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Schmidt

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(54) **WATER SALINIZER**

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(73) Assignee: **Robert Schmidt**, Carrollton, VA (US)

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(52) **U.S. Cl.**
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(58) **Field of Classification Search**
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See application file for complete search history.

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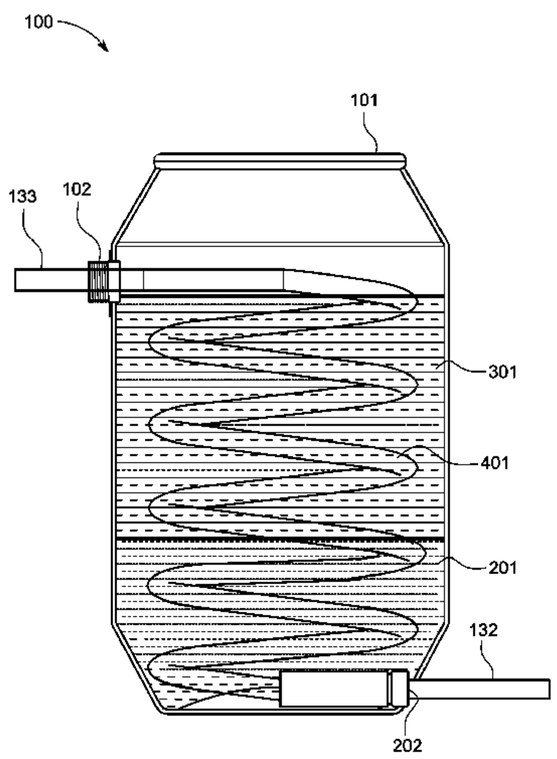
(57) **ABSTRACT**

An article of manufacture for providing a water salinizer to add salt to pool water is disclosed. The water salinizer includes a barrel having a sidewall, a convex bottom, an angled sidewall between the convex bottom and the side wall, and an opening is a top surface for dissolving material into water, an input port coupled to the angled sidewall and being configured with the convex bottom to direct an incoming pressurized water stream and salt around the barrel along the angled sidewall, and a discharge port coupled to the sidewall about the opening in the top surface on an opposite side of the barrel from the input port.

