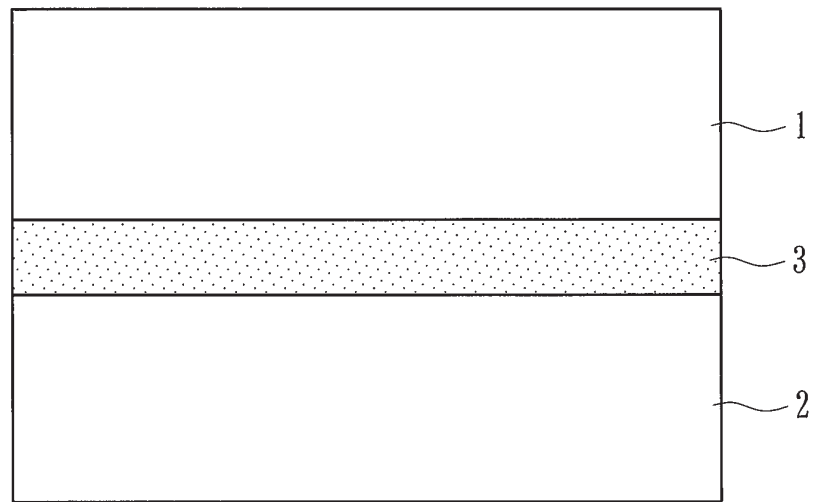
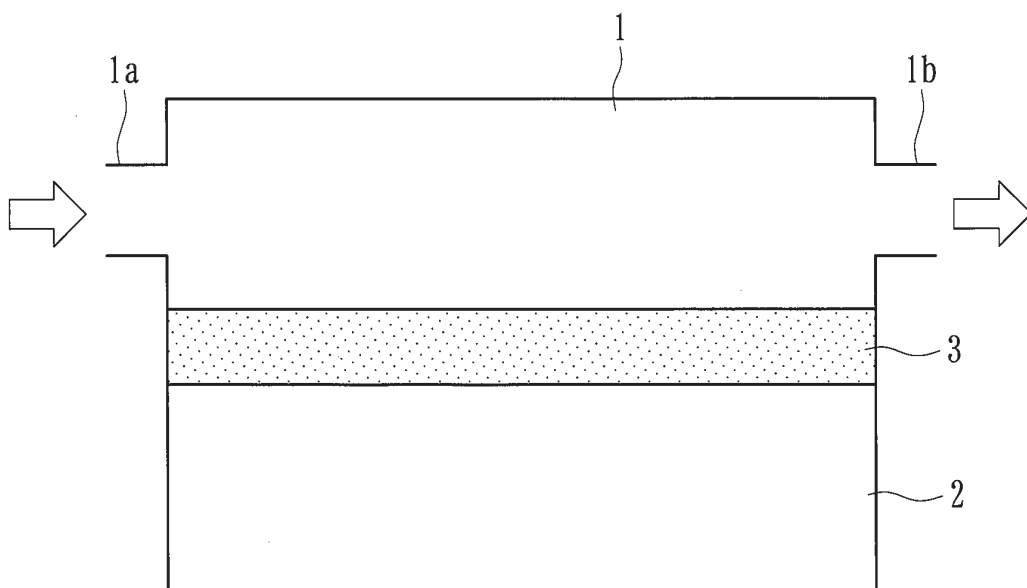


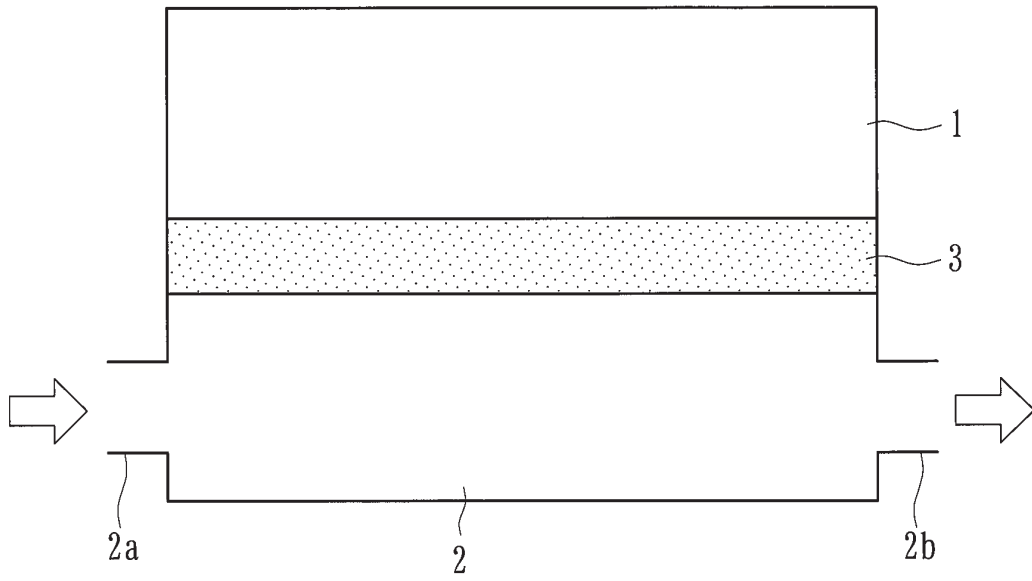
[Fig. 1]



