CLAIMS

1. A transducer comprising:

a substrate, wherein a cavity is defined at least partially through the substrate;

at least one stopper structure arranged within the cavity;

a support layer arranged over the at least one stopper structure and the cavity to seal the cavity; and

a piezoelectric functional arrangement arranged on the support layer;

wherein the substrate comprises a semiconductor;

wherein the at least one stopper structure comprises a semiconductor base comprising the semiconductor, and a polymer coat on the semiconductor base; and

wherein the support structure is an arrangement of a first oxide layer, a semiconductor layer on the first oxide layer, and a second oxide layer on the semiconductor layer so that the first oxide layer comes into contact with the stopper structure upon the support layer undergoing deformation.

2. The transducer as claimed in claim 1, wherein the support layer is arranged directly on the substrate.

3. The transducer as claimed in claim 1, wherein the piezoelectric functional arrangement is arranged directly on the support layer.

4. The transducer as claimed in claim 1, wherein the at least one stopper structure extends from a base surface of the cavity.

5. The transducer as claimed in claim 1, wherein the at least one stopper structure comprises an elongate structure.

6. The transducer as claimed in claim 1, wherein the at least one stopper structure comprises a ring structure.

7. The transducer as claimed in claim 1, wherein the at least one stopper structure comprises a tapered top region.

8. The transducer as claimed in claim 1, wherein the transducer comprises a plurality of stopper structures arranged within the cavity.

9. The transducer as claimed in claim 8, wherein the plurality of stopper structures are arranged in at least one concentric pattern.

10. The transducer as claimed in claim 8, wherein adjacent stopper structures of the plurality of stopper structures are arranged spaced apart from each other.

11. The transducer as claimed in claim 1, wherein the piezoelectric functional arrangement comprises a pair of electrodes and a piezoelectric element arranged in between the pair of electrodes.

12. The transducer as claimed in claim 1, further comprising an ultrasound frequency signal generating circuit electrically coupled to the piezoelectric functional arrangement.

13. The transducer as claimed in claim 1, further comprising an acoustic signal detector.

14. The transducer as claimed in claim 1, wherein a depth of the cavity is larger than about 1 μm.

15. The transducer as claimed in claim 1, wherein in an equilibrium position, a distance between a top surface of the at least one stopper structure and a lower surface of the support layer is between about 0.2 μm and about 10 μm.

16. The transducer as claimed in claim 1, wherein the cavity is at least substantially vacuum sealed.

17. A method for forming a transducer, the method comprising:
forming a cavity at least partially through a substrate;
forming at least one stopper structure within the cavity;
forming a support layer over the at least one stopper structure and the cavity to seal the cavity; and

forming a piezoelectric functional arrangement on the support layer;

wherein the substrate comprises a semiconductor;

wherein the at least one stopper structure comprises a semiconductor base comprising the semiconductor, and a polymer coat on the semiconductor base; and

wherein the support structure is an arrangement of a first oxide layer, a semiconductor layer on the first oxide layer, and a second oxide layer on the semiconductor layer so that the first oxide layer comes into contact with the stopper structure upon the support layer undergoing deformation.