

Fig.1

Practical example	In/(In+Zn+Sn)	Zn/(In+Zn+Sn)	Sn/(In+Zn+Sn)	Third component element M (whole metal)	Work function of sputtering target material(*)
1-1	0.93	0.17	0	Ce 0.03	5.61
1-2	0.93	0.17	0	Ce 0.06	
1-3	0.93	0.17	0	Sm 0.05	
1-4	0.93	0.17	0	Eu 0.10	
1-5	0.93	0.17	0	Bi 0.06	
1-6	0.89	0.06	0.05	Hf 0.05	
1-7	0.91	0	0.09	Ta 0.05	
1-8	0.91	0	0.09	Tb 0.05	
1-9	1.00	0	0	Ce 0.06	5.6
Comparative example					
1-1	0.83	0.17	0	-	4.75 5.22
1-2	0.91	0	0.09	-	
1-3	0	0	0	Ce 1	5.41

(*) Work function (AC-1: from Riken Keiki), in units of : eV

Fig.2

Practical example	Density g/cc	Bulk resistivity mΩ cm	Glass substrate				Film substrate			
			Resistivity*1	Transparency*2	Work function*3	Etching property*4	Resistivity*1	Transparency*2	Work function*3	
1-1	6.62	2.3	960	89	5.72	◎	980	87	5.70	
1-2	6.71	0.87	1850	90	6.03	◎	1890	89	5.93	
1-3	6.76	103	750	88	5.82	◎	810	87	5.80	
1-4	6.81	2.4	460	89	5.78	◎	610	88	5.73	
1-5	6.93	0.82	880	87	5.63	◎	960	87	5.61	
1-6	6.95	0.96	670	88	5.62	◎	750	88	5.60	
1-7	6.92	0.72	540	89	6.20	◎	540	88	6.17	
1-8	6.91	1.05	840	89	5.65	◎	860	88	5.61	
1-9	6.78	2.8	1250	89	5.68	◎	1450	88	5.66	
Comparative example										
1-1	6.65	2.5	380	89	5.22	◎	420	88	5.18	
1-2	6.85	0.46	170	90	4.92	×	680	89	4.88	
1-3	6.90	NA	NA	89	5.58	×	NA	88	5.55	

*1 : Four probe method (Loresta: from Mitsubishi Petrochemical), in unit of : $\mu\Omega\text{cm}$

*2 : Transmittance at 550 nm, in unit of : %

*3 : Work function (AC-1: from Riken Keiki), in unit of : eV

*4 : Evaluation on etching property depends on the presence/absence of residues occurring on each thin film after etching in a mixed acid of phosphoric acid -acetic acid-nitric acid type

◎: no residue at all ○: little residue △: a slight amount of residues ×: a large amount of residues, or unetchable

