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(54) **DUAL HEAD CONTINUOUS BUBBLE BLOWER**

(57) First and second rotational ring structures each include a plurality of individual circumferentially arranged rings. The structures are spaced from each other and situated in substantially the same plane. A fan creates an airflow through the housing. A liquid dispensing section has conduits which deliver bubble generating liquid onto rings of each of the rotational ring structures. A siphoning mechanism draws bubble generating liquid from a reservoir and to each of said first and second rotational ring structures. A drive mechanism rotates the rotational ring structures. A motor powers the siphoning mechanism, the drive mechanism, and the fan, such that separate continuous bubble streams are created simultaneously.

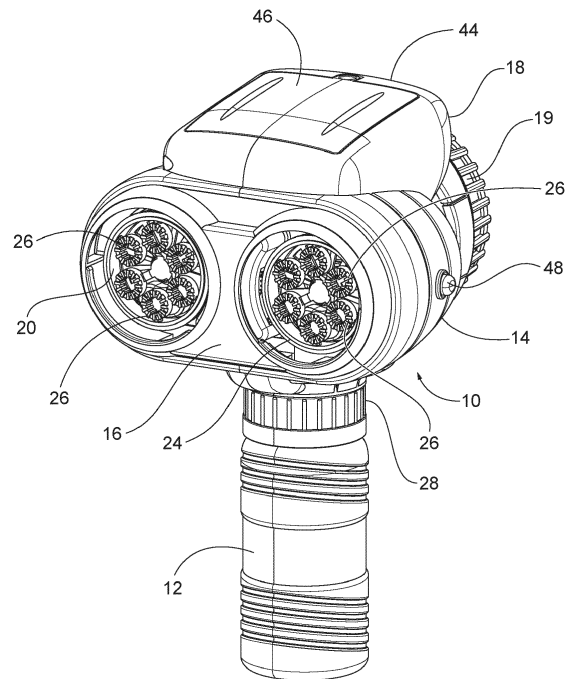


FIG. 1

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Description

BACKGROUND OF THE INVENTION

1. FIELD OF THE INVENTION

[0001] The present invention relates to bubble blower machines and more particularly to a bubble blower machine capable of creating two continuous bubble streams simultaneously.

2. DESCRIPTION OF PRIOR ART INCLUDING INFORMATION DISCLOSED UNDER 37 CFR 1.97 AND 1.98

[0002] U.S. Patent No. 8,636,557 discloses a hand-held bubble generating apparatus including a housing with a non-spill reservoir for storing bubble generating liquid. A tube carries the bubble generating liquid from the reservoir to a bubble assembly support inside the housing. The bubble assembly support has a main rotational bubble ring made up of a plurality of smaller individual rings spaced around the outer circumference of the main rotational bubble ring.

[0003] When the main rotational bubble ring is rotated proximate to and across a liquid dispensing section, each of the smaller individual rings receives enough bubble generating liquid to form a film across the ring. By rationing the amount of bubble liquid released on each individual ring, the device can incorporate a closed, non-spill reservoir. A stream of bubbles is produced when air is generated and blown through the film of bubble generating liquid on each of the individual rings of the main rotational bubble ring.

[0004] Although the bubble generating device of Pat No. US 8,636,557 works very well, it can only generate one continuous bubble stream at a time. The present invention is designed to overcome that limitation by providing a bubble film forming mechanism with two main rotational bubble rings, each having a plurality of smaller individual blowing rings. Each of the main rotational rings is capable of creating a continuous bubble stream. In this way, two continuous bubble streams can be created simultaneously.

[0005] This made possible by using only a single motor with modifications on the gears structure as well as the bubble siphoning feeding tubing. A major benefit of this design is that with the present invention, twice the number of bubbles are generated as compared to the amount produced in the patented bubble generating device, while at the same time keeping the design compact and easy for kids to carry around in an outdoor environment.

BRIEF SUMMARY OF THE INVENTION

[0006] In accordance with one aspect of the present invention, a bubble generating apparatus is provided including a housing having first and second end portions. First and second rotational ring structures are rotatably

seated in the housing and disposed proximate to an opening defined in the second end portion of the housing. Each of the first and second rotational ring structures is formed of a plurality of individual rings. The first and second rotational ring structures are spaced from each other and situated in substantially the same plane.

[0007] A reservoir is coupled with the housing and configured to store bubble generating liquid. A fan is situated proximate the first end portion of the housing and adapted to create an airflow through the housing. A liquid dispensing section includes first and second conduits, each of the conduits having an outlet to dispose the bubble generating liquid onto the plurality of individual rings of a different one of the first and second rotational ring structures. That creates a film of bubble generating liquid across the plurality of individual rings of each of the first and second rotational ring structures.

[0008] Within the housing is a siphoning mechanism which draws bubble generating liquid from the reservoir and through the first and second conduit outlets to each of the first and second rotational ring structures. A drive mechanism is adapted to rotate the first and second rotational ring structures. A motor powers the siphoning mechanism, the drive mechanism the fan, such that the apparatus creates separate continuous bubble streams simultaneously.

[0009] The first end portion of the housing in the form of a handle. The second end portion is in the shape of a barrel. The first end of the motor is proximate to the first end portion of the housing. A second end of the motor is proximate to the second end portion of the housing.

[0010] The plurality of individual rings of each of the first and second rotational ring structures are spaced circumferentially from each other.

[0011] The drive mechanism comprises an assembly of gears. The assembly includes a central gear situated between the first rotational ring structure and the second rotational ring structure. The motor is adapted to rotate the central gear. The gear assembly also includes a first gear connecting the central gear with the first rotational ring structure and a second gear connecting the central gear with the second rotational gear structure.

[0012] The liquid dispensing section is disposed proximate to the opening at the second end portion of the housing

[0013] The liquid dispensing section is coupled to a second end of the motor and is situated proximate to the opening in the second end portion of the housing.

[0014] In accordance with another aspect of the present invention, a bubble generating apparatus is provided including a housing having first and second end portions. A first rotational ring structure is rotatably seated in the housing and disposed proximate to an opening defined in the second end portion of the housing. A second rotational ring structure is rotatably seated in the housing and disposed proximate to an opening defined in the second end portion of the housing. Each of the first and second the rotational ring structures includes a plu-

rality of individual rings.