7 Claims, 19 Drawing Sheets



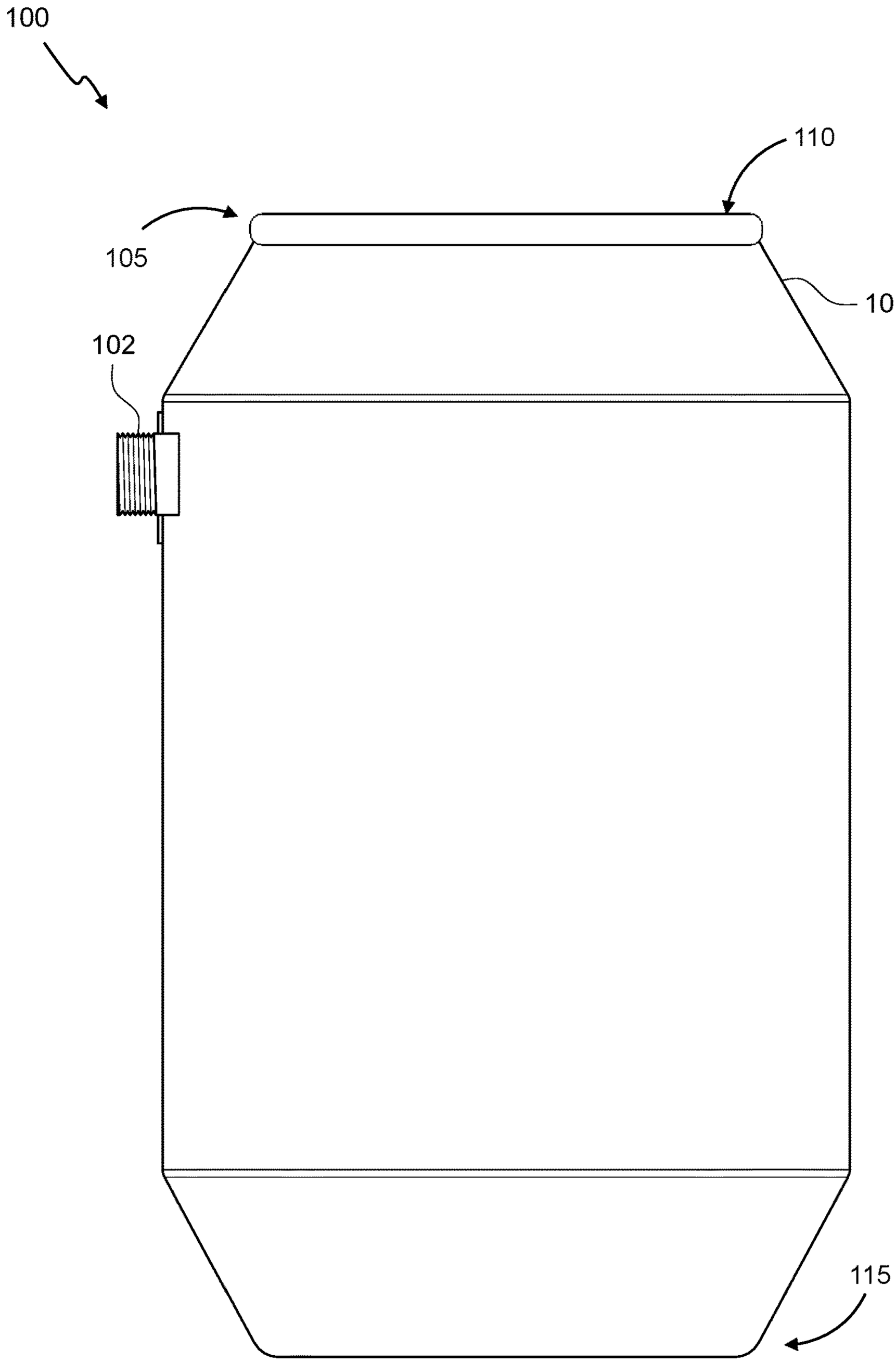


FIG. 1A

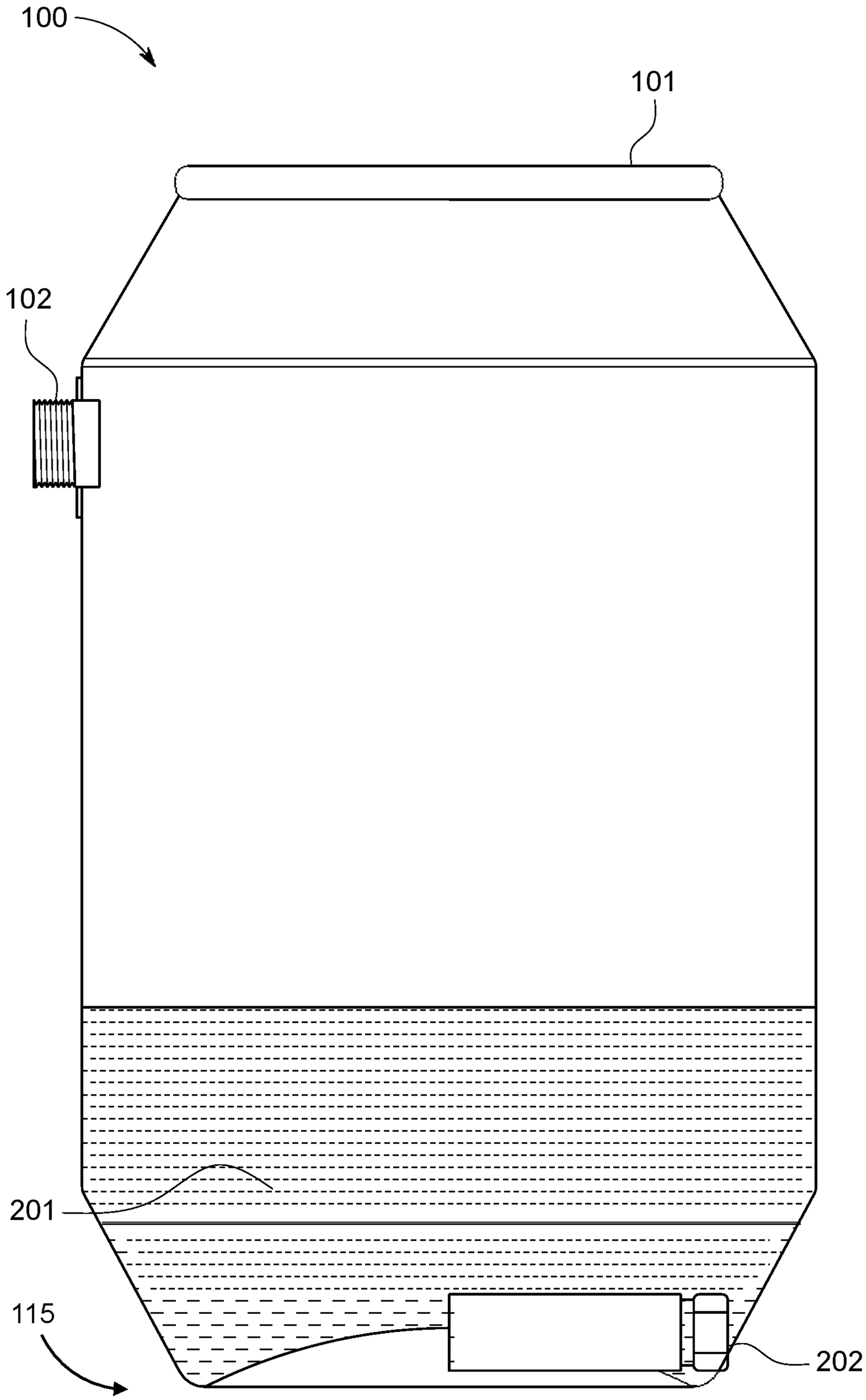


FIG. 1B

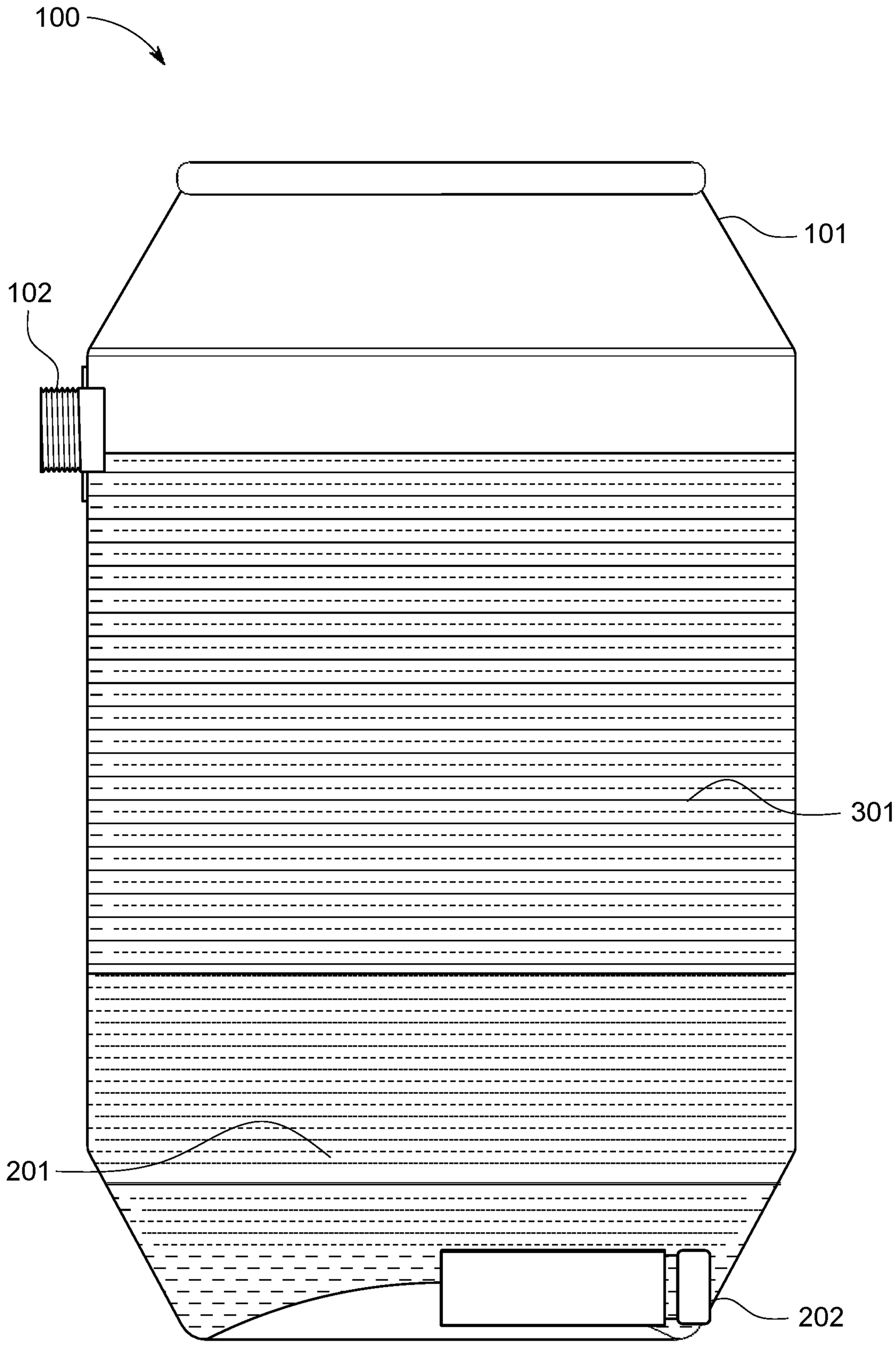


FIG. 1C

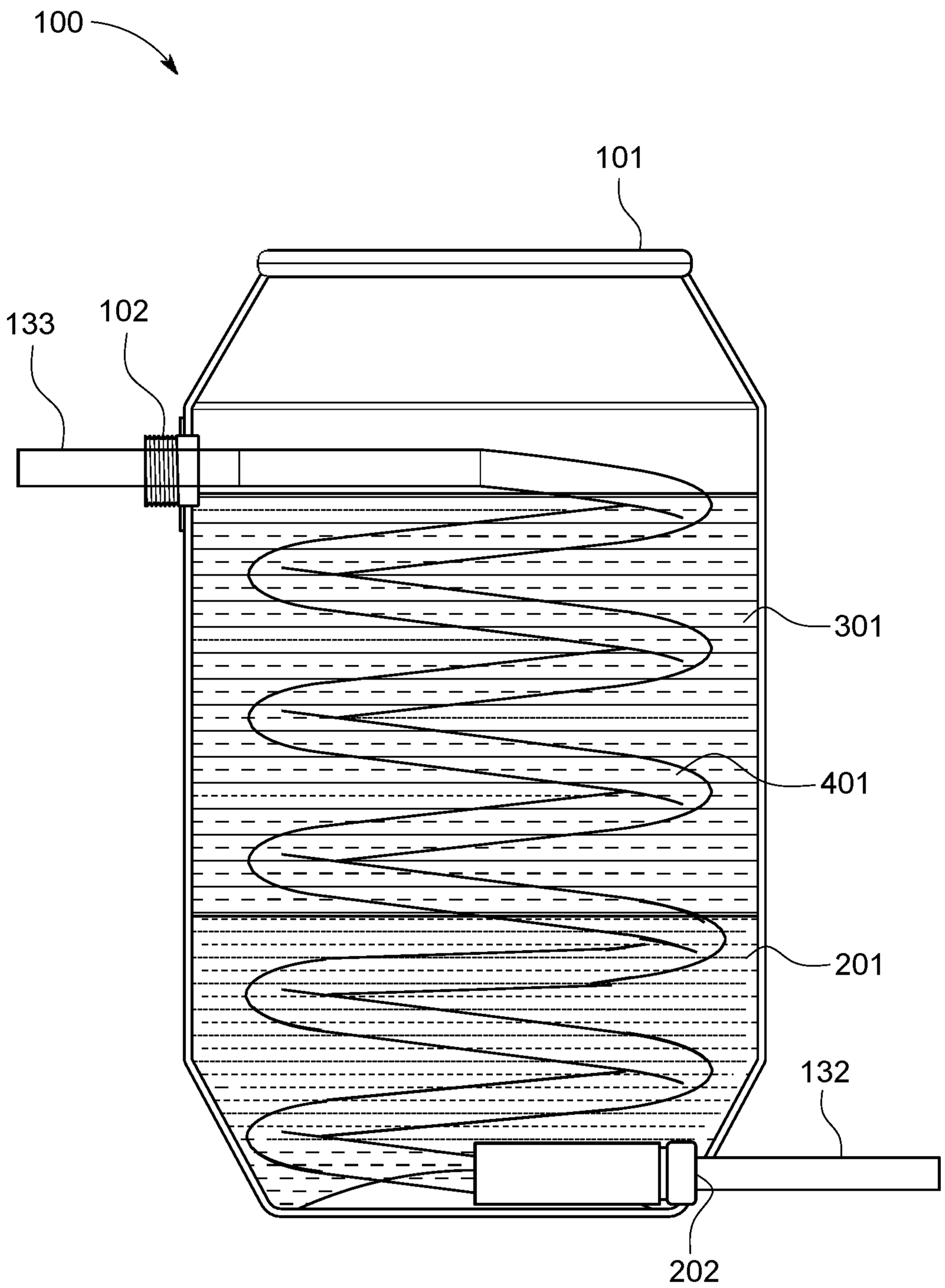


FIG. 1D

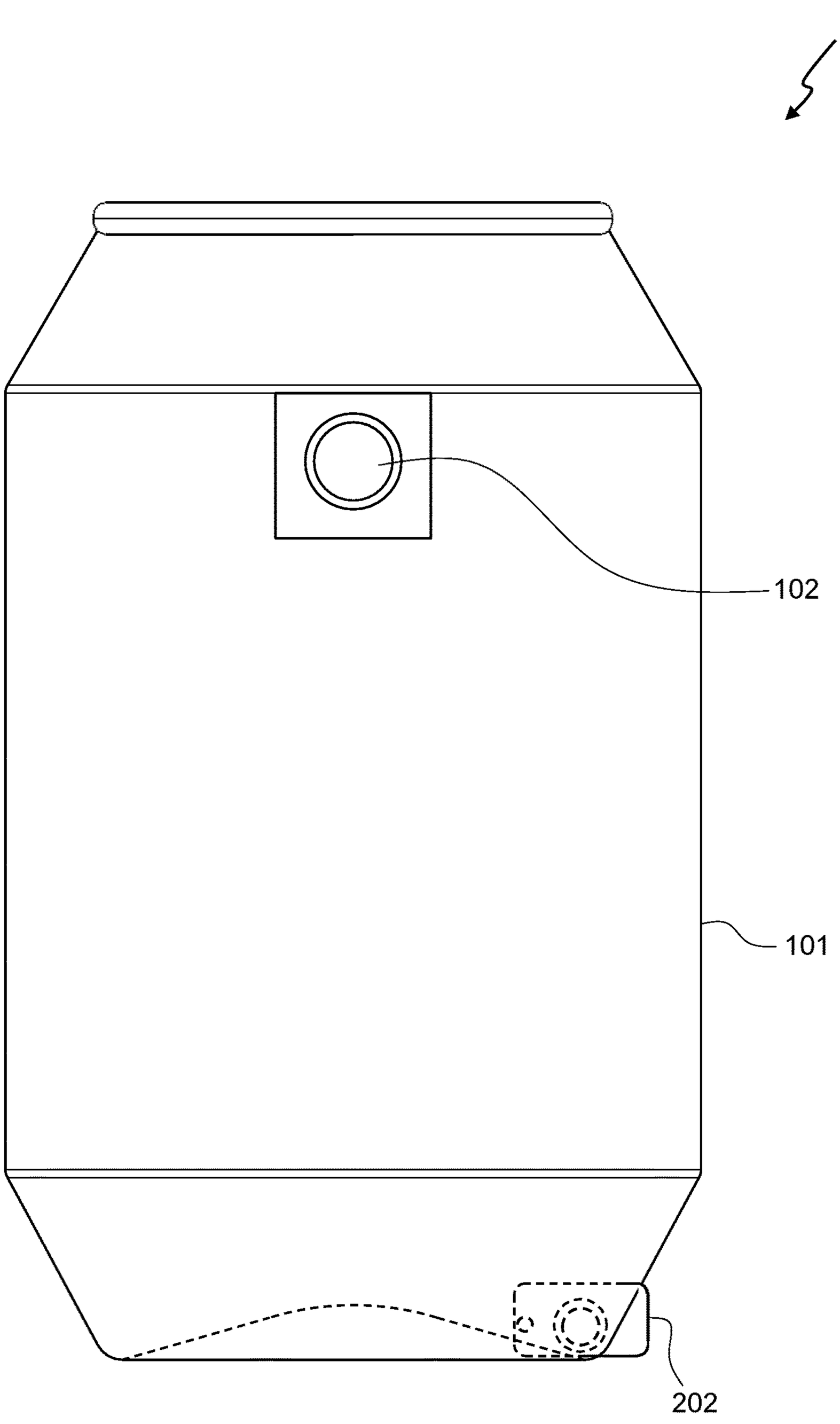


FIG. 2A

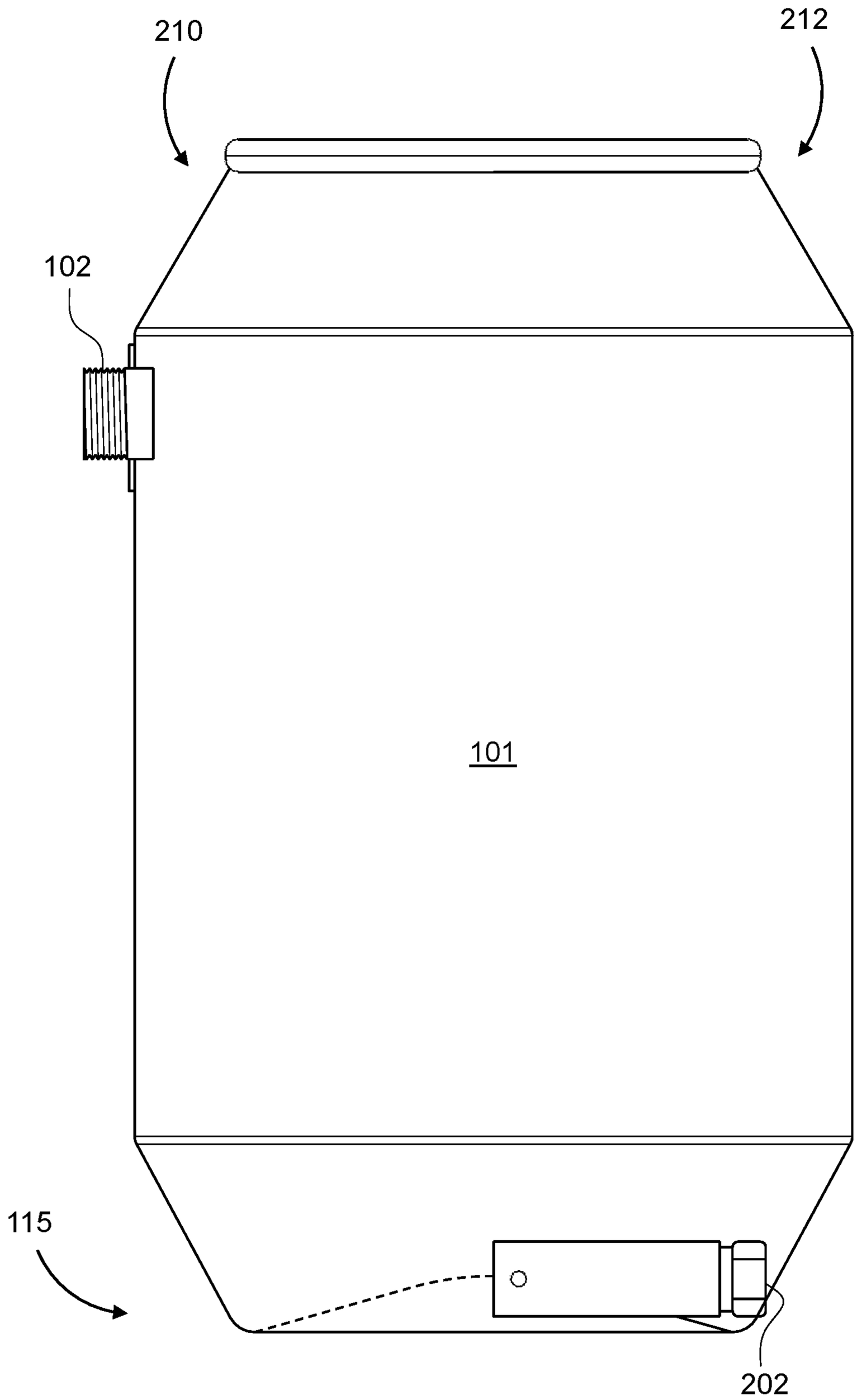


FIG. 2B

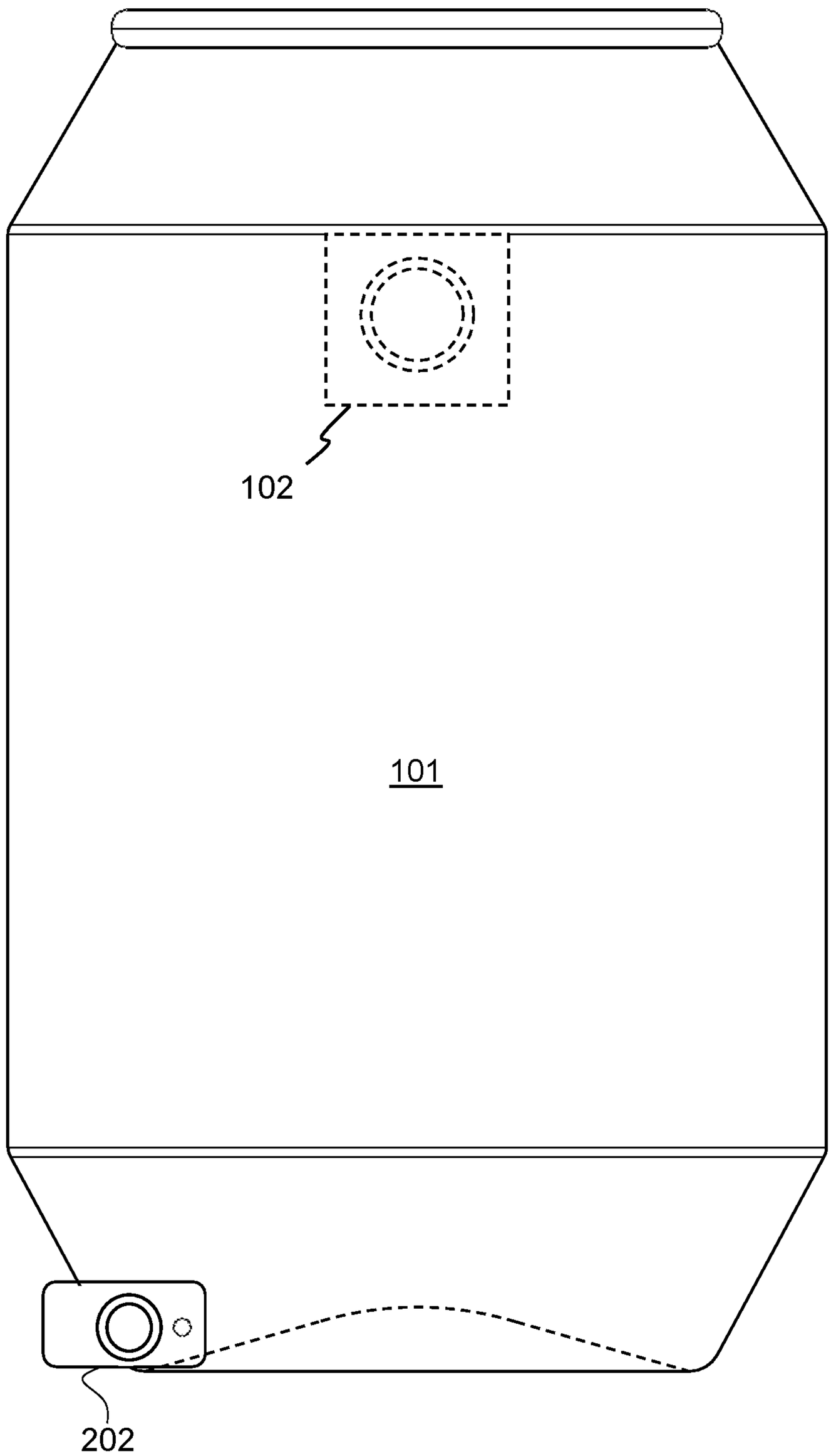


FIG. 2C

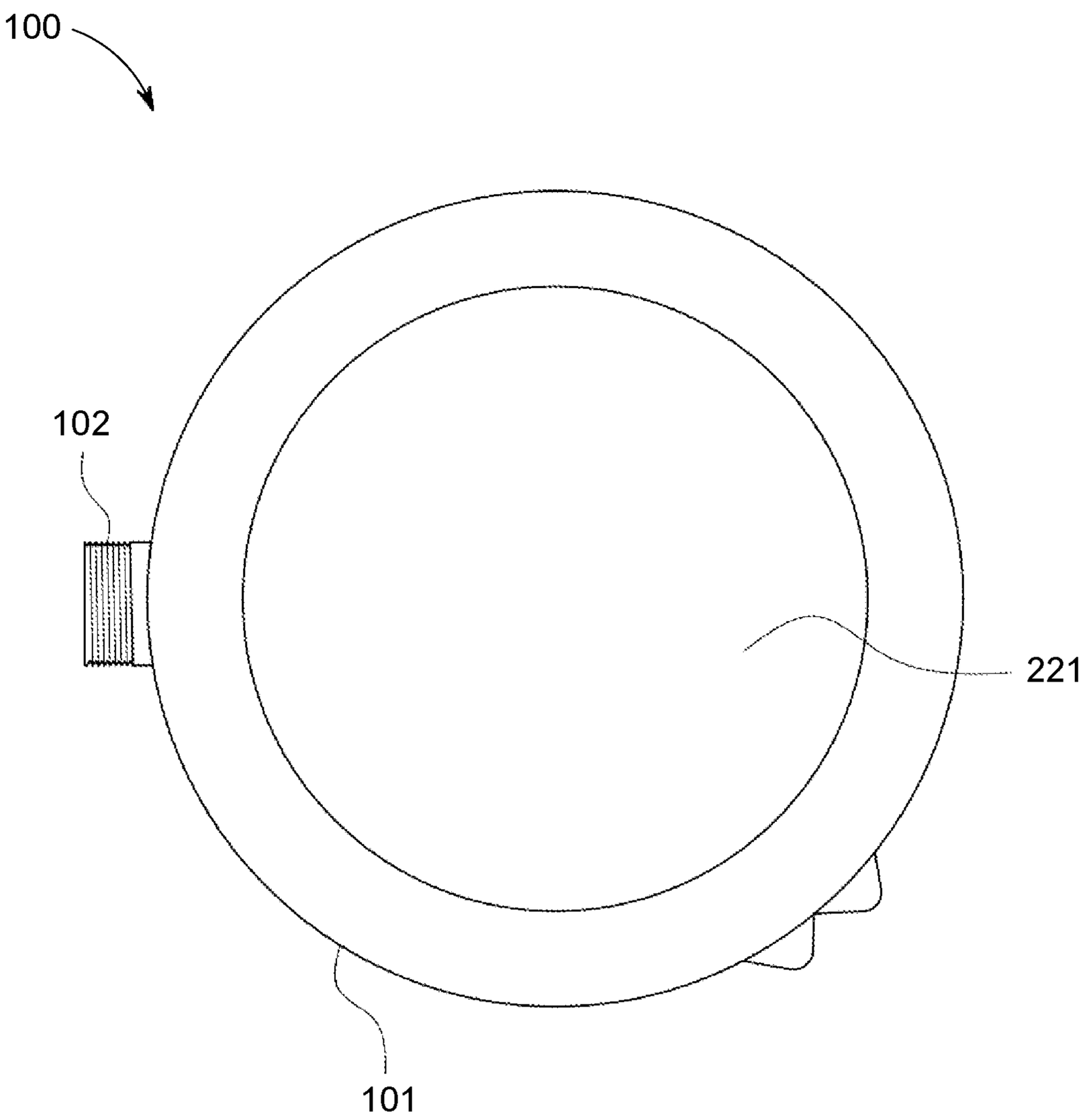


FIG. 2D

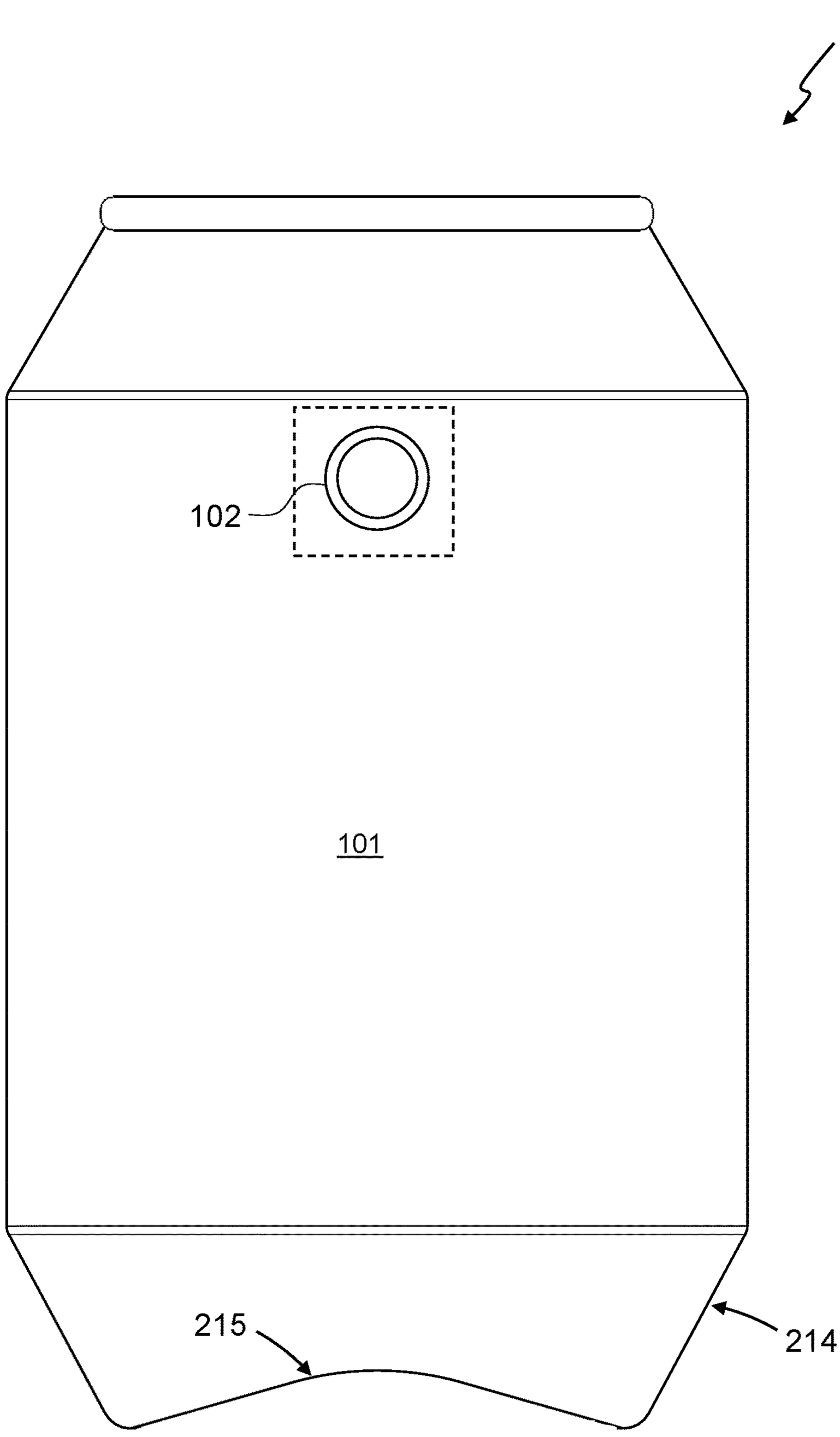


FIG. 2E

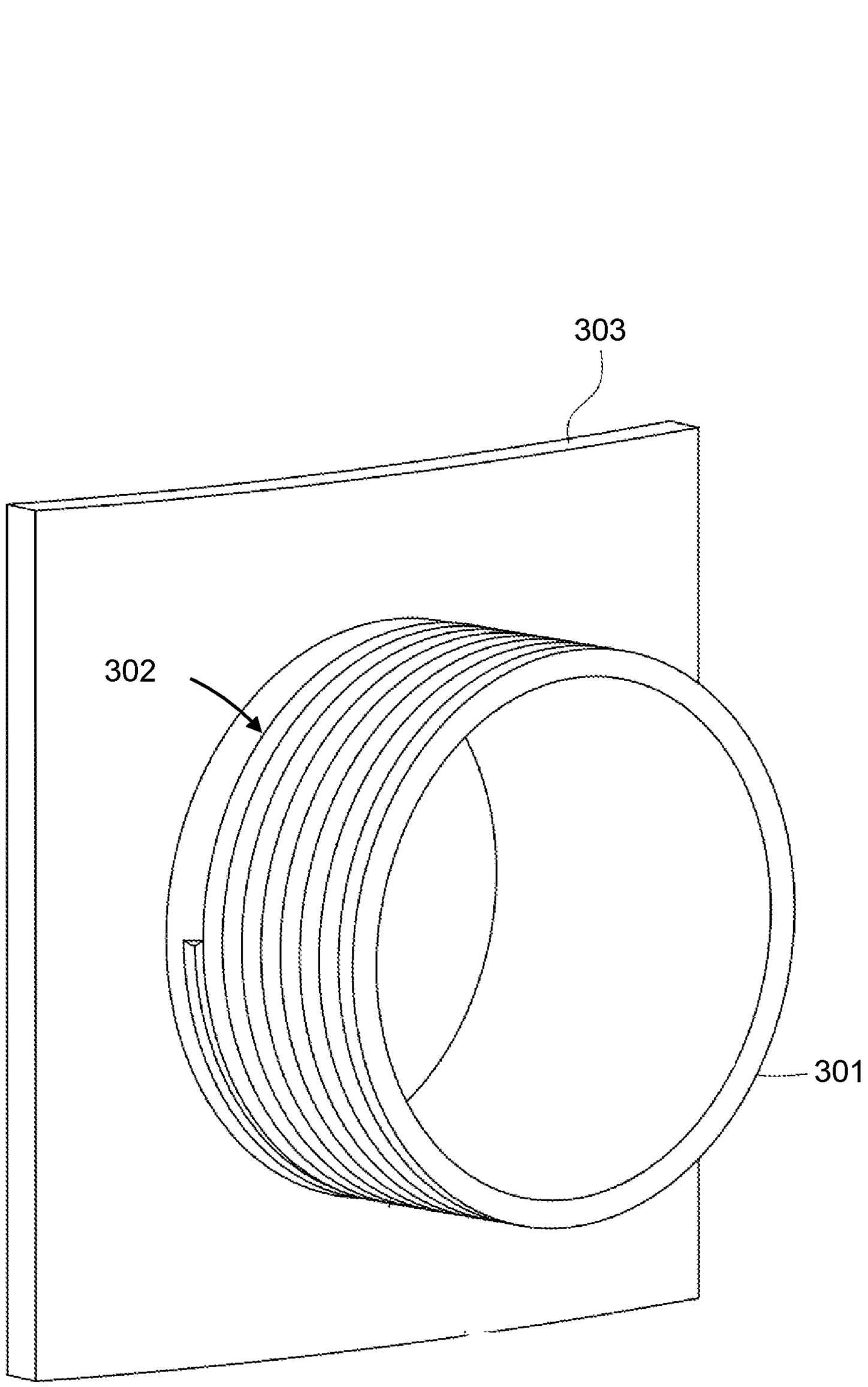


FIG. 3A

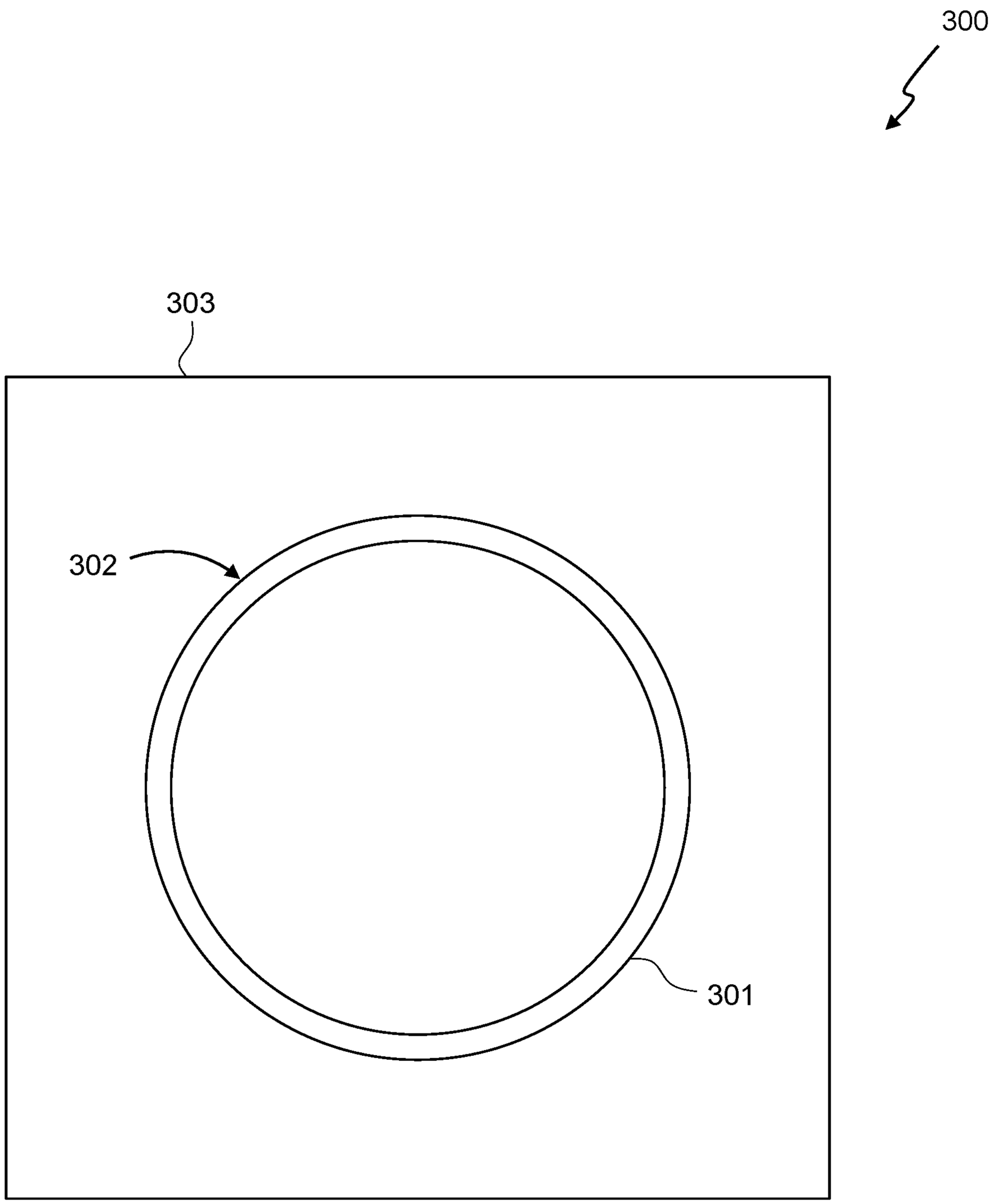


FIG. 3B

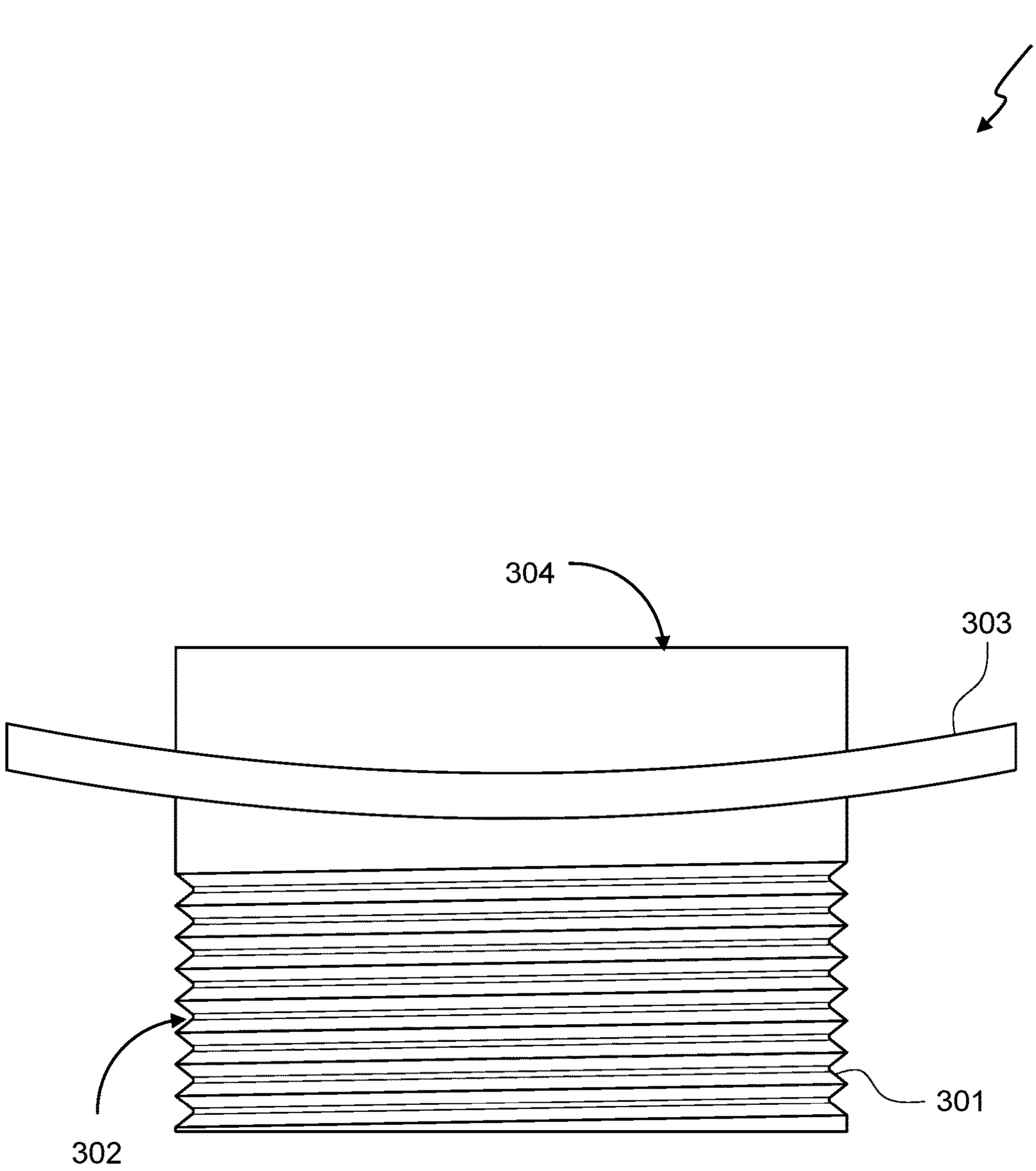


FIG. 3C

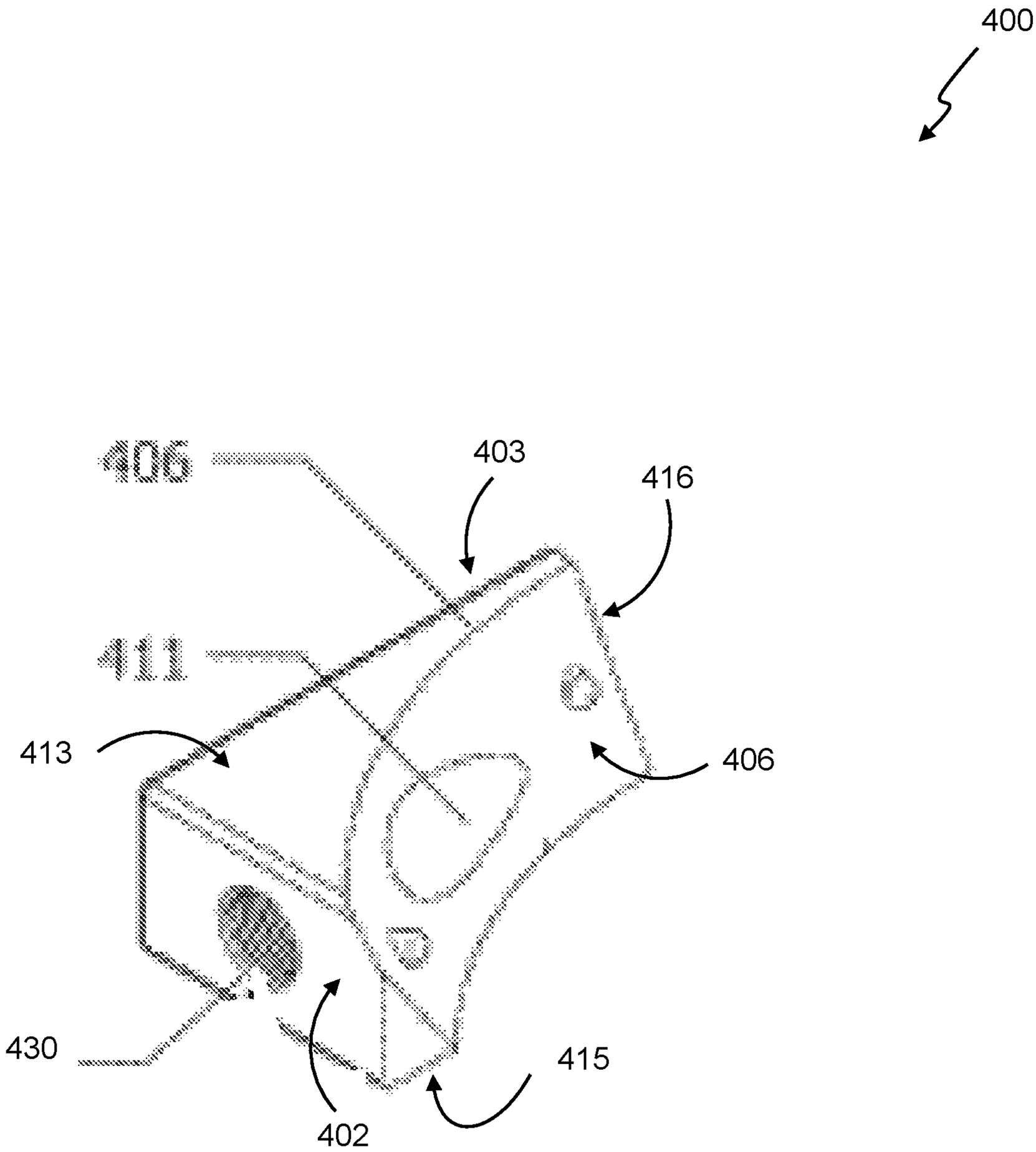


FIG. 4A

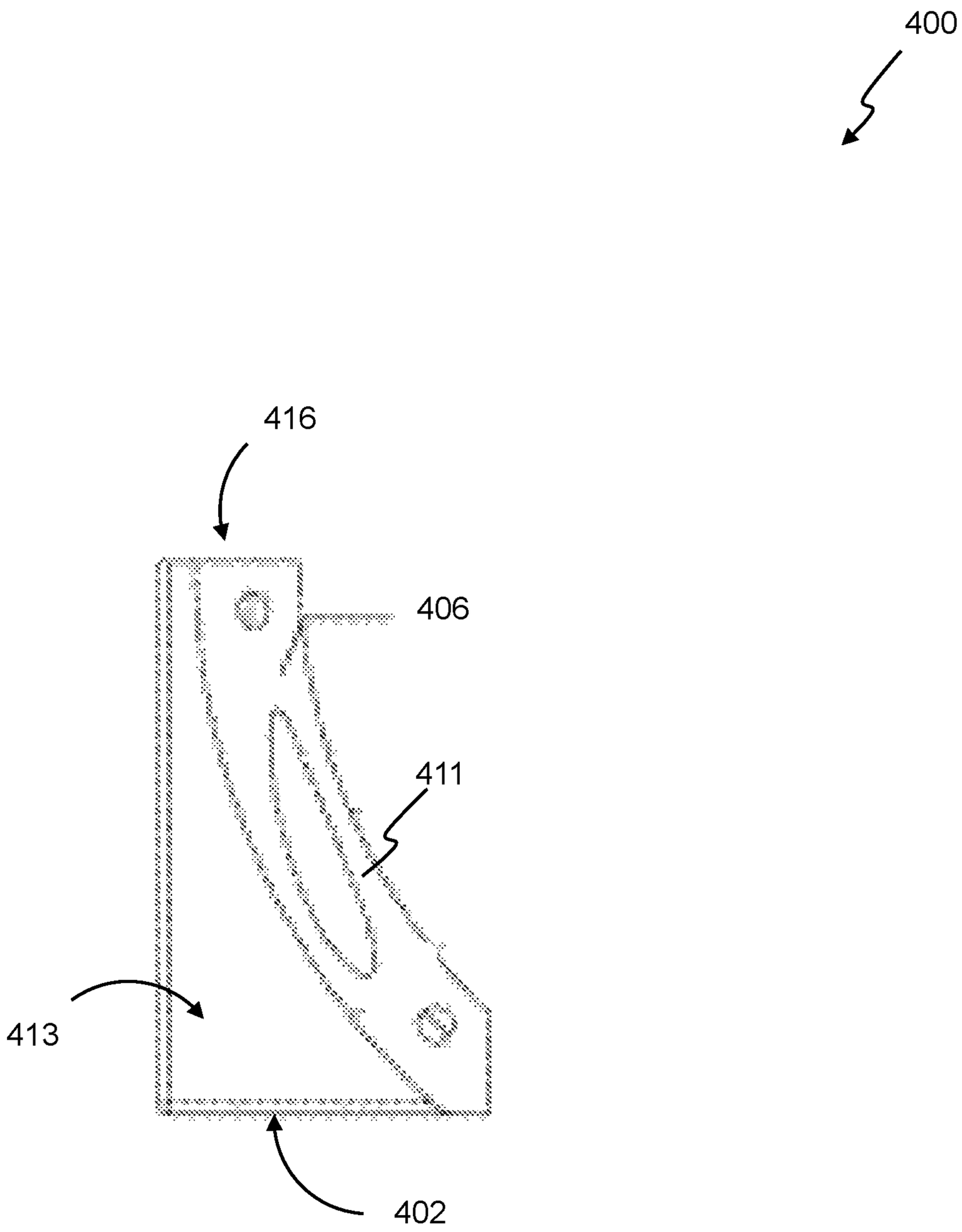


FIG. 4B

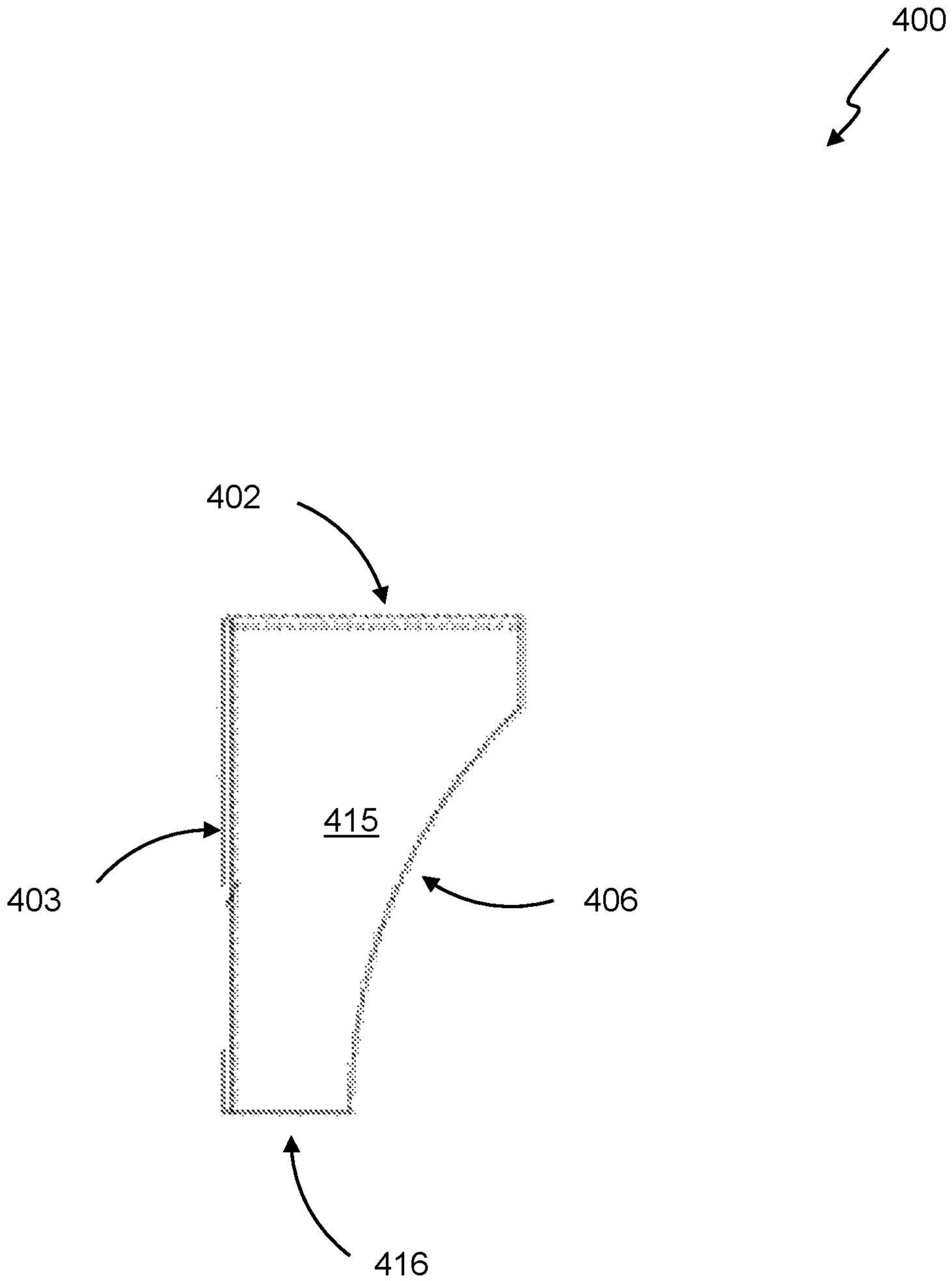


FIG. 4C

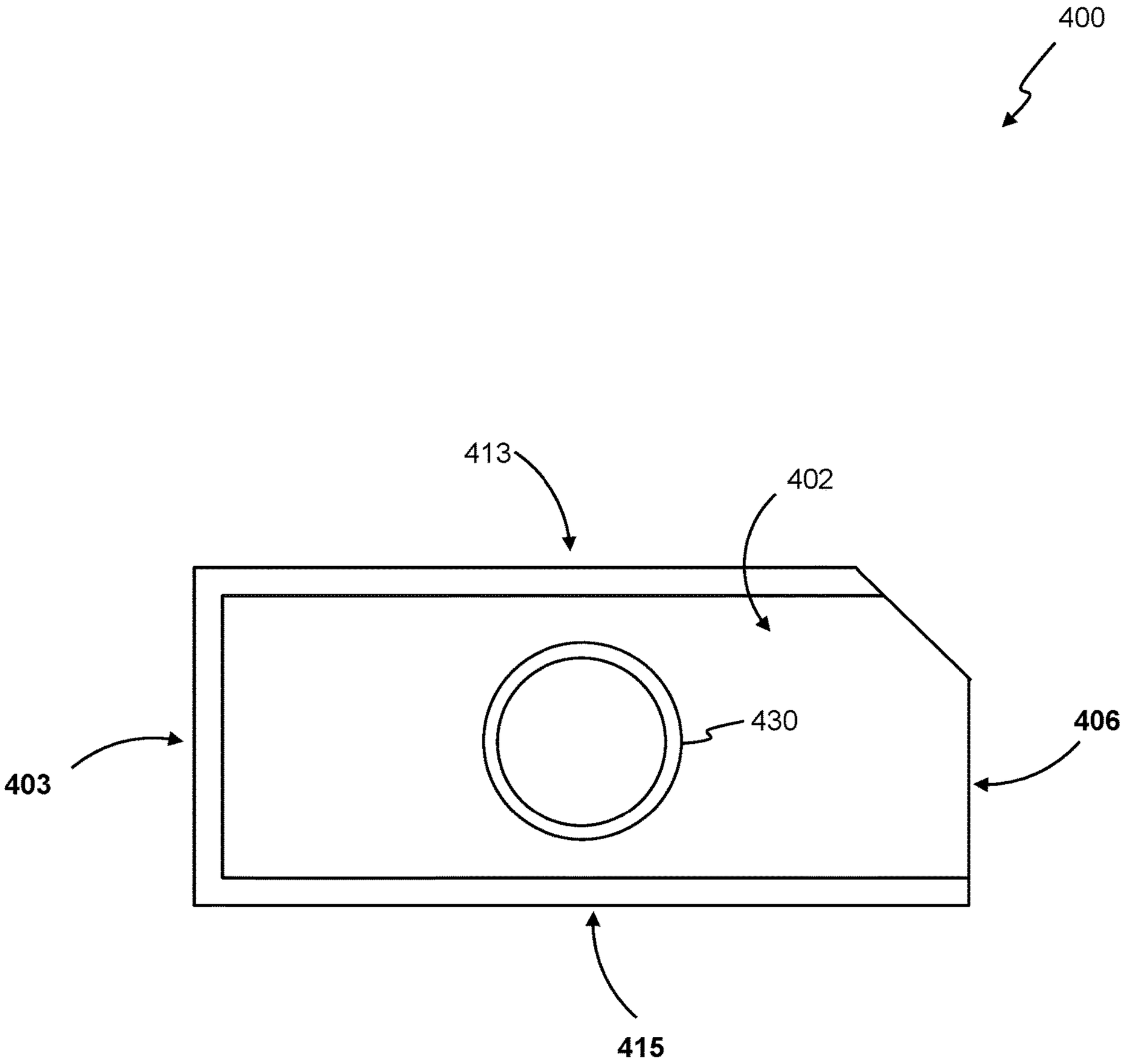


FIG. 4D

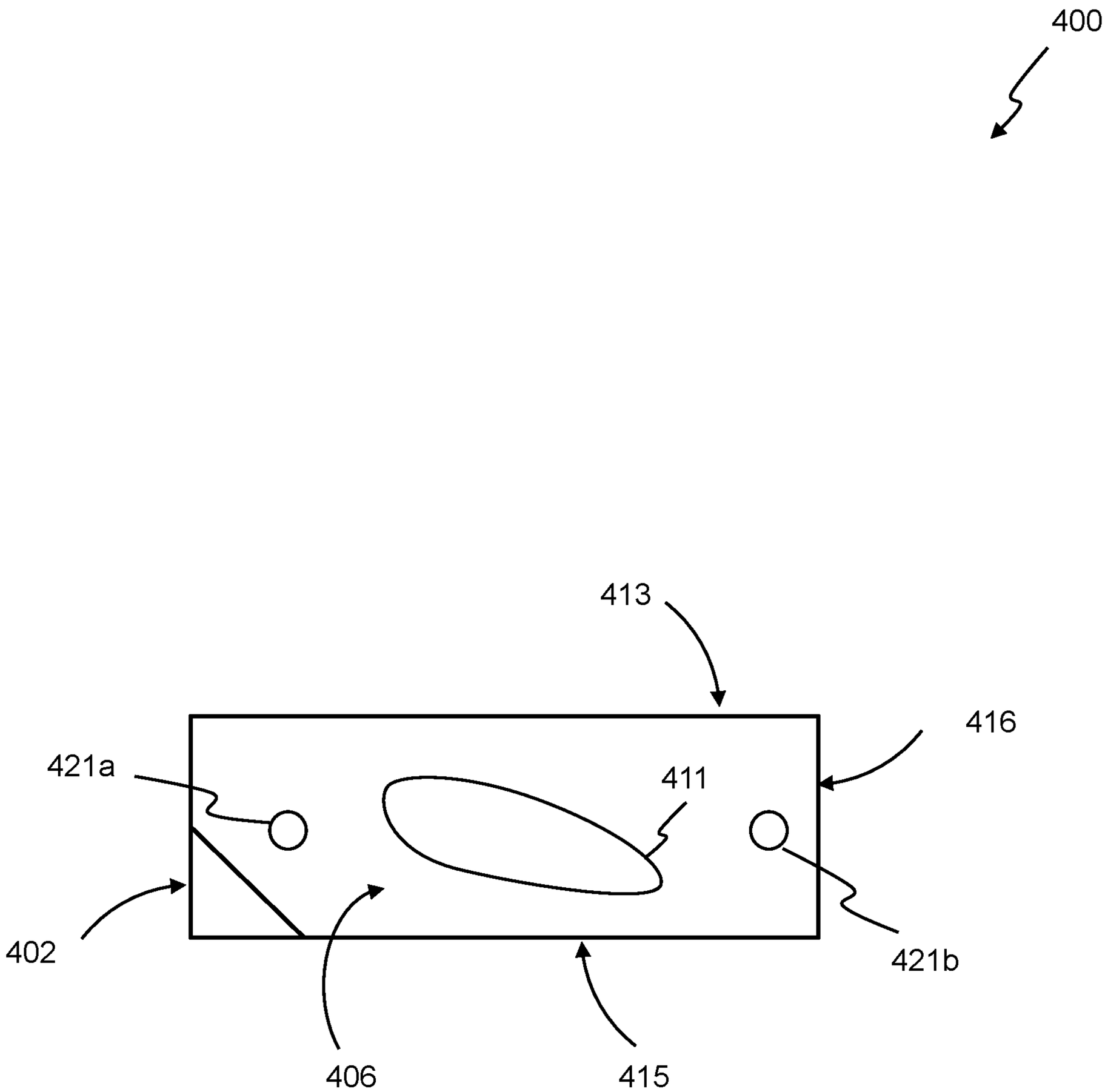


FIG. 4E

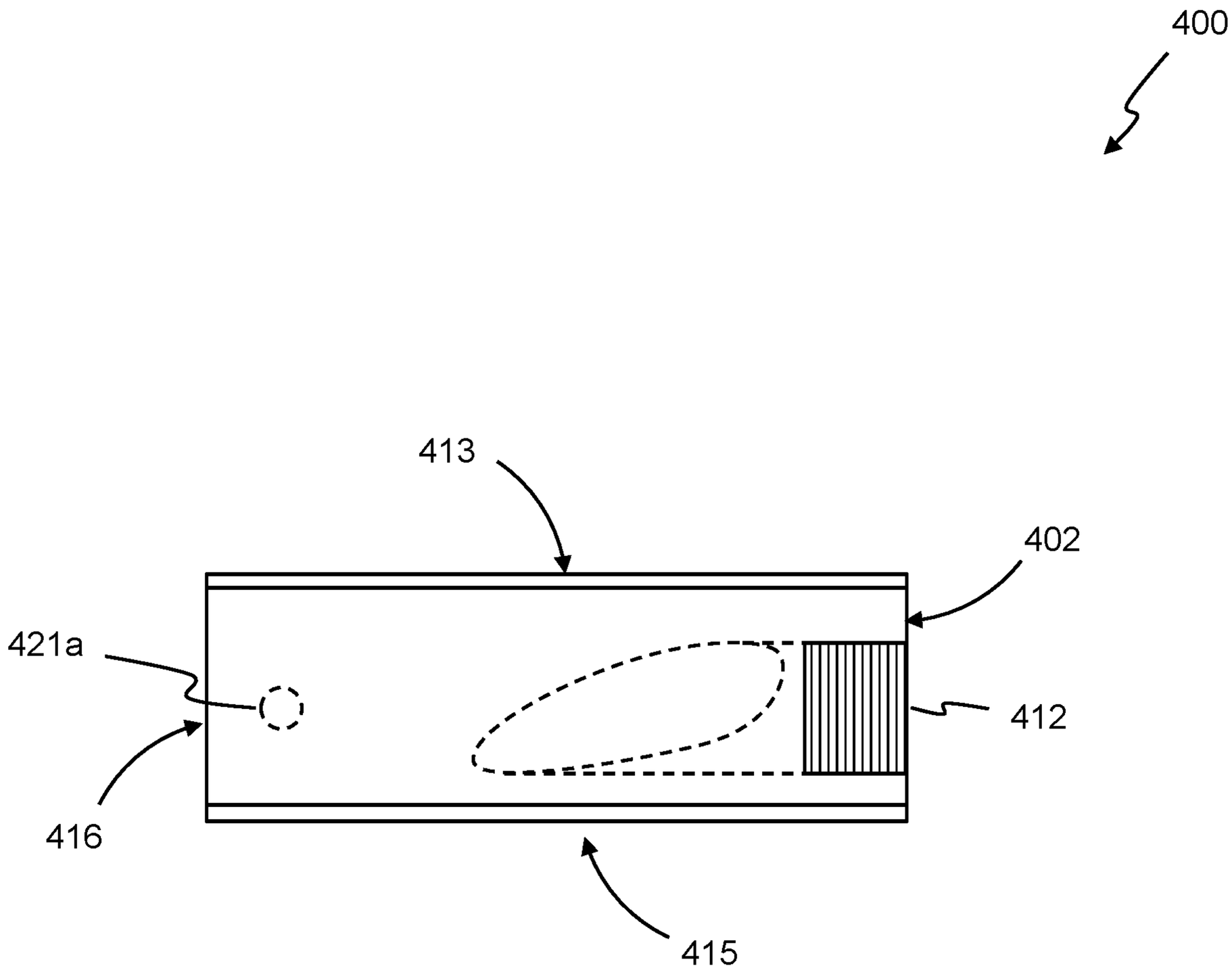


FIG. 4F

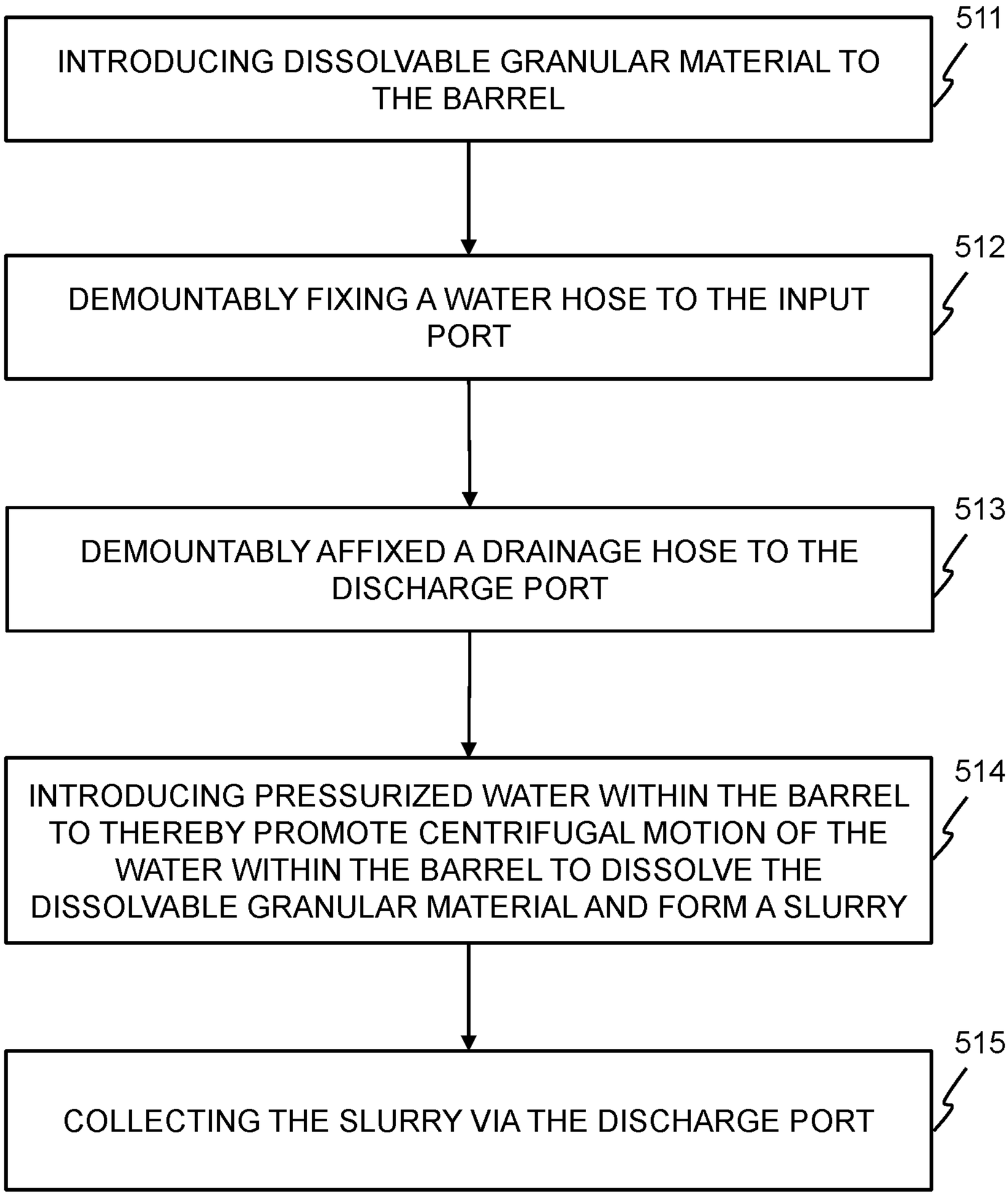

INTRODUCING DISSOLVABLE GRANULAR MATERIAL TO THE BARREL
511
DEMOUNTABLY FIXING A WATER HOSE TO THE INPUT PORT
512
DEMOUNTABLY AFFIXED A DRAINAGE HOSE TO THE DISCHARGE PORT
513
INTRODUCING PRESSURIZED WATER WITHIN THE BARREL TO THEREBY PROMOTE CENTRIFUGAL MOTION OF THE WATER WITHIN THE BARREL TO DISSOLVE THE DISSOLVABLE GRANULAR MATERIAL AND FORM A SLURRY
514
COLLECTING THE SLURRY VIA THE DISCHARGE PORT
515

FIG. 5

WATER SALINIZER

TECHNICAL FIELD

This application relates in general to an article of manufacture for providing water treatment, and more specifically, to an article of manufacture providing a water salinizer to add salt to pool water.

BACKGROUND

The water treatment business, both in private systems as well as municipal systems, produce upwards of 80 million gallons of water a day at a single facility. Upwards of a dozen chemicals in granular and powder form are necessary to be added to water for producing good drinking water. The same may be said for swimming pools. The municipal systems have huge mixing tanks where