

The opinion in support of the decision being entered today was *not* written for publication and is *not* binding precedent of the Board.

Paper No. 20

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte NOBUKAZU KAWAGOE, YUICHI KAWAKAMI,
KYOKO NAKAMURA, and YASUHISA KINTO

Appeal No. 2000-0431
Application No. 08/789,127

ON BRIEF

Before THOMAS, KRASS, and BARRY, *Administrative Patent Judges*.
BARRY, *Administrative Patent Judge*.

DECISION ON APPEAL

The examiner rejects claims 1-25 and 29-32. The appellants appeal therefrom under 35 U.S.C. § 134(a). We affirm-in-part and enter a new ground of rejection.

BACKGROUND

The invention at issue in this appeal relates to moving a

identify and record an area not yet traversed, and then traversing this area.

Claim 11, which is representative, follows:

11. A moving apparatus for running and moving on a floor, covering an entire accessible surface of said floor, comprising:

running control means for controlling the moving apparatus to run along running lanes in a zigzag fashion, whereby the moving apparatus repeatedly; runs in one of a plurality of lanes in a first direction, moves a prescribed pitch in a second direction perpendicular to said first direction, and thereafter runs in one of a plurality of lanes in a third direction opposite to said first direction;

setting means for setting a region where said moving apparatus moves;

input means for inputting a position where said moving apparatus completes movement in said set region; and

operation means for determining the prescribed pitch employed by said running control means based on the region set by said setting means and the position input by said input means.

The prior art applied by the examiner in rejecting the

Kawakami et al. ("Kawakami") 5,652,489 July 29, 1997
(filed Aug. 24, 1995)

Nakamura et al. ("Nakamura") 5,720,077 Feb. 24, 1998
(filed May 26, 1995).

Claims 1-25 and 29-31 stand rejected under 35 U.S.C. § 103(a) as obvious over Kawakami in view of Bancroft as obvious over Nakamura in view of Bancroft.

OPINION

After considering the record, we are persuaded that the examiner erred in rejecting claims 1-7 and 13-21 but did not err in rejecting claims 11-12. In addition, we find that claims 8-10, 22-25, and 29-32 are indefinite under 35 U.S.C. § 112, ¶ 2, and that the rejection of these claims under § 103(a) is inappropriate. Accordingly, we affirm-in-part and enter new ground of rejection for claims 8-10, 22-25, and 29-32. Our opinion addresses the following groups of claims:

- claims 1-7 and 13-21
- claims 8-10, 22-25, and 29-32
- claims 11 and 12.

therebetween. The examiner asserts, "Kawakami also discloses a CPU that receives the output of the obstacle sensor and changes the suitable running route while measuring the distance to the obstacle in the direction of movement, so as to accomplish the obstacle avoidance operation.. [sic] See column 3, lines 59-63." (Examiner's Answer at 3.) He further asserts, "Nakamura et al discloses a distance sensor for detecting the distance up to an obstacle (column 4, lines 10-11). Nakamura et al discloses a start and end position. See column 5, line 46 to column 6, line 19." (*Id.* at 4.) The examiner adds, "Figure 3 of Bancroft shows a zigzag movement of the robot. The robot repeatedly senses a distance. The distances (coordinates) are stored in the memory. See columns 1 and 2. See also column 3." (*Id.* at 4-5.) The appellants argue that none of the references teach "recognizing when [a moving apparatus] travels beyond the y coordinate of an obstacle in the cleaning area." (Appeal Br. at 27.)

part the following limitations: "recognizing means for recognizing, when the moving apparatus travels in a current running lane in the Y direction beyond the previously stored Y coordinate of the obstacle, presence of a remaining running region between the current running lane and said obstacle and not yet covered by the moving apparatus." Similarly, independent claim 13 specifies in pertinent part the following limitations: "upon running in a current one of the plurality of lanes in the Y direction beyond the Y coordinate of the obstacle, recognizing presence of a remaining running region between the current running lane and the obstacle not yet covered by the moving apparatus." Accordingly, the claims 1 and 13 require *inter alia* detecting when a moving apparatus has traveled beyond a previously stored Y coordinate of an obstacle and, upon such detection, recognizing the presence of a region located between the current running lane and the obstacle that has yet to be covered by the apparatus.

obviousness." *In re Rijckaert*, 9 F.3d 1531, 1532, 28 USPQ2d 1955, 1956 (Fed. Cir. 1993) (citing *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992)). "'A *prima facie* case of obviousness is established when the teachings from the prior art itself would appear to have suggested the claimed subject matter to a person of ordinary skill in the art.'" *In re Bell*, 991 F.2d 781, 783, 26 USPQ2d 1529, 1531 (Fed. Cir. 1993) (quoting *In re Rinehart*, 531 F.2d 1048, 1051, 189 USPQ 143, 147 (CCPA 1976)).