[0015] A reservoir is coupled with the housing and configured to store bubble generating liquid. A fan within the housing creates an airflow through the housing.

[0016] A liquid dispensing section includes a first liquid outlet and a second liquid outlet. The first outlet is operable to dispose the bubble generating liquid onto the plurality of individual rings of the first rotational ring structure, thereby creating a film of bubble generating liquid across the plurality of individual rings of the first rotational ring structure. The second outlet is operable to dispose the bubble generating liquid onto the plurality of individual rings of the second rotational ring structure, thereby creating a film of bubble generating liquid across the plurality of individual rings of the second rotational ring structure.

[0017] A conduit is provided with a first end extending into the reservoir and a second end connected to the first outlet and the second outlet. A siphoning mechanism operates to draw the bubble generating liquid from the reservoir and through the conduit to the first outlet and the second outlet

[0018] Also within the housing is a drive mechanism which drives the first rotational ring structure and the second rotational ring structure. A motor powers the drive mechanism, the fan; and the siphoning mechanism, such that airflow through the housing causes the first and second rotational ring structures to form separate continuous bubble streams.

[0019] The drive mechanism has an assembly of gears, including a central gear situated between the first rotational ring structure and the second rotational ring structure. The motor is adapted to rotate the central gear. A first gear connects the central gear with the first rotational ring structure. A second gear connects the central gear with the second rotational gear structure.

[0020] The first rotational ring structure and the second rotational ring structure are spaced from each other. The first rotational ring structure and the second rotational ring structure are situated in substantially the same plane.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF DRAWINGS

[0021] To these and to such other objects that may hereinafter appear, the present invention relates to a dual head continuous bubble blower as described in detail in the following specification and recited in the annexed claims, taken together with the accompanying drawings in which:

Figure 1 is a perspective exterior view showing the front, top and left side of the housing of the present invention;

Figure 2 is a perspective exterior view of the housing of the present invention from a different perspective than Figure 1;

Figure 3 is a perspective exterior view showing the left side, top and rear of the housing of the present invention;

Figure 4 is a perspective cut-away view showing the interior of the housing of the present invention including the motor, gear assembly and fan arranged to provide two continuous bubble streams;

Figure 5 is a perspective cut-away view showing the interior of the housing of the present invention including the siphoning mechanism which draws the bubble generating solution from the bubble generating liquid reservoir to each of the two rotational ring structures.

Figure 6 is a perspective cut-away view from the rear of the faceplate showing conduit connections from the siphoning mechanism to each of the rotational ring structures.

Figure 7 is a perspective cut-away view from the front of the housing showing the first and second rotational ring structures mounted on the faceplate and the drive gears situated between the rotational rings which rotate the rotational ring structures simultaneously;

Figure 8 is a perspective cut-away view of the housing showing the faceplate without the rotational ring structures; and

Figure 9 is a perspective exterior front view of the housing of the present invention shown creating two separate continuous streams of bubbles simultaneously.

DETAILED DESCRIPTION OF THE INVENTION

[0022] As seen in Figures 1, 2 and 3, the bubble generating apparatus includes a housing, generally designated 10. Housing 10 has a handle portion 12 and a barrel portion 14. Barrel portion 14 has a front end 16 and a rear end 18.

[0023] A first rotational ring structure 20 is rotatably seated in a faceplate 22 which forms the front 16 of housing 10. A second rotational ring structure 24 is also seated in faceplate 22 at a location spaced from and in substantially the same plane as first rotational ring structure 20.

[0024] Each of the first and second rotational ring structures 20, 24 is formed of a plurality of individual rings 26. Rings 26 are arranged circumferentially within the rotational ring structures.

[0025] Handle portion 12 of housing 10 is hollow and functions as a reservoir to store bubble generating liquid. The handle is coupled to the housing by an internally threaded cap-like connector 28 designed to mate with the externally threaded top portion of handle 12. The han-

dle is removable to allow the bubble generating liquid to be replenished.

[0026] A fan 30 is located in an opening in the rear 18 of the housing. When rotated, fan 30 will create an airflow through the housing. The fan is covered by a cage 19.

[0027] Figures 4, 5 and 6 show the liquid dispensing section of the blower is disposed proximate to the opening at the front end 16 of the housing. The liquid dispensing section includes a first conduit 32 and a second conduit 34. Each of the conduits 32, 34 has an outlet connected to the faceplate 22 to deliver bubble generating liquid onto the plurality of individual rings 26 of a different one of the first and second rotational ring structures 20, 24. That creates a film of bubble generating liquid across the plurality of individual rings 26 of each of the first and second rotational ring structures 20, 24.

[0028] When actuated, a siphoning mechanism 36 draws the bubble generating liquid from the reservoir in handle portion 12, through a supply conduit 38 and then through the outlets in first and second conduits 32, 34. In this way, the bubble generating liquid is provided to each of the first and second rotational ring structures 20, 24 and more particularly, to the individual rings 26 of each of the first and second rotational ring structures 20, 24.

[0029] Within the housings is a drive mechanism which rotates the first and second rotational ring structures. The drive mechanism includes a gear assembly, generally designated 40, which connects a motor 42 to each of the rotational ring structures 20 and 24. Motor 42 is situated within the housing near the rear end 18 of the housing, adjacent fan 30.

[0030] Motor 42 is energized by batteries (not shown) situated within a compartment in the top portion 44 of the housing. The battery compartment can be accessed through a removable cover 46 to replace the batteries. A pushbutton 48, accessible from the side of the housing, operates a switch within the housing (not shown). The switch electrically connects motor 42 with the batteries when pushbutton 48 is depressed.

[0031] As best seen in Figure 7, the front portion of gear assembly 40 includes a central gear 50 which is connected to the rotational ring structures 20 and 24 through gears 52 and 54, respectively. Rotational ring structures 20 and 24 each have gear teeth 56, 58 respectively situated around their exterior surface. Gear 52 engages the circumferential gear teeth 56 of rotational ring structure 20. Gear 54 engages the circumferential gear teeth 58 of rotational ring structure 24.

[0032] Motor 42 is connected to and powers siphoning mechanism 36, drive mechanism gear assembly 40 including central gear 50, and fan 30 such that the dual head blower can create two separate continuous bubble streams simultaneously, as illustrated in Figure 9.

