

WHAT IS CLAIMED IS:

1. ~~_____ A filter, comprising:
_____ a body having a cavity and a non-cylindrical shape defined by side walls;
_____ a plurality of pleat covers defining a first side channel, a first region, a center channel, a second region, and a second side channel in the cavity, each pleat cover of the plurality of pleat covers having openings;
_____ a plurality of pleat packs comprising a first pleat pack positioned in the first region and a second pleat pack positioned in the second region;
_____ a first end cap bonded to the body at a first end of the body, the first end cap having a first opening and a first flow passage, the first opening connected to an inlet port, the first flow passage structured for directing a fluid from the inlet port to the center channel, wherein the fluid is directed from the center channel through the first pleat pack positioned in the first region, through the second pleat pack positioned in the second region, and through the openings via parallel flows to the first side channel and the second side channel, respectively; and
_____ a second end cap bonded to the body at a second end of the body, the second end cap having a second opening and a second flow passage, the second opening connected to an outlet port, the second passage structured for directing the fluid from the first side channel and the second side channel to the outlet port.~~
2. ~~_____ The filter of claim 1, wherein the first pleat pack comprises a first pleated membrane, wherein the second pleat pack comprises a second pleated membrane, and wherein the first pleated membrane and the second pleated membrane are made of same material or different materials.~~
3. ~~_____ The filter of claim 1, wherein the side walls of the body are curved or substantially flat.~~
4. ~~_____ The filter of claim 1, wherein the plurality of pleat covers comprises a cage defining the center channel that separates the first region and the second region.~~
5. ~~_____ The filter of claim 4, wherein the cage comprises a structural support member positioned between pleat covers separated by first and second walls of the cage.~~

6. ~~The filter of claim 5, wherein the pleat covers of the cage have openings and wherein the first and second walls of the cage are solid.~~

7. ~~The filter of claim 1, wherein the first end cap is made of a potting end cap bonded to a fitting end cap.~~

8. ~~A filter, comprising:~~

~~—— a body having a cavity and a non-cylindrical shape defined by side walls;~~

~~—— a plurality of pleat covers defining a first side channel, a first region, a center channel, a second region, and a second side channel in the cavity, each pleat cover of the plurality of pleat covers having openings;~~

~~—— a plurality of pleat packs comprising a first pleat pack positioned in the first region and a second pleat pack positioned in the second region;~~

~~—— a first end cap bonded to the body at a first end of the body, the first end cap having a first opening and a first flow passage, the first opening connected to an inlet port, the first flow passage structured for directing a fluid from the inlet port to the first side channel and the second side channel, wherein the fluid is directed from the first side channel and the second side channel through the openings and the first pleat pack positioned in the first region and the second pleat pack positioned in the second region via parallel flows to the center channel; and~~

~~—— a second end cap bonded to the body at a second end of the body, the second end cap having a second opening and a second flow passage, the second opening connected to an outlet port, the second passage structured for directing the fluid from the center channel to the outlet port.~~

9. ~~The filter of claim 8, wherein the first pleat pack comprises a first pleated membrane, wherein the second pleat pack comprises a second pleated membrane, and wherein the first pleated membrane and the second pleated membrane are made of same material or different materials.~~

10. ~~The filter of claim 8, wherein the side walls of the body are curved or substantially flat.~~

11. ~~The filter of claim 8, wherein the plurality of pleat covers comprises a cage defining the center channel that separates the first region and the second region.~~

~~12. The filter of claim 11, wherein the cage comprises a structural support member positioned between pleat covers separated by first and second walls of the cage.~~

~~13. The filter of claim 12, wherein the pleat covers of the cage have openings and wherein the first and second walls of the cage are solid.~~

~~14. The filter of claim 8, wherein the first end cap is made of a potting end cap bonded to a fitting end cap.~~

~~15. A filter, comprising:~~

~~—— a body having a cavity and a non-cylindrical shape defined by side walls;~~
~~—— a plurality of pleat covers defining a first side channel and a second side channel in the cavity, the plurality of pleat covers including a separator defining a first region and a second region between the first side channel and the second side channel, each pleat cover of the plurality of pleat covers having openings;~~
~~—— a plurality of pleat packs comprising a first pleat pack positioned in the first region and a second pleat pack positioned in the second region;~~
~~—— a first end cap bonded to the body at a first end of the body, wherein flow passages defined in the first end cap, a second end cap, or both, connect the cavity to an inlet port and an outlet port, the flow passages structured for directing a fluid from the inlet port to the first side channel, wherein the fluid is directed to flow from the first side channel through the first pleat pack positioned in the first region, the openings of the separator, and the second pleat pack positioned in the second region via series flows to the second side channel, the flow passages further structured for directing the fluid from the second side channel to the outlet port.~~