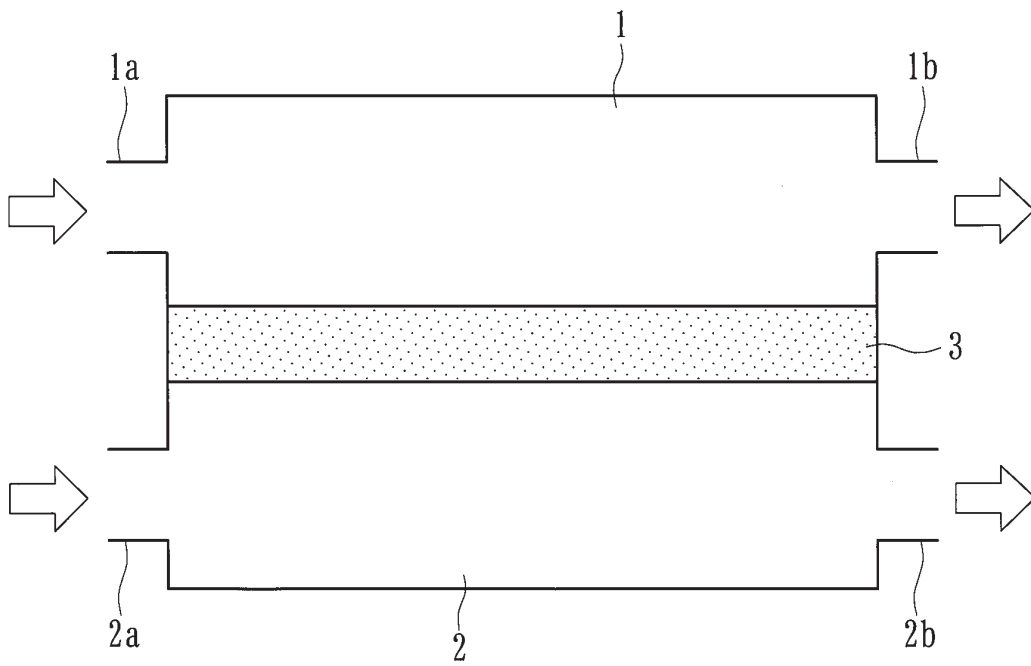
[Fig. 2]



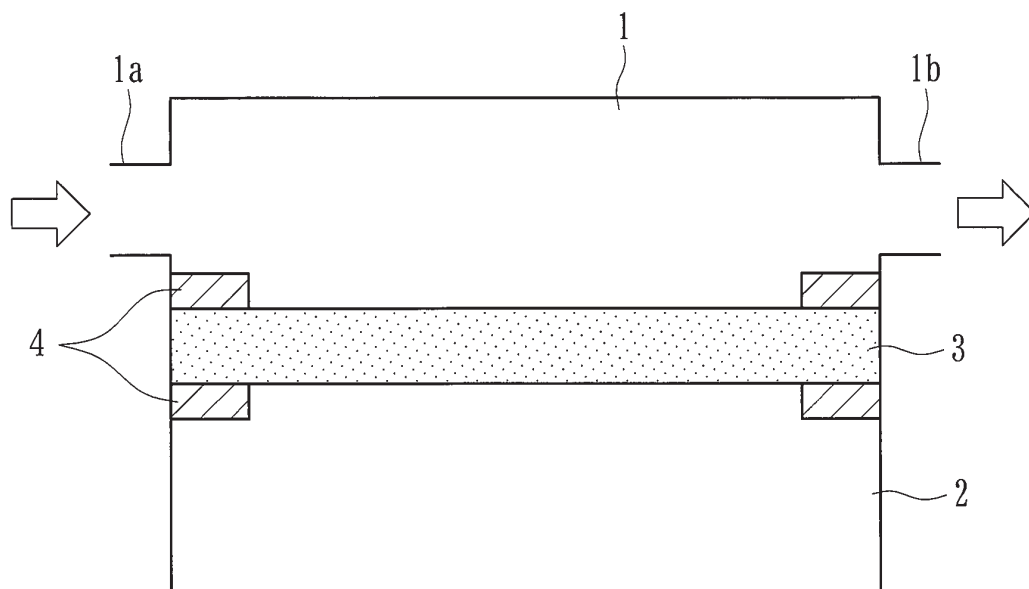
[Fig. 3]



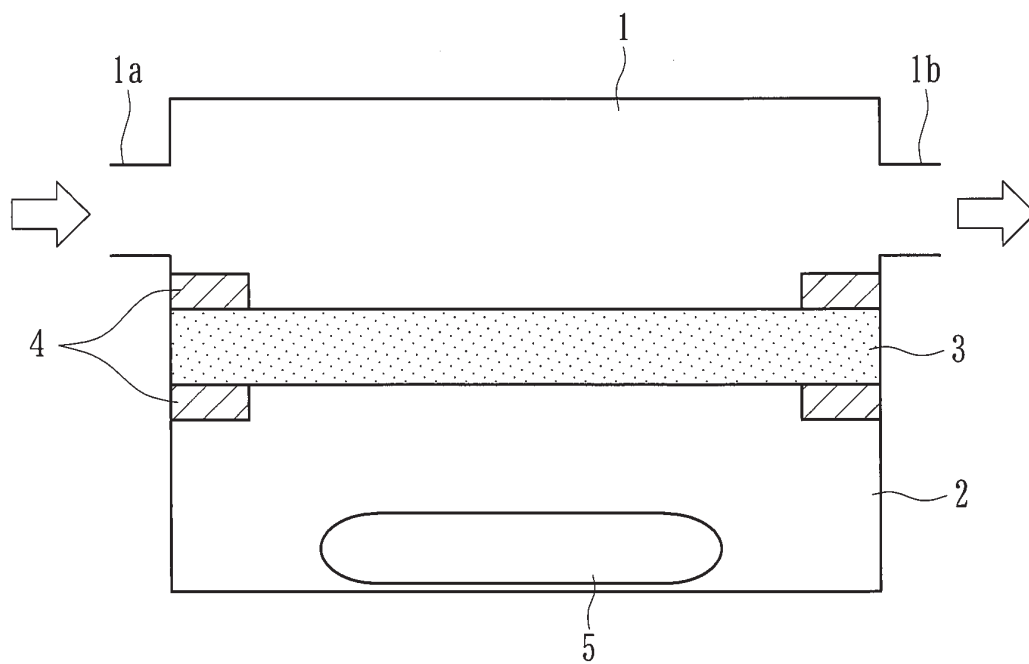
[Fig. 4]



