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(54) **STRUCTURE OF ROTOR NOZZLE AND WATERING DEVICE**

(57) A structure of rotor nozzle is equipped with a spray unit (100) of a watering device, the spray unit (100) is composed of a mounting member (11) and a housing (15) for defining a chamber (17), a rotor (20) deployed inside the chamber (17); wherein, at least one stopper (18) set on the inner side of the chamber (17) near the water outlet side (102) is correspondingly matched to multiple guide members (28) on one end of the water outlet (22) of the rotor (20), and it can be employable to the handy watering device.

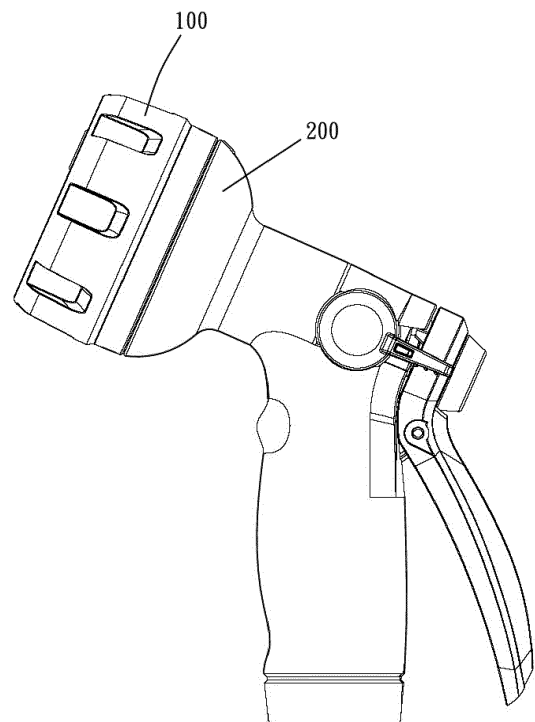


Fig. 1

EP 3 862 097 A1

Description**BACKGROUND****Technical Field**

[0001] The present disclosure relates to a nozzle structure of a watering device, especially to a rotor nozzle structure with the advantages of easy assembly and steady operation.

Related Art

[0002] The conventional structure of rotor nozzle as claimed in patent US9931652 discloses a housing 2 having a conical chamber 3 as an accommodation for a rotor 12 in column shape, the rotor 12 having one end deployed with water outlet hole 14 connecting to the outlet opening 6 of a spray gun, and the intermediate element 25 having a spherical surface against inner wall of the conical chamber 3 for the rotor 12 in an eccentric arrangement to the longitudinal axis of the conical chamber 3. In this way, when the fluid flows into the chamber 3, it rotates the rotor 12 with tilt current then turning into a swirling steam of 360 degrees running out of the outlet opening 6. Besides, the rotor 12 of this kind of rotor nozzle would also rotate in the chamber 3, thus output fluids would disperse.

SUMMARY

[0003] The present disclosure aims to provide a rotor nozzle adopting a longitudinal chamber to apply on a handy spray gun and preventing the rotor from rotating, so as to let output fluids concentrate.

[0004] Based on above-mentioned goals, the present disclosure provides a structure of rotor nozzle installed inside the spray unit of a watering device, the spray unit is composed of a mounting member and a housing for mutually defining a chamber having one water inlet and one water outlet, and the chamber deployed with a rotor for its end of water outlet connecting to the water outlet side. Wherein, at least one stopper set on the inner side of the chamber near the water outlet side is correspondingly matched to multiple guide members on the end of water outlet of the rotor.

[0005] Thanks to the deployment of a stopper, it secures the rotor in a tilt arrangement and dismisses the conventional conical chamber to be applied to existing spray nozzles.

[0006] Furthermore, the rotor has a spherical one end connecting to the water outlet of the watering device. Therefore, the water outlet side of the rotor forms at least two annular positioning areas. The present disclosure further provides a watering device for accommodating aforementioned structure of rotor nozzle.

