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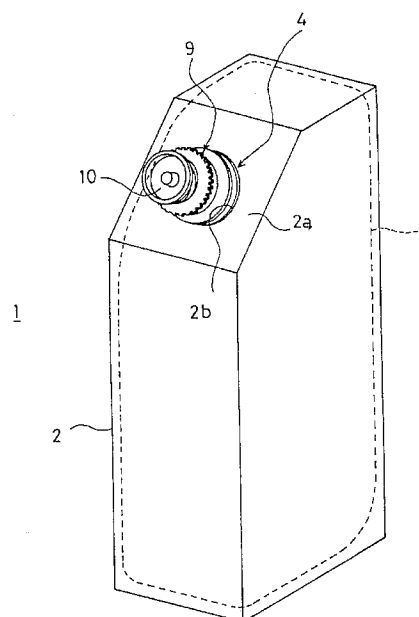
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(54) **Processing solution container for photosensitive material and processing apparatus.**

(57) A container to supply a processing apparatus with a processing solution for a silver halide photosensitive material, includes an outer box and an inner bag made of flexible material. A connection is provided to the inner bag to connect it with the processing apparatus. The connection includes a valve to be actuated by the connection between said connecting means and said processing apparatus so as to become open.

FIG. 1



The present invention relates to a photosensitive material processing solution container which can prevent leak and smell of a processing solution and be easily replaced or discarded, and further relates to a photosensitive material processing apparatus having the aforementioned photosensitive material processing solution container.

In a photosensitive material processing apparatus by which an exposed silver halide photosensitive material is processed, the silver halide photosensitive material is continuously conveyed to and processed in a color development, bleach, fixing and stabilization processing tank. In order to prevent the deterioration of quality of finished photosensitive material which is caused when a processing solution is used to process the silver halide photosensitive material and the component of the solution is consumed, a processing solution container storing a new processing solution is connected with the processing tank in which the silver halide photosensitive material processing solution is stored, and the processing solution is supplied to the processing tank from the processing solution container by a pump. (The silver halide photosensitive material processing solution will be referred to as a processing solution, hereinafter.) The processing solution is supplied in such a manner that: water is added to several kinds of liquid (or powder) composed of condensed liquid or powder, referred to as a kit, so that the liquid or powder can be dissolved; or a processing solution which can be used as it is, is supplied to the processing solution container. Recently, a new method has been devised, which is characterized in that: a container filled with a processing solution which can be used as it is, is supplied; and the processing solution container is replaced.

However, the container used for the aforementioned kit is made of a resin such as polyethylene so that it is bulky. Accordingly, when the container is scrapped, it is inconvenient to handle it, and further the cost is raised when the container is discarded.

When the processing solution is supplied or the processing solution container is replaced, the following environmental problems are caused, particularly with silver halide materials: The processing solution can leak or be spilled, and the smell of the processing solution spreads. Further, the hands of an operator can be stained with the processing solution, the automatic developing apparatus be corroded by the leaked solution, and a crystallised substance can form on the apparatus.

The present invention has been accomplished to solve the aforementioned problems. It is a primary object of the present invention to provide a processing solution container for use with a photosensitive material wherein when the container is scrapped, it is not bulky; the container can be burnt without causing an environmental problem; and the leak of liquid and smell can be prevented when the container is rep-

laced. Further, the present invention aims to provide a photosensitive material processing apparatus provided with the aforementioned processing solution container for use with a photosensitive material.

Furthermore, the present invention relates to an integrated photosensitive material processing apparatus provided with a processing solution tank, from the bad smell of processing solution for silver halid photosensitive material (referred to as photosensitive material, hereinafter) is not emitted, and by which leakage of processing solution is prevented.

The photosensitive material may be a silver halide material.

According to a conventional method, an exposed negative film is accommodated in a cartridge, this cartridge is set to a negative film developing unit, the negative film is pulled out from the cartridge so as to be developed, the developed negative film is set to a printer so that an image formed on the negative film is printed onto a photographic paper, and the printed image is developed so that a final product can be obtained.

Recently, in the market of color prints, competition of price and the time taken for delivery is intense, and as photographic shops have spread, the photographic processing apparatus has been widely used, and the number of photographic processing stations, referred to as mini-laboratories has rapidly increased. Accordingly, in many cases, an amateur operates the photographic processing apparatus in a photographic shop which is not a professional one. Consequently, an automated photographic processing apparatus which does not need maintenance is urgently required.

In order to perform a developing and printing operation, it is necessary for an operator to acquire the technique of operation of a processing apparatus, the technique of printing, such as judgment of a negative film, and the technique of controlling a processing solution. Concerning the processing apparatus, a short leader conveyance type of developing unit and a scanner built-in type of printer have been proposed, so that the automation of processing apparatus is advancing and the problems are being solved.

However, concerning the processing solution, in many cases, preparation is necessary when the processing solution is made and controlled, so that leakage and the smell of processing solution cause a big problem. Accordingly, it is an urgent necessity to simplify dissolution and control of the processing solution.

The present invention has been accomplished from the viewpoint mentioned above, and it is a secondary object of the present invention to provide an integrated photosensitive material processing apparatus, particularly for silver halide processing, characterized in that: a processing solution is supplied without preparation; the processing solution can be easily supplied and replenished; leakage of solu-

tion and smell is prevented; and the apparatus can be installed anywhere without providing a preparation unit and a water supply unit.

In order to attain the primary object, the processing solution container of the present invention for use in silver halide photosensitive material comprises: an outer box made of paper; an inner bag made of flexible material which is accommodated in the outer box so as to store a processing solution for use in silver halide photosensitive material; and an opening/closing valve provided to the inner bag which is opened when a connecting section of the container is connected with a processing tank.

The photosensitive material processing apparatus of the present invention is provided with a silver halide photosensitive material processing solution container including: an outer box made of paper; an inner bag made of flexible material which is accommodated in the outer box so as to store a processing solution for use in silver halide photosensitive material; and an opening/closing valve provided to the inner bag which is opened when a connecting section of the container is connected with a processing tank. Further, the photosensitive material processing apparatus of the present invention is provided with an opening/closing valve which is mounted on a connecting section on the processing tank side, wherein the opening/closing valve is opened when the aforementioned processing solution container is connected with the processing tank.

According to the present invention, an inner bag made of flexible material is accommodated in an outer box made of paper. Consequently, after all the processing solution contained in the inner bag has been supplied, the inner bag is taken out from the outer box, and the outer bag is broken up and the inner bag is folded up to be discarded. These outer box and inner bag can be burned or classified to be discarded. The connecting section of the silver halide photosensitive material processing solution container is provided with the opening/closing valve which is opened when the container is connected with the processing tank. Accordingly, when the silver halide photosensitive material processing solution container is connected with the processing tank, the occurrence of leak and smell of the solution can be prevented.

In the apparatus according to the present invention, the connecting section on the processing tank side is provided with the opening/closing valve which is opened when the connecting section on the processing tank side is connected with the connecting section on the processing solution container side, so that the occurrence of leak and smell of the solution can be prevented on the processing tank side.

In order to attain the secondary object, the present invention provides an integrated silver halide photosensitive material processing apparatus having a silver halide photosensitive material processing unit

for negative film use, a silver halide photosensitive material processing unit for photographic paper use, and an exposure unit for printing, which have in common at least one of a processing tank and a replenishing processing solution container of the silver halide photosensitive material processing unit for negative film use and a silver halide photosensitive material processing unit for photographic paper use, comprising: an exchangeable processing solution container connected with the processing tank so as to replenish the processing solution; and a valve provided to a connecting section between the processing tank and the processing solution container so as to communicate the connecting section when connection is effected.

The aforementioned integrated silver halide photosensitive material processing apparatus comprises: a processing solution container connected with a processing tank, to replenish the processing solution; and a valve provided to the processing solution container, wherein the valve is opened when the replenishing solution container is connected with the processing solution container.

According to the present invention, an exposed negative film is developed, and an image on the developed negative film is printed on a photographic paper, and then the photographic paper is developed so that a print can be made automatically.

The exchangeable processing solution container is connected with the processing tank to replenish the processing solution. When the processing solution container is not connected, the connecting section of the processing tank and that of the processing solution container are respectively closed by valves to prevent leakage of the solution and smell.

The processing solution container to replenish the processing solution is connected with the processing solution tank. When the replenishing container is connected with the processing solution container, the valve provided to the replenishing container is opened and the processing solution is supplied. When the replenishing container is not connected with the processing solution container, the valve is closed to prevent leakage of the solution and smell.

The invention will be further described by way of example only with reference to the accompanying drawings, in which:-

Fig. 1 is a perspective view of a silver halide photosensitive material processing solution container;

Fig. 2 is a perspective view of an inner bag;

Fig. 3 is a sectional view taken on line III-III in Fig. 2;

Fig. 4 is an enlarged sectional view of a connecting section of a silver halide photosensitive material processing solution container;

Fig. 5 is a sectional view of a silver halide photosensitive material processing solution container

showing the state in which a solution is supplied;
Fig. 6 is a sectional view of a silver halide photosensitive material processing solution container of another example showing the state in which a solution is supplied;

Fig. 7 is a schematic illustration of a photosensitive material processing apparatus;

Fig. 8 is a sectional view showing the connection between a silver halide photosensitive material processing solution container and a processing tank;

Fig. 9 is a sectional view showing the connection between a silver halide photosensitive material processing solution container and a processing tank;

Fig. 10 is a perspective view of a silver halide photosensitive material processing solution container;

Fig. 11 is a front view of the container shown in Fig. 10;

Fig. 12 is a left side view of the container shown in Fig. 10;

Fig. 13 is a right side view of the container shown in Fig. 10;

Fig. 14 is a rear elevation of the container shown in Fig. 10;

Fig. 15 is a plan view of the container shown in Fig. 10;

Fig. 16 is a bottom view of the container shown in Fig. 10;

Fig. 17 is a development elevation of an outer box of the container shown in Fig. 10;

Fig. 18 is a perspective view of a silver halide photosensitive material processing solution container;

Fig. 19 is a front view of the container shown in Fig. 18;

Fig. 20 is a left side view of the container shown in Fig. 18;

Fig. 21 is a right side view of the container shown in Fig. 18;

Fig. 22 is a rear elevation of the container shown in Fig. 18;

Fig. 23 is a plan view of the container shown in Fig. 18;

Fig. 24 is a bottom view of the container shown in Fig. 18;

Fig. 25 is a development elevation of an outer box of the container shown in Fig. 18;

Fig. 26 is a perspective view of a silver halide photosensitive material processing solution tank;

Fig. 27 is a perspective view of a silver halide photosensitive material processing solution container; and

Fig. 28 is a perspective view of a silver halide photosensitive material processing solution container.

Fig. 29 is a schematic illustration of an integrated

silver halide photosensitive material processing apparatus;

Fig. 30 is a perspective view of a processing solution container;

Fig. 31 is a sectional view showing the connection between a processing tank and a processing solution container;

Fig. 32 is a schematic illustration of an integrated silver halide photosensitive material processing apparatus; and

Fig. 33 is a view showing a state of connection when a processing solution is replenished to a processing solution container from a replenishing container.

Embodiments of the invention to attain the primary object is explained in detail hereinbelow, referring to the attached drawings.

A silver halide photosensitive material processing solution container 1 shown in Fig. 1, is composed of an outer box 2 and an inner bag 3 accommodated in the outer box 2. This silver halide photosensitive material processing solution container 1 is connected with a processing tank of a photosensitive material processing apparatus so that a solution stored in the inner bag 2 is supplied to the processing tank. The outer box 2 is made of paper and can be broken up or folded up so that it can be easily burned or discarded after the solution in the container has been supplied. When the container is discarded, it is not bulky, so that the cost to discard it can be reduced.

As shown in Fig. 1, the outer box 2 is rectangular, and a recessed portion 2a is formed in a corner. A container connecting section 4 of the inner bag 3 is protruded from an opening 2b formed in the recessed portion 2a. Since the silver halide photosensitive material processing solution container 1 has the recessed portion 2a in its corner of the outer box 2 and the container connecting section 4 of the inner bag 3 is protruded from the recessed portion 2a, the silver halide photosensitive material processing solution containers 1 can be easily piled up when they are conveyed or stored, wherein the container connecting section 4 does not interfere with the conveying or storing operation.

As shown in Fig. 2, the inner bag 3 is composed in such a manner that: two rectangular sheets 5, 6 are put upon each other; peripheral portions 7 of the rectangular sheets 5, 6 are thermally fused so that a bag can be formed; and a processing solution is stored in the inner bag 3. This inner bag 3 is made of combustible flexible material. Accordingly, after the solution in the bag has been supplied, the inner bag 3 is taken out from the outer box 3 and folded to be burned or discarded.

As shown in Figs. 3 and 4, the container connecting section 4 of the inner bag 3 is provided with an opening/closing valve 9 which is opened when the container connecting section 4 is connected with the

processing tank side. Further, the container connecting section 4 is provided with a cap 10 which covers the opening/closing valve 9. A pipe portion 11 of the container connecting section 4 is fixed to the sheet 5 of the inner bag 3, and this pipe portion 11 is engaged with a cut-out portion 12a of a cylindrical body 12 of the opening/closing valve 9. This cylindrical body 12 is provided with a bulkhead 12b, and through holes 12c are formed in the bulkhead 12b in such a manner that they are located circularly. Further, a protruded valve seat 12d is formed on the pipe side of the bulkhead 12b in such a manner that the valve seat 12d surrounds the through holes 12c. The cylindrical body 12 is provided with a plate-shaped valve body 13 made of flexible material. A plurality of through holes 13a are formed in the valve body 13 in such a manner that the through holes 13a are located circularly. An edge portion 13b of the valve body 13 is fixed to the cylindrical body 12, and a valve portion 13c of the valve body 13 is usually contacted with the valve seat 12d with pressure by the resilient force of the valve body 13.

