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(54) **Machine for cleaning glasses, floors and washable walls.**

(57) Machine for cleaning glasses, floors and washable walls comprising a steam generator (4), an electric group (5) sucking the air-liquid mixture, a container (1) gathering the sucked liquid, inside which the depression of the sucking group is produced, a first pipe (8) connected to the steam generator, a second pipe (9) in communication with the container (1) of the liquid, and a cleaning fixture (7) including, on its turn, a steam delivery device (14) connected to said first pipe (8), a suction mouth (13) in communication with said second pipe (9), broom shaped flexible means (12) for conveying the liquid formed on the surface to be cleaned towards said suction mouth (13), and a cleaning element (17), in correspondence with the steam delivering device (14), sponge-like or similar.

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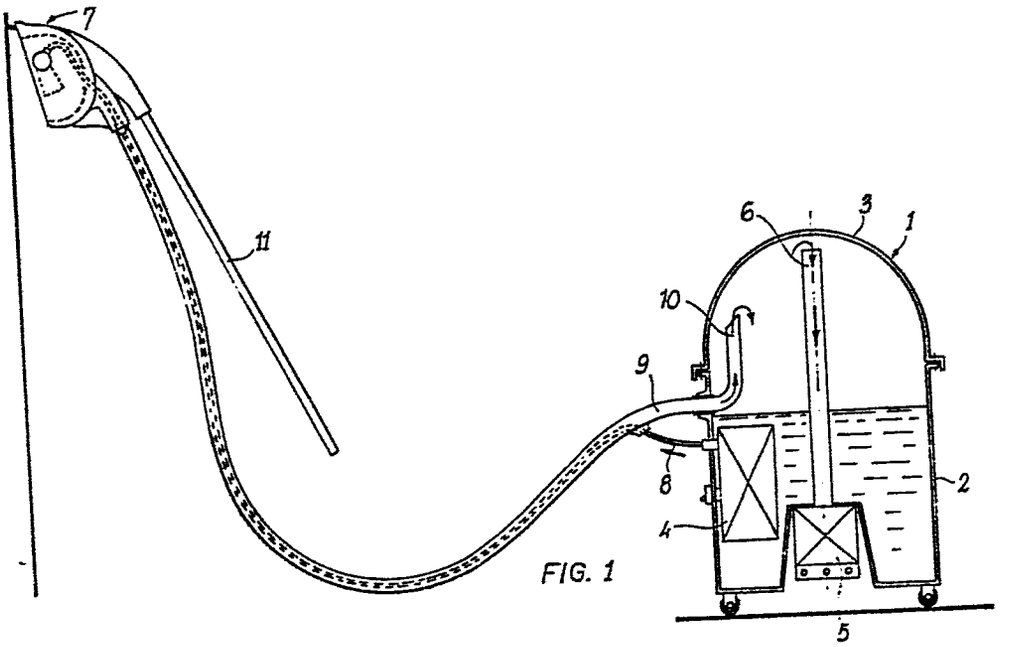

FIG. 1

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MACHINE FOR CLEANING GLASSES, FLOORS AND WASHABLE WALLS

This invention concerns a machine for cleaning glasses, floors and washable walls. More particularly the invention concerns a machine in which are combined the two actions of steam delivery, for washing and rinsing the surfaces to be cleaned, and of suction of the resulting liquid, in order to take away the dirt and dry them.

According to conventional practice, the glasses, the floors, the ceramic or anyway washable walls, and in general the smooth surfaces being susceptible of cleaning through washing, are treated through manual application of water containing, in general, a suitable detergent, often followed by dryin, with clothes or similar, in order to eliminate the residual water and the traces of dirt and detergent.

In order to simplify and make easier this job, there have been developed and put on the market several devices among which, most recently, some machines which deliver jets of stream, produced in the generator with which they are equipped, which impinges upon the surfaces to be cleaned, degreasing them and dissolving the dirt deposed thereon, thus eliminating the requirement of their wiping, so ensuring a better cleaning.

Said machines mostly have a configuration similar to that of common vacuum-cleaners, with a main body, inside which are provided the boiler and the electric components, plus one or more interchangeable cleaning fixtures, conn-

nected to the main body through normal pipes and hoses.

Even if are clear the advantages connected with the use of machines of this type, it is impossible to overlook the difficulties of a practical character, deriving from the lack of a function corresponding to the msnusl drying of washed surfaces.

Actually, none of the machines of this type is able to remove furtherly the condensed steam, mixed with dirt, deriving from the washing action, and which therefore remains lodged on horizontal surfaces or run along the vertical ones, thence requiring a further hand operation of liquid recovery.