multiple products are mechanically mixed for ease in release after dissolving into water being treated. In contrast, a homeowner of a swimming pool does not have access to a mixing tank option. Currently, these homeowners must manually mix all their granular and powder products by hand and dissolve them in the pool water.

All pool owners must either hand stir the products in a bucket to dissolve and then poor into the pool. When it comes to salt, you have 2 options. First, a homeowner may dump a 40-pound hag of salt into their pool and step on the salt for 2 or more days until it slowly dissolves. Alternatively, the homeowner may dump the same 40 lb. bag of salt into the pool and take a scrub brush for 20 to 30 minutes of hard manual labor to scrub the salt against the pool floor to assist the salt to dissolve in a timely manner. The homeowner may need to dissolve 2 or more 40 lb. bags of salt each week or more depending on your chemistry testing of the pool water which determines how much salt is needed per application.

Therefore, a need exists for an article of manufacture for providing a water salinizer to add salt to pool water without need for a significant amount of effort. The present invention attempts to address the limitations and deficiencies in prior solutions according to the principles and example embodiments disclosed herein.

SUMMARY

In accordance with the present invention, the above and other problems are solved by providing an article of manufacture for a water salinizer to add salt to pool water according to the principles and example embodiments disclosed herein.

In one embodiment, the present invention is an article of manufacture for providing a water salinizer to add salt to pool water. The water salinizer includes a barrel having a sidewall, a convex bottom, an angled sidewall between the convex bottom and the side wall, designed to direct the granular salt into path of water flow, and an opening is a top surface for dissolving material into water, an input port coupled to the angled sidewall and being configured to direct an incoming pressurized water stream around the convex bottom of the barrel and along the angled sidewall, and a discharge port coupled to the sidewall about the opening in the top surface on an opposite side of the barrel from the input port.