[0033] While only a single preferred embodiment of the present invention has been disclosed for purposes of illustration, it is obvious that many modifications and variations could be made thereto. It is intended to cover all of those modifications and variations which fall within the

scope of the present invention, as defined by the following claims.

5 Claims

1. A bubble generating apparatus comprising: a housing comprising first and second end portions; first and second rotational ring structures rotatably seated in said housing and disposed proximate to an opening defined in the second end portion of the housing, wherein each of said first and second rotational ring structures comprising a plurality of individual rings, said first and second rotational ring structures being spaced from each other and situated in substantially the same plane; a reservoir coupled with said housing and configured to store bubble generating liquid; a fan situated proximate said first end portion of said housing adapted to create an airflow through the housing; a liquid dispensing section comprising first and second conduits, each of said conduits having an outlet to dispose the bubble generating liquid onto said plurality of individual rings of a different one of said first and second rotational ring structures, thereby creating a film of bubble generating liquid across the plurality of individual rings of each of said first and second rotational ring structures; a siphoning mechanism operable to draw bubble generating liquid from the reservoir and through said first and second conduit outlets, to each of said first and second rotational ring structures; a drive mechanism adapted to rotate said first and second rotational ring structures; and a motor operable to power said siphoning mechanism, said drive mechanism, and said fan, such that said apparatus creates separate continuous bubble streams simultaneously.
2. The bubble generating apparatus of claim 1, wherein said housing comprises a first end portion comprising a handle and the second end portion comprising a barrel.
3. The bubble generating apparatus of claim 2, wherein a first end of the motor is proximate to the first end portion of the housing and a second end of the motor is proximate to the second end portion of the housing.
4. The bubble generating apparatus of any preceding claim, wherein the plurality of individual rings of each of said first and second rotational ring structures are spaced circumferentially from each other.
5. The bubble generating apparatus of any preceding claim, wherein said drive mechanism comprises a gear assembly, said gear assembly comprising a central gear situated between said first rotational ring structure and said second rotational ring structure.

6. The bubble generating apparatus of claim 5, wherein said motor is adapted to rotate said central gear.
7. The bubble generating apparatus of claim 5 or claim 6, wherein said gear assembly further comprises a first gear connecting said central gear with said first rotational ring structure and a second gear connecting said central gear with said second rotational gear structure.
8. The bubble generating apparatus of any preceding claim, wherein the liquid dispensing section is disposed proximate to the opening at the second end portion of the housing.
9. The bubble generating apparatus of any preceding claim, wherein the fan is coupled to a second end of the motor and is situated proximate to the opening in the second end portion of the housing.
10. A bubble generating apparatus comprising: a housing comprising first and second end portions; a first rotational ring structure rotatably seated in the housing and disposed proximate to an opening defined in the second end portion of the housing, a second rotational ring structure rotatably seated in the housing and disposed proximate to said opening defined in the second end portion of the housing, wherein each of said first and second the rotational ring structures comprise a plurality of individual rings; a reservoir coupled with the housing and configured to store bubble generating liquid; a fan which creates an airflow through the housing; a liquid dispensing section comprising a first liquid outlet and a second liquid outlet, said first outlet being operable to dispose the bubble generating liquid onto the plurality of individual rings of said first rotational ring structure, thereby creating a film of bubble generating liquid across the plurality of individual rings of said first rotational ring structure; said second outlet being operable to dispose the bubble generating liquid onto the plurality of individual rings of said second rotational ring structure, thereby creating a film of bubble generating liquid across the plurality of individual rings of said second rotational ring structure; a conduit having a first end extending into the reservoir and a second end connected to said first outlet and said second outlet; a siphoning mechanism operable to draw bubble generating liquid from the reservoir and through the conduit to said first outlet and said second outlet; a drive mechanism operable to drive said first rotational ring structure and said second rotational ring structure; a motor operable to power said drive mechanism, said fan; and said siphoning mechanism; wherein airflow through the housing causes said first and second rotational ring structures to form separate continuous bubble streams.
11. The bubble generating apparatus of claim 10, wherein said drive mechanism comprises an assembly of gears, said assembly comprising a central gear situated between said first rotational ring structure and said second rotational ring structure.
12. The bubble generating apparatus of claim 11, wherein said motor is adapted to rotate said central gear.
13. The bubble generating apparatus of claim 11 or claim 12, wherein said assembly of gears comprises a first gear connecting said central gear with said first rotational ring structure and a second gear connecting said central gear to said second rotational gear structure.
14. The bubble generating apparatus of any one of claims 10 to 13, wherein said first rotational ring and said second rotational ring are spaced from each other.
15. The bubble generating apparatus of any one of claims 10 to 14, wherein said first rotational ring structure and said second rotational ring structure are situated in substantially the same plane.

