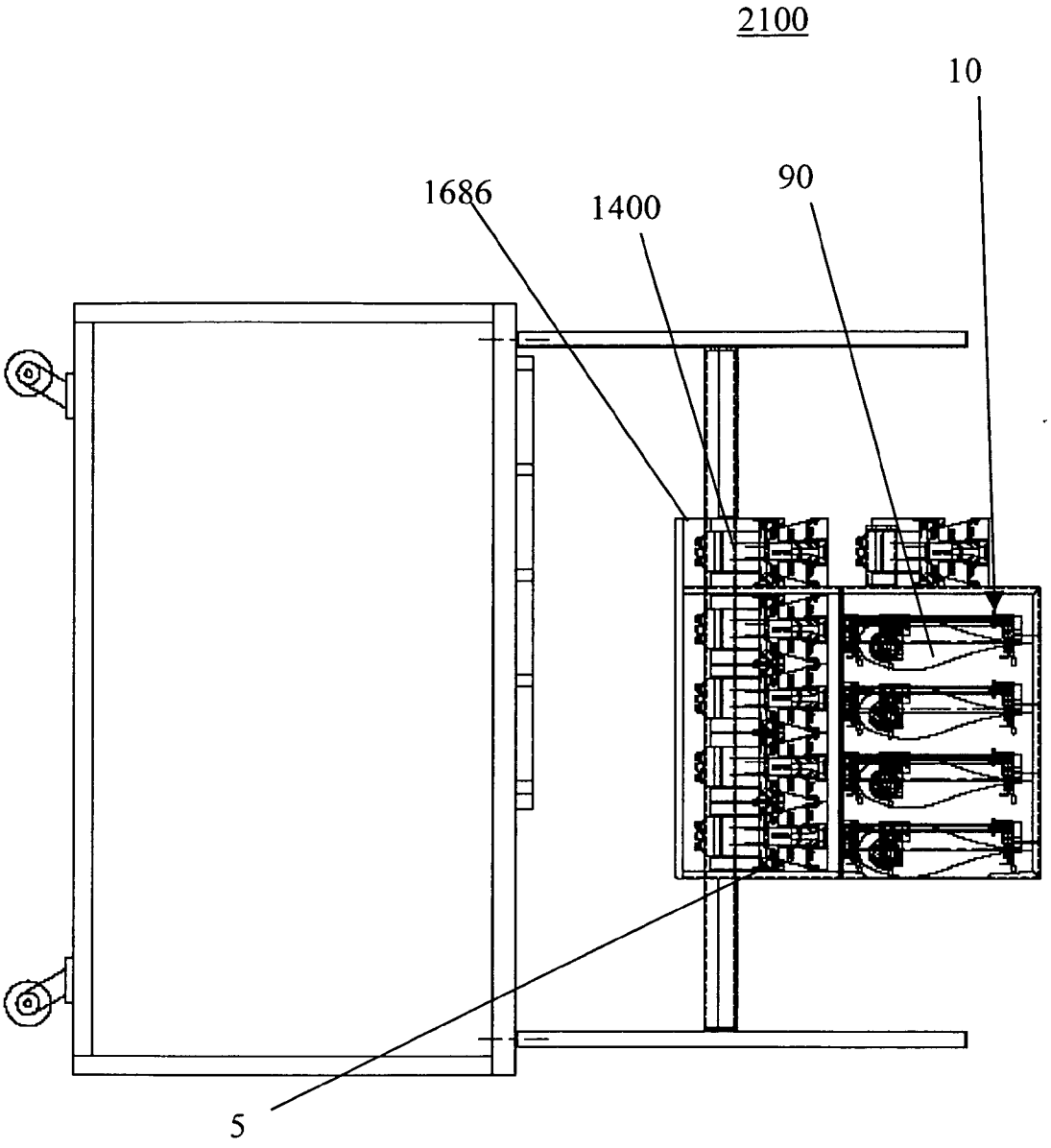

2010 - Begin
2000
2020 - Engaging a wing portion of a dispenser with a wing receptacle formed in a dispenser support
2030 - Filling the dispenser with particulate condiment
2040 - Disengaging the wing portion from the receptacle
2050 - Cutting particulates in the particulate condiment while dispensing a predetermined condiment volume

FIG. 20

FIG. 21



HANDHELD CONDIMENT DISPENSER

RELATED APPLICATIONS

[0001] This application claims priority to U.S. Provisional Patent Application Nos. 60/534,581 filed Jan. 6, 2004, 60/534,644 filed Jan. 7, 2004, and 60/545,122 filed Feb. 17, 2004. The entirety of each application is hereby incorporated by reference.

FIELD OF THE INVENTION

[0002] This invention generally relates to the art of dispensers and, particularly, to a dispenser with a pump.

BACKGROUND OF THE INVENTION

[0003] The ability to dispense a controlled quantity of a condiment, such as ketchup, mustard, relish, mayonnaise, salad dressings, hot wings sauce, spaghetti sauce, tartar sauce or other sauces, in an efficient manner has been important in the food service industry for many years. This is especially true for large volume food handling operations such as fast food restaurants, where employees and customers desire the ability to dispense condiments quickly and conveniently, and where even a marginal reduction in the waste of, or time required to dispense, condiments leads to significant savings in cost.

[0004] Dispensing condiments from large, flexible plastic bags is advantageous. Condiments can be easily packaged in large plastic bags at a central facility and shipped to the point of sale. Bulk plastic containers can incorporate gas barriers that allow condiments to be packaged so that they can be stored at room temperature, which makes the packages more convenient to ship and store. Storing the condiments at room temperature saves time when it is desirable that the condiment be served at room temperature by eliminating the requirement that the condiment be allowed to warm from a refrigerated temperature before use.

[0005] Flexible plastic bags are a common form of packaging for food and thus are readily handled by employees without special training. Further, storing the condiments at room temperature reduces the expense of refrigeration. In addition, bags are often more cost effective, easier to dispose of, and occupy less storage space.

[0006] Historically, many products and condiments have been shipped and stored in tin cans, often #10 tin cans. While tin cans offer good shelf life performance, tin cans contribute to waste of product that clings to the side of cans. Further, tin cans are heavy to ship, store, and are heavy and voluminous for disposal. Additionally, tin cans require can openers to open—retrieving the opener reduces operational speed, and the opener may be difficult to locate, further reducing efficiency. Opening tin cans may also result in sharp edges that may tear garbage bags and pose a laceration risk.

[0007] Other historical containers include gallon jugs and caulk cartridge type cans. However, gallon jugs contribute to waste in the same fashion as tin cans, and share many of the negative attributes of tin cans. Caulk cartridge type cans leave less product in the canister, but require priming of each can and generate significant wasted product. For example, a 25-ounce cartridge delivering a one-ounce payload necessarily wastes 4% of the product due to priming.

[0008] Devices attempting to efficiently dispense condiments from bulk flexible plastic bags exist, including devices that use rollers advanced by gravity, by gears or rack and pinion means to squeeze condiment out of the plastic bags, but these devices have several disadvantages. Devices that use gravity actuated rollers or gears are complicated to manufacture and may involve manipulating the rollers in non-intuitive ways. Other devices that utilize more complex means for releasing condiment from the bags require that the bags incorporate specially designed fittings, including tubes and couplings, which increase the cost and complexity of the packaging and add to product waste during cleanup. Yet other devices use motorized pumps that require electricity and possibly pressurized gases to operate, which adds to the cost and size of the dispensers, increasing manufacturing costs and adding complexity during cleaning. Further, pumps may result in undesired splatter, which both wastes product, as well as work effort to clean the splatter. If a pump in the front of the store splatters, customers may become unhappy. Motorized devices often require long tubes that contribute to waste of the condiment and complicate clean up. Furthermore, existing types of dispensers have a single outlet for the condiment, which reduces efficiency at workstations where multiple outlets can be accommodated. Additionally, tubes reduce the range of movement and freedom of motion of the applicator device. Additionally, devices using pressurized gas rely on the gas, and in event of gas malfunction, or lack of gas supply, the device is non-functional.

[0009] Other devices utilize fitments that require significant expense, and contribute to waste if the fitment is improperly fitted. For example, a plastic fitment is used to provide a valve to a flexible bag. For use, the fitment must be separately manufactured, and heat sealed to a flexible bag.

[0010] However, accurately fitting a flexible bag into any of these dispensers has been problematic. An appropriate fit of the bag within a dispensing device is important to ensure correct insertion, as well as minimizing waste and potentially damaging the package during use. It is further desirable to minimize the time required to insert the bag, while simultaneously increasing the accuracy of the insertion. It is also desirable to provide a bag that minimizes clean up and disposal costs. It is further desirable that the bag can be manufactured on a variety of packaging machines with the insertion of customized seal jaws to create spouts, locator pins and tear notches.

[0011] The present invention advances the art.

BRIEF SUMMARY OF THE INVENTION

[0012] One embodiment of the invention provides a dispenser including a container including a containment portion and a handle portion and a pump assembly received in the containment portion. The pump assembly includes a rod including a first knife blade receptacle, a cylinder including a second knife blade receptacle, a piston movable within the cylinder having a first knife blade and a valve having a second knife blade. When the valve is open the first knife blade engages with the first knife blade receptacle and when the valve is closed the second knife blade engages with the second knife blade receptacle.

[0013] Another embodiment of the invention provides a method for dispensing particulate condiment. The method

includes filling a pump cylinder with particulate condiment to a primed volume and compressing particulates within the particulate condiment to provide a cylinder cap. The method further includes dispensing the particulate condiment from the filled pump cylinder and compressing particulates within the particulate condiment to provide a cylinder floor.

[0014] Yet another embodiment of the invention provides a method for dispensing particulate condiment. The method includes engaging a wing portion of a dispenser with a wing receptacle formed in a dispenser support and filling the dispenser with particulate condiment. The wing portion is disengaged from the receptacle and particulates in the particulate condiment are compressed while dispensing a predetermined condiment volume.

