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SHENZHEN ALEX TECHNOLOGY CO., LTD.

**UNITED STATES DISTRICT COURT  
FOR THE NORTHERN DISTRICT OF CALIFORNIA**

SHENZHEN ALEX TECHNOLOGY CO.,  
LTD,

Plaintiff,

v.

Individuals, Corporations, Limited Companies,  
Partnerships and Unincorporated Associations  
Identified on Schedule A Hereto,

Defendants.

**CASE NO.: 4:23-cv-6309**

**COMPLAINT FOR PATENT  
INFRINGEMENT**

**DEMAND FOR JURY TRIAL**

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1 1. Plaintiff, Shenzhen Alex Technology Co., Ltd, by and through its undersigned  
2 counsel, brings this Complaint against Defendants, the Individuals, Corporations, Limited  
3 Companies, Partnerships and Unincorporated Associations Identified on Schedule A Hereto  
4 (collectively “Defendants”) for Patent Infringement, and in support thereof, alleges as follows:  
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6 **NATURE OF ACTION**

7 2. This is a civil action for infringement of United States Patent No. 11826534  
8 (hereinafter, the “534 Patent”) under the patent laws of the United States, including, without  
9 limitation, 35 U.S.C. § 1 et seq.  
10

11 **THE PARTIES**

12 3. Plaintiff, Shenzhen Alex Technology Co Ltd, a limited company organized and  
13 existing under the laws of China, with a principal place of business at Room 407, 409, Fourth  
14 floor, Hehuan Commercial Center, Building 36 Yintian Industrial Road, Xixiang Street, Baoan  
15 District, Shenzhen, 518000, China.

16 4. Since establishment in 2014, Plaintiff has focused on developing open-ear audio  
17 products including air conduction and bone conduction headphones. In 2021, in order to  
18 provide more comprehensive ear health solutions, Plaintiff has expanded into the R&D and  
19 manufacturing of ear cleaning and protection products.

20 5. As acoustic engineering experts, Plaintiff understands the risks of hearing  
21 damage from long-term headphone use. Plaintiff also knows that wrong ear cleaning can cause  
22 ear canal injury or infection. Therefore, Plaintiff aims to provide a combination of science-  
23 based audio products and ear care solutions so customers can enjoy music safely and  
24 comfortably, while achieving ideal ear hygiene.

25 6. With strong R&D capabilities and rich industry experience, Plaintiff has  
26 accumulated unique technical advantages in ear care. This enables Plaintiff to develop a product  
27 portfolio that truly protects ears while enhancing sound quality, delivering an all-new integrated  
28 ear care experience.

1           7. Defendants are individuals and business entities who reside in foreign  
2 jurisdictions. Defendants conduct business or assist in business activity conducted throughout  
3 the United States (including within the State of California and this Judicial District) through  
4 manufacturing, online advertising and offering for sale, and importation and distribution of the  
5 infringing Products using counterfeit and infringing versions of Plaintiff's patented products as  
6 claimed in the Asserted Patent. Each Defendant has targeted the United States, including  
7 California specifically, by selling or offering for sale, or knowingly assisting in the selling or  
8 offering for sale, Infringing Products to U.S. consumers, including consumers located in  
9 California, via various online stores. Defendants manufacture, advertise, offer for sale, sell,  
10 import, and distribute the infringing Products.

11           8. Upon information and belief, Defendants will likely continue to register or  
12 acquire new seller identification aliases for the purpose of selling and offering for sale  
13 counterfeits and infringements of Plaintiff's intellectual property rights unless preliminary and  
14 permanently enjoined.

15           9. Defendants' business names, i.e., the Seller IDs, associated payment accounts,  
16 and any other alias seller identification names or e-commerce stores used in connection with the  
17 sale of counterfeits and infringements of Plaintiff's intellectual property rights are essential  
18 components of Defendants' online activities and are one of the means by which Defendants  
19 further conduct their counterfeiting and infringement scheme and cause harm to Plaintiff.

20           10. Defendants are using counterfeits and infringements of Plaintiff's intellectual  
21 property rights to attract Internet consumers to their e-commerce stores operating under the  
22 Seller IDs, thereby increasing the value of the Seller IDs and decreasing the size and value of  
23 plaintiff's legitimate marketplace and intellectual property rights at Plaintiff's expense.

24           11. Defendants, through the sale and offer to sell counterfeit and infringing products,  
25 are directly, and unfairly, competing with Plaintiff's economic interests in the state of  
26 California and causing Plaintiff harm and damage within this jurisdiction.

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1 12. Upon information and belief, at all times relevant hereto, Defendants had actual  
2 or constructive knowledge of Plaintiff's intellectual property rights, including Plaintiff's  
3 exclusive right to use and license such intellectual property rights.  
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### 5 **JURISDICTION AND VENUE**

6 13. This Court has subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331 and  
7 1338(a).

8 14. Venue is proper in this Court pursuant to 28 U.S.C. § 1391, and this Court may  
9 properly exercise personal jurisdiction over Defendants as it directly targets business activities  
10 toward consumers in the United States, including California, through at least its fully  
11 interactive, e-commerce store operating under the seller aliases identified in Schedule A  
12 attached hereto (the "Seller Aliases") on Amazon.com ("Amazon"). Specifically, Defendants  
13 have targeted sales to California residents by setting up and operating an Amazon store that  
14 targets the United States, offers shipping to the United States, including to those in California,  
15 accepting payment in U.S. dollars and/or funds from U.S. bank accounts and, upon information  
16 and belief, having sold products that infringe the '534 Patent to residents of California. Each of  
17 the Defendants is committing tortious acts in California, is engaging in interstate commerce,  
18 and have wrongfully caused the Plaintiff substantial injury in the State of California.  
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### 20 **FACTUAL BACKGROUND AND GENERAL ALLEGATIONS**

#### 21 THE PLAINTIFF'S PATENT

22 15. Plaintiff invented and designed the electric ear wax cleaner as early as 20 May  
23 2021, aiming to help push extremely deep and tenacious wax out of ears by providing safe,  
24 reliable and effective water flow and without damaging the tympanic membrane.

25 16. Plaintiff owns all right, title and interests in, and/or has standing to sue for  
26 infringement of United States Patent No. 11,826,534 (the "534 Patent"), entitled "Ear, Nose and  
27 throat irrigator," issued on November 28, 2023. A copy of the 534 Patent is attached hereto as  
28 **Exhibit I**. The 534 Patent is valid and enforceable.

1           17.     Among all the claims in the 534 Patent , Independent Claim 16 of the 534 Patent  
2 is directed to: An ear, nose, and throat irrigator, comprising: a bottle body, a housing, a water  
3 pump, a first tube body, a second tube body, and a shielding cover; wherein a first end of the  
4 housing is connected with the bottle body; a spray head is arranged on a second end of the  
5 housing; the water pump is arranged in the housing; a first end of the first tube body is inserted  
6 into the bottle body; a second end of the first tube body is connected with a water inlet joint of  
7 the water pump; a first end of the second tube body is connected with a water outlet joint of the  
8 water pump; a second end of the second tube body is connected with the spray head; the  
9 shielding cover is arranged on the spray head; the shielding cover is configured to shield water  
10 sprayed from the spray head, wherein the housing comprises a vertical portion and a horizontal  
11 portion; the vertical portion and the horizontal portion are connected in a "7" shape; the vertical  
12 portion is connected with the bottle body; the ear, nose, and throat irrigator further comprises a  
13 power supply; the power supply is arranged in the horizontal portion; the water pump is  
14 arranged in the vertical portion.

15           18.     Among all the claims in the 534 Patent , Claims 17 of the 534 Patent is directed  
16 to: The ear, nose, and throat irrigator according to claim 16, wherein the water pump is  
17 vertically arranged in the vertical portion; the water inlet joint faces the bottle body.

18           19.     Among all the claims in the 534 Patent , Claims 18 of the 534 Patent is directed  
19 to: The ear, nose, and throat irrigator according to claim 16, wherein the ear, nose, and throat  
20 irrigator further comprises a weight ball; the weight ball is connected to the first end of the first  
21 tube body inserted into the bottle body; a first channel and a second channel are defined in the  
22 weight ball; the first channel is communicated with the first tube body; the second channel is  
23 communicated with the first channel: a diameter of the second channel is greater than a  
24 diameter of the first channel.

25           20.     Pictures of illustration of the patent are as follows:  
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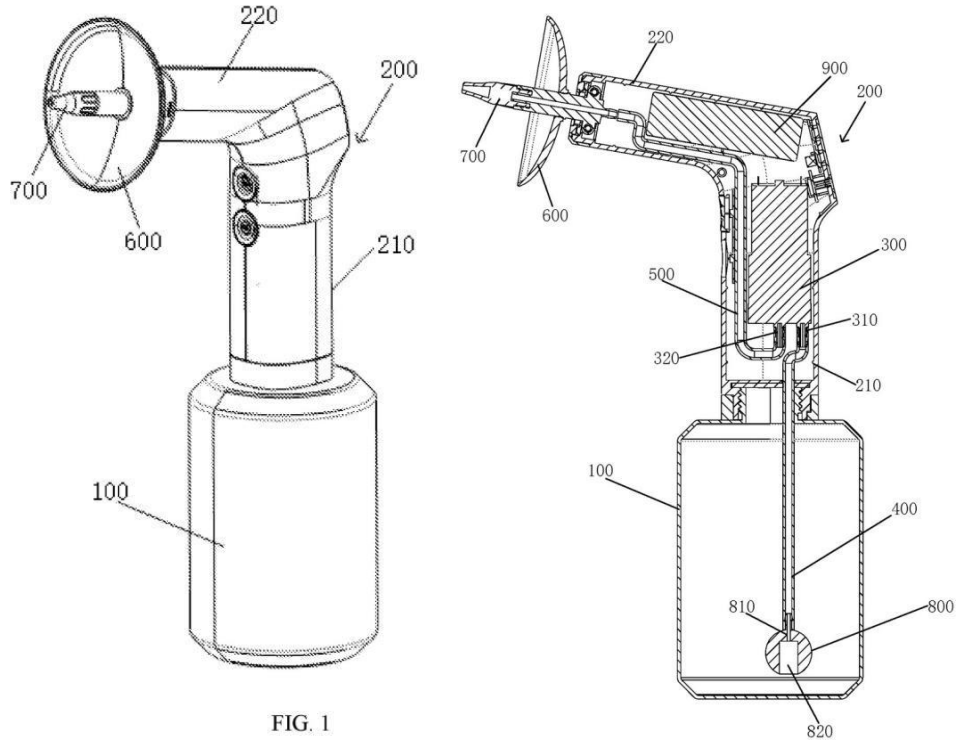


