Provisional Patent Application of

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For

TITLE: BAGPIPE CHANTER REED BLOWING-IN MACHINE

CROSS-REFERENCE TO RELATED APPLICATIONS: None.

FEDERALLY SPONSORED RESEARCH: None.

BACKGROUND

For hundreds of years, bagpipe players have had to "break in" or "blow-in" the double cane reeds used in the chanter of the bagpipe before the reed was suitably soft and conditioned enough to play music with the reed. To do this, players place a new chanter reed in the chanter and blow it for a few minutes either with or without the bag of the bagpipe attached. This process is repeated every day over a period of weeks until the player is satisfied with the reed's performance. This process required a great deal of effort, as new reeds are harder to blow than "blown-in" reeds. The effort required is often so that it is difficult to concentrate on playing.

What occurs to a reed when it is "blown-in" is that warm, moist air from the player causes the reed to vibrate, and this action causes the natural cane to soften in the right spots on the reed. This action coupled with the essential element of repeated blowing over a period of time causes the reed to become conditioned or "blown-in".

Mechanically reproducing the actions of naturally "blowing-in" a reed would save the player time and effort.

SUMMARY

The invention is a machine designed to perform this function. Compressed air is piped into the invention's precision air regulator which regulates precisely the desired "blowing" pressure. The regulated air is then fed into the bottom of a pressurized chamber which contains at the bottom a reservoir of hot water. The air is then diffused through tiny holes into the hot water. As the air bubbles rise, the regulated air is warmed and humidified by the water, simulating a player's breath. At the top of the chamber above the airspace that is above the water is a flat surface with 5 holes drilled in it. In these holes are placed 1 to 5 chanter reeds which vibrate or "play" against the pressurized air just like they would in a bagpipe chanter. Also at the top of the chamber is an air tube that leads to a water manometer, or other pressure measuring device, which is used as precision gauge for determining the air pressure of the chamber. In addition to being a gauge for the machine, by attaching a manometer to a bagpipe drone during playing of a preferred reed, one can precisely determine the pressure that one prefers one's reeds to play at. Outside of the chamber on the other side of the flat surface on 4 of the reed holes are vertical pieces of tubing of varying lengths which causes each reed to "play" a different bagpipe scale note. This feature allows the user to determine which reeds are "playing" and which aren't. Above the lengths of tubing is a piece of foam rubber that helps dampen some of the sound of the reeds. Reeds are blown in a few minutes a day over a period of weeks until the player is satisfied with their performance.

The advantages to the this machine are: 1. Strenuous blowing of reeds is eliminated. 2. Multiple reeds can be "blown-in" in the time it takes to "blow-in" one reed. 3. By knowing the preferred playing pressure of a player by way of the player using a manometer on his bagpipe, a third party can "blow-in" a suitable reed to that player's pressure by using the machine.

DRAWINGS

FIG. 1 is an orthogonal front side view of the machine showing the machine in its proper vertical position with the chamber in an open position.

FIG. 2 is the same view as FIG.1 with some cutaway areas that depict the inner components of the machine.

FIG. 3 is a perspective view from the top and front of the reed surface with the pitch varying tubes attached, the manometer tube, the regulated air supply tube and the air diffuser attached. These elements appear as if they had been removed from the two chamber assemblies.

FIG. 4 is an orthogonal view of the bottom of the reed surface which shows the configuration of the pitch varying tubes, reed holes, manometer tube, and regulated air supply tube. These elements appear as if they had been removed from the top chamber assembly.

FIG. 5 is a perspective view of the mounting clamp used to mount the machine to a vertical surface during use.

DETAILED DESCRIPTION

FIG. 1 is an orthogonal front side view of the machine showing the machine in its proper vertical position with the chamber in an open position. 2 is the bottom portion of a pressure chamber and consists of a cylinder that is closed on the bottom and open at the top. The top of the chamber is encircled by an O-ring seal 11. 2 is joined to the top portion of the chamber 1 by way of a hinge 5. Across the diameter of the cylinder openings from the hinge is a latch 3 on the bottom half of the chamber and the latch's hook 4 on the corresponding side of the top half of the chamber. The machine is operated in the closed position. Also depicted is the operating position of the mounting clamp 10 onto the bottom portion of the chamber. Also shown are the pressurized side of chamber regulated air supply tube 6, the air pressure regulator 8, the manometer connection tube 9, and the regulator exhaust tube 7.