Here, the examiner fails to allege, let alone show, that teachings from the references disclose or would have suggested the claimed limitations. Rather than comparing the language of the claims with the references, he merely describes the latter. We will not "resort to speculation," *In re Warner*, 379 F.2d 1011, 1017, 154 USPQ 173, 178 (CCPA 1967), as to how the aforementioned limitations might be disclosed or suggested thereby. Therefore, we reverse the rejection of claims 1 and 13 and of claims 2-7 and

II. Claims 8-10, 22-25, and 29-32

Under 37 C.F.R. § 1.196(b), we enter a new ground of rejection against claims 8-10, 22-25, and 29-32. The second paragraph of 35 U.S.C. § 112 requires that the specification conclude "with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention." "The test for definiteness is whether one skilled in the art would understand the bounds of the claim when read in light of the specification." *Orthokinetics Inc., v. Safety Travel Chairs, Inc.*, 806 F.2d 1565, 1576, 1 USPQ2d 1081, 1088 (Fed. Cir. 1986).

Here, independent claim 22 specifies in pertinent part the following limitations:

running along running lanes in a zigzag fashion by beginning at a starting Y coordinate, and, repeatedly; running along one of plurality of lanes in a Y direction, moving by a prescribed pitch in an X direction perpendicular to the Y direction, and running in one of a plurality of lanes in a direction opposite to the Y direction until the starting Y coordinate is reached;

Independent claims 8, 29, and 31 specify in pertinent part similar limitations.

Here, the limitations of claims 8, 22, 29, and 31 leave us in a quandary as to what the claims specify. We fail to grasp how the claimed robot can be moved "by a prescribed pitch" when the prescribed pitch is not determined until a latter step of the claim. In addition, the appellants' specification states that "[s]ide following sensors 8a to 8d detect the distance up to a wall when the robot moves straight along a wall located on its side." (Spec. at 13.) We are uncertain how the robot can "measur[e] a distance up to an obstacle in the X direction," as claimed, without having first moved straight along the obstacle. Accordingly, we find that one skilled in the art would not understand the bounds of the claims when read in light of the specification. Therefore, we reject claim 8 and claims 9 and 10, which depend therefrom; claim 22 and claims 23-25, which depend therefrom; claim 29 and claim 30, which depends therefrom; and

A rejection under 35 U.S.C. 103(a) should not be based on "speculations and assumptions." *In re Steele*, 305 F.2d 859, 862, 134 USPQ 292, 295 (CCPA 1962). "All words in a claim must be considered in judging the patentability of that claim against the prior art. If no reasonably definite meaning can be ascribed to certain terms in the claim, the subject matter does not become obvious-the claim becomes indefinite." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

Here, speculations and assumptions would be required to decide the meaning of the terms employed in claims 8-10, 22-25, and 29-32 and the scope of the claims. Therefore, we reverse *pro forma* the rejection of the claims 16-19 as obvious. We emphasize that our reversal is based on procedure rather than on the merits of the obviousness rejection. The reversal does not mean that we consider the claims to be patentable *vel non* as presently drafted.

(CCPA 1979)). When the patentability of a dependent claim is not argued separately, in particular, the claim stands or falls with the claim from which it depends. *In re King*, 801 F.2d 1324, 1325, 231 USPQ 136, 137 (Fed. Cir. 1986) (citing *In re Sernaker*, 702 F.2d 989, 991, 217 USPQ 1, 3 (Fed. Cir. 1983); *In re Burckel*, 592 F.2d 1175, 1178-79, 201 USPQ 67, 70 (CCPA 1979)).

Here, the appellants assert, "the claims are grouped as follows: . . . Group III: claims 11 and 12." (Appeal Br. at 11.) Therefore, claim 12 stands or falls with representative claim 11. With this representation in mind, we address the three points of contention between the examiner and the appellants.

First, the examiner asserts that it would have been obvious to modify the robots of Kawakami or Nakamura "by incorporating the features from the self-running cleaning apparatus of Bancroft because such modification will provide an 'efficient moving apparatus' where maximum area will be covered thereby."

(Appeal Br. at 36.) They further argue, "the motivation to combine Nakamura and Bancroft is wholly lacking." (*Id.* at 58.)