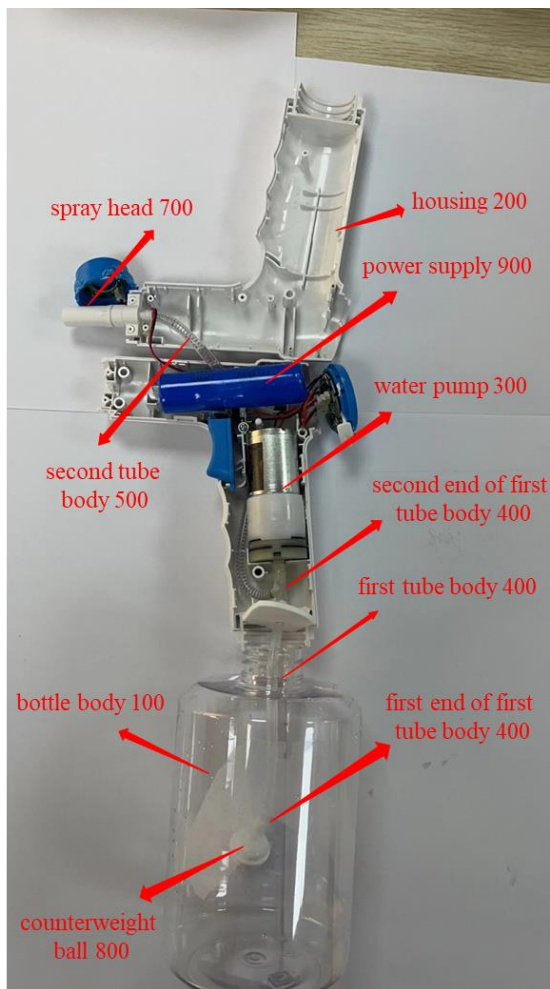
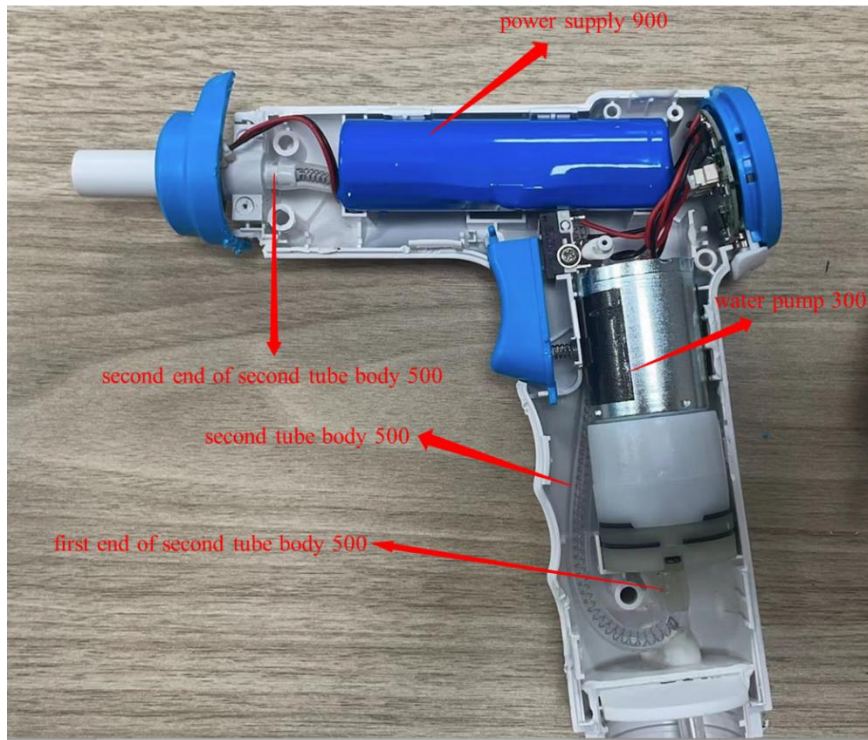
FIG. 1

**DEFENDANTS' PRODUCT**

21. Through purchasing one of the Defendants' products, the technical features of the accused products are disclosed by being disassembled and labeled as shown below:



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22. The technical features disclosed in claims 16-18 of the '534 Patent are compared and analyzed with the technical features of the involved product, respectively. The conclusion of comparison of claims 16-18 is as follows:

claims	technical features	technical features of the compared product (FIGS. a-f)	comparis on results	
claim 16	T1	an ear, nose, and throat irrigator	belongs to an ear, nose, and throat irrigator (see FIG. a)	same
	T2	comprises a bottle body	comprises a bottle body 100 (see FIG. d)	same
	T3	a housing	a housing 200 (see FIG. a)	same
	T4	a water pump	a water pump 300 (see FIGS. c-d)	same
	T5	a first tube body	a first tube body 400 (see FIGS. c-d)	same
	T6	a second tube body	a second tube body 500 (see FIGS. c-d)	same
	T7	a shielding cover	a shielding cover 600 (see FIGS. a-b)	same
	T8	a first end of the housing is connected with the bottle body, a spray head is arranged on a second end of the housing	a first end of the housing 200 is connected with the bottle body 100 (see FIG. d); a spray head 700 is arranged on a second end of the housing 200 (see FIG. d)	same
	T9	the water pump is arranged in the housing	the water pump 300 is arranged in the housing 200 (see FIGS. c-d);	same



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	T10	a first end of the first tube body is inserted into the bottle body; a second end of the first tube body is connected with a water inlet joint of the water pump	a first end of the first tube body 400 is inserted into the bottle body 100 (see FIG. d); a second end of the first tube body 400 is connected with a water inlet joint of the water pump 300 (see FIG. d);	same
	T11	a first end of the second tube body is connected with a water outlet joint the water pump; a second end of the second tube body is connected with the spray head	a first end of the second tube body 500 is connected with a water outlet joint the water pump 300; a second end of the second tube body 500 is connected with the spray head 700 (see FIG. c);	same
	T12	the shielding cover is arranged on the spray head; the shielding cover is configured to shield water sprayed from the spray head;	the shielding cover 600 is arranged on the spray head 700 (see FIG. a); the shielding cover 600 is configured to shield water sprayed from the spray head ;	same
	T13	the housing comprises a vertical portion and a horizontal portion; the vertical portion and the horizontal portion are	the housing 200 comprises a vertical portion and a horizontal portion (see FIGS. a and c); the vertical portion and the horizontal portion are connected in a “7” shape (see FIGS. a and c); the vertical	same

1		connected in a “7”	portion is connected with the	
2		shape; the vertical	bottle body 100 (see FIG. d);	
3		portion is connected		
4		with the bottle body;		
5		the ear, nose, and	the ear, nose, and throat	
6		throat irrigator	irrigator further comprises a	
7	T14	further comprises a	power supply 900; the power	same
8		power supply; the	supply 900 is arranged in the	
9		power supply is	horizontal portion (see FIG.	
10		arranged in the	c);	
11		horizontal portion;		
12		the water pump is	the water pump 300 is	
13		arranged in the	arranged in the vertical	same
14		vertical portion.	portion (see FIG. c).	
15	claim	The water pump is	The water pump is vertically	same
16	17	vertically arranged	arranged in the vertical	
17		in the vertical	portion (see FIG. c); the	
18		portion; the water	water inlet joint faces the	
19		inlet joint faces the	bottle body 100.	
20		bottle body.		
21		The ear, nose, and	The ear, nose, and throat	
22		throat irrigator	irrigator further comprises a	
23	claim	further comprises a	weight ball 800 (see FIG. d);	same
24	18	weight ball; the	the weight ball 800 is	
25		weight ball is	connected to the first end of	
26		connected to the first	the first tube body 400	
27		end of the first tube	inserted into the bottle body	
28		body inserted into	100 (see FIG. d); a first	
		the bottle body; a	channel 810 and a second	
		first channel and a	channel 820 are defined in	
		second channel are	the weight ball 800 (see	
		defined in the	FIGS. e-f); the first channel	

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		<p>weight ball; the first channel is communicated with the first tube body; the second channel is communicated with the first channel; a diameter of the second channel is greater than a diameter of the first channel.</p>	<p>810 is communicated with the first tube body 400; the second channel 820 is communicated with the first channel 810; a diameter of the second channel 820 is greater than a diameter of the first channel 810 (see FIGS. e-f).</p>	
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23. According to the above, it is concluded that Defendants’ products constitute the infringement of Plaintiff’s patented products.

**COUNT I: DIRECT INFRINGEMENT OF U.S. PATENT NO. ’534 Patent**

24. Plaintiff incorporates and realleges paragraphs 1 through 23 of this Complaint.

25. **Direct Infringement.** Defendant has infringed and continues to directly infringe upon one or more claims of the 534 Patent, either literally or under the Doctrine of Equivalents, by selling and/or offering to sell the Accused Product within the United States in violation of 35 U.S.C. § 271(a).

26. Upon information and belief, Defendant has gained revenues by virtue of its infringement of the 534 Patent.

27. Plaintiff has sustained damages as a direct and proximate result of Defendants’ infringement.

28. Plaintiff will suffer, and is suffering, irreparable harm from Defendant’s infringement of the 534 Patent.

1           29. Plaintiff has no adequate remedy at law and is entitled to an injunction against  
2 Defendants' continuing infringement of the 534 Patent.

3           30. Defendants' infringement of the '534 Patent renders this case exceptional within  
4 the meaning of 35 U.S.C. § 285.

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6                           **COUNT 2: INDIRECT INFRINGEMENT OF U.S. PATENT NO. '534 Patent**

7           31. Plaintiff incorporates and realleges paragraphs 1 through 35 of this Complaint.

8           32. Defendant has indirectly infringed and continues to indirectly infringe upon one  
9 or more claims of the 534 Patent by actively inducing others to practice the '534 Patent.

10          33. Plaintiff has sustained damages as a direct and proximate result of Defendant's  
11 indirect infringement of the '534 Patent.

12          34. Plaintiff will suffer and is suffering irreparable harm from Defendant's  
13 continued indirect infringement of the 534 Patent. Moreover, Plaintiff has no adequate remedy  
14 at law and is entitled to an injunction against Defendant's continuing infringement of the '534  
15 Patent.

16          35. Defendant's indirect infringement of the '534 Patent renders this case  
17 exceptional within the meaning of 35 U.S.C. § 285.

18  
19                           **Willful Infringement**

20          36. Plaintiff incorporates and realleges paragraphs 1 through 40 of this Complaint.

21          37. **Actual Knowledge of Infringement.** Since November 2022, when Defendants  
22 approached the Plaintiff for purchasing of the products from Plaintiff, Defendants was well-  
23 aware of the patent application filed by Plaintiff. Plaintiff.

24          38. Defendants' infringement of Plaintiff's Asserted Patents has been willful.

25                           **PRAYER FOR RELIEF**

26          WHEREFORE, Plaintiff prays for judgment against Defendants and entry of an Order  
27 directing as follows:

28           a. A judgement that the '534 Patent is valid and enforceable;

1 b. A judgement that Defendant has directly infringed and induced infringement of one  
2 or more claim of the '534 Patent;

3 c. An Order and judgement, temporarily restraining, preliminarily and permanently  
4 enjoining Defendant, its officers, directors, agents, servants, employees, affiliates, attorneys, all  
5 others acting in privity or in concert with them, and their parents, subsidiaries, divisions,  
6 successors and assigns from further acts of infringement of the '534 Patent;

7 d. A judgement awarding Plaintiff all damages adequate to compensate Plaintiff for  
8 Defendant's infringement of the '534 Patent, and in no event, less than a reasonable royalty,  
9 including all pre-judgement and post-judgment interest at the maximum interest rate permitted  
10 by law;

11 e. A judgement awarding Plaintiff all damages, including treble damages, based on any  
12 infringement found to be willful, pursuant to 35 U.S.C. § 284, in addition to pre-judgment  
13 interest;

14 f. Actual damages suffered by Plaintiff as a result of Defendant's unlawful conduct, in  
15 an amount to be proven at trial, in addition to pre-judgment interest as authorized by law;

16 g. Entering an Order that all banks, savings and loan associations, other financial  
17 institutions, payment processors, on-line marketplaces, and other third-parties who are in active  
18 concert or participation with Defendants, shall, within two (2) business days of receipt of an  
19 Order entered by this Court:

20 (i) Locate all accounts connected to Defendants, including, but not limited to, any  
21 Amazon, Alibaba Express, eBay, Shein and Temu accounts;

22 (ii) Restrain and enjoin such accounts from transferring or disposing of any money or  
23 other of Defendants' assets; and

24 (iii) Transfer any funds restrained in such accounts to Plaintiff within ten (10) business  
25 days of receipt of such Order.