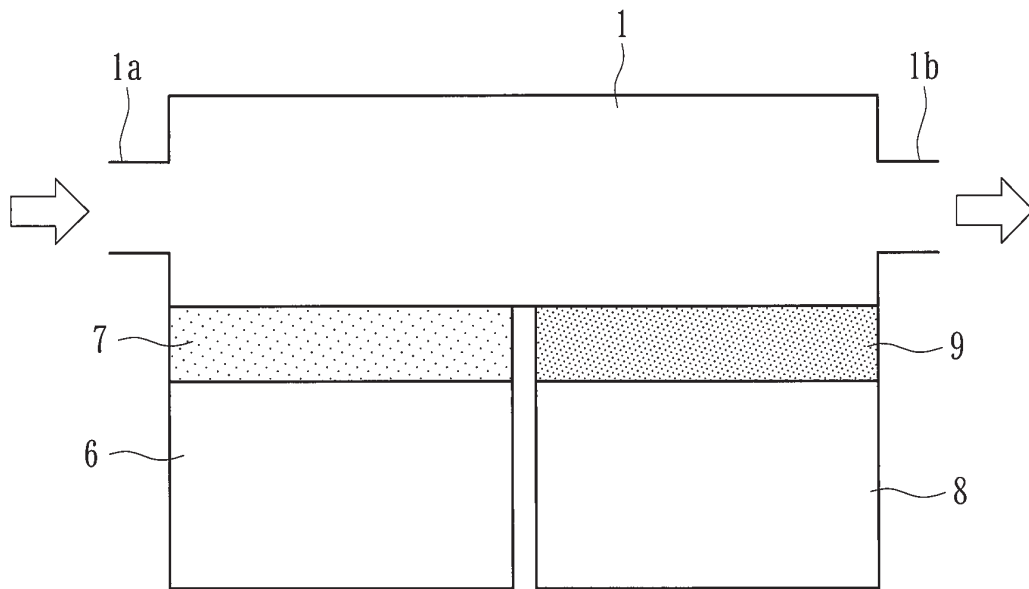
[Fig. 5]



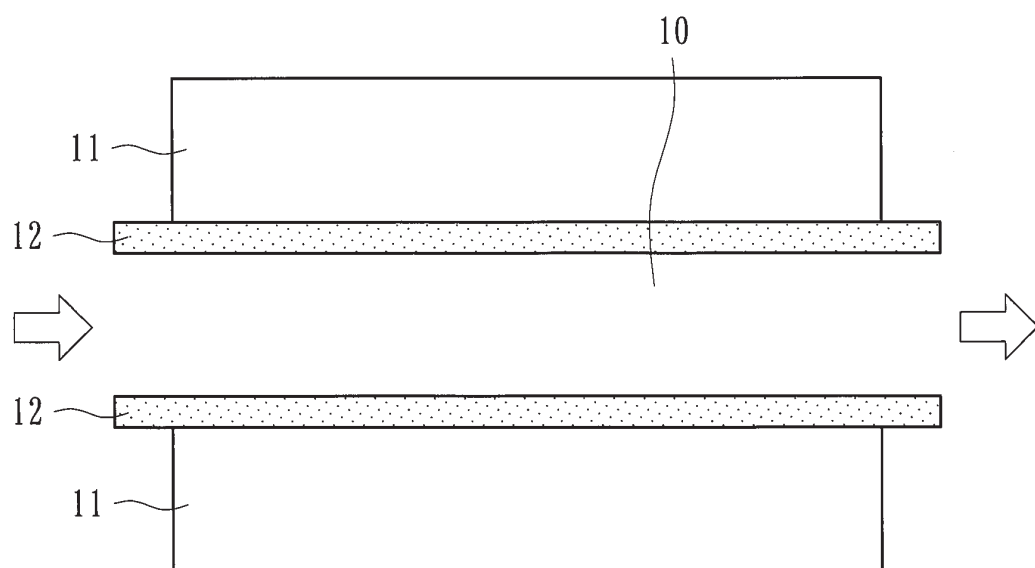
[Fig. 6]



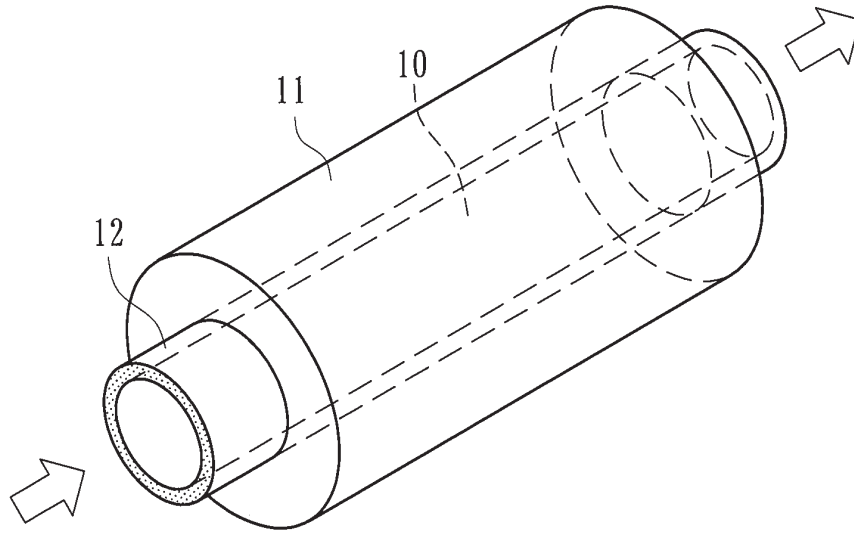
[Fig. 7]