There derives from the above the clear requirement of making available a machine, as the one proposed according to this invention, which is able to deliver steam for cleaning the surfaces, and to suck, at the same time or with a further operation, the resulting liquid mixed with dirt.

To this aim, according to the invention, it is proposed to implement a machine for cleaning glasses, floors and washable walls, the main body of which includes a steam generator and a system specifically designed for the suction of air and liquids mixtures, each of the cleaning fixtures which are to be employed according to the surfaces to be washed being so structured as to be able to perform, even at the same time, the functions of both delivery and suction of steam.

It is therefore the specific object of this invention a machine for cleaning glasses, floors and washable walls

comprising a steam generator, an electric group sucking the air-liquid mixture, a container gathering the sucked liquid, inside which the depression of the sucking group is produced, first pipe means connected to the steam generator, second pipe means in communication with the liquid container and a cleaning fixture including, on its turn, a steam delivery device connected to said first pipe means, a suction mouth in communication with said second pipe means and flexible broom means for conveying the liquid formed on the surface towards said suction mouth.

Preferably, according to the invention, the steam generator is housed within the container of liquid, while the suction group is placed outside the latter, in a housing built in its lower part, and communicates with the internal environment of same through a non sucking, vertical pipe.

Furtherly, the container of liquid can be built with two separable parts in order to allow, mostly, the exhaust of the liquid and the access to internal components.

Still according to the invention, the suction group includes a by-pass motor, suitable for sucking the gas-liquid mixtures, and the second pipe means are, in correspondence with their end communicating with the container, turned towards the upper part of the container itself, in such a way as to avoid that the squirts of the sucked liquid might be directly brought into contact with the sucking group.

In a preferred embodiment of the machine according to

this invention, the first pipe means, through which the steam passes, are placed inside the second pipe means and the whole unit can be built either completely with hoses, in which case a suitable handle is provided for holding and operating the fixture, or in a part with hoses and in another with rigid pipes, so that the rigid pipe is able to replace the supporting handle of the fixture.

Besides, said first and second pipe means, both in the solution where they are coaxially assembled, and in the case when they are mutually extended, can be made out by several lengths, which can be separated and coupled through seal joints, in such a way that their length can be changed and their size reduced when put away.

In a first, particularly preferred embodiment of the cleaning fixture for the machine according to this invention, said steam dispensing device is assembled within the lower part of the fixture, and in correspondence with same there is provided a spongy element which is run across by the delivered steam, and the broom flexible means are assembled in the upper part of the fixture, above the suction mouth.

Preferably, the steam delivering device includes a cross distributor pipe, provided with aligned holes, to which is jointly coupled the spongy element in correspondence with said holes, such distributor pipe being able to turn, by manual control, around its axis, both for eliminating the contact between the spongy element and the surface, and for allowing the inclination adjustment of the

element itself.

The upper angle of the spongy element can be formed by one part in abrasive material, especially useful for scraping the harder dirt.

A fixture implemented according the embodiment described appears to be advantageously employable for cleaning glasses or vertical walls, owing to the arrangement of the broom means and of the spongy element, as well as to the possibility of adjusting the inclination of the distributor pipe-spongy element unit.

In a second preferred embodiment of the fixture for the machine according to this invention, the same includes, transversally placed, starting from its front part, a first broom flexible means, the suction mouth, a second broom flexible means, the steam delivering device and a scraping flexible means.

In particular, the steam delivering device can include a cross distributor pipe, provided with aligned holes.

The fixture so implemented can be employed, particularly, for cleaning floors.

This invention will now be described according to its preferred embodiments, with special reference to the figures of the enclosed drawings in which:

figure 1 is a lateral view, partially cutaway, of the machine according to the invention;

figure 2 is a perspective view of a first embodiment of the cleaning fixture for the machine according to the invention;

figure 3 is a cross section of the fixture as per fig-

ure 2 in a first position;

figure 4 is a cross section of the fixture as per figure 2 in a second position;

figure 5 is a cross section of the fixture as per figure 2 in a third position;

figure 6 is a section across A-A as per figure 3;

figure 7 is a lateral view of a pipe length of the machine according to the invention;

figure 8 is a front perspective view, partially cutaway, of a second embodiment of the fixture for the machine according to the invention;

figure 9 is a rear perspective view of the fixture as per figure 8;

figure 10 is a cross sectional view of the fixture as per figure 8; and

figure 11 is an exploded view of the fixture as per figure 8.