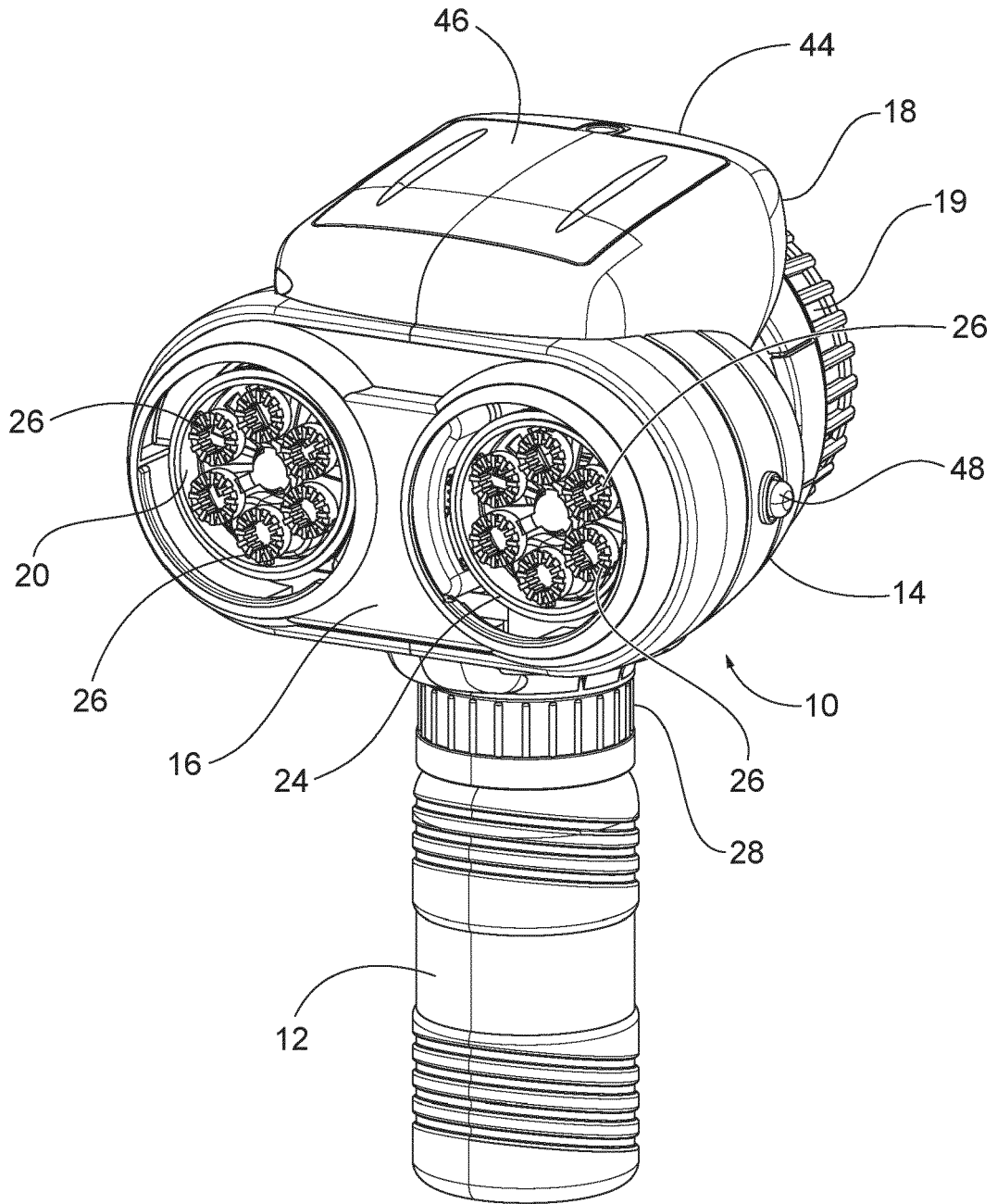


FIG. 1

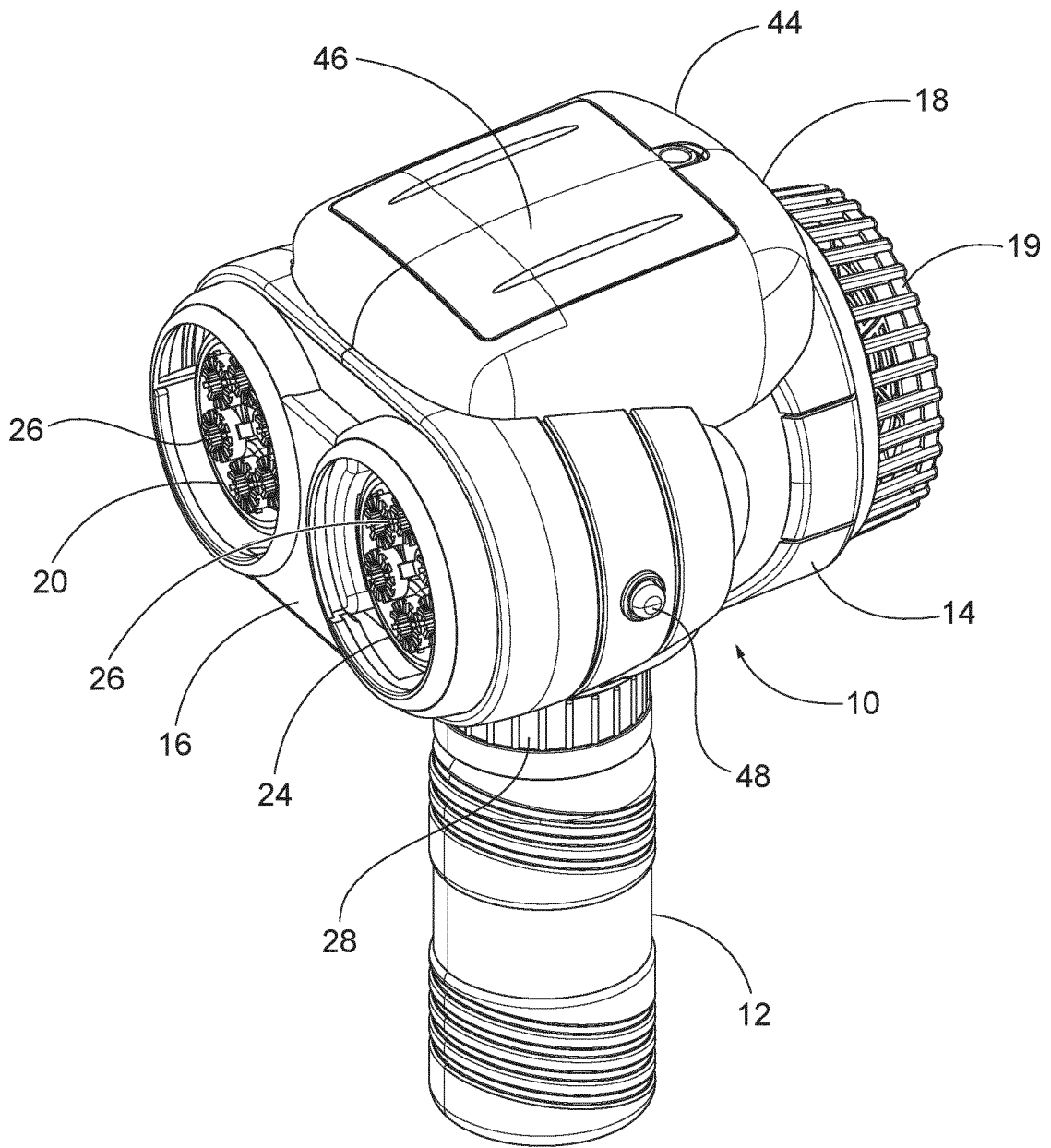


FIG. 2

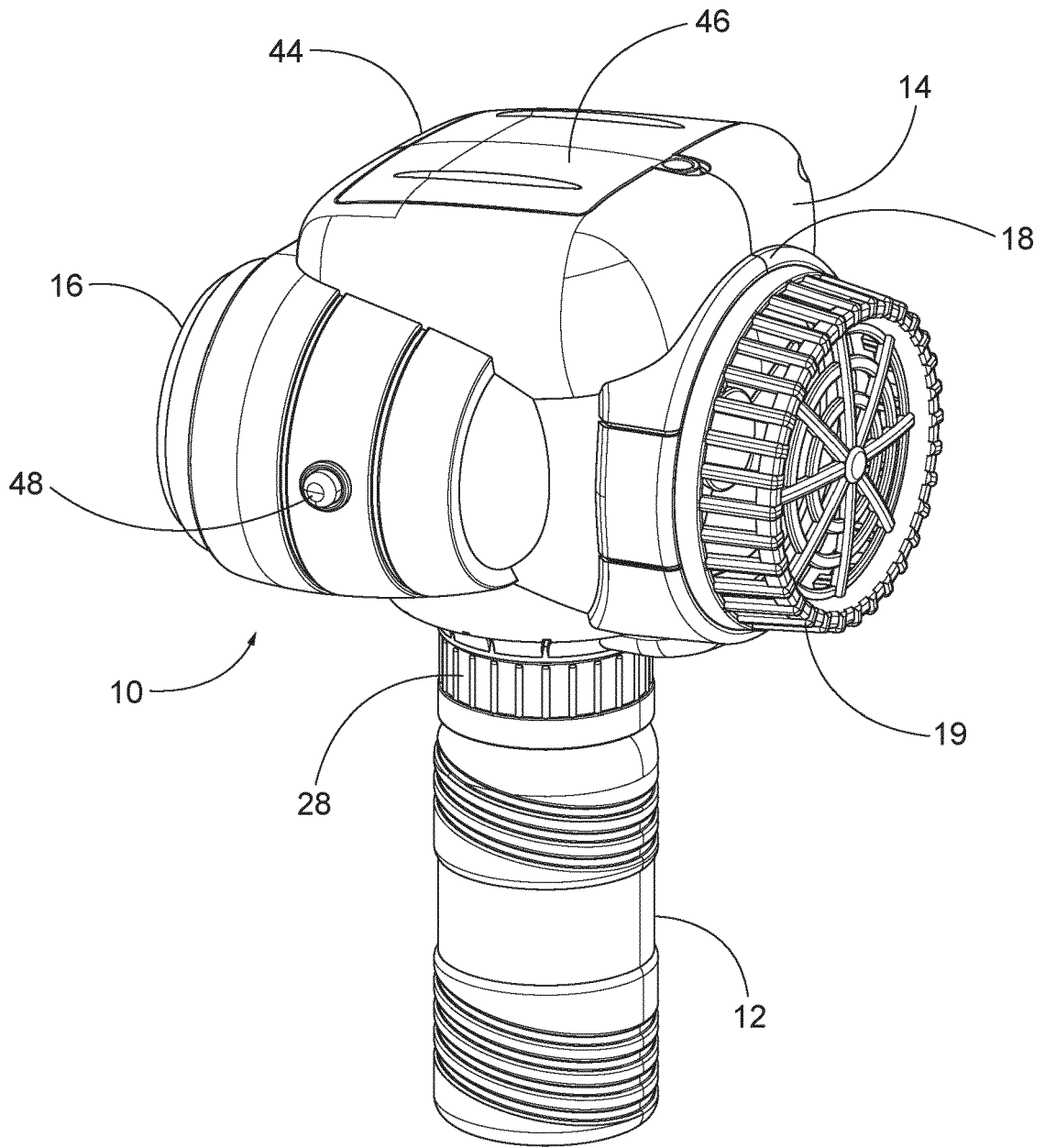


FIG. 3

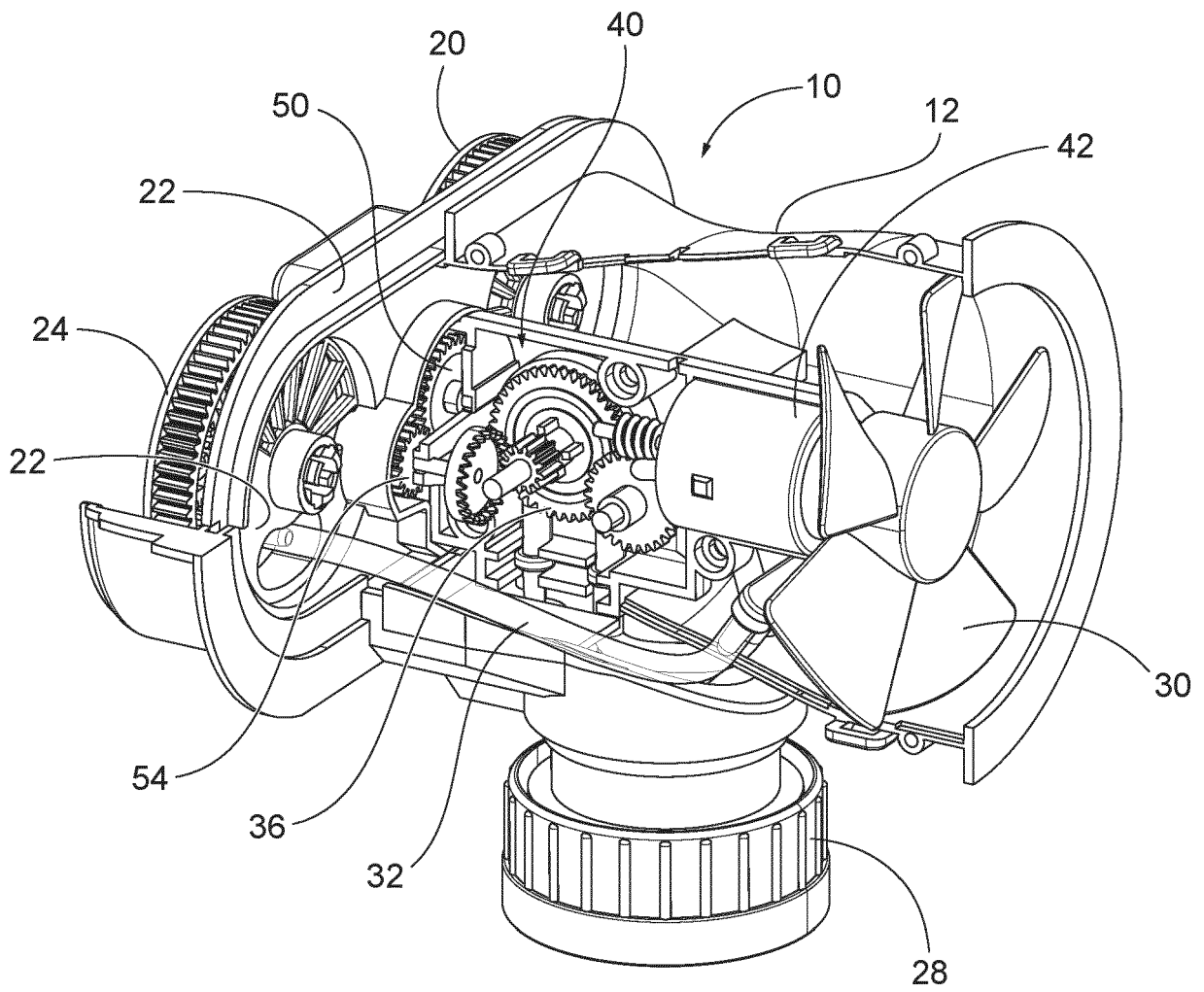


FIG. 4

