Claims

1. A spatial light modulator including:

a first reflector;

a second reflector; and

a liquid crystal layer between the first reflector and the second reflector;

wherein the first reflector comprises a first electrode and a distributed Bragg reflector, the distributed Bragg reflector is disposed between the liquid crystal layer and the first electrode;

wherein the second reflector comprises a second electrode;

~~wherein at least one reflector selected from the first reflector and the second reflector comprises a distributed Bragg reflector;~~ and

wherein the first reflector and the second reflector form a Fabry-Perot cavity.

2. The spatial light modulator according to claim 1,

wherein the first electrode comprises a continuous indium tin oxide layer.

3. The spatial light modulator according to claim 1,

wherein the second electrode comprises a discontinuous aluminum layer.

4. The spatial light modulator according to claim 1,

wherein the distributed Bragg reflector comprises a first plurality of layers of a first refractive index alternatively arranged with a second plurality of layers of a second refractive index different from the first refractive index.

5. The spatial light modulator according to claim 4,

wherein a real part of the first refractive index is greater than 2; and

wherein a real part of the second refractive index is smaller than 2.

6. The spatial light modulator according to claim 4,

wherein an imaginary part of the first refractive index is smaller than 0.1; and

wherein an imaginary part of the second refractive index is smaller than 0.1.

7. The spatial light modulator according to claim 4,

wherein the first plurality of layers of the first refractive index comprises titanium dioxide; and

wherein the second plurality of layers of the second refractive index comprises silicon dioxide.

8. The spatial light modulator according to claim 4,

wherein each layer of the first plurality of layers in a first portion of the distributed Bragg reflector has a first thickness;

wherein each layer of the first plurality of layers in a second portion of the distributed Bragg reflector has a second thickness different from the first thickness;

wherein each layer of the second plurality of layers in a first portion of the distributed Bragg reflector has a third thickness;

wherein each layer of the second plurality of layers in a second portion of the distributed Bragg reflector has a fourth thickness different from the third thickness.

9. The spatial light modulator according to claim 1,

wherein the spatial light modulator is configured to exhibit multiple resonances upon receiving incident light; and

wherein the spatial light modulator is configured such that frequencies of the multiple resonances shift upon varying a voltage difference applied between the first electrode and the second electrode.

10. The spatial light modulator according to claim 1,

wherein the ~~first~~ second reflector further comprises ~~the~~ a further distributed Bragg reflector, the further distributed Bragg reflector is disposed between the liquid crystal layer and the second electrode.

~~11. The spatial light modulator according to claim 10,~~

~~wherein the first electrode is between the distributed Bragg reflector and the liquid crystal layer.~~

~~12. The spatial light modulator according to claim 10,~~

~~wherein the distributed Bragg reflector is between the first electrode and the liquid crystal layer.~~

~~13~~11. The spatial light modulator according to claim 1,

wherein the second reflector comprises one or more further second electrodes so that the second electrode and the one or more further second electrodes form a plurality of second electrodes.

~~14~~12. The spatial light modulator according to claim ~~13~~11,

wherein liquid crystals comprised in different portions of the liquid crystal layer are configured to be oriented differently by applying a common voltage to the first electrode and different voltages to each of the plurality of second electrodes.

~~15~~13. A method of forming a spatial light modulator, the method comprising:

forming a first reflector;

forming a second reflector; and

forming a liquid crystal layer between the first reflector and the second reflector;

wherein the first reflector comprises a first electrode and a distributed Bragg reflector, the distributed Bragg reflector is disposed between the liquid crystal layer and the first electrode;

wherein the second reflector comprises a second electrode;

~~wherein at least one reflector selected from the first reflector and the second reflector comprises a distributed Bragg reflector;~~ and

wherein the first reflector and the second reflector form a Fabry-Perot cavity.

~~16~~14. The method according to claim ~~15~~13,

wherein the distributed Bragg reflector comprises a first plurality of layers of a first refractive index alternatively arranged with a second plurality of layers of a second refractive index different from the first refractive index.

~~17~~15. The method according to claim ~~16~~14,

wherein each layer of the first plurality of layers in a first portion of the distributed Bragg reflector has a first thickness;

wherein each layer of the first plurality of layers in a second portion of the distributed Bragg reflector has a second thickness different from the first thickness;

wherein each layer of the second plurality of layers in a first portion of the distributed Bragg reflector has a third thickness;

wherein each layer of the second plurality of layers in a second portion of the distributed Bragg reflector has a fourth thickness different from the third thickness.

~~18~~16. The method according to claim ~~15~~13,

wherein the spatial light modulator is configured to exhibit multiple resonances upon receiving incident light; and

wherein the spatial light modulator is configured such that frequencies of the multiple resonances shift upon varying a voltage difference applied between the first electrode and the second electrode.

~~19~~17. The method according to claim ~~15~~13,

wherein the second reflector comprises one or more further second electrodes so that the second electrode and the one or more further second electrodes form a plurality of second electrodes.

~~20~~18. The method according to claim 1~~9~~7,

wherein liquid crystals comprised in different portions of the liquid crystal layer are oriented differently by applying a common voltage to the first electrode and different voltages to each of the plurality of second electrodes.

19. The method according to claim 13, further comprising:

switching the liquid crystals by applying a potential difference or voltage across the first electrode and the second electrode.

20. The method according to claim 13,

wherein the second reflector further comprises a further distributed Bragg reflector, the further distributed Bragg reflector is disposed between the liquid crystal layer and the second electrode.