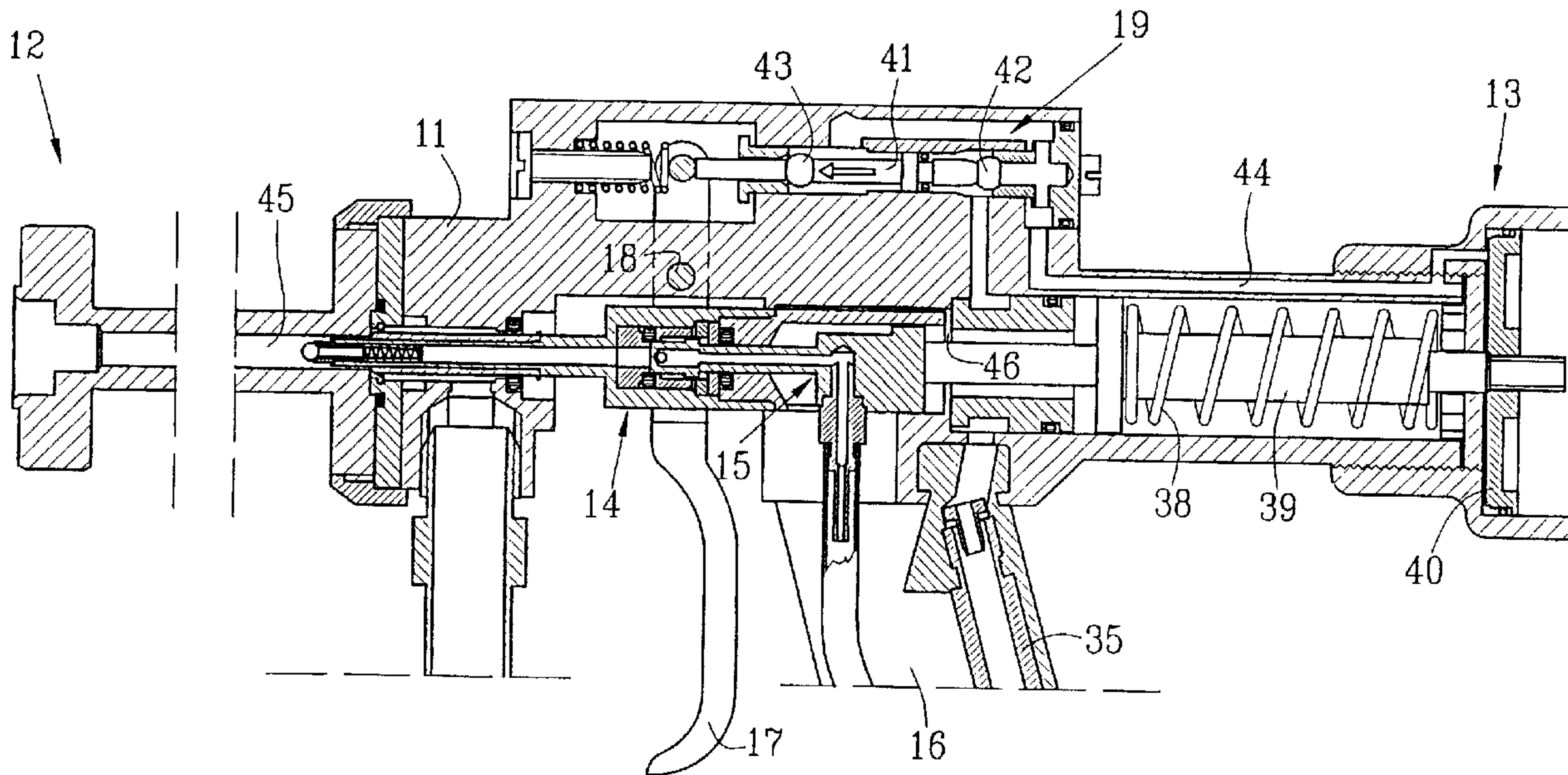




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(57) **Abrégé/Abstract:**

Spray gun for mixing and spraying of two media, and of the type incorporating a valve for one medium each. The two valves are provided one inside the other one and designed to be axially displaceable in a housing and relative to each other to and from one valve seat each against the action of a spring. The valves are together influenceable by an external force.