26 h. Entering an Order that, until Plaintiff has recovered full payment of monies owed to it  
27 by Defendants, in the event that any new financial accounts controlled or operated by  
28 Defendants are identified, Plaintiff shall have the ongoing authority to direct any banks, savings

1 and loan associations, other financial institutions, payment processors, and on-line  
2 marketplaces, including, without limitation, Amazon, Alibaba Express, eBay, Shein and Temu,  
3 with whom such newly identified accounts are maintained, to carry out the following activity:

4 (i) Locate all accounts connected to Defendants, including, but not limited to, any  
5 Amazon, Alibaba Express, eBay, Shein and Temu accounts;

6 (ii) Restrain and enjoin such accounts from transferring or disposing of any money or  
7 other of Defendants' assets; and

8 (iii) Transfer any funds restrained in such accounts to Plaintiff within ten (10) business  
9 days of receipt of this Order.

10 i. judgement that this is an exceptional case and an award to Plaintiff its costs and  
11 reasonable attorneys' fees incurred in this action, as provided by 35 U.S.C. § 285; and

12 j. Any further relief this Court deems to be just and proper under the circumstances.

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14 **JURY DEMAND**

15 39. Pursuant to Rule 38(b) of the Federal Rules of Civil Procedure, Plaintiff hereby demands  
16 trial by jury on all issues raised by the Complaint.

17  
18 Dated: Alamo, California  
19 November 29, 2023

Apex Attorneys at Law, LLP

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27 [tm@fairskylaw.com](mailto:tm@fairskylaw.com)

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**EXHIBIT I**

**United States Patent No. 11,826,534**



US011826534B2

(12) **United States Patent**  
**Liu**

(10) **Patent No.:** **US 11,826,534 B2**  
(45) **Date of Patent:** **Nov. 28, 2023**

(54) **EAR, NOSE, AND THROAT IRRIGATOR**

(71) Applicant: **SHENZHEN ALEX TECHNOLOGY CO., LTD**, Shenzhen (CN)

(72) Inventor: **Qingquan Liu**, Shenzhen (CN)

(73) Assignee: **SHENZHEN ALEX TECHNOLOGY CO., LTD**, Shenzhen (CN)

(\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 215 days.

(21) Appl. No.: **17/478,881**

(22) Filed: **Sep. 18, 2021**

(65) **Prior Publication Data**

US 2023/0013619 A1 Jan. 19, 2023

(30) **Foreign Application Priority Data**

Jul. 13, 2021 (CN) ..... 202121594878.4

(51) **Int. Cl.**  
*A61M 11/00* (2006.01)  
*A61M 3/02* (2006.01)

(52) **U.S. Cl.**  
CPC ..... *A61M 3/0245* (2013.01); *A61M 2205/587* (2013.01); *A61M 2210/065* (2013.01); *A61M 2210/0618* (2013.01); *A61M 2210/0662* (2013.01)

(58) **Field of Classification Search**

CPC ..... *A61M 11/00*; *A61M 2210/0618*; *A61M 2210/0681*; *A61M 2210/0662*; *A61M 3/0258*; *A61B 2017/246*; *A61C 17/032*  
See application file for complete search history.

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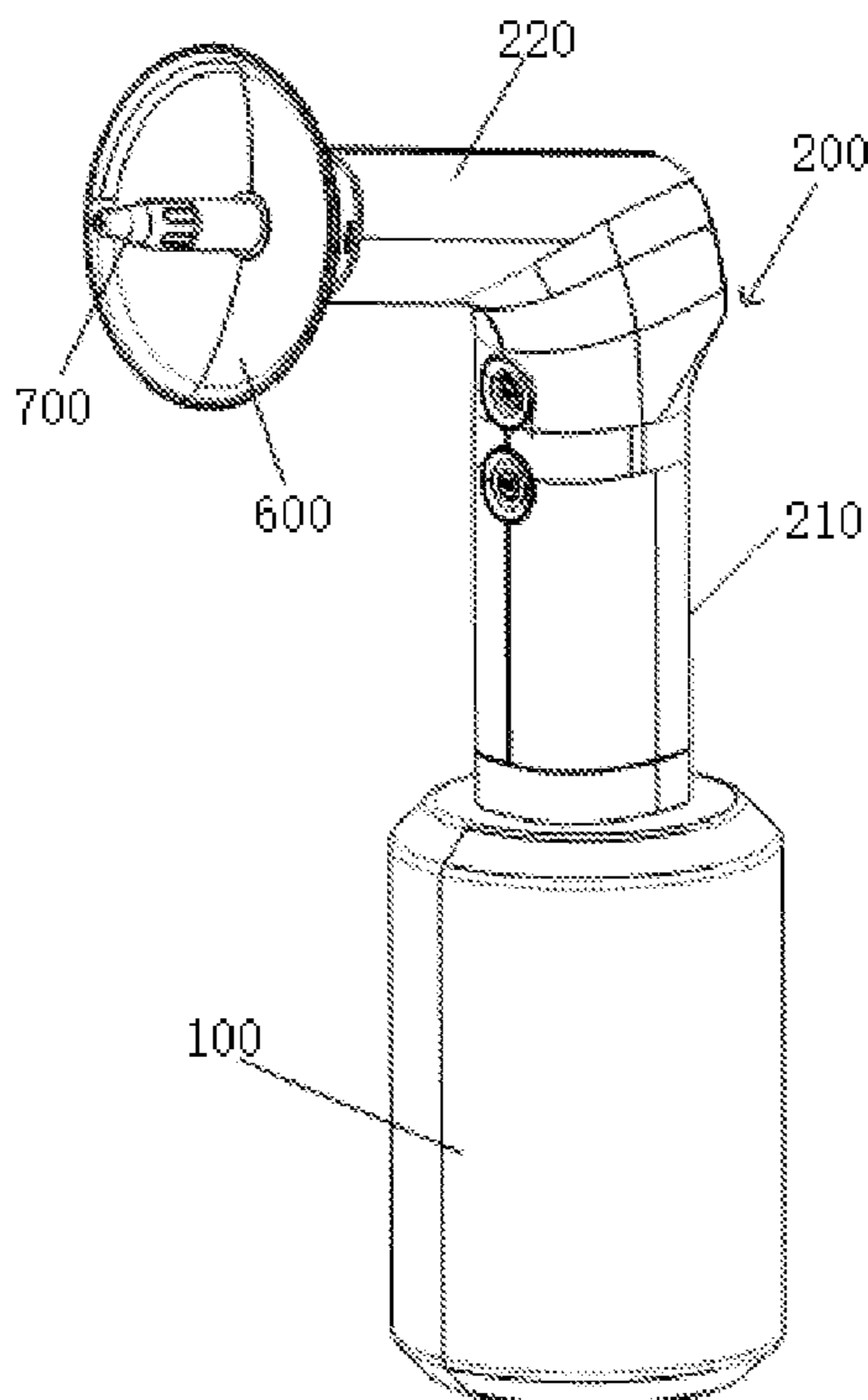
\* cited by examiner

*Primary Examiner* — Courtney B Fredrickson

(57) **ABSTRACT**

An ear, nose, and throat irrigator includes a bottle body, a housing; a water pump, a first tube body, a second tube body, and a shielding cover. A first end of the housing is connected with the bottle body. A spray head is arranged on a second end of the housing. The water pump is arranged in the housing. A first end of the first tube body is inserted into the bottle body. A second end of the first tube body is connected with a water inlet joint of the water pump. A first end of the second tube body is connected with a water outlet joint the water pump. A second end of the second tube body is connected with the spray head. The shielding cover is arranged on the spray head. The shielding cover is configured to shield water sprayed from the spray head.

