CLAIMS

1. A positioning device (1) for positioning and using a tool (4) within a cavity (2) of a gas turbine engine (3) having a cavity wall~~,~~ (9), the device comprising a flexible deployment device carrying the tool wherein the deployment device further comprises a soft robotics fixturing element (7) adjustable between a contracted deployment configuration during positioning of the tool and an expanded bracing configuration for abutment with the cavity wall during use of the tool~~.~~

~~2. The device according to claim 1,~~ wherein the deployment device comprises a segmented/articulated deployment arm or an articulated guide tube and insertion element~~.~~, characterised in that the deployment arm is a soft robotic arm comprising a plurality of deployment actuators.

~~3~~2. The device according to claim ~~2 wherein the deployment arm is a soft robotic arm comprising a plurality of deployment actuators.~~

~~4. The device according to any preceding claim~~ 1 wherein the fixturing element comprises one ~~of~~or more fixturing actuators.

~~5~~3. The device according to claim ~~3~~1 or ~~4~~2 wherein at least one or each deployment actuator and/or fixturing actuator comprises an inflatable bladder~~.~~ (10).

~~6~~4. The device according to any one of claims ~~3~~1 to ~~5~~3 wherein at least one or each deployment actuator and/or fixturing actuator comprises a dielectric elastomeric actuator.

~~7~~5. The device according to any one of claims ~~3~~1 to ~~5~~3 wherein at least one or each deployment actuator and/or fixturing actuator comprises a shape memory alloy.

~~8~~6. The device according to any one of claims ~~4~~2 to ~~7~~5 wherein the fixturing element comprises a plurality of fixturing actuators circumferentially-arranged around the deployment device.

~~9~~7. The device according to any one of the preceding claims wherein the tool comprises a spray cleaning tool, a media blasting tool, a vision system or a turning tool.

~~10~~8. A method of positioning and using a tool within a cavity having a cavity wall, using a positioning device according to any preceding claim, the method comprising positioning the tool within the cavity with the fixturing element in the contracted deployment configuration and expanding the fixturing element to its bracing configuration such that it abuts the cavity wall.

~~11~~9. The method according to claim ~~10~~8 wherein the or each fixturing actuator comprises an inflatable bladder, the method comprising inflating the fixturing actuator bladder(s) into the expanded configuration after positioning of the tool.

~~12~~10. The method according to claim ~~10~~8 or ~~11~~9 wherein the cavity is an annular cavity, the method comprising bracing the fixturing element against the radially outer cavity wall in its expanded configuration.

~~13~~11. The method according to claim ~~12~~10 wherein the fixturing element is an annular fixturing element, the method comprising bracing the fixturing element against the radially inner cavity wall in its expanded configuration.

~~14~~12. The method according to any one of claims ~~10~~8 to ~~13~~11 wherein the cavity is within a gas turbine engine.

~~15~~13. The method according to claim ~~14~~12 comprising cleaning a surface within a gas turbine using a surface cleaning tool when the tool is braced against the cavity wall by the fixturing element.

~~16~~14. The method according to claim ~~14~~12 comprising turning an engine shaft in a front section of the gas turbine engine using a turning tool when the tool is braced against the cavity wall by the fixturing element.