BRIEF DESCRIPTION OF THE DRAWINGS**[0007]**

- 5 Fig. 1 illustrates a perspective external view in the embodiment of the instant disclosure;
 Fig. 2 illustrates a cross-section view in the embodiment of the instant disclosure;
 10 Fig. 3 illustrates an explosive view in the embodiment of the instant disclosure;
 Fig. 4 illustrates a cross-section explosive view of Fig. 3 in the embodiment of the instant disclosure;
 15 Fig. 5 illustrates another explosive view in the embodiment of the instant disclosure.

DETAILED DESCRIPTION

[0008] Hereinafter to deliberate more specifically the embodiment of the present disclosure, the narration sets forth from which the water outlet of the adjustable watering device for a better understanding by the technicians skillful in the arts.

[0009] Fig. 1 to Fig. 4 illustrate a spray unit 100 of a watering device, the spray unit 100 is rotatably installed on the base 200 of the watering device and mainly assembled by an adjusting member 10 and a mounting member 11 correspondingly. Multiple spray heads are set between the adjusting member 10 and the mounting member 11, the spray heads respectively have a water outlet and a water inlet between the adjusting member 10 and the mounting member 11, the mounting member 11 is connected to the water inlet side 101 of the base 200 of the watering device, and the water inlet side 101 is connected to a water supply. Thus, due to the relative rotation between the spray unit 100 and the base 200 of the watering device, one of the spray heads can be connected to the water inlet side 101 of the base 200, so that water from the water supply flows through the water inlet side 101 and inside of the rotor nozzle, and ejects out from the water outlet side 102.

[0010] One of the spray heads has structure of rotor nozzle, the structure of rotor nozzle consists of a housing 15, a rotor 20, a flow director 40. Wherein, the housing 15 is roughly a tubular in shape having its front end engaged to the inner wall of the adjusting member 10, so that the water outlet side 102 of the housing 15 located on the adjusting member 10, and the housing 15 has its rear end connected to the mounting member 11 for mutually defining a chamber 17 with a longitudinal interior.

[0011] The flow director 40 has an annular base 41 located on the rear opening of the housing 15 and the block 12 on the side wall of the mounting member 11, so that the flow director 40 and the bottom of the mounting member 11 are arranged in a partition formation. Besides, the flow director 40 has a center base 45 spaced from the annular base 41, a position rod 47 protruding from the center base 45 forwards to the direction of the water outlet 102, and multiple guide vanes 43 connecting

to the inner side wall of the annular base 41 and the outer side wall of the center base 45, the guide vanes 43 are extending along the radial direction of the center base 45 and tangent to the center base 45 respectively at a predetermined angle, a swirl opening 46 is defined between the adjacent guide vanes 43. In other words, the swirl opening 46 is arc-shaped and penetrates the two opposite sides of the annular flow director 40.

[0012] The rotor 20 is installed inside the chamber 17 and forms a hollow column having two ends as a water inlet 21 and a water outlet 22. Wherein, the rotor 20 has an inner wall fixed with multiple current blades 26 extending to the water inlet 21 in a crossover formation. The rotor 20 has a spherical end 27 disposed of a water outlet 22 connecting to the water outlet side 102 of the adjusting member 10, and the spherical end 27 and the water outlet side 102 form a complementary mechanism. Besides, the rotor 20 has its water inlet 21 confined between the inner wall of the chamber 17 and the annular track of the position rod 47 of the flow director 40 for the rotor 20 in an eccentric arrangement, leaning backward and outward, to the water outlet.

[0013] The present disclosure provides an embodiment, wherein the chamber 17 near the water outlet side 102 is a longitudinal interior with multiple stoppers 18 protruding on the inner wall in annular form, and a slot 19 is formed between the stoppers 18, multiple stop rods are protruded radially on the spherical end 27 of the rotor 20 as guide members 28 and located on the slot 19. Besides, each stopper 18 has a bevel on its surface for guiding the surface of the rotor 20 in tilt arrangement, the water outlet side (the spherical end 27, guide members 28) of the rotor 20 forms at least two annular position areas, the rotor 20 rotates steadily and prevents the rotor 20 from rotating, in order to generate a centralized linear current spraying out from the water outlet 22 of the rotor 20 instead of the conical spurt produced by rotation of the conventional rotor.

