CLAIMS

1. A compression collar expander assembly for expanding a tubular compression collar used in coupling a tube to a tube fitting, the compression collar expander assembly comprising:

a guide plate having a top surface and an opposing bottom surface with a plurality of lower guide channels extending therethrough;

a spindle plate disposed adjacent to the bottom surface of the guide plate, the spindle plate being rotatable relative to the guide plate and having a top surface with an expansion channel formed thereon;

a plurality of carriages movably disposed on the top surface of the guide plate, the plurality of carriages comprising at least three carriages that are radially spaced about an axis extending through the guide plate and are radially aligned with the axis, each of the plurality of carriages comprising:

a body; and

a guide projecting from the body, through a corresponding one of the lower guide channels formed on the guide plate, and into the expansion channel; and

a die set comprising a plurality of dies, each die comprising a base coupled to a corresponding one of the plurality of carriages and a prong upstanding from the base.

2. The compression collar expander assembly as recited in claim 1, wherein the expansion channel has a spiral configuration that encircles the axis.

3. The compression collar expander assembly as recited in claim 1, wherein each prong has a wedge-shaped configuration with opposing side faces that extend between an inside face and an opposing outside face, the outside face being formed with a curvature.

4. The compression collar expander assembly as recited in claim 3, wherein the curvature of the outside face is an arc of a circle.

5. The compression collar expander assembly as recited in claim 3, wherein the opposing side faces converge toward the inside face and diverge toward the outside face.

6. The compression collar expander assembly as recited in claim 1, wherein the plurality of dies comprises at least 3, 5, 7, 9, 11 or 13 separate dies.

7. The compression collar expander assembly as recited in claim 1, wherein each of the plurality of dies are separate from each other, are radially spaced about the axis, and are radially aligned with the axis.

8. The compression collar expander assembly as recited in claim 1, further comprising:

each of the plurality of carriages having a mounting hole formed thereon or a mounting post projecting therefrom; and

each of the plurality of dies having the other of the mounting hole or mounting post formed thereon, each mounting post being received with a corresponding mounting hole so as to couple each die to a corresponding carriage.

9. The compression collar expander assembly as recited in claim 1, wherein each carriage comprises a plurality of travel wheels rotatably mounted to the body and resting on the top surface of the guide plate.

10. The compression collar expander assembly as recited in claim 1, wherein the guide comprises:

a projection extending from the body and extending into the corresponding lower guide channel; and

a lower guide wheel rotatably mounted to the projection and at least partially disposed within the expansion channel.

11. The compression collar expander assembly as recited in claim 1, wherein the guide comprises:

an axle projecting from the body; and

a lower guide wheel rotatably mounted to the axle and at least partially disposed within the expansion channel.

12. The compression collar expander assembly as recited in claim 1, wherein the plurality of carriages comprises at least 5, 7, 9, 11 or 13 separate carriages.

13. The compression collar expander assembly as recited in claim 1, further comprising a cover plate secured to the guide plate so that the plurality of carriages are disposed between the guide plate and the cover plate.

14. The compression collar expander assembly as recited in claim 13, further comprising:

the cover plate having a top surface and an opposing bottom surface with a plurality of upper guide channels being formed on the bottom surface; and

each carriage having an upper guide wheel rotatably mounted to the body and disposed within a corresponding one of the plurality of upper guide channels.

15. The compression collar expander assembly as recited in claim 1, further comprising a motor coupled with the spindle plate, the motor being configured to rotate the spindle plate in opposite directions.

16. A method for expanding a tubular compression collar used in coupling a tube to a tube fitting, the method comprising:

positioning the tubular compression collar on a die head of a die set so that the compression collar encircles the die head, the die head being comprised of a plurality of separate prongs radially spaced about an axis; and

radially displacing a plurality of carriages that are radially spaced about the axis so that the plurality of carriages move radially outward away from the axis, each of the plurality of carriages being coupled to a corresponding one of the plurality of prongs, the radial displacement of the plurality of carriages causing radial displacement of each of the plurality of prongs which in turn radially outwardly expands the tubular compression collar encircling the die head.

17. The method as recited in claim 16, wherein radially displacing the plurality of carriages comprises rotating a spindle plate about an axis of rotation, the spindle plate having a top surface with

an expansion channel formed thereon, the rotation of the spindle plate causing the plurality of carriages to be displaced radially outward away from the axis.

18. The method as recited in claim 17, wherein rotating the spindle plate comprises activating a motor coupled with the spindle plate, the motor being configured to rotate the spindle plate.

19. The method as recited in claim 16, wherein each carriage comprises a body having a plurality of travel wheels rotatably mounted thereto.

20. The method as recited in claim 16, wherein the plurality of carriages comprises at least 5, 7, 9, 11 or 13 separate carriages.