[0015] Yet another embodiment of the invention provides a system for dispensing particulate condiment including a dispenser including a wing portion, the dispenser including a pump assembly having first and second blades to compress particulates within the particulate condiment and a dispenser support including a wing receptacle.

[0016] Yet another embodiment of the invention provides a dispenser system. The system includes container means including a containment portion and a handle portion and pump means received in the containment portion, the means including means for compressing particulates disposed in a particulate condiment.

[0017] The foregoing and other features and advantages of the invention will become further apparent from the following detailed description of the presently preferred embodiments, read in conjunction with the accompanying drawings. The detailed description and drawings are merely illustrative of the invention rather than limiting, the scope of the invention being defined by the appended claims and equivalents thereof.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

[0018] **FIG. 1** is a back view of one embodiment of a system in accordance with one embodiment of the invention;

[0019] **FIG. 1A** is a perspective view of one embodiment of a bag in accordance with one aspect of the invention;

[0020] **FIG. 1B** is a perspective view of one embodiment of a bag in accordance with one aspect of the invention;

[0021] **FIG. 2A** is a front view of one embodiment of a system in accordance with one embodiment of the invention;

[0022] **FIG. 3A** is a cross-sectional view of one embodiment of a dispenser in accordance with the invention;

[0023] **FIG. 3B** is an exterior view of the bottom of one embodiment of a dispenser in accordance with the invention;

[0024] **FIG. 4** is a view of one aspect of a system in accordance with one embodiment, of the invention;

[0025] **FIG. 5** is a view of one embodiment of a system in accordance with one embodiment of the invention; and

[0026] **FIG. 6** is a view of one embodiment of a system in accordance with one embodiment of the invention;

[0027] **FIG. 7** is a bottom view of one embodiment of a system in accordance with one embodiment of the invention;

[0028] **FIG. 8** is a view of one embodiment of a system in accordance with one embodiment of the invention;

[0029] **FIG. 9** is a perspective view of one embodiment of a system in accordance with one aspect of the invention;

[0030] **FIG. 10** is a perspective view of one embodiment of a system in accordance with one aspect of the invention;

[0031] **FIG. 11** is a perspective view of one embodiment of a system in accordance with one aspect of the invention;

[0032] **FIG. 12** is a perspective view of one embodiment of a system in accordance with one aspect of the invention;

[0033] **FIG. 13** is a perspective view of one embodiment of a system in accordance with one aspect of the invention;

[0034] **FIG. 14** illustrates a perspective exploded view of one embodiment of a dispenser in accordance with one aspect of the invention;

[0035] **FIG. 15** illustrates a cross sectional exploded view of one embodiment of a dual knife blade pump assembly in accordance with one aspect of the invention;

[0036] **FIGS. 16A and 16B** illustrate perspective views of one embodiment of removable cap in accordance with one aspect of the invention;

[0037] **FIG. 16C** illustrates a top view of one embodiment of a dispenser support in accordance with one aspect of the invention;

[0038] **FIG. 16D** illustrates a perspective view of one embodiment of a dispenser support in accordance with one aspect of the invention

[0039] **FIG. 16E** illustrates a perspective view of one embodiment of a removable cap in accordance with one aspect of the invention;

[0040] **FIG. 16F** illustrates another embodiment of a pump assembly in accordance with one aspect of the invention;

[0041] **FIGS. 17 and 18** illustrate one embodiment of operation of a dispenser with a dual knife blade pump assembly in accordance with one aspect of the invention;

[0042] **FIG. 19** illustrates one embodiment of a method for dispensing particulate condiment in accordance with one aspect of the invention;

[0043] **FIG. 20** illustrates one embodiment of a method for dispensing particulate condiment in accordance with one aspect of the invention; and

[0044] **FIG. 21** illustrates one embodiment of a system for dispensing condiments in accordance with one aspect of the invention.

DETAILED DESCRIPTION

[0045] **FIG. 1** illustrates a system **10** in accordance with one embodiment of the invention. System **10** includes a frame **20**, top clip **30**, roller frame **40**, and valve assembly **50**. System **10** further includes housing **5** (see **FIG. 6**) and dispenser **310** (see **FIGS. 3A and 3B**). In one embodiment, flexible bag **90** is retained and supported, at least in part, by top clip **30** and held within roller assembly **40**.

[0046] Housing **5** is operable to support frame **20**. In one embodiment, housing **5** is a freestanding unit, configurable to rest upon, for example, a tabletop. In another embodiment, housing **5** is configured as a wall-mounted unit. In one embodiment, frame **20** includes a male adaptor configured to mate with a female adaptor in housing **5** for a sliding engagement between frame **20** and housing **5**. In one embodiment, frame **20** includes a female adaptor configured to mate with a male adaptor in housing **5** for a sliding engagement between frame **20** and housing **5**. Embodiments with a female adaptor on the frame **20** may have a groove, such as groove **101** depicted in **FIGS. 6 and 7**, in either the top of the frame (such as, for example, top clip **30**), the bottom of the frame (such as, for example, valve assembly **50**), or both. Housing **5** may comprise any appropriate material. In food applications, stainless steel or food grade plastics may offer advantages, while in other applications, another material, such as, for example, plastic, food grade plastics, or PVC plastic may offer superior performance. In another embodiment, housing **5** includes a support ledge for supporting a handheld dispenser such that the contents of a bag may be dispensed into the interior of the handheld dispenser. In one embodiment, the handheld dispenser is as illustrated in **FIGS. 3A and 3B**.

[0047] Frame **20** comprises two sides **21** connecting top clip **30** and valve assembly **50**. Frame **20** further includes slide support **26**. In one embodiment, sides **21** are disposed substantially at opposite ends of top clip **30** and valve assembly **50**, forming an approximately quadrilateral configuration. In one embodiment, sides **21** include grips configured to conform to human fingers to provide easy handling. In one embodiment, sides **21** are smooth and non-scalloped. In one embodiment, track support **26** connects top clip **30** and valve assembly **50** at approximately a midpoint of a length L of top clip **30** and valve assembly **50**. Frame **20** is sized so that a flexible bag carried within the frame extends substantially from the top clip **30** to the valve assembly **50**, with the top clip **30** supporting the bag and valve assembly **50** controlling the dispensing of product contained by the bag

[0048] Slide support **26** includes a base portion **27** and top portion **28**. Base portion **27** is attached to the valve assembly **50**. Top portion **28** is affixed to top clip **30**. Track support **26** is configured, in an example, so that roller frame **40** is slidably engaged and translates axially along track support **26** via a bearing surface of the roller frame **40**. In one embodiment, roller frame **40** translates freely along track support **26**. In another embodiment, the interface between roller frame **40** and track support **26** comprises any variety of bearing configurations including a frictional grip, low friction interface, teeth, or ratchets. Track support **26** with base portion **27** and top portion **28** is illustrated in **FIG. 1** engaged with roller frame **40**. In one embodiment, track support **26** is configured for snap in and out attachment with top clip **30** and valve assembly **50**.

[0049] Top clip **30** includes front **24** hingedly attached to back **25**. In a closed configuration, front **24** and back **25** are positioned parallel and positioned adjacent each other. In an open configuration, front **24** and back **25** are non-parallel. In one embodiment, front **24** is secured to back **25** with a latch assembly **23**. In one embodiment, latch assembly **23** is integral with the front **24** and back **25**. In another embodiment, latch assembly **23** includes a spring **22** operable to bias front **24** and back **25** into an open configuration. In one embodiment, back **25** is configured to be fixed relative to frame **10**, while front **24** is configured to open and close relative to back **25**.

[0050] Roller frame **40** includes a first roller arm **41** and a second roller arm **42**. While in a closed configuration, first roller arm **41** and second roller arm **42** are positioned parallel and adjacent each other. In an open configuration, first roller arm and second roller arm **42** are non-parallel. First roller arm **41** and second roller arm **42** are hingedly attached at one end of each. In one embodiment, first and second roller arms are hingedly attached at the same end as front **24** and back **25**. First roller arm **41** and second roller arm **42**, in one embodiment, are maintained in a closed configuration with a latch assembly **39** (**FIG. 2A**). In one embodiment, the latch assembly includes a spring operable to bias the first and second roller arms into an open configuration. In one embodiment first roller arm **41** and second roller arm **42** are rotatably attached to the frame **40**. In another embodiment, first roller arm **41** is rotatably attached to frame **40** and second roller arm **42** is attached to frame **40**.

[0051] First roller arm **41** includes a roller **43** axially disposed with first roller arm **41** and rotatably affixed to the first roller arm. Second roller arm **42** includes a roller **44** axially disposed with second roller arm **42** and rotatably affixed to the second roller arm **42**. Each roller **43**, **44** is rotatably attached to roller frame **40**. Roller frame **40** is configured to translate along track support **26**, and includes a bearing surface in second roller arm **42**. In one embodiment, second roller arm **42** is omitted, and roller **44** remains rotatably attached to roller frame **40**. In embodiments including a second roller arm **42**, second roller arm **42** provides additional strength or support for roller **44**. In embodiments without second roller arm **42**, roller **44** is configured to be sufficiently strong as to obviate a need for second roller arm, and configured for latching attachment to roller frame **40**.

[0052] When in a closed configuration, first and second arms **41**, **42** are configured to retain a flexible bag containing product. When in a closed configuration, roller arms **43**, **44** form a nip **45**. As first and second rollers **43**, **44** rotate, product from a bag positioned in the nip is dispensed through a spout in the bag and through valve assembly **50**.