FIG. 2 is the same view as FIG.1 with some cutaway areas that depict the inner components of the machine. The previous elements described in FIG.1 are also depicted in FIG. 2. On the top half of the chamber is mounted a precision air pressure gauge 8 with a range of .07 PSI to 30 PSI. The exhaust port of the regulator has flexible tubing 7 that enters the side of the non pressurized portion of the chamber, passes through to the pressurized portion of the chamber via the reed surface 17 and is coupled with flexible tubing 6. Tubing 6 is then connected to an air diffuser 12 that rests in the bottom of the pressurized portion of the chamber. The diffuser consists of a horizontal positioned loop of metal tubing with tiny holes drilled on both the inside and the outside of its circumference. One end of the diffuser tube rises vertically to meet with tube 6. Depicted on reed surface 17 are three of the five holes used for placing reeds. Shown in this figure are holes 18, 19, and 20. Protruding from the non pressurized side of the reed surface centered around the reed holes are differing lengths of rigid plastic tubing: 13, 14, 15, and 16. The reed hole for 16 is not shown in Fig. 2. At the non pressurized open end of the chamber is a circular foam rubber insert that acts as a sound dampener. Manometer connection tube 9 is connected to the pressurized side of the chamber via the reed surface 17 and extends into the non pressurized side and exits the side of the chamber near the regulator exhaust tube. One reed hole plug 26 is shown stuck inside a reed hole. These plugs are stuck by the user into various reed holes to limit the number of reeds being used during operation.

FIG. 3 is a perspective view from the top (pressurized side) and front of the reed surface with the pitch varying tubes attached, the manometer tube, the regulated air supply tube and the air diffuser attached. These elements appear as if they had been removed from the two chamber assemblies. Shown is the regulator exhaust tube 7 connecting with flexible tubing 6 and the air diffuser 12 via the reed surface 17. Also shown is the manometer connection tube connected to the pressurized portion of the chamber via the reed surface. Shown are the 5 reed holes 18, 19, 20, 23, and 22. With the exception of reed hole 22 which does not have a length of rigid tubing associated with it, the remaining reed holes are shown with their respective length of rigid tubing 13, 14, 15, and 16 attached to the non pressurized side of the reed surface.

FIG. 4 is a orthogonal view of the bottom (non pressurized side) of the reed surface which shows the configuration of the varying lengths of rigid tubes 13, 14, 15, and 16; reed holes 18, 19, 20, 22, and 23; manometer connection tube 9 , and regulator exhaust tube 7. These elements appear as if they had been removed from the top chamber assembly.

FIG. 5 is a perspective view of the mounting clamp 10 which interfaces with the chamber in order to mount the machine to a vertical surface using screws 24 and 25. The clamp is made of rigid plastic. The chamber is forced into the opening on the curved side of the clamp causing the chamber to be trapped inside the cylindrical portion of the clamp with the clamp exerting constant force upon the chamber to keep it secure.

REFERENCE NUMERALS

1	top of chamber
2	bottom of chamber
3	latch
4	latch hook
5	hinge
6	pressurized side of chamber regulated air supply tube
7	regulator exhaust tube
8	precision air pressure regulator (Model NIR200 manufactured by SMC Corporation of Japan with a maximum input of 100 PSI and a range of .07-30 PSI is the preferred regulator)
9	manometer connection tube for the connection of an 8 ft. high water manometer or other type of pressure measuring device for measuring pressures from 0-2.088 PSI
10	mounting clamp
11	rubber O-ring gasket
12	air diffuser
13	pitch varying length of rigid tube
14	pitch varying length of rigid tube
15	pitch varying length of rigid tube
16	pitch varying length of rigid tube
17	reed surface
18	reed hole
19	reed hole
20	reed hole
21	foam rubber insert
22	reed hole
23	reed hole
24	mounting clamp screw