In another aspect of the present invention, the input port comprises intake directional port having a female hose fitting in an end extending to a location outside of the barrel, a curved top surface located within the barrel, a directional output is positioned about the middle of the top surface, and a channel connecting the female hose fitting to the directional output.

In another aspect of the present invention, the discharge port comprises a wall-mating surface, a threaded hose connection on an output side of a wall-mating surface, an inner barrel port on the barrel side of the wall-mating surface, and a discharge channel connecting the inner barrel port to the threaded hose connection.

In another aspect of the present invention, the barrel is an 8-gallon barrel capable of containing 40 pounds of salt granules to be dissolved when pressurize water enters the barrel through the input port with the dissolved salt and water exiting the barrel through the discharge port.

In another aspect of the present invention, the barrel is further configured to generate a centrifugal flow pattern as the pressurized water flows from the input port and out of the discharge port.

In another embodiment, the present invention is a method of salinizing water in a barrel. The barrel has a sidewall, a convex bottom, an angled sidewall between the convex bottom and the side wall, designed to help direct granular salt into path of water flow, and an opening is a top surface for dissolving material into water, an input port coupled to the angled sidewall and being configured to direct an incoming pressurized water stream around the convex bottom of the barrel along the angled sidewall, and a discharge port coupled to the sidewall about the opening in the top surface