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(54) DUAL HEAD CONTINUOUS BUBBLE BLOWER

KONTINUIERLICHES BLASENGEBLÄSE MIT DOPPELKOPF

SOUFFLEUR DE BULLES CONTINU À DOUBLE TÊTE

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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

[0002] U.S. Patent No. 8,636,557 discloses a handheld 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 steams 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] The present invention provides a bubble generating apparatus according to the appended claims. In accordance with the claimed 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 may be spaced from each other and may be 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 may be in the form of a handle. The second end portion may be in the shape of a barrel. The first end of the motor may be proximate to the first end portion of the housing. A second end of the motor may be 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 may be spaced circumferentially from each other.

[0011] The drive mechanism may comprise an assembly of gears. The assembly may include a central gear situated between the first rotational ring structure and the second rotational ring structure. The motor may be adapted to rotate the central gear. The gear assembly may also include 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 may be disposed proximate to the opening at the second end portion of the housing

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

[0014] The first rotational ring structure and the second rotational ring structure may be spaced from each other.

[0015] The first rotational ring structure and the second rotational ring structure may be situated in substantially the same plane.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF DRAWINGS

[0016] 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

[0017] 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.

[0018] 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.

[0019] 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.

[0020] 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 handle is removable to allow the bubble generating liquid to be replenished.

[0021] 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.

[0022] 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.

[0023] 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.

[0024] 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.

[0025] 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.

[0026] 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.

[0027] 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.

[0028] 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.

Claims

1. A bubble generating apparatus comprising: a housing (10) comprising first and second end portions; first (20) and second (24) 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 comprises a plurality of individual rings (26); a reservoir coupled with said housing and configured to store bubble generating liquid; a fan (30) situated proximate said first end portion of said housing adapted to create an airflow through the housing; a liquid dispensing section comprising first (32) and second (34) 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 (36) 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 (42) 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 (12) and the second end portion comprising a barrel (14).

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 (40), said gear assembly comprising a central gear (50) 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 (52) connecting said central gear with said first rotational ring structure and a second gear (54) 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. The bubble generating apparatus of any preceding claim, wherein said first rotational ring and said second rotational ring are spaced from each other.

11. The bubble generating apparatus of any preceding claim, wherein said first rotational ring structure and said second rotational ring structure are situated in substantially the same plane.

12. The bubble generating apparatus of any of claims 1 to 9, wherein said first and second rotational ring structures are spaced from each other and situated in substantially the same plane.

13. The bubble generating apparatus of any preceding claim, wherein said 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, and said second rotational ring structure is rotatably seated in the housing and disposed proximate to said opening defined in the second end

portion of the housing.

Patentansprüche

1. Blasen erzeugende Vorrichtung, umfassend: ein Gehäuse (10), das einen ersten und einen zweiten Endabschnitt umfasst; eine erste (20) und eine zweite (24) Drehringstruktur, die drehbar in dem Gehäuse gelagert und in der Nähe einer Öffnung angeordnet sind, die in dem zweiten Endabschnitt des Gehäuses definiert ist, wobei jede von der ersten und der zweiten Drehringstruktur eine Vielzahl einzelner Ringe (26) umfasst; einen Behälter, der mit dem Gehäuse gekoppelt und dazu konfiguriert ist, eine Blasen erzeugende Flüssigkeit zu speichern; einen Lüfter (30), der in der Nähe des ersten Endabschnitts des Gehäuses positioniert und dazu ausgelegt ist, einen Luftstrom durch das Gehäuse zu bilden; einen Flüssigkeitsabgabebereich, der eine erste (32) und eine zweite (34) Leitung umfasst, wobei jede der Leitungen einen Auslass aufweist, um die Blasen erzeugende Flüssigkeit auf die Vielzahl von einzelnen Ringen einer anderen von der ersten und der zweiten Drehringstruktur anzuordnen, wodurch ein Film aus Blasen erzeugender Flüssigkeit über die Vielzahl von einzelnen Ringen jeder von der ersten und der zweiten Drehringstruktur gebildet wird; einen Absaugmechanismus (36), der betreibbar ist, um Blasen erzeugende Flüssigkeit aus dem Behälter und durch den ersten und den zweiten Leitungsauslass zu jeder von der ersten und der zweiten Drehringstruktur zu saugen; einen Antriebsmechanismus, der dazu ausgelegt ist, die erste und die zweite Drehringstruktur zu drehen; und einen Motor (42), der betreibbar ist, um den Absaugmechanismus, den Antriebsmechanismus und den Lüfter mit Leistung zu versorgen, sodass die Vorrichtung gleichzeitig getrennte, kontinuierliche Blasenströme bildet.

2. Blasen erzeugende Vorrichtung nach Anspruch 1, wobei das Gehäuse einen ersten Endabschnitt, der einen Griff (12) umfasst, und den zweiten Endabschnitt umfasst, der einen Zylinder (14) umfasst.

3. Blasen erzeugende Vorrichtung nach Anspruch 2, wobei sich ein erstes Ende des Motors in der Nähe des ersten Endabschnitts des Gehäuses befindet und sich ein zweites Ende des Motors in der Nähe des zweiten Endabschnitts des Gehäuses befindet.

4. Blasen erzeugende Vorrichtung nach einem vorhergehenden Anspruch, wobei die Vielzahl einzelner Ringe jeder von der ersten und der zweiten Drehringstruktur in Umfangsrichtung voneinander beabstandet sind.

5. Blasen erzeugende Vorrichtung nach einem vorhergehenden Anspruch, wobei der Antriebsmechanismus eine Zahnradanordnung (40) umfasst, wobei die Zahnradanordnung ein zentrales Zahnrad (50) umfasst, das zwischen der ersten Drehringstruktur und der zweiten Drehringstruktur positioniert ist.