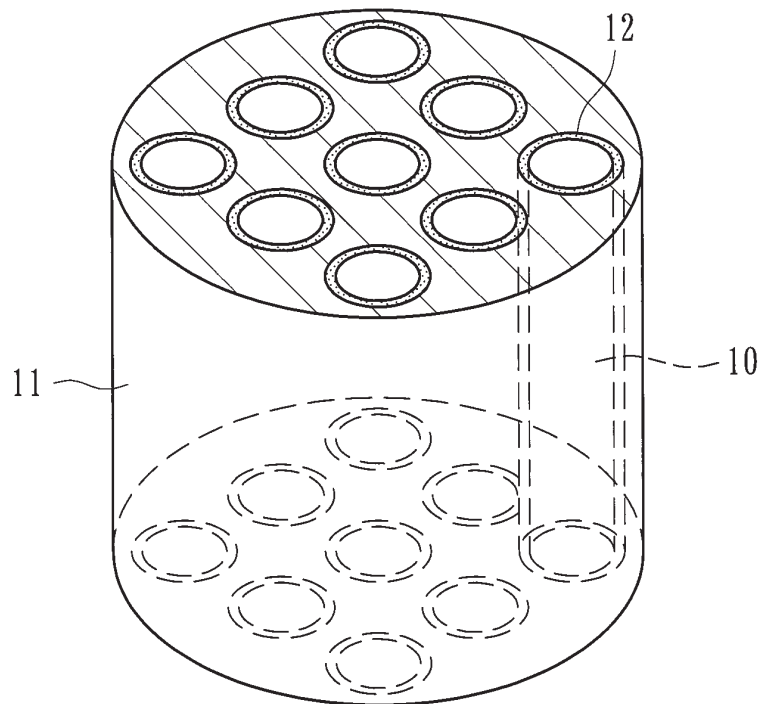
[Fig. 8]



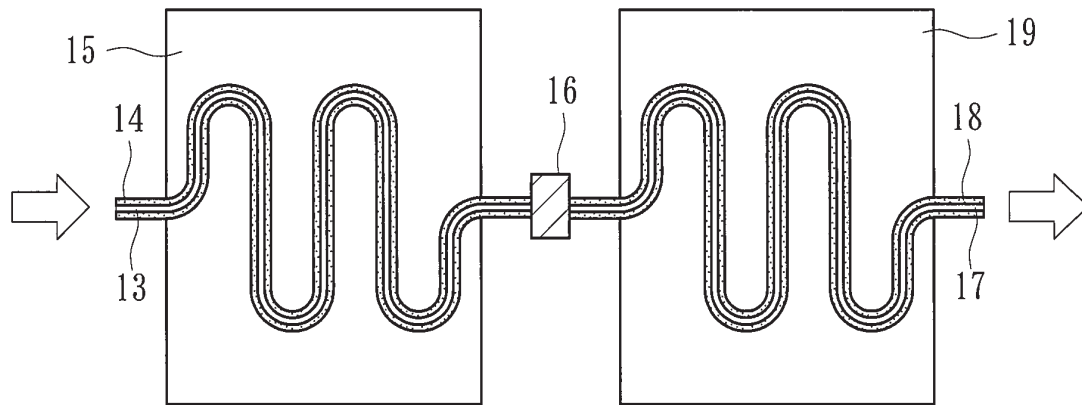
[Fig. 9]



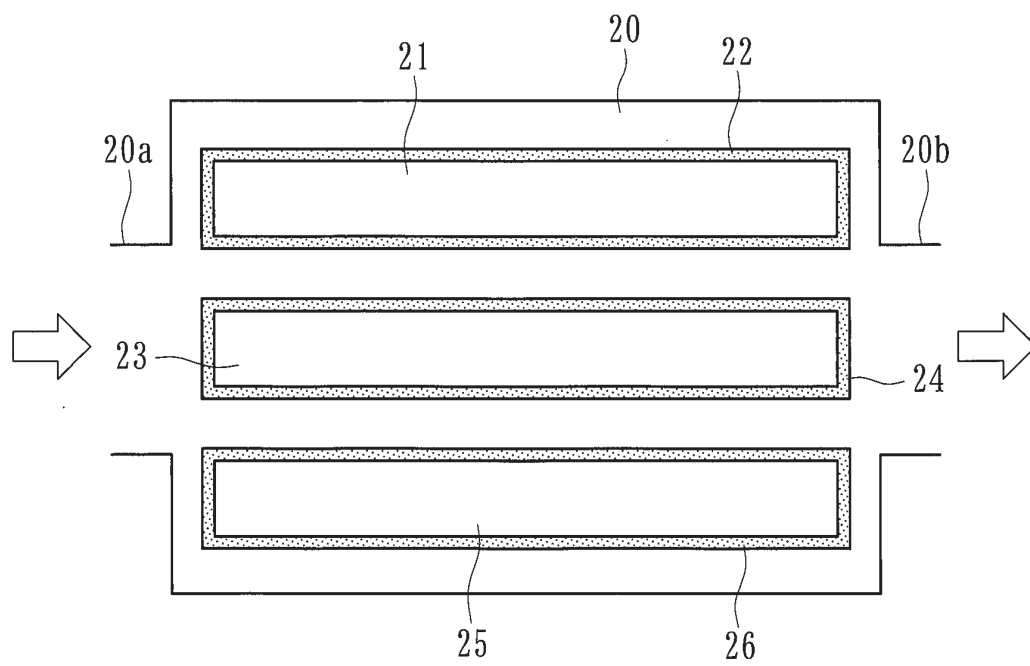
[Fig. 10]



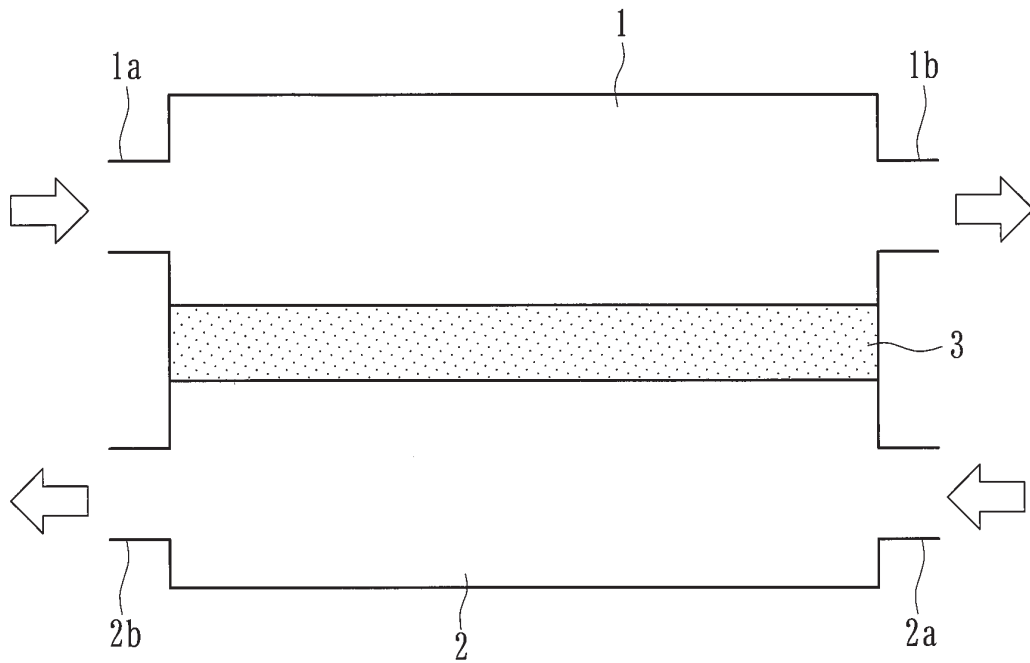
[Fig. 11]



