Paper No. 21

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte CHARLES E. MONTAGUE

Appeal No. 2001-2065
Application 09/124,871[1]

HEARD: February 19, 2002

Before KRASS, JERRY SMITH, and BARRETT, Administrative Patent Judges.

BARRETT, Administrative Patent Judge.

DECISION ON APPEAL

[1] Application for patent filed July 30, 1998, entitled "Electronic Missile Location."

This is a decision on appeal under 35 U.S.C. § 134 from the non-final rejection of claims 1-8. The claims having been twice rejected, the appeal is proper.

We reverse.

BACKGROUND

The invention relates to a system for accurately measuring the location of a missile embedded in a target, such as a dart embedded in a dart board. In the prior art electronically scored dart system of Allen, U.S. Patent 5,662,333, the target has a conductive element beneath each target scoring area. The system detects darts embedded in the target by interference with incoming electromagnetic radiation. Appellant has discovered that errors may occur where the dart is embedded adjacent the boundary between a large scoring area and a smaller scoring area and/or where the dart is embedded to a shallow depth, due to the difference in magnitude of the size of the scoring areas (specification, pp. 1-2). The problem is solved by dividing the conductive element of the large scoring area into two pieces, one of

which has an area approximately equal to the area of the smaller scoring area and which is located adjacent thereto.

Claim 1 is reproduced below.

> 1. A system for the accurate location of a missile embedded in a target, comprising:
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> a target having a target face, said target face having a plurality of target areas formed of material into which one or more of the missiles may be selectively embedded; said target areas including a first target area which has a first magnitude of area size and a second target area which is adjacent to said first target area and which has a second magnitude of area size which is substantially larger than said first magnitude of area size;
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> signal receiving elements associated with respective ones of said target areas for receiving and sensing electromagnetic signals which are received at each of said target areas when a missile is embedded in or near respective ones of said target areas; said signal receiving elements being positioned on a side of said material opposite said target face and substantially conforming in size and shape to each of said target areas, said signal receiving element of said first target area having an area size which is substantially equal in magnitude to said first magnitude of area size, and said signal receiving element of said substantially larger second target area having a total area size which is substantially equal to said second magnitude of area size, but including a signal sensing portion which is electrically distinct from the signal receiving element of said first target area and also electrically distinct from the remainder of the total area of the signal receiving element of said second target area; and
>
> processing means electrically connected to said signal receiving elements and said sensing portion which is electrically distinct from the remainder of the total

area of the signal receiving element of said second target area, said processing means distinguishing between a first electromagnetic signal which is received and sensed by one of said signal receiving elements or said signal sensing portion, and a second electromagnetic signal which results from the presence of a missile in close proximity to said target area of said one of said signal receiving elements or said sensing portion, wherein the close proximity of the missile permits the accurate detection of the location of the missile.

The Examiner relies on the following references:

Vranish et al. (Vranish)	4,950,987	August 21, 1990
Santos et al. (Santos)	5,442,313	August 15, 1995
Allen	5,662,333	September 2, 1997
Schulz	5,987,349	November 16, 1999 (filed April 18, 1997)

Claims 1-8 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Allen in view of Vranish and Schulz and Santos.

We refer to the non-final rejection (Paper No. 12) and the examiner's answer (Paper No. 15) (pages referred to as "EA__") for a statement of the Examiner's rejection, and to the appeal brief (Paper No. 14) (pages referred to as "Br__") and the reply brief (Paper No. 17) for a statement of Appellant's arguments thereagainst.

OPINION

Allen discloses the subject matter of claim 1 except for the large signal receiving element of the second large target area "including a signal sensing portion which is electrically distinct from the signal receiving element of said first target area and also electrically distinct from the remainder of the total area of the signal receiving element of said second target area" and the added signal sensing portion being electrically connected to the processing means.

Allen does not recognize the problem of inaccuracy in missile location detection where a large area signal receiving element, such as element E_1 corresponding to target area A_1, adjoins a smaller area signal receiving element, such as element E_2 corresponding to target area A_2. Nor does Allen suggest Appellant's solution of dividing the large area signal receiving element into two portions including a signal sensing portion of an area substantially equal to the first target area and located adjacent to the first target area. However, it is noted that claim 1 recites dividing the larger signal receiving element into two smaller electrically distinct portions, but does not recite that the smaller signal sensing

portion is located adjacent to the signal receiving element of the first target area (this is specified in dependent claim 2) or has a size substantially equal to the magnitude of the first size area (this is recited in dependent claim 3). Accordingly, claim 1 broadly reads on structures which solve the accuracy problem and structures which do not (e.g., where the signal sensing portion has a size equal to the magnitude of the first area size, but is not located adjacent the signal receiving element of the first target area). Structures which do not solve the accuracy problem are nonetheless still operative.

The issue with respect to claim 1 is whether it would have been obvious to divide the signal receiving element under a large target area in Allen into two (or more) signal receiving elements. It need not be shown that the dividing solves any accuracy problem because claim 1 reads on structure which does not solve the problem. See In re Lintner, 458 F.2d 1013, 1015, 173 USPQ 560, 562 (CCPA 1972) ("Claims which are broad enough to read on obvious subject matter are unpatentable even though they also read on nonobvious subject matter.").

The Examiner applies Vranish, Schulz, and Santos "for their teachings that a multiplicity or duplication of sensors can indeed be used together to increase the coverage and enhance the measurement resolution of a[n] item to be measured" (EA5).

Vranish teaches (col. 6, lines 3-6): "The present invention gathers detailed information about the approaching object because of the tiny size of each sensor element and the fact that there are a very large number of them in an array."

