THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 40

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MARK R. STAKER, JOHN C. MACKICHAN,
and JASHWANT S. DAHELE

Appeal No. 95-1186
Application 08/051,797[1]

HEARD: May 4, 1998

Before KRASS, BARRETT, and LEE, Administrative Patent Judges.

KRASS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the final rejection of claims 1 through 15 and 17 through 25. Claim 16 has been

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[1] Application for patent filed April 26, 1993. According to appellants, this application is a continuation of Application 07/566,412, filed August 21, 1990.

allowed.

The invention is directed to microstrip antennas. More particularly, the invention provides for an antenna having a plurality of substantially rectangular patches energizable at a resonant frequency, each patch having an opposing pair of first edges and an opposing pair of second edges corresponding in length to the resonant frequency. The patches are disposed on a common substrate and arranged in elemental groups with each group having a first patch fed from a feed line and a pair of second patches, each adjacent to and spaced from one of the second edges of the first patch, wherein the second patches are fed only parasitically from the first. The spacing between groups on the substrate is such that the spacing between patches of adjacent groups substantially exceeds the spacing between patches within a group.

Representative independent claim 1 is reproduced as follows:

1. An antenna comprising:

a plurality of substantially rectangular patches, disposed upon a common substrate, each patch having a pair of parallel first edges of length W perpendicular to another pair of parallel second edges of length L, which dimension L defines a corresponding resonant frequency,

the patches forming an array of groups, each such group comprising a first patch fed from a feed line and a pair of second patches each adjacent to and spaced from one of the second edges L of the first patch, the second patches being fed only parasitically from the first patch,

the groups being spaced apart on the substrate in said array with the spacing between patches of adjacent groups exceeding the spacing between patches within a group.

The examiner relies on the following references:

Zaghloul	4,761,654	Aug. 2, 1988
Coe et al. (Coe)	4,812,855	Mar. 14, 1989
Wood et al. (Wood) (UK)	2,067,842	Jul. 30, 1981

Claims 1 through 15 and 17 through 25 stand rejected under 35 U.S.C. § 103 as unpatentable over Wood in view of Coe. Claims 17, 20 and 22 stand further rejected under 35 U.S.C. § 102(e) as anticipated by Zaghloul.

Reference is made to the briefs and answers for the respective positions of appellants and the examiner.

OPINION

We reverse.

Turning first to the rejection of claims 17, 20 and 22 under 35 U.S.C. § 102(e), independent claim 17 requires, inter alia, that the array of groups of patches be "disposed on the surface of a common substrate." In Zaghloul, the feed line 2,

radiating patch 4 and feeding patch 3 are on different levels, vertically disposed from each other.

The examiner argues, at page 14 of the principal answer, that the cross section of Zaghloul's Figures 1a and 1b is "deemed to show 'the surface of a common substrate'," and that a "substrate is not merely a single printed circuit board, but is the material on which 'circuits' are formed," concluding therefrom that circuits 1, 2, 3 and 4 of Zaghloul are formed on the surface of a substrate. While we might be persuaded that the recitation of a "substrate" does not preclude an element of several layers and that the cross section of several layers in Figures 1a and 1b of Zaghloul may be interpreted as a "substrate," so that the patches are on a "common" substrate, claim 17 requires the array of groups of patches to be disposed on the "surface" of a common substrate. It appears clear to us that by reciting a "surface" of a common substrate in the claim, the array of groups of patches must lie in a single plane which is a surface of a substrate no matter how many layers that substrate comprises. The groups of patches in Zaghloul do not lie in a single plane, or surface of a substrate. Accordingly, the rejection of claims

17, 20 and 22 under 35 U.S.C. § 102(e) is improper and will not be sustained.

We now turn to the rejection of claims 1 through 15 and 17 through 25 under 35 U.S.C. § 103.

These claims require, in various ways, a certain relationship between the spacing between adjacent groups of patches and the spacing between patches within each group. More particularly, the spacing between patches of adjacent groups exceeds the spacing between patches within a group.

The examiner admits that while Wood may show a group of patches (in Figure 5), it does not disclose an array of such groups. Therefore, since Wood fails to disclose or suggest an array of groups of patches, it does not, and cannot, disclose or suggest any relationship between the spacing between patches of adjacent groups and the spacing between patches within a group.

The examiner relies on Coe for the teaching of arranging groups of patches into an array, pointing to Figure 8 of the patent to show an array of antenna elements. The examiner concludes [page 4 of the principal answer] that it would have been obvious to "pluralize the basic radiating group of Fig. 5

of Wood et al as taught by Coe et al (Fig. 8) for the purpose of forming a phased array, and to space the inter-group arrays by a distance more than the inter-element spacing within each group to prevent destructive coupling and interferenece [sic] therebetween." The examiner also contends that the specific dimensions and values would have been "well known design expedients..."

It is doubtful that any skilled artisan would have sought to combine the microstrip antenna system of Wood with elements of a dipole antenna system as taught by Coe as the systems are quite different (this is apparently recognized by Coe at column 1, lines 18-31). But, in any event, Coe adds nothing to the deficiency of Wood regarding the relationship between the spacing between adjacent groups and the spacing between patches within a group. The only array Coe discloses is shown in Figure 8 thereof and that array is a generalization disclosing nothing about the spacing between any individual patches within the blank boxes of Coe's Figure 8.

Since neither reference discloses or suggests the claimed relationship between the spacing between adjacent groups and

the spacing between patches within a group, we fail to find a prima facie case of obviousness. We are unpersuaded, particularly in view of appellants' challenge [reply brief-page 2], by the examiner's claim of "well known design expedients" since we have no evidence before us that the prior art recognized any advantage to be achieved by spacing adjacent groups of patches further apart than the spacing between patches within an individual group.

We have not sustained either the rejection of claims 1 through 15 and 17 through 25 under 35 U.S.C. § 103 or the rejection of claims 17, 20 and 22 under 35 U.S.C. § 102(e). Accordingly, the examiner's decision is reversed.

REVERSED

Errol A. Krass Administrative Patent Judge	)	
Lee E. Barrett Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
Jameson Lee Administrative Patent Judge	)	

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