Referring to figure 1, a container for the sucked liquid is shown with reference 1 and it is formed by a lower part 2 and by an upper one 3, as its cover. Inside the lower part 2 a steam generator 4 is housed while, under the same, externally, the suction group 5 is housed, being in communication with the inside of container 1 through a non sucking pipe 6. Actually,the open end of pipe 6 is set at such an height as to never be reached by the level of liquid drained into container 1.

Steam generator 4 is connected to the cleaning fixture 7 through the small hose 8 which, for the greater part of its length, is placed within the hose 9 which pipes the sucked

air-liquid mixture. Said hose 9 communicates with the internal environment of container 1 through one of its ends 10, upturned, in such a way that the splashes coming from the latter may bounce against the upper part 3 of container 1 without falling inside the pipe 6, thus avoiding the direct contact between the suction group and the liquid.

The cleaning fixture 7 is provided with a rigid handle 11 allowing for its holding and operation.

In figures from 2 to 6 there is particularly shown the cleaning fixture 7, in its embodiment suitable for cleaning glasses and vertical walls.

It includes, at the top, a flexible broom 12 which pushes the condensate mixed with dirt towards the suction mouth 13, from which the latter are conveyed along pipe 9.

Under the suction mouth 13 there is provided a steam delivering device, formed by a small hose 14 connected to a distributor pipe 15, equipped on its turn with aligned holes 16 from which the steam is exhausted.

In correspondence with said holes 16 a small sponge 17 is fixed to distributor pipe 15, the former being used for distributing evenly the steam on the surface and for performing a wiping action.

The distributor pipe 15 can be made to rotate around its axis by the knob 18, so as to locate the small sponge 17 as shown in figures 3, 4 and 5.

Knob 18 is made out in such a way as to be able to be extracted along arrow 19, so that the tube 15-small sponge 17 unit can be replaced.

On the upper edge of small sponge 17 there is provided

an abrasive part 20 which, when arranging the small sponge 17 as shown in figure 5, allows to perform a stronger scraping action.

The coupling between pipe 9 and fixture 7, shown by reference 21, is formed by a pressure conical coupling, while the one between the small hoses 14 and 8 is provided by a fitting 22, both ends of which are truncated cones.

Fixture 7 can be employed in the position of figure 3, in correspondence of which both actions of steam delivery and of suction of resulting liquid are performed at the same time, or in the position of figure 4 when the steam delivery action is excluded by withdrawing the small sponge 17 towards the inside of chamber 23.

In this latter situation the possible drippings of small sponge 17 are gathered inside chamber 23 and conveyed, through holes 24, into suction hose 9.

In figure 7 there is shown the solution when hose 9 includes a rigid length, in the proximity of fixture 7, which exploits the same functions of stick 11.

In figures from 8 to 11 there is shown a second embodiment of fixture 7, especially suited for cleaning floors.

The lower part 24, on which the suction mouth 25 is provided and to which the flexible brooms 26 and 27 are fixed, can be disjoined from fixture 7, both for replacement of part and for ensuring its interchangeability with other devices suitable for cleaning different surfaces, such as for instance moquettes and carpets.

The possibility of disassembly for part 24 is allowed by threaded pins 28 which, when entering through holes 29 on fixture 27, are coupled with small knobs 30. To ensure the seal between the interchangeable part 24 and the fixture 7 there is provided a packing 31.

The steam delivery device includes a distributor duct 32 provided with delivery holes 33. At the back of the steam distributor a small scraping brush 34 is provided.

The coupling between hose 9 and fixture 7 is obtained analogously to that shown with 21 in figure 3, while the coupling between the small hose 8 and the duct 35, through which the steam is sent to pipe 32, is obtained through the quick joint 36. Such solution allows to obtain the coupling of coaxial hoses 8 and 9 by just one motion, both with further hose lengths and with fixture 7.

This invention has been described with particular reference to some specific embodiments but it is to be understood that any variation and modification could be effected by the experts of the art without owing to this trespassing the scope of the invention.

CLAIMS:

1. A machine for cleaning glasses, floors and washable walls characterized in that it comprises a steam generator, an electric group sucking the air-liquid mixture, a container gathering the sucked liquid, first pipe means connected to steam generator, second pipe means in communication with the container of liquid and a cleaning fixture including, on its turn, a steam delivery device connected to said first pipe means, a suction mouth in communication with said second pipe means and broom flexible means for conveying the liquid formed on surface towards said suction mouth.

2. Machine according to claim 1 characterized in that said steam generator is housed within the container for gathering the liquid, and in that said suction group is placed outside the container itself, in a lodging built in its lower part, and it communicates with the internal environment of same through a non sucking vertical pipe.