[0053] Roller **43** is operably attached to an actuator **46**. Rotation of the actuator **46** directly rotates roller **43**, roller **44** rotates in response to rotation of roller **43**, and simultaneously translates the rollers **43**, **44** relative to a product filled bag positioned in the nip to dispense food product. In one embodiment, actuator **46** is a knob. In another embodiment, actuator **46** is a lever. In one embodiment, actuator **46** is manually actuated, while in another embodiment, actuator **46** is actuated with mechanical, electrical, pneumatic, or magnetic assistance. In one embodiment, actuation of actuator **46** results in vertical translation of the roller frame along track support **26**. In one embodiment, actuator **46** comprises a portion of an actuator assembly **49**. In one embodiment, actuator assembly **49** includes a spring biasing the actuator **46** to a closed configuration.

[0054] In one embodiment, at least one of the rollers **43**, **44** comprises a knurled region **47**. **FIG. 2A** depicts knurled region **47**. In one embodiment, the knurled region **47** extends along substantially all of a length of the roller. In

another embodiment, at least one of the rollers **43**, **44** includes a relief region **48** that is not knurled. **FIG. 2A** best depicts relief region **48**. In one embodiment, a relief region **48** includes a covering, such as, for example, an elastomeric or rubber sleeve to increase friction between the relief region **48** and a complementary region on the other roller. In other embodiments, the interface between relief region **48** and knurled region **47** reduces adverse effects on the material of a bag, such as bag **90**, in the event that the material bunches up in the interface. In other embodiments, the covering is configured for a smooth, relatively high friction surface to interface with the other roller. In embodiments where the relief region **48** is a sleeve, the sleeve may be adhesively applied to the roller. As used herein, a "knurl" is a protrusion that is regularly spaced but does not extend axially along a substantial portion of the roller without interruption. The word "knurl" further comprises a series of small ridges or grooves on the surface or edge of a metal object to aid in gripping, so long as the ridges or grooves do not extend axially along a substantial portion of the roller without interruption. In one embodiment, the knurl is a protrusion in a pyramid configuration, with the peak of the pyramid extending perpendicularly from the axis of the roller. In one embodiment, both rollers **43**, **44** are knurled in at least a knurled region **47**. In one embodiment, the knurled region **47** comprises a middle region of the roller **43**, **44**, and the relief region **48** is formed adjacent at least one end region of the roller **43**, **44**. In other embodiments, at least a portion of knurled region **47** is adjacent at least one end portion of the roller **43**, **44**. For example, knurled region **47** may be immediately adjacent an end of roller **43**, with a relief region **48** adjacent knurled region **47** and a second knurled region adjacent relief region **48**. In other embodiments, a knurl as used herein includes, straight knurls, round knurls, splines or gear attachments. In another embodiment, each roller is covered by an elastomeric covering.

[**0055**] In one embodiment, first roller **43** includes a knurled region **47** between two relief regions **48** located at opposite ends of first roller **43**, while second roller **44** comprises a knurled region **47** but does not include a relief region. In one embodiment, each relief region **48** comprises no more than approximately 20% of the length L of the roller **43**.

[**0056**] In one embodiment, actuator **46** is substantially coaxial with at least one of the roller arms **43**, **44**.

[**0057**] Valve assembly **50** includes a front **51** and a back **52**. When in a closed configuration, front **51** and back **52** are substantially parallel and adjacent each other. In another embodiment, front **51** and back **52** are hingedly attached at one side of each. In one embodiment, front **51** and back **52** are hingedly attached at the same end as front **24** and back **25**. Front **51** and back **52**, in one embodiment, are maintained in a closed configuration with a latch assembly **59**. In one embodiment, the latch assembly includes a spring operable to bias the front **51** and back **52** into an open configuration. The latch assembly may be constructed either integrally with the front **51** and back **52**, or the latch assembly may be affixed to the valve assembly **50** with any known means of attachment, including clips, hook and loop fasteners, snaps, screws, rivets, zippers, or the like.

[**0058**] In one embodiment, valve assembly **50** further includes a heating element (not shown) extending parallel with at least one of front **51** or back **52**. In one embodiment, the heating element is configured to heat to 130 degrees Fahrenheit to heat the contents of bag **90**. Other heating or cooling configurations are within the scope of this disclosure.

[**0059**] Front **51** and back **52**, in one embodiment, further include at least one bag alignment indicator **57**. In one embodiment, bag alignment indicator **57** comprises a pin affixed with one of front **51** and **52** configured to match a pin receiving hole integral with the other of front **51** and **52**. The pin may be integral with one of front **51** and back **52**. Bag alignment indicator **57** may be configured to mate with bag alignment indicators of a flexible bag, discussed below. In another embodiment, bag alignment indicators include flat pins with or without barbs or hooks. In one embodiment, bag alignment indicator **57** works in concert with at least one tang to guide placement of the bag In one embodiment, track support **26** connects valve assembly **50** and roller frame **40** at approximately a midpoint of a length L of valve assembly **50**. In one embodiment, track support **26** connects valve assembly **50** and roller frame **40** at approximately a midpoint of a length L of roller frame **40**.

[**0060**] In one embodiment, back **52** includes a groove **101** configured to mate with a housing rail **645** (see **FIG. 6**) to provide additional support to system **10** and provide a sliding connection between back **52** and housing **5**. In one embodiment, groove **101** is configured to slidingly engage with housing rail **645** (see, **FIGS. 6, 7**). In one embodiment, groove **101** includes a taper at the front or back of the groove to enhance alignment.

[**0061**] Valve assembly **50** further includes at least one spout receiving portion **55** (see **FIG. 2**). Spout receiving portion **55** is configured to receive a spout **93** of a flexible bag **90** containing product. Each spout receiving portion **55** is configured with complementary cut-out areas **56** on each of front **51** and back **52**, as well as a valve **53** contained within the cut-out areas **56**. Valve **53** is operably attached to an actuator **58** (see **FIG. 7**). In one embodiment, actuator **58** comprises a lever that is hingedly attached to the valve **53**.

[**0062**] In yet another embodiment, valve **53** is actuated by the actuator **46** that actuates the rollers **43**, **44**. In such an embodiment, each valve **53** is connected with a link to the actuator **46**, such that actuation of actuator **46** simultaneously actuates the rollers **43**, **44** and valves **53**. Actuation of actuator **46** drives a catch axial to the rollers, actuating a driving rod configured to be driven by the catch. In one embodiment, the driving rod is polygonal. Actuating the driving rod causes the rod to rotate about an axis that is non-parallel to the rollers. In one embodiment, the axis of the rod is substantially perpendicular to the axis of the rollers. Rotation of the driving rod causes translation of a valve catch in valve assembly **50**. The valve catch is configured to be driven by the driving rod. In one embodiment, the valve catch includes a toggle. In another embodiment, the valve catch includes a rotatable lever configured to apply force to the valve. Translation of the valve catch opens and closes the valves **53**. In one embodiment, the valve catch is configured such that valve **53** is locked in a closed configuration, while even a slight rotation of the driving rod causes the valve catch to disengage from its locked position, and valve **53** will open. One embodiment of such a valve catch is as illustrated in **FIG. 4**, as valve catch **445**. In

another such embodiment, valve **53** is biased to a closed position with a spring biasing the actuator **46**. Thus, in certain embodiments, actuator **58** may be the identical structure as actuator **46**. Actuation of actuator **46** includes a variety of methods known in the art, such as rotation of a knob-type actuator by any appropriate degree of rotation, for example, 90 degrees, 45 degrees or 30 degrees.

[**0063**] The elements of an embodiment wherein actuator **46** actuates the valve **53** are shown in exploded view in **FIG. 4**. At **400**, the actuator system **410** are illustrated as including knob **420**, spring **415**, receiver **423**, driving element **425**, driving disc **427**, rod **430**, valve element **435**, actuator catch **440**, and valve catch **445**. Spring **415** biases the position of knob **420** relative to receiver **423**. Receiver **423** mates with flights formed using conventional techniques into the outer surface of driving element **425** to rotate the rollers **42**, **43** using driving disc **427** mated with the rollers, as described above. Rotation of knob **420** simultaneously results in the axial translation of actuator catch **440** by pressure applied to surface **441** at one side of leg **442**. Leg **442** and actuator catch **440** rotate relative to each other about hinge **444**. Actuator catch **440** includes a reception hole configured such that rod **430** snugly fits within reception hole **443**. In one embodiment, rod **430** and reception hole comprise a hexagonal cross-section, although other polygonal shapes may be used. In one embodiment, rod **430** and the reception hole comprise a rectangular shape. Reception hole **443** is hingedly attached with hinge **444** to the remaining portion of actuator catch **440** such that axial translation of actuator catch **440** results in rotation of reception hole **443** and thus rotation of rod **430**. Rotation of rod **430** results in axial translation of valve element **435** using similar principles—rotation of rod **430** causes translation of valve element **435**. Reception hole **446** mates with hinge **444**. Valve catch **445** also functions as an actuator catch.

[**0064**] Various embodiments of the invention include use of two knobs **420**—one on each side of the roller assembly. In embodiments using a single knob **420**, valve catch **440** is an unnecessary element of the structure.

[**0065**] Valve **53** is configured to match the profile of a flexible bag. In one embodiment, valve **53** is configured to provide product from the contents of the flexible bag. In one embodiment, a flexible bag includes a spout receiving portion configured to match valve **53**. In one embodiment, valve assembly **50** is configured such that at least a portion of a lower sealed region of a bag extends through the valve **53** such that the product dispensed by the bag does not contact the valve **53** during dispensing.

[**0066**] **FIG. 7** is an underside view of valve assembly **50**.

[**0067**] Referring now to **FIGS. 1A and 1B**, system **10** further includes a flexible bag **90** containing product to be dispensed. Bag **90** includes a product containment portion **92** and at least one spout receiving portion **93** in communication with the product containment portion. Product containment portion **92** is an interior region of the bag **90** defined by a top sealed support portion **94**, and at least two sealed sidewall portions **91**. Product containment portion is further defined by a lower sealed region **95** adjacent a bottom end **99** of the containment portion **92**. In one embodiment, the lower sealed region **95** includes at least one bag alignment indicator **97**, wherein the bag alignment indicator **97** allows alignment of the spout receiving portion **93** with a valve (e.g. valve **53**) to position the spout receiving portion to receive a dispenser spout. In one embodiment, the bag alignment indicator comprises a hole configured to mate with a bag alignment pin in valve assembly **50**. In one embodiment, bag **90** includes a single spout receiving portion **93**, while in another embodiment bag **90** includes two spout receiving portions **93**. In one embodiment, bag **90** is implemented as shown in U.S. Design patent application Ser. No. 29/203,851, filed Apr. 16, 2004. In another embodiment, bag **90** comprises a tube sealed at its ends. In another embodiment, bag **90** is a bag sealed at only a single side.