~~16. The filter of claim 15, wherein the first pleat pack comprises a first pleated membrane, wherein the second pleat pack comprises a second pleated membrane, and wherein the first pleated membrane and the second pleated membrane are made of same material or different materials.~~

~~17. The filter of claim 15, wherein the side walls of the body are curved or substantially flat.~~

~~18. The filter of claim 15, further comprising:~~

~~a second end cap bonded to the body at a second end of the body.~~

~~19. The filter of claim 18, wherein the second end cap has openings structured for connecting to at least a vent port.~~

~~20. The filter of claim 15, wherein the first end cap is made of a potting end cap bonded to a fitting end cap.~~

241. A filter, comprising:

a body having a non-cylindrical shape defined by side walls; the body having a plurality of cavities; the body having a non-cylindrical shape defined by side walls; and the filter comprising a plurality of subassemblies; wherein each subassembly of the plurality of subassemblies structured and dimensioned to fit inside a cavity of the plurality of cavities; each subassembly of the plurality of subassemblies having:

a plurality of pleat covers defining a first side channel, a first region, a center channel, a second region, and a second side channel in the cavity, each pleat cover of the plurality of pleat covers having openings; wherein the first region is located between the first side channel and the center channel and wherein the second region is located between the center channel and the second side channel; and

a plurality of pleat packs comprising a first pleat pack positioned in the first region and a second pleat pack positioned in the second region; wherein each subassembly of the plurality of subassemblies is structured and dimensioned to fit inside a cavity of the plurality of cavities; and

wherein a first end cap is bonded to the body at a first end of the body ~~and a second end cap is bonded to the body at a second end of the body.~~

2. The filter of claim 1, further comprising:

a second end cap bonded to the body at a second end of the body.

223. The filter of claim 242, wherein the first end cap has a first opening and a first flow passage, the first opening connected to an inlet port, the first flow passage structured for directing a fluid from the inlet port to the center channel, wherein the fluid is directed from the center channel through the first pleat pack positioned in the first region, through the second pleat pack positioned in the second region, and through the openings via parallel flows to the first side channel and the second side channel, respectively, and wherein the second end cap has a second opening and a second flow

passage, the second opening connected to an outlet port, the second passage structured for directing the fluid from the first side channel and the second side channel to the outlet port.

~~234~~. The filter of claim ~~242~~, wherein the first end cap has a first opening and a first flow passage, the first opening connected to an inlet port, the first flow passage structured for directing a fluid from the inlet port to the first side channel and the second side channel, wherein the fluid is directed from the first side channel and the second side channel through the openings and the first pleat pack positioned in the first region and the second pleat pack positioned in the second region via parallel flows to the center channel, and wherein the second end cap has a second opening and a second flow passage, the second opening connected to an outlet port, the second passage structured for directing the fluid from the center channel to the outlet port.

~~245~~. The filter of claim ~~242~~, wherein flow passages defined in the first end cap, the second end cap, or both, connect the cavity to an inlet port and an outlet port, the flow passages structured for directing a fluid from the inlet port to the first side channel, wherein the fluid is directed to flow from the first side channel through the first pleat pack positioned in the first region and the second pleat pack positioned in the second region via series flows to the second side channel, the flow passages further structured for directing the fluid from the second side channel to the outlet port.

~~256~~. The filter of claim ~~242~~, wherein a first flow passage defined in the first end cap, the second end cap, or both, connects a first opening to the first and second side channels in the plurality of cavities, and wherein a second flow passage defined in the first end cap, the second end cap, or both, connects a second opening to the center channels in the plurality of cavities.

7. The filter of any of the previous claims, wherein the first pleat pack comprises a first pleated membrane, wherein the second pleat pack comprises a second pleated membrane, and wherein the first pleated membrane and the second pleated membrane are made of same material or different materials.

8. The filter of claim 7, wherein the first pleated membrane and the second pleated membrane are made of different materials.

9. The filter of any of the previous claims, wherein the side walls of the body are curved.

10. The filter of any of the claims 1 to 8, wherein the side walls of the body are substantially flat.

11. The filter of any of the previous claims, wherein the plurality of pleat covers comprises a cage defining the center channel that separates the first region and the second region.

12. The filter of any of the previous claims, wherein the cage comprises a structural support member positioned between pleat covers separated by first and second walls of the cage.

13. The filter of any of the previous claims, wherein the first and second walls of the cage are solid.

14. The filter of any of the previous claims, wherein the first end cap is made of a potting end cap bonded to a fitting end cap.

15. The filter of any of claims 3 to 14, wherein the second end cap has openings structured for connecting to at least a vent port.