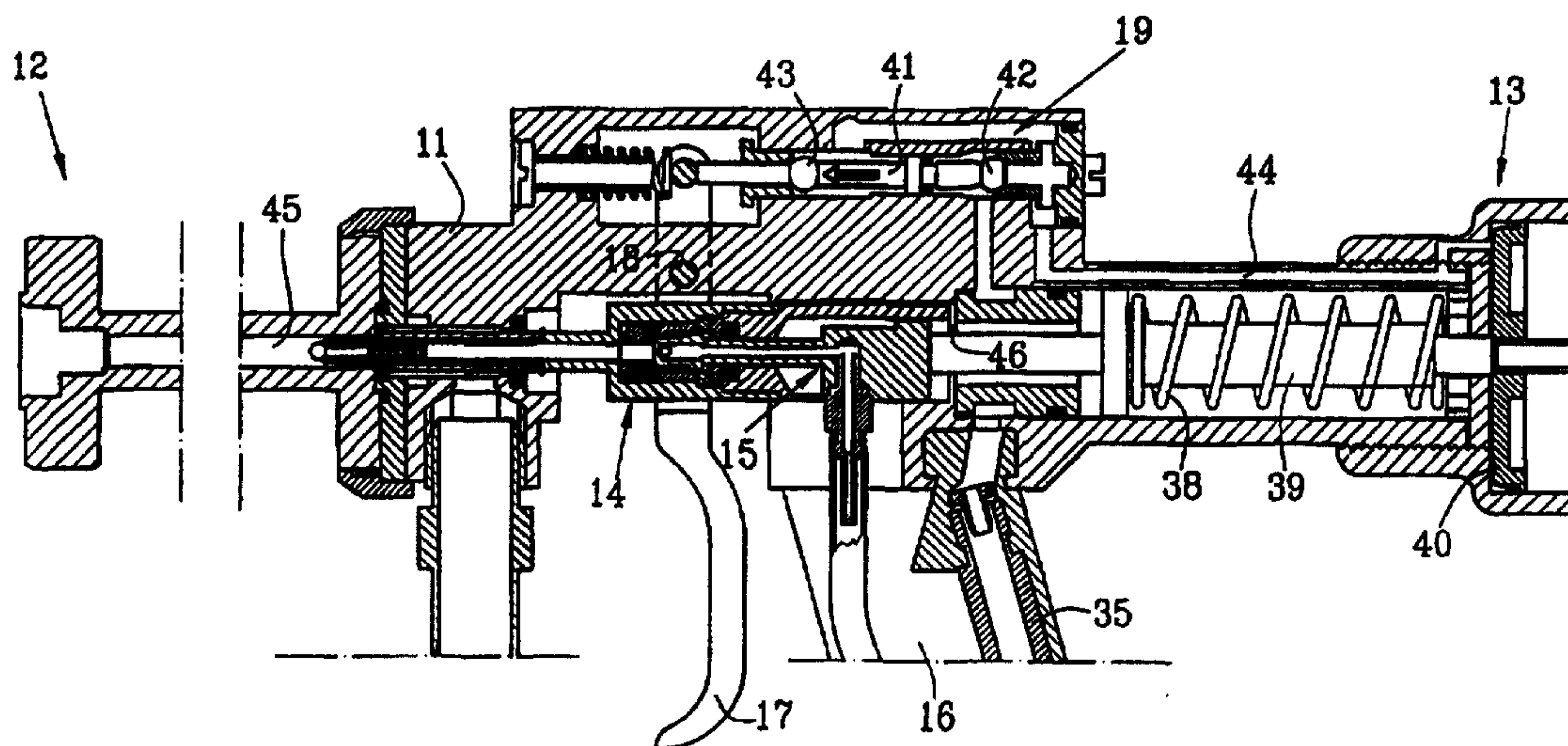
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(57) Abstract

Spray gun for mixing and spraying of two media, and of the type incorporating a valve for one medium each. The two valves are provided one inside the other one and designed to be axially displaceable in a housing and relative to each other to and from one valve seat each against the action of a spring. The valves are together influenceable by an external force.