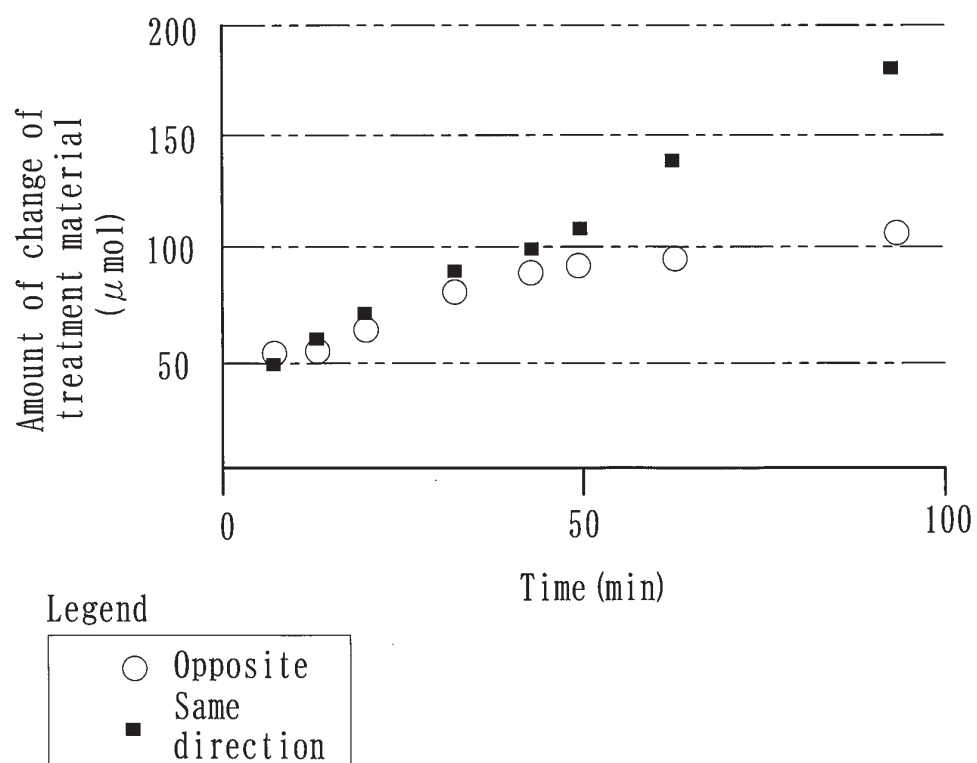
[Fig. 12]



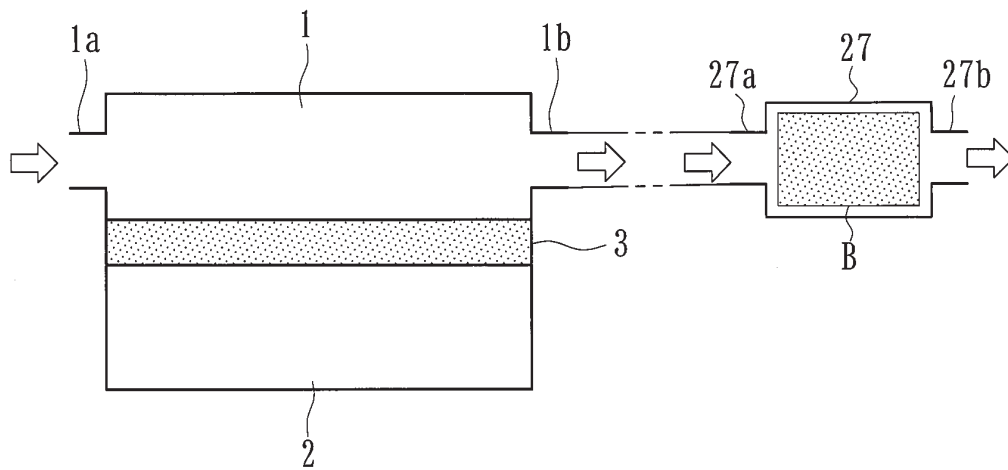
[Fig. 13]