A valve stem 14 is fixed to the center of the valve body 13. This valve stem 14 is slidably inserted into the bulkhead 12b. When the valve stem 14 is pushed and moved to the pipe portion, the valve portion 13c of the valve body 13 is separated from the valve seat 12d so that a solution communicating passage can be formed. In the manner mentioned above, the opening/closing valve 9 is opened.

Consequently, under the condition that the silver halide photosensitive material processing solution container 1 is not connected with the processing tank side, the valve portion 13c of the valve body 13 of the opening/closing valve 9 provided in the container connecting section 4 is contacted with the valve seat 12d with pressure, so that the processing solution passage is blocked. As a result, leak and smell of the solution can be prevented.

Figs. 7, 8 and 9 show a photosensitive material processing apparatus having the silver halide photosensitive material processing solution container of the present invention. Fig. 7 is a schematic illustration of the photosensitive material processing apparatus, and Figs. 8 and 9 are sectional views showing the connection between the silver halide photosensitive material processing solution container and the processing tank side.

A photographic paper supply magazine 21 is set on one side of a photographic material processing apparatus 20, wherein a photographic paper that is photographic material P is put in the magazine 21. Photographic material P is pulled out from the supply magazine 21 by rollers 22. An image on negative film F is printed on photosensitive material P in a printing section 23. Photosensitive material P on which the image has been printed, is sequentially conveyed to a developing tank 24, bleach tank 25, fixing tank 26

and stabilization tank 27 so that the printed image can be developed. After that, photosensitive material P is conveyed to a drying section 28 so that it can be dried.

One set of the silver halide photosensitive material processing solution container 1 is set to the lower portion of each of the bleach tank 25, fixing tank 26, stabilization tank 27 and the drying section 28. Each of the silver halide photosensitive material processing solution container 1 is connected with the developing tank 24, bleach tank 25, fixing tank 26 and stabilization tank 27 through a hose 29. The processing solution contained in the silver halide photosensitive material processing solution container 1 is sucked by a pump 30 which is provided to each hose 29 so that the processing solution can be supplied to each processing tank.

As shown in Figs. 8 and 9, an opening/closing valve 35 which opens when the container connecting section 4 of the silver halide photosensitive material processing solution container 1 is connected, is provided to a processing tank side connecting section 34 of the hose 29 which supplies the processing solution to the processing tank. A cylindrical body 36 of the opening/closing valve 35 is screwed to a valve head 37 of the processing side connecting section 34, and the cylindrical body 36 and the valve head 37 are sealed by an O-ring 38. A plunger 39 is slidably provided in the cylindrical body 36, and a spring 40 is provided between a protrusion 39a formed around the plunger 39 and a valve head 37. An O-ring 41 provided in a valve portion 39b of the plunger 39 is pressed to a valve seat 36a of the cylindrical body 36 by the action of the spring 40 so that the O-ring 41 always comes into contact with the valve seat 36a. A flange 42a of a fastening ring 42 is slidably provided in a recess portion 36b of the cylindrical body 36.

Consequently, under the condition that the processing tank side is connected with the silver halide photosensitive material processing solution container 1, the opening/closing valve 35 of the processing tank side connecting section 34 provided to the processing tank side hose 29 is closed in such a manner that: the valve portion 39b of the plunger 39 is contacted with the valve seat 36a of the cylindrical body 36 by the action of the spring 40. So that a processing solution passage 43 is blocked, and the leak and smell of the processing solution can be prevented.

As shown in Fig. 8, the container connecting section 4 of the silver halide photosensitive material processing solution tank 1 is connected with the processing tank side connecting section 34 of the hose 29 on the processing tank side in such a manner that: the cylindrical body 12 of the opening/closing valve 9 of the container connecting section 4 of the silver halide photosensitive material processing solution tank 1 is set to the cylindrical body 36 of the opening/closing valve 35 of the processing tank side connecting section 34 of the hose 29; and the fastening

ring 42 is rotated in the fastening direction. When the fastening ring 42 is rotated in the aforementioned manner, the cylindrical body 12 of the opening/closing valve 9 of the container connecting section 4 is connected with the cylindrical body 36 of the opening/closing valve 35 of the processing tank side connecting section 34 as shown in Fig. 9.

Under the aforementioned connecting condition, the valve stem 14 of the opening/closing valve 9 of the container connecting section 4 of the silver halide photosensitive material processing solution container 1, and the valve portion 39b of the plunger 39 of the opening/closing valve 35 of the processing tank side connecting section 34 of the hose 29 are contacted and pushed to each other. When the valve stem 14 and the valve portion 39b are pushed, the valve stem 14 is moved in the pipe direction, so that the valve portion 13c of the valve body 13 is separated from the valve seat 12d. On the other hand, the plunger 39 is moved resisting the force of the spring 40, so that the O-ring 41 of the valve portion 39b is separated from the valve seat 39b of the cylindrical body 36, and the respective opening/closing valves 9, 35 are opened, so that the processing solution can be supplied.

In the manner described above, the container connecting section 4 of the silver halide photosensitive material processing solution container 1 and the processing tank connecting section 34 of the hose 29 are connected, the respective opening/closing valves 9, 35 are opened. Therefore, leak of the solution and smell from the processing tank side can be prevented in the case of replacement of the silver halide photosensitive material processing solution container 1.

In this example, the silver halide photosensitive material processing solution container 1 is utilized for supplying the processing solution to the processing tank. This silver halide photosensitive material processing solution container 1 can be utilized in such a manner that: the processing solution container 1 is connected with the processing solution tank in order to abandon the waste processing solution.

Figs. 10 - 28 show another example in which the container connecting section 4 of the silver halide photosensitive material processing solution container 1 is covered with the outer box 2.

In the case of the example illustrated in Figs. 10 - 17, perforations 100 are formed on the outer box 2 in such a manner that a ceiling portion 2f of the outer box 2 of the silver halide photosensitive material processing solution container 1 is left, and further a portion 100a is formed by the perforations 100 so that an operator's finger can be easily put into it when the processing solution container 1 is utilized. When the processing solution container 1 is utilized, the perforations 100 are cut off so that the inner bag 3 is exposed and connected with the container connecting section 4. Fig. 10 is a perspective view, Fig. 11 is a front view, Fig. 12 is a left side view, Fig. 13 is a right

side view, Fig. 14 is a rear elevation, Fig. 15 is a plan view, Fig. 16 is a bottom view, and Fig. 17 is a development elevation of the outer box. The outer box 2 is assembled in such a manner that: an inserting portion 2g is inserted into an inserting hole 2h.

In the example illustrated in Figs. 18 - 25, the perforations 100 are also formed in the ceiling portion 2f of the outer box 2 of the silver halide photosensitive material processing solution container 1, and other portions are structured in the same manner as that described before. When the ceiling portion 2f of the outer box 2 is cut off, the inner bag 3 can be easily exposed and connected with the container connecting section 4. Fig. 18 is a perspective view, Fig. 19 is a front view, Fig. 20 is a left side view, Fig. 21 is a right side view, Fig. 22 is a rear elevation, Fig. 23 is a plan view, Fig. 24 is a bottom view, and Fig. 25 is a development elevation of the outer box.

In the example shown in Fig. 26, the perforations 100 are formed on a front portion 2i of the outer box 2 of the silver halide photosensitive material processing solution container 1, and a portion 100a into which an operator's finger is put, is formed elliptic so that the opening is small.

In the example shown in Fig. 27, the perforations 100 are formed on the front portion 2i and side portion 2j of the outer box 2 of the silver halide photosensitive material processing solution container 1, and the portion 100a into which an operator's finger is put, is formed circular.

In the example shown in Fig. 28, the perforations 100 are formed on the ceiling portion 2h, front portion 2i and side portion 2j of the outer box 2 of the silver halide photosensitive material processing solution container 1, and the perforations 100 on the side portion 2e is curved.

As explained above, the processing solution is stored in the inner bag made of flexible material which is accommodated in the outer box made of paper. Accordingly, after the solution in the container has been supplied, the inner bag is taken out from the outer box, and the outer box is taken apart into pieces and wrapped by the inner bag so as to be discarded. Further, the outer box and the inner bag can be burned or discarded being classified. When the silver halide photosensitive material processing solution container 1 is discarded, it is not bulky, and further it can be burned so that it can meet the environmental requirements. When the processing solution container of the present invention is used, it is not necessary to pour a solution from one container to another, and the container connecting section of the silver halide photosensitive material processing solution container is provided with an opening/closing valve which is opened when the container is connected with the processing tank side. Therefore, the leak of the solution and smell can be prevented during the connecting operation, and when an operator touches the

solution container, his hands are not stained with the solution so that the working environment can be maintained clean.

According to the present invention, the processing tank side connecting section is also provided with the opening/closing valve which can be opened when the processing tank side connecting section is connected with the container connecting section of the silver halide photosensitive material processing solution container. Consequently, when the silver halide photosensitive material processing solution container is replaced, the solution is not leaked from the processing tank side, and leak of smell is also prevented. Operator's hands and the processing apparatus are not stained with the solution, and the environment can be maintained clean.

Referring now to the attached drawings, an embodiment of the present invention to attain the secondary object will be explained in detail as follows. Fig. 29 to Fig. 31 show an integrated silver halide photosensitive material processing apparatus of the present invention. Fig. 29 is a schematic illustration of an integrated silver halide photosensitive material processing apparatus, Fig. 30 is a perspective view of a processing solution container, and Fig. 31 is a sectional view showing a state of connection between a processing tank side and a processing solution container.

An integrated silver halide photosensitive material processing apparatus 101 comprises: a silver halide photosensitive material processing unit 102 for negative film use, which develops exposed negative film F in its processing tank; an exposure unit 109 for printing use, which prints an image formed on developed negative film F onto photographic paper P; and a silver halide photosensitive material processing unit 103 for photographic paper use, which develops photographic paper P in a processing tank. The silver halide photosensitive material processing unit 102 for negative film use and the silver halide photosensitive material processing unit 103 for photographic paper use, are provided with exchangeable processing solution containers 104 which are connected with the processing tank side to replenish a processing solution.

A cartridge 110 in which an exposed negative film F is accommodated is set to the silver halide photosensitive material processing unit 102 for negative film use. Film F is pulled out from the cartridge 110, and successively conveyed through a negative film color developing tank 120, a bleaching tank 121, a fixing tank 122, and a negative film stabilizing tank 123 so that the film can be developed. After that, film F is dried in a drying section 124. Developed negative film F is conveyed to the exposure unit 109 for printing use.

The exposure unit 109 for printing use is provided with an accumulating section 130, and negative film

F is supplied to a printing section 131 from the silver halide photosensitive material processing unit 102 for negative film use through the accumulating section 130. A photographic paper supply magazine 111 is set in the upper portion of the exposure unit 109 for printing use, and photographic paper P is pulled out from this magazine 111. An image formed on negative film F is printed on photographic paper P in the printing section 131. After that, photographic paper P is conveyed to the silver halide photosensitive material processing apparatus 103 for photographic paper use, and successively passes through processing tanks including a photographic paper color developing tank 132, bleaching tank 133, fixing tank 134 and photographic paper stabilizing tank 135. Further, photographic paper P is conveyed to a drying section 136 to be dried, and discharged from the apparatus as a final product.

Processing solution containers 104 for silver halide photosensitive material are provided below the negative film color developing tank 120, bleaching tank 121, fixing tank 122, negative film stabilizing tank 123, photographic paper color developing tank 132, and photographic paper stabilizing tank 135.

A color developer for negative film use is stored in the processing solution container 104 disposed below the color developing tank 120 of the silver halide photosensitive material processing apparatus 102 for negative film use. A bleaching solution used for both negative films and photographic papers is stored in the processing solution container 104 disposed below the bleaching tank 121. A fixing solution used for both negative films and photographic papers is stored in the processing solution container 104 disposed below the fixing tank 122. A negative film stabilizing solution is stored in the processing solution container 104 disposed below the negative film stabilizing tank 123.

A color developing solution for photographic paper use is stored in the processing solution tank 104 disposed below the photographic paper color developing tank 132 of the silver halide photosensitive material processing section 103 for photographic paper use. A photographic paper stabilizing solution is stored in the processing solution container 104 disposed below the photographic paper stabilizing tank 135.

Processing solution containers 104 are connected with each other through hoses 105. The processing solution in the processing solution container 104 is sucked by a pump 106 provided to each hose so as to be supplied to each processing tank.

In order to reduce the volume when the processing solution container 104 is discarded, it is preferable to use a container composed of a collapsible outer box and an inner bag made of a flexible member. However, for example, a hard bottle made of polyethylene may be utilized.

Fig. 30 shows an example of the container which is composed of an outer box and an inner bag. The container is composed of the outer box 140 and the inner bag 141 provided inside the outer box 140, and a processing solution stored in the inner bag 141 is supplied to the processing tank. A valve 143 is provided to a connecting portion 142 of the inner bag 141 in such a manner that the valve 143 is opened when the container is connected with the processing tank. A cap 144 covering the valve 143 is provided to the connecting portion 142.

A valve stem 146 is fixed to the central portion of a valve body 145 of the valve 143. This valve stem 146 is slidably inserted through a bulkhead 147a of a cylindrical body 147. When this valve stem 146 is moved in the axial direction, a valve portion 145a of the valve body 145 is separated from a valve seat 146a so that the valve 143 is opened and a passageway for a processing solution is connected. Under the condition that the processing solution container 104 is not connected with the processing tank, the valve portion 145a of the valve body 145 of the valve 143 is contacted with the valve seat 146a with pressure, so that the passageway for the processing solution is closed and leakage of the processing solution and smell can be prevented.