on an opposite side of the barrel from the input port. The method adds granular salt into the barrel, connects an input water hose to the pressurized water inlet, connects a drainage hose to the discharge port, introduces fresh water into the barrel through the pressurized water inlet, and directs salinized water outflowing from the discharge port once the barrel has filled with water.

The foregoing has outlined rather broadly the features and technical advantages of the present invention in order that the detailed description of the invention that follows may be better understood. Additional features and advantages of the invention will be described hereinafter that form the subject of the claims of the invention.

It should be appreciated by those skilled in the art that the conception and specific embodiment disclosed may be readily utilized as a basis for modifying or designing other structures for carrying out the same purposes of the present invention. It should also be realized by those skilled in the art that such equivalent constructions do not depart from the spirit and scope of the invention as set forth in the appended claims. The novel features that are believed to be characteristic of the invention, both as to its organization and method of operation, together with further objects and advantages will be better understood from the following description when considered in connection with the accompanying figures. It is to be expressly understood, however, that each of the figures is provided for the purpose of illustration and description only and is not intended as a definition of the limits of the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

Referring now to the drawings in which like reference numbers represent corresponding parts throughout:

FIGS. **1***a-d* illustrate an example embodiment of an article of manufacture providing a water salinizer to add salt to pool water according to the present invention.

FIG. **2** illustrates multiple views of an article of manufacture providing a water salinizer to add salt to pool water according to the present invention.

