

CLAIMS

1. A device for hot swapping at least one electronic device from an immersion cooling tank having a first opening, the device comprising:
- 5 a condensing device, removably locatable in the first opening of the immersion cooling tank, the condensing device comprising a condensing coil forming a second opening through which the at least one electronic device is removable; and
- an apparatus coupled to the condensing device for selectively adjusting at least one of a height and a location of the condensing device about the first opening of the immersion cooling tank.
- 10 2. The device of claim 1, wherein the condensing device further comprises an outer rim portion connected to the condensing coil.
3. The device of claim 1, wherein the apparatus comprises a crane.
4. The device of claim 3, wherein the crane comprises:
- 15 a lifting arm for adjusting the height of the condensing device;
- a movable platform operatively coupled to the lifting arm for adjusting the location of the condensing device; and
- a plurality of casters operatively coupled to a bottom portion of the movable platform for positioning the movable platform.
5. The device of claim 3, wherein the crane is integrated into a movable device selected
- 20 from the group consisting of a self-powered device, an externally powered device, a forklift, and a truck.
6. The device of claim 1 further comprising:
- a coolant container in fluid communication with the condensing device; and
- a chiller pump for circulating a coolant fluid from the coolant container to the condensing
- 25 device.
7. The device of claim 1 further comprising an item lock selectively attachable to the electronic device.

8. The device of claim 7 further comprising an apparatus for adjusting a height of the item lock.
9. The device of claim 8, wherein the apparatus for adjusting the height of the item lock comprises a pulley system.
- 5 10. The device of claim 9, wherein the pulley system comprises:
a plurality of sheaves;
a winch; and
a hoist wire disposed through the plurality of sheaves and having a proximal end operatively attached to the winch and a distal end operatively attached to the item lock.
- 10 11. The device of claim 10, wherein the winch is at least one of a hand-operated winch and a motor-driven winch.
12. The device of claim 8, wherein the apparatus for adjusting the height of the item lock comprises at least one of a chain hoist/forklift assembly or a belt-drive/forklift assembly.
13. The device of claim 12, wherein the chain hoist/forklift assembly comprises:
15 a plurality of gear-wheels;
a winch operatively coupled to at least one of the gear-wheels;
a roller chain disposed about the gear-wheels; and
a mounting bracket operatively coupled to the roller chain.
14. The device of claim 1, wherein the item lock further comprises a vibration motor.
- 20 15. The device of claim 1, wherein the device for adjusting the height of the item lock is selected from the group consisting of comprises at least one of a gantry-type overhead crane, a monorail-type overhead crane, and a bridge-type overhead crane.
16. The device of claim 1, wherein the device for adjusting the height of the item lock comprises an angled extension rod.
- 25 17. The device of claim 16, wherein the angled extension rod is operatively coupled to a lifting tower.

18. The device of claim 17, wherein the lifting tower is at least one of secured to the immersion cooling tank and selectively movable along the immersion cooling tank.
19. The device of claim 1, wherein an outer peripheral surface of the condensing coil is adapted to fit within an inner peripheral surface of the immersion cooling tank.
- 5 20. The device of claim 2, wherein at least one outer peripheral dimension of the outer rim portion is larger than at least one inner peripheral dimension of the immersion cooling tank.
21. The device of claim 1, wherein the condensing device comprises an adjustable condensing device having a selectively variable second opening.
22. The device of claim 1 further comprising a cover for the first opening of the immersion
10 cooling tank.
23. The device of claim 22, wherein the cover comprises a sheet with at least one of fixed or variable opening dimensions.
24. A method of hot swapping at least one electronic device from an immersion cooling tank having a first opening, the method comprising:
- 15 providing a condensing device comprising a condensing coil forming a second opening;
selectively adjusting a height and a location of the condensing device about the first opening of the immersion cooling tank;
inserting an item lock into the immersion cooling tank through the second opening; and
removing, with the item lock, the at least one electronic device from the immersion
20 cooling tank via the second opening.
25. The method of claim 24, wherein selectively adjusting the height and the location of the condensing device comprises using a crane.
26. The method of claim 24, wherein inserting the item lock comprises using a pulley system to at least one of raise and lower the item lock.
- 25 27. The method of claim 24, wherein the second opening is smaller than the first opening.

28. A condensing device for use in hot swapping at least one electronic device from an immersion cooling tank having a first opening, the condensing device comprising a condensing coil forming a second opening through which the at least one electronic device is removable.
29. The condensing device of claim 28 further comprising an outer rim portion connected to
5 the condensing coil.
30. The condensing device of claim 29, wherein at least one outer peripheral dimension of the outer rim portion is larger than at least one inner peripheral dimension of the immersion cooling tank.