A valve 151 which is opened when a connecting section 150 of the hose 105 is connected with the connecting section 142 of the processing solution container 104, is provided in the connecting section 150 of the hose 105. A cylindrical body 152 of the valve 151 is screwed to a valve head 153 of the connecting section 150. A gap between the cylindrical body 152 and the valve head 153 is sealed by an O-ring 154. A plunger 155 is movably provided to the cylindrical body 152, and a spring 156 is provided between a protrusion 155a formed around the plunger 155 and the valve head 153. An O-ring 157 provided to a valve section 155b of the plunger 155 is pushed by the spring 156 so that the O-ring 157 can be always contacted with a valve seat 152a of the cylindrical body 152. A flange 158a of a fastening ring 158 is slidably provided to a cut-out portion 152b of the cylindrical body 152.

Accordingly, under the condition that the processing solution container 104 for silver halide photosensitive material and the processing tank are not connected, in the valve 151 provided in the connecting section 150 of the hose 105, the valve portion 155b of the plunger 155 is contacted with the valve seat 152a of the cylindrical body 152 by the action of the spring 156. Therefore, a processing solution passageway 159 is closed, so that leakage of the processing solution and smell is prevented.

In order to connect the connecting section 142 of the processing solution container 104 for silver halide photosensitive material with the connecting section 150 of the hose 105 of the processing tank, the cylin-

dric body 147 of the valve 143 of the connecting section 142 of the processing solution container 104 is made to come into contact with the cylindrical body 152 of the valve 151 of the connecting section 150 of the hose 105 as illustrated in Fig. 31, and the fastening ring 158 is rotated in the direction of fastening. When the fastening ring 158 is rotated in the aforementioned manner, the cylindrical body 147 of the valve 143 of the connecting section 142 of the processing solution container 104 is fixed to the cylindrical body 152 of the valve 151 of the connecting section 150 of the hose 105, and the connecting condition shown in Fig. 31 can be obtained.

In the aforementioned connecting condition, the valve stem 146 of the valve 143 of the connecting section 142 of the processing solution container 104 comes into contact with the valve portion 155b of the plunger 155 of the valve 151 of the connecting section 150 of the hose 105 with pressure. Therefore, the valve stem 146 is moved in the axial direction, and the valve portion 145a of the valve body 145 is separated from the valve seat 146a. On the other hand, the plunger 155 is moved, resisting against the force of the spring 156, so that the O-ring 157 of the valve portion 155b is separated from the valve seat 155b of the cylindrical body 152. Therefore, the valves 143, 151 are opened and the processing solution can be supplied.

As explained above, when the connecting section 142 of the processing solution container 104 and the connecting section 150 of the hose 105 are connected with each other, the valves 143, 151 are respectively opened. Therefore, when the processing solution container 104 is replaced, the leakage of the solution and smell caused on the processing tank side can be prevented.

Figs. 32 and 33 show the integrated silver halide photosensitive material processing apparatus of the present invention. Fig. 32 is a schematic illustration of an integrated silver halide photosensitive material processing apparatus. Fig. 33 is a view showing a state of connection when a processing solution is replenished to a processing solution container from a replenish container.

In the case of the integrated silver halide photosensitive material processing apparatus 101, the silver halide photosensitive material processing apparatus 102 for negative film use, the exposure unit 109 for printing use by which an image on negative film F is printed on photographic paper P, and the silver halide photosensitive material processing unit 103 for photographic paper use by which photographic paper P is developed in its processing tank, are structured in the same manner as shown in Fig. 29. The silver halide photosensitive material processing unit 102 for negative film use and the silver halide photosensitive material processing unit 103 for photographic paper use are respectively provided with a processing

solution container 107 connected with the processing tank, and the processing solution in the container 107 is supplied to the processing tank by the pump 106 through the hose 105.

The processing solution is supplied to the processing solution container 107 from a replenishing container 108 which is connected with the processing solution container 107. A valve 181 which is opened by a connecting operation is provided to a connecting section 180 of the replenishing container 108. The connecting section 180 of the replenishing container 108 is structured in the same manner as the connecting section 143 shown in Fig. 31, and the connecting section 170 of the processing solution container 107 is provided with a valve stem pushing means 171 which opens a valve 181 of a connecting section 180 of the replenishing container 108.

Accordingly, the processing solution is supplied to the processing solution container 107 after the replenishing container 108 has been lifted up. Under the condition that the connecting section 180 of the replenishing container 108 is not connected with the connecting section 170 of the processing solution container 107, the valve 181 provided to the connecting section 180 is closed, and when a connecting operation is completed, the valve 181 is automatically communicated, so that the processing solution is supplied to the processing solution container 107 from the replenishing container 108. Therefore, when the processing solution is supplied to the processing solution container 107 from the replenishing container 108, leakage of the solution and smell can be prevented.

The processing solution is supplied to the processing solution container 107 through the replenishing container 108, and then supplied to the processing tank from the processing solution container 107 by the pump 106. Hard vinyl chloride is preferably used for the processing solution container 107 from the viewpoint of chemical resistance and convenience when the processing solution is removed from the replenishing container 108 to the processing solution container 107. However, the material of the processing solution container 107 is not limited, and other materials can be used.

The replenishing container 108 is loaded with the processing solution in order to supply the solution, and the supplied processing solution is removed to the processing solution container 107 from the replenishing container 108. A hard bottle made of polyethylene is preferably used for the replenishing container 108 from the viewpoint of operability and convenience in the case where the processing solution is removed from the replenishing container 108 to the processing solution container 107. However, the material of the replenishing container 108 is not limited, and other materials can be used.

As described above, according to the present invention, an exposed negative film is developed, and

an image on the developed negative film is printed onto a photographic paper, and then the photographic paper is developed, so that a print can be automatically finished.

The exchangeable processing solution container is connected to the processing tank side so as to supply the processing solution, and the processing solution container is replaced. When the processing solution container is not connected, the connecting section on the processing tank side and that of the processing solution container are respectively closed by the valve. Therefore, the processing solution can be supplied without performing preparation of the solution, and replacement of the solution can be easily conducted. Leakage of solution and smell can be prevented, and further the apparatus of the present invention can be installed anywhere without providing a solution preparation unit and a water supply unit.

The processing solution container to supply the processing solution is connected on the processing tank side, and this processing solution container is connected with the replenishing container so that the solution can be replenished to the processing solution container. When the processing solution container is not connected with the replenishing container, the connecting section is closed by the valve. Therefore, the processing solution can be supplied without performing preparation of the solution, and replacement of the solution can be easily conducted. Leakage of solution and smell can be prevented, and further the apparatus of the present invention can be installed anywhere without providing a solution preparation unit and a water supply unit.

Claims

1. A container to supply a processing apparatus with a processing solution for a silver halide photosensitive material, comprising:
 - a box to form the outer figure of said container;
 - an inner bag disposed inside said box and made of flexible material, to store said processing solution; and
 - means for connecting said inner bag with said processing apparatus, said connecting means including a valve to be actuated by the connection between said connecting means and said processing apparatus so as to become open.
2. The container of claim 1, wherein said box is made of paper.
3. An apparatus for processing a silver halide photosensitive material with a processing solution, comprising
 - a processing tank to store a solution to pro-

cess said material;

a container to supply the solution to said processing tank;

means for connecting said container with said processing tank, said connecting means including a pair of joint members which come in engagement with each other, wherein one of said joint members is fixed to said processing tank and the other one is fixed to said container; and

each of said joint members having a valve which is actuated to open by the engagement between said joint members or to close by the disengagement between them.

4. An apparatus for processing a silver halide photosensitive material with a processing solution, comprising

a plurality of processing tanks each containing a solution to process said material;

a plurality of storage tanks each storing a solution;

means for supplying said solution from one of said storage tanks to one of said processing tanks, said supplying means including a pipe line through which said solution is discharged from said storage tank;

connection means for connecting said pipe line with said storage tank, said connection means including a pair of joint members which come in engagement with each other, wherein one of said joint members is fixed to said pipe line and the other one is fixed to said storage tank; and

each of said joint members having a valve which is actuated to open by the engagement between said joint members or to close by the disengagement between them.

5. The apparatus of claim 4, further comprising a negative film-processing device, a photographic paper-processing device, and a printer to expose an image of a negative film onto a photographic paper, wherein each of said negative film-processing device and said photographic paper-processing device has said processing tanks and said storage tanks, and wherein at least one of said storage tank is used for both said negative film-processing device and said photographic paper-processing device.