25 mounting clamp screw

26 reed hole plug

OPERATION

1. The user mounts the device in the manner depicted in FIG. 1 to a vertical surface.
2. The user attaches a manometer to the manometer connection hose.
3. The user fills the bottom half of the chamber 1/2 full with hot tap water.
4. The user connects an air compressor hose that will deliver between 90-95 PSI of dry, filtered air to the input port of the regulator. At this time, the user should ensure that the regulator is completely closed and not supplying air.
5. One to five reeds are first wetted and then placed into the reed holes. Wooden plugs are used to plug holes that are not being used to prevent air from escaping from them.
6. The user closes the chamber, latches the latch and slowly increases air pressure by way of the regulator knob until all reeds are "playing" their respective "notes". Depending on the users preference and the type of reed, the reeds are blown for 3-15 minutes. This process is repeated daily over a period of weeks until the user is satisfied with the performance of the reeds.
7. The user may wish to note the starting pressures indicated on the manometer as well as the lower pressures that the reeds will play at as the "blowing-in" process progresses.

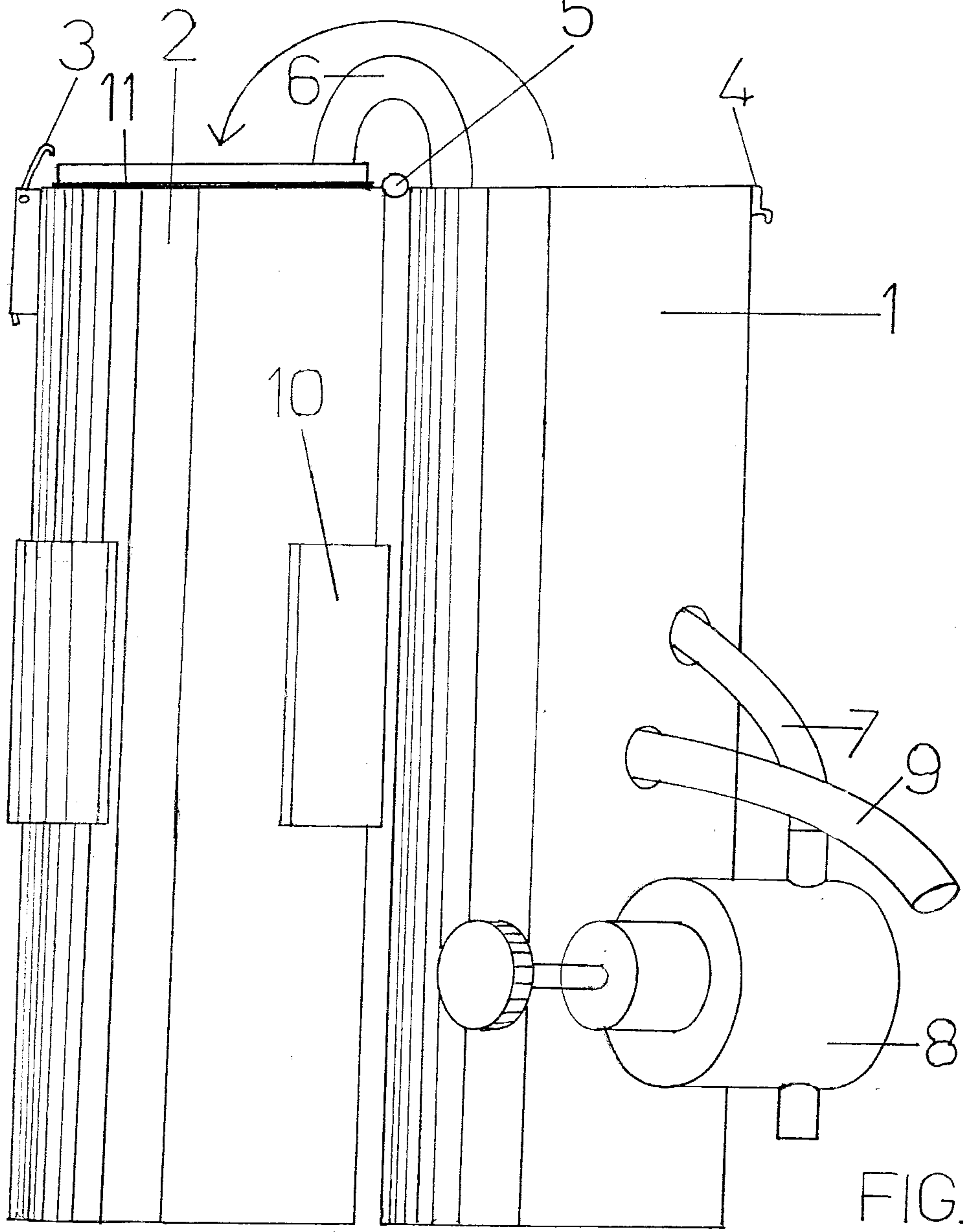

FIG. 1

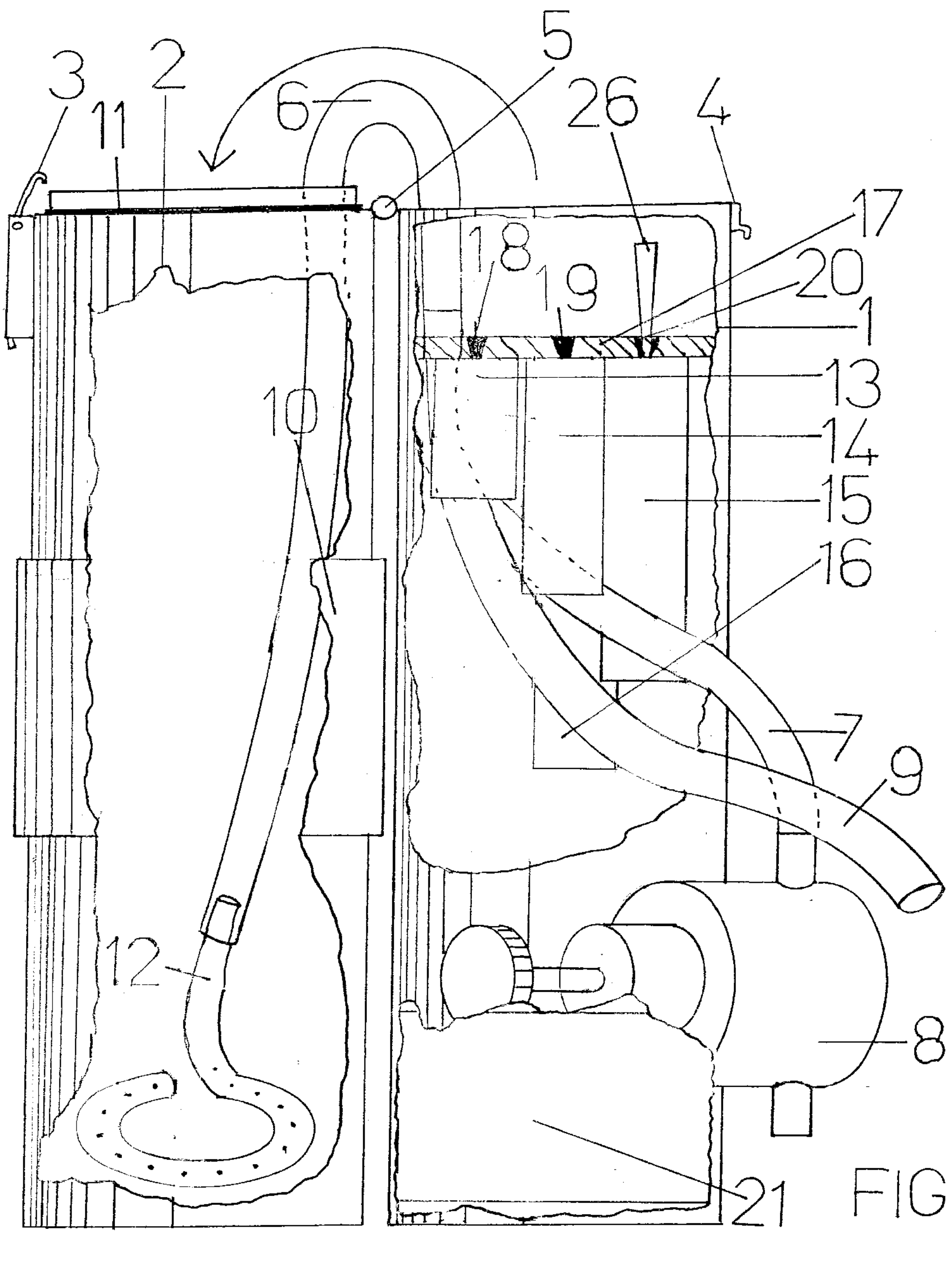

FIG. 2

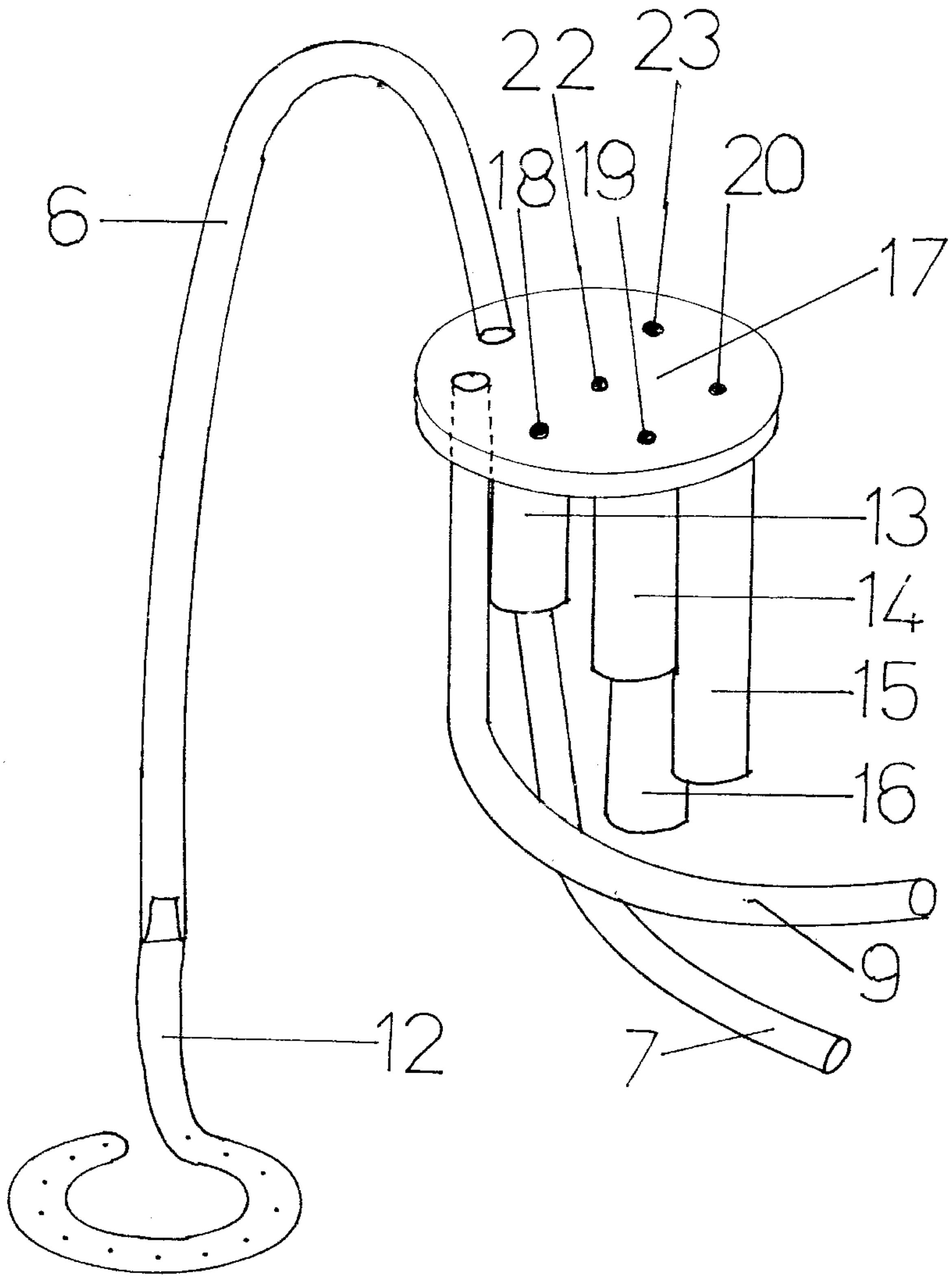

FIG. 3

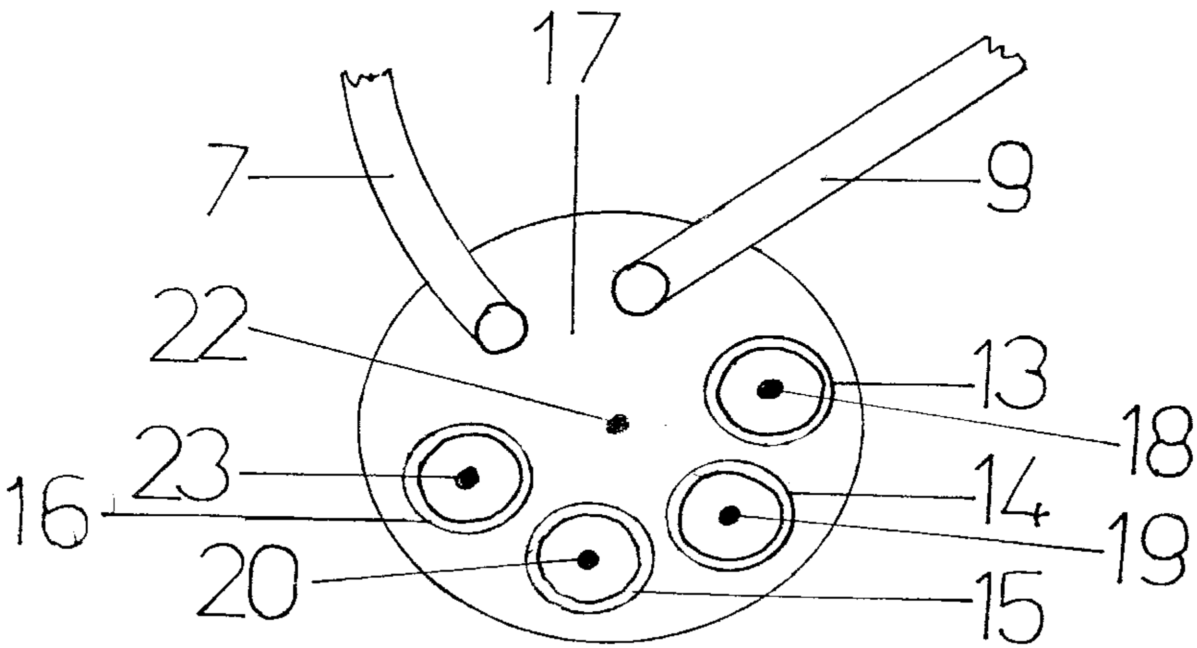

FIG. 4

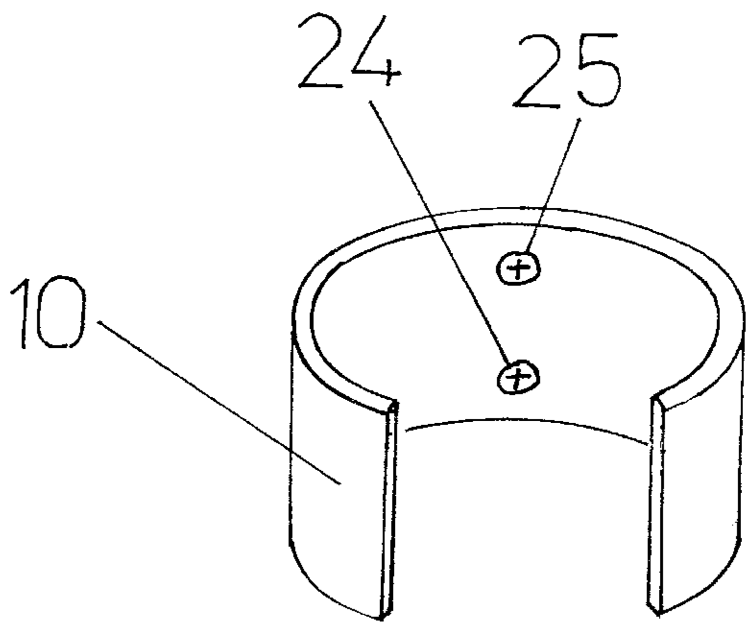

FIG.5