Schulz discloses an optical system for locating the position of the tip of a probe inside a three-dimensional object using sensors 20, 22, and 24, and states (col. 8, lines 34-37): "Alternatively, additional sensors, identical to sensors 20, 22, and 4 [sic, 24], could be used either to broaden coverage of the field of view or to enhance measurement resolution."

Santos teaches (col. 1, lines 9-15): "Traditionally, increased resolution with speed or displacement sensors has been achieved by mechanical multiplication. For example, if magnetic poles and digital Hall-effect sensors are used to produce data points, additional magnetic poles or sensors may be added between initial magnetic poles or sensors to achieve

closer spacing between data points." The Examiner concludes that it would have been obvious to modify Allen with additional sensors "to improve the resolution and sensing accuracy of the dart board such that a dart could be sensed anywhere on the 'skin' or surface of a dart board" (EA5).

We agree with the Examiner's finding that Vranish, Schulz, and Santos teach that sensors can be added to increase the coverage and enhance the measurement resolution. However, we do not see why this fact would have motivated one of ordinary skill in the art to divide the signal receiving elements of Allen. It has not been explained, nor is it apparent in the absence of Appellant's disclosure, why enhanced measurement resolution would have been desirable in Allen. The "resolution" in Allen is defined by the size of the target area: all points within the target area are assigned the same value or "score." It is simply not necessary to determine the position of the dart within a target area with any greater resolution. Allen does not indicate any problem with making or using a single signal receiving element for each target area. Accordingly, the rejection lacks a showing of motivation for the proposed

modification. We fully agree with Appellant's arguments (at Br10-12) that Vranish, Schulz, and Santos do not suggest the difference at issue.

The Examiner stated during prosecution (Paper No. 12, p. 5):

"[I]t is extremely well known in the sensing arts, regardless of what type of sensor, to place additional sensors where a discrepancy in the sensing has taken place, or to increase resolution of the monitored area." This statement is not repeated in the examiner's answer. Nevertheless, it appears that the Examiner's reasoning is based on this thinking. The Examiner's statement relies on impermissible hindsight in view of Appellant's disclosure because nowhere does Allen discuss a problem in sensing. However, even if the accuracy problem was known, the Examiner has not established that the claimed solution of dividing the signal receiving element would have been an obvious solution to the problem.

The Examiner points to several statements in Allen (EA6) and states that he "has a problem understanding the appellant's position of exacerbated error detection of a missile being related to the depth of the missile and the size

of the sensing areas since both Allen '333 and the instant application utilize exactly the same sensors the only variation being the number and placement of the sensors" (EA6-7). Subsequently, the Examiner states that "the specific error problems that exist in the prior art have been overcome by Allen '333 where it is repeatedly disclosed that the depth of the missile or dart is not relevant to whether the missile or dart can be sensed" (EA9).

Appellant argues that the cited portions of Allen at EA6 are irrelevant either to Appellant's arguments or the present invention (RBr1-3). It is argued that the present application specifically recognizes the existence of errors in Allen and improves upon the Allen system to eliminate those errors and that the Examiner has not shown otherwise (RBr5).

We find no factual basis for the Examiner to question Appellant's position that he discovered a previously unknown measurement problem with the system of Allen related to the depth of the missile and the size of sensing areas that was not appreciated by Allen or to question whether those problems actually exist in Allen. One would not expect Allen to recognize or discuss an unknown problem.

The Examiner states that Vranish, Schulz, and Santos teach that sensors can be added to enhance the measurement resolution and that "the designer of the dart board could selectively place additional sensors of Allen's system for increased resolution" (EA8). The Examiner states that it is difficult to conceive of a more obvious method of improving resolution than by providing extra sensors and that duplication of sensors for improved effect is hornbook engineering (EA8).

Appellant argues that Allen does not suggest that the signal pickup elements are broken into portions or multiplied (RBr4). It is argued that the present invention is more than mere multiplication of sensor elements (RBr6-7).

Again, we find no reason why one of ordinary skill in the art would have been motivated to increase the resolution within a target area in Allen. It is not necessary to discriminate between different areas of the same target area because all points within a target area have the same value. Allen does not disclose or suggest that there is a problem with using a single signal receiving element for each target area. It is immaterial that a designer of the dart board

could place additional sensors in Allen's system for increased resolution absent some motivation why increased resolution would have been desirable. See In re Fritch, 972 F.2d 1260, 1266, 23 USPQ2d 1780, 1783-84 (Fed. Cir. 1992) ("The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification.")(citing In re Gordon, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984)).

For the reasons stated above, we conclude that the Examiner has failed to establish a prima facie case of obviousness as to claim 1. The rejection of claims 1-8 is reversed. Nevertheless, we make the following comments regarding the Examiner's rejection of claims 2 and 3.

As to claim 2, the Examiner reasons (EA11): "[I]t is known to provide additional sensors for increased resolution and placement of such sensors would necessarily be in the position where such detection enhancement is needed." As to claim 3, the Examiner states (EA11): "[W]ith respect to the size of the sensors that are in the adjacent larger signal sensing area being substantially equal to the area of the

small signal receiving area, the number and placement of sensors for an artisan skilled in the detection arts and [sic] would necessarily be in the position where such detection enhancement is needed." These statements clearly indicate that the Examiner has used Appellant's disclosure against him because only Appellant has stated where the accuracy problem occurs. In addition, the Examiner's reasoning regarding claim 3 does not address the claim language about substantially equal signal sensing areas.

CONCLUSION

The rejections of claims 1-8 are reversed.

REVERSED

ERROL A. KRASS)
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JERRY SMITH) APPEALS
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