FIGS. **3***a-c* illustrate multiple views of a discharge port fitting in an article of manufacture providing a water salinizer to add salt to pool water according to the present invention.

FIG. **4** illustrates multiple views of an intake directional port of an article of manufacture providing a water salinizer to add salt to pool water according to the present invention.

FIG. **5** illustrates a flowchart of a method to salinize water using an article of manufacture providing a water salinizer to add salt to pool water according to the present invention.

DETAILED DESCRIPTION

This application relates in general to an article of manufacture for providing water treatment, and more specifically, to an article of manufacture for providing a water salinizer to add salt to pool water according to the present invention.

Various embodiments of the present invention will be described in detail with reference to the drawings, wherein like reference numerals represent like parts and assemblies throughout the several views. Reference to various embodiments does not limit the scope of the invention, which is limited only by the scope of the claims attached hereto. Additionally, any examples set forth in this specification are not intended to be limiting and merely set forth some of the many possible embodiments for the claimed invention.

In describing embodiments of the present invention, the following terminology will be used. The singular forms "a," "an," and "the" include plural referents unless the context clearly dictates otherwise. As used herein, a plurality of items, structural elements, compositional elements, and/or materials may be presented in a common list for convenience. However, these lists should be construed as though each member of the list is individually identified as a separate and unique member. Thus, no individual member of such list should be construed as a de facto equivalent of any other member of the same list solely based on their presentation in a common group without indications to the contrary. As used herein, the singular forms "a," "an," and "the" are intended to include the plural forms as well, unless the context clearly indicates otherwise.

