CLAIMS

1. A multiple start thread pattern for use in a medical device connector comprising:

a first start thread path wherein the first start thread path has a first major profile, a first minor profile, a first pitch, and a first thread section profile;

at least a second start thread path wherein the second start thread path has a second major profile, a second minor profile, a second pitch, and a second thread section profile;

wherein the first thread section profile and the second thread section profile are different,

the first start thread path and the second start thread path form a female thread pattern,

the first and second start thread paths are configured to interface with a complimentary male thread of a secondary medical device connector, said complimentary male thread having a third major profile with a uniform outer diameter, a third minor profile, and a third pitch substantially equivalent to said first pitch, and

when at least said first start thread path engages said complimentary male thread contacting said third major profile, a first helical void is formed by the space enclosed by the first start thread path and at least one of said third major profile and said third minor profile of the complimentary male thread.

2. The multiple start thread pattern of claim 1, wherein

when said second start thread path engages said complimentary male thread contacting said third major profile, a second helical void is formed by the space enclosed by the second start thread path and at least one of said third major profile and said

third minor profile of complimentary male thread, said second helical void being larger than the first helical void.

3. The multiple start thread pattern of claim 1 or 2 wherein

said first start thread path and said second start thread path further comprise respective root section profiles and respective crest section profiles, wherein the respective root section profiles are substantially similar and the respective crest section profiles are substantially different.

4. The multiple start thread pattern of claim 1, wherein

the second start thread path interfaces with the complimentary male thread substantially tangentially.

5. The multiple start thread pattern of claim 1, wherein

the first start thread path interfaces with the complimentary male thread to substantially engage the complimentary male thread.

6. A cap comprising:

a multiple start thread pattern comprising

a first start thread path wherein the first start thread path has a first major profile, a first minor profile, a first pitch, and a first thread section profile, and

at least a second start thread path wherein the second start thread path has a second major profile, a second minor profile, a second pitch, and a second thread section profile; and

an inner cavity comprising an inner surface having said first and second start thread paths, a closed end, and an open end opposite said closed end comprising an opening configured to receive a secondary medical device connector,

wherein

the first thread section profile and the second thread section profile are different,

the first pitch and the second pitch are substantially equivalent,

the first and second start thread paths are configured to interface with a complimentary male thread of said secondary medical device connector, said complimentary male thread having a third major profile with a uniform outer diameter, a third minor profile, and a third pitch substantially equivalent to the first and second pitches of the first and second start thread paths, and

when said complimentary thread is engaged to said first and second start thread paths contacting said third major profile a first helical void is formed by the space enclosed by at least one of said third major profile and said third minor profile of the complimentary male thread and the first start thread path and a second helical void is formed by the space enclosed by at least one of said third major profile and said third minor profile of the complimentary male thread and the second start thread path, wherein said second helical void is larger than the first helical void, and

an airflow path from a proximal end of the cap to the inner cavity is formed by said first and second helical voids when said complimentary male thread is engaged to said multiple start thread pattern.

7. The cap of claim 6 further comprising

a disinfection agent retention sponge retained in the inner cavity essentially at a distal end of the cap.

8. The cap of claim 6 wherein

the inner surface forms an essentially frustoconical inner cavity having a larger cross section at the proximal end of the cap.

9. The cap of claim 6 wherein

the inner surface forms an essentially cylindrical inner cavity having a cross section greater than the third major profile of the complimentary male thread of the secondary medical device connector.

10. The multiple start thread pattern of claim 1, wherein

the first start thread path interfaces with the complimentary male thread to substantially engage at least a portion of the complimentary male thread tangentially and non-tangentially.

11. The cap of claim 6, wherein

the first start thread path interfaces with the complimentary male thread to substantially engage at least a portion of the complimentary male thread tangentially and non-tangentially.