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FIG. 1

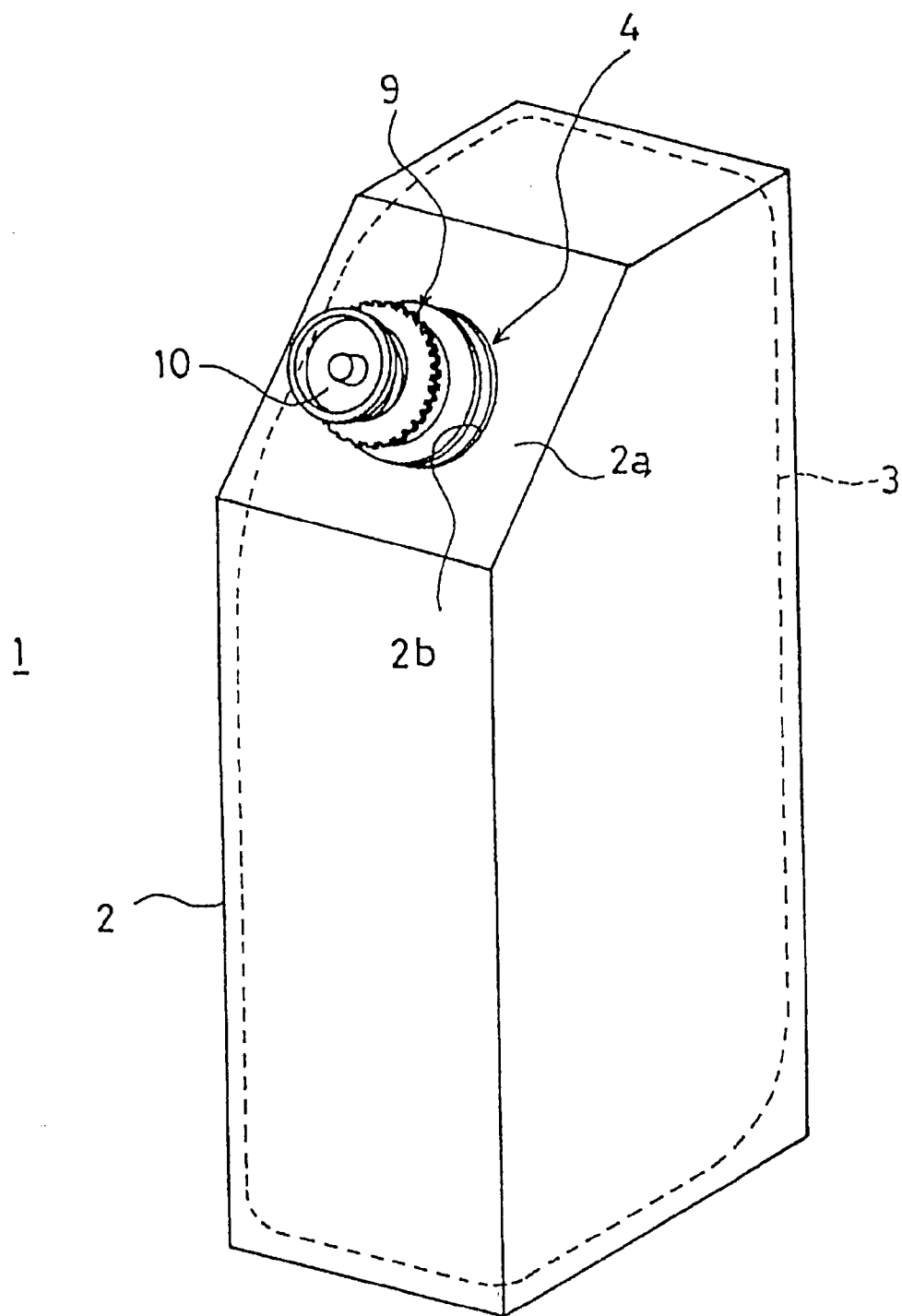


FIG. 2

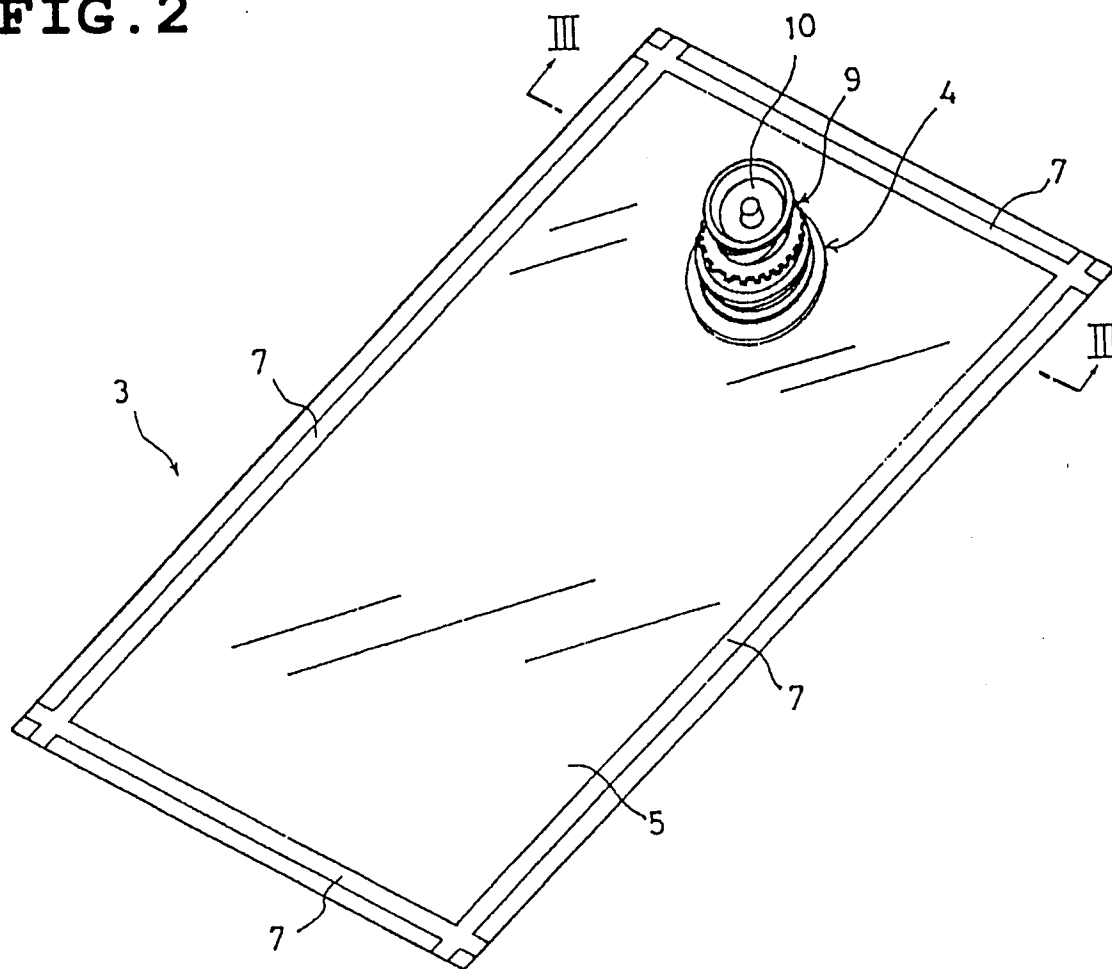


FIG. 3

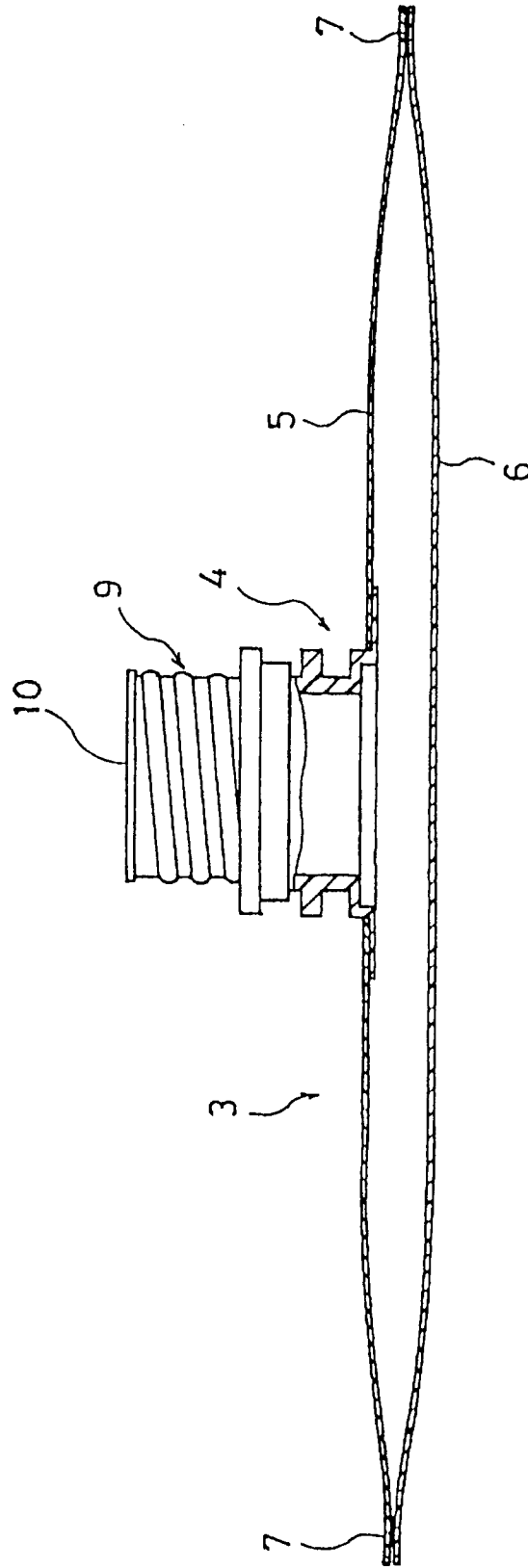


FIG. 4

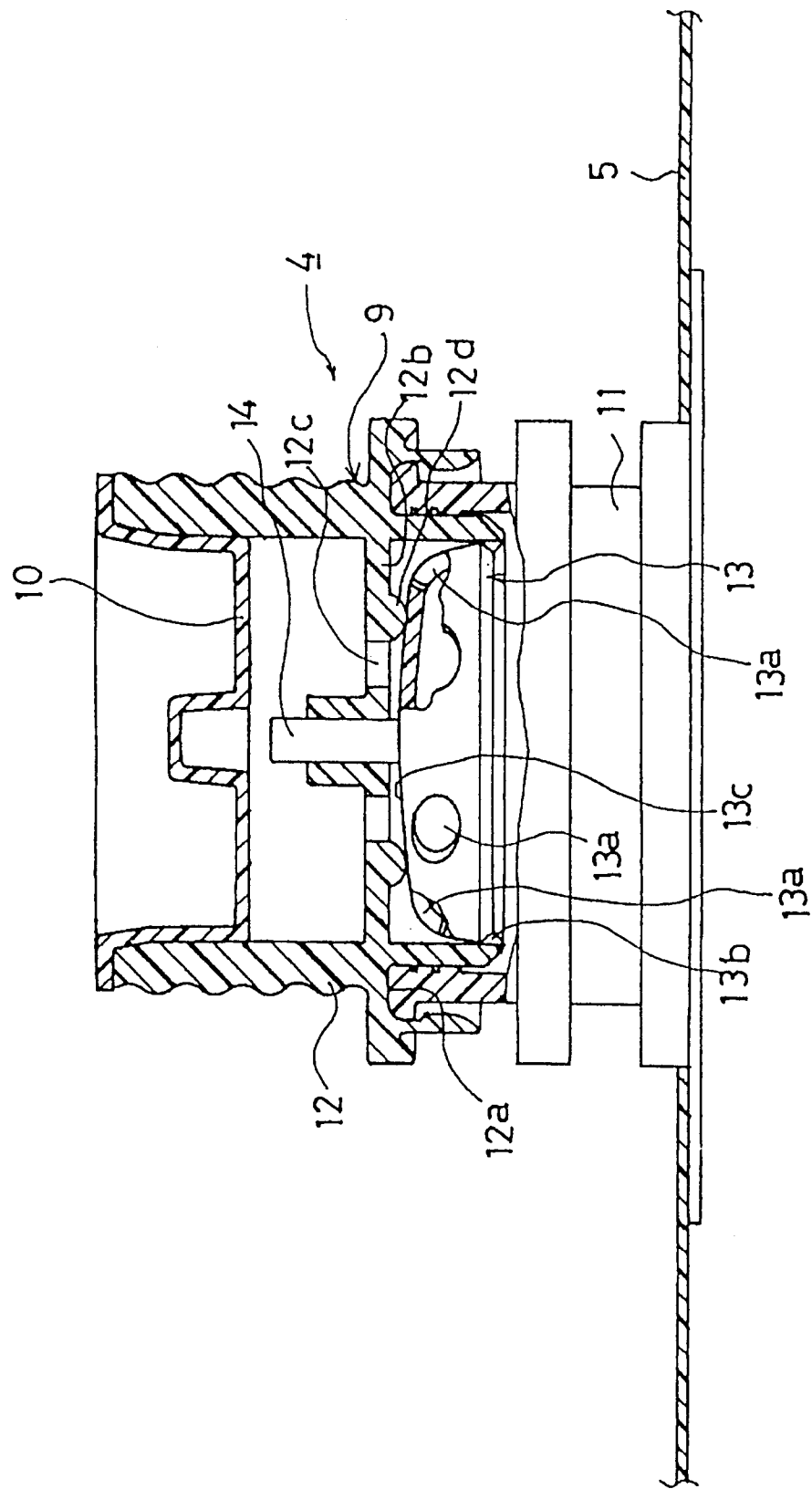


FIG. 5

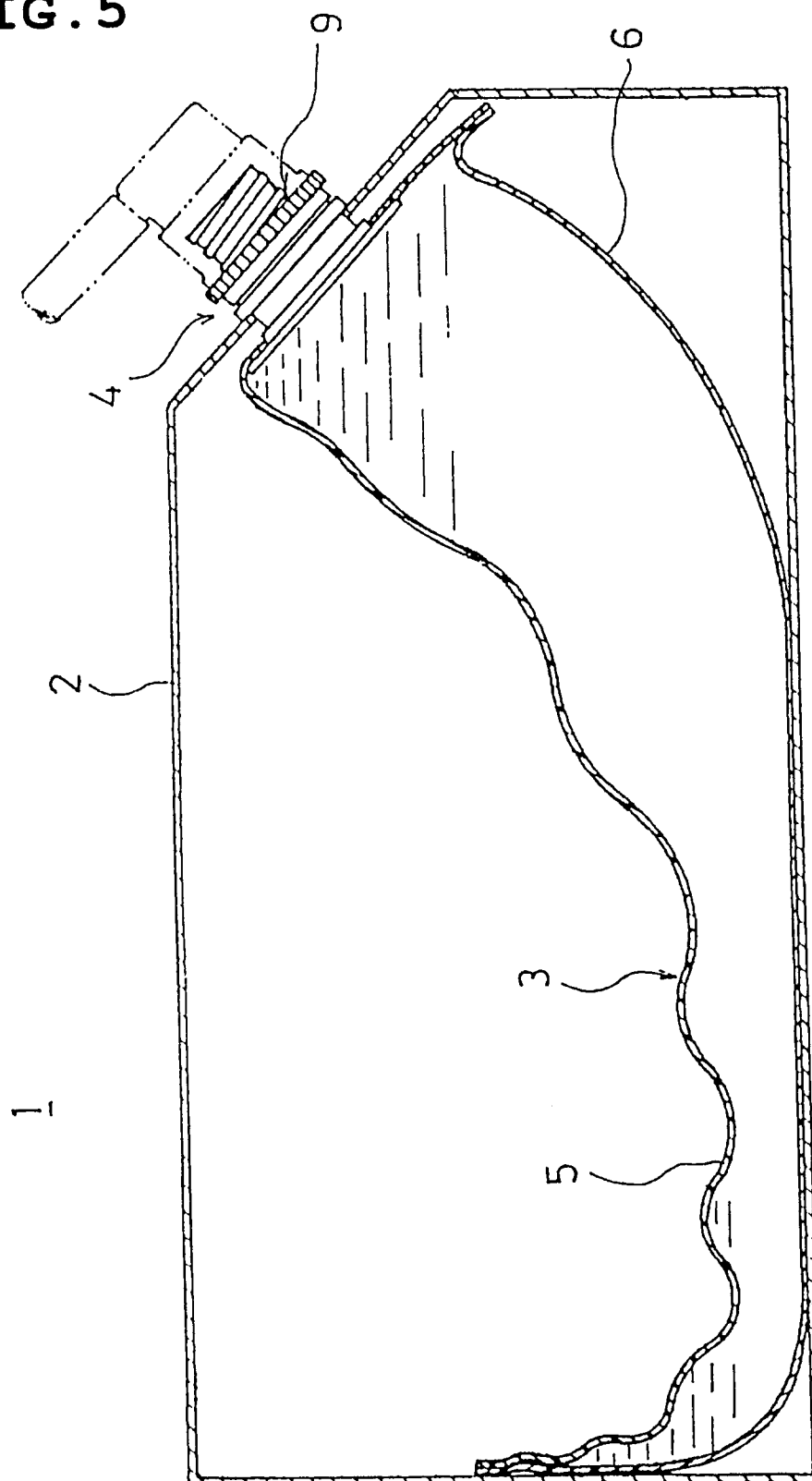