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SPRAY GUN

The present invention refers to a spray gun for mixing and spraying of two media, and of the type incorporating a valve
5 for one medium each.

Background and problem of the invention.

Spray guns of the type mentioned above are earlier known,
10 which have two separate valves for one medium each and positioned at some distance from each other and a common mixing chamber. A drawback with these is that when the two media react with each other the orifices of the valves will be clogged up and for preventing this is required a careful
15 cleaning at every interruption of the spraying operation. A further drawback is that the spray gun will become bulky, is more difficult to handle, has many movable components and therefore requires more maintenance and is more expensive to manufacture than spray guns for one medium only.

20

Purpose of the invention and solution of the problem.

The purpose of the invention is to provide a spray gun, which:

25

- .is easy to clean, by wiping it off
- .prevents contamination of the valve orifices to a large extent,
- .is as easy to handle as spray guns for one medium only,

30

- .has a few movable components,
- .requires a minimum of maintenance,
- .is worth its price.

35

These tasks have been solved in that the two valves are provided one inside the other and designed axially

displaceable in a housing and relative to each other to and from one valve seat each against the action of a spring, and that the valves are actuatable together by an external force.

5

Accordingly, in one aspect, the invention provides a spray gun for mixing and spraying of two media, the spray gun comprising an inner and outer valve, for one medium each, wherein the two valves are provided one inside the other and designed axially displaceable in a housing and relative to each other to and from first and second valve seats each, against the action of a spring, and wherein the valves together are influenceable by an external force.

15 **Description of the drawings**

Hereinafter the invention will be further described as an embodiment with reference to the accompanying drawings.

Fig. 1 shows a section through a spray gun according to the invention in closed, passive position.

20

Fig. 2 shows in bigger scale a section through the intermediate portion of the spray gun, with the valves in open, active position.

Fig. 2a is a partial enlargement of the encircled portion 2a from Fig. 2.

25

Fig. 2b is a partial enlargement of the encircled portion 2b from Fig. 2.

Description of embodiment

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The spray gun according to the invention consists of a central housing 11, which at its forward part is equipped with a spraying nozzle 12 and at its rearmost portion with a servo mechanism 13. The central housing 11

2a

5 incorporates two valves 14 and 15, the inner one 15 of which is provided within the other, outer valve 14. The housing also incorporates a handle 16 and in front of this a trigger 17 in the form of a two-armed lever, which is pivotable about a shaft 18. In the upper part of the housing is also provided a valve arrangement 19 for controlling the servo mechanism 13.

10 The outer valve 14, which is axially displaceable in the housing 11 consists of a sleeve 20, which passes over into

a coaxial tube 21, which extends into the spraying nozzle 12. A protective bushing 22 is thread over the tube 21, and the forward tapering end 23 of which cooperates with a valve seat 24 in the housing 11. At the front end of the tube is provided a non-return valve 25, which opens at a pressure inside the tube. The protective bushing 22 is surrounded by an annular channel 30, which communicates with a supply conduit 31 for a first medium, e.g. polyester. At the transition between the tube 21 and the sleeve 20 is provided a valve seat 26 in the latter, which cooperates with the end surface of the valve body 27 of the inner valve 15. This is constituted by a tube 28, the forward end of which is closed, but provided with lateral openings 29, which communicate with a second annular channel 32, which can be brought in communication with the interior channel 33 of the tube 21, when the valve body 27 is displaced in a direction away from its seat 26 and the opening of the channel 33 is exposed.

The inner valve 15, which is axially displaceable in the sleeve 20 of the outer valve 14, passes over with its tubular valve body 28 into a bush 34, which is guided inside the sleeve 20. The inner channel 36 of the tube 28 opens at this bushing, and a supply conduit 37 for a second medium, e.g. a hardening agent is connected to this channel. A piston rod 39 of a piston 40, forming part of the servo mechanism 13 and being subjected to load by a pressure spring 38 is also attached to the bushing 34.

