Claims:

1. An apparatus, comprising:

a cannula, comprising:

a tubular body extending between a first end and a second end, the tubular body having a first side and an opposite second side; and

a leading edge formed at the first end, the leading edge extending along a first plane, the first plane extending between the first side and second side, the first plane forming a leading edge angle between the intersection of the first side and the first plane, wherein the leading edge angle is between 12 degrees and 20 degrees;

a mandrel, comprising:

a body extending between a first end and a second end;

a trocar point formed by the first end;

a notch formed by the body, the notch forming a bed extending between the first end and the second end;

a first sample region formed by the bed, the first sample region, comprising:

a first plurality of ridges, wherein each of the first plurality of ridges comprises:

a flank extending from the bed toward the second end, the flank terminating at a crest;

a second sample region formed by the bed, the second sample region comprising:

a second plurality of ridges, wherein each of the second plurality of ridges comprises:

a flank extending from the bed toward the second end, the flank terminating in a crest; and

a concave slope descending from the crest; and

a deck disposed between the first plurality of ridges and the second plurality of ridges;

a cannula force source imparting movement to the cannula, wherein the cannula force source imparts a loaded force between 7 lbs. and 11 lbs.

2. The apparatus of Claim 1, wherein:

the leading edge angle is 12 degrees; and

the loaded force is 7.32 lbs.

3. The apparatus of Claim 1, wherein the cannula force source is a compression spring.

4. The apparatus of Claim 1, wherein the cannula force source imparts between 2 lbs./in and 3.2 lbs./in upon the cannula.

5. The apparatus of Claim 4, wherein the mandrel force source moves the mandrel between 1 mm and 66 mm.

6. The apparatus of Claim 1, further comprising a mandrel force source imparting movement to the mandrel, wherein the mandrel force source imparts a loaded force between 7 lbs. and 11 lbs.

7. The apparatus of Claim 6, wherein the mandrel force source is a compression spring.

8. The apparatus of Claim 1, wherein:

the leading edge angle is 20 degrees; and

the loaded force is 7.32 lbs.

9. The apparatus of Claim 1, wherein the bed further comprises:

a reverse ridge, the reverse ridge comprising:

a flank extending from the bed toward the first end, the flank terminating at a crest; and

a concave slope descending from the crest.

10. An apparatus, comprising:

a cannula, comprising:

a tubular body extending between a first end and a second end, the tubular body having a first side and a second side;

a vet point formed at the first end, the vet point including:

a leading edge extending along a first plane, the first plane extending between the first side and second side, the plane forming a leading edge angle between the intersection of the first side and the first plane, wherein the leading edge angle is 12 degrees;

a mandrel, comprising:

a body extending between a first end and a second end along a central longitudinal axis;

a trocar point formed by the first end, the trocar point comprising:

a first beveled surface forming first bevel angle between the intersection of the first beveled surface and the central longitudinal axis, wherein the first bevel angle is 15 degrees;

a notch formed by the body, the notch forming a bed extending between the first end and the second end;

a first sample region formed by the bed, the first sample region, comprising:

a first plurality of ridges, wherein each of the first plurality of ridges comprises:

a flank extending from the bed toward the second end, the flank terminating at a crest; and

a concave slope descending from the crest;

a second sample region formed by the bed, the second sample region comprising:

a second plurality of ridges, wherein each of the second plurality of ridges comprises:

a flank extending from the bed toward the second end, the flank terminating in a crest; and

a concave slope descending from the crest; and

a deck disposed between the first plurality of ridges and the second plurality of ridges;

a cannula spring imparting movement to the cannula, the cannula spring comprising a loaded force of 7.32 lbs.;

a mandrel spring imparting movement to the mandrel, the mandrel spring comprising a loaded force of 7.32 lbs.; and

an actuator housing the cannula spring and mandrel spring.

11. The apparatus of Claim 10, wherein the bed further comprises:

a reverse ridge, the reverse ridge comprising:

a flank extending from the bed toward the first end, the flank terminating at a crest; and

a concave slope descending from the crest.

