

CLAIMS

What is claimed is:

1. An occlusion device comprising:
 - a hollow body including an outer surface and a passage, the passage having a proximal end and a distal end;
 - a plurality of caps covering the proximal end and the distal end of the passage to enclose the passage within the hollow body, wherein the plurality of caps are coupled with each other by a connector;
 - a flexible tail coupled with a proximal cap of the plurality of caps, wherein the flexible tail trails proximally from the proximal cap; and
 - an expandable layer on the outer surface.
2. The occlusion device of claim 1, further comprising one or more anchors coupled with the outer surface, the one or more anchors having an expandable diameter.
3. The occlusion device of claim 1, wherein the flexible tail includes a radiopaque filler.
4. The occlusion device of claim 1, wherein the flexible tail includes an elongated body trailing between a distal end at the proximal cap and a proximal end.
5. The occlusion device of claim 4, wherein the elongated body fits within a microcatheter lumen to allow a microcatheter to be introduced over the flexible tail.
6. The occlusion device of claim 4, wherein the flexible tail includes a loop portion contiguous with the proximal end.
7. The occlusion device of claim 6, wherein the loop portion is further contiguous with the distal end.
8. The occlusion device of claim 1, further comprising a contrast agent filling the enclosed passage.

9. The occlusion device of claim 1, wherein the outer surface includes a shape selected from the group consisting of: convex, cylindrical, and concave.
10. The occlusion device of claim 9, wherein a length between the proximal end and the distal end is between 2 and 35 mm.
11. The occlusion device of claim 1, wherein one or more of the plurality of caps are integrally formed with the hollow body.
12. The occlusion device of claim 11, wherein the one or more integrally formed caps include a penetrable wall configured to be pierced by a cannulation member.
13. The occlusion device of claim 12, wherein the penetrable wall is thinner than an adjacent wall of the hollow body.
14. The occlusion device of claim 13, wherein the penetrable wall includes one or more depressions.
15. The occlusion device of claim 1, wherein one or more of the plurality of caps are formed separately from the hollow body, and wherein the separately formed caps plug the passage.
16. The occlusion device of claim 1, wherein the expandable layer includes a non-slip surface.
17. The occlusion device of claim 16, wherein the expandable layer includes a hydrogel.
18. The occlusion device of claim 17, wherein the hydrogel is selected from the group consisting of biostable and bioresorbable hydrogels.
19. The occlusion device of claim 18, wherein the expandable layer includes a radiopaque filler in the hydrogel.

20. The occlusion device of claim 16, wherein the expandable layer includes a shape memory polymer.
21. The occlusion device of claim 20, wherein the shape memory polymer is selected from the group consisting of biostable and bioresorbable shape memory polymers.
22. The occlusion device of claim 2, wherein the one or more anchors include an expandable coil having an attached end coupled with the outer surface and an unattached end configured to expand radially apart from the attached end when the expandable coil is unconstrained.
23. A method of female contraception comprising:
delivering an occlusion device of claim 1 into a fallopian tube; and
expanding the expandable layer to occlude the fallopian tube.
24. The method of claim 23, further comprising reversing the female contraception by opening the plurality of caps to uncover the passage and unblock the fallopian tube.
25. The method of claim 23 or 24, further comprising expanding an anchor coupled with the outer surface into contact with the fallopian tube to secure the occlusion device to the fallopian tube.
26. The method of claim 24, wherein opening the plurality of caps comprises dislodging one or more of the caps.
27. The method of claim 26, further comprising introducing a microcatheter over a flexible tail coupled with a proximal cap of the plurality of caps, wherein the flexible tail trails proximally from the proximal cap.
28. The method of claim 24, wherein opening the plurality of caps comprises piercing one or more of the caps.