CLAIMS:

1. An electroplating processor, comprising:

a vessel;

a electrode plate in the vessel with a continuous flow path formed in a channel in the electrode plate and extending between an inlet and an outlet on the electrode plate;

a membrane on the electrode plate; and

a membrane plate attached to the electrode plate, with the membrane in between the electrode plate and the membrane plate.

2. The electroplating processor of claim 1 with the flow path having rings formed between a coiled channel wall.

3. The electroplating processor of claim 2 with the membrane plate having a coiled support matching the shape of the channel wall.

4. The electroplating processor of claim 3 with the channel wall having a flat top surface and the coiled support having a flat bottom surface, and with the membrane clamped between the flat top surface of the channel wall and the flat bottom surface of the coiled support.

5. The electroplating processor of claim 1 further comprising a flat inert electrode at the bottom of the channel.

6. The electroplating processor of claim 5 with the channel and the flat electrode having a rectangular cross section.

7. The electroplating processor of claim 1 wherein the continuous coiled flow path is a spiral or concentric circles connected by flow segments.

8. The electroplating processor of claim 1 wherein the cross section of the flow path adjacent to the outlet is greater than at the inlet.

9. The electroplating processor of claim 3 wherein the membrane plate has one or more rings of ribs, and with the coiled support attached to a bottom surface of the ribs.

10. The electroplating processor of claim 1 with the channel plate having a thickness equal to 2-5 of the depth of the channel.

11. An electroplating processor, comprising:

a vessel;

a electrode plate at a bottom of the vessel;

a coiled channel in a top surface of the electrode plate, with the coiled channel forming a coiled flow path between a coiled channel wall;

an electrolyte inlet and an electrolyte outlet in the electrode plate, with the coiled flow path connecting the electrolyte inlet to the electrolyte outlet;

at least one electrode in the coiled channel;

a membrane plate attached to the electrode plate;

a coiled support on a bottom surface of the membrane plate in alignment with the channel wall; and

a membrane in between the electrode plate and the membrane plate, and the membrane compressed between a top surface of the channel wall and a bottom surface of the coiled support.

12. The electroplating processor of claim 11 with the flow path having 5 to 10 rings formed between the channel wall.

13. The electroplating processor of claim 11 with the channel wall having a flat top surface and the coiled support having a flat bottom surface.

14. The electroplating processor of claim 11 comprising first and second electrodes in the channel

15. The electroplating processor of claim 14 with the first and second electrodes comprising inert electrodes.

16. An electroplating processor, comprising:

a vessel;

a continuous flow path formed in a tubular membrane extending between an inlet and an outlet on the electrode plate; and

an electrode wire extending through the tubular membrane.

CLAIMS:

The invention claimed is:

1. An electroplating processor, comprising:

a vessel;

an electrode plate in the vessel with a continuous flow path formed in a channel in the electrode plate and extending between an inlet and an outlet on the electrode plate, the continuous flow path having rings formed into a coil;

a membrane on top of the electrode plate, with the membrane covering the continuous flow path formed in the channel; and

a membrane plate attached to the electrode plate, with the membrane in between the electrode plate and the membrane plate.

2. The electroplating processor of claim **1** with the membrane plate having a coiled support matching the shape of the channel wall.

3. The electroplating processor of claim **2** with the channel wall having a flat top surface and the coiled support having a flat bottom surface, and with the membrane clamped between the flat top surface of the channel wall and the flat bottom surface of the coiled support.

4. The electroplating processor of claim **1** further comprising a flat inert electrode at the bottom of the channel.

5. The electroplating processor of claim **4** with the channel and the flat electrode having a rectangular cross section.

6. The electroplating processor of claim **1** wherein the continuous flow path is a spiral or concentric circles connected by flow segments.

7. The electroplating processor of claim **1** wherein the cross section of the flow path adjacent to the outlet is greater than at the inlet.

8. The electroplating processor of claim **2** wherein the membrane plate has one or more rings of ribs, and with the coiled support attached to a bottom surface of the ribs.

9. The electroplating processor of claim **1** with the electrode plate having a thickness equal to 2-5 of the depth of the channel.

10. An electroplating processor, comprising:
a vessel;
an electrode plate at a bottom of the vessel;
a coiled channel on a top surface of the electrode plate, with the coiled channel forming a coiled flow path between a coiled channel wall;
an electrolyte inlet and an electrolyte outlet in the electrode plate, with the coiled flow path connecting the electrolyte inlet to the electrolyte outlet;
at least one electrode in the coiled channel;
a membrane plate attached to the electrode plate;
a coiled support on a bottom surface of the membrane plate in alignment with the channel wall; and
a membrane in between the electrode plate and the membrane plate, and the membrane compressed between a top surface of the channel wall and a bottom surface of the coiled support.

11. The electroplating processor of claim **10** with the flow path having 5 to 10 rings formed between the channel wall.

12. The electroplating processor of claim **10** with the channel wall having a flat top surface and the coiled support having a flat bottom surface.

13. The electroplating processor of claim **10** comprising first and second electrodes in the channel.

14. The electroplating processor of claim **13** with the first and second electrodes comprising inert electrodes.

15. An electroplating processor, comprising:
a vessel;
an electrode plate in the vessel with a continuous flow path formed in a channel in the electrode plate and extending between an inlet and an outlet on the electrode plate, the continuous flow path having rings formed between a coiled channel wall;
a membrane on the electrode plate;
a membrane plate attached to the electrode plate, with the membrane in between the electrode plate and the membrane plate, and with the membrane plate having a coiled support matching the shape of the channel wall.