[0014] It is worth mentioning that the position rod 47 of the flow director 40 is in a line with the water inlet side 101 and the water outlet side 102. A rod body 25 is extending from one end of the water inlet 21 of the rotor 20 along the rear end of the current blade 26 for locating on the outer wall of the position rod 47 to thereby steady the rotation track of the rotor 20. When water of the water supply flows to the swirl opening 46 of the flow director 40 from the water inlet side 101, tilt current generated in the chamber 17 drives the rotor 20 to rotate, fluids flows through the water inlet 21 of the rotor 20 to the water outlet side 102 of the spray unit 100 and swirling steam outputs by the rotation of the rotor 20.

[0015] Please refer to Fig. 5, it illustrates a spray unit of another watering device. In this embodiment, a bevel is set on the chamber near the water inlet side 101 for guiding the surface in rear of the rotor 20. The chamber near the water outlet side 102 has a longitudinal interior, and three stoppers 18 protruding on its inner wall are arranged equiangular. Multiple slots are arranged radi-

ally in an annular form on the water outlet of the rotor 20, the slots are provided as guide members for placing the stoppers 18, in this way, the rotor 20 rotates steadily with its tilt arrangement and prevents the rotor 20 from self rotating.

[0016] The present disclosure provides an embodiment, wherein the number of the guide members 28 is integer multiple of the number of the stoppers 18, to maintain rotational balance. However, the number of the stoppers 18 also can be only one, to locate the rotor 20.

Claims

1. A spray unit (100) of a watering device with a structure of a rotor nozzle, the spray unit (100) comprising a mounting member (11) and a housing (15) for mutually confining a chamber (17) with one water inlet side (101) and one water outlet side (102), a rotor (20) installed inside the chamber (17) having one end as water outlet (22) in connection with the water outlet side (102), **characterized in that:** at least one slot set on inner wall (19) of the chamber (17) near the water outlet side (102) is correspondingly matched to at least one guide member (28) on the end of water outlet (22) of the rotor (20).
2. The spray unit as in claim 1, wherein the housing (15) and the mounting member (11) make relative rotating connection, the housing (15) and the mounting member (11) respectively deployed with a flow director (40), and the flow director (40) equipped with at least one guide vane (43).
3. The spray unit as in claim 2, wherein the flow director (40) has one annular base (41) located on the mounting member (11), one center base (45) and the annular base (41) arranged in partition formation, and the at least one guide vane (43) connects to the inner wall of the annular base (41) and the outer wall of the center base (45).
4. The spray unit as in claim 2, wherein a rod body (25) is extendedly set on one end of the rotor (20) near the water inlet (21) for locating on the outer wall of a position rod (47) extended from the flow director (40).
5. The spray unit as in claim 1, wherein the rotor (20) forms a hollow column having one inner wall equipped with at least one current blade (26).
6. The spray unit as in claim 2, wherein the flow director (40) and the bottom of the mounting member (11) are arranged in a partition formation.
7. The spray unit as in claim 1, wherein one end of the water outlet (22) of the rotor (20) is a spherical end

(27) forming a complementary mechanism to the water outlet side (102).