It further will be understood that the terms "comprises," "comprising," "includes," and "including" specify the presence of stated features, steps, or components, but do not preclude the presence or addition of one or more other features, steps, or components. It also should be noted that in some alternative implementations, the functions and acts noted may occur out of the order noted in the figures. For example, two figures shown in succession may in fact be executed substantially concurrently or may sometimes be executed in the reverse order, depending upon the functionality and acts involved.

The terms "individual" and "user" refer to an entity, e.g., a human, using an article of manufacture providing a water salinizer to add salt to pool water associated with the invention. The term user herein refers to one or more users.

The term "invention" or "present invention" refers to the invention being applied for via the patent application with the title "Water Salinizer." Invention may be used interchangeably with salinizer.

In general, the present disclosure relates to an article of manufacture providing a water salinizer to add salt to pool water according to the present invention. To better understand the present invention, FIGS. **1***a-d* illustrate an example embodiment of an article of manufacture providing a water salinizer to add salt to pool water according to the present invention. FIGS. **1** *a-d* show a water salinizer **100** in a process to salinize water using the article of manufacture according to the present invention. A barrel **101** is shown in FIG. **1***a* having a discharge port **102** coupled through a side wall of the barrel about a top edge of the barrel **101**. The salinized water flows out of the discharge port **102** for use in a pool or other location.