6. Blasen erzeugende Vorrichtung nach Anspruch 5, wobei der Motor dazu ausgelegt ist, das zentrale Zahnrad zu drehen.

7. Blasen erzeugende Vorrichtung nach Anspruch 5 oder Anspruch 6, wobei die Zahnradanordnung ferner ein erstes Zahnrad (52), das das zentrale Zahnrad mit der ersten Drehringstruktur verbindet, und ein zweites Zahnrad (54), das das zentrale Zahnrad mit der zweiten Drehzahnradstruktur verbindet, umfasst.

8. Blasen erzeugende Vorrichtung nach einem vorhergehenden Anspruch, wobei der Flüssigkeitsabgabebereich in der Nähe der Öffnung an dem zweiten Endabschnitt des Gehäuses angeordnet ist.

9. Blasen erzeugende Vorrichtung nach einem vorhergehenden Anspruch, wobei der Lüfter mit einem zweiten Ende des Motors gekoppelt ist und in der Nähe der Öffnung in dem zweiten Endabschnitt des Gehäuses positioniert ist.

10. Blasen erzeugende Vorrichtung nach einem vorhergehenden Anspruch, wobei der erste Drehring und der zweite Drehring voneinander beabstandet sind.

11. Blasen erzeugende Vorrichtung nach einem vorhergehenden Anspruch, wobei die erste Drehringstruktur und die zweite Drehringstruktur in der im Wesentlichen gleichen Ebene positioniert sind.

12. Blasen erzeugende Vorrichtung nach einem der Ansprüche 1 bis 9, wobei die erste und die zweite Drehringstruktur voneinander beabstandet sind und in der im Wesentlichen gleichen Ebene positioniert sind.

13. Blasen erzeugende Vorrichtung nach einem vorhergehenden Anspruch, wobei die erste Drehringstruktur drehbar in dem Gehäuse gelagert und in der Nähe einer Öffnung angeordnet ist, die in dem zweiten Endabschnitt des Gehäuses definiert ist, und die zweite Drehringstruktur drehbar in dem Gehäuse gelagert und in der Nähe der Öffnung angeordnet ist, die in dem zweiten Endabschnitt des Gehäuses definiert ist.

Revendications

1. Appareil générateur de bulles comprenant : un boîtier (10) comprenant des première et seconde parties d'extrémité ; des première (20) et seconde (24) structures annulaires rotatives placées de manière rotative dans ledit boîtier et disposées à proximité d'une ouverture définie dans la seconde partie d'extrémité du boîtier, dans lequel chacune desdites première et seconde structures annulaires rotatives comprend une pluralité d'anneaux individuels (26) ; un réservoir couplé audit boîtier et configuré pour stocker un liquide générateur de bulles ; un ventilateur (30) situé à proximité de ladite première partie d'extrémité dudit boîtier, adapté pour créer un flux d'air à travers le boîtier ; une section de distribution de liquide comprenant un premier (32) et un second (34) conduits, chacun desdits conduits comportant une sortie pour disposer le liquide générateur de bulles sur ladite pluralité d'anneaux individuels de l'une différente desdites première et seconde structures annulaires rotatives, créant ainsi un film de liquide générateur de bulles à travers la pluralité d'anneaux individuels de chacune desdites première et seconde structures annulaires rotatives ; un mécanisme de siphonnage (36) pouvant fonctionner pour aspirer le liquide générateur de bulles à partir du réservoir et à travers lesdites première et seconde sorties de conduit, vers chacune desdites première et seconde structures annulaires rotatives ; un mécanisme d'entraînement adapté pour faire tourner lesdites première et secondes structures annulaires rotatives ; et un moteur (42) pouvant fonctionner pour alimenter ledit mécanisme de siphonage, ledit mécanisme d'entraînement et ledit ventilateur, de telle sorte que ledit appareil crée simultanément des flux de bulles continus séparés.

2. Appareil générateur de bulles selon la revendication 1, dans lequel ledit boîtier comprend une première partie d'extrémité comprenant une poignée (12) et la seconde partie d'extrémité comprenant un cylindre (14).

3. Appareil générateur de bulles selon la revendication 2, dans lequel une première extrémité du moteur se trouve à proximité de la première partie d'extrémité du boîtier et une seconde extrémité du moteur se trouve à proximité de la seconde partie d'extrémité du boîtier.

4. Appareil générateur de bulles selon l'une quelconque des revendications précédentes, dans lequel la pluralité d'anneaux individuels de chacune desdites première et seconde structures annulaires rotatives sont espacés circonférentiellement les uns des autres.

5. Appareil générateur de bulles selon l'une quelconque des revendications précédentes, dans lequel ledit mécanisme d'entraînement comprend un ensemble d'engrenages (40), ledit ensemble d'engrenages comprenant un engrenage central (50) situé entre ladite première structure annulaire rotative et ladite seconde structure annulaire rotative.

6. Appareil générateur de bulles selon la revendication 5, dans lequel ledit moteur est adapté pour faire tourner ledit engrenage central.

7. Appareil générateur de bulles selon la revendication 5 ou la revendication 6, dans lequel ledit ensemble d'engrenages comprend en outre un premier engrenage (52) reliant ledit engrenage central à ladite première structure annulaire rotative et un deuxième engrenage (54) reliant ledit engrenage central à ladite deuxième structure d'engrenage rotatif.

8. Appareil générateur de bulles selon l'une quelconque des revendications précédentes, dans lequel la section de distribution de liquide est disposée à proximité de l'ouverture au niveau de la seconde partie d'extrémité du boîtier.

