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Ovist et al.

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(54) **COUPLER SYSTEM**

- (71) Applicant: **Grovist Innovations, LLC**, Portland, OR (US)
- (72) Inventors: **Vince Ovist**, Happy Valley, OR (US); **William T. Grohs**, Eugene, OR (US)
- (73) Assignee: **Grovist Innovations LLC**, Las Vegas, NV (US)
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- This patent is subject to a terminal disclaimer.

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(56) **References Cited**

U.S. PATENT DOCUMENTS

470,211 A * 3/1892 Philips G02B 7/182 359/875
3,286,391 A 11/1966 Mengerlinghausen
(Continued)

FOREIGN PATENT DOCUMENTS

DE 3035698 A1 4/1982
DE 8333865 U1 4/1987
(Continued)

OTHER PUBLICATIONS

Amiri, Nahid, Authorized Officer, U.S. Receiving Office, "International Preliminary Report on Patentability" in connection with related International Application No. PCT/US2011/039333, dated May 29, 2012, 8 pages.

(Continued)

Primary Examiner — Amber R Anderson

Assistant Examiner — Nahid Amiri

(74) *Attorney, Agent, or Firm* — Kolisch Hartwell, P.C.

(57) **ABSTRACT**

A coupler system for connecting elongate, horizontally disposed rods to vertical supports includes a top-cap component for attaching to the top of a vertical support, and including a body with plural cavities formed therein, and at least one ball-cap component for attaching to an end of a rod, and including a ball region that is constructed to fit within one of the plural cavities of the top-cap component. The body may be formed with four of the plural cavities, with each of them having beveled edges. The ball-cap components may include a ball region, a neck region, and an angled region located adjacent the neck region and away from the ball region. The top-cap and ball-cap components may include insertion regions with opposing sets of ribs. The coupler system may further include a cover component, and the body may be formed with a central hole for receiving a

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