NA: resistivity $>M\Omega\cdot\text{cm}$

Fig.3

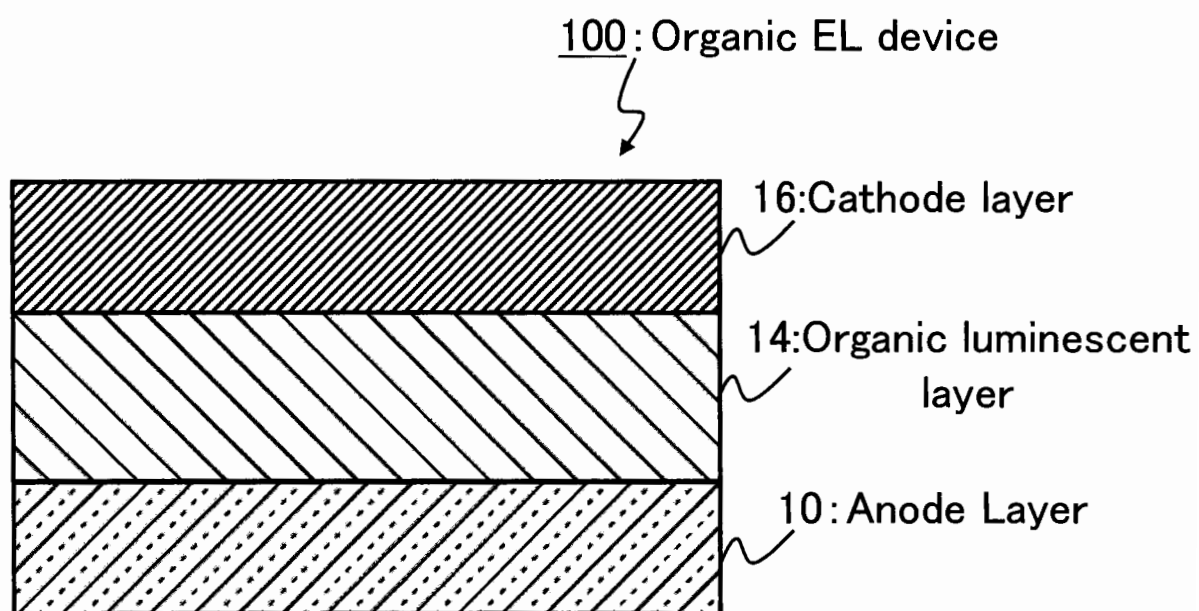


Fig.4

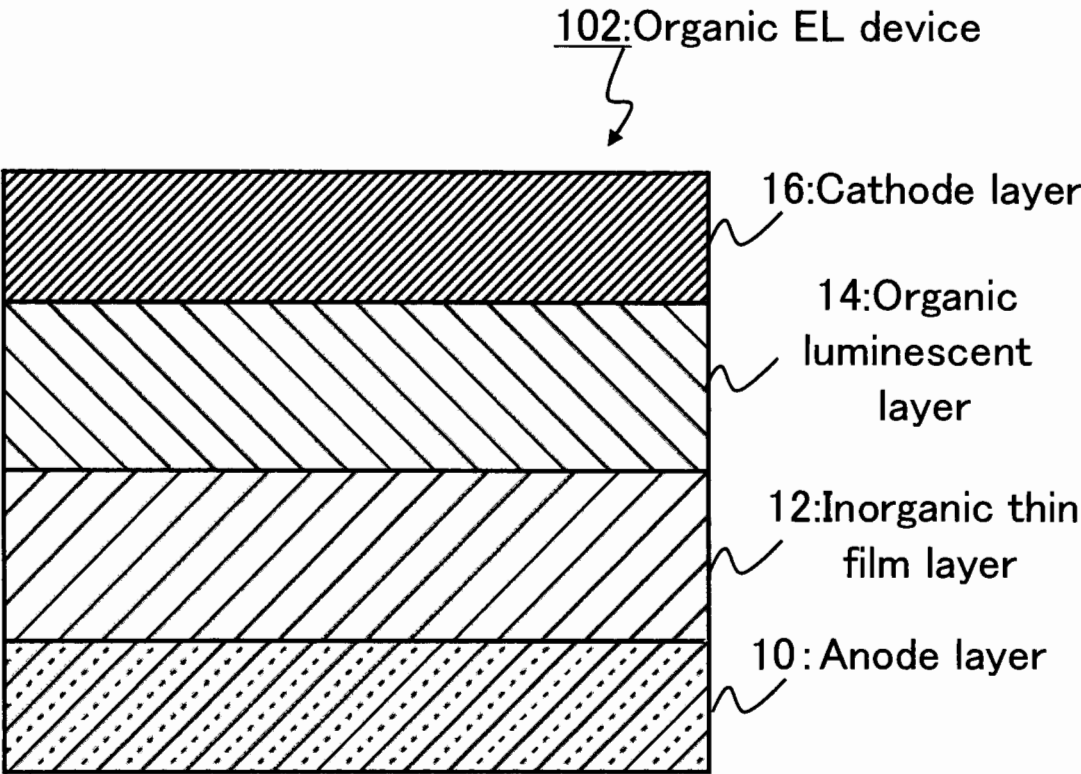


Fig.5