FIG. 6

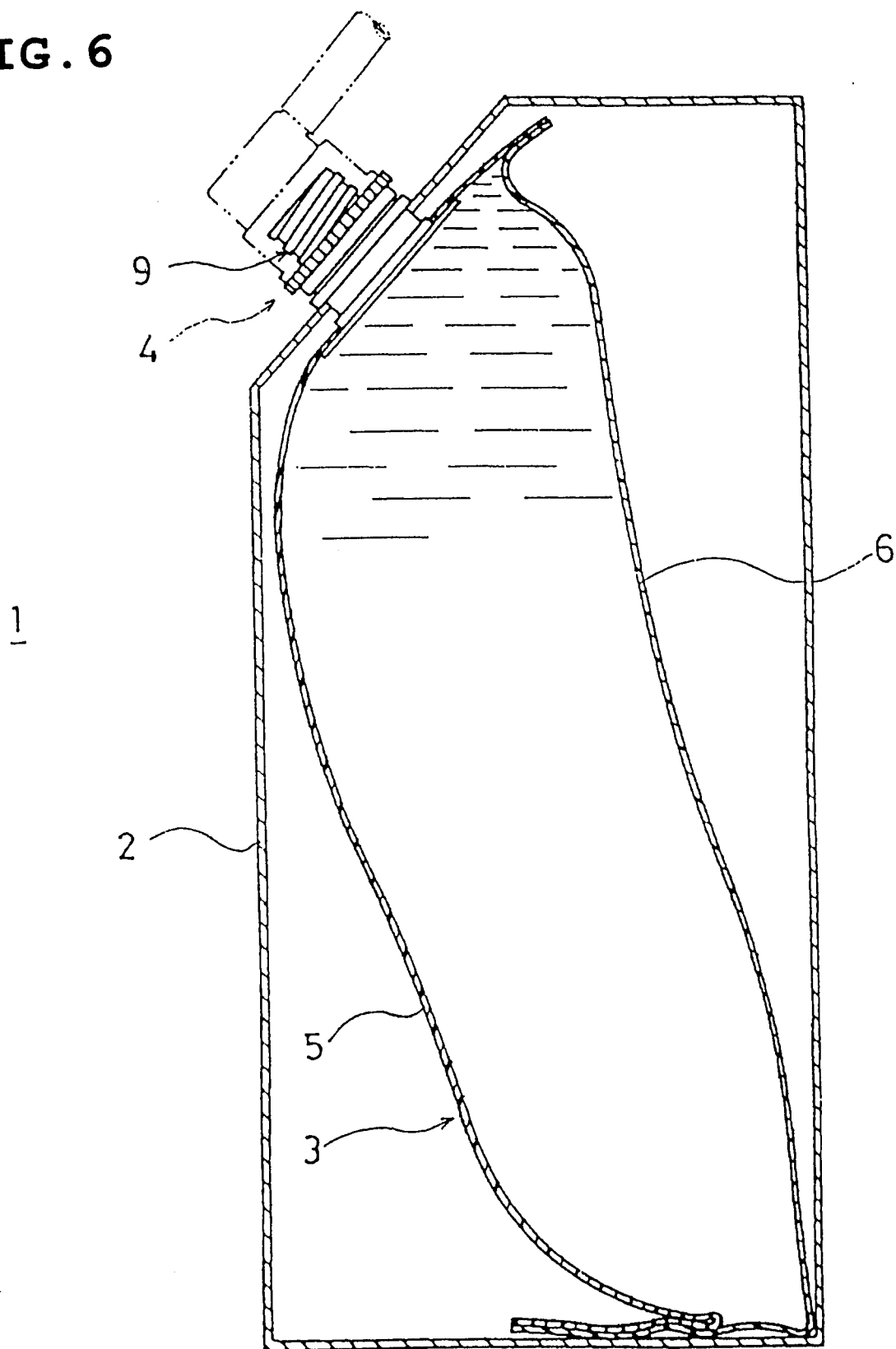
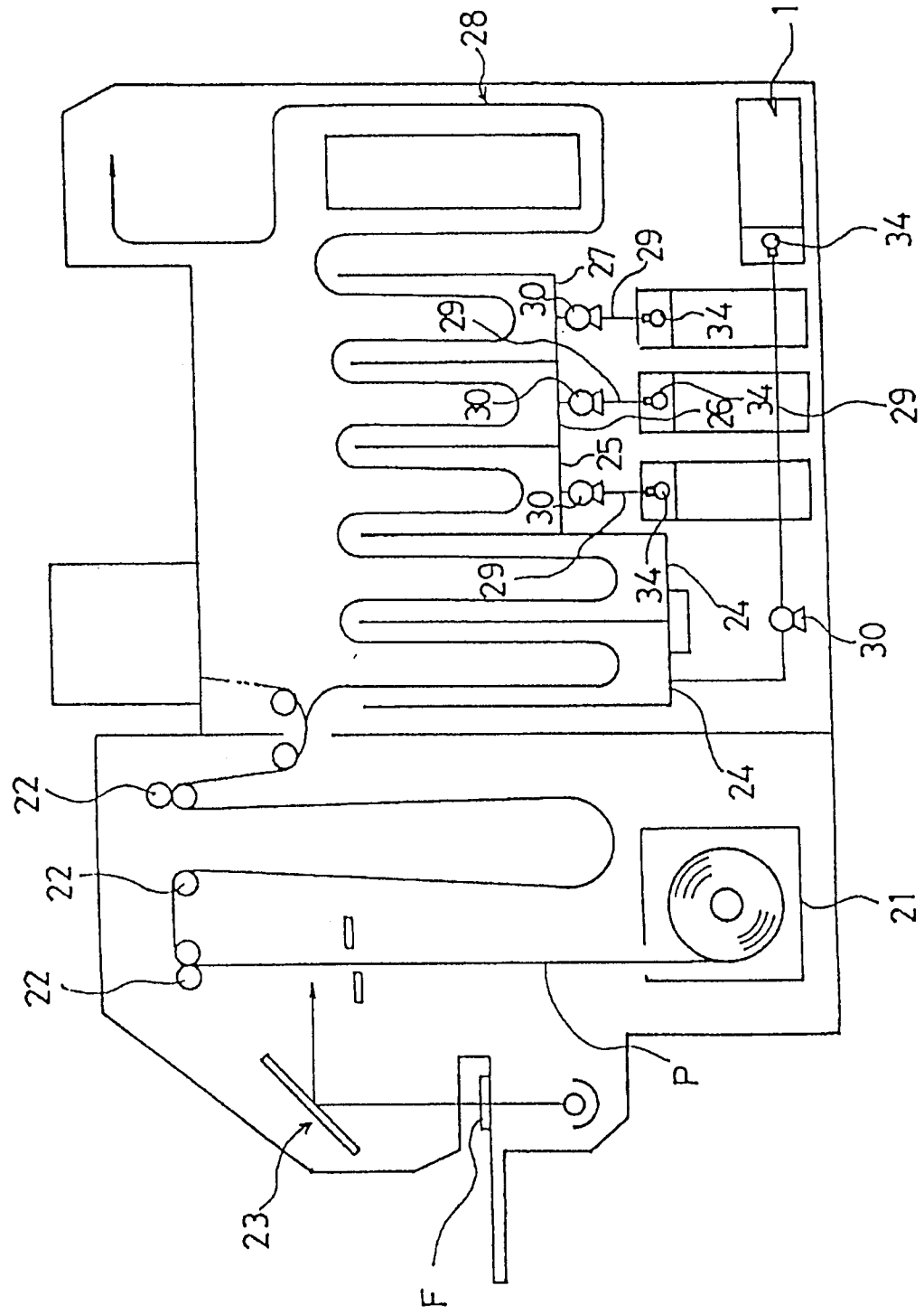
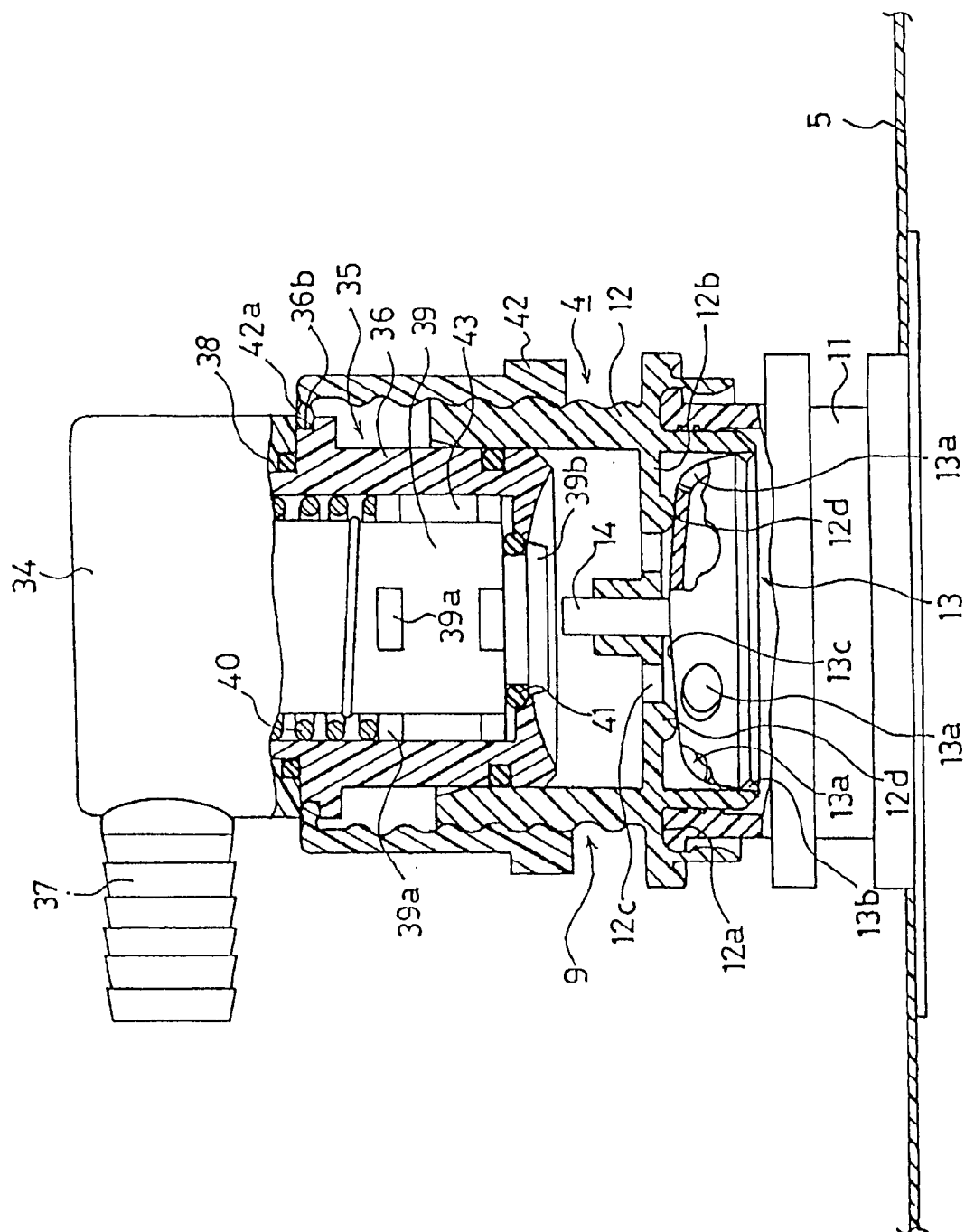


FIG. 7

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8. 6. 1. 1.



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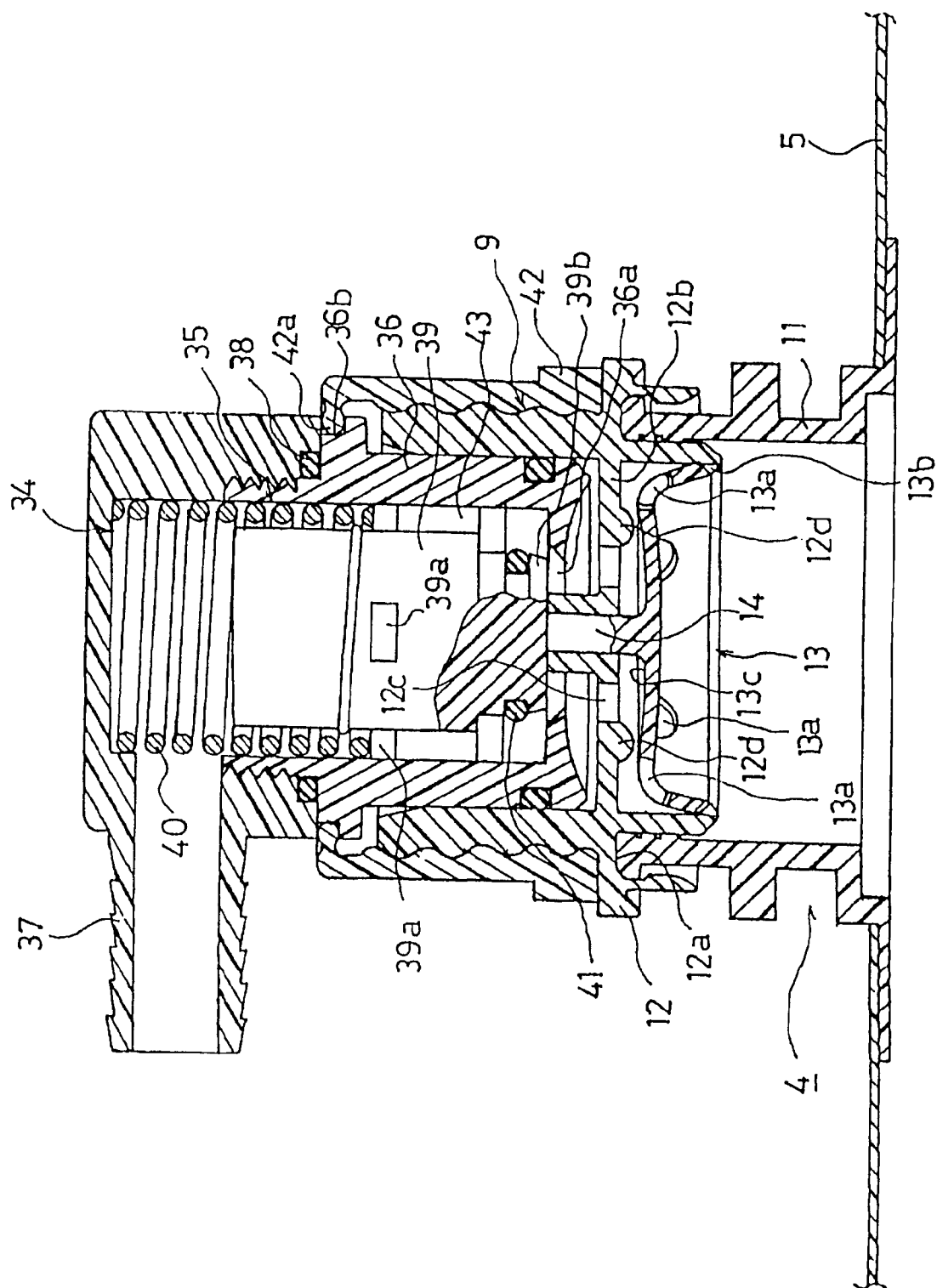


