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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte SAMRA SAMAK SANGARI, KURTIS S. WILLDEN, JAMES M. COBB, GARY M. BUCKUS, CARLOS CRESPO, and SAMUEL F. PEDIGO

Appeal 2015-008009
Application 13/166,306
Technology Center 2100

Before ELENI MANTIS MERCADER, CARL W. WHITEHEAD JR., and ADAM J. PYONIN, *Administrative Patent Judges*.

Per Curiam.

DECISION ON APPEAL

STATEMENT OF THE CASE

This is a decision on appeal under 35 U.S.C. § 134(a) from the Final Rejection of claims 1–6, 8–12, 14–19, 21–28, and 30–50. Final Rejection 2. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

Introduction

Appellants' invention relates to an "automated ply layup system [that] uses a robot and an end effector for selecting plies from a kit and placing the plies at predetermined locations on a tool." Abstract.

Representative Claim (Disputed limitations emphasized)

> 1. A system for laying composite plies at preselected locations on a tool; comprising:
>
> a robot;
>
> an end effector on the robot for lifting a ply and placing the ply at a preselected location on the tool;
>
> a scanner on the end effector, the scanner configured to identify a feature at the preselected location on the tool, the scanner further configured to pre-inspect the preselected location prior to ply placement;
>
> *a position recording device for recording a position of the ply on the end effector*; and
>
> a controller coupled with the position recording device for controlling the robot and the end effector to place the ply at the preselected location based on a pre-inspection measurement by the scanner of the preselected location.

Rejections on Appeal

Claims 1, 2, 5, 6, 8–12, 14, 16, 17, 19, 21–28, 30, 32, and 50 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ruth, "Robotic Lay-up of Prepreg Composite Plies," Proceedings of the 1990 IEEE International Conference on Robotics and Automation, Vol. 2 pages 1296–1300 (May 1990) in view of Leeper, "Using Near-Field Stereo Vision for Robotic Grasping in Cluttered Environments," Proceedings of ISER 2010, pages 1–15 (December 2010). Final Rejection 2–3.

Claims 3, 4, 15, 18, 31, 36–40, 44–46, and 48 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ruth in view of Leeper, and further in view of Chestney, "Dielectric Selection For a Robotic Electrostatic Gripping Device," IEE Seventh International Conference on Dielectric Materials Measurements & Applications, Conference Publication No. 430, pages 103–107 (September 1996). Final Rejection 19–20.

Claims 33–35 and 49 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ruth in view of Leeper, and further in view of Olsen, "Automated Composite Tape Lay-Up Using Robotic Devices," Proceedings of the IEEE International Conference on Robotics and Automation, Volume 3 pages 291–297 (May 1993). Final Rejection 31.

Claims 41–43 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ruth in view of Leeper and Chestney, and further in view of Dexmet, "Aircraft Lightning Strike Protection," Dexmet Corporation, https://web.archive.org/web/20101226022612/http://www.dexmet.com/Aircraft-Lightning-Strike-Protection.html (December 2010). Final Rejection 37.

Claim 47 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Ruth in view of Leeper and Chestney, and further in view of Pelrine (US 2010/0271746 A1; October 28, 2010). Final Rejection 41.

ANALYSIS

Rather than reiterate the arguments of Appellants and the Examiner, we refer to the Final Rejection (mailed December 4, 2014), the Appeal Brief (filed January 26, 2015), the Answer (mailed July 2, 2015), and the Reply Brief (filed September 2, 2015) for the respective details. We have

considered in this decision only those arguments Appellants actually raised in the Briefs.

We have reviewed the Examiner's rejections in light of Appellants' arguments that the Examiner has erred. We adopt as our own (1) the findings and reasons set forth by the Examiner in the action from which this appeal is taken and (2) the reasons set forth by the Examiner in the Examiner's Answer in response to Appellants' Appeal Brief, except where noted.

Rejection of Claim 1

Appellants argue Examiner error because the combination of references "does not disclose 'a position recording device for recording a position of the ply on the end effector,' as in claim 1." Appeal Brief 15. Particularly, Appellants contend "the wrist camera on the robot in Ruth is used to identify indices on the ply and on the mold, and then control system uses the positions of the indices to correctly align the ply" and "Ruth never checks the position of the ply on the end effector." Appeal Brief 16.