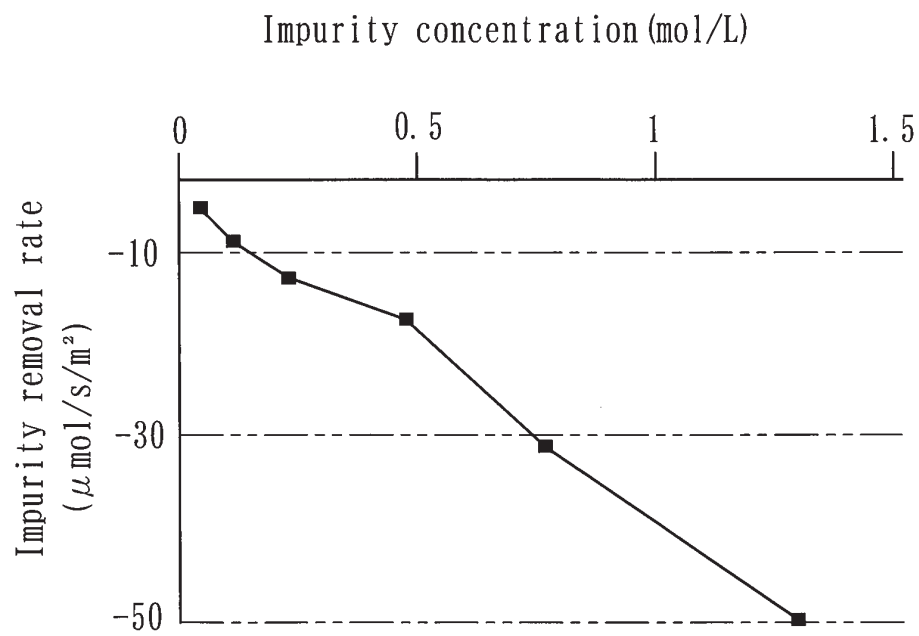
[Fig. 14]



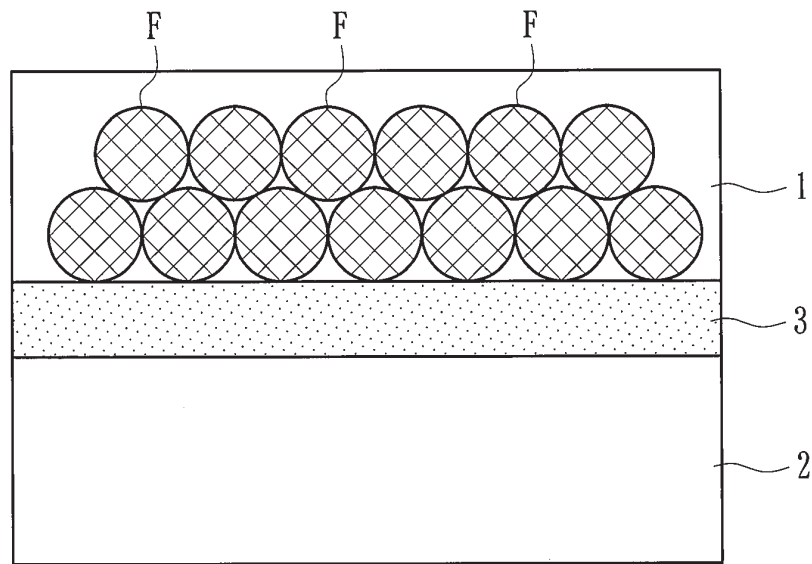
[Fig. 15]



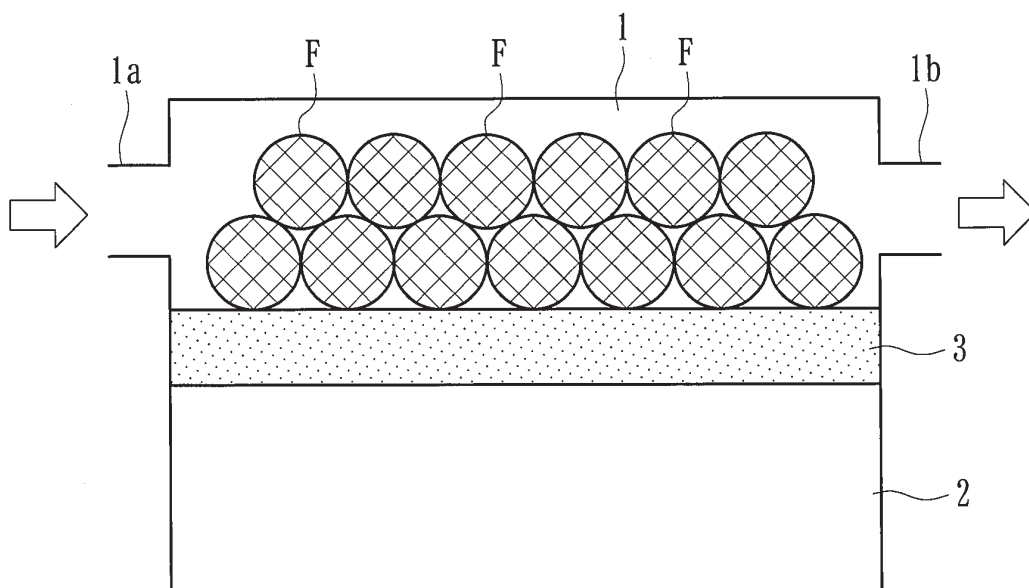
[Fig. 16]



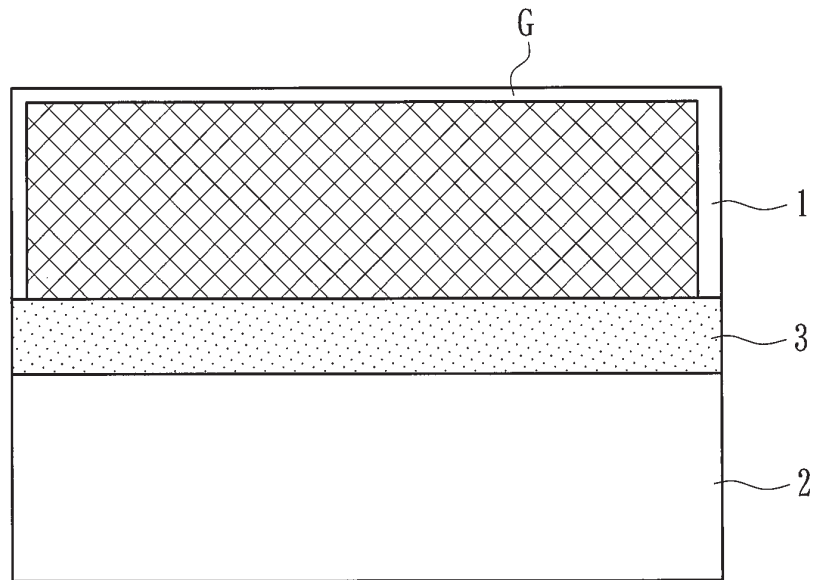
[Fig. 17]