3. Machine according to claim 1 characterized in that said container gathering the liquid is built with two separable parts, one of which is the lower and the other the cover one.

4. Machine according to claim 1 characterized in that said suction group includes a by-pass motor.

5. Machine according to claim 1 characterized in that said second pipe means have their end communicating with container turned towards the upper part of container itself.

6. Machine according to claim 1 characterized in that

said first pipe means are placed inside said second pipe means.

7. Machine according to claim 1 or 6 characterized in that said first and second pipe means are formed by hoses, a suitable handle being provided for holding and operating said fixture.

8. Machine according to claim 1 or 6 characterized in that said second pipe means are made out in a part by hose and in another by rigid pipe.

9. Machine according to claim 1, 6, 7 or 8 characterized in that said first and second pipe means are made out by several lengths which can be separated and coupled through seal joints.

10. Machine according to claim 1 characterized in that said cleaning fixture includes a steam dispensing device assembled within its lower part, a spongy element provided in correspondence with said steam dispensing device and run across by the delivered steam, and broom flexible means assembled in its upper part, above the suction mouth.

11. Machine according to claim 10 characterized in that said steam dispensing device includes a cross distributor pipe, provided with outlet holes, to which the spongy element is jointly coupled, in correspondence with said holes.

12. Machine according to claim 11 characterized in that said distributor turns, by manual control, around its axis.

13. Machine according to claim 11 characterized in that the distributor pipe-spongy element unit is movable from the fixture.

14. Machine according to claim 11 or 12, characterized in that the upper angle of the spongy element is formed by abrasive material.

15. Machine according to claim 1 characterized in that said cleaning fixture includes, transversally placed, starting from its front part, a first broom flexible means, a suction mouth, a second broom flexible means, a steam delivering device and a scraping flexible means.

16. Machine according to claim 15 characterized in that said steam dispensing device includes a cross distributor pipe provided with outlet holes.

17. Machine for cleaning glasses, floors and washable walls according to each one of the previous claims, substantially as illustrated and described.

