[0012] It will be understood that by reversing the configuration used in a power splitter arrangement that the device may also advantageously be employed as a power combiner where two or more input signals are combined onto a single transmission line. In another configuration the device may be suitably configured to provide a combined combiner-splitter where two or more individual signals are combined onto the transmission line and then split again to provide a feed for two or more output lines.

[0013] Accordingly the invention provides a power splitter in accordance with claim **1**. Advantageous embodiments are provided in the claims dependent thereto. The invention further provides power combiner in accordance with claim **40**. Advantageous embodiments are provided in the claims dependent thereto.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] The present invention will now be described with reference to the accompanying drawings in which:

[0015] FIG. **1** is a schematic showing a multi-stub tuner operable coupled to a transmission line

[0016] FIG. **2**A shows current and voltage profiles versus position along a transmission line incorporating a single stub and provided with a load across the end of the transmission line.

[0017] FIG. **2**B shows the current and its associated phase for the graph of FIG. **2**A,

[0018] FIG. **2**C shows voltage and its associated phase for the graph of FIG. **2**.

[0019] FIG. **3** is a schematic showing an insert that may be provided within the transmission line to provide the N-secondary former.

[0020] FIG. **4** is an end view of the multi-stub tuner with windings of the N-secondary former provided in a twisted pair arrangement through holes in a shorted end-plate of the tuner.

[0021] FIG. **5** shows in schematic form how a power splitter in accordance with the present teaching may be integrated into a vacuum chamber.

[0022] FIG. **6** shows an example of a power arrangement for providing power to a plurality of electrodes within a single plasma source.

[0023] FIG. **7** shows how a power splitter may be modified to couple low frequency power onto the secondary windings.

[0024] FIG. **8** shows in schematic form how the former may be graded to reduce reflections within the device.

[0025] FIG. **9** shows an example of how a device in accordance with the present teaching may be employed to provide a coupling of power from N individual amplifiers to provide a single high power output.

[0026] FIG. **10** shows a modification to the device of FIG. **9** so as to provide a second former on the opposing end of the transmission line to that of the former providing the support for the secondary windings at the input end, the second former arranged to provide a support for a second set of secondary windings;

[0027] FIGS. **11***a*, **11***b* and **11***c* (bottom, middle, top) are graphical representations of power deposition profiles on substrate as achieved using a multiple tile electrode plasma source as driven using a power splitter in accordance with the present teaching. The graphical representations show the effects of adjustment are made to the power splitting to change power provided to central 2 tiles for a 12-tile system within a 3×4 electrode array for generating a plasma. In this arrangement 6 secondary loops are provided driving 12 tiles. One of the loops feeds the two central tiles. FIG. **11***a* illustrates a case in which 'too little' power obtained by a set-up in which all secondary loops are the same length. FIG. **11***b* illustrates a case in which 'too much' boosted power is provided to central two electrodes obtained by a set-up in which the length of the winding feeding the two central electrodes is increased by ~33%; and FIG. **11***c* illustrates a good power balance at the electrodes obtained by a set-up in which secondary winding for central two electrodes at ~25% longer than the other 5-windings; and

[0028] FIG. **12** shows a cut-away view of the power splitter for use in driving single-ended co-axial cables. The connection shown at A is an example of 1-of-N such connections that could be made spread azimuthally around the exterior of the transmission line. The connection shown at B is an example of 1-of-M such connections that could be spread azimuthally around the interior of the transmission line. The volume of the transmission line is filled with dielectric material, which may be air or vacuum, or may be material with desirable electric permativity and magnetic permativity properties.

DETAILED DESCRIPTION OF THE DRAWINGS

[0029] FIGS. **1** to **4** show an exemplary arrangement whereby an azimuthal magnetic field on a transmission line can be used to induce power into secondary windings arranged along a portion of the transmission line so as to create a power splitter. In the exemplary arrangements that follow the transmission line power splitter includes an impedance matching network in the form of a stub tuner. While described with reference to the exemplary arrangement of a power splitter it will be understood that the arrangement could be equally configured for use as a signal combiner or a power coupler/combiner.

[0030] An example of a power splitter **100** provided in accordance with the teaching of the invention is provided in FIG. **1**. In this exemplary arrangement such a splitter includes an impedance matching network for VHF/UHF applications. It will be appreciated that the provision of the impedance matching network may be beneficial for certain applications but where impedance matching is not critical that such an arrangement may be omitted. In the described exemplary arrangement, a stub tuner **130** is shown.

[0031] As shown in FIG. **1** in the context of two stubs **130***a*, **130***b*, if used, a stub tuner may include one or more individual stubs, each of which may include a sliding short to enable tuning of the stub tuner **130**. In this exemplary arrangement, the output of the stub-tuner **130** is connected to a section of transmission line **110** which is shorted at an end portion **111**. The transmission line may be provided by a coaxial cable, having an inner core **116** and an outer shield **117** separated by a dielectric **118**. By shorting the coaxial cable through for example connection of the inner core **116** to the outer shield **117**, (or any other suitable technique to provide for a shorting of the cabling that is used to provide the transmission line) it is possible to generate a standing wave **200** on the transmission line (shown in FIG. **2**), with the short causing a zero-voltage point **205** (a node) and simultaneously a maximum in current **210** (anti-node). The RF wave reflecting off of the short, particularly in combination with the stub-tuner results in high circulating power within the coaxial transmission line from the short as far back as the stub-tuner. Associated with the high circulating power are regions of high RF current and/or voltage. This high RF current results in high azimuthal