A conduit 35 for pressurized air is also connectable to the housing 11, and which supplies pressurized air to a valve stem 41 equipped with two valve bodies 42 and 43, one of which always closes against a valve seat, whereas the other one is open. The position of the valve stem is controlled by means of the trigger 17. When the trigger is acted upon, the

valve body 42 opens the passage to an air conduit 44, which leads the pressurized air to the forward side of the piston 40. The piston rod 39 thereby will be subjected to a tensile force acting against the action of the spring 38. The
5 tensile force is transferred to the bushing 34, whereby the entire valve package consisting of the outer and the inner valves 14, 15 is displaced against a stop 46, such as shown in Fig. 2 and 2a. In this stage the two valves 14, 15 form an interconnected unit, due to the fact that the second
10 medium contained in the annular slot 32 and the channel 36 is under pressure. In this position the passage beyond the valve seat 24 is opened, thus that the first medium can flow from the supply conduit 31 to the connecting channel 45 of the spray nozzle 12. This channel is designed as a mixing
15 chamber or mixing channel equipped with not shown, for instance screw-shaped, mixing members.

At continued supply of pressurized air to the piston 40 the passage beyond the valve seat 26 will be opened, thus that
20 the second medium can flow from the annular slot 32 to the inner channel 33 of the tube 21 and further to the non-return valve 25, which is thereby opened. Thereby the second medium will reach the mixing chamber 45 and an intimate mixing of the two media can take place.

25
As the outlet opening for the second medium at 25 is situated somewhat in front of the outlet openings at 24 for the first medium and the first medium always is discharged first, there will not be any contamination at these outlet
30 openings 24. The cleaning then can be limited to wiping off the non-return valve 25, after the spraying nozzle 12 has been screwed off.

List over reference numerals

	11	housing
	12	spraying nozzle
5	13	servo mechanism
	14	outer valve
	15	inner valve
	16	handle
	17	trigger/lever
10	18	shaft
	19	valve arrangement
	20	sleeve
	21	tube
	22	protective bushing
15	23	tapering end
	24	valve seat
	25	non-return valve
	26	valve seat
	27	valve body
20	28	tube
	29	opening
	30	1st annular channel
	31	supply conduit
	32	2nd annular channel
25	33	inner channel
	34	bushing
	35	conduit for pressurized air
	36	inner channel
	37	supply conduit
30	38	pressure spring
	39	piston rod
	40	piston
	41	valve stem
	42	valve body
35	43	valve body
	44	air conduit
	45	connecting channel/mixing chamber
	46	stop

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A spray gun for mixing and spraying of two media, the spray gun comprising:
an inner and outer valve, for one medium each, wherein the two valves are provided one inside the other and designed axially displaceable in a housing and relative to each other to and from first and second valve seats each, against the action of a spring, and wherein the valves together are influenceable by an external force.
2. A spray gun as claimed in claim 1, wherein the second valve seat of the inner valve is provided in the outer valve, the first valve seat of which is provided in the housing.
3. A spray gun as claimed in claim 1 or 2, wherein the inner and outer valves during an initial displacement motion are interconnected hydraulically, with a valve body of the inner valve in closed position.
4. A spray gun as claimed in claim 3, wherein the external force is constituted by a pneumatically actuatable piston, having a piston rod which is connected to the valve body of the inner valve, which is displaceable in the outer valve, and wherein axial displaceability of the outer valve is limited by a stop in the housing and that the valve body of the inner valve is further displaceable under opening of the inner valve.
5. A spray gun as claimed in claim 4, wherein the movement of the pneumatically actuatable piston is