FIG. 10

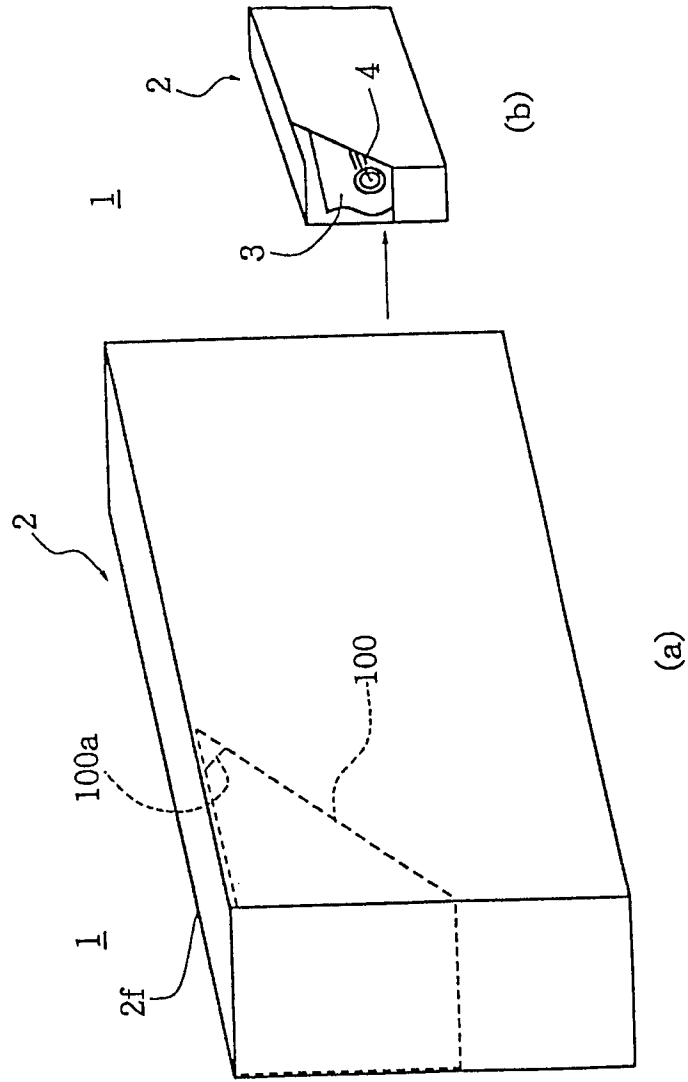


FIG. 11

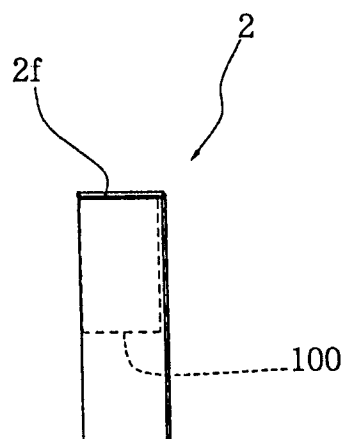


FIG. 12

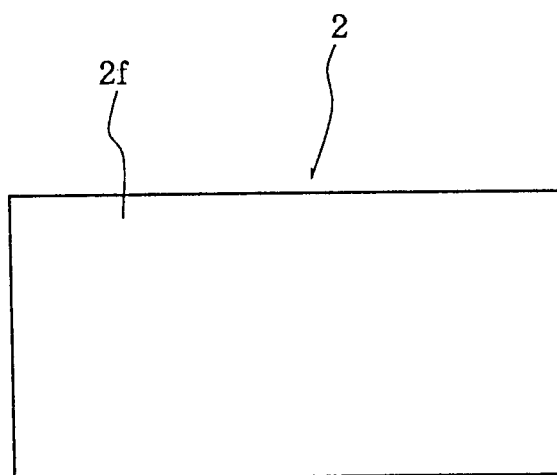


FIG. 13

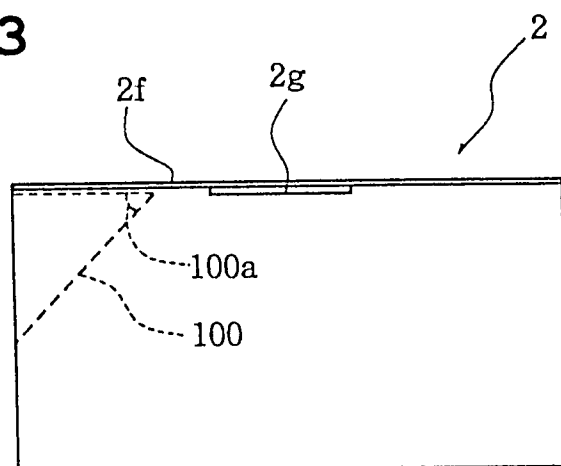


FIG. 14

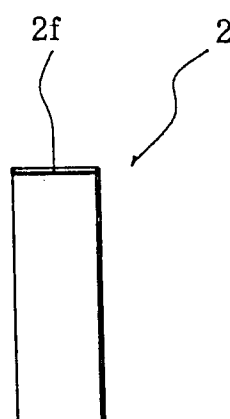


FIG. 15

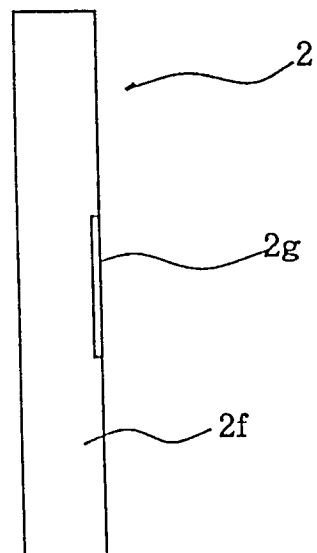
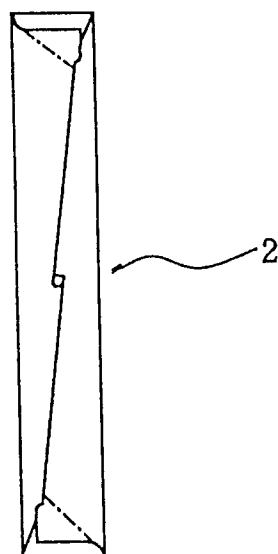


