CLAIMS

1. Micromechanical unit, in particular an adjustable optical filter comprising a first device layer and a second substrate layer at least partially fastened to each other, wherein the device layer comprises a number of moveable reflecting elements distributed between a number of fixed reflecting elements, where the fixed elements are fastened to the substrate through a dielectric layer, and where a cavity is defined in the substrate and each movable element, each movable element being set up to provide a controllable movement into the cavity, and wherein a number of dielectric spacer blocks are placed in the cavities between each movable element and the substrate in which the cavity is made, wherein the spacer blocks are made in the same dielectric material as said dielectric layer fastening the substrate to the fixed elements and being provided with a rough surface, the spacer blocks being positioned at the substrate within said cavities, the cavities being provided into said substrate using an etching process.

2. Unit according to claim 1, where the movable elements and the substrate are connected to a voltage source to apply a voltage between the movable elements and the substrate to create an electrostatic force between them and thereby move the element in relation to the substrate.

3. Unit according to claim 1, where a dielectric layer separates all the beams from the substrate, where the dielectric layer has an even thickness and where it constitutes the spacer blocks between the movable beams and the substrate.

4. Unit according to claim 1, where the spacer blocks have a contact surface against the movable beams which encompasses a considerably smaller part of the total area of the beams, preferably less than 1%.

5. Unit according to claim 1, where the unit is an optical filter and where the depth of the cavities are of the order of ¼ of the wavelength of the light in the relevant area.

6. Method to produce a unit according to claim 1, with a number of movable beams of a predetermined form comprising the following steps:

a) using an etching process formation of a number of recesses in a substrate wafer of a selected material with a chosen depth in a surface on the substrate wafer, where the recesses present a pattern on the surface of the substrate corresponding to the placing and form of the movable beams,, said etching process providing a rough substrate surface in said recesses,

b) providing a dielectric layer on the surface of the substrate wafer with the recesses, said dielectric layer obtaining a rough surface in said recesses,

c) removing said dielectric layer in said recesses providing a pattern defining spacer blocks with rough surface in predetermined positions in said recesses,

d) fastening of an upper device layer on said dielectric layer,

e) dividing the upper layer to form movable beams in said pattern over said recesses.

7. Method according to claim 6, where step c) comprises etching of the dielectric layer in the recesses to form separate spacer blocks with a height that corresponds to the thickness of the dielectric layer and set up to have a contact surface against the movable beams that constitutes a considerably smaller part than the area of the beams.

8. Method according to claim 6, where step d) encompasses a so called fusion bonding process.

9. Method according to claim 6, where the upper device layer is supplied with a reflecting surface.

10. Method according to claim 6, where the upper device layer is supplied with a diffractive relief pattern.

CLAIMS

1. Micromechanical unit comprising a device layer and a substrate layer at least partially fastened to each other, wherein the device layer comprises a number of moveable beams distributed between a number of fixed beams, where the fixed beams are fastened to the substrate through a dielectric layer, and where a cavity is defined between the substrate and each movable beam, each movable beam being set up to provide a controllable movement into the cavity, and wherein a number of dielectric spacer blocks are placed in the cavities between each movable beam and the substrate in which the cavity is made, wherein the spacer blocks are made in the same dielectric material as said dielectric layer fastening the substrate to the fixed beams, the spacer blocks being positioned at the substrate within said cavities, the cavities being provided into said substrate using an etching process.

2. Unit according to claim 1, where the movable elements and the substrate are connected to a voltage source to apply a voltage between the movable beams and the substrate to create an electrostatic force between them and thereby move the movable beams in relation to the substrate.

3. Unit according to claim 1, where a dielectric layer separates all the movable beams and the fixed beams from the substrate, where the dielectric layer has an even thickness and where it constitutes the spacer blocks between the movable beams and the substrate.

4. Unit according to claim 1, where the spacer blocks have a contact surface against the movable beams which encompasses less than 1% of the total area of the movable beams.

5. Unit according to claim 1, where the unit is an optical filter and where the depth of the cavities are of the order of 1/4 of the wavelength of the light.

6. Method to produce a unit according to claim 1, with a number of movable beams of a predetermined form comprising the following steps:

a) using an etching process for forming a number of recesses having a chosen depth in a surface of a substrate wafer of a selected material, where the recesses present a pattern on the surface of the substrate corresponding to the placing and form of the movable beams,

b) providing a dielectric layer on the surface of the substrate wafer with the recesses,

c) removing said dielectric layer in said recesses providing a pattern defining spacer blocks in predetermined positions in said recesses,

d) fastening of an upper device layer on said dielectric layer,

e) dividing the upper device layer to form movable beams in said pattern over said recesses.

7. Method according to claim 6, where step c) comprises etching of the dielectric layer in the recesses to form separate spacer blocks with a height that corresponds to the thickness of the dielectric layer and set up to have a contact surface against the movable beams that constitutes a considerably smaller part than the area of the beams.

8. Method according to claim 6, where step d) encompasses a so called fusion bonding process.

9. Method according to claim 6, where the upper device layer is supplied with a reflecting surface.

10. Method according to claim 6, where the upper device layer is supplied with a diffractive relief pattern.