[**0068**] In order to dispense the product contained within bag **90**, a tear strip **96** is included. Tear strip **96** may be configured to be easily torn by hand, or may be configured to require a sharp implement to cut along the strip. In embodiments configured to be torn by hand, tear strip **96** may be perforated, or may comprise an area where lower sealed region **95** has reduced thickness relative to the remaining portions of lower sealed region **95**. Tear strip **96**, in one embodiment, is located so that the at least one bag alignment indicator **97** is disposed between the tear strip **96** and the product containment portion **92**. In one embodiment, tear strip **96** includes an area without perforations, such as an area created by seal jaws with a dulled portion.

[**0069**] In the embodiment illustrated in **FIG. 1A**, bag **90** includes two spout receiving portions **93** configured to match two valves **53**. In one embodiment, lower sealed region **95** comprises a triangular shape between the two spout receiving portions, such that any product contained in product containment portion **92** will be biased to flow to one of the two spout receiving portions.

[**0070**] In the embodiment illustrated in **FIG. 1B**, bag **90** includes a single spout receiving portion **93** disposed near an edge of lower sealed region **95**. In such an embodiment, lower sealed region **95** is configured with a slope **89** such that any product contained in product containment portion **92** is biased to flow to the spout receiving portion. In one embodiment, the slope is an angle between approximately 1 degree and approximately 5 degrees.

[**0071**] Spout receiving portion **93** is configured to dispense the product contained within product containment portion. In one embodiment, spout receiving portion **93** is configured to mate with a spout **505** (see **FIG. 5**) to receive the product and convey the product to a desired location. In one embodiment, the spout includes an angle to dispense the product to a location other than directly below the spout receiving portion. In one embodiment, the spout is configured in an approximate "s" shape. In one embodiment, the spout is carried within a hinged housing **510** external to the system **10**. In an embodiment, the hinged housing **510** comprises a hinged attachment configured to attach to valve assembly **50**. In another embodiment the spout is configured to dispense the product exterior to a housing carrying system **10**.

[**0072**] Top sealed support portion **94** is configured to provide a region for support. In one embodiment, top sealed support portion **94** is configured to be supported by top **22**. In another embodiment, roller frame **40** provides sufficient support when in a closed configuration. In one embodiment, top sealed support portion **94** is at an end of the food product containment portion opposite the lower sealed region **95**.

[**0073**] In one embodiment, bag **90** is constructed of a flexible plastic capable of preserving the condiment at room

temperature. In another example, bag **90** is a barrier bag. At least one of edges of the bag **94**, **95**, **91** are heat-sealed, and one or more openings spout receiving portions **93** are molded into the lower sealed region. In one embodiment, bag **90** comprises a flexible food grade plastic. In one embodiment, the bag comprises a bi-axially oriented nylon material laminated to an ethyl-vinyl-alcohol (EVOH) polyethylene or metallocene sealant. In another embodiment, the bag comprises a uni-axially oriented nylon or polypropylene laminated to an EVOH and then laminated to a linear low-density polyethylene (LLDPE) or metallocene sealant. Alternatively, the uni-axially oriented polypropylene or nylon can be laminated to a 5 to 7 layer EVOH-LLDPE sealant. In another embodiment, bag **90** comprises PVC, polystyrene, or high-impact styrene. Other embodiments include the use of linear low density blends as well as low density EVA blends.

[**0074**] In another embodiment, bag **90** is composed of a laminated material that provides uniform and consistent tearing properties at least in the region adjacent to and including the at least one spout receiving portion **93**. One exemplary embodiment of bag **90** having uniform and consistent tearing properties is composed of a three-ply laminated film. A first layer of the three-ply film is composed of 100 gauge (1 ml) uniaxially oriented polypropylene. The first layer is laminated to a second layer composed of 50 gauge (0.5 ml) biaxially oriented ethyl-vinyl-alcohol (EVOH). The second layer is laminated to 250 gauge (2.5 ml) linear low-density polyethylene.

[**0075**] In another embodiment, tear strip **96** is configured to include at least one locating hole to further guide tearing of the bag.

[**0076**] Another exemplary embodiment of bag **90** having the uniform and consistent tearing properties is composed of a two-ply laminated film. A first layer of the two-ply film is composed of 100 gauge (1 ml) uniaxially oriented polypropylene. The first layer is laminated to a second layer composed of 300 gauge (3.0 ml) EVOh/polyethylene.

[**0077**] In an exemplary embodiment, the system as described herein may be used to dispense condiments both in the "front of the store" and in the "back of store" using identical bags **90**. Operation of the system entails providing a system **10** and a bag **90** containing product to be dispensed through the system **10**. Roller assembly **40** is operated to configure roller assembly **40** into an open configuration. An upper portion of bag **90** is inserted between rollers **43**, **44** such that the majority of product is located between the rollers **43**, **44** and the lower sealed region **95**. Roller assembly **40** is then operated to configure roller assembly to a closed and locked configuration. Roller assembly **40** is placed adjacent top clip **30**, and if sufficient material of bag **90** is available for insertion into top clip **30**, top clip **30** is operated to assume an open configuration, at least a portion of the sufficient material is placed between the arms of top clip **30** and top clip **30** is then operated to assume a closed configuration. Valve assembly **50** is operated to assume an open position and the lower sealed region **95** is placed between front **51** and back **52**, such that at least one spout receiving portion mates with at least one valve **53**, and the valve **53** is located between any tear strip **96** and the spout receiving portion. In embodiments with bag alignment indicators, the bag alignment indicators **59**, **97** are also aligned. Valve assembly **50** is then operated to assume a closed, and locked, configuration. An operator may choose to ensure that valve **53** is in a closed configuration such that the product containment portion **92** is insulated from the tear strip **96**. Tear strip **96** is then torn, or a lower sealed portion is cut such that if valve **53** assumes an open configuration, product disposed in product containment portion **92** may be dispensed from the bag into the environment. In one embodiment, product is dispensed into a container, such as, for example, the container described in **FIGS. 3A and 3B**. In another embodiment, product is dispensed directly onto an area below valve **53**.

[**0078**] In another embodiment, bag **90** is loaded into assembly **10** by first opening the top clip and bottom, valve assembly. The rollers remain closed and in a substantially parallel configuration. The bag is positioned over the tangs and bag locators, and the valve assembly is closed over the bag. The top portion of the bag is fed through the rollers until a nip is formed. Once the nip is formed, a sufficient portion of the bag is available to clip into top clip. Having fully supported the bag, the bottom of the bag is torn or cut off to enable dispensing of product from the bag into a dispenser.

[**0079**] **FIG. 3A** illustrates a dispenser **310** comprising a reservoir **311** that contains the condiment, a pump **312** that releases the condiment in controlled quantities, and a handle **313** with a trigger **333** that actuates the pump in accordance with one embodiment of the invention. Pump **312** may also be referred to as a positive displacement pump.

[**0080**] The reservoir **311** has an open top **320**, sides **321**, and a bottom **322**. In one embodiment, the reservoir **311** is generally cylindrical, and the top **320** has a larger diameter than the bottom **322**. In some embodiments, the top **320** is sized to facilitate easy refilling of the reservoir **311**. In another embodiment, the dispenser **310** is substantially frusto-conical. Optionally, a cover (not shown) can be placed over the top **320** to reduce the likelihood of foreign matter falling into the reservoir **311**. Additionally, a cover may reduce dehydration of the contents of the reservoir.

[**0081**] **FIG. 3B** illustrates the bottom **322** of one embodiment of a reservoir **311** comprising 5 holes **323**. In other embodiments, the bottom **322** contains a plurality of holes **323**. Holes **323** permit the condiment to exit the reservoir **311**. The bottom **322** is sized and the holes **323** are spaced so that the dispenser releases the condiment onto a food product in a predetermined pattern, also called a diffusion pattern. Holes **323** may be arranged in any number of predetermined diffusion patterns. In one example, holes **323** are arranged at the vertices of a pentagon. In another example, holes **323** are arranged at the vertices of a square with an additional hole **323** at the center of the square.

[**0082**] The reservoir **311** is made, in one embodiment, of a single piece of a plastic that does not react with food products, is durable, and is easy to clean. In another embodiment, the reservoir **311** is constructed from a plurality of pieces that may be molded together or formed using any appropriate fabrication technique. In another embodiment, reservoir **311** comprises a high density polyethelene (HDPE) or other food grade plastic that is resistant to the contents of the reservoir. The embodiment shown in **FIG. 3B** incorporates a plurality of horizontal lines **324** on the walls of the reservoir **311** that indicate suggested minimum and maximum levels for the condiment in the reservoir. The horizon-

tal lines **324** are molded, in one embodiment, into the walls **321** of the reservoir **311**. In another embodiment, additional horizontal lines **324** are included to indicate other suggested fill levels, such as a level to fill at times during which the condiment likely will not be frequently used, such as, for example, late at night or during off-hours.