FIG. 16



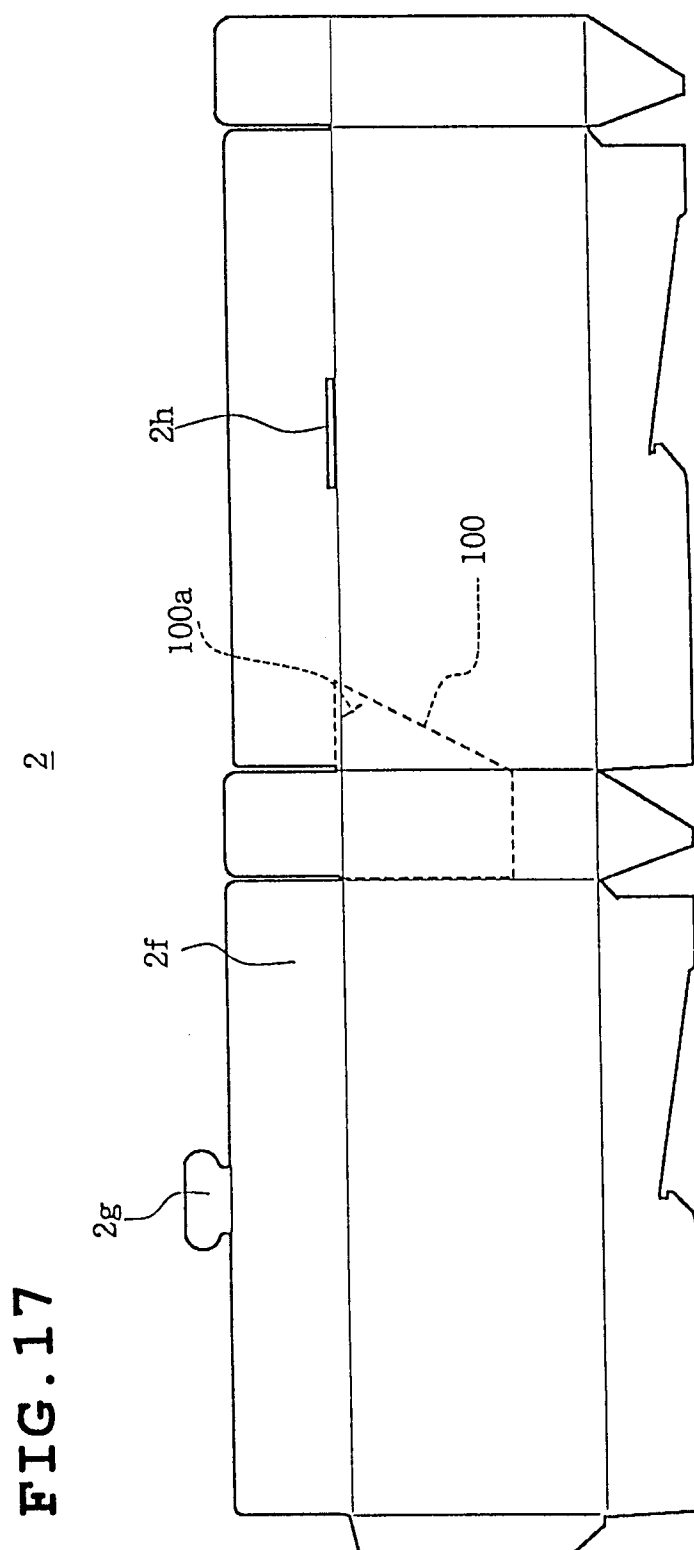


FIG. 18

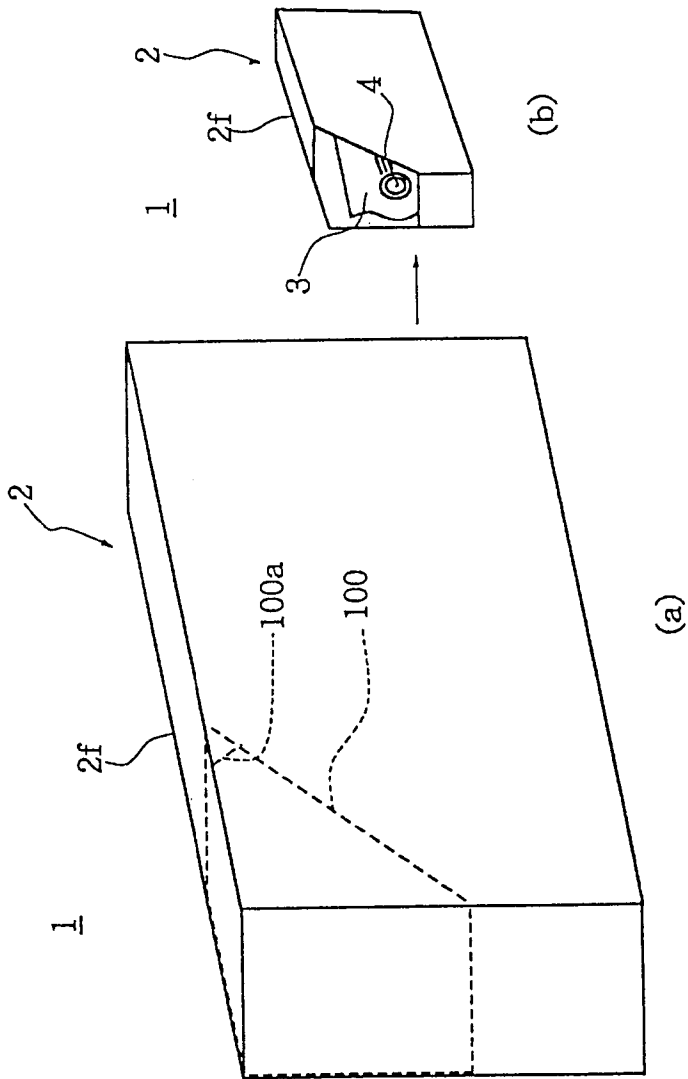


FIG. 19

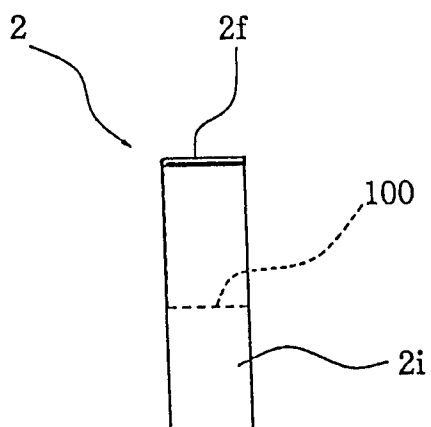


FIG. 20

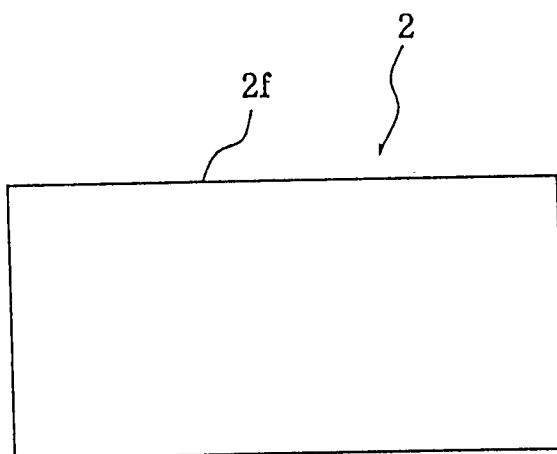


FIG. 21

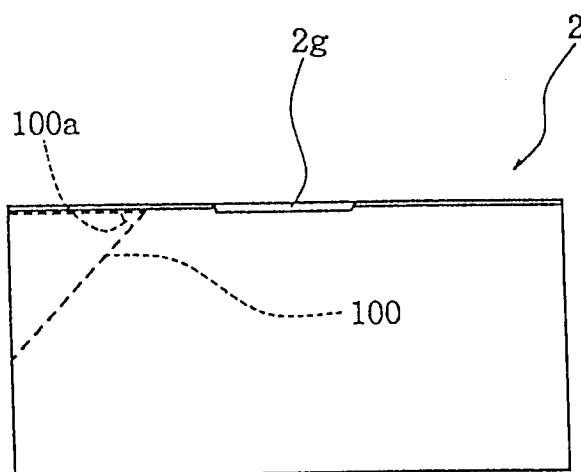


FIG. 22

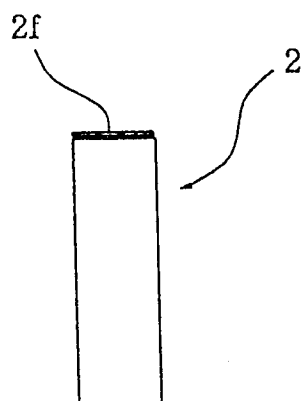


FIG. 23

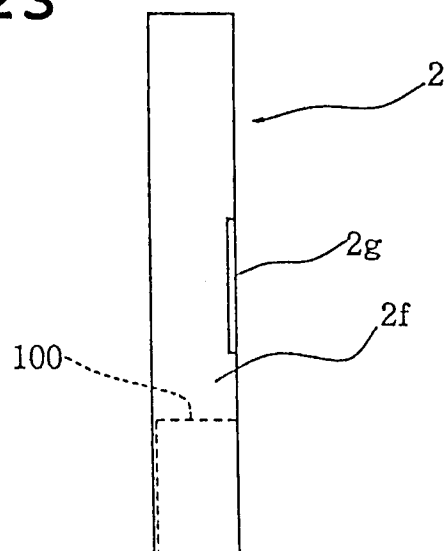


FIG. 24

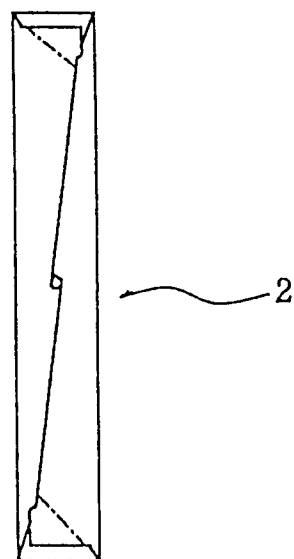