**16 Claims, 6 Drawing Sheets**





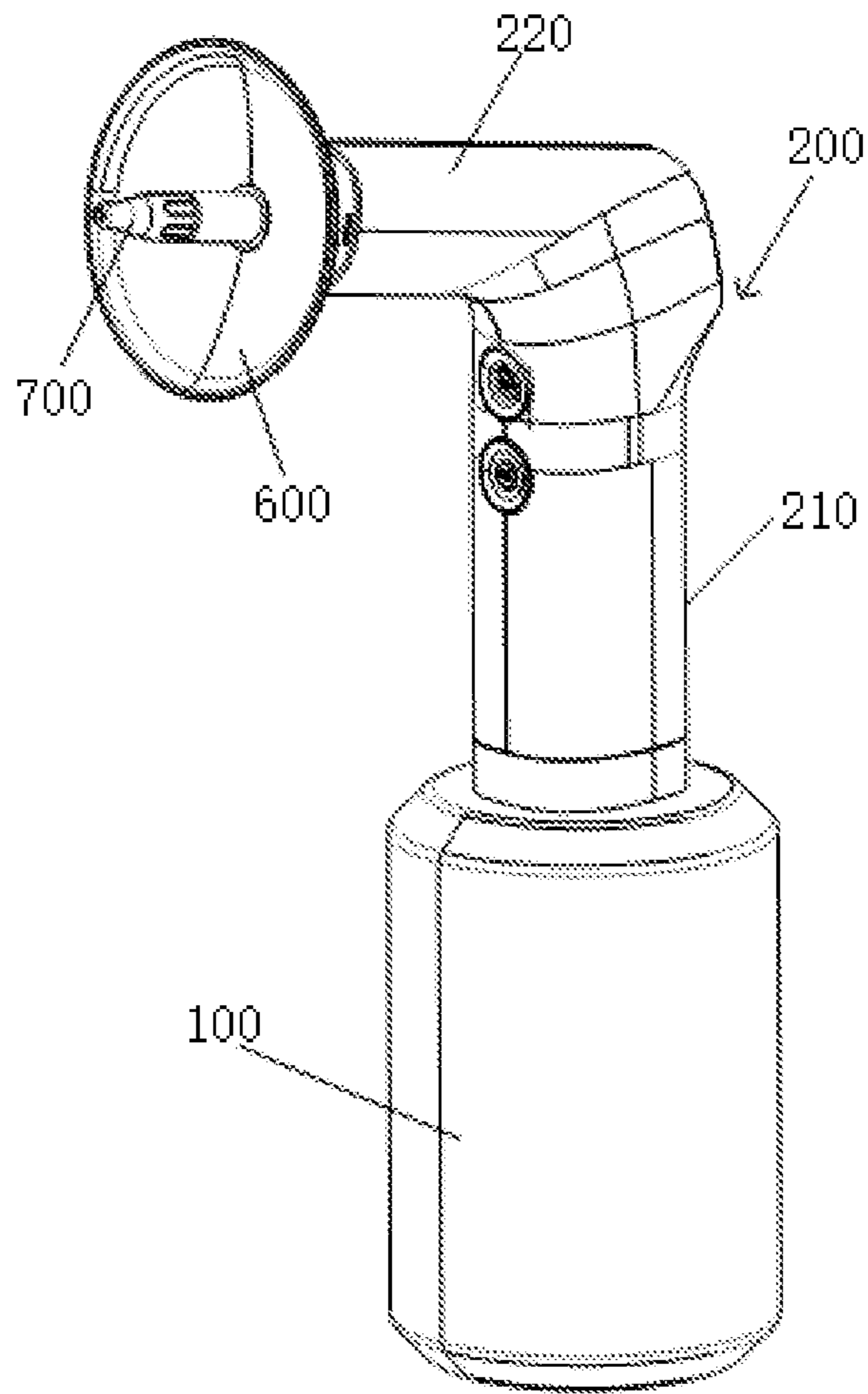


FIG. 1

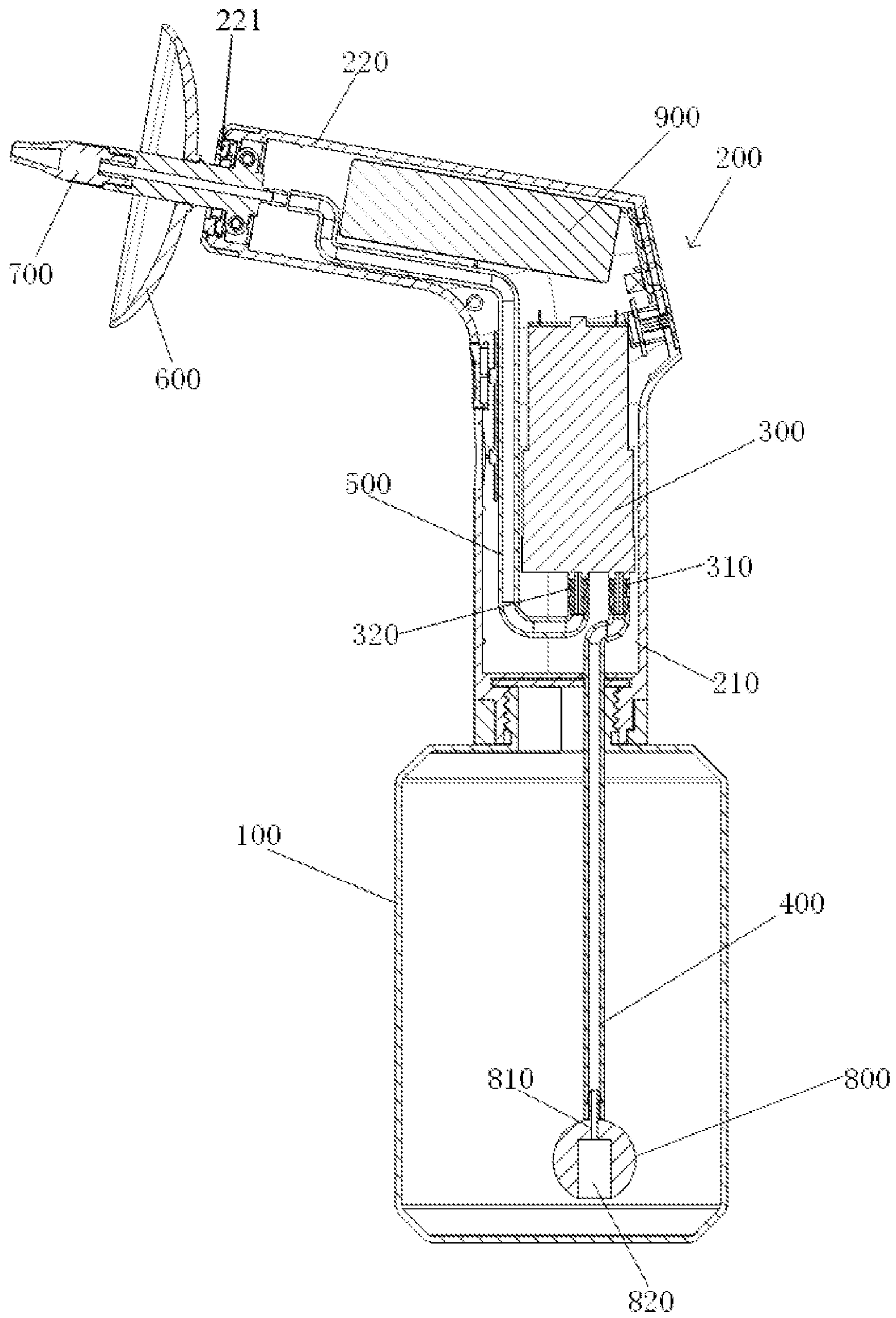


FIG. 2

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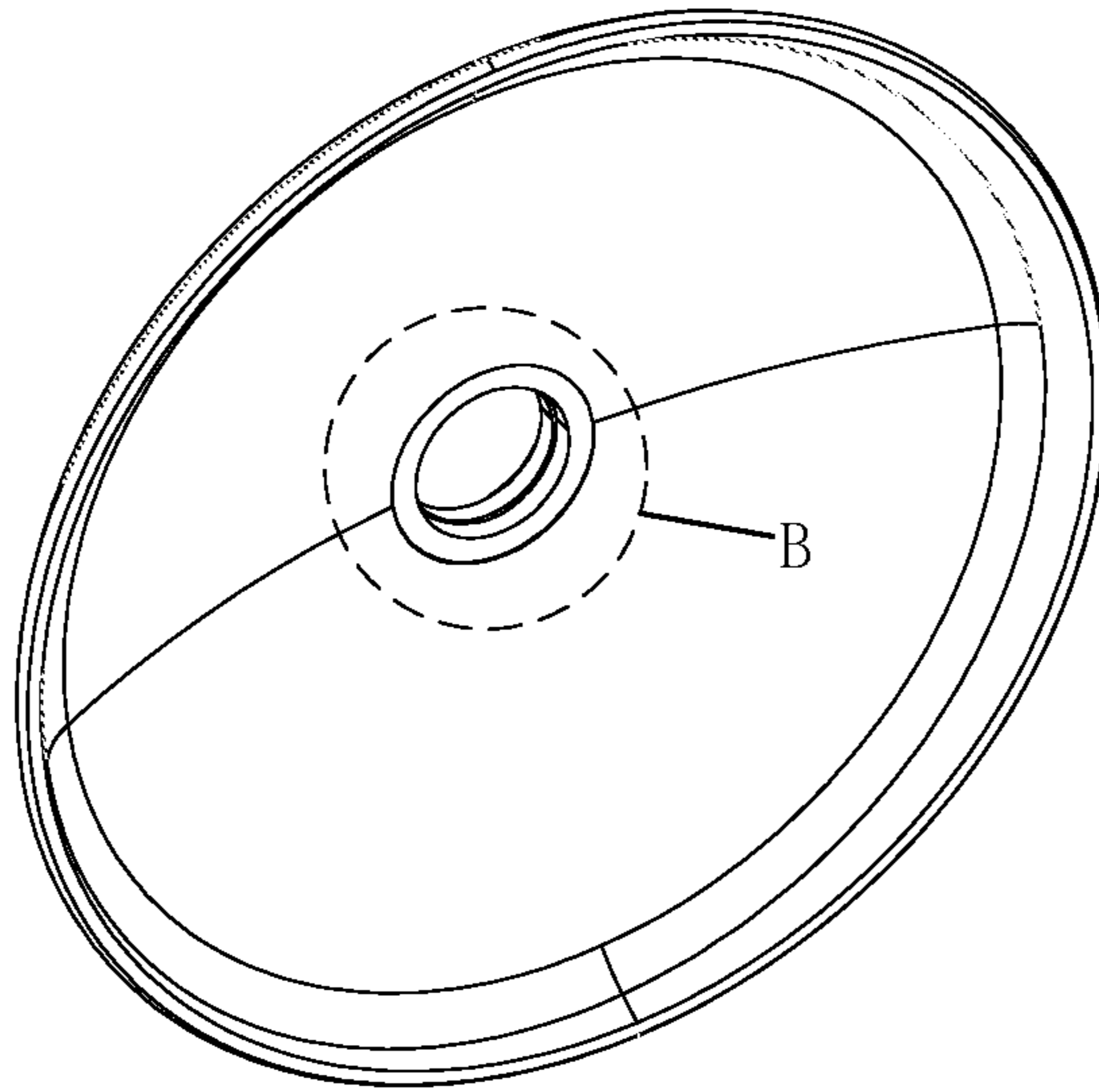