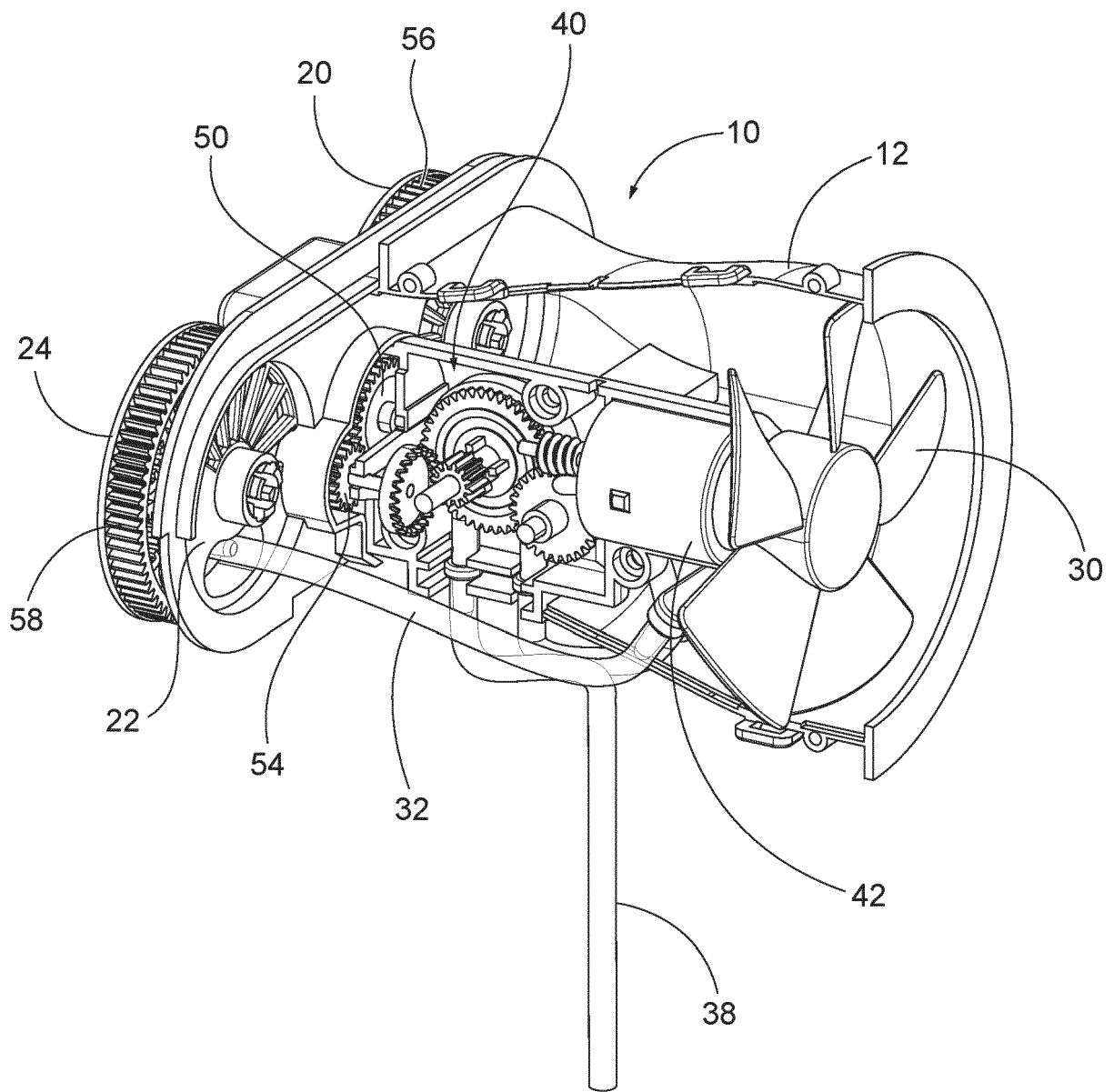


FIG. 5

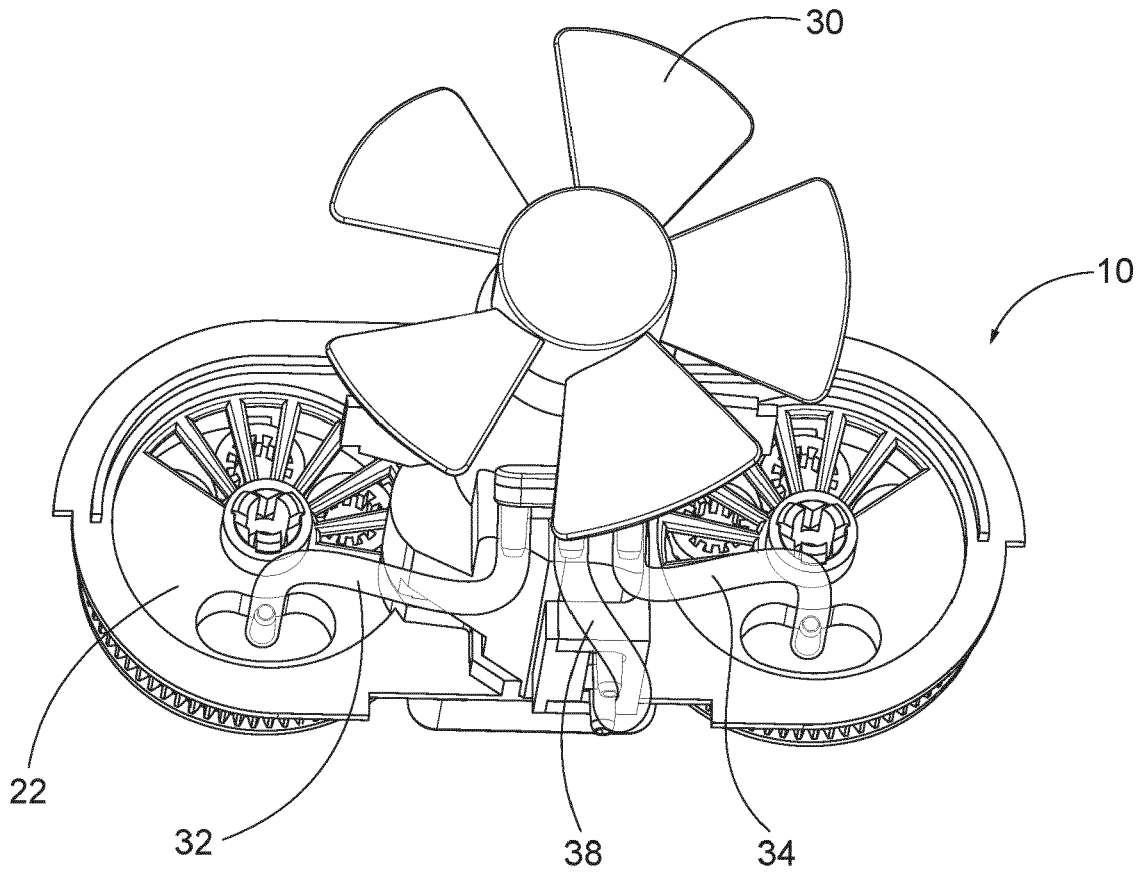


FIG. 6

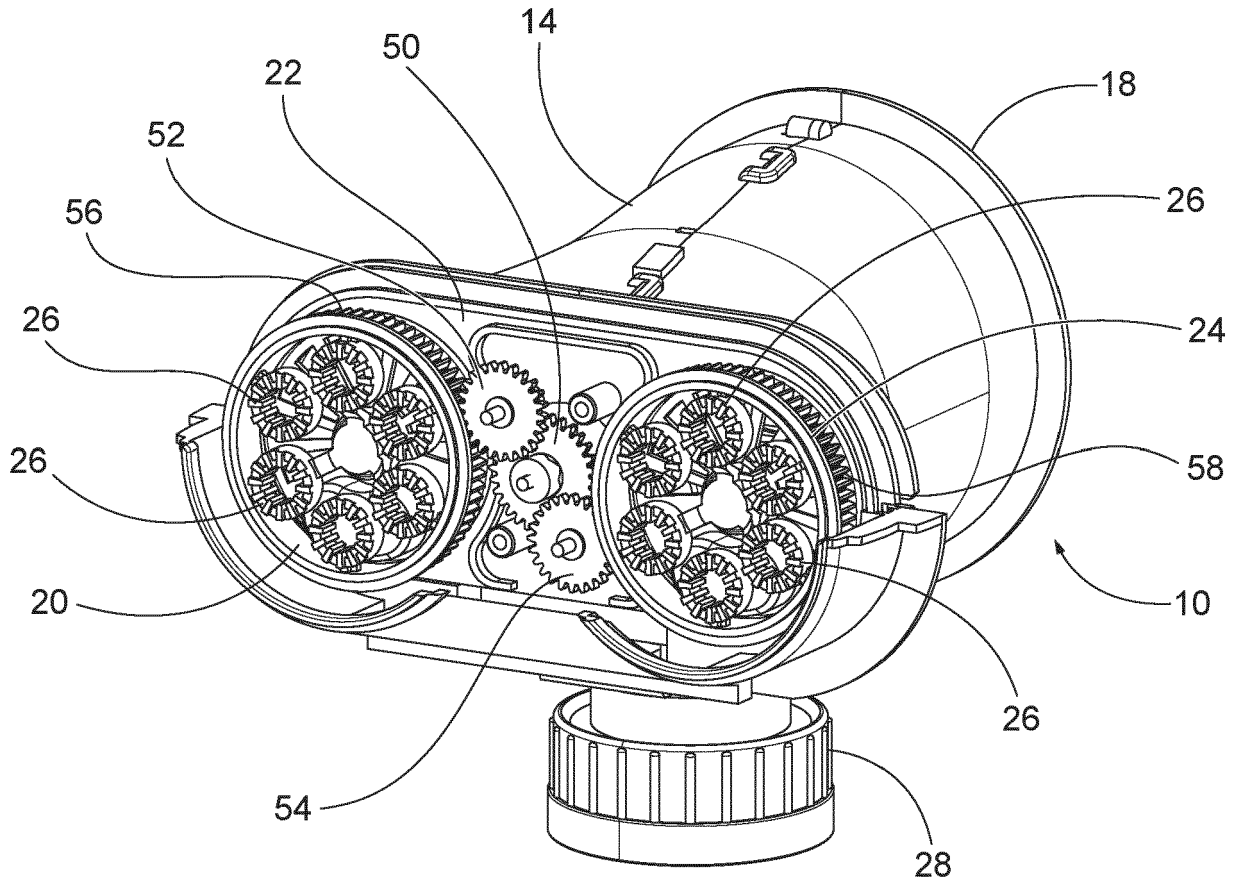


FIG. 7

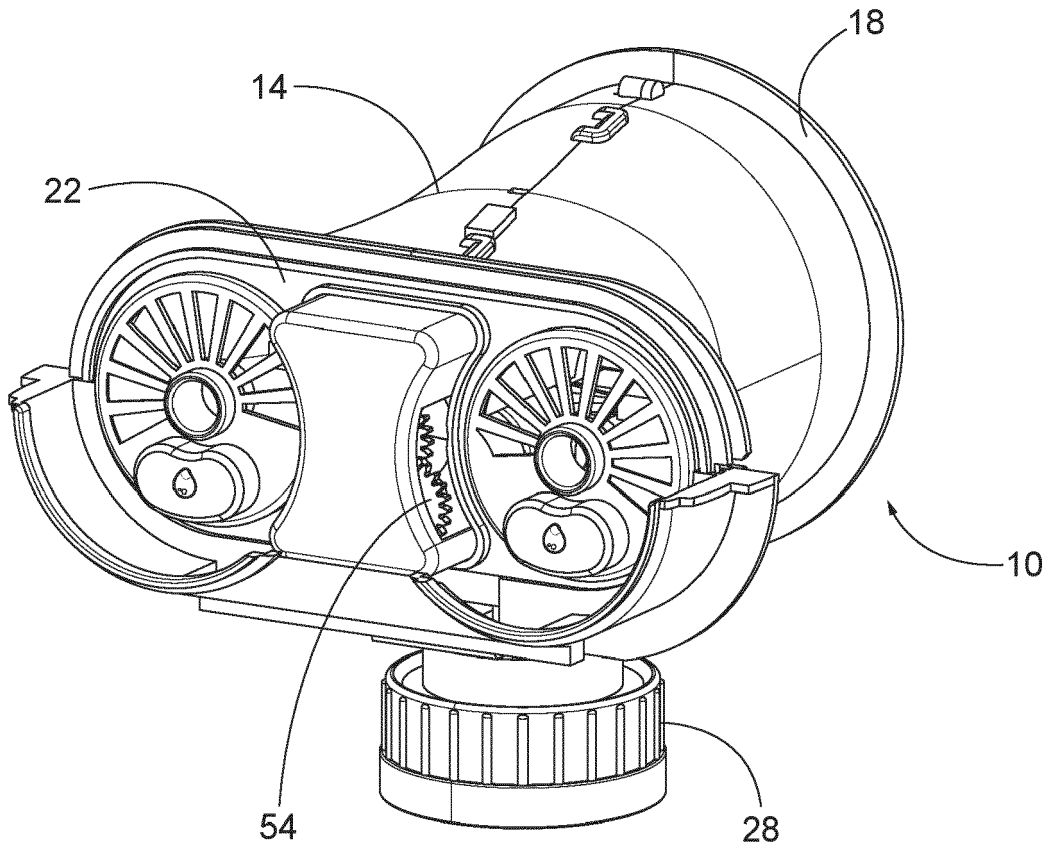


FIG. 8

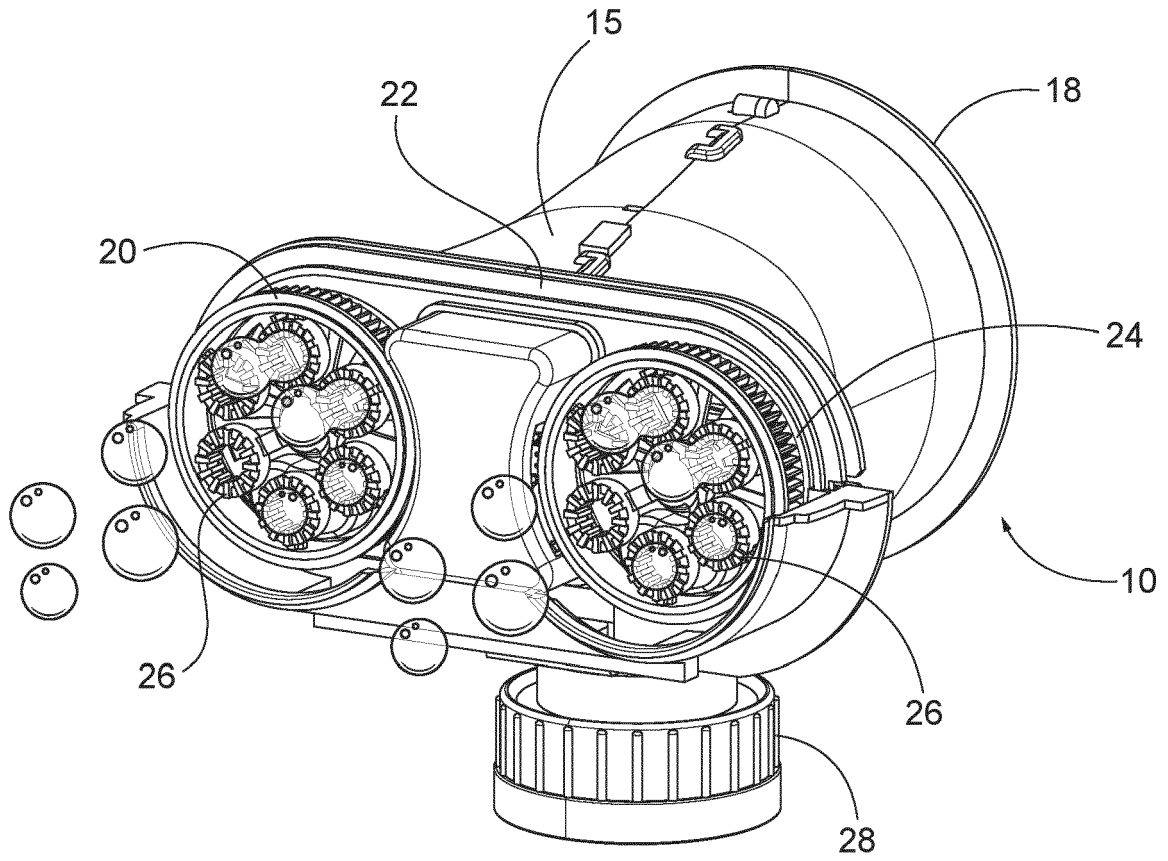


FIG. 9



EUROPEAN SEARCH REPORT

Application Number
EP 22 19 0912

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DOCUMENTS CONSIDERED TO BE RELEVANT			
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A	US 8 123 584 B2 (THAI DOUGLAS [US]; ARKO DEV LTD [HK]) 28 February 2012 (2012-02-28) * column 264 - column 8, line 61; figures *	1-15	
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			TECHNICAL FIELDS SEARCHED (IPC)
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 16 December 2022	Examiner Lucas, Peter
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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