FIG. **1***b* shows the barrel **101** having an input port **202** located through the side wall of the barrel **101** about a bottom end **115** on an opposite side of the barrel **101** from the outflow port **102**. The bottom end **115** is positioned opposite a top end **105** of the barrel **101**. The barrel **101** has an opening positioned in the top end **105** that permits the addition of dissolvable material (e.g., granular pool salt **201**).

As shown in FIG. **1***c*, when pressurized fresh water is forced into the input port **202** of the barrel, the incoming water passes through the granular salt **201** in the barrel **101** to generate salinized water **301**. When the barrel is filled with incoming pressurized fresh water, salinized water flows out of the discharge port **102**. A hose (not shown) may be attached to the outflow port **102** to direct the salinized water **403** to a desired location.

Due to the location of the pressurized water inlet **202** (i.e., proximate to the bottom end **115**) pressurized water (e.g., water **132**) is introduced along the angled sidewall **214**, which causes the water **132** to, circulate **401** through the salt in a centrifugal pattern to facilitate dissolution. As the pressurized water centrifugally flows through and dissolves the salt granules **201** salinated water **133** (i.e., a slurry) is formed and discharged through the discharge port **102** by the pressure of the incoming fresh water.

The water salinizer **100** dissolves the salt granules **201** as the water enters the input port **202**, traverses the barrel **101** and discharges via the discharge port **102**. For example, the salinated water can be collected into a pool or similar structure configured to hold water. A user that desires to add salt to a pool may control the quantity of salt added to the pool water by operating the water salinizer **100** for a predetermined time period to dissolve a predetermined amount of salt. Other minerals and water treatment additives may be dissolved in a similar manner using the water salinizer **100** as described herein.

FIGS. **2**A-**2**E illustrates a left-side view, a front view, a right-side view, a top view, and a cut-through views, respectively, of the water salinizer **100**, according to some embodiments of the present invention. The water salinizer **100** includes a left side **210** and a right side **212**. The discharge port **102** and the pressurized water inlet **202** are shown to disclose the relative position of each to the other. The top opening **221** in the barrel **101** used to add the granular salt is shown in the top view **213**. The cut-through view **213** of the barrel **101** view shows a convex bottom **215** and angled sidewall **214**. The convex bottom **215** and angled sidewall **214** of the water salinizer **100** significantly aids the incoming water flow as it circulates through the barrel **101** to dissolve the granular salt. The slope of the convex bottom **215** is configured to direct granular material (e.g., granular salt) into the path of water that flows from the water inlet **202**. In the same vein, the slope of the angled sidewall **214** is configured to direct the granular material into the path of water that flows from the water inlet **202**.

In a preferred embodiment, the barrel **101** is an 8-gallon drum. The inflow port **202** comprises a 0.750-inch inlet housing **400**, shown in detail in FIG. **4**, and a 0.750-inch

female garden hose fitting **300** shown in detail in FIG. **4**. The discharge port **102** comprises a standard 1.50 inch male hose fitting, as shown in FIG. **3**, to allow a hose to direct the salinized water to a desired location. The bottom surface of the barrel **101** comprises an upward convex surface and an angled sidewall of the barrel **101** attached to the bottom to assist to direct the granular salt **201** into the path of the pressurized fresh water **132** as it circulates upward.

FIGS. **3**A-**3**C illustrate a perspective view, a front view, and a top view of a discharge port fitting, generally **300**, of the water salinizer **100**, according to other embodiments. The discharge port fitting **300** includes a wall-mating surface panel **303** and a discharge channel **301** positioned to extend through the wall mating surface panel **303**. The slurry (e.g., the salinized water) that is formed within the barrel **101** is discharged via the discharge channel **301**. The discharge channel includes a threaded region **302** externally positioned opposite an inner barrel port region **304**. The threaded region **302** includes threads (or other fasteners) to demountably receive a hose. The threaded region **302** is externally positioned on the barrel **101**. The inner barrel port region **304** is internally positioned on the barrel **101**. The wall-mating surface **303** is curved to match the radius of the barrel **101**. The threaded region **302** is sized to match a hose to be used to direct the salinized water to its destination. The inner barrel port region **304** passes through the barrel **101** sidewall to access the salinized water in the barrel **101**. The discharge port fitting **300** may be coupled through the barrel **101** using PVC glue or similar adhesive between the barrel walls and the wall-mating surface **303**.

FIG. **4**A illustrates a perspective view of an intake directional port, generally **400**, according to some embodiments. Preferably, the input port **202** is in the form of the intake directional port **400**. The intake directional port **400** is an apparatus that is externally affixed to the barrel **101** in a manner to direct the flow of water (or other solution) that enters the barrel **101** to facilitate a centrifugal motion of the water within the barrel **101**. The intake directional port **400** is externally affixed to the angled sidewall **214**. The intake directional port **400** includes a top surface **413**, a bottom surface **415**, a first end **402**, a second end **416**, a first sidewall **403**, and a second side wall **406**. FIGS. **4**B-**4**D illustrate a top view, a bottom view, and a left side view (and View B), respectively, of the intake directional port **400**, according to certain embodiments. The first end **402** is preferentially positioned parallel to the second end **416**. Although the height of the first end **402** is the same as that of the second end **416**, the first end **402** is wider than the second end **416**. The overall length of the first wall **403** is the same as that of the second wall **406**. The first side wall **403** is preferably oriented parallel to the first end **402** and the second end **416**. Each of the first side wall **403**, the first end **402**, and the second end **416** are preferably oriented parallel to both the top surface **413** and the bottom surface **415**. The top surface **413** and the bottom surface **415** are preferably oriented parallel to each other. The overall width of the bottom surface **415** is wider than that of the top surface **413** such that the second sidewall **406** is angularly oriented relative to both the top surface **413** and the bottom surface **415** (see FIGS. **4**A-**4**C). The second sidewall **406** curves as it extends from the second end **416** to the wider first end **402** (see FIGS. **4**A-**4**C) to accommodate the overall angle the angled sidewall **214** (i.e., to accommodate the radius of curvature of the sidewall **214**). In other words, the radius of curvature of both the second sidewall **406** and the angled sidewall **214** are preferably the same.

FIG. **4**E depicts a front view of the intake directional port **400**, according to other embodiments. A directional port **411** is axially aligned within the intake directional port **400**. FIG. **4**F depicts a cut-through view (View B of FIG. **4**C) of the intake directional port **400**, according to yet still other embodiments. The directional port **411** is aligned with an opening in the barrel **101** and functions as a conduit to introduce materials (i.e., solutions) into the barrel **101**. The directional port **411** is tangentially aligned with the angled sidewall **214**. The directional port **411** includes a channel **414** positioned adjacent to a threads **430** that functions as a connector (e.g., a connector known in the arts) to receive a hose of similar conduit. The threads **430** is a threaded orifice extends to and is accessible via the first end **403**. For example, when a water hose is connected to the directional port **411** via the threads **430**, the channel **414** directs water between the convexed bottom **215** and the angled sidewall **214** to thereby promote a centrifugal motion of the water within the barrel **101**. This curved shape directs the pressurized fresh water to circulate about the barrel along the sidewall as the water flows through the granular salt. In certain embodiments, the top surface is sloped downward having a radius of 4.52 inches along the barrel sidewall side **403** and a radius of 5.27 inches the inner barrel side **406**. The intake directional port **400** is externally secured to the sidewall of the barrel using PVC glue or similar adhesive in the preferred embodiment. Locator projections (e.g., locator projections **421***a* and **421***b*) are little nubs that laterally extend from the second sidewall and are oriented orthogonal to the first sidewall **403**. The locator projections align exactly with dimples or indentions that laterally extend from the angled sidewall **214** for perfect alignment for affixing with PVC glue.

The ¾" (0.75") threads **412** start out straight into the block but with the shape turning into and angular/radius/form, now it is exiting in an angular fashion to mate with the curvature of the barrel **101**. The same angular exiting shape with be drilled through the side angle of the barrel **101** but does not need to be threaded as the only threads **412** needed are in the inlet assembly **400** to screw in a ¾"garden hose fitting.

FIG. **5** illustrates a flowchart of a method to salinize water using the water salinizer **100**, according to some embodiments. At Step **511**, dissolvable granular material (e.g., granular salt) is introduced to the barrel **101** via the opening **110**. At Step **512**, a water hose is demountably affixed to the input port **202**. At Step **513**, a drainage hose is demountably affixed to the discharge port **102**. The drainage hose directs the discharge of water salinizer **100** to a repository (e.g., a pool or other liquid storage structure). At Step **514**, pressurized water is introduced to the barrel **101** via the input port **202** in a manner to promote centrifugal motion of the introduced water within the barrel **101** to dissolve the dissolvable granular material and thereby form a slurry (e.g., salinated water). At Step **515**, the slurry is collected via the discharge port **102**.

Once configured, fresh water is introduced through the pressurized water inlet **202** into the barrel **101** about its bottom surface in step **514**. The barrel **101** fills with a slurry (i.e., water that has passed through the granular salt added to the barrel in step **511**) thereby causing the slurry (salinized water) to flow out of the discharge port **300** when the slurry rises thereto.

Test step **516** determines whether the salt granules have dissolved within the barrel, and if not, the process **500** returns to step **514** to continue to add fresh water to the

barrel **101**. When all of the test step **516** determines that all of the salt granules have been dissolved, the process **500** ends **502**.

Even though particular combinations of features are recited in the present application, these combinations are not intended to limit the disclosure of the invention. In fact, many of these features may be combined in ways not specifically recited in this application. In other words, any of the features mentioned in this application may be included in this new invention in any combination or combinations to allow the functionality required for the desired operations.

No element, act, or instruction used in the present application should be construed as critical or essential to the invention unless explicitly described as such. Further, the phrase "based on" is intended to mean "based, at least in part, on" unless explicitly stated otherwise.

What is claimed is:

1. A water salinizer comprising:

a barrel comprising:

a top end;

a bottom end positioned opposite the top end;

a cylindrical sidewall;

a convex bottom positioned proximate to the bottom end and comprising an apex that extends towards the top end;

an angled sidewall positioned between the convex bottom and the cylindrical side wall;

an opening positioned proximate to the top end;

an input port configured to be coupled to a water source and externally coupled to the angled sidewall proximate to the bottom end in a manner to direct incoming water between the convexed bottom and the angled side wall; and

a discharge port coupled to the cylindrical sidewall proximate to the top end;

wherein

the barrel receives dissolvable material via the opening;

the dissolvable material collects between the convex bottom and the angled sidewall;

the input port is configured to be demountably affixed to a water source;

the input port positions incoming water between the convex bottom and the angled sidewall to thereby cause incoming water to centrifugally traverse the granular material and form a slurry; and

the slurry exits the barrel when the slurry rises to the discharge port.

2. The water salinizer of claim **1**, wherein

the input port is in the form of an intake directional port comprising:

a top surface;

a bottom surface;

a first end;

a second end;

a first sidewall;

a second side wall;

wherein

the bottom surface is wider than that of the top surface such that the second sidewall is angularly oriented relative to both the top surface and the bottom surface.

3. The water salinizer of claim **2**, wherein

the intake directional port comprises a directional port axially aligned within the intake directional port;

the directional port comprises a channel positioned adjacent to threads;

the threads are accessible via the first end and configured to demountably receive a hose;

the channel directs water between the convexed bottom and the angled sidewall to thereby facilitate incoming water to centrifugally traverse the granular material and form the slurry.

4. The water salinizer of claim **3**, wherein

the first end is wider than the second end; and

the second sidewall curves as it extends from the second end to the first end to accommodate the angled sidewall.

5. The water salinizer of claim **4**, wherein

the first end is positioned parallel to the second end; and

the first end **402** and the second end are similar in height.

6. The water salinizer of claim **5**, wherein

the directional port is tangentially aligned with the angled sidewall.

7. A method to form a slurry, comprising:

adding dissolvable material to an opening of the water salinizer of claim **1**;

affixing a water source to the input port;

affixing a hose to the discharge port;

adding pressurized water to the water salinizer via the input port to dissolve the dissolvable material and thereby form a slurry; and

collecting the slurry via the discharge port.

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