[**0083**] In one embodiment, handle **313** actuates pump **312**. Actuation of pump **312** controls the flow of condiment from the reservoir **311**. The handle **313** includes a fixed component **331** and a movable trigger **332**, as shown in **FIG. 3A**. In the embodiment shown in **FIG. 3A**, the fixed component **331** is molded as an integral part of the reservoir **311**. In another embodiment, fixed component **331** is hollow with an open bottom. Fixed component **331** and trigger **332** are configured so that trigger **332** actuates pump **312** and mates and is accepted into a hollow portion of the fixed component **331**. In one embodiment, the fixed component **331** extends from the reservoir **311** at an angle that allows the dispenser to be disposed above a target with bottom **322** of the dispenser level with the food product. Thus, fixed component **331**, in an embodiment, extends from reservoir **311** at an angle between 0 and 90 degrees. In such an embodiment, the operator's hand may attain an ergonomically neutral position.

[**0084**] The trigger **332** is functionally connected to the pump **312**, and it is located on the handle **313**. In one embodiment, an operator can hold the dispenser **310** and actuate the pump **312** with one hand. Several alternative structures exist that would perform the function of the trigger **332**, but the trigger **332** shown in the drawings includes a lower arm **333**, an axle **334**, and an upper arm **336**. The lower arm **333** extends below the fixed component **331** of the trigger **332** and between the fixed component **331** and the reservoir **311**, where an operator can apply force to the lower arm **333** and actuate the trigger **332**. Axle **334** operably and rotatably connects trigger **332** with fixed component **331**. In one embodiment, axle **334** is substantially cylindrical and rotates within bearing pockets formed in the fixed component **331** of the handle **313**. In one embodiment, the bearing pockets are substantially the same diameter as axle **334**. In one embodiment, the bearing pockets are slotted to allow for removal of the arm. Upper arm **336** extends from axle **334** to the topmost element of the pump **312**. When force is applied to lower arm **333** of trigger **332**, trigger **332** rotates about the axle **334**, moving upper arm **336** downward, and actuating pump **312**. In the embodiment illustrated in **FIG. 3A**, trigger **332** comprises finger grips configured to match the contours of a human hand. In other embodiments, trigger **332** is smooth.

[**0085**] In one embodiment, trigger **332** is configured so that the pressure applied to trigger **332** determines which of at least two volumes of product is released. For example, a two position trigger may dispense 5 grams of product if 5 foot pounds of pressure is applied to the trigger, and dispense 9 grams of product if more than 6 foot pounds of pressure is applied. The configuration actuates the pump to dispense a default volume of product, i.e. 5 grams in the above example, or a larger volume if desired. Such a configuration may be desirable, for instance, if two similar products are to receive the product. For example, a restaurant may serve two similar hamburgers—a hamburger featuring a quarter pound of hamburger and a hamburger featuring a half pound of hamburger. In this example, the quarter pound hamburger may receive a smaller volume of ketchup than the half pound hamburger, and this may be selected by the amount of force applied to the trigger. In one embodiment, the configuration of trigger **332** comprises a spring loaded stop block, such as female block assembly **391**.

[**0086**] In one embodiment, fixed element **331** includes a female block assembly **391** configured to communicate with a male block assembly **390** of trigger **332**. Male block assembly **390** mates with female block assembly **91** to stop trigger **332** in an actuated position.

[**0087**] Pump **312** comprises an upper column, a lower column, a piston **342** and a cylinder **343**. As shown in **FIG. 3A**, upper arm **336** includes a cavity that receives the upper end of the upper column **340**. The upper column **340** extends from the cavity **337** in the upper arm **336** to the lower column. The bottom of the upper column **340** is closed, and rests atop the lower column.

[**0088**] A vertical wall extends around the circumference of the bottom. Opening **345** is sized to accept bottom **347** and vertical wall **344**, and is configured so that the edge of the vertical wall **344** connects with the edge of the piston **342**. In operation, the vertical wall **344** forms an interface with the opening **345** of the piston **342** when trigger **332** is squeezed. Wall **344** severs or compresses any particulate matter that would interfere with an interface between upper column **340** and the piston **342**. In one embodiment, vertical wall **344** is thinner than the reservoir **311**.

[**0089**] Piston **342** rests in the upper chamber **348** of the pump cylinder **343**, as shown in **FIG. 3A**. Piston **342** includes a central hole **349** through which the lower column **341** extends. Reservoir **311** and upper chamber **348** communicate through a plurality of piston holes **346**. The piston holes **346** have walls that are chamfered so as to remove sharp edges at the top and bottom surfaces of the piston **342**.

[**0090**] Pump cylinder **343** rests at the bottom of the reservoir **311**. In one embodiment, pump cylinder **343** is sized to form an interface between the exterior of the cylinder **343** and the bottom of the reservoir **311**. In one embodiment, the interface created between the exterior of cylinder **343** and the bottom of reservoir **311** prevents the condiment from leaking around the cylinder. In addition to the upper chamber **348**, described above, pump cylinder **343** includes a lower chamber **350** and a partition **351** that separates the upper chamber from the lower chamber. Like the piston **342**, the partition **351** has a central hole **352** through which the lower column **341** extends and a plurality of holes **353**. In one embodiment, the holes **353** are chamfered to remove sharp edges at the top and bottom surfaces of the partition. A cylindrical vertical wall **354** extends below the partition **351** and forms an interface with the bottom plate **355** of the lower column **341**. In one embodiment, vertical wall **354** is thinner than the walls of the reservoir **311**. In operation, the vertical wall **353** severs or compresses any particulate matter in the condiment, thereby improving the interface between the pump cylinder **343** and the bottom plate **355** of the lower column **341**.

[**0091**] As shown in **FIG. 3A**, the top of the lower column **341** is in contact with the bottom of the upper column **340**. The lower column **341** has a bottom plate **355** that fits into the thin vertical wall **354** of the pump cylinder **343** to

interface, as described above. Upper plate **356** of lower column **341** is positioned below the piston **342**. The upper plate **356** is positioned so as to engage the piston **342** but not to obstruct the piston holes **346**. A spring (not shown) biases lower column **341** to form a seal between bottom plate **355** and pump cylinder **343**. The spring further biases lower column **341** so that the piston **342** is located near the top of the upper chamber **348** when the trigger **332** is not actuated.

[**0092**] The operation of the embodiment of the invention shown in **FIG. 3A** is as follows. When the trigger **332** is not depressed, the lower column **341** is positioned so that the bottom plate **355** forms a seal with the vertical walls **354** of the pump cylinder **343**. The piston **342** is positioned at the top of the upper chamber **348**, and a gap exists between the piston and the upper column **340**. In this position, the condiment can flow from the reservoir **311** through the gap between the piston **342** and the upper column **340** and through the piston holes **346** into the upper chamber **348** of the pump cylinder **343**. The seal between the bottom plate **355** and the vertical walls **354** of the pump cylinder **343** prevents the condiment from flowing into the lower chamber **350** and exiting through the holes **323** in the bottom **322** of the dispenser **310**.

[**0093**] On actuation of trigger **332**, the vertical wall **344** moves downward and engages with wall **345** of the piston **342**, forming an interface that prevents further condiment from flowing into the upper chamber **348**. The action of the trigger **332** also moves the lower column **341** downward, which forms a gap between the bottom plate **355** and the pump cylinder **343** due to pressure of the condiment, permitting condiment in the upper chamber **348** to flow through the holes **353** of the pump partition **351** and out the holes **323** in the bottom **322** of the dispenser. Further action of the trigger **332** depresses the piston **342**, thereby forcing the condiment in the upper chamber **348** out of the dispenser.

[**0094**] When the trigger **332** is released, lower column **341** moves upward as biased by the lower spring, restoring the interface between the bottom plate **355** and the vertical walls **354** of the pump cylinder **343**. The upper plate **356** engages the piston **342** and moves piston **342** upward to its original position near the top of the upper chamber **348**. The upper column **340** is biased upward by the upper spring, restoring the gap between the piston wall **345** and the vertical wall **344**. In this position, condiment flows into the upper chamber **348** but not the lower chamber **350**, and the dispenser **310** is ready to be used again.

[**0095**] A container in accordance with the embodiments illustrated in **FIGS. 3A and 3B** may be constructed of modular components that may be disassembled and reassembled.

[**0096**] **FIG. 14** illustrates another embodiment of a dispenser in accordance with another aspect of the invention. **FIG. 14** illustrates a dispenser **1400** including a dual knife blade pump assembly with a check valve.

[**0097**] Dispenser **1400** includes a trigger **1405** operably connected to rod **1410**. In one embodiment, trigger **1405** is manufactured as a unitary piece, including protrusions configured to mate with holding gaps **1407** manufactured into a receptacle **1408** of grip **1409**. Grip **1409** further includes stop block **1475**. Stop block **1475** is configured to control the distance that can be traveled between trigger **1405** and grip **1409**. In one embodiment, stop block **1475** is removable and configured to control the amount of product dispensable with dispenser **1400**. For example, one stop block is configured to allow trigger **1405** to displace a certain distance to dispense 5 grams of product. In another example, a different stop block is configured to allow trigger **1405** to displace a different distance to dispense 3 grams of product. In another example, stop block **1475** is configured with a spring load to enable multiple levels of product dispensing. For example, a spring loaded stop block is configured so that displacing trigger **1405** until the handle meets the resistance from the spring dispenses 5 grams of product, while continuing the displacement and overcoming the spring resistance results in dispensing 7 grams of product. In other embodiments, stop block **1475** is configured to mount to trigger **1405**.

[**0098**] Trigger **1405** is configured to slide through receptacle **1408**, such that when properly assembled trigger **1405** is disposed between handle portion **1409** and the body of container **1420**. This configuration is illustrated in **FIG. 17** (trigger **1405** in a non-deployed position) and **18** (trigger **1405** in a deployed position). Operation of trigger **1405** moves handle closer or farther away from a lower surface **1498**. In other words, if a human holds dispenser **1400** in their right hand, in a 'hand-shaking' fashion, the user's fingers surround trigger **1405** while a palm of the hand surrounds grip **1409**. Application of pressure by the user's fingers moves the trigger **1405** about axis **1493** and closer to handle portion **1409** in "gripping" fashion. In one embodiment, trigger **1405** includes finger guard **1404** configured to facilitate handling dispenser **1400**. In another embodiment, trigger **1405** includes rest position blocks **1401** configured to limit trigger upstroke.