FIG. 25

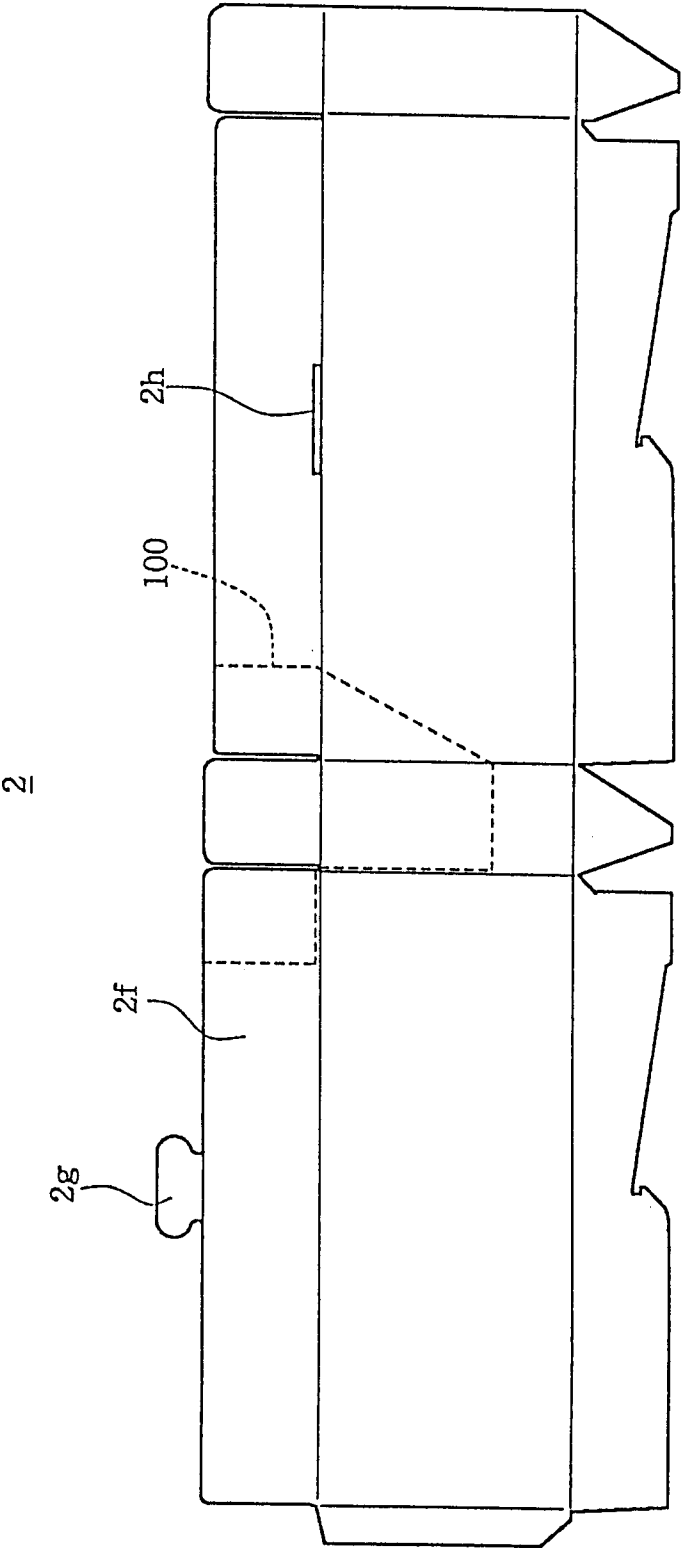


FIG. 26

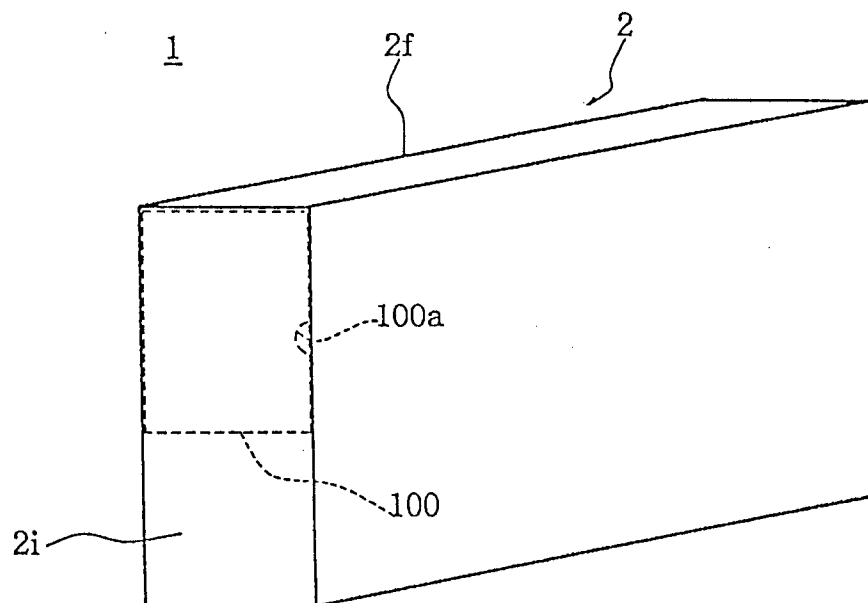


FIG. 27

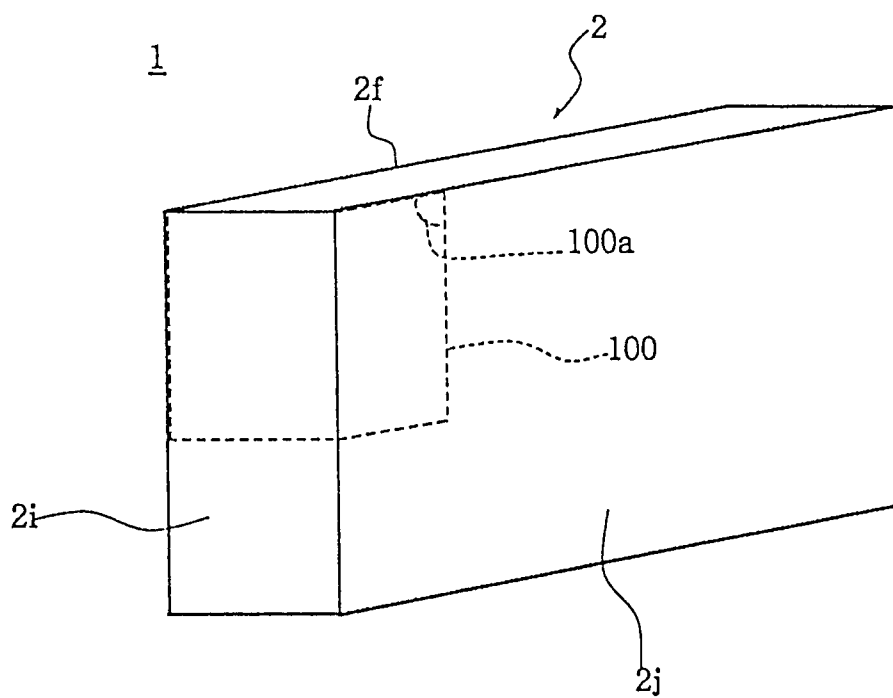


FIG. 28

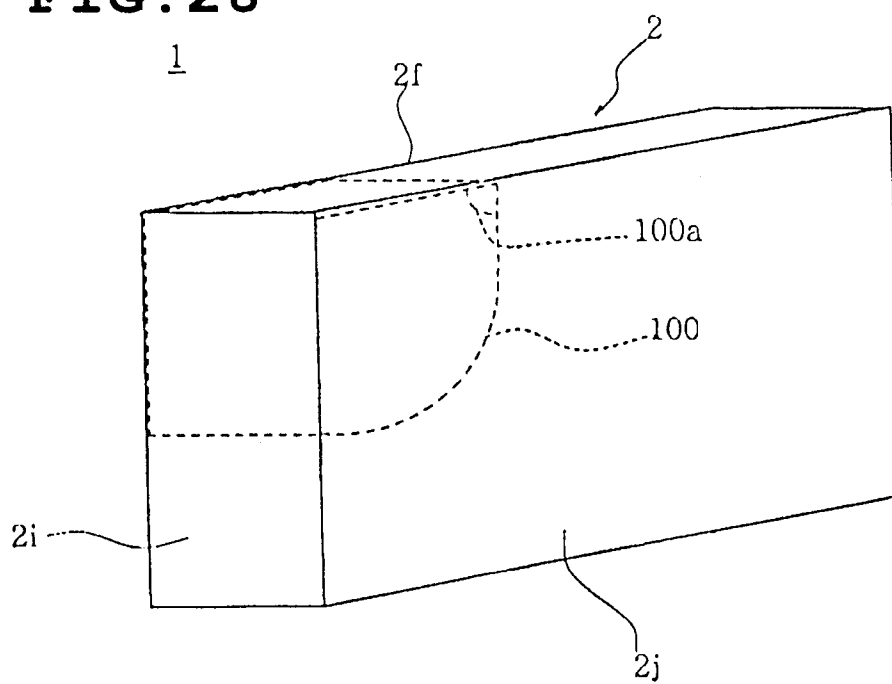


FIG. 29

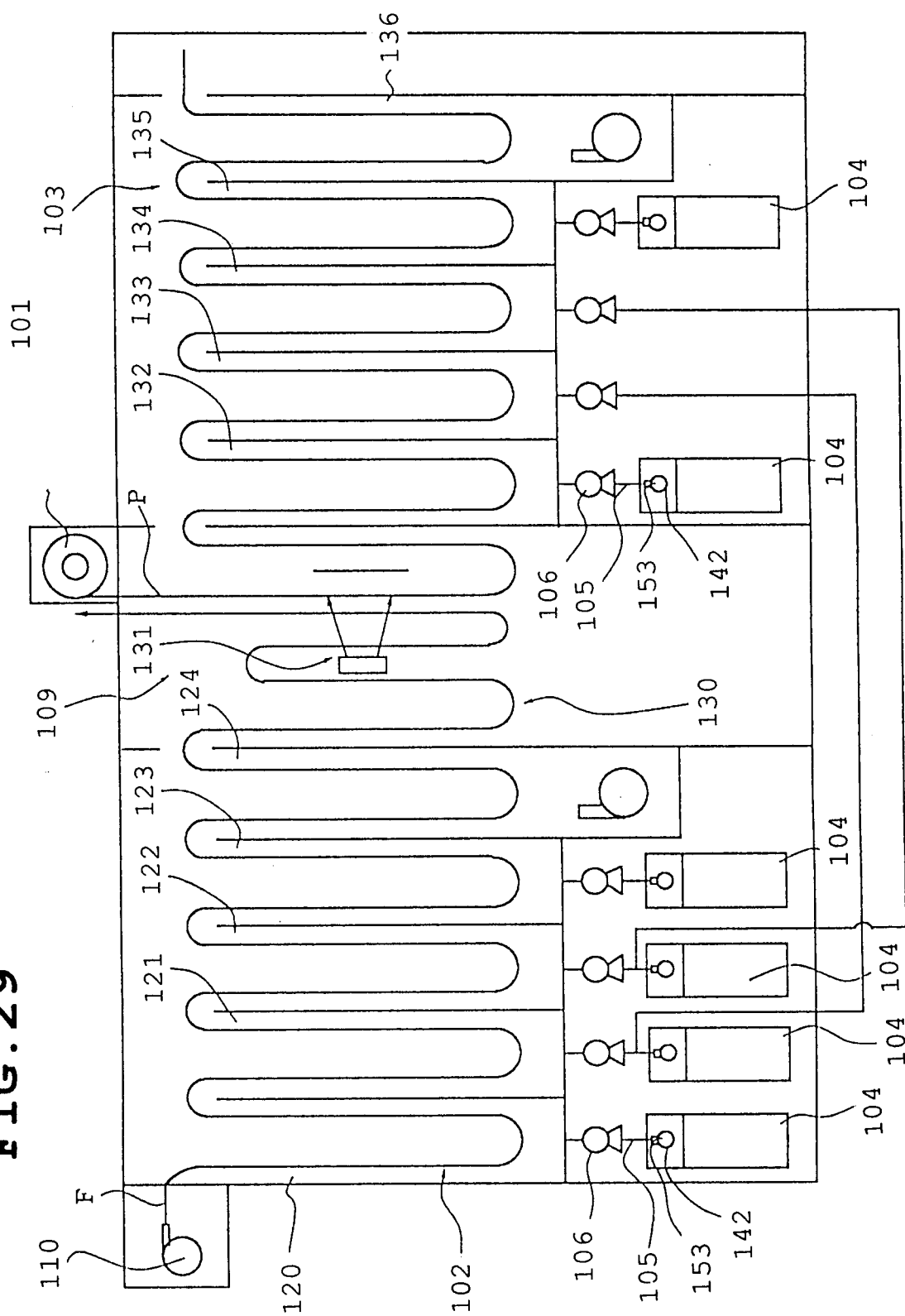


FIG. 30

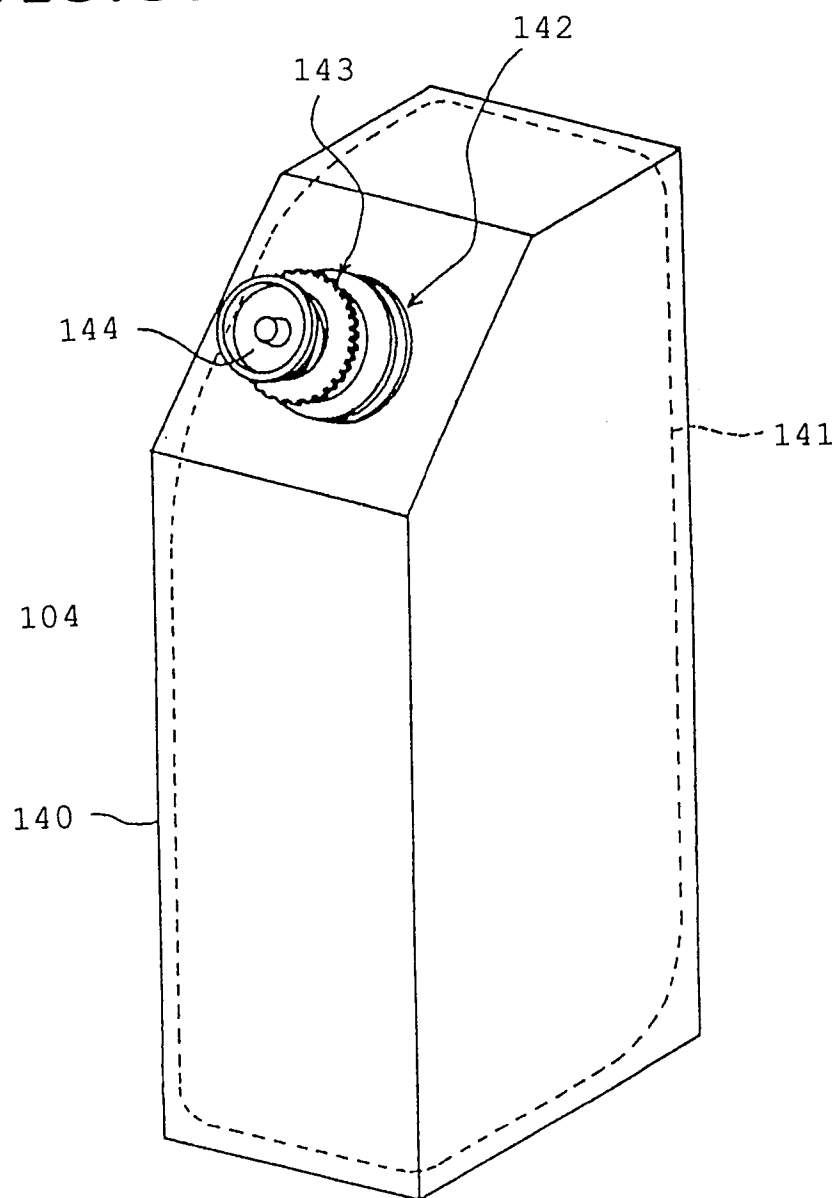


FIG. 31

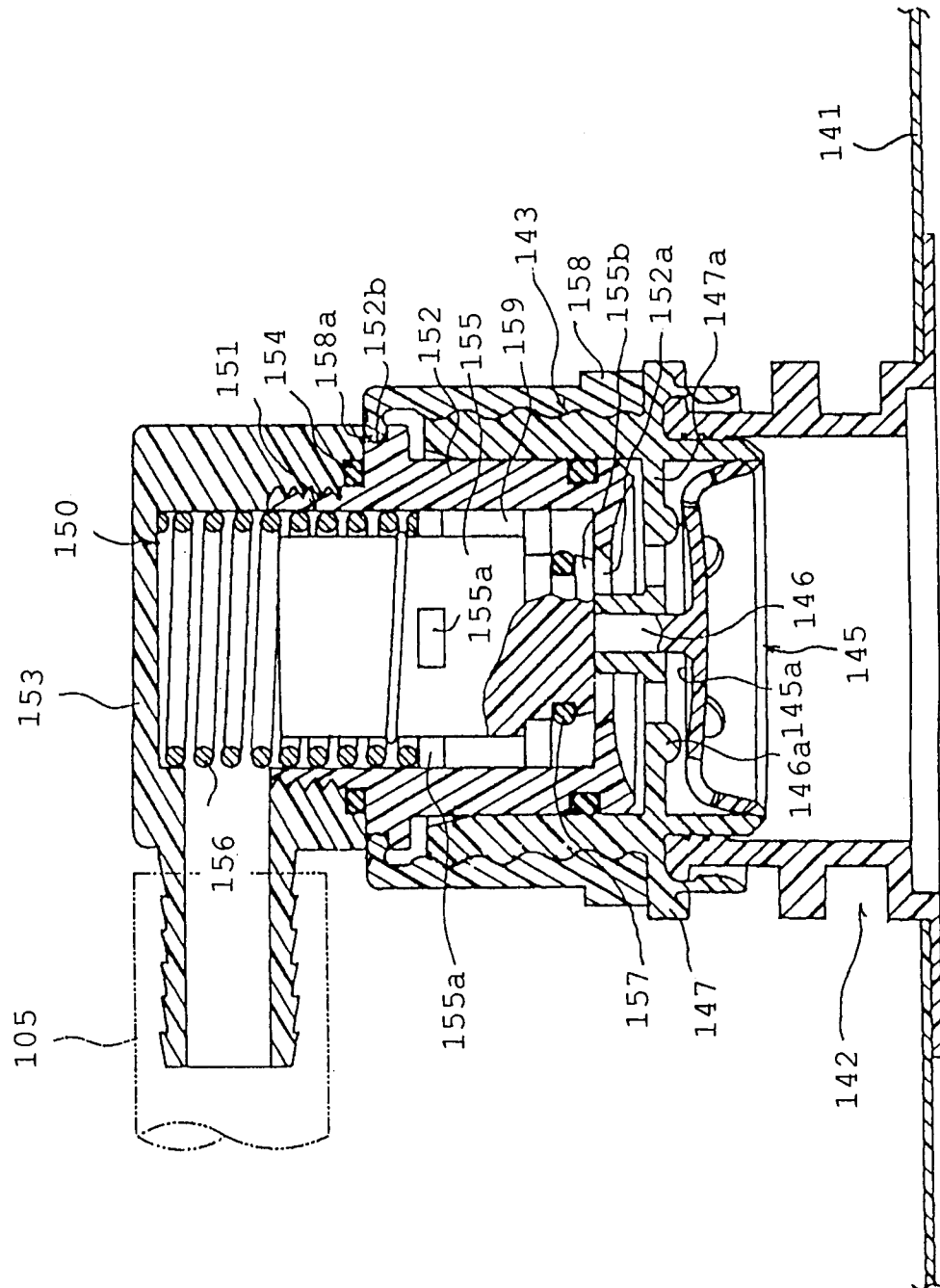


FIG. 32

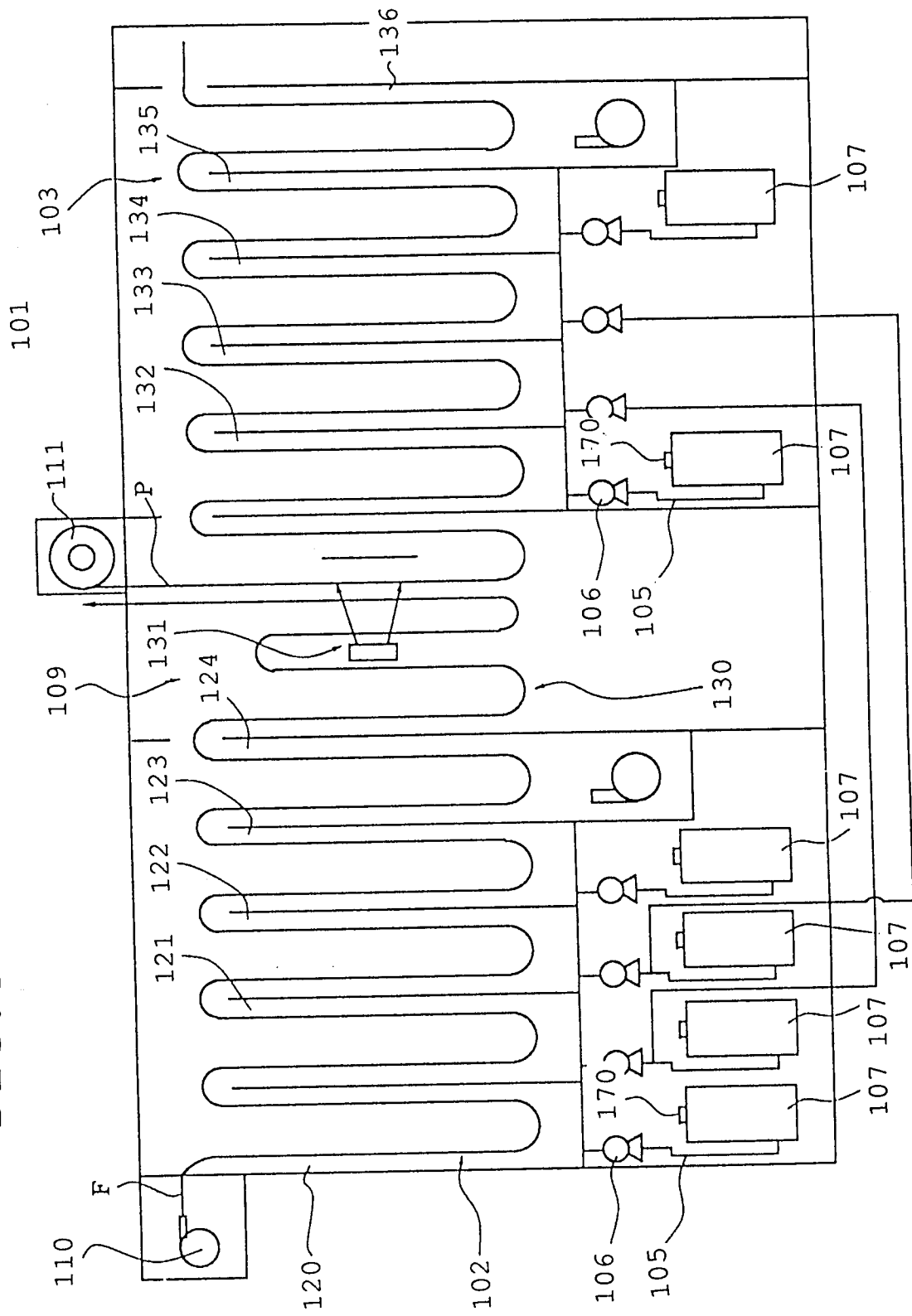


FIG. 33