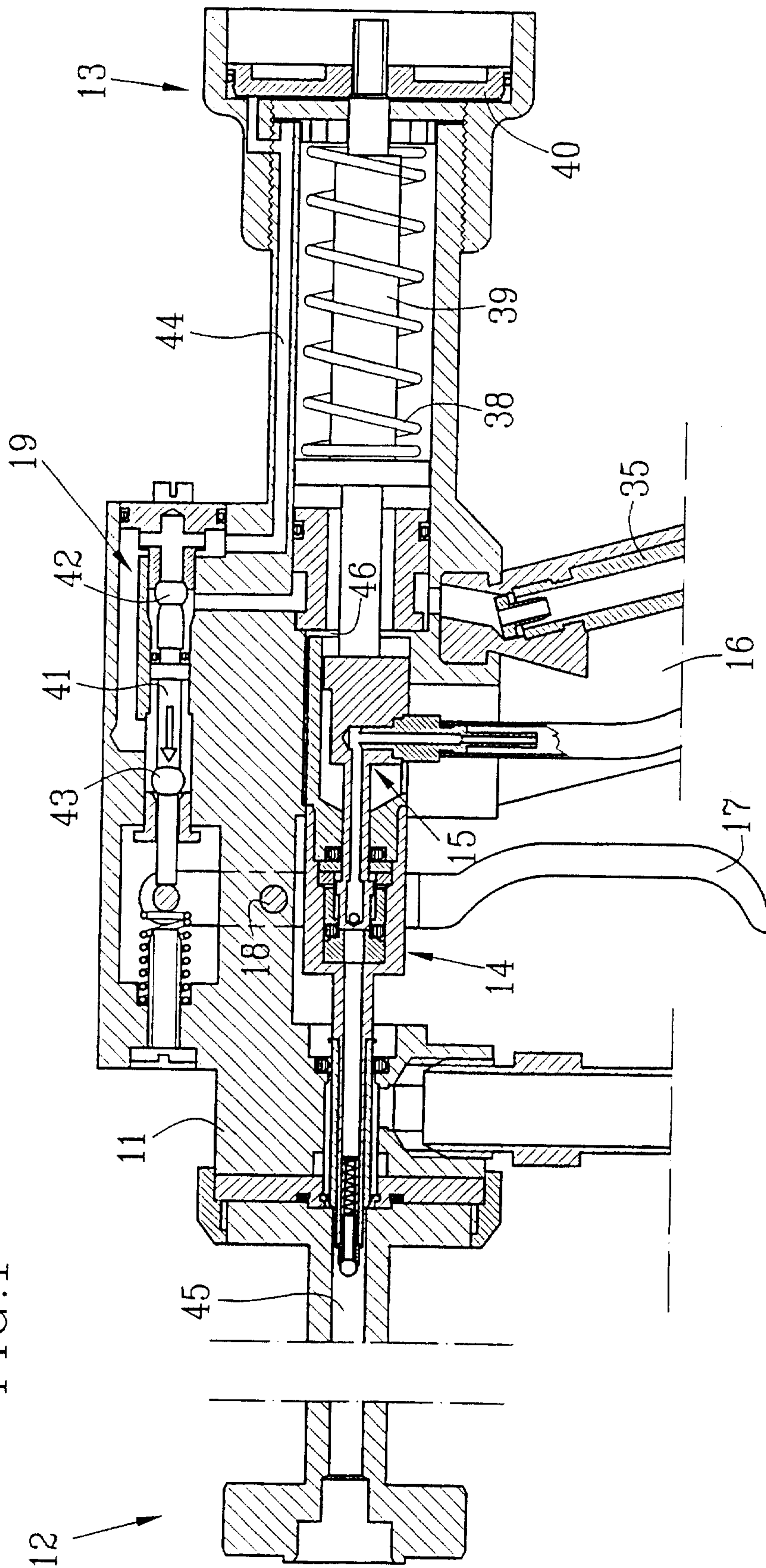
controlled by a valve stem actuatable by a trigger of the spray gun, and which is adapted in one of its end positions alternately to close an air supply to the pneumatic piston and simultaneously to open a ventilating opening.

6. A spray gun as claimed in any one of claims 1 to 5, wherein a non-return valve, which is openable by influence of one of the two media is provided at an outlet orifice of the inner valve.

7. A spray gun as claimed in any one of claims 1 to 5, wherein an orifice of one of the valves is axially spaced from an orifice of the other valve.