[**0099**] Dispenser **1400** includes a container **1420**. Container **1420** includes a containment portion **1421** configured to hold product within dispenser **1400**. Container **1420** further includes grip **1409**, and at least one wing **1423**. In one embodiment, wing **1423** is configured as a protrusion extending outward from an outer wall of the containment portion **1421** and substantially perpendicular to an axis extending through a centerline **1426** of the product area. In one embodiment, the at least one wing **1423** is shaped to mate with a wing receptacle of a dispenser support (**FIG. 16D**). In one embodiment, wing **1423** comprises a vertical ridge. In one embodiment, wing **1423** is any structure configured to guide placement of the dispenser. In one embodiment, at least one wing **1423** is manufactured integrally with container **1420**. In one embodiment, wing **1423** is configured to prevent 'painting' or spreading of the contents of a dispenser upon a roller assembly or a housing supporting the roller assembly. In one embodiment, a wing **1423** reduces mess involved in operation of the dispenser, facilitating clean up. In another embodiment, container **1420** includes visual indicators **1422** for at least two fill levels. For example, container **1420** includes a visual indicator for a minimum fill level, a maximum fill level and a "night" fill level. Container **1420** further includes dual knife blade pump assembly **1440**, described in further detail in **FIG. 15** below.

[**0100**] Trigger **1405** is configured to rotate about an axis **1493** between the protrusions when fitted into the gaps **1408**. Thus, in operation, trigger **1405** rotates about axis **1493** to

bring trigger **1405** closer or farther from grip **1409**. Trigger **1405** is, in one embodiment, configured to actuate the dual knife blade pump assembly.

[**0101**] Dispenser **1400** further includes a removable cap **1430**. In one embodiment, removable cap is configured to be screwed on to a cap portion **1431** of container **1420**. Cap **1430** includes a top surface **1432** and bottom surface **1433**. Top surface **1432** is configured to be in contact with product prior to dispensing the product, while bottom surface **1433** is opposite top surface **1432**. Cap **1430** includes at least one hole **1437** (**FIGS. 16A, 16B**) extending through the cap **1430** and extending from top surface **1432** through to bottom surface **1433** and configured to dispense the product contained in container **1420**. The holes are configured to create a diffusion pattern, and each hole has a diameter configured to affect the diffusion pattern of the product and may also be configured to dispense particulates contained in the product. For example, a cap **1430** configured to dispense Thousand Island dressing must have holes with a diameter sufficient to dispense the particulates contained in Thousand Island dressing. In another embodiment, cap **1430** includes single filers disposed on top surface **1432** to direct product flow through the holes and to direct any particulates to line up single file for dispensing through the holes. See, **FIG. 16E**, below. In one embodiment, the single filers are manufactured into top surface **1432**. In another embodiment, top surface **1432** is chamfered to improve product flow. In another embodiment, dispenser **1400** is one element of a system to dispense product, the system further including a plurality of matched removable caps. In embodiments featuring a plurality of matched removable caps, the caps may also be matched with stop blocks to control the amount of product dispensed.

[**0102**] **FIG. 16A** illustrates one embodiment of a cap **1430** in accordance with one embodiment of the invention. As illustrated in **FIG. 16A**, cap **1430** features 5 holes **1437**. **FIG. 16B** illustrates one embodiment of a cap **1430** in accordance with one embodiment of the invention. As illustrated in **FIG. 16B**, cap **1430** features 3 holes **1437**. **FIG. 16E** illustrates another embodiment of a cap **1430** in accordance with another aspect of the invention. **FIG. 16E** shows top surface **1432** of cap **1430**, including 3 holes **1437** and single filers **1499**. In one embodiment, single filers **1499** comprise a groove chamfered into top surface **1432** to guide movement of particulate matter through holes **1437**. Single filers **1499** comprise a groove with increasing depth, i.e., a deeper cut through cap **1430**, approaching holes **1437**. **FIG. 16E** additionally illustrates screw threads **1998** cut or formed into cap **1430** for attachment to container **1420**, although any other appropriate means may be used for attachment, including snap fitting, hinge or bayonet style attachments.

[**0103**] **FIG. 16C** illustrates a top view of a dispenser support **1686** in accordance with one aspect of the invention. Dispenser support **1686** includes wing receptacle **1667** formed within the dispenser support. Wing receptacle **1667** is configured to engage with a wing portion **1423** of dispenser **1400**. **FIG. 16D** illustrates a perspective view of dispenser support **1686** in accordance with one aspect of the invention. **FIG. 16D** further shows wing receptacles **1667** formed in dispenser support **1686**. Wing receptacles **1667** include wing engagement portion **1668** formed within the dispenser support **1686**. As shown in **FIGS. 16C** and **16D**, dispenser support **1686** is configured with two wing receptacles **1667**. It is apparent that any number of wing receptacles **1667** may be formed in a dispenser support **1686**. In one embodiment, wing engagement portion **1668** includes wing locator **1669** configured to indicate that a product containment portion, i.e. product containment portion **1421**, is in its desired position, and that dispenser **1400** is appropriately positioned. In one embodiment, dispenser support **1686** is configured to attach to a housing, such as housing **5**, below a dispenser, such as the roller assembly previously discussed.

[**0104**] **FIG. 15** illustrates one embodiment of a dual knife blade pump assembly **1440** in accordance with one embodiment of the invention. Trigger **1405** actuates the pump assembly, and in one embodiment, is implemented as trigger **1405** as described above with reference to **FIG. 14**.

[**0105**] Trigger **1405** operably connects to rod **1510**. In one embodiment, trigger **1405** attaches to rod **1510** with a snap, although other connection methods are anticipated and included in this disclosure. Rod **1510** includes a lower region **1513**. Lower region **1513** includes first knife blade receptacle **1520**. First knife blade receptacle **1520** is configured to mate with first knife blade **1530**. In one embodiment, first knife blade receptacle **1520** is a chamfered surface formed in lower region **1513** and configured to closely meet with first knife blade **1530**. First knife blade **1530** and first knife blade receptacle **1520** forms an upper knife blade assembly. Manufacturing tolerances for the upper knife blade assembly should be tight, as engagement between first knife blade **1530** and first knife blade receptacle **1520** is especially beneficial for the invention. It should be noted that although metallic knife blades may be used to create a relatively sharp knife edge, metallic knife edges are not necessary, and first knife blade **1530** and first knife blade receptacle **1520** may be molded from plastics or other material as a unitary part.

[**0106**] Piston **1540** includes first knife blade **1530** and includes at least one product opening to allow product to flow from around rod **1510** and through piston **1540** to cylinder **1550**. In one embodiment, each product opening is chamfered to minimize the number of surfaces with a plane perpendicular to an axis **1501** running through a centerline of dual knife blade pump assembly **1440**. Piston **1540** slides along pin **1543**. In one embodiment, pin **1543** is made as unitary construction with rod **1510**, while in other embodiments, pin **1543** is a separate piece configured for operable attachment to rod **1510**. Although pin **1543** is shown in **FIGS. 14 and 15** as disposed between rod **1510** and piston **1540**, in one embodiment, pin **1543** is disposed between piston **1540** and spring **1545**. This embodiment is illustrated in **FIG. 16F**.

[**0107**] It should be noted that first knife blade **1530** could be disposed upon rod **1510** and that first knife blade receptacle **1520** could be configured on piston **1540**, and that such a configuration is considered the equivalent.

[**0108**] First knife blade **1530** is disposed on an upper surface **1531** and configured to mate with first knife blade receptacle **1520**. Piston **1540** further includes a lower surface **1532** including an upper spring seat **1537**. As shown in **FIG. 16F**, upper spring seat **1537** is disposed on pin **1543**. Returning to **FIG. 15**, upper spring seat **1537** is configured to meet with spring **1545** so as to provide a surface resistive

to forces applied by spring **1545**. Forces may be applied to spring **1545** by upper spring seat **1537** or by lower spring seat **1548**.

[**0109**] Cylinder **1550** surrounds spring **1545** and is operably disposed within product portion **1495** of **FIG. 14**. Cylinder **1550** is configured for sliding engagement within product portion **1495** such that cylinder **1550** may be easily removed from product portion **1495**, e.g. for cleaning. In one embodiment, the inner diameter of product portion **1495** is substantially the same as the outer diameter of cylinder **1550** for a snug fit. Cylinder **1550** includes an inner wall and an outer wall. The inner wall of cylinder **1550** includes lower spring seat **1548**. In one embodiment, lower spring seat **1548** comprises a section of the inner wall with a smaller inner diameter creating a surface substantially perpendicular to axis **1501** wide enough to support spring **1545**. Cylinder **1550** further includes openings **1555** configured to allow fluidic communication between an area surrounding spring **1545** and valve **1560**. In one embodiment, cylinder openings **1555** are configured without surfaces perpendicular to axis **1501**. In one embodiment, each surface of cylinder **1550** is chamfered. In another embodiment, each cylinder openings **1555** includes single filers chamfered to channel any particulate matter through a cylinder openings **1555**. Cylinder **1550** further includes valve guide **1565** configured to guide displacement of valve **1570** along axis **1501**. Cylinder **1550** further includes second knife blade **1580** configured to mate with valve knife blade receptacle **1590**. In one embodiment, cylinder openings **1555** comprise holes.

[**0110**] Valve **1570** displaces along axis **1501** to dispense product, guided by valve guide **1565**. Valve **1570** further includes second knife blade receptacle **1590** and bottom spring seat **1595** configured to provide a surface for spring **1575**. The combination of second knife blade **1580** and second knife blade receptacle **1590** forms a lower knife blade assembly. The upper knife blade assembly and lower knife blade assembly form a dual knife blade assembly. Manufacturing tolerances for the lower knife blade assembly should be reasonably tight, as engagement between second knife blade **1580** and valve knife blade receptacle **1590** is especially beneficial for the invention. It should be noted that although metallic knife blades may be used to create a relatively sharp knife-edge, metallic knife-edges are not necessary, and second knife blade **1580** and second knife blade receptacle **1590** may be molded from plastics or other material as a unitary part.

