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(19) **United States**(12) **Patent Application Publication****Varela Benitez et al.**(10) **Pub. No.: US 2022/0354025 A1**(43) **Pub. Date:****Nov. 3, 2022**(54) **LIQUID PUMPING UNITS, AND RELATED SYSTEMS AND METHODS**(71) Applicant: **CoolIT Systems, Inc.**, Calgary (CA)(72) Inventors: **Sebastian Varela Benitez**, Calgary (CA); **Dennis Trieu**, Calgary (CA); **Brydon Gierl**, Calgary (CA); **Seyed Kamaleddin Mostafavi Yazdi**, Calgary (CA); **Cameron Turner**, Calgary (CA)(21) Appl. No.: **17/867,457**(22) Filed: **Jul. 18, 2022****Related U.S. Application Data**

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(57)

ABSTRACT

A pump tray has a liquid pump with an inlet and outlet. A blindly matable liquid coupler fluidically couples with the pump inlet and a blindly matable liquid coupler fluidically couples with the pump outlet. A chassis of the pump tray has an alignment member configured to removably engage with another device and to restrict, to a limited number of degrees-of-freedom, movement of the chassis relative to the other device (e.g., a liquid pumping unit). The blindly matable liquid couplers are so physically coupled with the chassis as to inhibit movement of them relative to the chassis. A liquid pumping unit also has a chassis defining a bay configured to receive a pump tray, a liquid inlet coupler and a liquid outlet coupler, and a reservoir fluidically coupled with the liquid inlet coupler. A blindly-matable liquid coupler fluidically couples with the reservoir outlet and a blindly-matable liquid coupler fluidically couples with the liquid outlet coupler. An alignment member is configured to removably engage with the pump tray and to restrict, to a limited number of degrees-of-freedom, movement of the pump tray relative to the chassis of the liquid pumping unit.