9. Appareil générateur de bulles selon l'une quelconque des revendications précédentes, dans lequel le ventilateur est couplé à une seconde extrémité du moteur et se trouve à proximité de l'ouverture dans la seconde partie d'extrémité du boîtier.

10. Appareil générateur de bulles selon l'une quelconque des revendications précédentes, dans lequel ledit premier anneau rotatif et ledit deuxième anneau rotatif sont espacés l'un de l'autre.

11. Appareil générateur de bulles selon l'une quelconque des revendications précédentes, dans lequel ladite première structure annulaire rotative et ladite seconde structure annulaire rotative sont situées sensiblement dans le même plan.

12. Appareil générateur de bulles selon l'une quelconque des revendications 1 à 9, dans lequel lesdites première et seconde structures annulaires rotatives sont espacées l'une de l'autre et situées sensiblement dans le même plan.

13. Appareil générateur de bulles selon l'une quelconque des revendications précédentes, dans lequel ladite première structure annulaire rotative est placée de manière rotative dans le boîtier et disposée à proximité d'une ouverture définie dans la seconde partie d'extrémité du boîtier, et ladite seconde structure annulaire rotative est placée de manière rotative dans le boîtier et disposée à proximité de ladite ouverture définie dans la seconde partie d'extrémité du boîtier.

