

**We claim:**

1. A downhole tool, conveyable downhole along the axis of a well casing, comprising a setting tool having an axial actuator and an expansion element having a first diameter for conveyance along the casing, the expansion element being compressible axially by the axial actuator for expanding radially to a second diameter for plastic deformation of the casing.

2. The tool of claim 1, wherein the setting tool further comprises a tubular body having a bore, an outer sleeve and an axial actuator operable axially in the bore, the axial actuator connected to a mandrel drivable axially with respect to the outer sleeve, the outer sleeve forming a first stop and the mandrel supporting a second stop, the axial actuator operable to drive the second stop relative to the first stop to compress the expansion element sandwiched therebetween.

3. The tool of claim 2, wherein the outer sleeve has an uphole end adapted for conveyance and a downhole end forming the first stop, the mandrel extending telescopically from the downhole end.

4. The tool of claim 1, 2 or 3, wherein the expansion element is a stack of pleated rings.

5. The tool of claim 4, wherein in the released position, the stack of pleated rings have a first diameter less than that of the casing and when in the

compressed position, the stack of pleated rings has a second diameter adapted to engage the casing.

6. The tool of claim 1, 2 or 3, wherein the expansion element is an elastomeric bushing.

7. The tool of any one of claims 1 to 6, wherein the axial actuator comprises one or more pistons housed within the outer sleeve, the one or more pistons connected to the mandrel.

8. The tool of claim 7, wherein the setting tool's tubular body is conveyed by electrical wireline, the axial actuator further comprising

an electric motor within the tubular body and connected through the wireline with a source of electric power at surface; and

a hydraulic pump within said tubular body and having a source of hydraulic fluid and a fluid output, the pump being drivably coupled to the motor, the fluid output being fluidly connected to the one or more pistons.

9. The tool of claim 5, wherein the stack of pleated rings is a plurality of wave spring rings separated and spaced apart by annular washers and slidably mounted about the mandrel between the first and second stops, each pleated ring having axially undulating peaks and valleys and, when compressed between the first and second stops, the peaks of each pleated ring flatten against

the washers and the second diameter increases to engage and plastically expand the casing.

10. The tool of claim 9, wherein the stack of pleated rings further comprises a viscous fluid in the interstices between peaks, when actuated to the compressed position, the viscous fluid seals between adjacent washers, the mandrel, the adjacent pleated rings and the casing when for further applying fluid pressure to the casing.

11. A method for insitu expansion of well casing comprising:  
conveying an expansion element downhole on a conveyance string to a specified location along the casing;  
actuating the element radially outwards to plastically expand the casing at the specified location; and  
releasing the expansion element.

12. The method of claim 11, wherein the element is single use and the releasing of the expansion element is to release the element from the conveyance string for abandonment in the casing.

13. The method of claim 11 or 12, wherein the element is multi-use and the releasing of the expansion element comprises contracting the element radially inwards from the expanded casing.

14. The method of claim 13, wherein after releasing the expansion element further comprising moving the conveyance string along the casing to a successive specified location and repeating the actuating and element-releasing steps.

15. The method of claim 14, wherein the element has a Poisson's Ratio, the actuation step comprises axially compressing the element along the casing for expanding the element radially.

16. The method of claim 15, wherein the expanding of the element radially is irreversible.

17. The method of claim 15 wherein the expanding of the element radially is reversible.

18. The method of claim 11, wherein the well casing has a cement sheath thereabout, the actuating of the element to plastically expand the casing at the specified location further comprises compressing the cement sheath to compact the cement.

19. The method of claim 13, wherein the well casing comprises jointed casing, each joint of casing having a weld seam, and after releasing the

expansion element, further comprising moving the conveyance string along the casing to a successive specified location in a successive jointed casing and repeating the actuating and element-releasing steps.

20. The method of claim 19, further comprising repeating the moving of the conveyance string along the casing to a successive specified location in a successive jointed casing and repeating the actuating and element-releasing steps for two or more repetitions.

21. The method of claim 11, herein the expansion of well casing comprises remediation of an abandoned well completed with casing and having a cemented sheath thereabout at least a portion thereof, the well exhibiting surface casing vent flow originating at or below a specific location