**CLAIMS**

1. An accelerometer comprising:

a pivot arm having a first end region and a second end region opposite to the first end region;

a pivot coupled to the pivot arm;

an annular predefined mass having a peripheral part coupled to the first end region or the second end region of the pivot arm;

a first capacitive sensor located at the first end region of the pivot arm; and

a second capacitive sensor located at the second end region of the pivot arm such that the pivot is arranged between the first capacitive sensor and the second capacitive sensor,

wherein the predefined mass is configured to move in response to an acceleration force along a predefined direction; and

wherein the first capacitive sensor and the second capacitive sensor are configured to determine a differential capacitance value which relates to the acceleration force.

2. The accelerometer of claim 1, wherein the pivot arm comprises a non-compliant pivot arm and wherein the peripheral part of the predefined mass is coupled to the first end region or the second end region of the pivot arm via a compliant connector.

3. The accelerometer of claim 2, wherein the compliant connector comprises a link spring.

4. The accelerometer of claim 3, wherein the link spring has a mode shape of a fundamental resonance mode where the predefined mass moves along the predefined direction.

5. The accelerometer of claim 4, wherein the fundamental resonance mode is of a predetermined mode separation from high-order resonant modes.

6. The accelerometer of claim 5, wherein the predetermined mode separation is 400Hz.

7. The accelerometer of any one of claims 1 to 6, wherein the predefined mass is configured to move in response to a z-axis acceleration.

8. The accelerometer of any one of claims 1 to 7, wherein the first capacitive sensor or the second capacitive sensor is positioned within an inner region enclosed by the annular predefined mass.

9. The accelerometer of any one of claims 1 to 8, wherein the first capacitive sensor and the second capacitive sensor, each comprises an upper comb structure of electrodes and a lower comb structure of electrodes, wherein the upper comb structure of electrodes interleaves with the lower comb structure of electrodes such that a displacement formed between the upper comb structure of electrodes and the lower comb structure of electrodes determines a capacitive value.

10. The accelerometer of claim 9, wherein the electrodes are configured to position along a plane parallel to the predefined direction.

11. The accelerometer of any one of claims 1 to 10, wherein the pivot is coupled to the pivot arm in the same plane as the pivot arm.

12. The accelerometer of any one of claims 1 to 11, wherein the accelerometer further comprises a plurality of pivot arms, wherein respective peripheral part of the predefined mass is coupled to respective first end region or second end region of each pivot arm.

13. The accelerometer of claim 12, wherein the pivot arms are spaced apart along radial axes of the predefined mass.

14. The accelerometer of claim 12 or 13, further comprising a plurality of first and second capacitive sensors, wherein each of the plurality of first capacitive sensors and each of the plurality of second capacitive sensors is located at the respective first end region of each pivot arm and the respective second end region of each pivot arm, respectively.

15. The accelerometer of any one of claims 1 to 14, wherein the pivot comprises a torsion spring.

16. The accelerometer of any one of claims 1 to 15, wherein the accelerometer is configured to produce a bidirectional force feedback signal when the predefined mass moves in response to the acceleration force.

17. The accelerometer of any one of claims 1 to 16, wherein the annular predefined mass comprises an annular circular predefined mass or an annular rectangular predefined mass.

18. A method of fabricating an accelerometer, the method comprising:

forming on a device layer of a wafer respective trenches for forming a first and a second capacitive sensors, and a pivot of the accelerator therebetween ;

depositing a first polysilicon into the respective trenches to form comb structures of electrodes of the first and the second capacitor sensors, and the pivot;

forming on the first polysilicon and the device layer respective cavities to provide a gap between the comb structures of electrodes formed by the first polysilicon and interleaving comb structures of electrodes of the first and the second capacitor sensors disposed on the device layer, and to provide a spacing between the pivot and a pivot arm of the accelerometer such that the pivot arm is movable about the pivot;

depositing a second polysilicon over the first polysilicon and the device layer to form a predefined mass and the pivot arm, wherein the pivot arm is configured to couple respectively to the predefined mass, the comb structures of electrodes and the pivot;

patterning the second polysilicon to obtain a structure of the accelerometer.

19. The method of claim 18, wherein forming the trenches comprises using deep reactive-ion etching (DRIE) on the device layer of the wafer.

20. The method of claim 18 or 19, wherein prior to depositing the first polysilicon, the method comprises forming oxide layers over walls of the trenches; and wherein prior to depositing the second polysilicon, the method comprises forming oxide layers over the cavities of the first polysilicon; and wherein patterning the second polysilicon further comprises removing the oxide layers to release the structure of the accelerometer.