12. The apparatus of Claim 10, wherein the mandrel spring moves the mandrel between 1 mm and 66 mm.

13. The apparatus of Claim 10, wherein the cannula spring and mandrel spring are compression springs.

14. An apparatus, comprising:

a cannula, comprising:

a tubular body extending between a first end and a second end, the tubular body having a first side and a second side;

a vet point formed at the first end, the vet point including:

a leading edge extending along a first plane, the first plane extending between the first side and second side, the plane forming a leading edge angle between the intersection of the first side and the first plane, wherein the leading edge angle is 20 degrees;

a mandrel, comprising:

a body extending between a first end and a second end along a central longitudinal axis;

a trocar point formed by the first end, the trocar point comprising:

a first beveled surface forming first bevel angle between the intersection of the first beveled surface and the central longitudinal axis, wherein the first bevel angle is 15 degrees;

a notch formed by the body, the notch forming a bed extending between the first end and the second end;

a first sample region formed by the bed, the first sample region, comprising:

a first plurality of ridges, wherein each of the first plurality of ridges comprises:

a flank extending from the bed toward the second end, the flank terminating at a crest; and

a concave slope descending from the crest;

a second sample region formed by the bed, the second sample region comprising:

a second plurality of ridges, wherein each of the second plurality of ridges comprises:

a flank extending from the bed toward the second end, the flank terminating in a crest; and

a concave slope descending from the crest; and

a deck disposed between the first plurality of ridges and the second plurality of ridges;

a cannula spring imparting movement to the cannula, the cannula spring comprising:

a spring rate of 2 lbs./in.; and

a loaded force of 7.32 lbs.;

a mandrel spring imparting movement to the mandrel, the mandrel spring comprising:

a spring rate of 2 lbs./in.; and

a loaded force of 7.32 lbs.;

an actuator housing the cannula spring and mandrel spring.

15. The apparatus of Claim 14, wherein the bed further comprises:

a reverse ridge, the reverse ridge comprising:

a flank extending from the bed toward the first end, the flank terminating at a crest.

16. The apparatus of Claim 15, wherein the reverse ridge further comprises a concave slope descending from the crest.

17. The apparatus of Claim 14, wherein the mandrel spring moves the mandrel between 1 mm and 66 mm.

18. The apparatus of Claim 14, wherein the cannula spring and mandrel spring are compression springs.

19. An apparatus, comprising:

a cannula assembly, comprising:

a tubular body extending between a first end and a second end, the tubular body having a first side and an opposite second side; and

a leading edge formed at the first end, the leading edge extending along a first plane, the first plane extending between the first side and second side, the first plane forming a leading edge angle between the intersection of the first side and the first plane, wherein the leading edge angle is between 12 degrees and 20 degrees;

a mandrel assembly, comprising:

a body extending between a first end and a second end;

a trocar point formed by the first end;

a notch formed by the body, the notch forming a bed extending between the first end and the second end;

a first sample region formed by the bed, the first sample region, comprising:

a first plurality of ridges, wherein each of the first plurality of ridges comprises:

a flank extending from the bed toward the second end, the flank terminating at a crest; and

a concave slope descending from the crest;

a second sample region formed by the bed, the second sample region comprising:

a second plurality of ridges, wherein each of the second plurality of ridges comprises:

a flank extending from the bed toward the second end, the flank terminating in a crest; and

a concave slope descending from the crest; and

a deck disposed between the first plurality of ridges and the second plurality of ridges;

wherein the cannula assembly translates in a first direction; and

a cannula force source imparting movement to the cannula assembly, wherein the cannula assembly includes a momentum between 0.099 kg m/s and 0.256 kg m/s in the first direction.

20. The apparatus of Claim 19, wherein the cannula assembly momentum is between 0.150 kg m/s and 0.217 kg m/s in the first direction.

21. The apparatus of Claim 19, wherein the first sample region further comprises:

a reverse ridge, the reverse ridge comprising:

a flank extending from the bed toward the first end, the flank terminating at a crest.

22 The apparatus of Claim 19, further comprising:

wherein the mandrel assembly translates in the first direction; and

a mandrel force source imparting movement to the mandrel assembly, wherein the mandrel assembly includes a momentum between 0.120 kg m/s and 0.282 kg m/s

in the first direction.

23. The apparatus of Claim 22, wherein the mandrel assembly momentum is between 0.165 kg m/s and 0.239 kg m/s in the first direction.