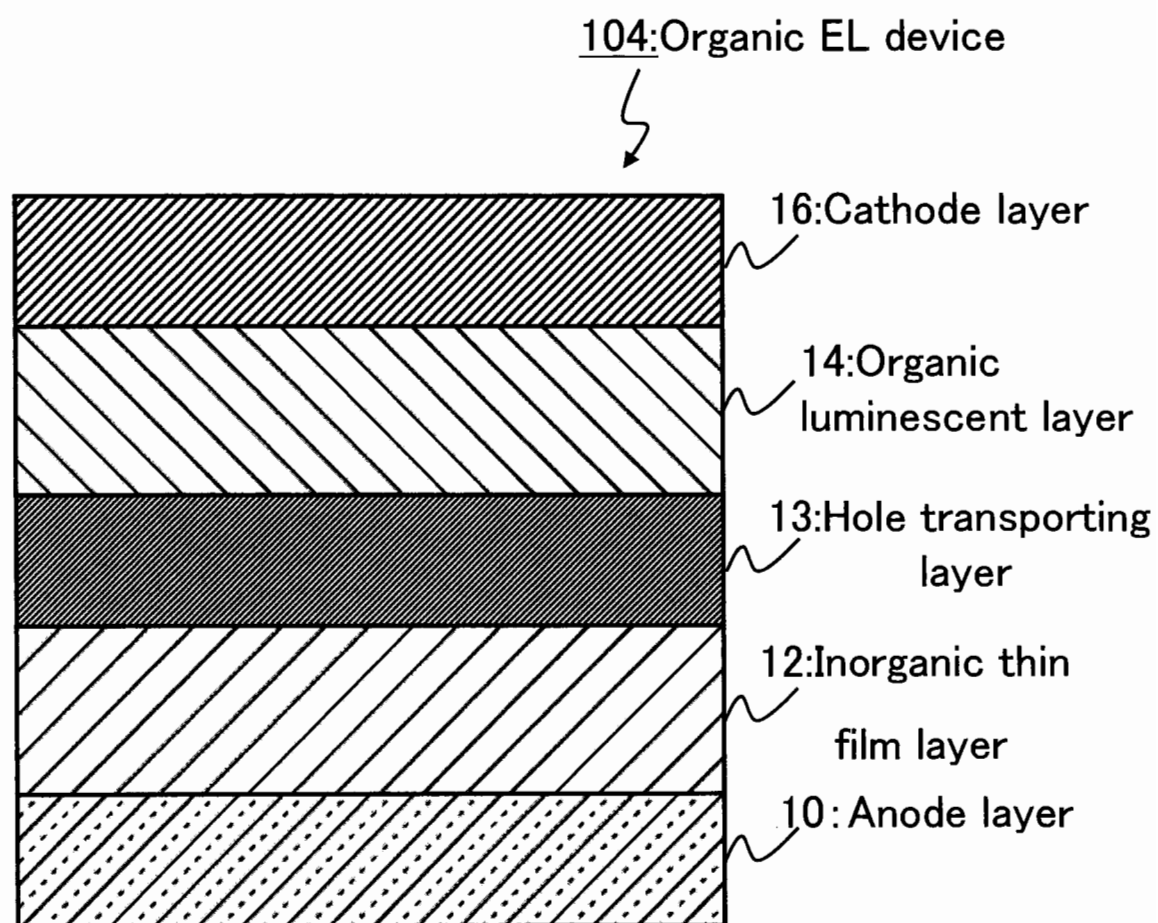


Fig.6

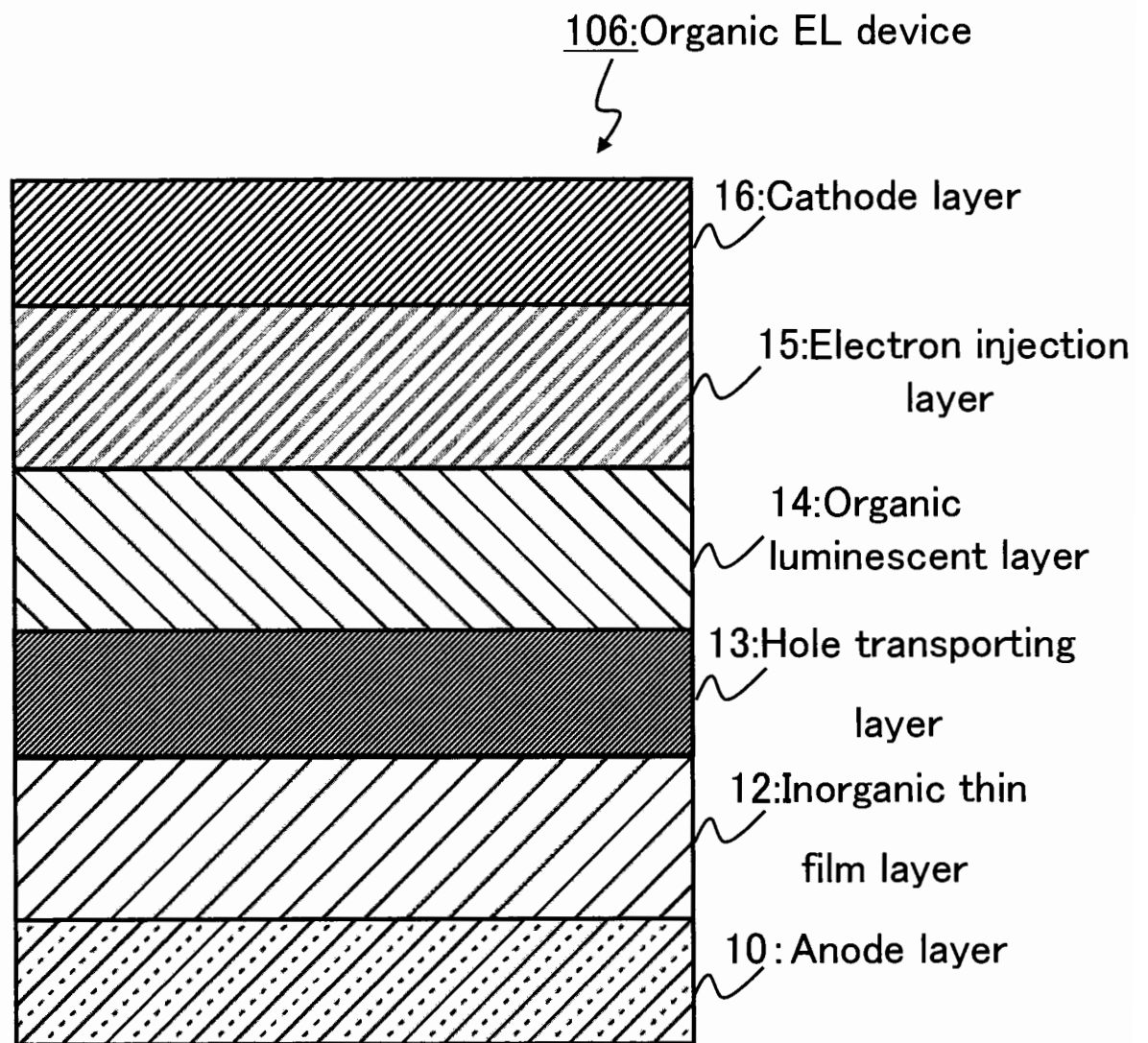


Fig.7

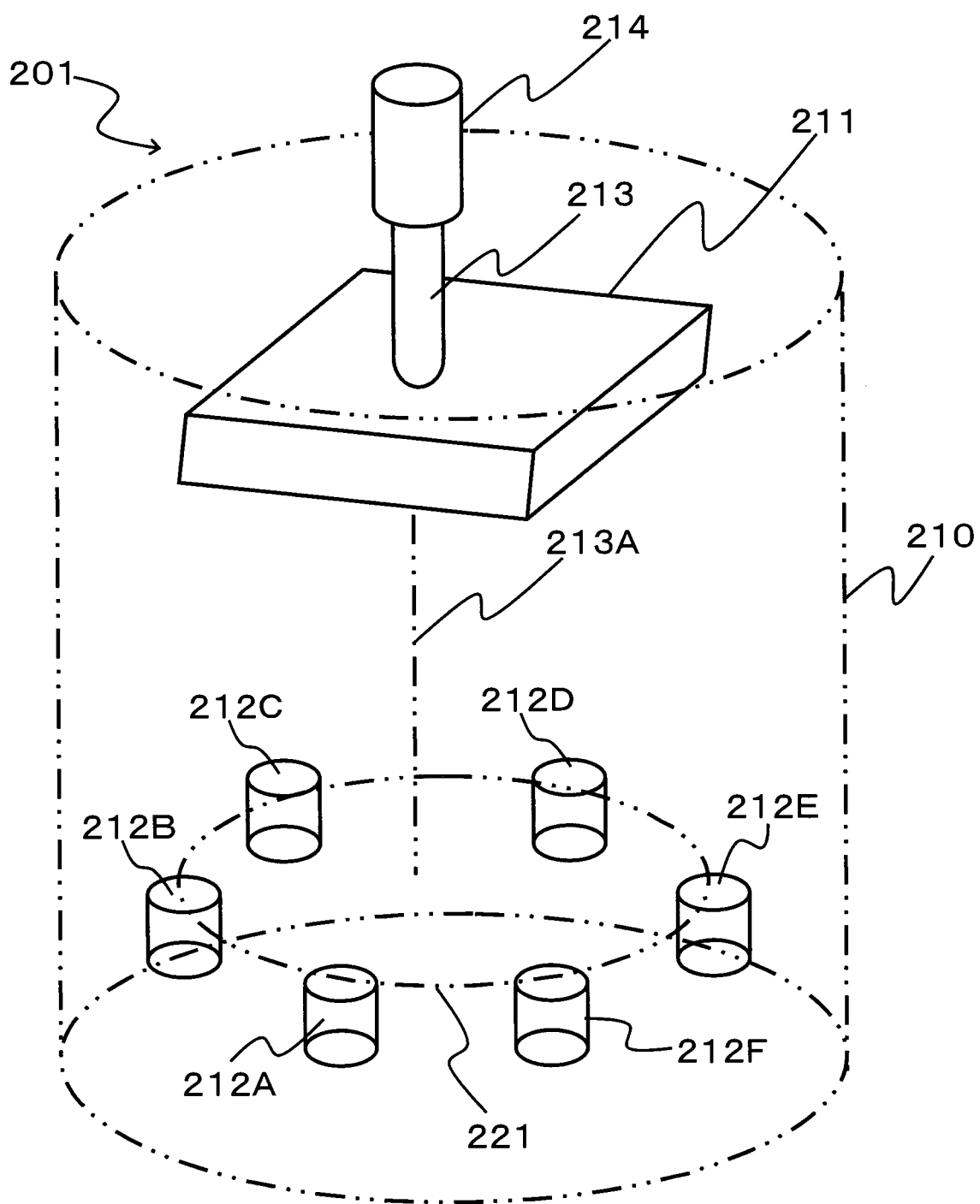


Fig.8