FIG. 3

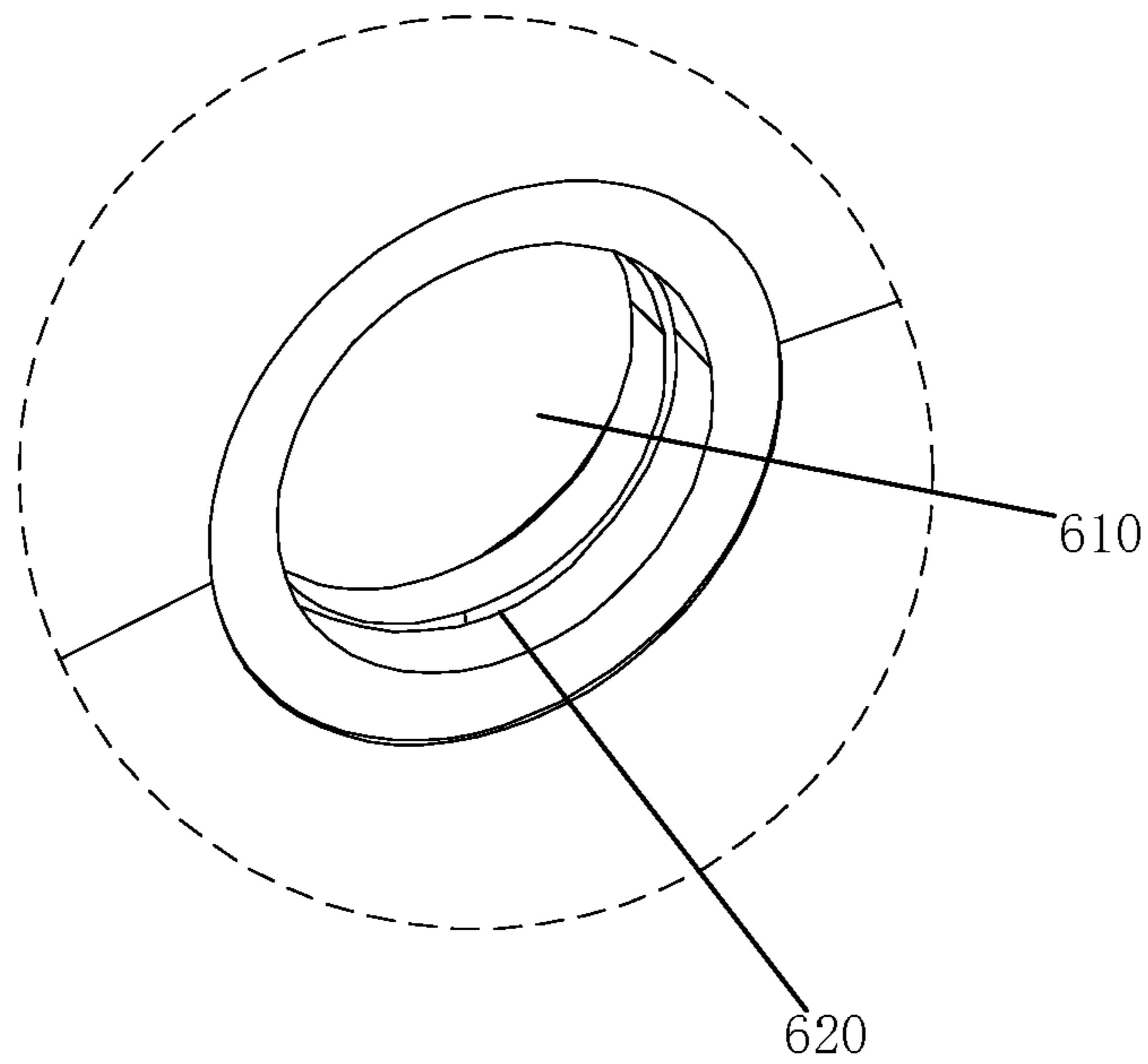


FIG. 4

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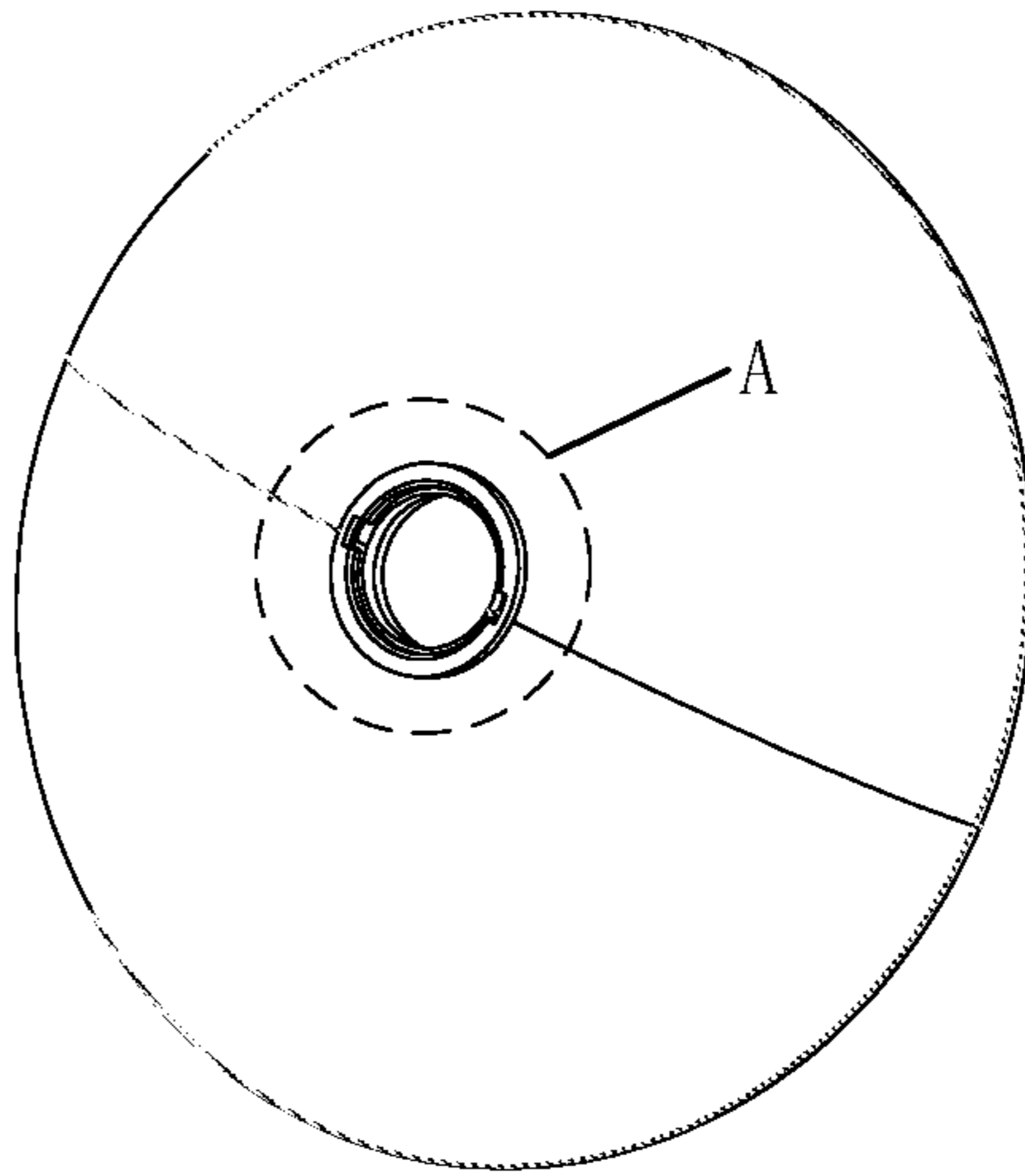


FIG. 5

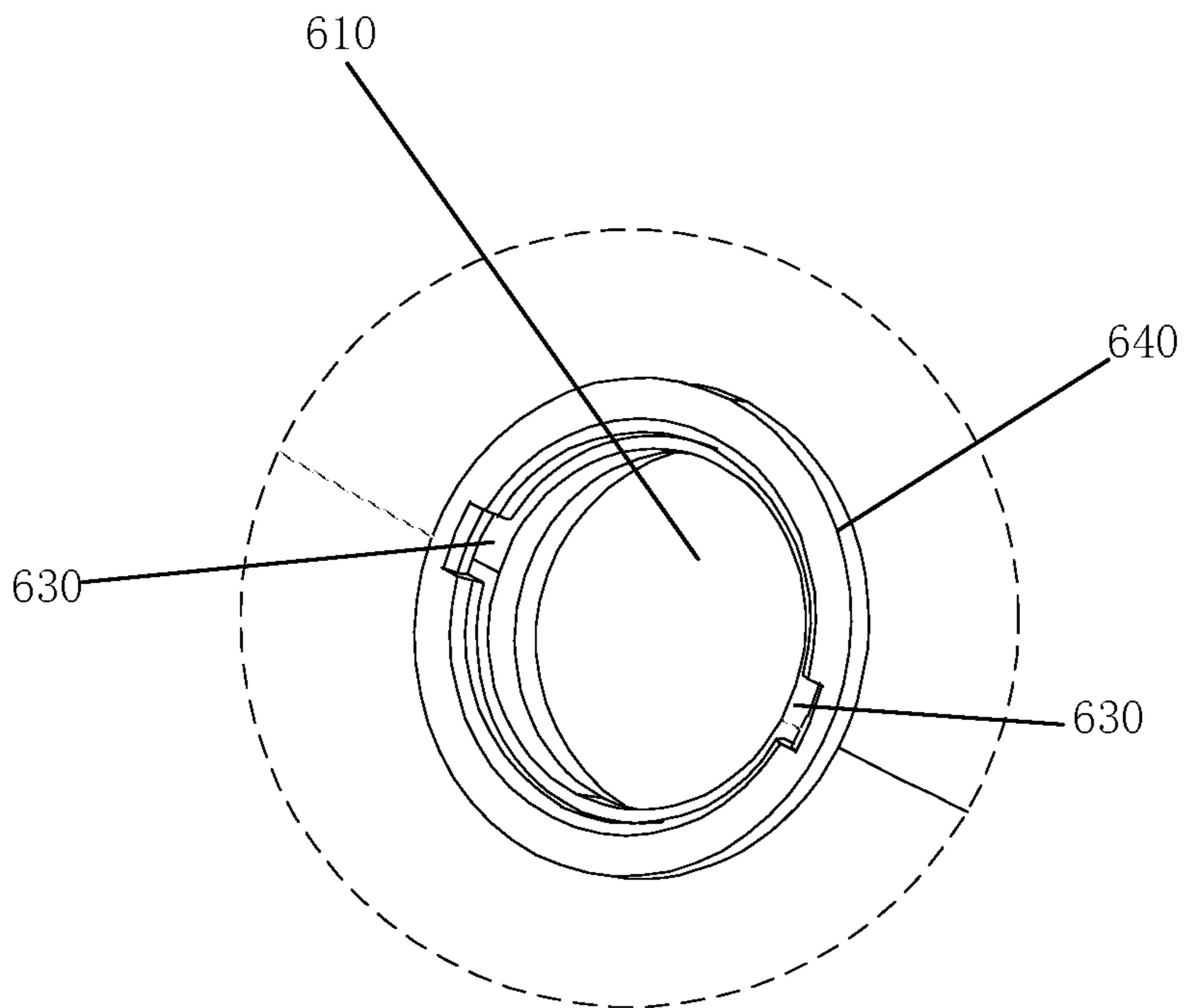


FIG. 6

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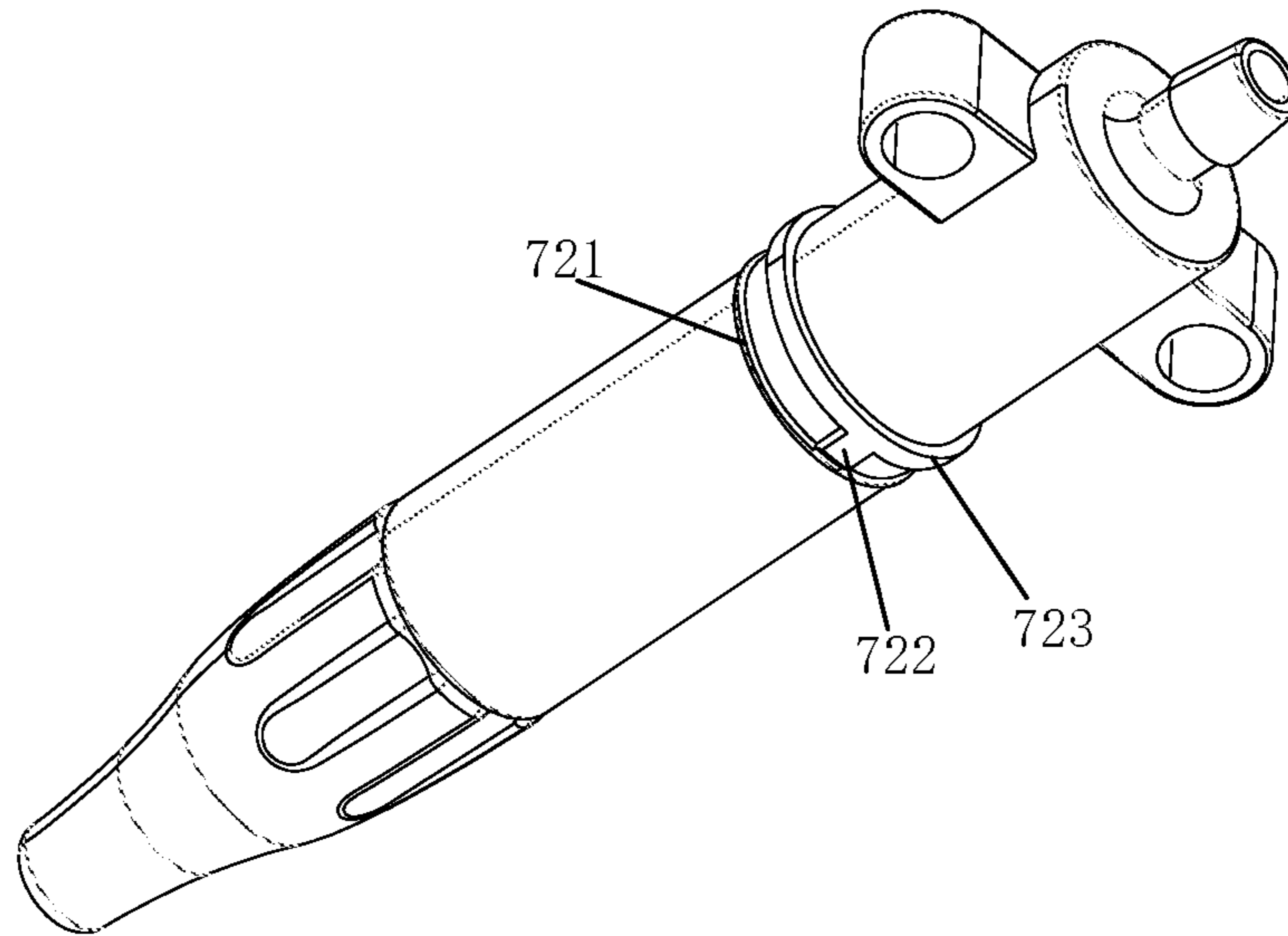