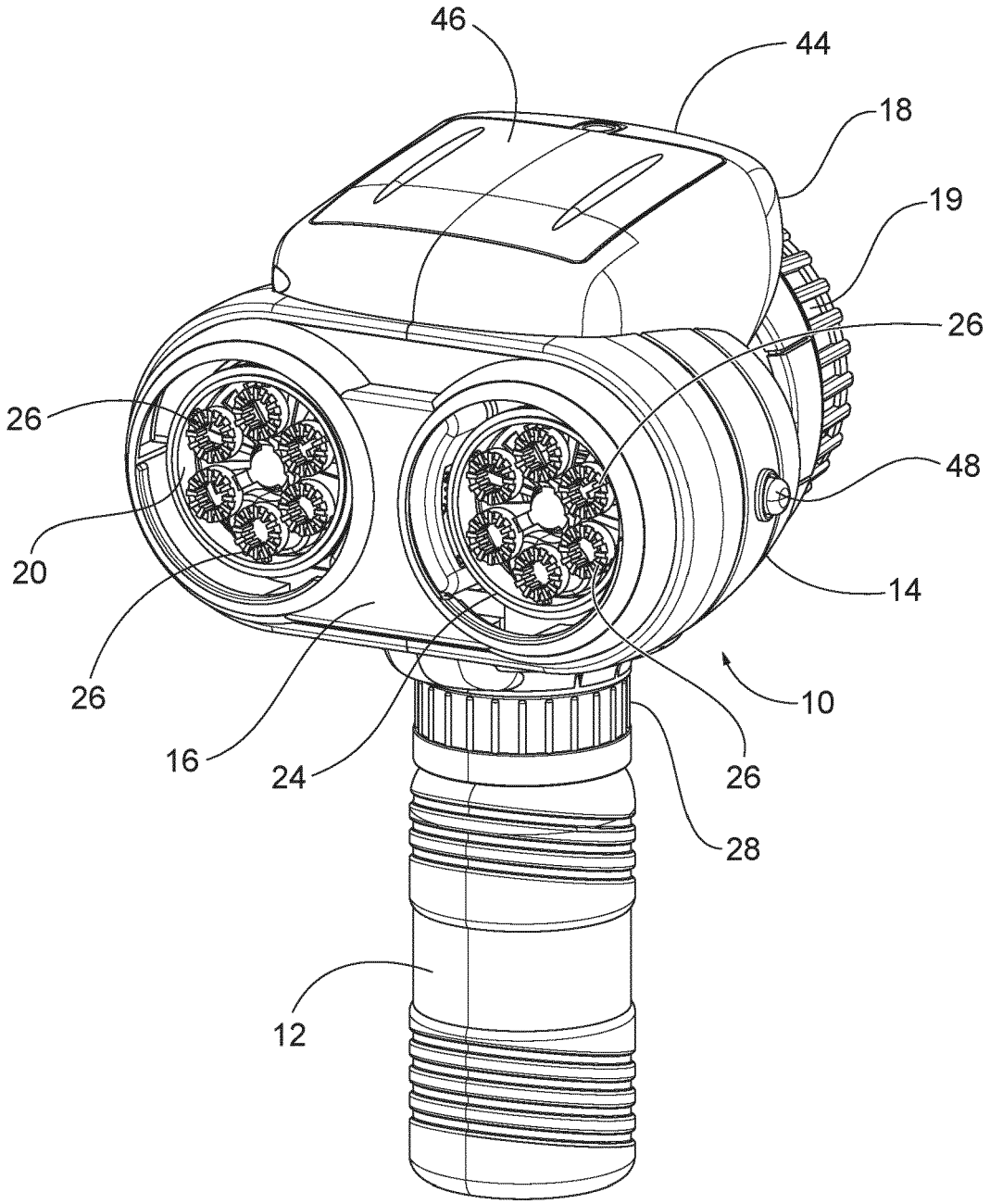

FIG. 1

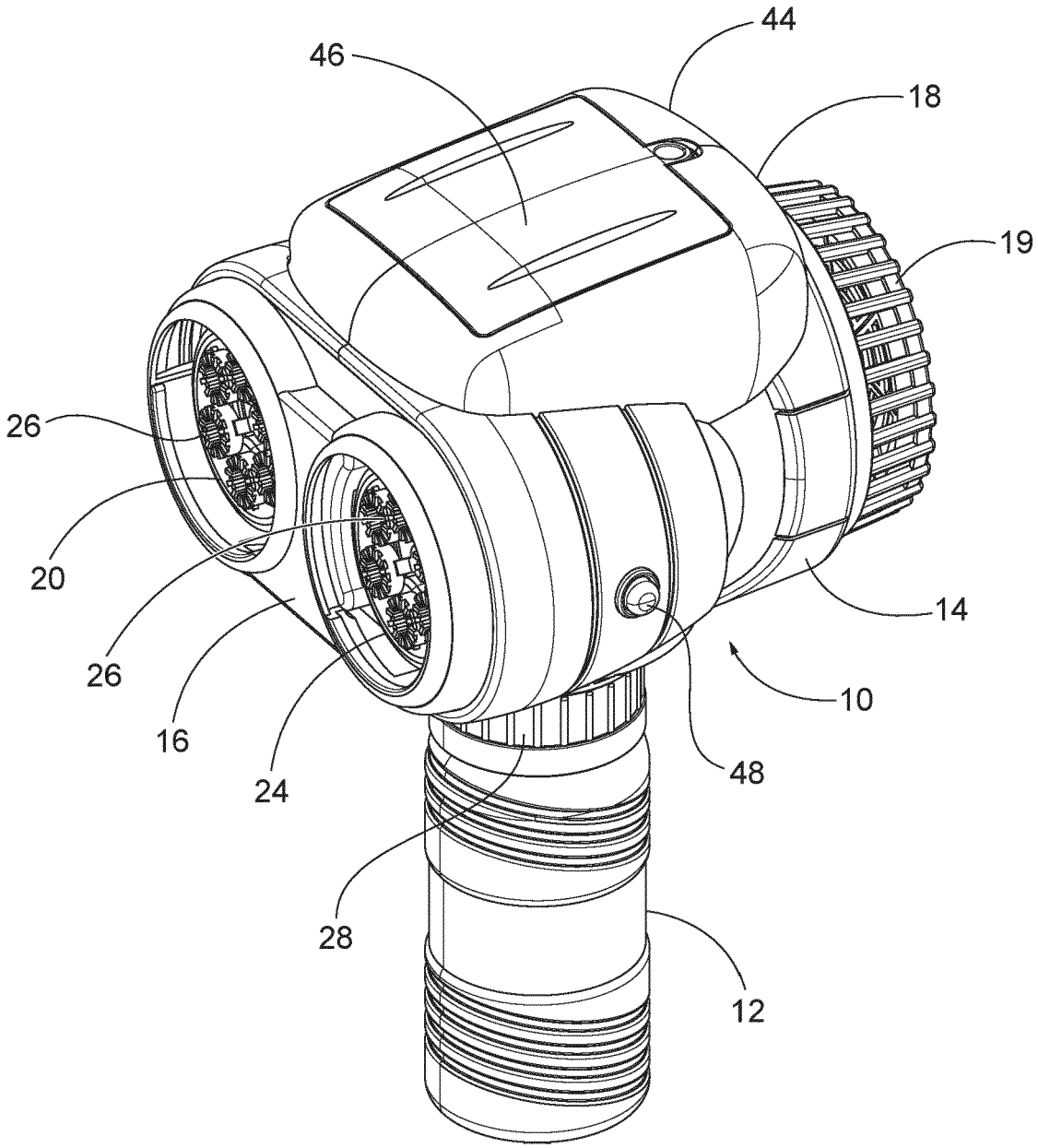

FIG. 2