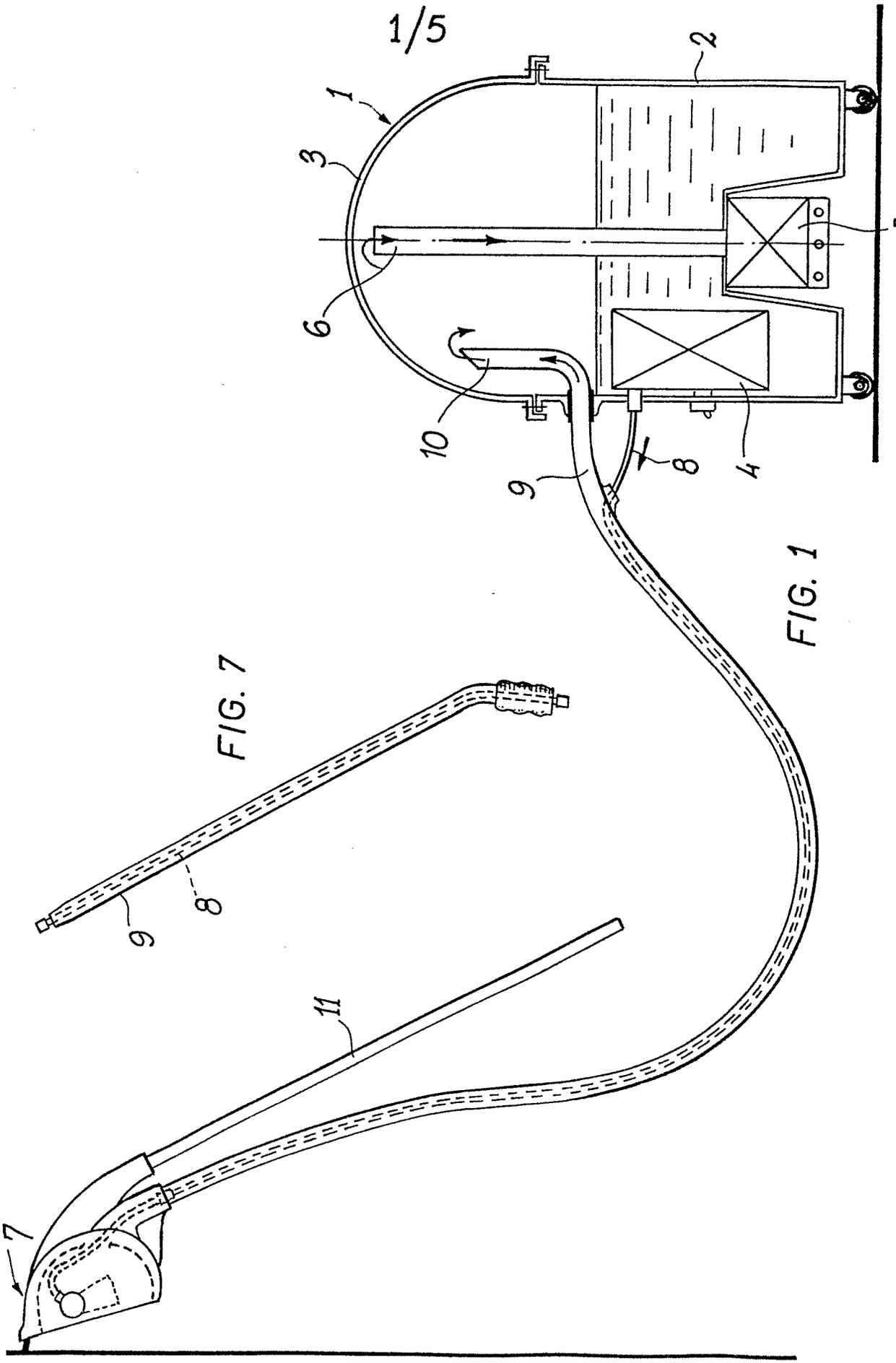


FIG. 1

FIG. 7

FIG. 2