[**0111**] It should be noted that second knife blade **1580** could be disposed upon valve **1570** and that second knife blade receptacle **1590** could be configured on cylinder **1550**, and that such a configuration is considered the equivalent.

[**0112**] Operation of dispenser **1400** is described as follows, referencing **FIGS. 14, 15, 17** and **18**. In operation, dispenser **1400** operates to dispense controlled amounts of a fluid, such as a condiment. For example, dispenser **1400** dispenses controlled amounts of tartar sauce, ketchup, or Thousand Island dressing. The dual knife blade assembly of pump **1440** is especially well suited for fluids containing particulates, i.e., Thousand Island dressing, although the pump is equally suited for fluids that do not contain particulates, i.e., ketchup.

[**0113**] When dispenser **1400** has no product contained in cylinder **1550**, the dual knife blade pump assembly must be primed for its first use. It should be noted that so long as the amount of product in containment portion **1421** does not fall below a certain "minimum level," no further priming is necessary until dispenser **1400** is emptied of product again, such as for cleaning.

[**0114**] Priming the dual knife blade pump assembly comprises filling cylinder **1550** with product. Prior to priming, trigger **1405** sits at rest in a non-deployed position. Actuation of trigger **1405** to operate dispenser **1400** moves trigger **1405** closer to grip **1409**. Movement of trigger **1405** displaces rod **1510** axially along axis **1501**. When rod **1510** is at its uppermost position (trigger **1405** is in its non-deployed position), product in containment portion **1421** flows around lower region **1513** and through holes **1531**, filling cylinder **1550** with product. When space in the pump assembly has been filled with product, the dual knife blade pump assembly is said to be primed.

[**0115**] After priming, dispenser **1400** is set to dispense product. Dispenser **1400** is shown in a configuration ready to dispense product in **FIG. 17**, and in a deployed configuration in **FIG. 18**. Again, rod **1510** is displaced along axis **1501** by trigger **1405**. Displacement of rod **1510** in direction A moves piston **1540** in direction A after the first knife blade engages, and forces product within cylinder **1550** through holes **1565** and through valve **1570**, over knife blade receptacle **1590** and through cap **1430**. As piston **1540** comes in contact with rod **1510**, first knife blade receptacle **1520** meets first knife blade **1530**. Contact between first knife blade receptacle **1520** and first knife blade **1530** creates a seal, and effectively or substantially severs or compresses any particulate that is disposed between the complementary surfaces of first knife blade receptacle **1520** and first knife blade **1530**. Movement of piston **1540** in direction A loads spring **1545**. Further, movement of the product over valve **1570** loads spring **1575**.

[**0116**] Having dispensed the product contained within cylinder **1550**, trigger **1405** returns to its non-deployed position, displacing rod **1510** in direction B. Displacement of rod **1510** effectively breaks the interface between first knife blade receptacle **1520** and first knife blade **1530**. The removal of the force applied in direction A removes the forces from spring **1545** and dispensing the product reduces the forces from spring **1575**, allowing each spring to unload its loaded force, biasing rod **1510** in direction B. Unloading spring **1575** moves valve **1570** in direction B until second knife blade **1580** and second knife blade receptacle **1590** meet. The contact between second knife blade **1580** and second knife blade receptacle **1590** creates an effective seal, and effectively or substantially compresses or severs any particulate that is disposed between the complementary surfaces second knife blade **1580** and valve knife blade receptacle **1590**. Product then flows into cylinder **1550**, as valve **1570** has closed, and piston **1540** has separated from cylinder **1550** moving through the product, creating a gap between first knife blade receptacle **1520** and first knife blade **1530**.

[**0117**] When dispensing relatively viscous products, suck back created by movement of the piston **1540** assists in moving the valve and releasing forces from spring **1575**. Additionally, suck back will assist in reducing undesired product drip from the removable cap.

[**0118**] During operation as described herein, when the valve is open, the first knife blade **1530** engages with first

knife blade receptacle **1520**. Conversely, when the valve is closed, the second knife blade **1580** engages with second knife blade receptacle **1590**. In one embodiment, engagement between the respective knife blades and knife blade receptacles creates a seal.

[**0119**] In one embodiment, stop block **1475** and cap **1430** are a matched pair, such that stop block **1475** is configured to be removable from grip **1409**. For example, both stop block **1475** and cap **1430** are colored red for a dispenser configuration to dispense ketchup. In another example, both stop block **1475** and cap **1430** are colored white for a dispenser configuration to dispense tartar sauce. In other embodiments, stop block **1475** and cap **1430** are inscribed with writing to indicate either a product to be dispensed, or an amount of product to be dispensed. In another embodiment, the trigger is configured to actuate the pump assembly. In yet another embodiment, the trigger includes a stop block configured to control the amount of product dispensed with a single pump actuation.

[**0120**] In another embodiment, stop blocks **1475** are a portion of the trigger, and the triggers are matched to the removable cap.

[**0121**] **FIG. 8** illustrates one embodiment of a housing for a system **10** in accordance with one aspect of the invention. As illustrated in **FIG. 8**, housing **810** includes a hinged door **820** providing selective access to an interior portion (not shown) of housing **810**. Housing **810** further includes a base portion **830**, support portion **840** and product portion **850**. Product portion **850** includes an interior region configured to entirely enclose system **10** as described in **FIGS. 1 and 2** with a bag **90** as described in **FIGS. 1A and 1B**. Housing **810** further includes a gap **860** configured to be in sliding engagement with actuator assembly **49** such that as product is dispensed from bag **90**, actuator **46** descends along gap **860**. Base portion **830** may include spill portion **831**. As better illustrated in **FIG. 5**, housing **810** provides access for a spout **505** to dispense the product contained within bag **90**.

[**0122**] **FIG. 9** illustrates one embodiment of a "front-of-store" system in accordance with one embodiment of the invention. **FIG. 9** illustrates a housing **905** for enclosing system **10** as described above. Housing **905** includes hinged doors **920** and **921** rotatable between a closed configuration wherein doors **920** and **921** abut each other and an open configuration wherein doors **920** and **921** are not abutting. Housing **905** further includes a base portion **930** and product portion **950**. Doors **920** and **921** include a locking device **925** configured to maintain doors **920** and **921** in a closed configuration. As depicted in **FIG. 9**, locking device **925** comprises a slotted configuration, although those of ordinary skill in the art will readily recognize a number of other locking devices **925** that would be operable to maintain doors **920** and **921** in a closed configuration. Such other locking devices may comprise hook and loop fasteners (e.g. Velcro®-brand fasteners), zippers, snaps, screws, rivets, latches or other similar devices. Locking device **925** may also comprise means to secure a padlock or similar security device to the locking device **925** to reduce incidence of unauthorized access to product portion **950**. A cup dispenser may be affixed to a side of the housing **905** to dispense souffle cups. The dispenser may dispense paper souffle cups, as known in the art, or modified cups as described below.

[**0123**] Housing **905** further includes support clip **945**. Support clip **945** is configured to mate with spout housing **1005** (described below in **FIG. 10**). Spout housing **1005** slides into locking engagement with support clip **945** to position spout **1010** in a predetermined position.

[**0124**] In other embodiments, housing **905** includes a single door configured to enclose the product portion while in a closed configuration and allow access to the product portion while in an open configuration. A locking device in such an embodiment would be configured to lock the door to the product portion.

[**0125**] **FIG. 10** illustrates one embodiment of spout housing **1005** mated with support clip **945** of **FIG. 9** in accordance with one embodiment of the invention.

[**0126**] **FIG. 11** illustrates one embodiment of support clip **945** in accordance with one embodiment of the invention.

[**0127**] **FIG. 12** illustrates one embodiment of spout housing **1005** in accordance with one aspect of the invention. Spout housing **1005** comprises two wings **1220** and **1230**, hingedly attached at hinge **1250** for rotation between an open configuration (pictured in **FIG. 12**) and a closed configuration (pictured in **FIG. 10**). Spout housing **1005** may further include spout locator **1240** configured to accept spout **1010** (**FIG. 10**) and at least a portion of bag **90** (**FIG. 10**).

[**0128**] Spout **1010** is configured so that only spout **1010** is in contact with the contents of bag **90** in one embodiment. Thus, in such embodiments, bag **90** and spout **1010** are configured so that the interior of bag **90** is in fluidic communication with an interior of spout **1010**.

[**0129**] **FIG. 13** illustrates an alternative embodiment of a valve assembly, in accordance with another aspect of the invention. Valve assembly **50**, as illustrated in, e.g., **FIG. 2A**, comprises a t-shaped groove to mate with a support rail. **FIG. 13** illustrates valve assembly **1349** comprising a straight walled groove **1360**, such that valve assembly **1349** is configured to not move laterally when in position—placing or removing valve assembly **1349** into a supported position along a support rail requires angling valve assembly (and assembly **10**) to allow clearance of the sidewall.

[**0130**] In another embodiment, valve assembly **50** includes a pump to meter the amount of product dispensed from the bag. In one embodiment the pump is a peristaltic pump. In one embodiment, the peristaltic pump meters out 2 grams of ketchup. In another embodiment, the peristaltic pump meters out an amount of product calibrated to fill a souffle cup. The peristaltic pump may be powered, or rely on gravitational forces for measurements. In other embodiments, the assembly **10** includes a peristaltic pump that is not a part of valve assembly **50**. In another embodiment, the pump is a peristaltic pump.