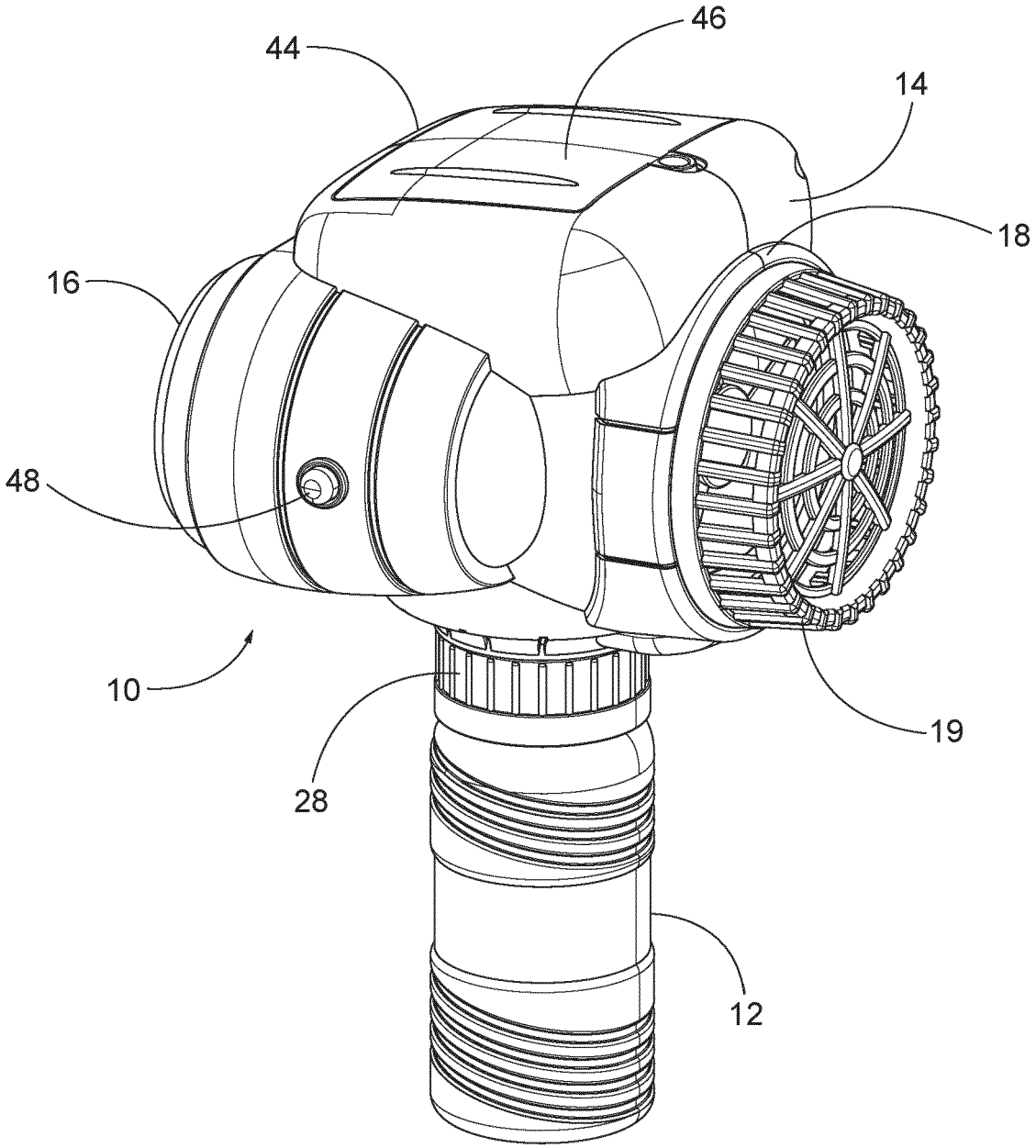

FIG. 3

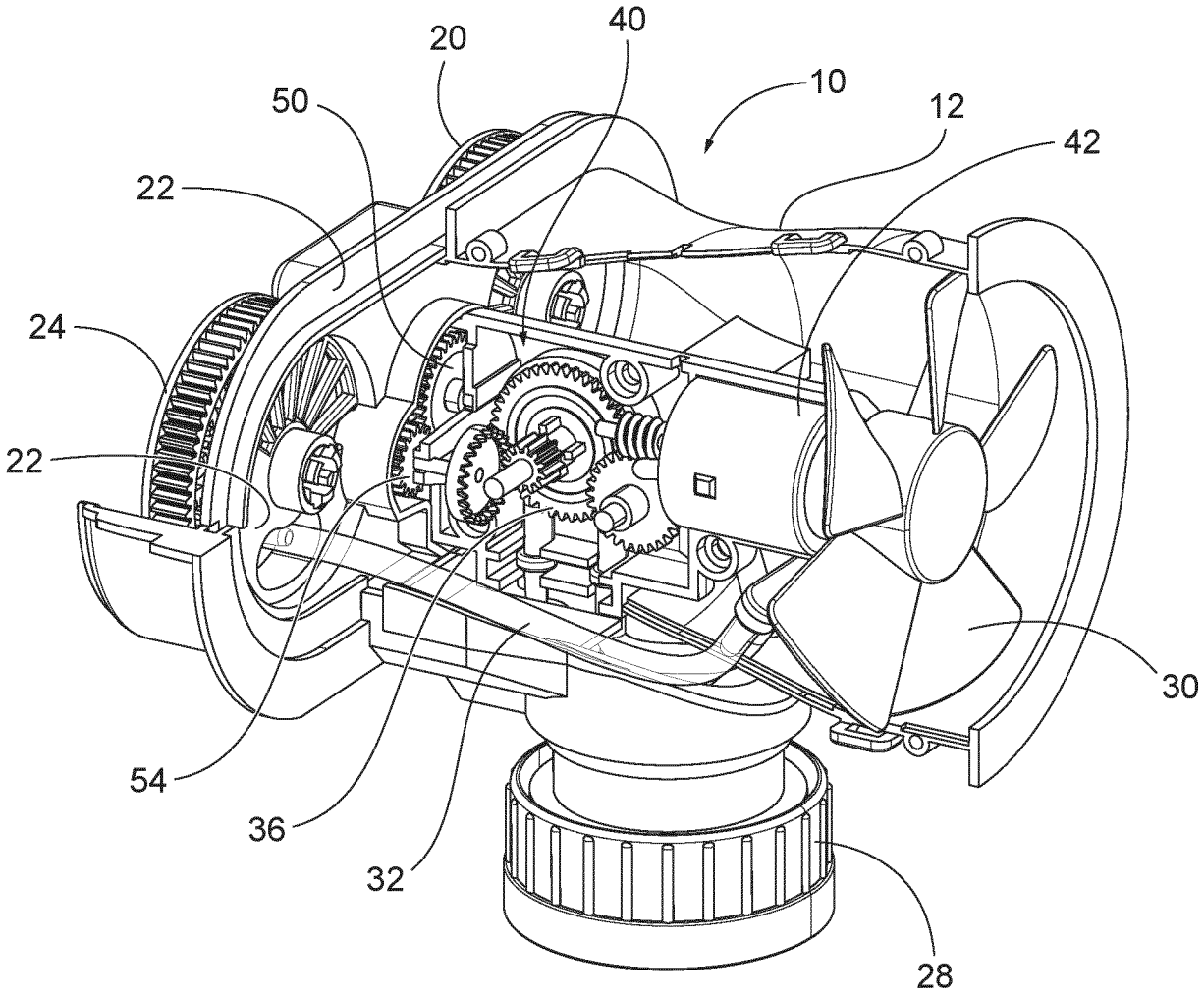

FIG. 4

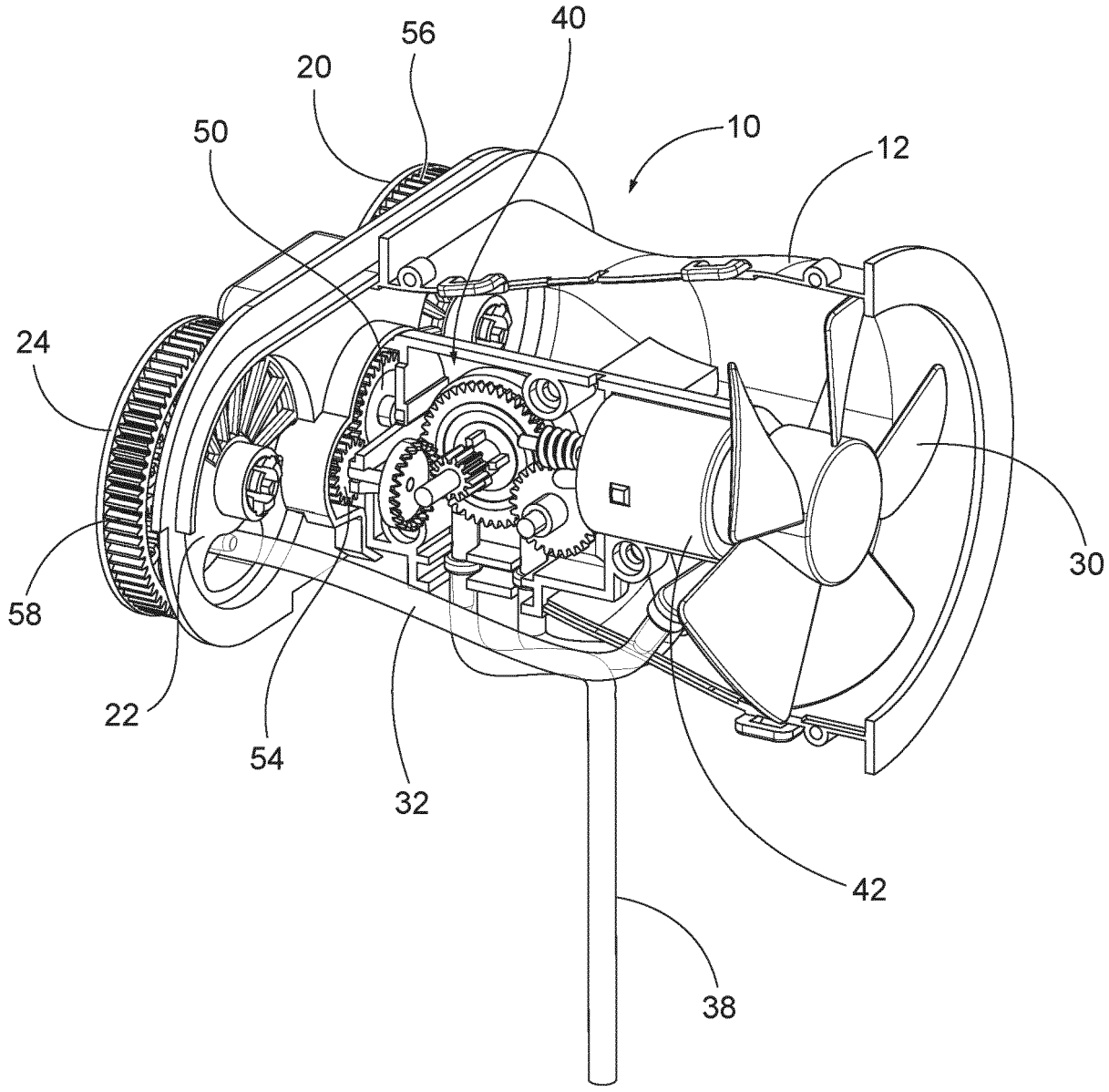