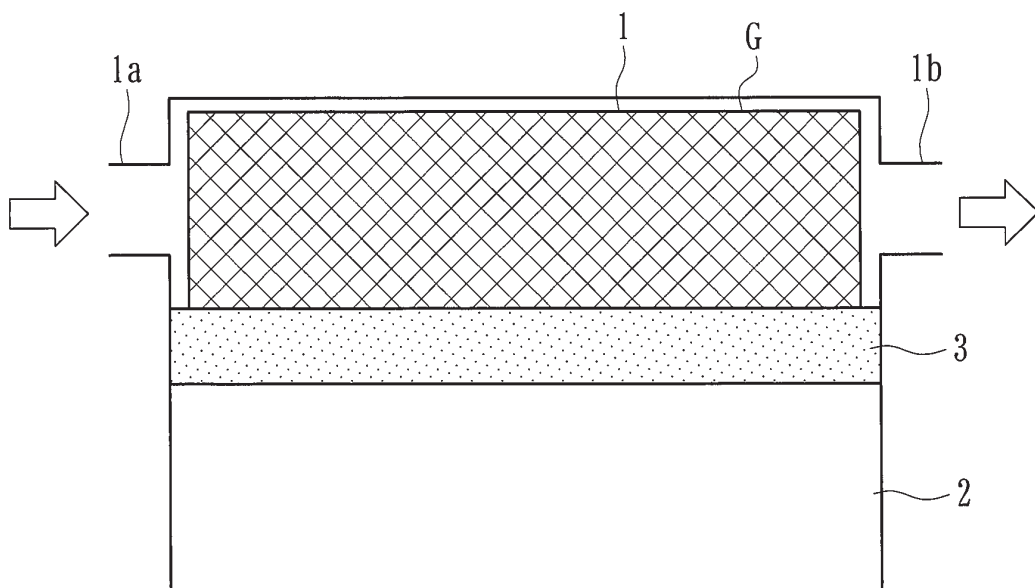
[Fig. 18]



[Fig. 19]



[Fig. 20]



[Fig. 21]

	Raw-water section			Treatment section (First treatment section)				Second treatment section				Test result
	Impurity ion	Concent- ration [mol/L]	Flow rate [cm/s]	Compo- sition	Concent- ration [mol/L]	Flow rate [cm/s]	Membrane area [cm ²]	Compo- sition	Concent- ration [mol/L]	Flow rate [cm/s]	Membrane area [cm ²]	
Example 1	K (Br)	0.1	0	HCl	0.11	0	18					0.09
Example 2	Br (K)	0.1	0	NaOH	0.11	0	18					0.09
Example 3	K (Br)	0.1	0	HCl	0.11	0	18					0.06
Example 4	K (Br)	0.1	0	HCl	0.11	0	18					0.08
Example 5	K (Br)	1	0	HCl	4	0	18					3.8
Comparative Example 1	K (Br)	0.2	0	HCl	0.1	0	18					0.09
Example 6	Ca (Cl ₂)	1	0	NaCl	4	0	18					2.8
Example 7	Ca (Cl ₂)	1	0	NaCl	37	0	18					4.2
Example 8	Ca (Cl ₂)	1	0	NaCl	20	0	18					4.9

[Fig. 22]

	Raw-water section			Treatment section (First treatment section)				Second treatment section				Test result
	Impurity ion	Concent- ration [mol/L]	Flow rate [cm/s]	Compo- sition	Concent- ration [mol/L]	Flow rate [cm/s]	Membrane area [cm ²]	Compo- sition	Concent- ration [mol/L]	Flow rate [cm/s]	Membrane area [cm ²]	
Example 9	Ca (Cl ₂)	1	8	HCl	1.9	0	18					1.8
Example 10	Ca (Cl ₂)	1	8	HCl	2.1	0	18					2
Example 11	Ca (Cl ₂)	1	8	HCl	12	0	18					8.6
Example 12	Ca (Cl ₂)	1	8	HCl	6	0	18					5.7
Example 13	Ca (Cl ₂)	2	8	HCl	6	0	18					5.5
Example 14	Ca (Cl ₂)	4	8	HCl	6	0	18					5.8
Example 15	Ca (Cl ₂)	1	16	HCl	6	0	18					5.8

[Fig. 23]

	Raw-water section			Treatment section (First treatment section)				Second treatment section				Test result
	Impurity ion	Concent- ration [mol/L]	Flow rate [cm/s]	Compo- sition	Concent- ration [mol/L]	Flow rate [cm/s]	Membrane area [cm ²]	Compo- sition	Concent- ration [mol/L]	Flow rate [cm/s]	Membrane area [cm ²]	
Example 16	K (Br)	1	8	CaCl ₂	6	0	18					5.5
Example 17	Br (K)	0.01	8	Ca (OH) ₂	0.04	0	18					0.03

[Fig. 24]

	Raw-water section			Treatment section (First treatment section)				Second treatment section				Test result
	Impurity ion	Concent- ration [mol/L]	Flow rate [cm/s]	Compo- sition	Concent- ration [mol/L]	Flow rate [cm/s]	Membrane area [cm ²]	Compo- sition	Concent- ration [mol/L]	Flow rate [cm/s]	Membrane area [cm ²]	
Example 18	Ca (Cl ₂)	1	0	HCl	6	8	18					4.7
Example 19	Ca (Cl ₂)	1	8	HCl	6	8	18					5.4
Example 20	Ca (Cl ₂)	1	0	HCl	12	0	18					8.8
Example 21	Ca (Cl ₂)	1	8	HCl	12	0	18					10.2

[Fig. 25]

	Raw-water section			Treatment section (First treatment section)				Second treatment section				Test result
	Impurity ion	Concent- ration [mol/L]	Flow rate [cm/s]	Compo- sition	Concent- ration [mol/L]	Flow rate [cm/s]	Membrane area [cm ²]	Compo- sition	Concent- ration [mol/L]	Flow rate [cm/s]	Membrane area [cm ²]	
Example 22	Ca/Cl ₂	2	8	HCl	6	0	18	NaOH	6	0	18	5. 5/5. 7
Example 23	Ca/Cl ₂	2	8	HCl	12	0	18	NaOH	10	0	18	10. 1/8. 6
Example 24	Ca/Cl ₂	2	8	NaCl	6	0	18	NaOH	6	0	18	5. 6/5. 6
Example 25	Ca/Cl ₂	2	8	HNO ₃	10	0	18	NaOH	10	0	18	8. 1/6. 9
Example 26	Mg/Cl ₂	2	8	H ₂ SO ₄	18	0	18	NaOH	10	0	18	6. 2/6. 8
Example 27	K/Cl	2	8	H ₃ PO ₄	14	0	18	NaOH	10	0	18	14. 1/8. 7
Example 28	K/Cl	2	8	CH ₃ - COOH	8	0	18	Na ₂ CO ₃	5	0	18	6. 7/4. 4

[Fig. 26]

	Raw-water section			Treatment section (First treatment section)				Second treatment section				Test result
	Impurity ion	Concent- ration [mol/L]	Flow rate [cm/s]	Compo- sition	Concent- ration [mol/L]	Flow rate [cm/s]	Membrane area [cm ²]	Compo- sition	Concent- ration [mol/L]	Flow rate [cm/s]	Membrane area [cm ²]	
Example 29	Ca (Cl ₂)	1	8	HCL	12	0	141					10.5
Example 30	Ca (Cl ₂)	1	8	HCL	12	0	565					11.5

[Fig. 27]

	Raw-water section			Treatment section (First treatment section)				Second treatment section				Test result
	Impurity ion	Concent- ration [mol/L]	Flow rate [cm/s]	Compo- sition	Concent- ration [mol/L]	Flow rate [cm/s]	Membrane area [cm ²]	Compo- sition	Concent- ration [mol/L]	Flow rate [cm/s]	Membrane area [cm ²]	
Example 31	Ca (Cl ₂)	1	8	HCl	6	0	18					4.4
Example 32	Ca (Cl ₂)	1	8	HCl	6	0	18					5.7
Example 33	Ca (Cl ₂)	1	8	HCl	6	0	18					5.6

[Fig. 28]

	Raw-water section			Treatment section (First treatment section)				Second treatment section				Test result
	Impurity ion	Concent- ration [mol/L]	Flow rate [cm/s]	Compo- sition	Concent- ration [mol/L]	Flow rate [cm/s]	Membrane area [cm ²]	Compo- sition	Concent- ration [mol/L]	Flow rate [cm/s]	Membrane area [cm ²]	
Example 34	Ca (Cl ₂)	1	8	Na ₂ CO ₃	5	0	18					4.4
Example 35	Br (K)	0.1	8	Ca (OH) ₂	6	0	18					5.1

[Fig. 29]

	Raw-water section			Treatment section (First treatment section)				Test result	
	Impurity ion	Concent- ration [mol/L]	Flow rate [cm/s]	Compo- sition	Concent- ration [mol/L]	Flow rate [cm/s]	Membrane area [cm ²]	Ion-exchange capacity [meq/cm ³]	Leakage of treatment material [meq/cm ³]
Example 36	Ca (Cl ₂)	0.001	4	NaCl	2	4	18	1.8	0.2
Example 37	Ca (Cl ₂)	0.001	4	NaCl	2	4	18	1.9	0.1

[Fig. 30]

	Raw-water section			Treatment section				Auxiliary treatment section		
	Impurity ion	Concent-ration [mol/L]	Flow rate [cm/s]	Compo-sition	Concent-ration [mol/L]	Flow rate [cm/s]	Membrane area [cm ²]	Ion exchanger	Flow rate [cm/s]	Exchanger volume [cm ³]
Example 38	Ca (Cl ₂)	0.001	4	NaCl	2	0	18			
Example 39	Ca (Cl ₂)	0.001	4	NaCl	2	0	18	Resin	8	10

	Test result			
	Ion-exchange capacity [meq/cm ³]	Treatment time [min]	Amount of treatment material leaked [meq/cm ³]	
Example 38	1.8	6	0.22	
Example 39	1.7	3	0.22	

[Fig. 31]

	Raw-water section					Treatment section				Test result	
	Impurity ion	Concent-ration [mol/L]	Flow rate [cm/s]	Shape of packed ion exchanger	Volume of packed ion exchanger	Compo-sition	Concent-ration [mol/L]	Flow rate [cm/s]	Membrane area [cm ²]	Ion-exchange capacity [meq/cm ³]	Treatment time [min]
Example 40	Ca (Cl ₂)	0.001	4	Spherical	5.4	NaCl	2	0	18	1.8	4
Example 41	Ca (Cl ₂)	0.001	4	Fibrous	9	NaCl	2	0	18	1.8	2

[Fig. 32]

	Raw-water section			Treatment section					
	Impurity ion	Concentration [mol/L]	Flow rate [cm/s]	Composition	Molecular weight [g/mol]	Amount of Na	Concentration [mol/L]	Flow rate [cm/s]	Membrane area [cm ²]
Example 42	Ca (Cl ₂)	0.001	4	Sodium oxalate	134	2	2	0	18
Example 43	Ca (Cl ₂)	0.001	4	Sodium glutamate	169	1	2	0	18
Example 44	Ca (Cl ₂)	0.001	4	Na ₄ P ₂ O ₇	266	4	2	0	18
Example 45	Ca (Cl ₂)	0.001	4	Sodium stearate	306	1	2	0	18
Example 46	Ca (Cl ₂)	0.001	4	Na ₄ P ₂ O ₇	266	4	2	4	18

[Fig. 33]

	Test result		
	Ion-exchange capacity [meq/cm ³]	Leakage of treatment material [meq/cm ³]	Treatment time [min]
Example 42	3.5	0.15	7
Example 43	1.2	0.12	6
Example 44	4.6	0	6
Example 45	2.0	0	7
Example 46	4.6	0	5

[Fig. 34]