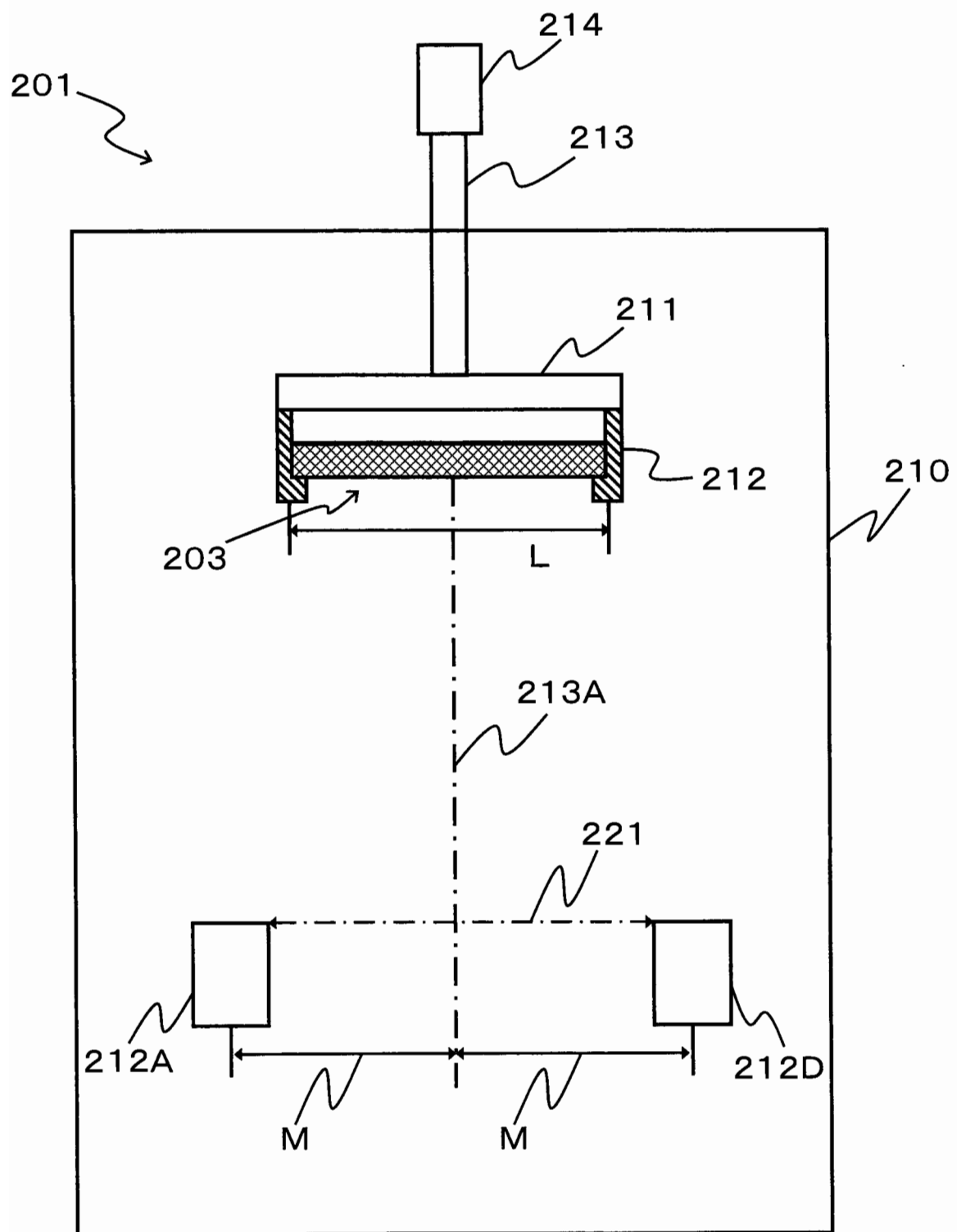


Fig.9

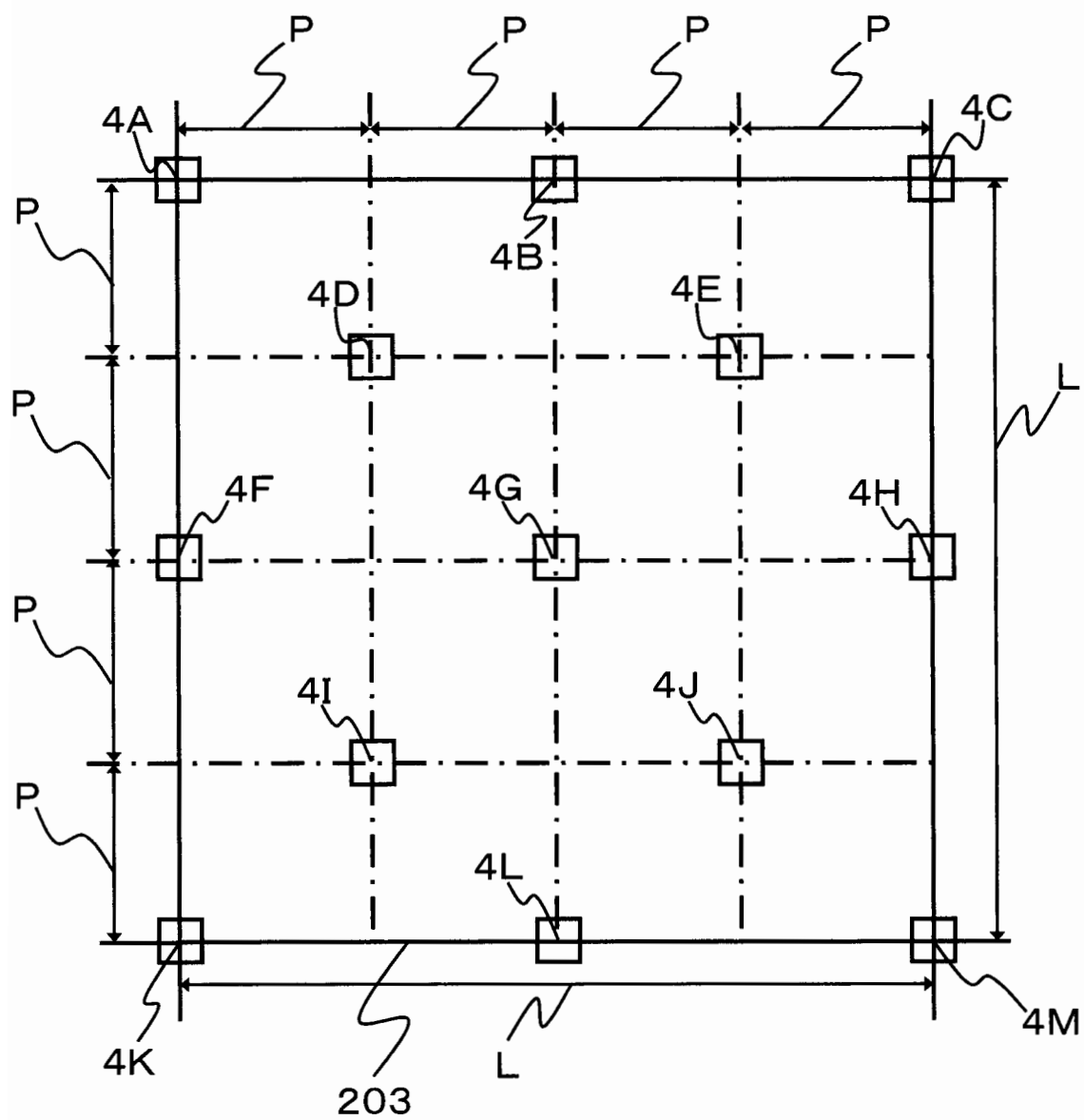


Fig.10

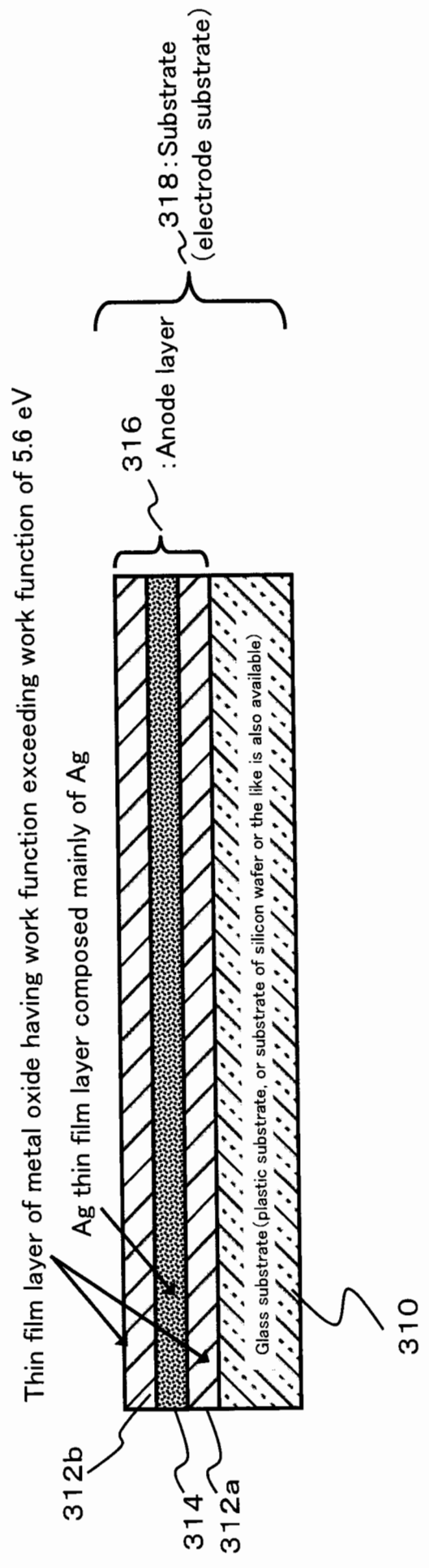


Fig.11

