CLAIMS

1. A multi-start scroll compressor comprising:

a first scroll being one of a fixed scroll and an orbiting scroll; and

a second scroll being the other of the fixed scroll and the orbiting scroll,

wherein the first scroll comprises a first scroll plate and a first scroll wall arranged to define a flow path including a first portion in which the first scroll plate and first scroll wall define a plurality of substantially parallel channels that extend from an inlet and converge at a second portion in which the first scroll plate and the first scroll wall define a single channel extending to an outlet, and

wherein the second scroll comprises a second scroll plate and second scroll wall intermeshing with the first scroll wall of the first scroll so that, on relative orbital movement of the first and second scrolls, a volume of gas is trapped between the first and second scrolls and pumped in parallel through the plurality of substantially parallel channels along the first portion of the flow path from the inlet to converge at the second portion and be pumped along the second portion of the flow path to the outlet, and wherein an axial extent of the trapped volume between the first and second scroll plates is less along the first portion of the flow path than the axial extent of the trapped volume along the second portion of the flow path.

2. The multi-start scroll compressor of claim 1, wherein the axial extent of the trapped volume along a third portion of the flow path is different from the axial extent of the trapped volume along at least one of the first portion and the second portion.

3. The multi-start scroll compressor of claim 2, wherein the second portion is between the first portion and the third portion along the flow path and the axial extent of the trapped volume along the second portion is greater than the axial extent of the trapped volume along the first portion and the third portion.

4. The multi-start scroll compressor of claim 1, wherein the first scroll plate comprises an axial step between the first portions and the second portion of the flow path thereby increasing the axial extent of the trapped volume at the axial step.

5. The multi-start scroll compressor of claim 4, wherein the axial step comprises a first axial step, and wherein the first axial step coincides with a second axial step in the second scroll wall.

6. The multi-start scroll compressor of claim 4, wherein the axial step is arcuate.

7. The multi-start scroll compressor of claim 1, wherein the first and second scroll walls have respective seals at axial ends thereof which seal against the opposing scroll plate.

8. The multi-start scroll compressor of claim 1, wherein the first and second portions extend through at least 360° of the flow path.

9. The multi-start scroll compressor of claim 1, wherein the first portion extends from the inlet to a convergence, and wherein the second portion extends from the convergence to the outlet.

10. The multi-start scroll compressor of claim 9, wherein the first scroll plate comprises an axial step at the convergence thereby increasing the axial extent of the trapped volume at the axial step.

11. The multi-start scroll compressor of claim 10, wherein the axial step coincides with a gap between the two generally parallel circular sections and the single involute wall section of the orbiting scroll wall.

12. The multi-start scroll compressor of claim 1, wherein the inlet comprises a plurality of inlets.

CLAIMS

1. A scroll compressor comprising two scrolls having respective scroll plates and respective scroll walls, the scroll walls intermeshing so that on relative orbital movement of the scrolls a volume of gas is trapped between the scrolls and pumped from an inlet to an outlet wherein the axial extent of said trapped volume between said scroll plates is less along a first portion of a flow path between the inlet and the outlet than the axial extent of said trapped volume along a second portion of the flow path, and wherein the first portion is closer to the inlet than the second portion along the flow path.

2. A scroll compressor as claimed in claim 1, wherein the first portion of the flow path is at the inlet thereby reducing the pumping capacity of the compressor.

3. A scroll compressor as claimed in claim 1 or 2, wherein the axial extent of the trapped volume along a third portion of the flow path is different from the axial extent of the trapped volume along at least one of the first portion and the second portion.

4. A scroll compressor as claimed in claim 3, wherein the second portion is between the first portion and the third portion along the flow path and the axial extent of the trapped volume along the second portion is less than the axial extent of the trapped volume along the first portion and the third portion.

5. A scroll compressor as claimed in any one of the preceding claims, wherein the scroll plate of at least one of said scrolls comprises an axial step between said portions of the flow path thereby increasing or decreasing the axial extent of the trapped volume at the axial step.

6. A scroll compressor as claimed in claim 5, wherein the or each axial step in the scroll plate of one of the scrolls coincides with an axial step in the scroll wall of the other of the scrolls.

7. A scroll compressor as claimed in claim 6, the axial steps of the scroll plate and the coincident scroll wall are arcuate for reducing a clearance therebetween throughout relative orbital motion of the scrolls.

8. A scroll compressor as claimed in claim 6 or 7, wherein one of the scrolls is fixed and the other of the scrolls is arranged to orbit relative to the fixed scroll and the or each axial step is formed in the scroll plate of the fixed scroll.

9. A scroll compressor as claimed in claim 8, wherein the scroll wall and the scroll plate of the fixed scroll form two channels extending from the inlet or from respective inlets which converge to form a single channel which extends to the outlet thereby providing a multi-start flow path between the inlet and the outlet.

10. A scroll compressor as claimed in claim 9, wherein the first portions of the flow paths extend along said two channels and the second portion of the flow paths extends along said single channel.

11. A scroll compressor as claimed in claim 10, wherein the axial extent of the trapped volume between the scrolls along said two channels is less than the axial extent of the trapped volume along said single channel.

12. A scroll compressor as claimed in any one of the preceding claims, wherein a said volume of gas is trapped between the scrolls on each side of the scroll wall of the orbiting scroll and pumped from the inlet to the outlet and said respective volumes of gas are pumped along respective flow paths between the inlet and the outlet.

13. A scroll compressor as claimed in any one of the preceding claims, wherein said scroll walls have respective seals at axial ends thereof which seal against the opposing scroll plate.

14. A scroll compressor as claimed in any one of the preceding claims, wherein said first, second or third portions extend through at least 360° of the flow path or paths.