FIG. 7

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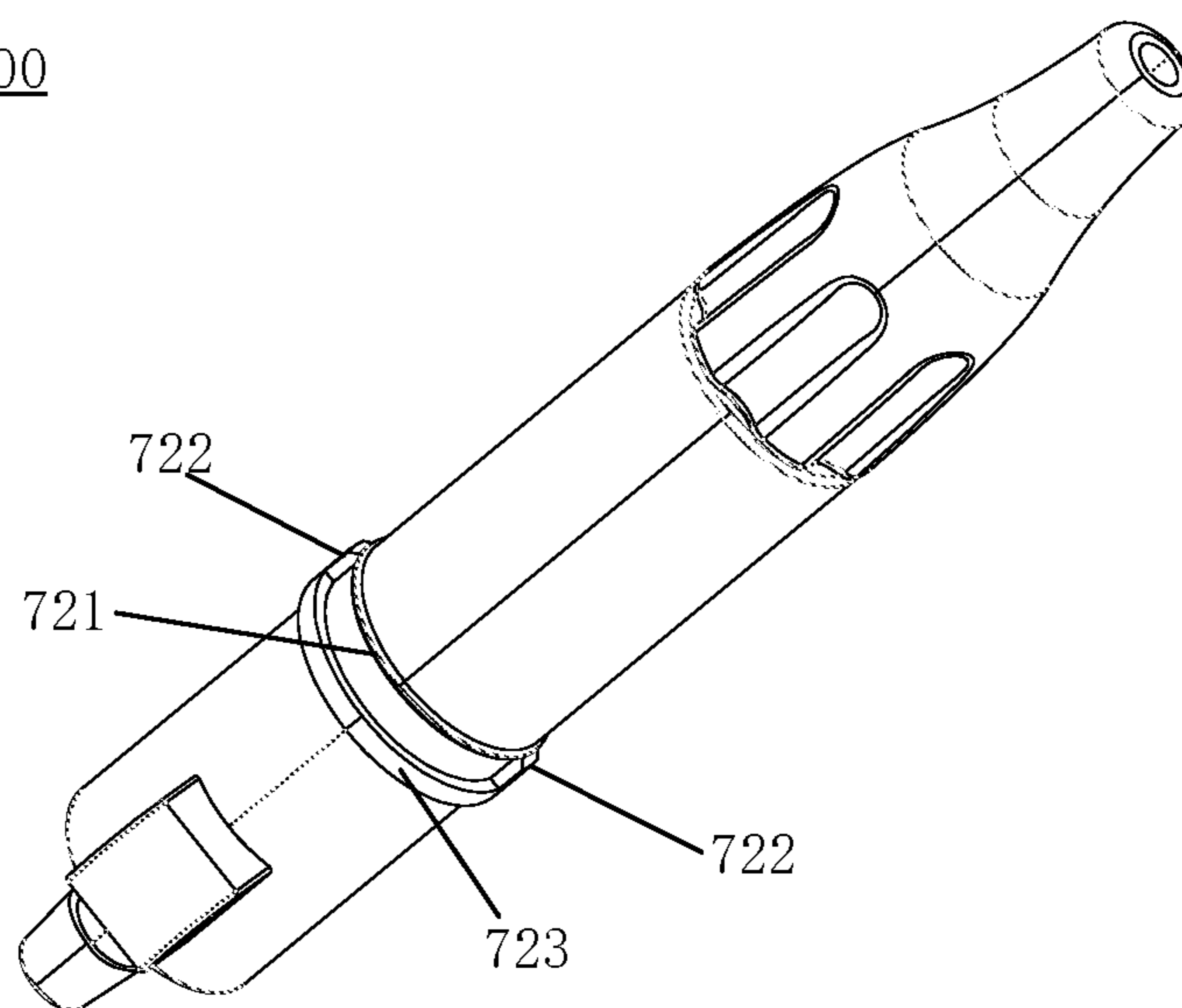


FIG. 8

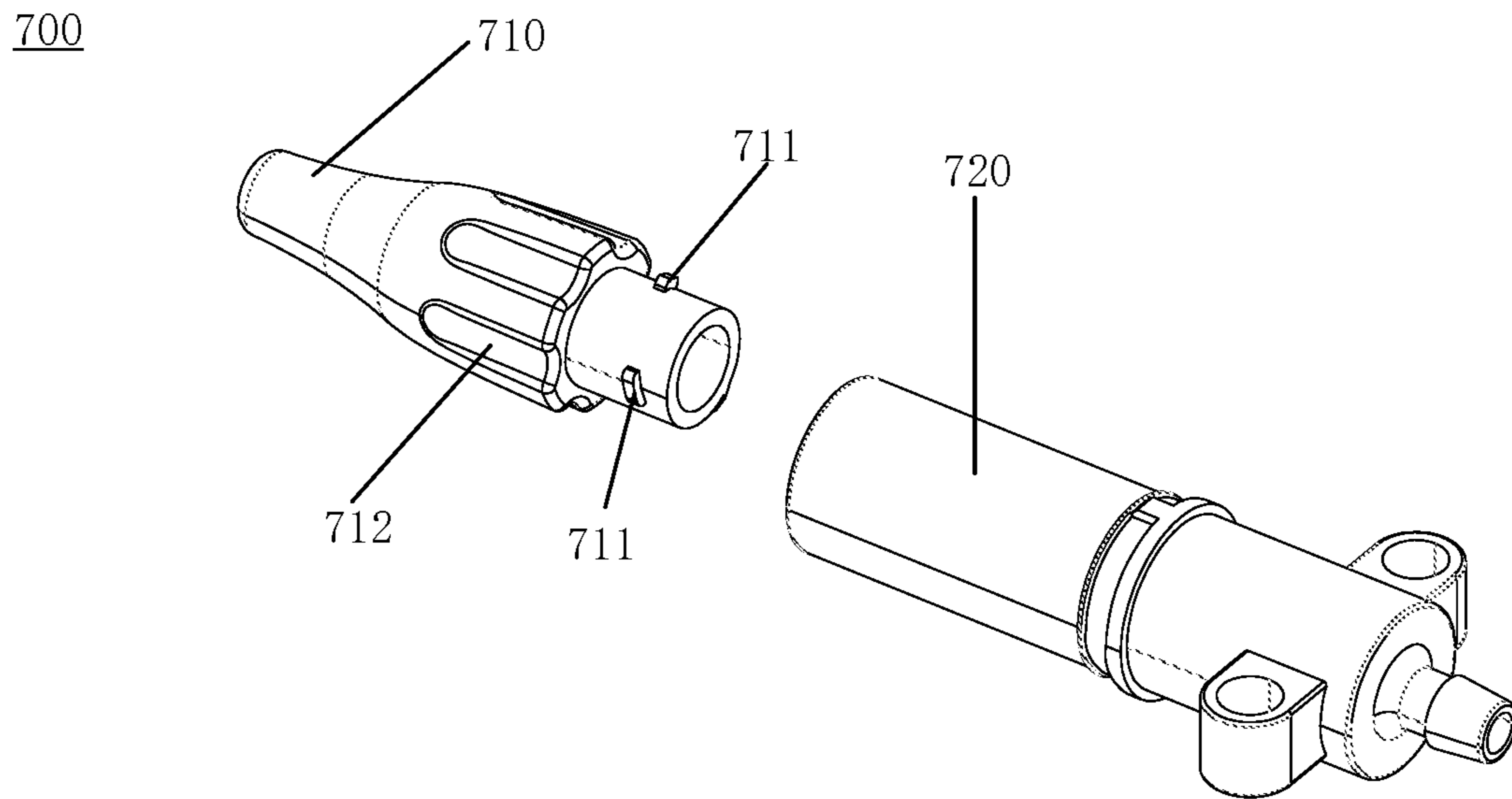


FIG. 9

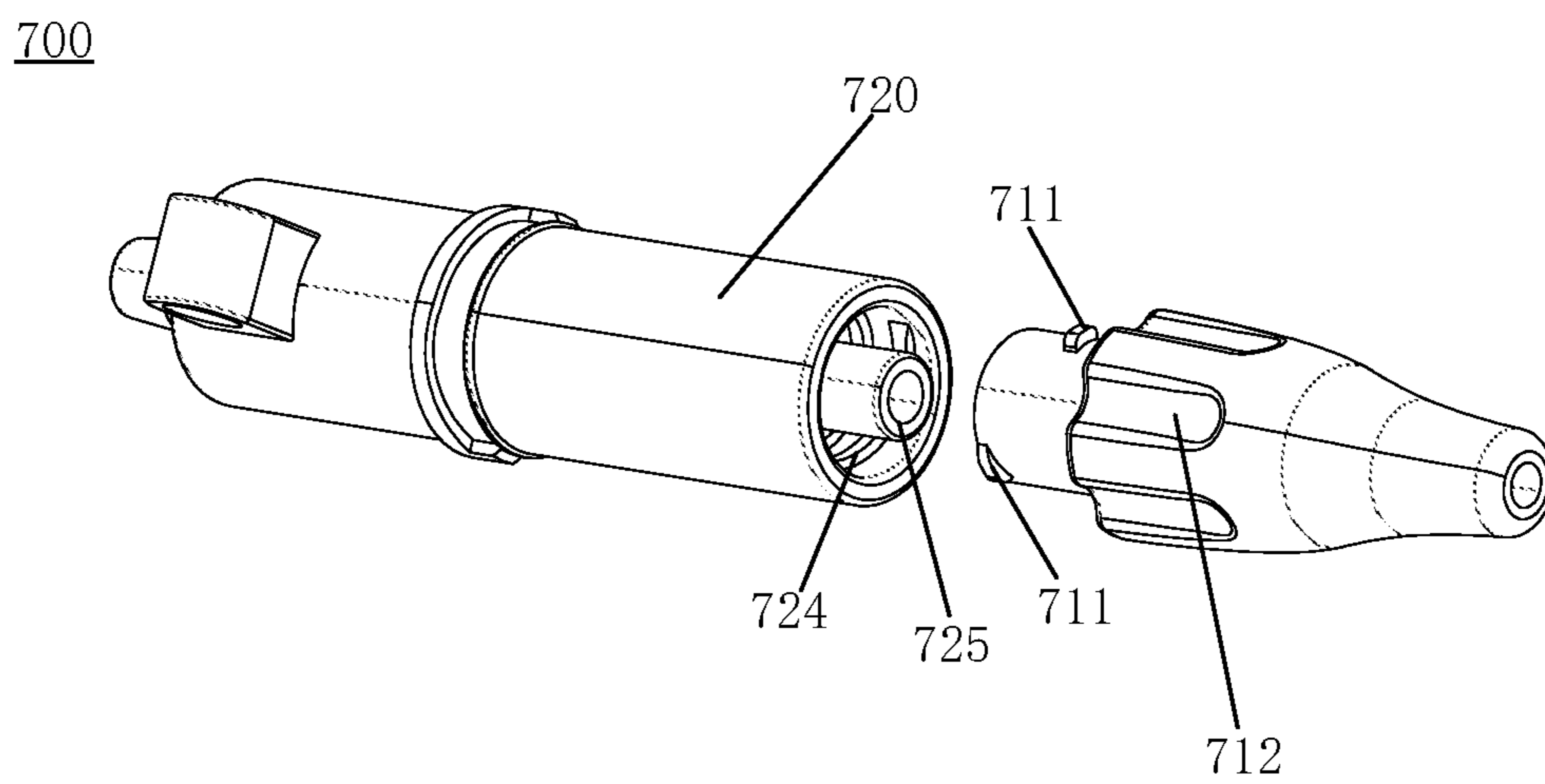


FIG. 10

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## EAR, NOSE, AND THROAT IRRIGATOR

## TECHNICAL FIELD

The present disclosure relates to a field of ear, nose, and throat irrigators technology, and in particular to an ear, nose, and throat irrigator.