FIG. 5

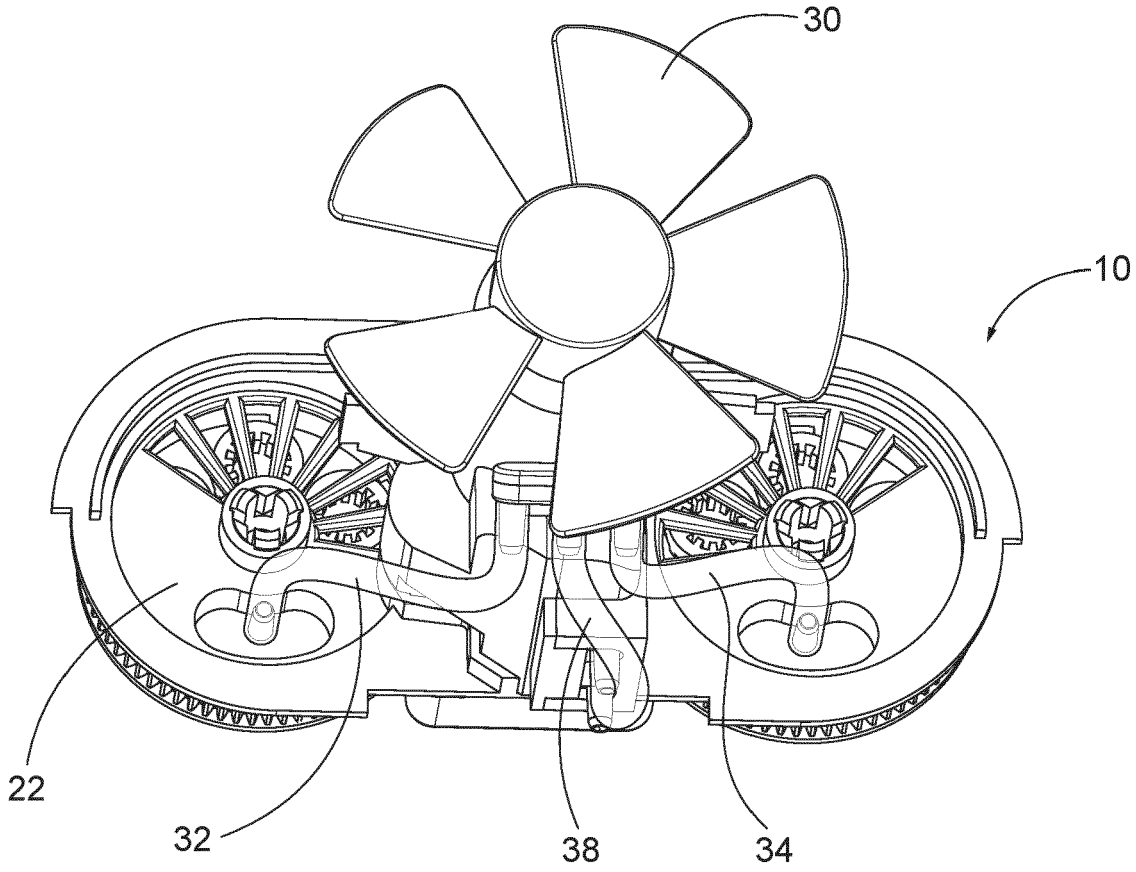

FIG. 6

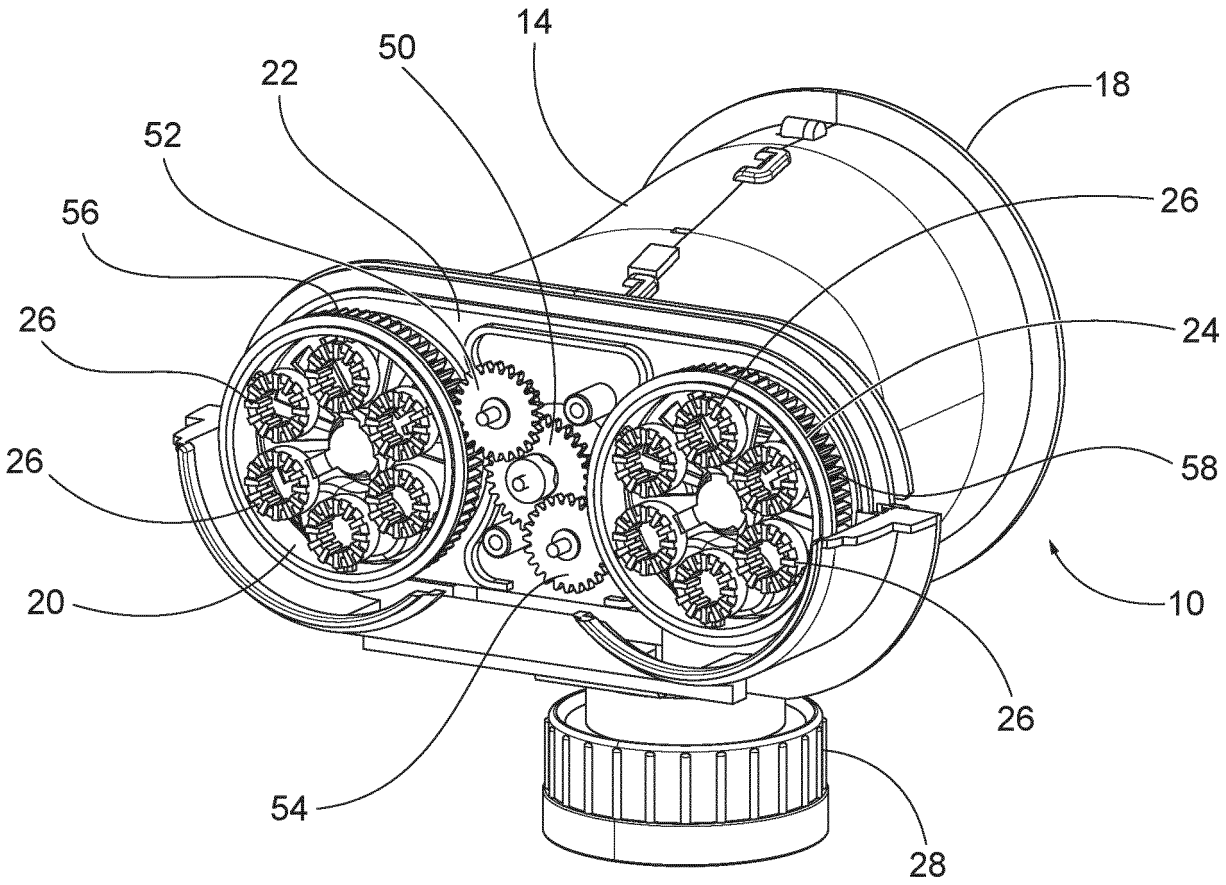