8. The spray unit as in claim 1, wherein at least one guide member (28) of the rotor (20) forms at least one slot (19). 5
9. The spray unit as in claim 1, wherein the chamber (17) has at least a stopper (18) forming at least a slot (19). 10
10. The spray unit as in claim 9, wherein the at least one stopper (18) has a bevel.
11. A watering device has one spray unit (100) composed of one mounting member (11) and one housing (15), and the mounting member (11) and the housing (15) mutually defining one chamber (17), **characterized in that:** the chamber (17) equipped with a rotor (20) having one end of the water outlet (22) in connection with the water outlet side (102) of the spray unit (100), at least one slot (19) set on the inner side of the chamber near the water outlet side (102) is correspondingly matched to at least one guide member (28) on the end of the water outlet (22) of the rotor (20). 15
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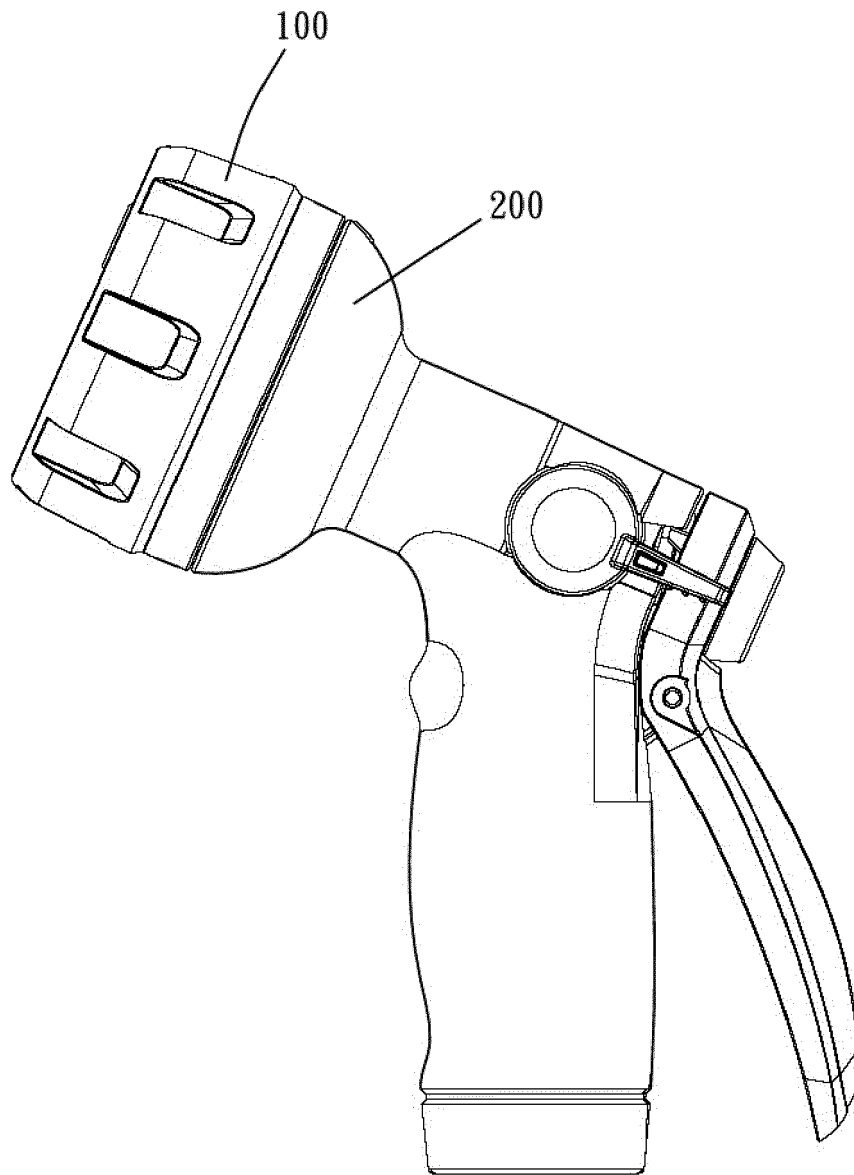