"`[T]he question is whether there is something in the prior art as a whole to suggest the desirability, and thus the obviousness, of making the combination.'" *In re Beattie*, 974 F.2d 1309, 1311-12, 24 USPQ2d 1040, 1042 (Fed. Cir. 1992) (quoting *Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1462, 221 USPQ 481, 488 (Fed. Cir. 1984)). "[E]vidence of a suggestion, teaching, or motivation to combine may flow from the prior art references themselves, the knowledge of one of ordinary skill in the art, or, in some cases, from the nature of the problem to be solved. . . ." *In re Dembiczak*, 175 F.3d 994, 999, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999) (citing *Pro-Mold & Tool Co. v. Great Lakes Plastics, Inc.*, 75 F.3d 1568, 1573, 37 USPQ2d 1626, 1630 (Fed. Cir. 1996); *Para-Ordnance Mfg. v. SGS Imports Int'l, Inc.*, 73 F.3d 1085, 1088, 37 USPQ2d 1237, 1240 (Fed. Cir. 1995)).

limitation. . . ." Col. 8, ll. 40-42. For its part, Kawakami invites "changes and modifications," col. 9, l. 20, to its invention.

Bancroft suggests such a change or modification. We agree with the examiner that "in column 3, Bancroft discloses the size (or width) of the running or working are, [sic, area] i.e. are [sic, area] to be cleaned." (Examiner's Answer at 4-5.) Specifically, "[t]he present invention avoids these problems by dividing the autonomous operation of the robot into two phases. The first phase quickly determines the area to be cleaned and a path for accomplishing the cleaning." Col. 1, ll. 40-43. "The second phase is then the actually cleaning of the area." *Id.* at l. 45. The secondary reference also discloses advantages flowing from its two-phased operation. Specifically, "no operator assistance is needed to train the robot and it is quickly determinable if the robot is going to stay in the desired area. In addition, because the area to be cleaned is known before the

Because using the two-phased operation of Bancroft with the robots of Kawakami or Nakamura would have eliminated a need for operator assistance, would have enabled a quick determination if the robot was going to stay in a desired area, and would have provided efficient coverage of a cleaning area, we find that the prior art as a whole would have suggested combining teachings of the references.

Second, the appellants argue, "neither Kawakami nor Bancroft teach a system which covers an entire accessible surface of the floor." (Appeal Br. at 35.) They similarly argue, "neither Nakamura nor Bancroft teach a system which covers an entire accessible surface of the floor." (*Id.* at 57.)

"Generally, . . . the preamble does not limit the claims." *DeGeorge v. Bernier*, 768 F.2d 1318, 1322 n.3, 226 USPQ 758, 761 n.3 (Fed. Cir. 1985). In particular, "[t]he preamble of a claim does not limit the scope of the claim when it merely states

. . . a compelling reason must exist before the language can be given weight." *Arshal v. United States*, 621 F.2d 421, 430-31, 208 USPQ 397, 406-07 (Ct. Cl. 1980) (citing *In re de Castelet*, 562 F.2d 1236, 1244 n.6, 195 USPQ 439, 447 n.6 (CCPA 1977)).

Here, the expression "covering an entire accessible surface of said floor" is found only in the preamble of representative claim 11. It merely states a purpose or intended use of the claimed "moving apparatus." The body of the claim neither repeats nor references the covering of an entire accessible surface; it instead specifies "a region where said moving apparatus moves. . . ." Because the language in the body of the claim standing alone is clear and unambiguous, there is no compelling reason to give the expression weight.

Assuming *arguendo* that we give the expression patentable weight, the limitations require *inter alia* covering an entire accessible surface of a floor. "'All of the disclosures in a

Here, Kawakami's mobile robot covers an entire accessible surface of a floor. Specifically, "[w]ork route 41 of mobile robot A 43 is set so as to clean the **entire** rectangular range 40 starting from the top left of rectangular range 40 by having mobile robot A 43 zigzag in a vertical direction." Col. 4, ll. 10-13 (emphasis added). The reference also mentions that "[i]f an obstacle detected in the work route is a stationary obstacle, the work route is changed . . . and work continues without stopping," *id.* at ll. 29-31, and that "this method is basically undesirable insofar as some residual work area remains due to the avoidance operation." *Id.* at ll. 31-33. Figure 4 shows that the aforementioned range 40, however, includes no such stationary objects. When cleaning the range 40, therefore, the mobile robot A 43 cleans the entire accessible surface of the range.

In addition, the very problem that Nakamura seeks to solve involves the prior art's incomplete coverage of a surface of a

robot covers an entire accessible surface of a floor. Specifically "it is possible to carry out a work in a large working area at one time by operating the working member in a fixed state or in a running state, depending on the situation. It is also possible to carry out a work to a corner of the working area efficiently. Further, the working member can directly act on the working area of a narrowed portion." Col. 8, ll. 32-38.

