CC-C

CC-C: Claim Chart Comparing claims 1, 12-14, 17, 21, 24 and 29 of th to Misra under 35 U.S.C. § 102

Prior art cited in this chart:

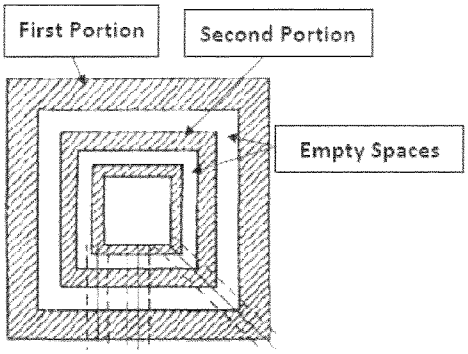
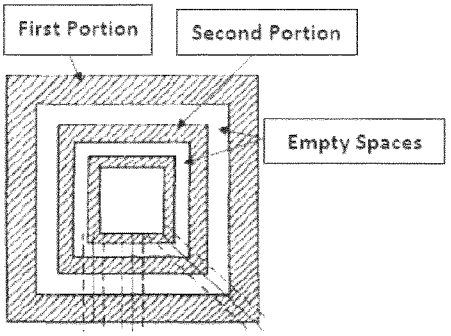
- Misra, Ita et al., "Experimental Investigations on the Impedance and Radiation Properties of a Three-Elemen Concentric Microstrip Antenna", Microwave and Optical Technology Letters, Vol. 11, No. 2, February 5, 19

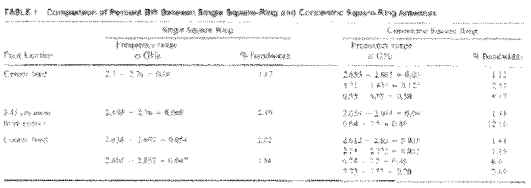
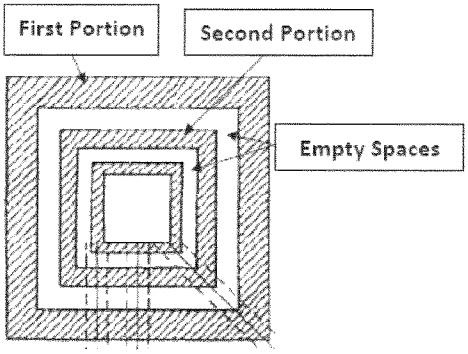
Claims of the '431 Patent	Disclosure of the Prior Art
Claim 1	
1. A multi-band antenna comprising:	"The present article deals with a concentric microstrip square-ring a containing three elements." Misra, p. 67. "…the concentric microstrip square-ring antenna has a multiple ban in total percent bandwidth with respect to the single square ring hav physical dimension of the CMSRA." Misra, p. 68.

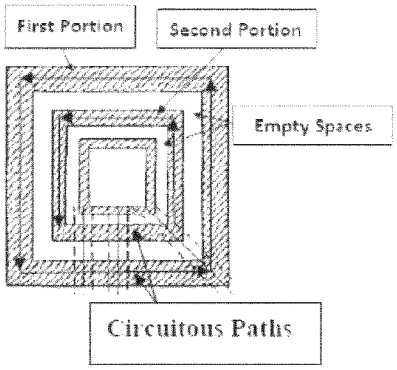
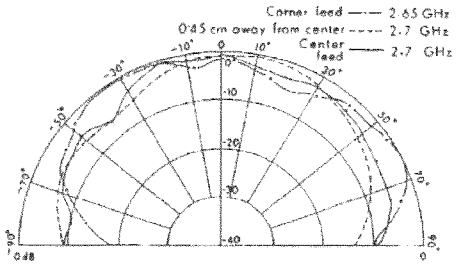
TABLE 1 Comparison of Percent BW Between Single Square-Ring and Concentric Square-Ring Antennas

	Single Square Ring		Concentric Square Ring	
Feed location	Frequency range in GHz	% Bandwidth	Frequency range in GHz	% Bandwidth
Center feed	2.7 – 2.74 = 0.04	1.47	2.654 – 2.665 = 0.01 2.71 – 2.815 = 0.105 6.45 – 6.55 = 0.10	1.12 3.82 1.47
0.45 cm away from center	2.676 – 2.76 = 0.084	2.99	2.654 – 2.668 = 0.01 6.65 – 7.5 = 0.85	1.49 12.16
Center feed	2.679 – 2.692 = 0.013 2.695 – 2.857 = 0.047	1.92 1.66	2.647 – 2.65 = 0.003 2.74 – 2.773 = 0.033 6.74 – 7.2 = 0.46 7.37 – 7.57 = 0.20	1.14 1.19 6.5 2.69

Table 1 – Misra

a conductive radiating element including at least one multilevel structure,	 **Annotated Figure 2(a) – Misra, p.67.** The caption of Fig. 2(a) reads: "Three-element concentric microstrip antenna." Misra , p. 67.
said at least one multilevel structure comprising a plurality of electromagnetically coupled geometric elements,	"A three-element CMSRA has been designed and its measured impe patterns have been compared with those of a single square-ring anter dimension equal to the largest element of the CMSRA." Abstract, "Electromagnetic coupling is an attractive aspect [of a microstrip ant multilayered structure, which allows the antenna to be integrated wit Misra , p. 67. Fig. 2a of Misra illustrates a three-element-concentric-microstrip squ (CMSRA) having a multilevel structure with a plurality of electroma geometric elements. See, Fig. 2a, Misra , p. 67.  **Annotated Figure 2(a) – Misra, p.67.**

said plurality of geometric elements including at least two portions, a first portion being associated with a first selected frequency band and a second portion being associated with a second selected frequency band,	"The compared 1: 2 [voltage standing wave band width] VSWR BW ring and concentric ring at different feed locations is given in Table is seen that the total 1: 2 VSWR BW is increased for the three eleme microstrip square-ring antenna] CMSRA as compared to that of the s effect is prominent at the feed location 0.45 cm away from the cente  **Table 1 – Misra** "The ring widths and spacings increase from the innermost element [outermost element." Misra, p. 68.
said second portion being located substantially within the first portion,	 **Annotated Figure 1 – Misra**
said first and second portions defining empty spaces in an overall structure of the conductive radiating element to provide a circuitous current path within the first portion and within the second portion,	"We have first chosen the innermost square-ring antenna with side *a* *w* = 0.2 cm. The spacing between the adjacent elements and their w chosen…" Misra , p. 68. "The ring widths and spacings increase from the innermost element t element." Misra , p. 68.

	 **Annotated Figure 2(a) – Misra, p.67.**
and the current within said first portion providing said first selected frequency band with radio electric behavior substantially similar to the radio electric behavior of said second selected frequency band and the current within the second portion providing said second selected frequency band with radio electric behavior substantially similar to the radio electric behavior of said first selected frequency band.	"Comparison of the radiation pattern of a single ring and CMSRA (F shows that over the entire bandwidth the nature of the radiation patte similar to that of the single ring operating at the fundamental mode. 6 it is seen that radiation patterns for CMSRA remain unchanged wit location." Misra , p. 68.  **Figure 5** E-plane radiation pattern of single square-ring antenna at different feed locations **Figure 5 – Misra**

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