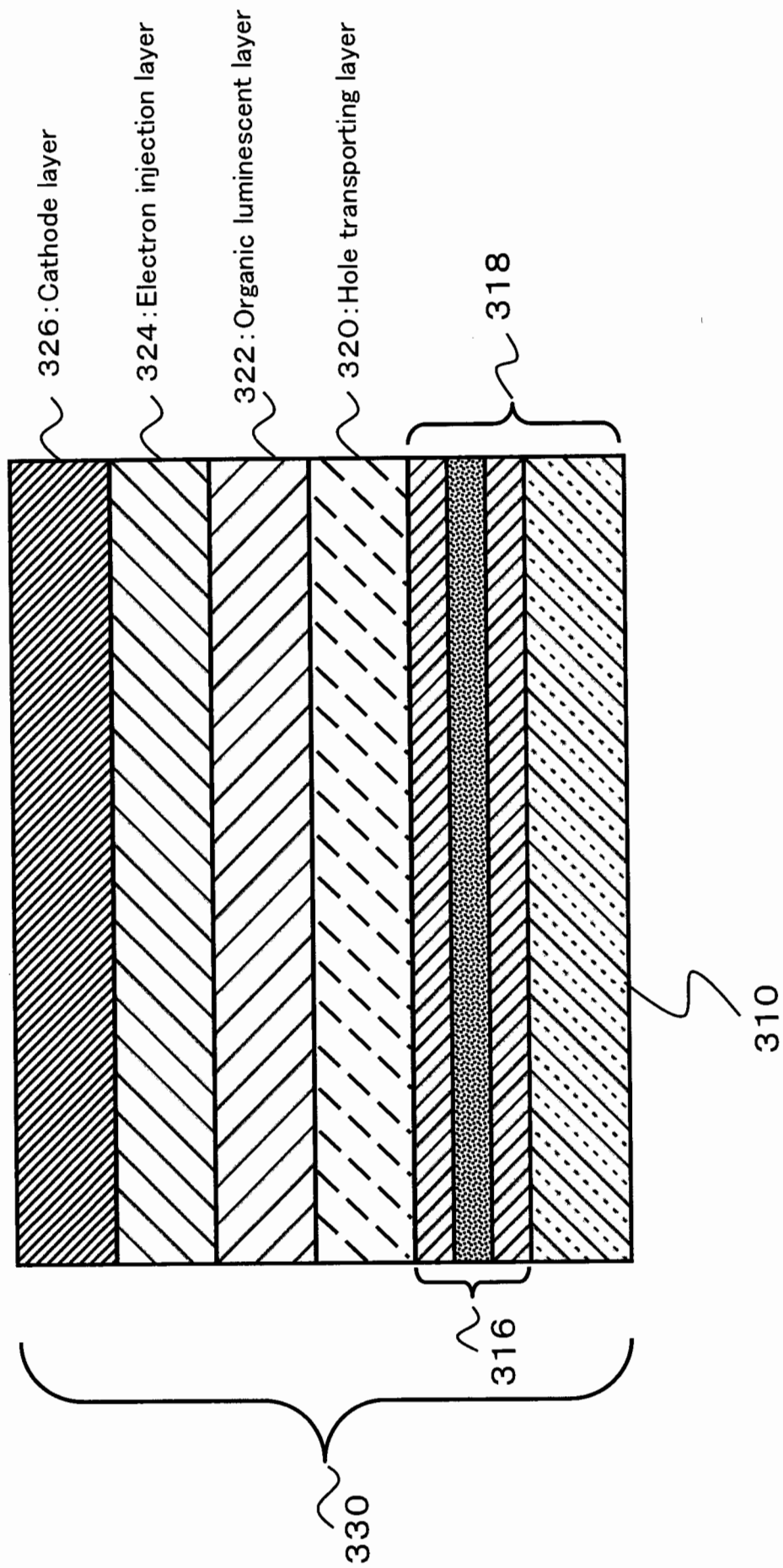


Fig.12

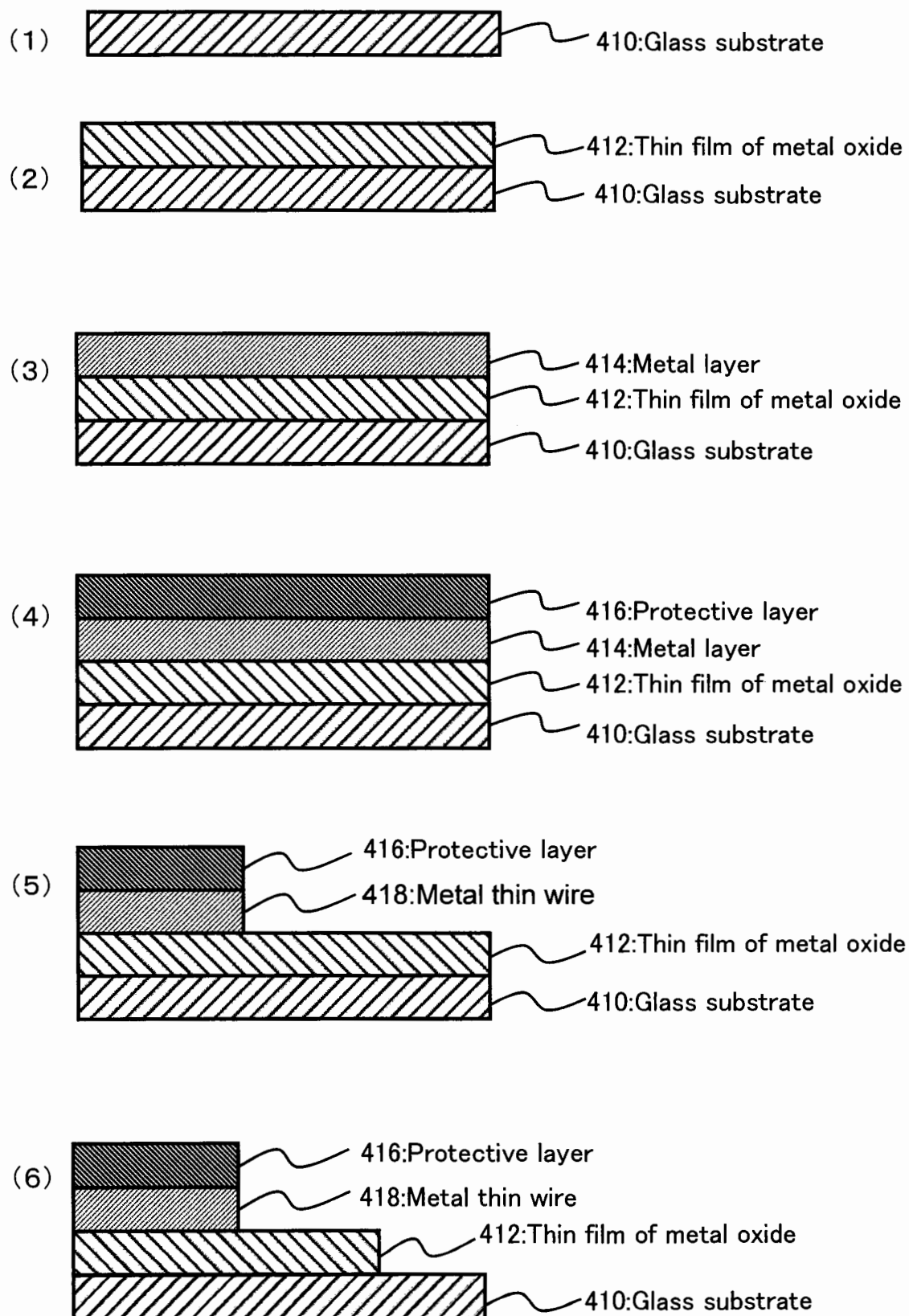


Fig.13

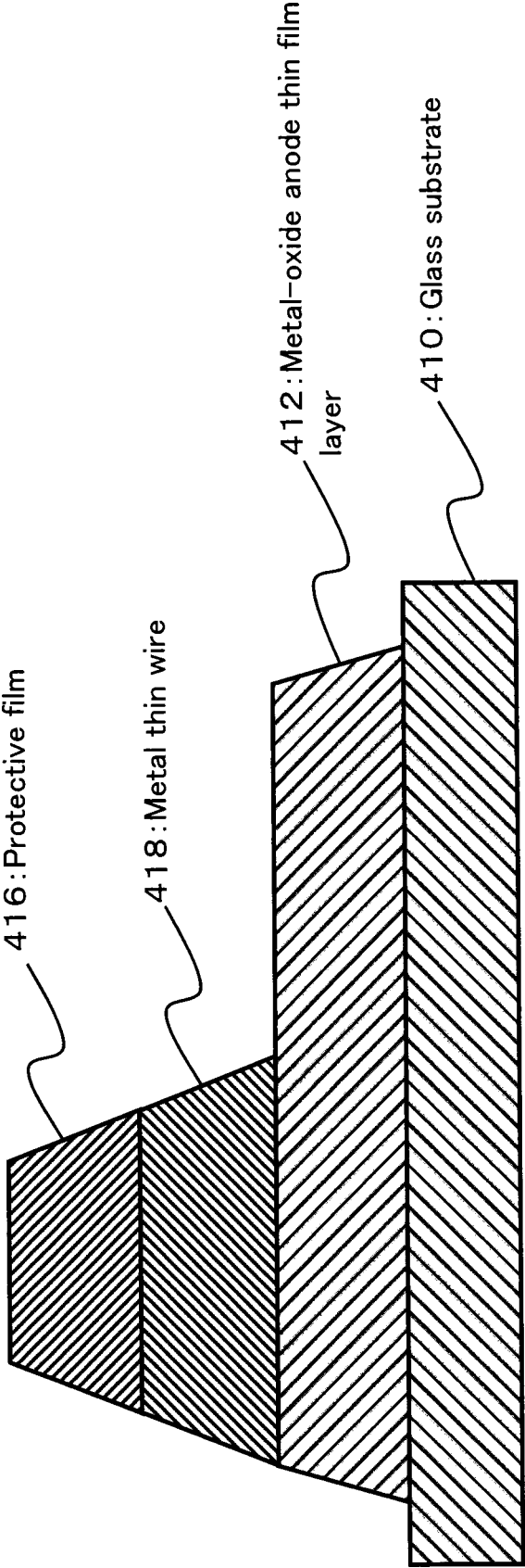


Fig.14