## BACKGROUND

In various medical situations or daily life, it is often necessary to irrigate the ear, nose, and throat. For example, among the common diseases of otology, otitis media, middle ear effusion, and other clinical treatment operations need to clean up ear discharge. Clinicians perform further examination and treatment after cleaning an external auditory canal of a patient.

An ear, nose, and throat irrigator is a device configured to irrigate the ears, nose, and throat, and is used in various medical situations and daily life. However, during an irrigating process of the ear, nose, and throat irrigator, washing liquid is prone to splash around when sprayed onto a portion to be irrigated. Thus, the washing liquid splashes on a body of a user or the patient, or splashes on the ear, nose and throat irrigator, which is inconvenient to use.

## SUMMARY

An object of the present disclosure is to provide an ear, nose, and throat irrigator, which is not easy to splash around and is convenient to use.

The present disclosure provides an ear, nose, and throat irrigator. The ear, nose, and throat irrigator comprises a bottle body, a housing, a water pump, a first tube body, a second tube body, and a shielding cover. A first end of the housing is connected with the bottle body. A spray head is arranged on a second end of the housing. The water pump is arranged in the housing. A first end of the first tube body is inserted into the bottle body. A second end of the first tube body is connected with a water inlet joint of the water pump. A first end of the second tube body is connected with a water outlet joint the water pump. A second end of the second tube body is connected with the spray head. The shielding cover is arranged on the spray head. The shielding cover is configured to shield water sprayed from the spray head.

Optionally, a surface of the spray head comprises a clamping protrusion. A through hole is on the shielding cover. A locking groove is arranged on a wall surface of the through hole. The shielding cover is sleeved on the spray head through the through hole. The clamping protrusion is engaged with the locking groove.

Optionally, anti-rotation protrusions are arranged on the surface of the spray head, and anti-rotation grooves are arranged on the wall surface of the through hole. The anti-rotation protrusions are embedded in the anti-rotation grooves.

Optionally, a resisting protrusion is arranged on the surface of the spray head. The resisting protrusion is arranged on one side of the spray head close to the housing. The resisting protrusion abuts against the shielding cover.

Optionally, the shielding cover is transparent.

Optionally, illuminating lights are arranged on an end surface of the housing close to the shielding cover.

Optionally, a thickness of the shielding cover gradually decreases from a middle portion to a periphery portion.

Optionally, the housing comprises a vertical portion and a horizontal portion. The vertical portion and the horizontal

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portion are connected in a "7" shape. The vertical portion is connected with the bottle body. The ear, nose, and throat irrigator further comprises a power supply. The power supply is arranged in the horizontal portion. The water pump is arranged in the vertical portion.

Optionally, the water pump is vertically arranged in the vertical portion; the water inlet joint faces the bottle body.

Optionally, the ear, nose, and throat irrigator further comprises a weight ball. The weight ball is connected to the first end of the first tube body inserted into the bottle body. A first channel and a second channel are defined in the weight ball. The first channel is communicated with the first tube body. The second channel is communicated with the first channel. A diameter of the second channel is greater than a diameter of the first channel.

In the ear, nose, and throat irrigator of the present disclosure, by arranging the shielding cover on the spray head, through shielding of the shielding cover, washing liquid is prevented from splashing around. Washing liquid is not easy to splash on a body of a user or a patient, and it is also not easy to splash on the ear, nose, and throat irrigator, which is convenient to use.

## BRIEF DESCRIPTION OF DRAWINGS

The drawings are included to provide a further understanding of embodiments of the present disclosure, which form portions of the specification and are used to illustrate implementation manners of the present disclosure and are intended to illustrate operating principles of the present disclosure together with the description. Apparently, the drawings in the following description are merely some of the embodiments of the present disclosure, and those skilled in the art are able to obtain other drawings according to the drawings without contributing any inventive labor. In the drawing:

FIG. 1 is a schematic diagram of an ear, nose, and throat irrigator according to one embodiment of the present disclosure.

FIG. 2 is a cross-sectional view of an ear, nose, and throat irrigator according to one embodiment of the present disclosure.

FIG. 3 is a schematic diagram of a shielding cover according to one embodiment of the present disclosure.

FIG. 4 is an enlarged view of portion B shown in FIG. 3.

FIG. 5 is another schematic diagram of the shielding cover according to one embodiment of the present disclosure.

FIG. 6 is an enlarged view of portion A shown in FIG. 5.

FIG. 7 is a schematic diagram of a spray head according to one embodiment of the present disclosure.

FIG. 8 is another schematic diagram of the spray head according to one embodiment of the present disclosure.

FIG. 9 is an exploded schematic diagram of the spray head according to one embodiment of the present disclosure.

FIG. 10 is another exploded schematic diagram of the spray head according to one embodiment of the present disclosure.

In the drawings:

100—bottle body; 200 housing; 210—vertical portion; 220—horizontal portion; 221—illuminating light; 300—water pump; 310—water inlet joint; 320—water outlet joint; 400—first tube body; 500—second tube body; 600—shielding cover; 610—through hole; 620—locking groove; 630—anti-rotation groove; 640—reinforcing protrusion; 700—spray head; 710—nozzle; 711—clamping block; 712—groove strip; 720—rod; 721—clamping protrusion; 722—

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anti-rotation protrusion; **723**—resisting protrusion; **724**—thread; **725**—inserting tube; **800**—counterweight ball; **810**—first channel; **820**—second channel; **900**—power supply.

## DETAILED DESCRIPTION

It should be understood that terms used herein and the specific structure and function details disclosed are only for describing specific embodiments and are representative. However, the present disclosure can be implemented in many alternative forms and should not be interpreted as limited to the embodiments described herein.

The present disclosure will be described in detail below with reference to the drawings and optional embodiments.

As shown in FIGS. 1 and 2, as one embodiment of the present disclosure, an ear, nose, and throat irrigator is disclosed. The ear, nose, and throat irrigator comprises a bottle body **100**, a housing **200**, a water pump **300**, a first tube body **400**, a second tube body **500**, and a shielding cover **600**. A first end of the housing **200** is connected with the bottle body **100**. A spray head **700** is arranged on a second end of the housing **200**. The water pump **300** is arranged in the housing **200**. A first end of the first tube body **400** is inserted into the bottle body **100**. A second end of the first tube body **400** is connected with a water inlet joint of the water pump **300**. A first end of the second tube body **500** is connected with a water outlet joint the water pump **300**. A second end of the second tube body **500** is connected with the spray head **700**. The shielding cover **600** is arranged on the spray head **700**. The shielding cover **600** is configured to shield water sprayed from the spray head **700**.

During an irrigating process of a conventional ear, nose, and throat irrigator, washing liquid is prone to splash around when sprayed onto a portion to be irrigated. Thus, the washing liquid splashes on a body of a user or the patient, or splashes on the ear, nose and throat irrigator, which is inconvenient to use.

In the ear, nose, and throat irrigator of the present disclosure, by arranging the shielding cover **600** on the spray head **700**, through shielding of the shielding cover **600**, the washing liquid is prevented from splashing around. The washing liquid is not easy to splash on the body of the user or the patient, and it is also not easy to splash on the ear, nose, and throat irrigator, which is convenient to use.

An operation process of the ear, nose, and throat irrigator is described as follow. Specifically, the bottle body **100** is filled with washing liquid, and the washing liquid may be a therapeutic liquid or water. The bottle body **100** is connected with the housing **200**, and the first tube body **400** is inserted into the bottle body **100** and inserted into the washing liquid. Then the water pump **300** is turned on, and the water pump **300** draws out the washing liquid through the first tube body **400** and pumps it to the spray head **700** through the second tube body **500**. The washing liquid is sprayed from the spray head **700**. When the washing liquid is sprayed on the portion to be irrigated, the washing liquid inevitably splashes around. At this time, the shielding cover **600** arranged on the spray head **700** blocks the splashing washing liquid, and the washing liquid is not easy to splash around.

Specifically, as shown in FIGS. 3-8, a surface of the spray head **700** comprises a clamping protrusion **721**. A through hole **610** is on the shielding cover **600**. A locking groove **620** is arranged on a wall surface of the through hole **610**. The shielding cover **600** is sleeved on the spray head **700** through the through hole **610**. The clamping protrusion **721** is engaged with the locking groove **620**.

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In the embodiment, through cooperation of the clamping protrusions **721** and the locking grooves **620**, the shielding cover **600** is easily mounted on the spray head **700** and is easily detached from the spray head **700**, so that the shielding cover **600** is conveniently detachable from the spray head **700**. The shielding cover **600** is convenient to disassemble and assemble, and is convenient to replace. Specifically, the clamping protrusion **721** are arranged around a circumferential direction of the surface of the spray head **700**, and the locking grooves **620** are arranged around one circle around a circumferential direction of the wall surface of the through hole **610**, which makes fixing effect good, and the shielding cover **600** is not easy to fall off.

Specifically, at least one anti-rotation protrusion **722** is arranged on the surface of the spray head **700**, and at least one anti-rotation groove **630** is arranged on the wall surface of the through hole **610**. The at least one anti-rotation protrusion **722** is embedded in the at least one anti-rotation grooves **610**.

In the embodiment, through cooperation of the at least one anti-rotation protrusions **722** and the at least one anti-rotation grooves **630**, the shielding cover **600** is prevented from rotating relative to the spray head **700**, and the fixing effect of the shielding cover **600** is good. Furthermore, in the embodiment, two anti-rotation protrusions **722** are provided, and two anti-rotation grooves **630** are provided accordingly. The two anti-rotation protrusions **722** are separately embedded in a respective anti-rotation grooves **630**. Furthermore, the two anti-rotation protrusions **722** are arranged at an interval of  $180^\circ$ , the two anti-rotation grooves **630** are arranged corresponding to the two anti-rotation protrusions **722**. The two anti-rotation protrusions **722** are arranged at the interval of  $180^\circ$ , so the force is more even, and the anti-rotation effect is good. In other embodiments, one, three, or even more anti-rotation protrusions **722** and one, three, or even more anti-rotation grooves **630** may be provided, which is not limited thereto. For example, when there are three anti-rotation protrusions **722** and three anti-rotation grooves **630**, both of the three anti-rotation protrusions **722** and the anti-rotation grooves **630** are evenly spaced. A circumference angle formed between each two adjacent anti-rotation protrusions **722** is same. A circumference angle formed between each two adjacent anti-rotation grooves **630** is same.

Specifically, a resisting protrusion **723** is arranged on the surface of the spray head **700**. The resisting protrusion **723** is arranged on one side of the spray head **600** close to the housing **200**. The resisting protrusion **723** abuts against the shielding cover **600**.

When the shielding cover **600** is in use, due to an impact of the washing liquid, the shielding cover **600** may gradually move axially toward the housing **200**. In the embodiment, by providing the resisting protrusion **723** on the spray head **700** on the side that the shielding cover **600** is close to the housing **200**, the shielding cover **600** is prevented from moving axially along the spray head **700** and approaching the housing **200** by resistance of the resisting protrusions **723**. Furthermore, the resisting protrusion **723** is arranged around a circumferential direction of the surface of the spray head **700**, and the resisting effect is good. In other embodiments, multiple resisting protrusions **723** may be provided and the resisting protrusions **723** are arranged at intervals.

Specifically, a reinforcing protrusion **640** is arranged on an edge of a side of the through hole **610** facing the housing **200**. The reinforcing protrusion **640** is arranged around a periphery of an edge of the through hole **610**. The through hole **610** is a position where the force is relatively large and



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frequently, and because the through hole 610 is defined, a structural strength of the through hole 610 is small. In the embodiment, by providing the reinforcing protrusion 640, a structural strength of a periphery of the through hole 610 is strengthened, and the shielding cover 600 is prevented from being damaged.