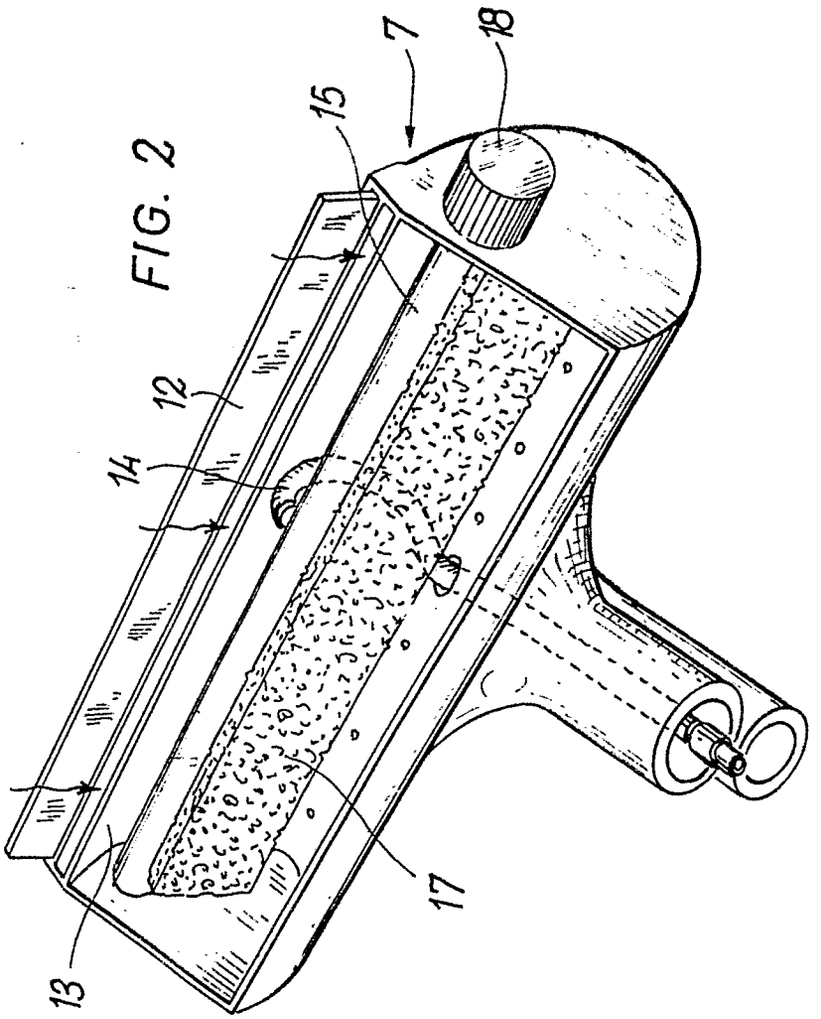
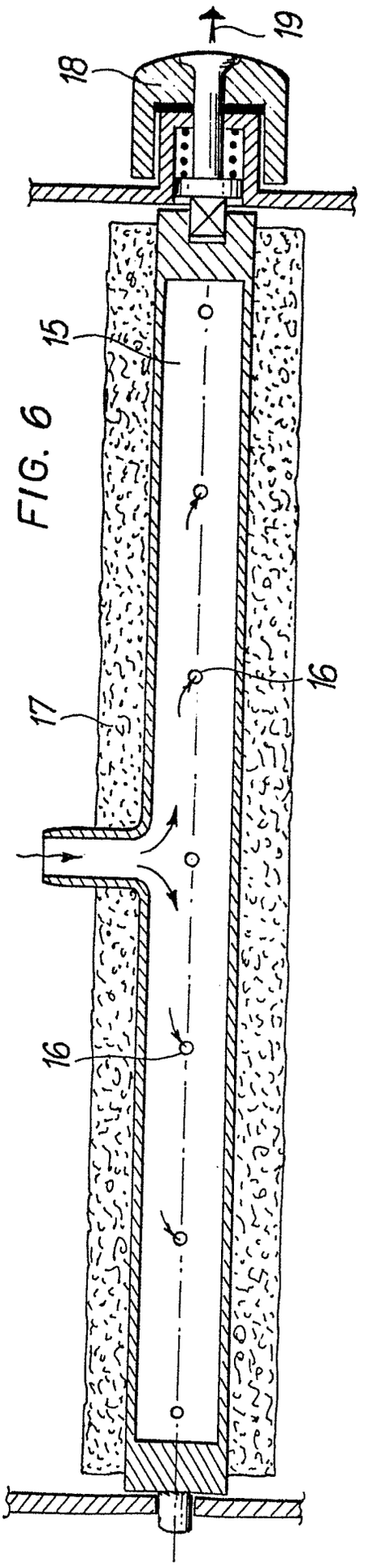