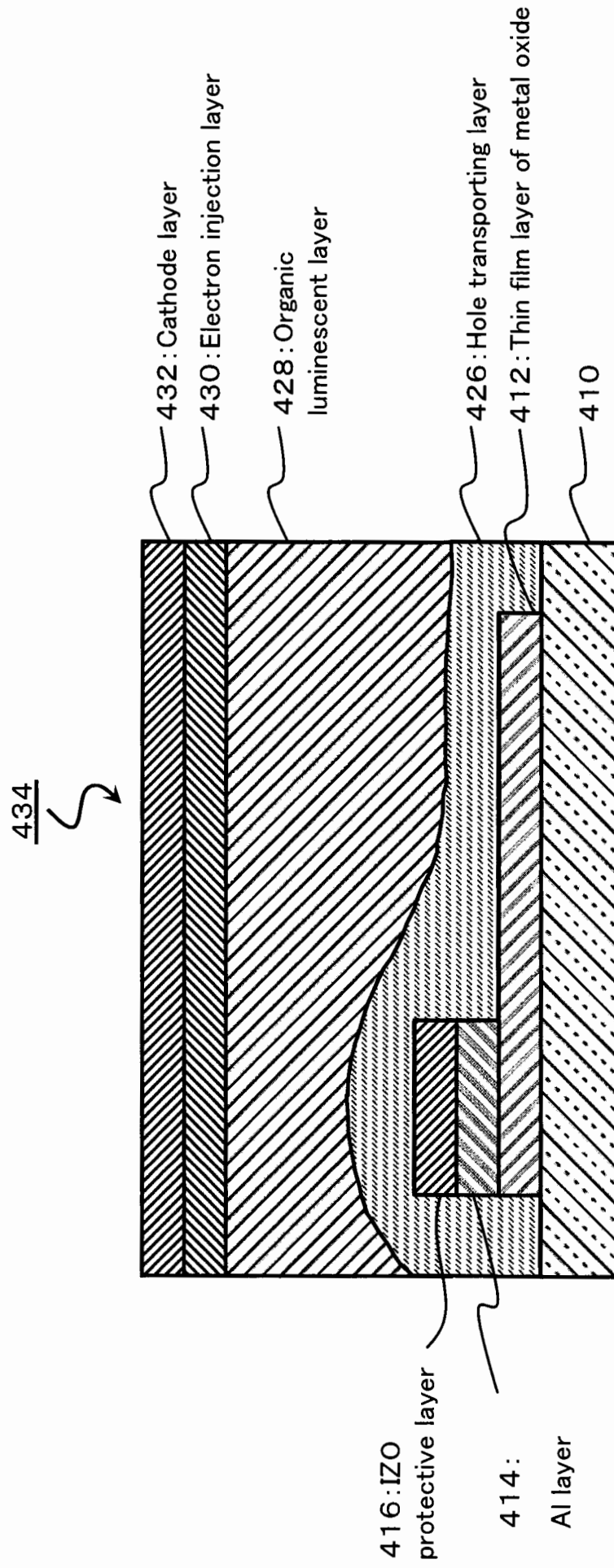


Fig.15

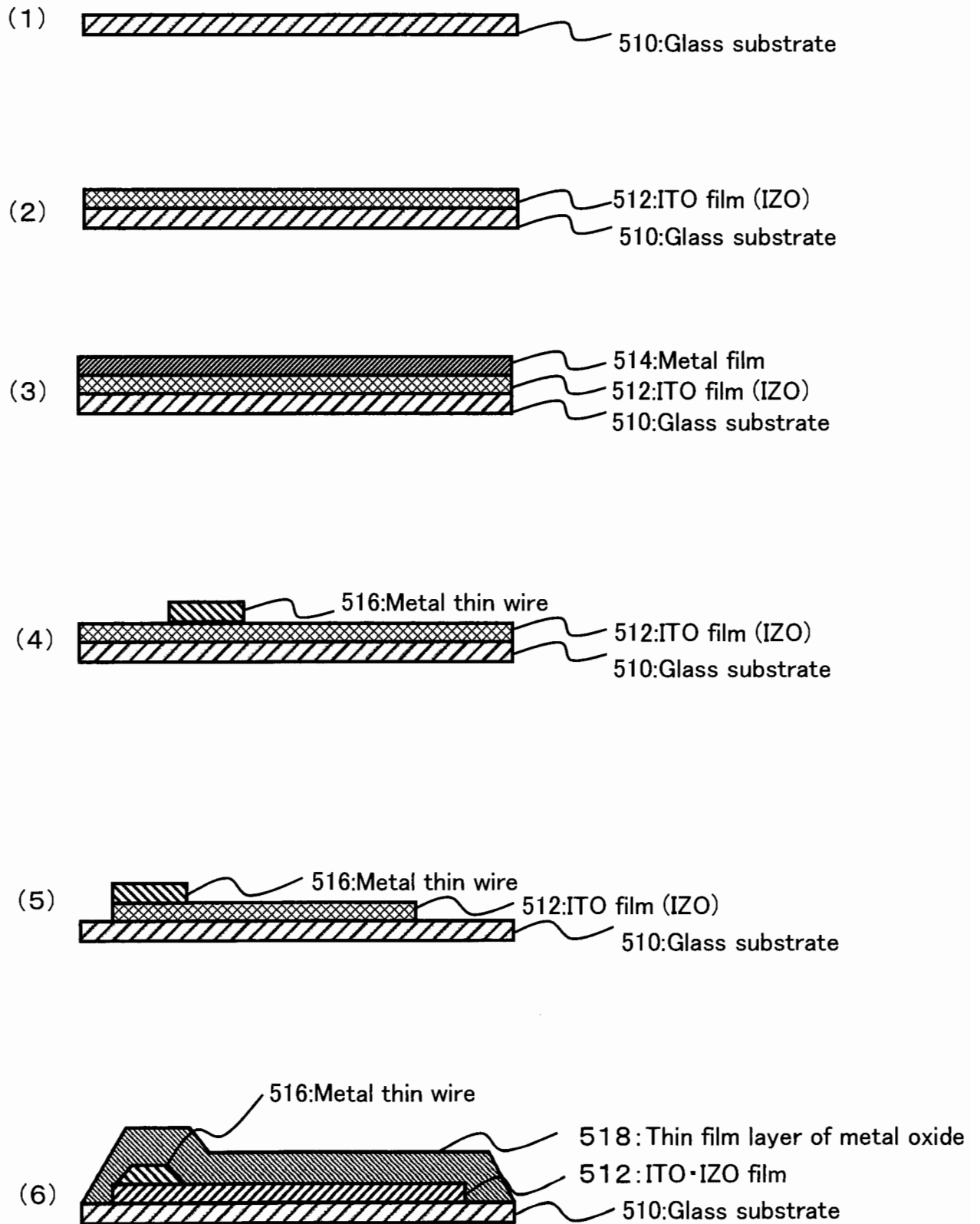


Fig.16

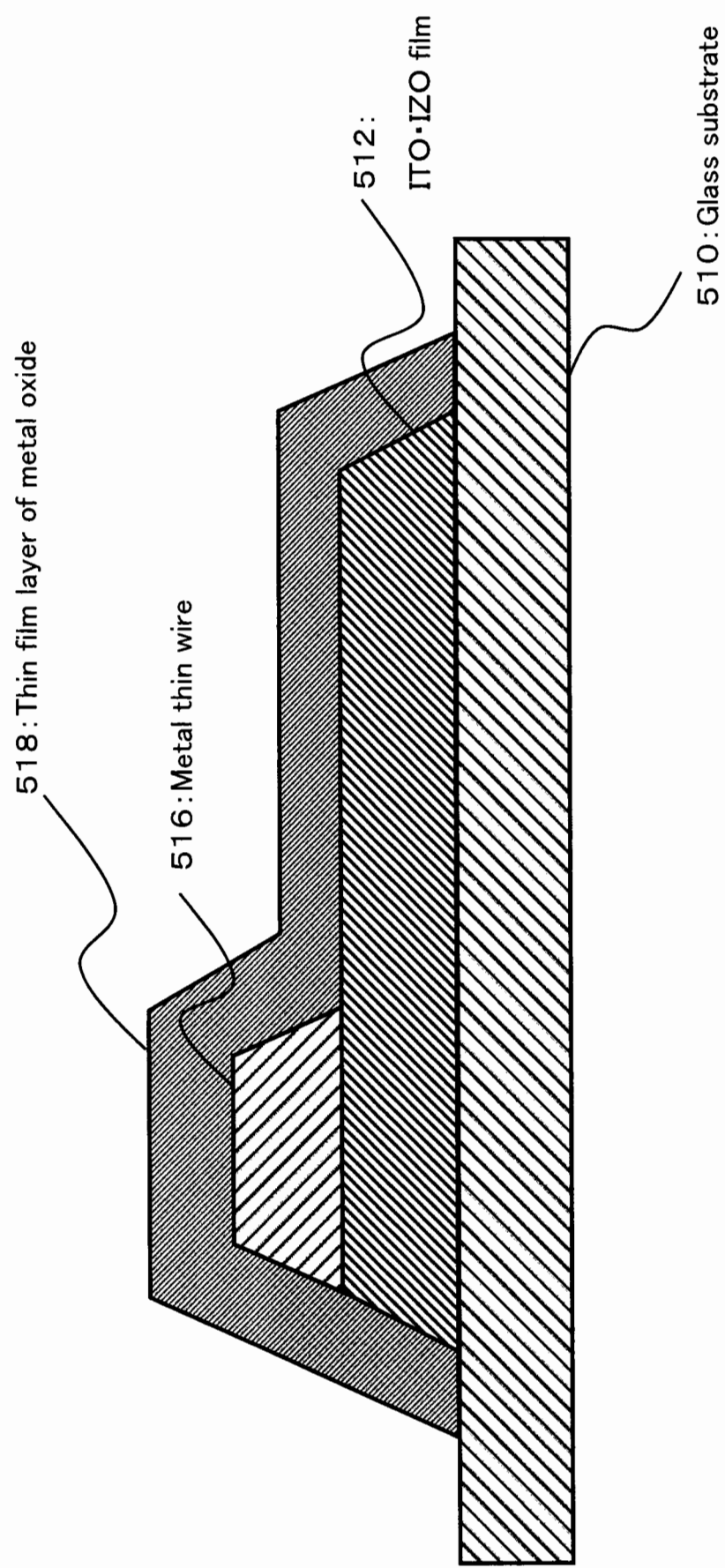