We are not persuaded by Appellants' arguments. The Examiner finds, and we agree, that Ruth's "[w]rist-mounted camera is used to record the ply as it is held by the transport robot in order determine and correct any errors that will lead to position errors of the ply when placed on the mold." Final Rejection 3–4, citing Ruth Table 1 and pages 1299–1300. Ruth's wrist-mounted camera records "a position" of the ply when the ply is positioned on the robot's end-effector, because the position of the ply can be

determined by the ply's index mark, which is all the claim requires.[1] Appellants' argument that "Ruth never checks the position" is not commensurate with the scope of the claim, because the claim does not require the position to be checked.

Appellants additionally argue the "asserted rationale [to combine the references] is both irrelevant and overshadowed by the difficulty posed by the combination." Appeal Brief 17. Appellants contend "[t]here are no problems of a cluttered background in Ruth" and "any camera placed on the fingers of Ruth would become gummed at obstructed with the tacky resin of the prepreg plies." *Id.*; see also Appeal Brief 18–21.

We are not persuaded by Appellants' arguments. The Examiner finds, and we agree, that "[o]ne of ordinary skill in the art would have been motivated [to combine Ruth and Leeper] in order to obtain a better sensory view of desired objects or positions." Final Rejection 4, citing Leeper page 4 and Figure 2 Caption. Appellants have not provided persuasive arguments or technical evidence to rebut the Examiner's findings. *See, e.g., In re Geisler*, 116 F.3d 1465, 1470 (Fed. Cir. 1997) (attorney arguments or conclusory statements are insufficient to rebut a prima facie case).[2]

Therefore, we sustain the Examiner's obviousness rejection of independent claim 1, as well as independent claims 10, 17, 26, 32, 36, 41,

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[1] We further note that claim 1 requires the controller to place the ply at the preselected location "based on a pre-inspection measurement by the scanner of the preselected location" and thus the controller does not place the ply based on "a position" recorded by the position recording device.

[2] We further note that the schematic top view of the robotic ply lay-up testbed of Ruth appears highly suggestive of a cluttered environment. See Ruth Figure 2 at page 1297.

44, and 49 commensurate in scope, and claims 2–6, 8, 11–12, 14, 15, 18, 19, 21, 23–25, 27, 28, 30, 31, 33–35, 37–40, 42, 43, and 45–48 not separately argued. *See* Appeal Brief 21–24.

Rejection of Claims 9, 16, 22, and 50

Appellants argue Examiner error because "[t]he Office Action failed to state a *prima facie* obviousness rejection against claim 9 because the cited combination of references, considered alone or together, does not disclose 'a sensor on the end effector for sensing an amount of the compaction force.'" Appeal Brief 22. Appellants contend "Ruth discloses robotic manipulators capable of sensing force, but that does not mean that Ruth discloses a sensor for sensing an amount of the compaction force, as claimed." Appeal Brief 22.

We are not persuaded by Appellants' arguments. The Examiner finds, and we agree, that "Ruth teaches in the second paragraph of the background section of Pg. 1296, that compaction smoothing is required. Furthermore, on 1300 in section 'Ply Tacking and Smoothing,' Ruth states that pressure is applied." Answer 6. "[O]bviousness does not require the prior art to reach expressly each limitation exactly. Rather, obviousness may render a claimed invention invalid where the record contains a suggestion or motivation to modify the prior art teaching to obtain the claimed invention." *Beckson Marine, Inc. v. NFM, Inc.*, 292 F.3d 718, 727 (Fed. Cir. 2002) (citations omitted).

Here, Ruth indicates the plies must be "compacted under vacuum" in order "to remove air, ensure seating, and prevent wrinkles." Ruth page 1296, column 1 ¶ 2. One skilled in the art would consider the addition of a

sensor on the end-effector for sensing compaction force, in order to prevent wrinkles and ensure seating. Therefore, we sustain the Examiner's rejection of claims 9, 16, 22, and 50.

DECISION

We affirm the Examiner's rejections of claims 1–6, 8–12, 14–19, 21–28, and 30–50.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED