WHAT IS CLAIMED IS:

1. A method of releasing a liner hanger running tool from a liner hanger, the method comprising the steps of:

applying left-hand torque to the running tool; and

then releasing the running tool from the liner hanger by applying a first tensile force to the running tool.

2. The method of claim 1, wherein the releasing step further comprises applying a compressive force to the running tool after the step of applying the first tensile force.

3. The method of claim 2, wherein the releasing step further comprises applying a second tensile force to the running tool after the step of applying the compressive force.

4. The method of claim 1, further comprising the step of radially outwardly expanding at least a portion the liner hanger in a wellbore prior to the left-hand torque applying step.

5. The method of claim 4, wherein the expanding step further comprises the step of increasing pressure in a work string used to convey the running tool and liner hanger into the wellbore, thereby biasing an expansion device to displace within the portion of the liner hanger.

6. The method of claim 1, wherein the left-hand torque applying step further comprises transmitting the torque through the running tool without the torque being transmitted by threads of any threaded connections positioned between end connections of the running tool.

7. A method of setting a liner hanger, the method comprising the steps of:

conveying the liner hanger into a wellbore using a running tool;

applying a first compressive force to the running tool;

then applying left-hand torque to the running tool; and

then applying a first tensile force to the running tool.

8. The method of claim 7, further comprising the step of, after the first tensile force applying step, applying increased pressure in a work string attached to the running tool.

9. The method of claim 8, wherein the increased pressure applying step further comprises driving an expansion device through at least a portion of the liner hanger to thereby expand the liner hanger.

10. The method of claim 7, wherein the left-hand torque applying step further comprises transmitting the torque through the running tool without the torque being transmitted by threads of any threaded connections positioned between end connections of the running tool.

11. The method of claim 7, further comprising the step of applying a second compressive force to the running tool after the first tensile force applying step.

12. The method of claim 11, further comprising the step of applying a second tensile force to the running tool after the second compressive force applying step, to thereby release the running tool from the liner hanger.

13. A running tool for conveying and setting a liner hanger in a subterranean well, the running tool comprising:

threaded connections positioned between end connections at opposite ends of the running tool, the threaded connections connecting multiple components of the running tool to each other; and

wherein torque transmitted through the running tool is not transmitted by threads of the threaded connections.

14. The running tool of claim 13, wherein at least one torque transmitting device at each of the threaded connections prevents transmission of torque by threads of the threaded connections.

15. The running tool of claim 14, wherein the torque transmitting device comprises at least one torque pin received in each of the components at a respective threaded connection.

16. The running tool of claim 13, wherein the torque is right-hand torque.

17. The running tool of claim 13, wherein the torque is left-hand torque.

18. The running tool of claim 17, wherein the running tool releases from the liner hanger in response to the left-hand torque applied to the running tool.

19. The running tool of claim 13, wherein the running tool is operative to expand the liner hanger radially outward.

20. A running tool for conveying and setting a liner hanger in a subterranean well, the running tool comprising:

subassemblies capable of setting the liner hanger in response to left-hand torque applied to the running tool followed by increased pressure applied to the running tool, and in response to increased pressure applied to the running tool without prior left-hand torque being applied to the running tool.

21. The running tool of claim 20, wherein the subassemblies include an upper adapter subassembly, a piston mandrel subassembly, and a valve sleeve mandrel subassembly.

22. The running tool of claim 21, wherein the upper adapter subassembly and piston mandrel subassembly permit

substantially unlimited compressive force to be applied to the running tool without initiating release of the running tool from the liner hanger.

23. The running tool of claim 20, wherein the subassemblies include threaded connections positioned between end connections at opposite ends of the running tool, the threaded connections connecting multiple components of the running tool to each other, and wherein torque transmitted through the running tool is not transmitted by threads of the threaded connections.

24. The running tool of claim 20, wherein the running tool is releasable from the liner hanger in response to application of alternating tensile and compressive forces to the running tool after application of left-hand torque to the running tool.

25. The running tool of claim 20, wherein the running tool is capable of expanding the liner hanger radially outward.

26. A running tool for conveying and setting a liner hanger in a subterranean well, the running tool comprising:

subassemblies capable of releasing the running tool from the liner hanger in response to application of alternating tensile and compressive forces to the running tool after application of left-hand torque to the running tool.

27. The running tool of claim 26, wherein the subassemblies are further capable of setting the liner hanger in response to left-hand torque applied to the running tool followed by increased pressure applied to the running tool, and in response to increased pressure applied to the running tool without prior left-hand torque being applied to the running tool.

28. The running tool of claim 26, wherein the subassemblies include threaded connections positioned between end connections at opposite ends of the running tool, the threaded connections connecting multiple components of the running tool to each other, and wherein torque transmitted through the running tool is not transmitted by threads of the threaded connections.

What is claimed is:

1. A method of releasing a liner hanger running tool from a liner hanger, the method comprising the steps of: radially outwardly expanding at least a portion of the liner hanger in a wellbore; then applying left-hand torque to the running tool, thereby shearing at least one shear element; then applying a first tensile force to the running tool; and then applying right-hand torque to the running tool.

2. The method of claim 1, further comprising the step of applying a compressive force to the running tool after the step of applying right-hand torque.

3. The method of claim 2, further comprising the step of applying a second tensile force to the running tool after the step of applying the compressive force.

4. The method of claim 1, wherein the expanding step further comprises the step of increasing fluid pressure in a work string used to convey the running tool and liner hanger into the wellbore, thereby biasing an expansion device to displace within the portion of the liner hanger.

5. A method of releasing a liner hanger running tool from a liner hanger, the method comprising the steps of: applying left-hand torque to the running tool, thereby shearing at least one shear element; then applying a first tensile force to the running tool; and then applying right-hand torque to the running tool, wherein the left-hand torque applying step further comprises transmitting the torque through the running tool without the torque being transmitted by threads of any threaded connections positioned between end connections of the running tool.

6. A method of setting a liner hanger, the method comprising the steps of: conveying the liner hanger into a wellbore using a running tool; expanding at least a portion of the liner hanger; applying a first compressive force to the running tool; then applying left-hand torque to the running tool, thereby shearing at least one shear element; and then applying a first tensile force to the running tool.

7. The method of claim 6, further comprising the step of, after the first tensile force applying step, applying increased fluid pressure in a work string attached to the running tool.

8. The method of claim 7, wherein the increased fluid pressure applying step further comprises driving an expansion device through the portion of the liner hanger, thereby expanding the liner hanger.

9. The method of claim 6, further comprising the step of applying a second compressive force to the running tool after the first tensile force applying step.

10. The method of claim 9, further comprising the step of applying a second tensile force to the running tool after the second compressive force applying step, to thereby release the running tool from the liner hanger.

11. A method of setting a liner hanger, the method comprising the steps of: conveying the liner hanger into a wellbore using a running tool; applying a first compressive force to the running tool; then applying left-hand torque to the running tool, thereby shearing at least one shear element; and then applying a first tensile force to the running tool, wherein the left-hand torque applying step further comprises transmitting the torque through the running tool without the torque being transmitted by threads of any threaded connections positioned between end connections of the running tool.

12. An apparatus for conveying and setting a liner hanger in a subterranean well, the apparatus comprising: a running tool which expands the liner hanger radially outward; at least one threaded connection positioned between opposite ends of the running tool, the threaded connection connecting a first threaded component of the running tool to a mating second threaded component of the running tool; and wherein torque transmitted from the first threaded component to the second threaded component is not transmitted by threads of the threaded connection.

13. The apparatus of claim 12, wherein at least one torque transmitting device prevents transmission of torque by threads of the threaded connection.

14. The apparatus of claim 13, wherein the torque transmitting device comprises at least one torque pin received in each of the first and second threaded components.

15. The apparatus of claim 12, wherein the torque is right-hand torque.

16. The apparatus of claim 12, wherein the torque is left-hand torque.

17. The apparatus of claim 16, wherein the running tool releases from the liner hanger in response to the left-hand torque applied to the running tool.

18. A running tool for conveying and setting a liner hanger in a subterranean well, the running tool comprising: subassemblies which set the liner hanger in response to left-hand torque applied to the running tool followed by increased fluid pressure applied to the running tool, and in response to increased fluid pressure applied to the running tool without prior left-hand torque being applied to the running tool.

19. The running tool of claim 18, wherein the subassemblies include an upper adapter subassembly, a piston mandrel subassembly, and a valve sleeve mandrel subassembly.

20. The running tool of claim 19, wherein the upper adapter subassembly and piston mandrel subassembly can tolerate substantial compressive force to be applied to the running tool without initiating release of the running tool from the liner hanger.

21. The running tool of claim 18, wherein the running tool is releasable from the liner hanger in response to application of alternating tensile and compressive forces to the running tool after application of left-hand torque to the running tool.

22. A running tool for conveying and setting a liner hanger in a subterranean well, the running tool comprising: subassemblies which set the liner hanger in response to left-hand torque applied to the running tool followed by increased fluid pressure applied to the running tool, and in response to increased fluid pressure applied to the running tool without prior left-hand torque being applied to the running tool, wherein the subassemblies include threaded connections positioned between end connections at opposite ends of the running tool, the threaded connections connecting multiple components of the running tool to each other, and wherein torque transmitted through the running tool is not transmitted by threads of the threaded connections.

23. A running tool for conveying and setting a liner hanger in a subterranean well, the running tool comprising: subassemblies which set the liner hanger in response to left-hand torque applied to the running tool followed by increased fluid pressure applied to the running tool, and in response to increased fluid pressure applied to the running tool without prior left-hand torque being applied to the running tool, wherein the running tool expands the liner hanger radially outward.

24. A running tool for conveying and setting a liner hanger in a subterranean well, the running tool comprising: subassemblies which release the running tool from the liner hanger in response to left-hand torque applied to the running tool followed by application of a tensile force to the running tool, and in response to application of a compressive force to the running tool without prior left-hand torque being applied to the running tool.

25. The running tool of claim 24, wherein the subassemblies set the liner hanger in response to left-hand torque applied to the running tool followed by increased fluid pressure applied to the running tool, and in response to increased fluid pressure applied to the running tool without prior left-hand torque being applied to the running tool.

26. A running tool for conveying and setting a liner hanger in a subterranean well, the running tool comprising: subassemblies which release the running tool from the liner hanger in response to left-hand torque applied to the running tool followed by application of a tensile force to the running tool, and in response to application of a

compressive force to the running tool without prior left-hand torque being applied to the running tool, wherein the subassemblies include threaded connections positioned between end connections at opposite ends of the running tool, the threaded connections connecting multiple components of the running tool to each other, and wherein torque transmitted through the running tool is not transmitted by threads of the threaded connections.