Fig.17

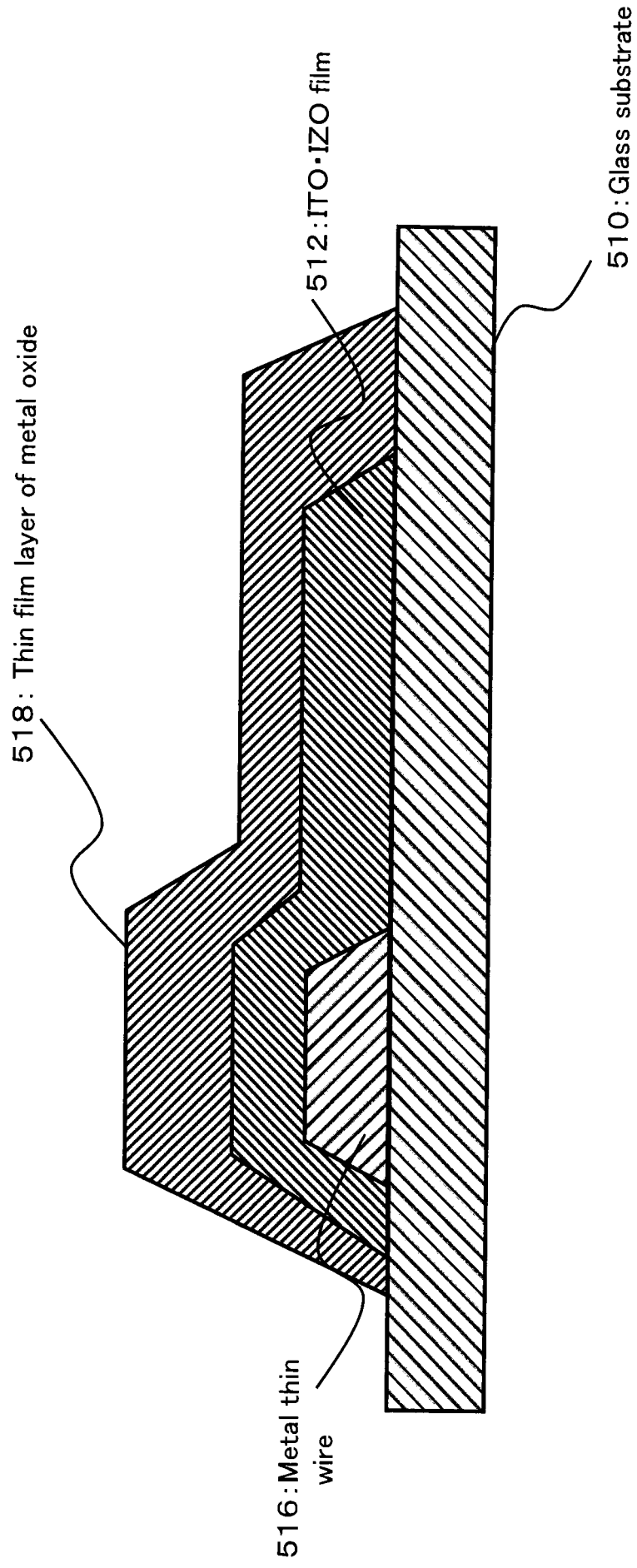


Fig.18

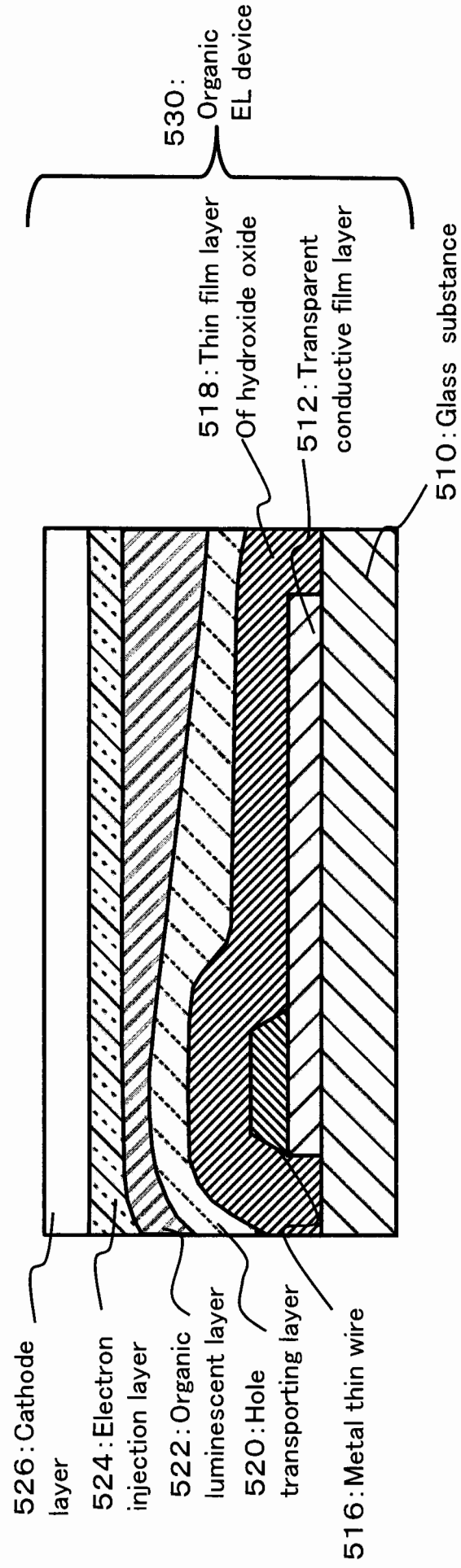
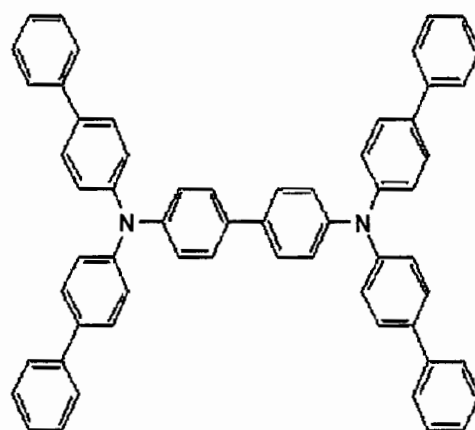