8. A spray gun as claimed in any one of claims 1 to 5, wherein outlet orifices of both valves are arranged to open in a common mixing chamber/channel.

FIG.1



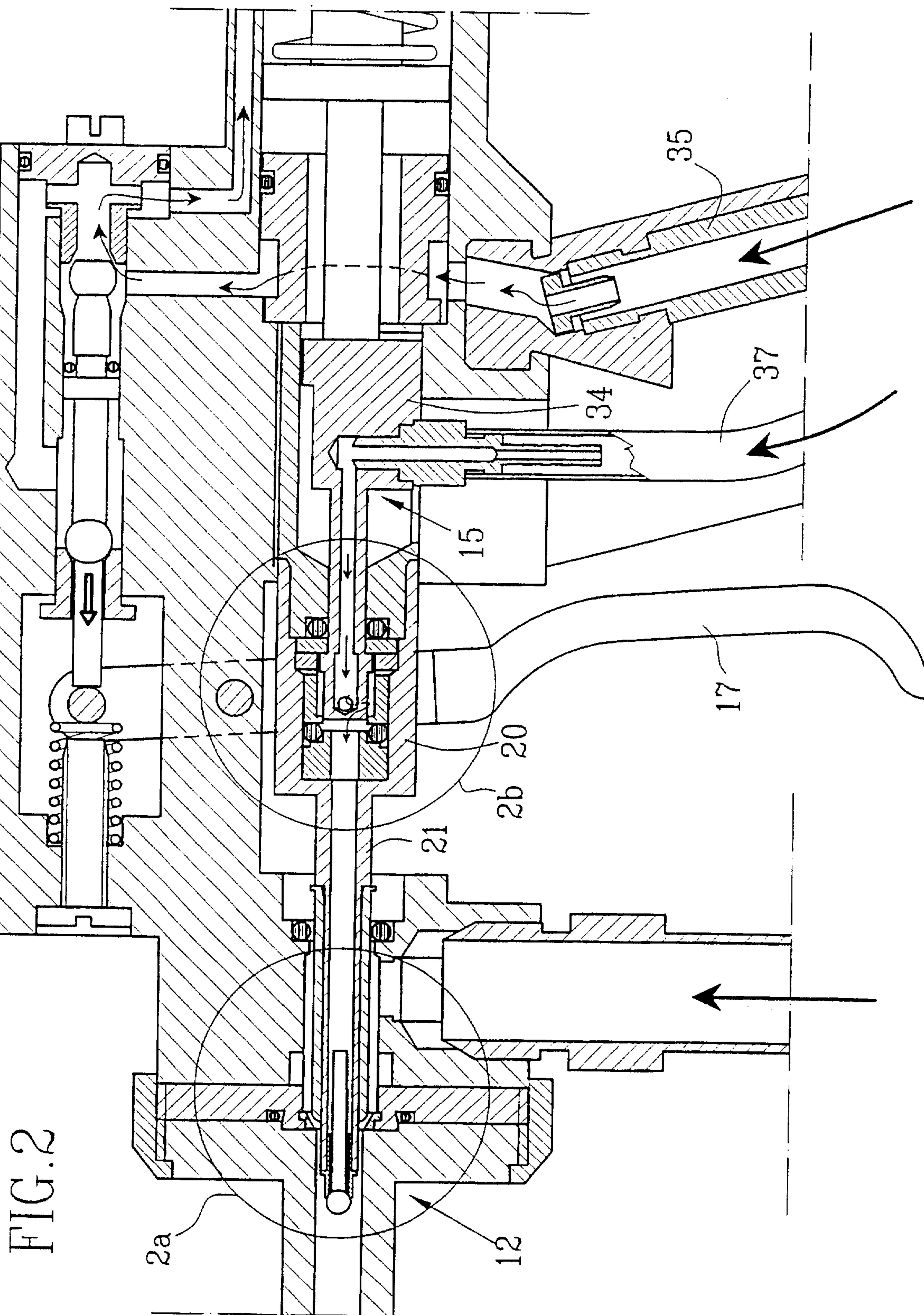


FIG.2a

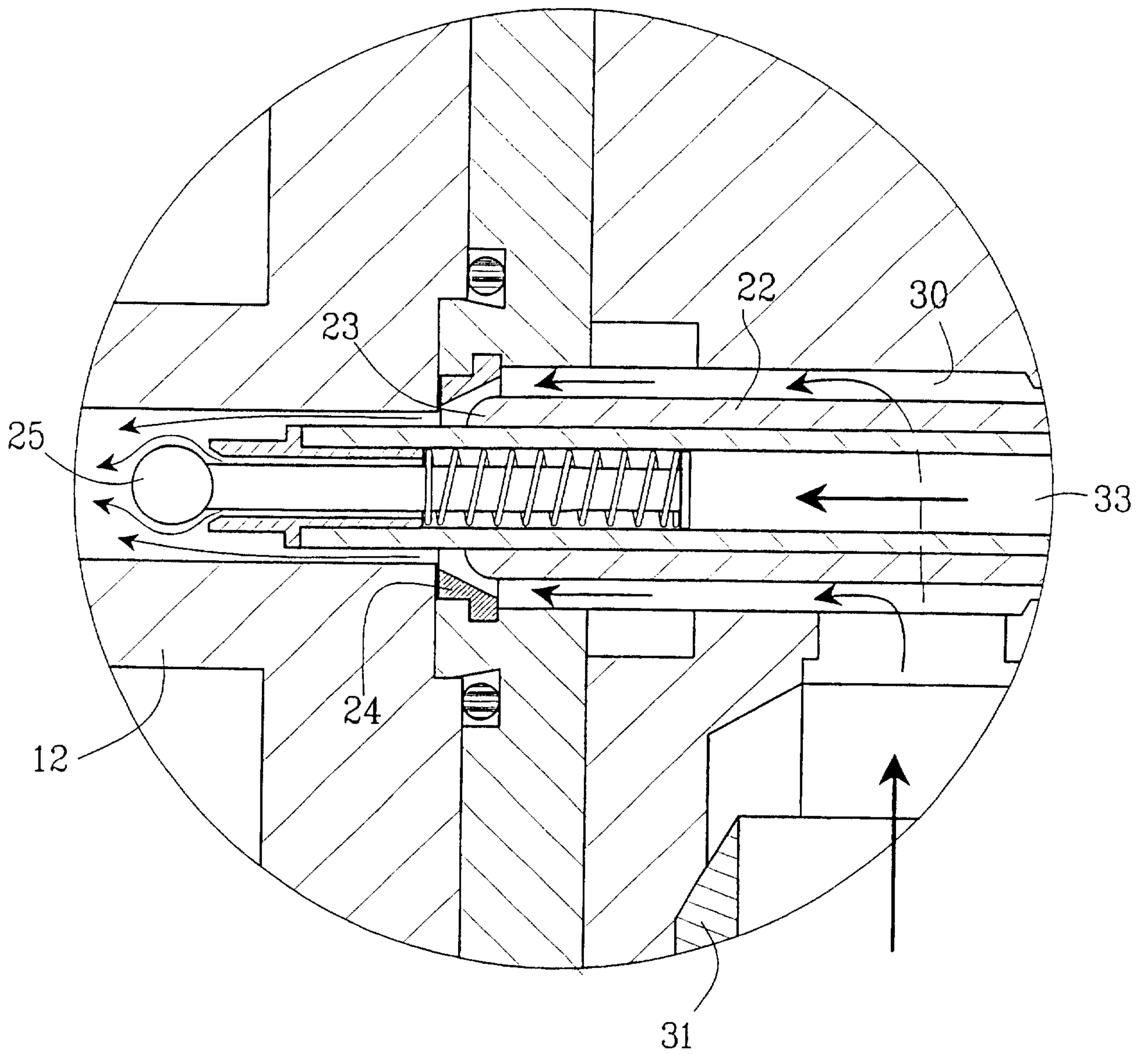


FIG.2b