Fig. 1

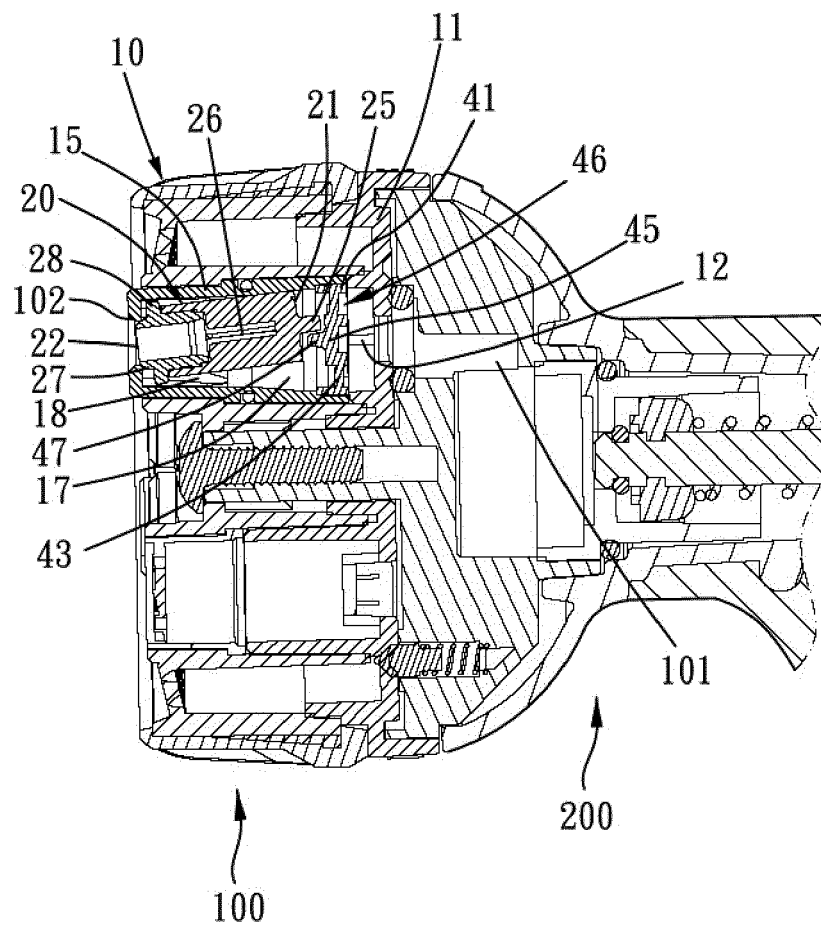


Fig. 2

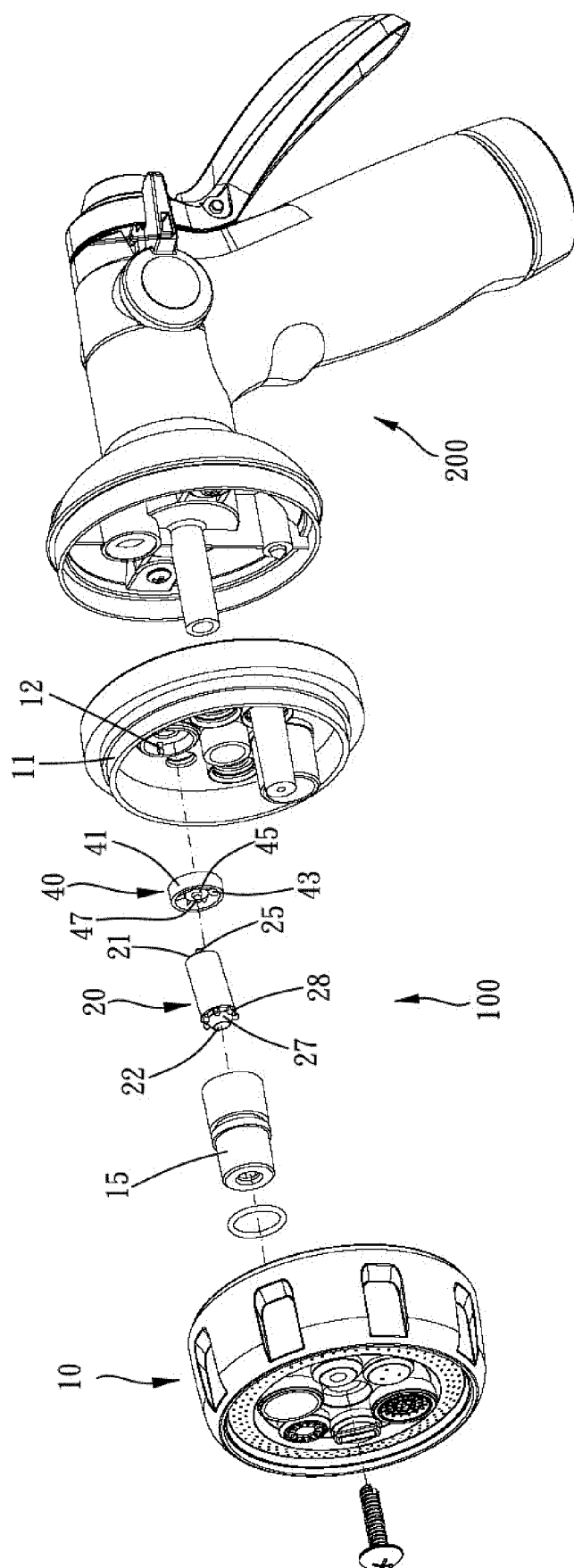


Fig. 3

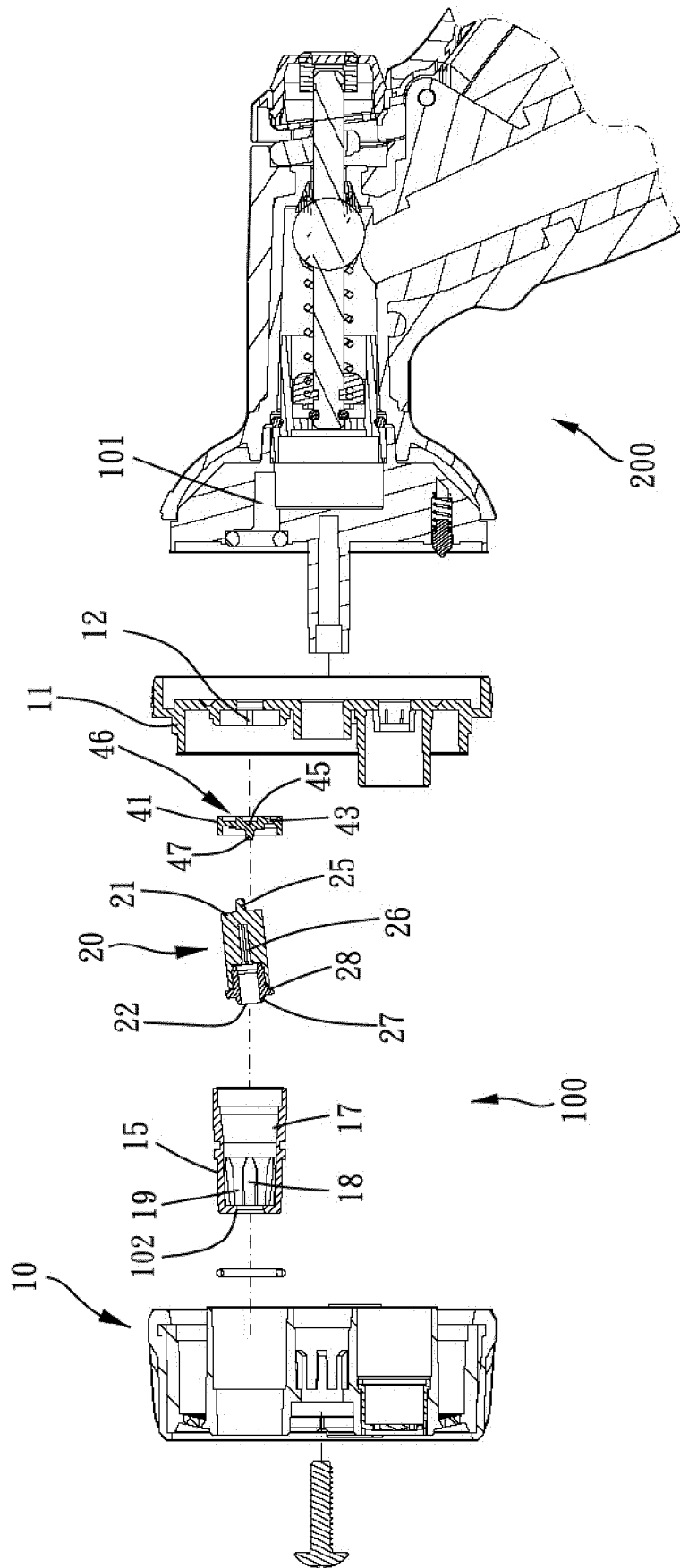


Fig. 4