Specifically, the shielding cover 600 is transparent. In the embodiment, the shielding cover 600 is set to be transparent, and the shielding cover 600 does not obstruct the user's sight while shielding splashing of the washing liquid, which is convenient for the user to observe a washing portion. Furthermore, the shielding cover 600 is made of a soft, deformable material, such as rubber, silicone, and the like. The soft shielding cover 600 is easy to deform so it is easy to install. Furthermore, a thickness of the shielding cover 600 gradually decreases from a middle portion to a periphery portion. A structure of the washing portion of the ear, nose and throat is relatively complicated, and it is difficult to observe. In the embodiment, the thickness of the shielding cover 600 gradually decreases from the middle portion to the periphery portion, so a shape of the shielding cover 600 is thick in the middle portion and thin at the periphery portion, so that the shielding cover 600 has a magnifying function, similar to a magnifying glass. In this way, the shielding cover 600 magnifies the washing portion, which is convenient for the user to observe the washing portion.

Specifically, a surface of the shielding cover 600 facing away from the housing 200 is curved, and the curved surface is recessed toward the housing 200. The surface of the shielding cover 600 facing away from the housing 200 is used to shield the splashed washing liquid. By arranging the surface as the curved surface and recessed toward the housing 200, the splashed washing liquid is buffered and received, which prevents the washing liquid from splashing back to the washing portion. At the same time, the curved surface also plays a role of gathering the splashing washing liquid to prevent the washing liquid from splashing again.

Specifically, illuminating lights 221 are arranged on an end surface of the housing 200 close to the shielding cover 600. The structure of the washing portion of the ear, nose, and throat is relatively complicated, light is poor, and it is difficult to observe. In the embodiment, the washing portion is illuminated by the illuminating light 221, which is convenient for the user to observe the washing portion. Furthermore, there are four illuminating lamps 221, and the four illuminating lights are evenly arranged on the end surface of the housing 200 close to the shielding cover 600, so that the light is stronger and a brightness is uniform.

As shown in FIG. 2, the housing 200 comprises a vertical portion 210 and a horizontal portion 220. The vertical portion 210 and the horizontal portion 220 are connected in a "7" shape. The vertical portion 210 is connected with the bottle body 100. The ear, nose, and throat irrigator further comprises a power supply 900. The power supply 900 is arranged in the horizontal portion 220. The water pump 300 is arranged in the vertical portion 210.

The housing 200 is in the shape of "7", and the spray head 700 is arranged on the end surface of the horizontal portion 220 to facilitate washing by the user. More importantly, a weight of the water pump 300 is relatively large, to arrange the water pump 300 in the vertical portion 210 is able to lower a center of gravity of the ear, nose, and throat irrigator. The weight is reasonable, so the ear, nose, and throat irrigator is placed stably. When the user picks it up, it is also labor-saving. At the same time, arranging the power supply 900 in the horizontal portion 220 is able to fully and rationally utilize and internal space of the housing 200.

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Specifically, the water pump 300 is vertically arranged in the vertical portion 210. The water inlet joint 310 faces the bottle body 100. In the embodiment, the water pump 300 is arranged vertically and the water inlet joint 310 faces the bottle body 100. In this way, water inlet of the first pipe body 400 does not need to bend, and the water inlet is smooth.

Specifically, the ear, nose, and throat irrigator further comprises a weight ball 800. The weight ball 800 is connected to the first end of the first tube body 400 inserted into the bottle body 100. A first channel 810 and a second channel 820 are defined in the weight ball 800. The first channel 810 is communicated with the first tube body 400. The second channel 820 is communicated with the first channel 810. A diameter of the second channel 820 is greater than a diameter of the first channel 810.

The weight ball 800 has a certain weight and straightens the first tube body 400 to facilitate smooth water inlet. The weight ball 800 comprises the first channel 810 and the second channel 820. The second channel 820 has a larger diameter than the first channel 810, which reduces water inlet resistance, facilitates the washing liquid to quickly enter the first tube body 400, and reduces a working load of the water pump 300.

Specifically, as shown in FIGS. 9 and 10, the spray head 700 comprises a nozzle 710 and a rod 720. The rod 720 is connected with the housing 200 and connected with the second tube body 500. A clamping block 711 is arranged on one end of the nozzle 710. Threads 724 are arranged on an inner wall of the rod 720, and the clamping block 711 is inserted into the rod and engaged with the threads 724. The nozzle 710 is screwed to the rod 720 through cooperation of the clamping block 711 and the threads 724, and the nozzle 710 is replaceable. Furthermore, an inserting tube 725 is arranged in the rod 720. When the nozzle 710 is screwed on the rod 720, the inserting tube 725 is inserted into the nozzle 710, which makes connection strong. Furthermore, groove strips 712 are arranged on a surface of the nozzle 710 to increase friction of the nozzle 710, so when the user rotates the nozzle 710, it is not easy to slip, which saves effort.

The above content is a further detailed description of the present disclosure in combination with specific optional embodiments, and it is not considered that the specific implementation of the present disclosure is limited to these descriptions. For those of ordinary skill in the field to which the present disclosure belongs, a number of simple deductions or substitutions can be made without departing from the concept of the present disclosure, which should be regarded as falling within the protection scope of the present disclosure.

What is claimed is:

1. An ear, nose, and throat irrigator, comprising: a bottle body, a housing, a water pump, a first tube body, a second tube body, and a shielding cover; wherein a first end of the housing is connected with the bottle body; a spray head is arranged on a second end of the housing; the water pump is arranged in the housing; a first end of the first tube body is inserted into the bottle body; a second end of the first tube body is connected with a water inlet joint of the water pump; a first end of the second tube body is connected with a water outlet joint of the water pump; a second end of the second tube body is connected with the spray head; the shielding cover is arranged on the spray head; the shielding cover is configured to shield water sprayed from the spray head, wherein the shielding cover is transparent, wherein illuminating lights are arranged on an end surface of the housing adjacent to the shielding cover, the illuminating lights are configured for illuminating a washing portion for users to

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observe, wherein a surface of the spray head comprises a clamping protrusion; a through hole is on the shielding cover; a locking groove is arranged on a wall surface of the through hole; the shielding cover is sleeved on the spray head through the through hole; the clamping protrusion is engaged with the locking groove; and wherein anti-rotation protrusions are arranged on the surface of the spray head, and anti-rotation grooves are arranged on the wall surface of the through hole; the anti-rotation protrusions are embedded in the anti-rotation grooves.

2. The ear, nose, and throat irrigator according to claim 1, wherein a resisting protrusion is arranged on the surface of the spray head; the resisting protrusion is arranged on one side of the spray head close to the housing; the resisting protrusion abuts against the shielding cover.

3. The ear, nose, and throat irrigator according to claim 2, wherein the ear, nose, and throat irrigator further comprises a weight ball; the weight ball is connected to the first end of the first tube body inserted into the bottle body; a first channel and a second channel are defined in the weight ball; the first channel is communicated with the first tube body; the second channel is communicated with the first channel; a diameter of the second channel is greater than a diameter of the first channel.

4. The ear, nose, and throat irrigator according to claim 1, wherein a thickness of the shielding cover gradually decreases from a middle portion to a periphery portion.

5. The ear, nose, and throat irrigator according to claim 1, wherein the housing comprises a vertical portion and a horizontal portion; the vertical portion and the horizontal portion are connected in a "7" shape; the vertical portion is connected with the bottle body; the ear, nose, and throat irrigator further comprises a power supply; the power supply is arranged in the horizontal portion; the water pump is arranged in the vertical portion.

6. The ear, nose, and throat irrigator according to claim 5, wherein the water pump is vertically arranged in the vertical portion; the water inlet joint faces the bottle body.

7. The ear, nose, and throat irrigator according to claim 1, wherein the ear, nose, and throat irrigator further comprises a weight ball; the weight ball is connected to the first end of the first tube body inserted into the bottle body; a first channel and a second channel are defined in the weight ball; the first channel is communicated with the first tube body; the second channel is communicated with the first channel; a diameter of the second channel is greater than a diameter of the first channel.

8. An ear, nose, and throat irrigator, comprising: a bottle body, a housing, a water pump, a first tube body, a second tube body, and a shielding cover; wherein a first end of the housing is connected with the bottle body; a spray head is arranged on a second end of the housing; the water pump is arranged in the housing; a first end of the first tube body is inserted into the bottle body; a second end of the first tube body is connected with a water inlet joint of the water pump; a first end of the second tube body is connected with a water outlet joint of the water pump; a second end of the second tube body is connected with the spray head; the shielding cover is arranged on the spray head; the shielding cover is configured to shield water sprayed from the spray head, wherein a surface of the spray head comprises a clamping protrusion; a through hole is on the shielding cover; a locking groove is arranged on a wall surface of the through hole; the shielding cover is sleeved on the spray head through the through hole; the clamping protrusion is engaged with the locking groove, wherein anti-rotation

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protrusions are arranged on the surface of the spray head, and anti-rotation grooves are arranged on the wall surface of the through hole; the anti-rotation protrusions are embedded in the anti-rotation grooves.

9. The ear, nose, and throat irrigator according to claim 8, wherein a resisting protrusion is arranged on the surface of the spray head; the resisting protrusion is arranged on one side of the spray head close to the housing; the resisting protrusion abuts against the shielding cover.

10. The ear, nose, and throat irrigator according to claim 9, wherein a thickness of the shielding cover gradually decreases from a middle portion to a periphery portion.

11. The ear, nose, and throat irrigator according to claim 8, wherein the housing comprises a vertical portion and a horizontal portion; the vertical portion and the horizontal portion are connected in a "7" shape; the vertical portion is connected with the bottle body; the ear, nose, and throat irrigator further comprises a power supply; the power supply is arranged in the horizontal portion; the water pump is arranged in the vertical portion.

12. The ear, nose, and throat irrigator according to claim 11, wherein the water pump is vertically arranged in the vertical portion; the water inlet joint faces the bottle body.

13. The ear, nose, and throat irrigator according to claim 8, wherein the ear, nose, and throat irrigator further comprises a weight ball; the weight ball is connected to the first end of the first tube body inserted into the bottle body; a first channel and a second channel are defined in the weight ball; the first channel is communicated with the first tube body; the second channel is communicated with the first channel; a diameter of the second channel is greater than a diameter of the first channel.

14. An ear, nose, and throat irrigator, comprising: a bottle body, a housing, a water pump, a first tube body, a second tube body, and a shielding cover; wherein a first end of the housing is connected with the bottle body; a spray head is arranged on a second end of the housing; the water pump is arranged in the housing; a first end of the first tube body is inserted into the bottle body; a second end of the first tube body is connected with a water inlet joint of the water pump; a first end of the second tube body is connected with a water outlet joint of the water pump; a second end of the second tube body is connected with the spray head; the shielding cover is arranged on the spray head; the shielding cover is configured to shield water sprayed from the spray head, wherein the housing comprises a vertical portion and a horizontal portion; the vertical portion and the horizontal portion are connected in a "7" shape; the vertical portion is connected with the bottle body; the ear, nose, and throat irrigator further comprises a power supply; the power supply is arranged in the horizontal portion; the water pump is arranged in the vertical portion.

15. The ear, nose, and throat irrigator according to claim 14, wherein the water pump is vertically arranged in the vertical portion; the water inlet joint faces the bottle body.

16. The ear, nose, and throat irrigator according to claim 14, wherein the ear, nose, and throat irrigator further comprises a weight ball; the weight ball is connected to the first end of the first tube body inserted into the bottle body; a first channel and a second channel are defined in the weight ball; the first channel is communicated with the first tube body; the second channel is communicated with the first channel; a diameter of the second channel is greater than a diameter of the first channel.

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