[**0131**] A modified soufflé cup receives the output of the bag in one embodiment. Such a soufflé cup comprises a cup that has a substantially circular bowl shape, with its width greater than its height. In one embodiment, the modified cup includes an arced dipping angle created by the base of the cup as it flows into the walls of the cup. In one embodiment, the modified cup includes a flanged portion of the wall at its terminus. Such a modified cup may provide a user with the impression of holding a great deal of product, while holding a smaller amount than prior art paper soufflé cups known in the art. The cup may comprise polylactic acid, paper, plas-

tics, or any other material known. The cups may be stored in a container affixed to the side of housing **905** as illustrated in, e.g. **FIG. 9**. The container for the modified cups may include a bottom portion to support the cups at their base, rather than at a flanged upper portion of the cup, wherein the bottom portion includes a groove configured to allow a user to remove a single cup at a time by angling the cup for removal. In addition to the substantially circular bowl shape, a number of other shape configurations are possible, including square, diamond, triangular, or other polygonal configurations, each of which is encompassed by this disclosure. In one embodiment, the shape of the soufflé cup is configured to minimize product waste during use.

[**0132**] Hinged attachments described herein may comprise any number of known hinge assemblies. For example, a hinged attachment includes a pin inserted through the hinged parts, and the hinged parts rotate about the axis of the pin. In another example, the hinge is externally affixed to the devices, such that the devices rotate about the axis of the external hinge. External hinges may be affixed to the device using known means, such as adhesives, screws, hook and loop fasteners such as Velcro-brand fasteners, etc. Thus, the components of hinged attachments may be integral with other structures.

[**0133**] Those of ordinary skill in the art will readily recognize that bag **90** may contain any number of consumer and commercial products. Bag **90**, for example, may contain food products, such as ketchup, mustard, and other condiments. In another example, bag **90** may contain sanitizers, soap or other cleaning products. In another example, bag **90** may contain healthcare products. In another example, bag **90** contains salad dressing or pasta sauces. In another example, bag **90** contains glue. In another example, bag **90** contains pancake batter, or an egg batter. In another example, bag **90** contains chemicals or other industrial products.

[**0134**] Those of ordinary skill in the art will readily recognize that the parts of system **10** other than bag **90** may comprise any appropriate material or materials. Thus, the structural components, such as frame **20**, top clip **30**, roller frame **40**, valve assembly **50**, housing **5** and dispenser **15** may be plastic, PVC plastic, metal, steel or any other appropriate material or combination of materials. In one embodiment, the gripping connections between the front of an assembly or clip may include steel portions mating with plastic portions of the back of the assembly or clip. In another embodiment, track **26** comprises stainless steel or similar material.

[**0135**] One embodiment of the invention includes the use of more than one system **10** in a modular system. Using a plurality of systems **10** in a modular system allows the operator to provide a plurality of condiments, for example, in a single location. Modular systems may provide a smaller footprint, conserving space utilization.

[**0136**] **FIG. 19** illustrates one embodiment of a method **1900** for dispensing particulate condiment in accordance with one aspect of the invention.

[**0137**] Method **1900** begins at step **1910**. At step **1920**, a pump cylinder is filled with particulate condiment to a primed volume. In one embodiment, the pump cylinder is implemented as cylinder **1550** described above for **FIGS. 14, 15, 17** and **18**. In another embodiment, the pump cylinder is a portion of a dual knife blade pump assembly as described above.

[**0138**] After priming the pump, method **1900** cuts the particulates within the particulate condiment to provide a cylinder cap at step **1930**. In one embodiment, cutting the particulates is implemented by engaging first knife blade **1530** and first knife blade receptacle **1520**. In one embodiment, the cylinder cap is implemented with piston **1540**.

[**0139**] Having cut the particulates, method **1900** dispenses the particulate condiment from the filled pump cylinder in step **1940**. In one embodiment, the particulate condiment is dispensed through removable cap **1530** by opening valve **1570**.

[**0140**] Having dispensed the particulate condiment, method **1900** cuts particulates within the particulate condiment to provide a cylinder floor in step **1950**. In one embodiment, cutting the particulates comprises engaging second knife blade **1580** with second knife blade receptacle **1590**. In one embodiment, closing the valve **1570** creates the cylinder floor.

[**0141**] **FIG. 20** illustrates one embodiment of a method **2000** for dispensing particulate condiment in accordance with one aspect of the invention.

[**0142**] Method **2000** begins at **2010**. A wing portion of a dispenser is engaged with a wing receptacle, i.e. **1667**, formed in a dispenser support, i.e. **1686** at step **2020**. In one embodiment, the dispenser is implemented as dispenser **1400**. In another embodiment, the wing portion is implemented as wing **1423**.

[**0143**] Having engaged the dispenser with a wing receptacle, the dispenser is filled with particulate condiment at step **2030**, and the dispenser is disengaged from the wing portion at step **2040**.

[**0144**] After disengaging the dispenser, the particulate condiment is dispensed in a predetermined condiment volume while cutting particulates in the particulate condiment in step **2050**. In one embodiment, predetermined condiment volume is dispensed in an amount determined by a matched set of stop blocks and removable caps. In another embodiment, the predetermined condiment volume is determined by a volume of a pump cylinder, such as cylinder **1550**. In another embodiment, cutting particulates is performed by engaging first knife edge, i.e. **1530**, with first knife blade receptacle, i.e. **1520**, and by engaging second knife edge, i.e. **1580**, with second knife blade receptacle, i.e. **1590**.

[**0145**] **FIG. 21** illustrates one embodiment of a system **2100** for dispensing condiments. System **2100** includes dispenser **1400** supported in housing **5** by wing receptacle **1686**, and disposed in a dispensing position adjacent roller assembly **10** supporting bag **90**. As shown in **FIG. 21**, a dispenser system includes a roller assembly supporting a flexible bag, and a dispenser positioned below the flexible bag and positioned to be filled by the flexible bag, the dispenser including a pump assembly having first and second blades to compress particulates within a particulate condiment.

[**0146**] In another embodiment, a dispenser is included in a system for dispensing particulate condiment. The system includes a dispenser including a wing portion. In one embodiment, the dispenser is implemented as dispenser **1400**, and wing portion is implemented as wing **1423**. The system further includes a pump assembly having first and

second blades to cut particulates within the particulate condiment. In one embodiment, the pump assembly is implemented as pump **1440**, and the first and second blades are implemented as first knife blade **1530** and second knife blade **1580**.

[**0147**] As used herein, the term "cutting" includes compressing, severing, squeezing or similar actions that may or may not result in division of an object.

[**0148**] While the embodiments of the invention disclosed herein are presently considered to be preferred, various changes and modifications can be made without departing from the spirit and scope of the invention. The scope of the invention is indicated in the appended claims, and all changes that come within the meaning and range of equivalents are intended to be embraced therein.

What is claimed is:

1. A pump comprising:

a rod including a first knife blade receptacle, a cylinder including a second knife blade receptacle and a second knife blade, a piston movable within the cylinder having a first knife blade and a valve having a second knife blade receptacle, wherein when the valve is open the first knife blade engages with the first knife blade receptacle and when the valve is closed the second knife blade engages with the second knife blade receptacle.

2. A dispenser comprising:

a container including a containment portion and a handle portion; and

a pump assembly received in the containment portion, the assembly including a rod including a first knife blade receptacle, a cylinder including a second knife blade receptacle, a piston movable within the cylinder having a first knife blade and a valve having second knife blade, wherein when the valve is open the first knife blade engages with the first knife blade receptacle and when the valve is closed the second knife blade engages with the second knife blade receptacle.

3. The dispenser of claim 2 wherein the container further includes a wing portion configured to engage a wing receptacle of a dispenser support.

4. The dispenser of claim 2 further comprising a removable cap including at least one opening.

5. The dispenser of claim 4 wherein the removable cap comprises at least one single filer configured to lead at least one opening.

6. The dispenser of claim 2 further comprising a trigger configured to actuate the pump assembly.

7. The dispenser of claim 1 wherein the trigger includes a stop block configured to control the amount of product dispensed with a single pump actuation.

8. The dispenser of claim 7 wherein the stop block is spring loaded.

9. The dispenser of claim 2 wherein engagement of the first knife blade with the first knife blade receptacle creates a seal.

10. The dispenser of claim 2 wherein engagement of the second knife blade with the second knife blade receptacle creates a seal.

11. A method for dispensing particulate condiment, the method comprising:

filling a pump cylinder with particulate condiment to a primed volume;

compressing particulates within the particulate condiment to provide a cylinder cap;

dispensing the particulate condiment from the filled pump cylinder; and

compressing particulates within the particulate condiment to provide a cylinder floor.

12. The method of claim 11 wherein cutting particulates within the particulate condiment to provide a cylinder cap comprises engaging a first knife blade with a first knife blade receptacle.

13. The method of claim 11 wherein providing a cylinder cap comprises engaging a piston with a cylinder.

14. The method of claim 11 wherein cutting particulates within the particulate condiment to provide a cylinder floor comprises engaging a second knife blade with a second knife blade receptacle.

15. The method of claim 11 wherein providing a cylinder floor comprises closing a valve.

16. A method for dispensing particulate condiment, the method comprising:

engaging a wing portion of a dispenser with a wing receptacle formed in a dispenser support;

filling the dispenser with particulate condiment;

disengaging the wing portion from the receptacle;

compressing particulates in the particulate condiment while dispensing a predetermined condiment volume.

17. A system for dispensing particulate condiment comprising:

a dispenser including a wing portion, the dispenser including a pump assembly having first and second blades to compress particulates within the particulate condiment; and

a dispenser support including a wing receptacle.

18. A dispenser system comprising:

container means including a containment portion and a handle portion; and

pump means received in the containment portion, the means including means for compressing particulates disposed in a particulate condiment.

19. The system of claim 18 further comprising means to adjust the amount of condiment dispensed by the pump means.

20. A dispenser system comprising:

a roller assembly supporting a flexible bag, and a dispenser positioned below the flexible bag and positioned to be filled by the flexible bag, the dispenser including a pump assembly having first and second blades to compress particulates within a particulate condiment.

* * * * *