CLAIMS

The invention claimed is:

1. A filter comprising:

a plurality of tri-arc filaments having a generally-Y shape cross-section having bulbous or arcing tips.

2. The filter of claim 1, wherein the tri-arc filaments comprises at least one selected from the group consisting of cellulose acetate, cellulose diacetate, cellulose triacetate, cellulose propionate, cellulose butyrate, cellulose acetate-propionate, cellulose acetate-butyrate, cellulose propionate-butyrate, starch acetate, acrylonitrile, vinyl chloride, vinyl ester, vinyl ether, any derivative thereof, any copolymer thereof, and any combination thereof.

3. The filter of claim 1, wherein the tri-arc filaments have a denier per filament of about 1 dpf to about 30 dpf.

4. The filter of claim 1, wherein the filter has a circumference of about 17 mm or less.

5. The filter of claim 1, wherein the filter has a circumference of about 26 mm or less.

6. The filter of claim 1, wherein the filter has an encapsulated pressure drop of about 4.5 mm water/mm length of filter or less, the filter having a circumference of about 26 mm or less.

7. The filter of claim 1, wherein the filter has a circumference of about 26 mm or less and comprises an effective amount of an additive to achieve an encapsulated pressure drop of about 4.5 to about 20 mm water/mm length of filter, wherein without the additive the filter has an encapsulated pressure drop of about 3 mm water/mm length of filter or less.

8. The filter of claim 1, wherein the filter is a sectioned filter that comprises a first section comprising the tri-arc filaments and a second section.

9. A method comprising:

providing a bale of crimped tow band that comprises tri-arc filaments having a generally-Y shape cross-section having bulbous or arcing tips; and

placing the crimped tow band in an apparatus so as to form a filter rod.

10. The method of claim 9, wherein the tri-arc filaments comprises at least one selected from the group consisting of cellulose acetate, cellulose

diacetate, cellulose triacetate, cellulose propionate, cellulose butyrate, cellulose acetate-propionate, cellulose acetate-butyrate, cellulose propionate-butyrate, starch acetate, acrylonitrile, vinyl chloride, vinyl ester, vinyl ether, any derivative thereof, any copolymer thereof, and any combination thereof.

11. The method of claim 9, wherein the tri-arc filaments have a denier per filament of about 1 dpf to about 30 dpf.

12. The method of claim 9 further comprising:

blooming the crimped tow band yielding a bloomed tow band;

channeling the bloomed tow band yielding a continuous tow cable;

wrapping the continuous tow cable with a paper yielding a wrapped tow rod;

adhering the paper of the wrapped tow rod yielding a filter rod length; and

cutting the filter rod length into the filter rod.

13. The method of claim 9, wherein the filter rod has a circumference of about 17 mm or less.

14. The method of claim 9, wherein the filter rod has a circumference of about 26 mm or less.

15. The method of claim 9 further comprising:

cutting the filter rod into filter sections.

16. The method of claim 9 further comprising:

operably connecting the filter rod or a filter section thereof to a tobacco column.

17. A smoking device comprising:

a smokeable substance; and

a filter in fluid communication with the smokeable substance, the filter comprising a plurality of tri-arc filaments having a generally-Y shape cross-section having bulbous or arcing tips.

18. The smoking device of claim 17, wherein the tri-arc filaments comprises at least one selected from the group consisting of cellulose acetate, cellulose diacetate, cellulose triacetate, cellulose propionate, cellulose butyrate, cellulose acetate-propionate, cellulose acetate-butyrate, cellulose propionate-butyrate, starch acetate, acrylonitrile, vinyl chloride, vinyl ester, vinyl ether, any derivative thereof, any copolymer thereof, and any combination thereof.

19. The smoking device of claim 17, wherein the tri-arc filaments have a denier per filament of about 0.1 dpf to about 30 dpf.

20. The smoking device of claim 17, wherein the filter comprises a plurality of sections.

CLAIMS

The invention claimed is:

1. A filter comprising :

a plurality of cellulose acetate tri-arc filaments having a generally-Y shape cross-section having bulbous or arcing tips.

2. The filter of claim 1, wherein the cellulose acetate tri-arc filaments have a denier per filament of about 1 dpf to about 30 dpf.

3. The filter of claim 1, wherein the filter has a circumference of about 17 mm or less.

4. The filter of claim 1, wherein the filter has a circumference of about 26 mm or less.

5. The filter of claim 1, wherein the filter has an encapsulated pressure drop of about 4.5 mm water/mm length of filter or less, the filter having a circumference of about 26 mm or less.

6. The filter of claim 1, wherein the filter has a circumference of about 26 mm or less and comprises an effective amount of an additive to achieve an encapsulated pressure drop of about 4.5 to about 20 mm water/mm length of filter, wherein without the additive the filter has an encapsulated pressure drop of about 3 mm water/mm length of filter or less.

7. The filter of claim 1, wherein the filter is a sectioned filter that comprises a first section comprising the cellulose acetate tri-arc filaments and a second section.

8. A method comprising :

providing a bale of crimped tow band that comprises cellulose acetate tri-arc filaments having a generally-Y shape cross-section having bulbous or arcing tips; and

placing the crimped tow band in an apparatus so as to form a filter rod.

9. The method of claim 8, wherein the cellulose acetate tri-arc filaments have a denier per filament of about 1 dpf to about 30 dpf.

10. The method of claim 8 further comprising :

blooming the crimped tow band yielding a bloomed tow band;

channeling the bloomed tow band yielding a continuous tow cable;

wrapping the continuous tow cable with a paper yielding a wrapped tow rod;

adhering the paper of the wrapped tow rod yielding a filter rod length; and

cutting the filter rod length into the filter rod.

11. The method of claim 8, wherein the filter rod has a circumference of about 17 mm or less.

12. The method of claim 8, wherein the filter rod has a circumference of about 26 mm or less.

13. The method of claim 8 further comprising :

cutting the filter rod into filter sections.

14. The method of claim 8 further comprising :

operably connecting the filter rod or a filter section thereof to a tobacco column.

15. A smoking device comprising :

a smokeable substance; and

a filter in fluid communication with the smokeable substance, the filter comprising a plurality of cellulose acetate tri-arc filaments having a generally-Y shape cross-section having bulbous or arcing tips.

16. The smoking device of claim 15, wherein the cellulose acetate tri-arc filaments have a denier per filament of about 1 dpf to about 30 dpf.

17. The smoking device of claim 15, wherein the filter comprises a plurality of sections.