FIG. 6



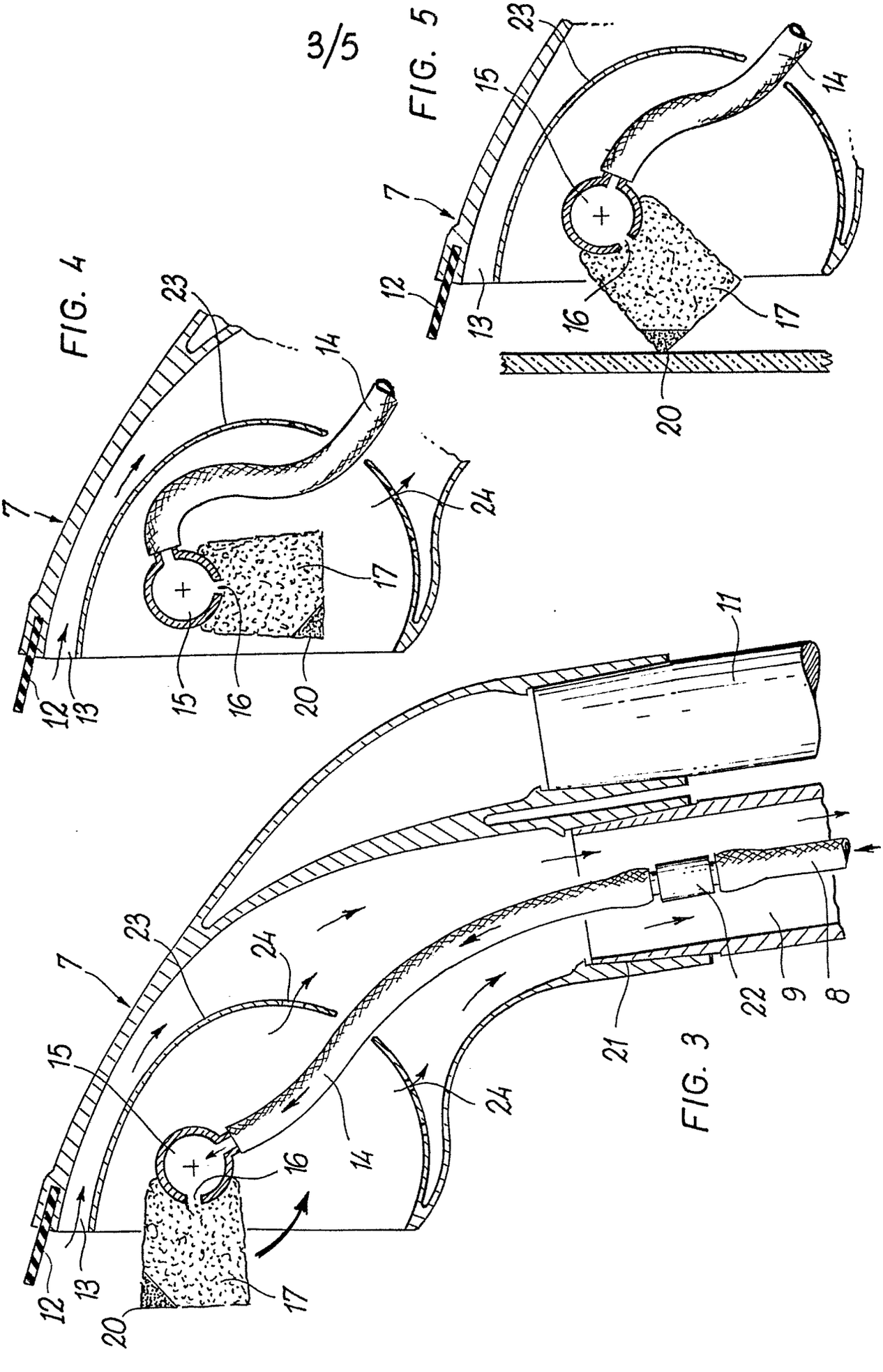


FIG. 5
FIG. 4
FIG. 3
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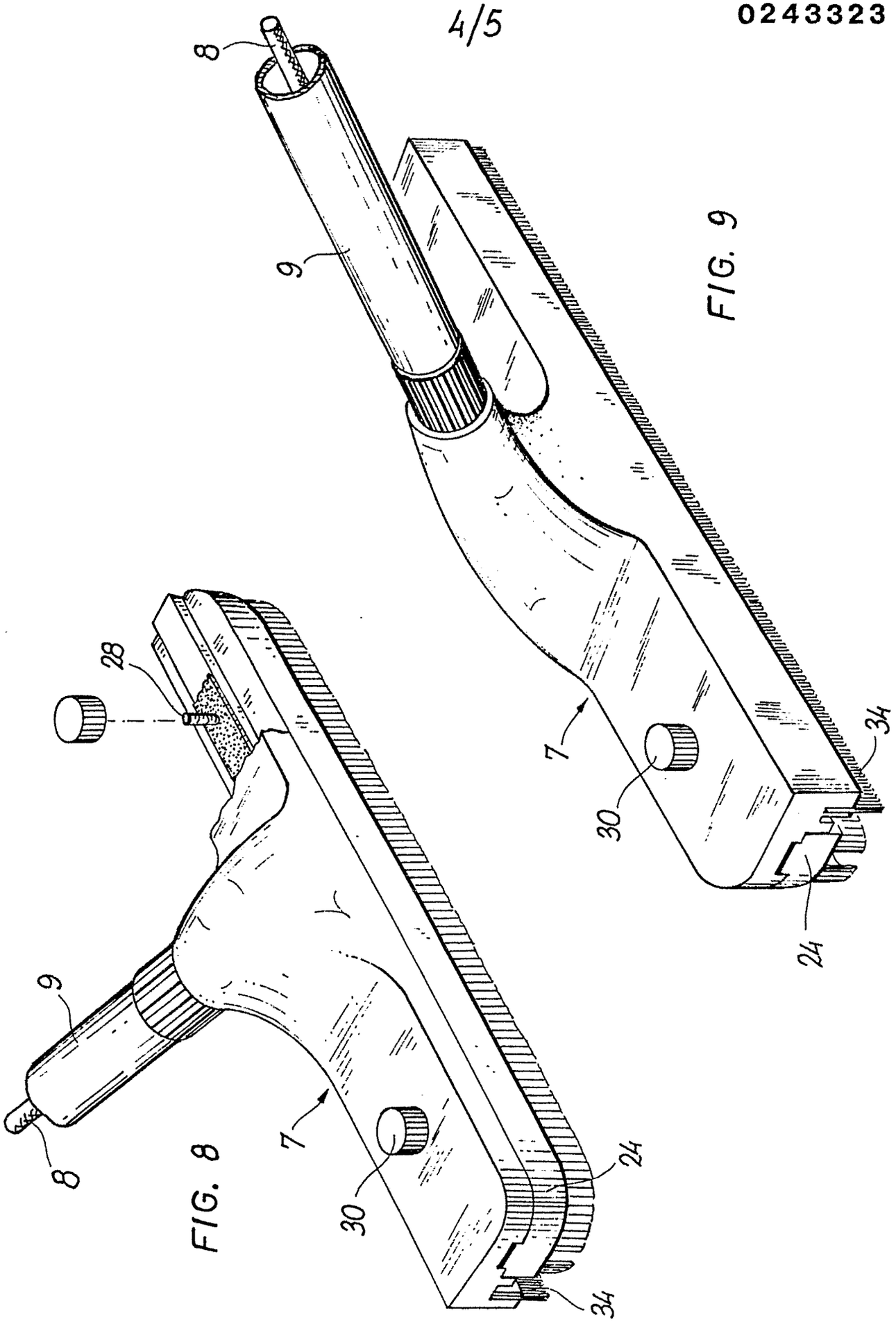

