SUMMARY OF THE INVENTION

[0009] In one aspect of the invention, there is provided a multi-coil choke, comprising: a magnetic core having a first leg, a second leg and a third leg, said legs being substantially parallel to each other; a first coil wrapped around said first leg and terminating in a first lead at a first end thereof and a second lead at a second end thereof; a second coil wrapped around said second leg and terminating in a first lead at a first end thereof and a second lead at a second end thereof; a third coil wrapped around said third leg and terminating in a first lead at a first end thereof and a second lead at a second end thereof; a fourth coil formed from a proximal portion of the second lead of said first coil, said fourth coil being wrapped around a distal portion of the second lead of said third coil but not being wrapped around the core; a fifth coil formed from a proximal portion of the second lead of said third coil, said fifth coil being wrapped around a distal portion of the second lead of said first coil but not being wrapped around the core; the distal portion of the second lead of said first coil passes through said third coil before passing through said fifth coil; the distal portion of the second lead of said third coil passes through said first coil before passing through said fourth coil; and said first coil is wrapped in one of a clockwise and counterclockwise direction, and said second and third coils are wrapped in the other of said clockwise and counterclockwise direction. There is also provided ~~In accordance with the invention,~~ a multi-coil choke as follows ~~is provided~~. The choke includes a magnetic core having a first leg, a second leg and a third leg. The three legs are substantially parallel to each other. A first coil is wrapped around the first leg. The first coil terminates in a first lead at a first end thereof and a second lead at a second end thereof. A second coil is wrapped around the second leg of the core and terminates in a first lead at a first end thereof and a second lead at a second end thereof. A third coil is wrapped around the third leg and terminates in a first lead at a first end thereof and a second lead at a second end thereof. A fourth coil is formed from a proximal portion of the second lead of the first coil. The fourth coil is wrapped around a distal portion of the second lead of the third coil. A fifth coil is formed from a proximal portion of

the second lead of the third coil. The fifth coil is wrapped around a distal portion of the second lead of the first coil.

[0010] In a preferred embodiment, the distal portion of the second lead of said first coil passes through said third coil before passing through said fifth coil. Likewise, the distal portion of the second lead of said third coil passes through said first coil before passing through said fourth coil.

[0011] The magnetic core can be formed from two rectangular closed cores placed side-by-side with adjacent sides forming the second leg. The first and third legs can each include a gap. The second leg can include substantially aligned gaps in the adjacent sides of the rectangular closed cores. The gaps can be centrally located along their respective legs. An additional gap can be provided along the length of the adjacent sides of the rectangular closed cores. Moreover, each of the rectangular closed cores can be contained within an insulating cover.

[0012] A multi-coil choke in accordance with a preferred embodiment of the invention has its first coil wrapped in one of a clockwise and counterclockwise direction, with the second and third coils being wrapped in the other of the clockwise and

counterclockwise direction. More particularly, the first coil can be wrapped in a counterclockwise direction with the second and third coils wrapped in a clockwise direction. The fourth coil is wrapped in the same direction as the first coil, e.g., counterclockwise. The fifth coil is wrapped in the same direction as the third coil, e.g., clockwise.

[0013] According to another aspect, there is provided a power conditioner for AC power lines, comprising: a multi-coil choke; at least one capacitor; and means for coupling said choke and at least one capacitor in series across an AC power source; wherein said choke comprises: a magnetic core having a first leg, a second leg and a third leg, said legs being substantially parallel to each other; a first coil wrapped around said first leg and terminating in a first lead at a first end thereof and a second lead at a second end thereof; a second coil wrapped around said second leg and terminating in a first lead at a first end thereof and a second lead at a second end thereof; a third coil wrapped around said third leg and terminating in a first lead at a first end thereof and a second lead at a second end thereof; a fourth coil formed from a proximal portion of the second lead of said first coil, said fourth coil being wrapped around a distal portion of the second lead of said third coil but not being wrapped around the core; a fifth coil formed from a proximal portion of the second lead of said third coil, said fifth coil being wrapped around a distal portion of the second lead of said first coil but not being wrapped around the core; the distal portion of the second lead of said first coil passes through said third coil before passing through said fifth coil; the distal portion of the second lead of said third coil passes through said first coil before passing through said fourth coil; and said first coil is wrapped in one of a clockwise and counterclockwise direction, and said second and third coils are wrapped in the other of said clockwise and counterclockwise direction. There is also provided a~~A~~ power conditioner for AC power lines which~~in accordance with the invention~~ includes a multi-coil choke and at least one capacitor. Means are provided for coupling the choke and at least one capacitor in series across an AC power source. The choke comprises a magnetic core having a first leg, a second leg and a third leg. The legs of the core are substantially parallel to each other. A first coil is wrapped around the first leg. The first coil

terminates in a first lead at a first end thereof and a second lead at a second end thereof. A second coil is wrapped around the second leg. The second coil terminates in a first lead at a first end thereof and a second lead at a second end thereof. A third coil is wrapped around the third leg and terminates in a first lead at a first end thereof and a second lead at a second end thereof. A fourth coil is formed from a proximal portion of the second lead of the first coil. The fourth coil is wrapped around a distal portion of the second lead of the third coil. A fifth coil is formed from a proximal portion of the second lead of the third coil. The fifth coil is wrapped around a distal portion of the second lead of the first coil.

[0014] The power conditioner can have a plurality of the multi-coil chokes, each coupled in series with at least one capacitor across a respective AC power source. In such an embodiment, the coupling means are adapted to couple each of the multi-coil chokes with the first and fourth coils in series with at least one capacitor across a respective AC power source, the second coil in series with at least one capacitor across a respective AC power source, and the third and fifth coils in series with at least one capacitor across a respective AC power source.

[0015] In an embodiment with a single multi-coil choke, the coupling means can be adapted to couple the first and fourth coils in series with at least one capacitor across a respective AC power source, the second coil in series with at least one capacitor across