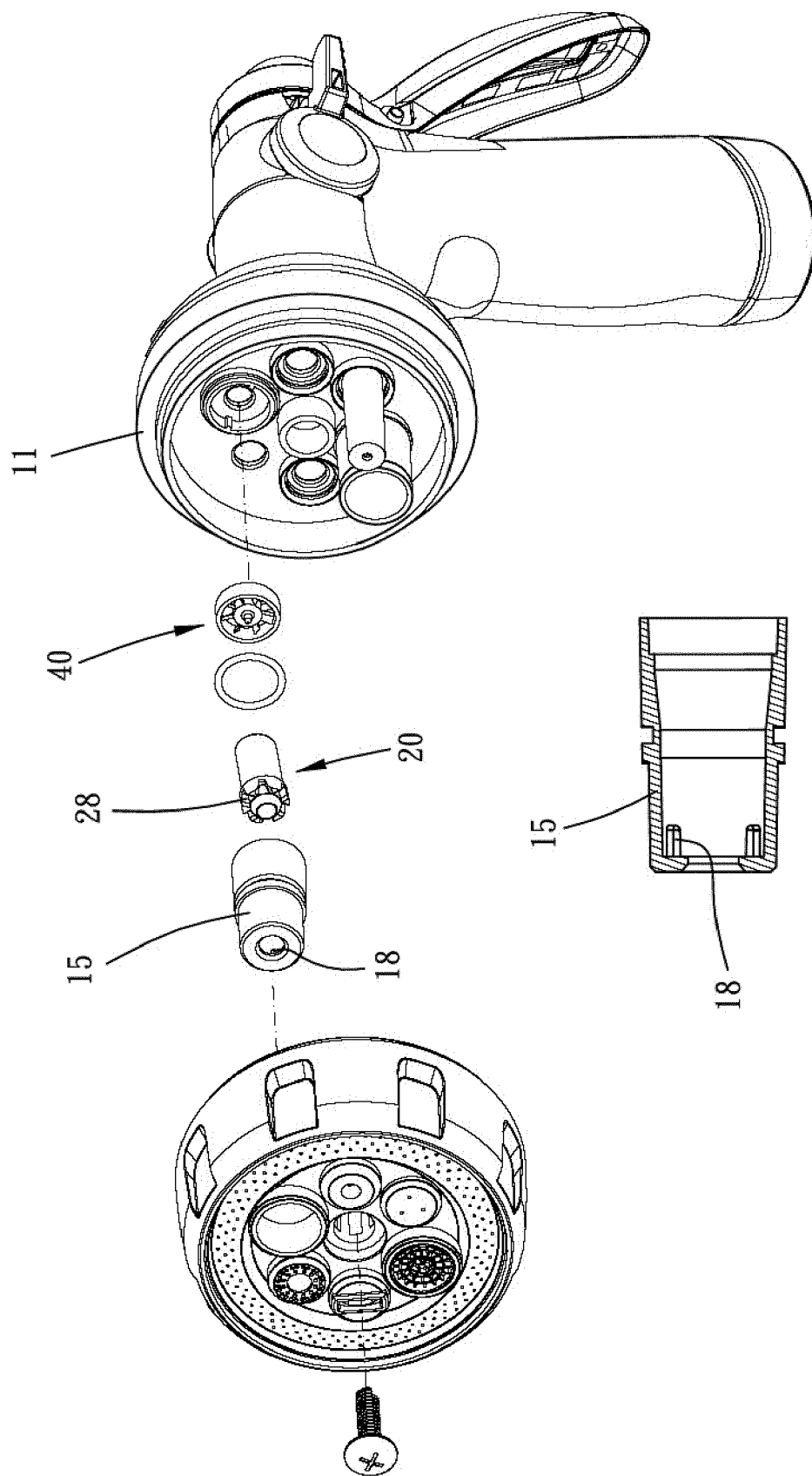


Fig. 5



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Place of search Munich		Date of completion of the search 11 August 2020	Examiner Neiller, Frédéric
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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