For its part, Bancroft's mobile robot also covers an entire accessible surface of a floor. Specifically, "[o]nce the plan of the area 40 is determined, the robot 10 determines a path to **completely** traverse the area 40." Col. 3, ll. 16-17 (emphasis added). The reference mentions that its robot cannot clean an area beyond "an obstacle 50 . . . detected by the forward sensor 32, col. 3, ll. 9-10, "the obstacle 50 may be, for example, a wall. . . ." *Id.* at l. 10. Stopping at the wall of a room, however, does not prevent the robot from cleaning the

"alcoves," col. 3, l. 44, or inside "a large branching hallway 66." Col. 4, l. 2. Figures 2 and 3 of the secondary reference, however, show that the aforementioned area 40 includes neither alcoves nor hallways. When cleaning the area 40, therefore, the robot 10 cleans the entire accessible surface of the area.

Third, as mentioned regarding the first point of contention, the examiner asserts, "in column 3, Bancroft discloses the size (or width) of the running or working are, [sic, area] i.e. are [sic, area] to be cleaned." (Examiner's Answer at 4-5.) The appellants argue that none of the references "teach[] the operation means that determines a prescribed pitch, let alone a prescribed pitch based upon input parameters of the area to be cleaned and the position of the apparatus, recited in claim 11." (Appeal Br. at 35-36.)

"In the patentability context, claims are to be given their broadest reasonable interpretations. Moreover, limitations are

(Fed. Cir. 1989)).¹ Here, representative claim 11 specifies in pertinent part the following limitations:

setting means for setting a region where said moving apparatus moves;

input means for inputting a position where said moving apparatus completes movement in said set region;
and

operation means for determining the prescribed pitch employed by said running control means based on the region set by said setting means and the position input by said input means.

The appellants' specification states that "[t]he distance between a forward path and a backward path in zigzag running is herein referred to as 'a traverse movement pitch.'" (Spec. at 19.) Giving the claim its broadest reasonable interpretation, the limitations merely require *inter alia* determining a distance

¹ "The PTO broadly interprets claims during examination of a patent application since the applicant may 'amend his claims to obtain protection commensurate with his actual contribution to the art.'" *In re Yamamoto*, 740 F.2d 1569, 1571, 222 USPQ 934, 936 (Fed. Cir. 1984) (quoting *In re Prater*, 415 F.2d 1393,

between a forward path and a backward path in a zig zag pattern based on the parameters of a region and a stopping point.

Bancroft's robot also determines a distance between a forward path and a backward path in a zig zag pattern based on the parameters of a region and a stopping point. As mentioned regarding the first point of contention, "during the first phase [the robot] quickly determines the area to be cleaned and a path for accomplishing the cleaning." Col. 1, ll. 40-43. Determining the area to be cleaned involves determining a region, viz., the width of the area. Specifically, "[t]he robot repeatedly senses a distance to the right boundary, a distance to the left boundary. . . . These distances are stored in memory means." Col. 1, ll. 56-58.

The reference's determination of the area to be cleaned also involves determining a stopping point, viz., the length of the area. Specifically, as Bancroft's robot travels from a near wall

from the distance sensors 28, 30 and the encoders 24, 26, the robot 10 determines the dimensions of the area 40." Col. 3, ll. 13-15. "Once the plan of the area 40 is determined, the robot 10 determines a path to completely traverse the area 40. For example, a zigzag path 52 such as shown in FIG. 3 may be calculated by the microprocessor 34 taking into account the dimensions of the area 40 and the cleaning width 54 of the robot 10." *Id.* at ll. 16-21. We find that calculating the zig zag path 52 necessarily involves determining a distance between a forward path and a backward path in the zig zag path based on the parameters of a region and a stopping point. Therefore, we affirm the rejection of claim 11 and of claim 12, which falls therewith.

CONCLUSION

In summary, the rejection of claims 1-7 and 13-21 under § 103(a) is reversed, but the rejection of claims 11 and 12 is affirmed. Our affirmance is based only on the arguments made in

the rejection of these claims under § 103(a) as obvious is reversed.

Our opinion contains a new ground of rejection under 37 C.F.R. § 1.196(b), as amended at 62 Fed. Reg. 53131, 53197 (Oct. 10, 1997). Section 1.196(b) provides that "[a] new ground of rejection shall not be considered final for purposes of judicial review." It also includes the following provisions.

The appellant, within two months from the date of the decision, must exercise one of the following two options with respect to the new grounds of rejection to avoid termination of proceedings (§ 1.197(c)) as to the rejected claims:

(1) Submit an appropriate amendment of the claims so rejected or a showing of facts relating to the claims so rejected, or both, and have the matter reconsidered by the examiner, in which event the application will be remanded to the examiner. . . .

(2) Request that the application be reheard under § 1.197(b) by the Board of Patent Appeals and Interferences upon the same record. . . .

No time for taking any action connected with this appeal may be extended under 37 C.F.R. § 1.136(a).



AFFIRMED-IN-PART
37 C.F.R. § 1.196(b)

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Administrative Patent Judge)	
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)	BOARD OF PATENT
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