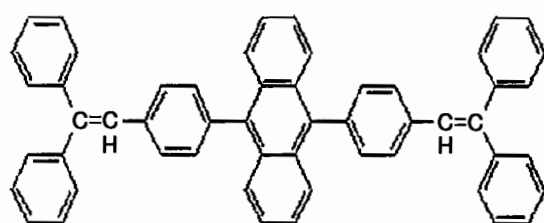


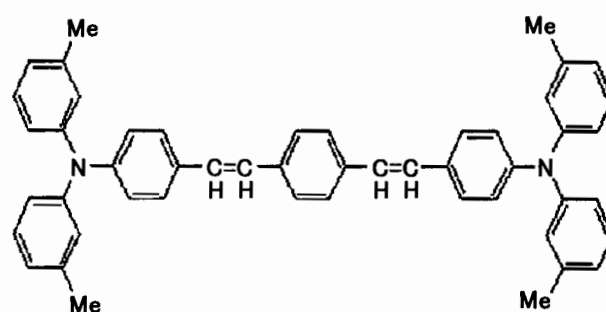
Fig.19



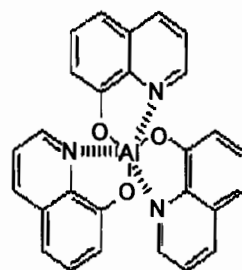
TBDB



DPVDPAN



D1



Alq