FIG. 7

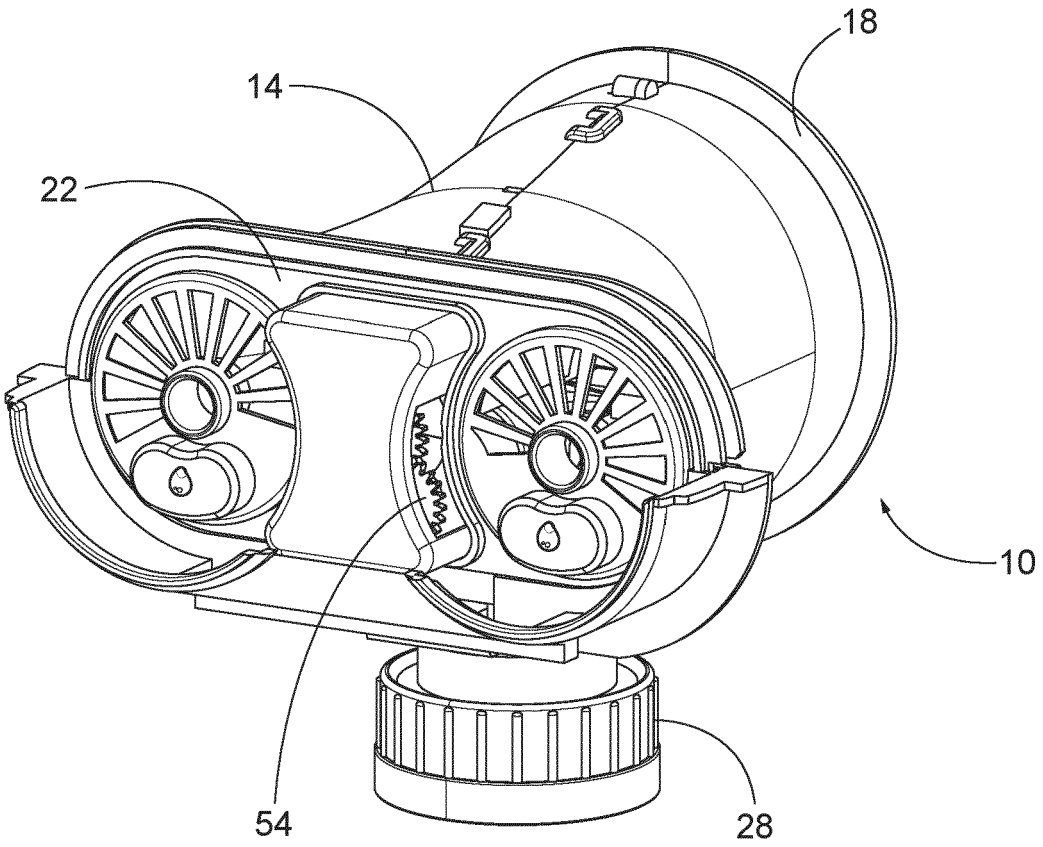

FIG. 8

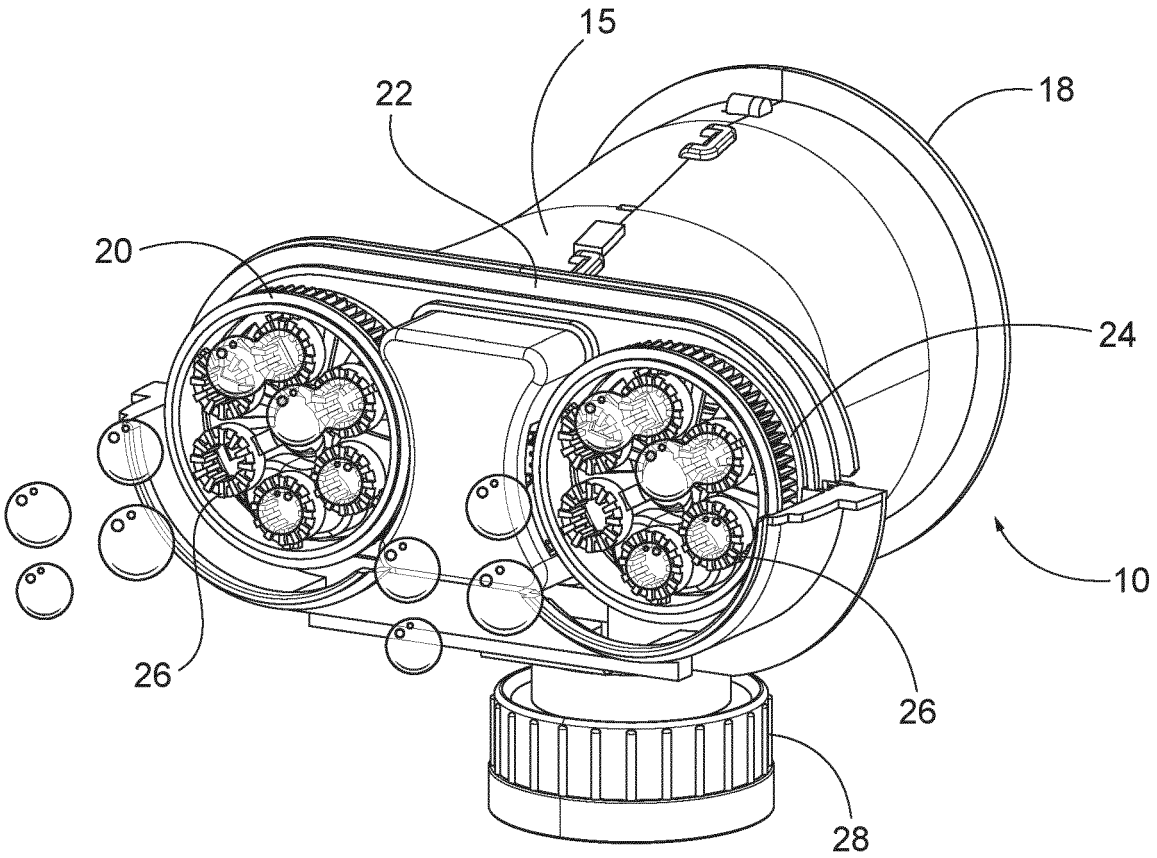

FIG. 9

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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