FIG. 9

FIG. 8

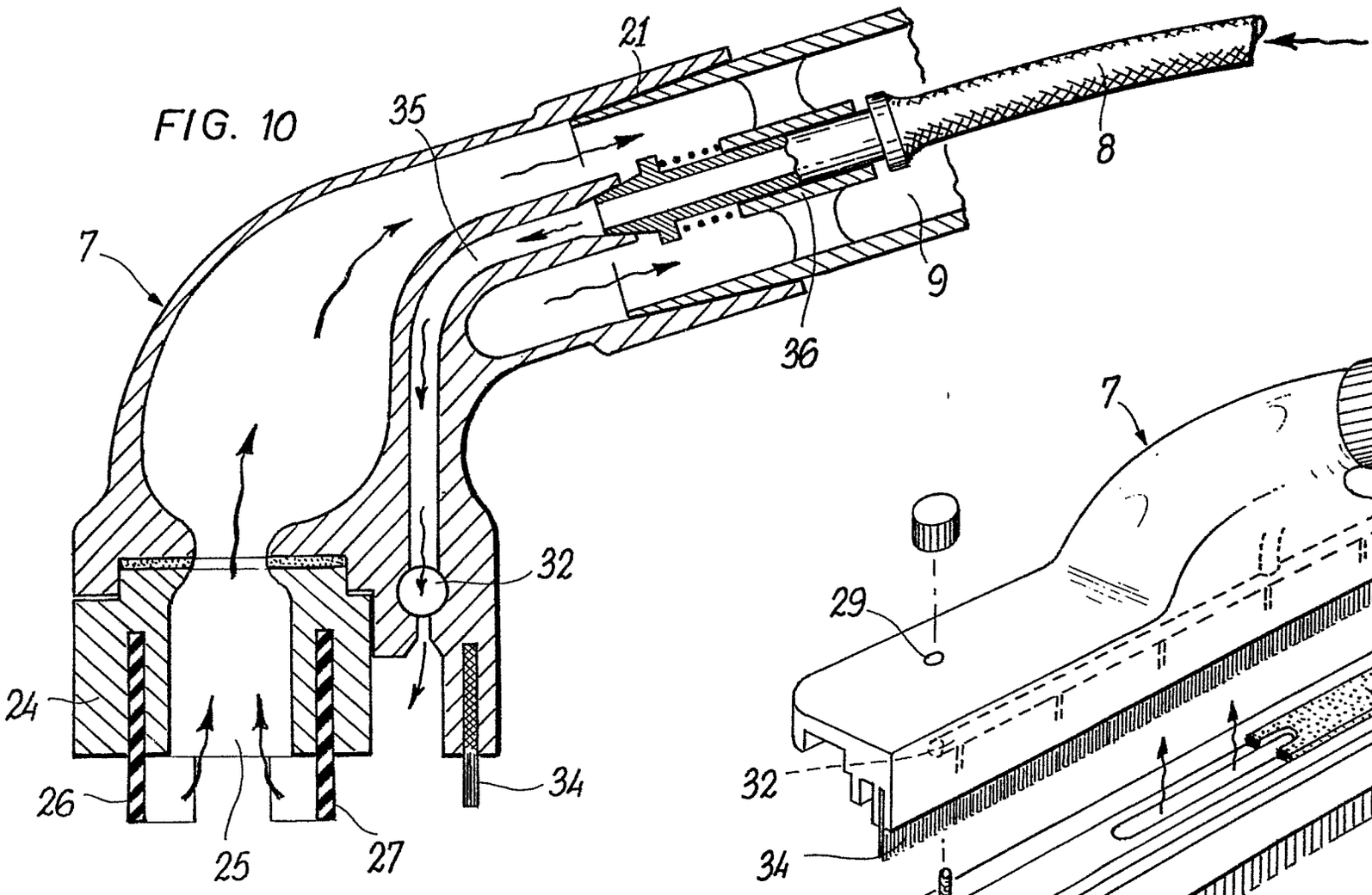

FIG. 10

FIG. 11

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