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(54) Title: DUTY BASED MODULATING HYDRONIC CIRCUIT TECHNOLOGY METHOD AND APPARATUS FOR OPTIMIZED CONFIGURATION OF MULTIPLE HEAT PUMPS

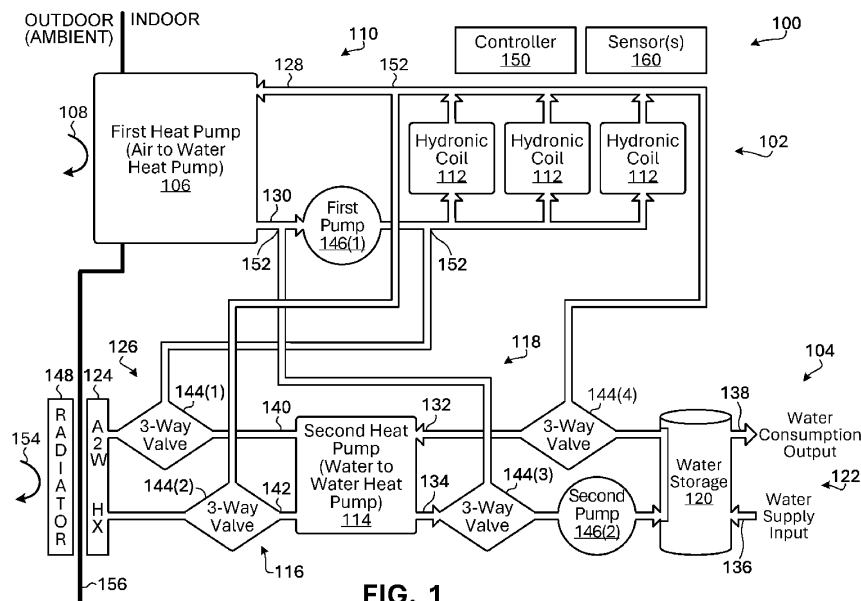


FIG. 1

(57) Abstract: A hydronic system that can co-ordinate heat pumps, valves, and load circuits based on load-based and condition based factors to assess the optimal operating hydronic circuit configuration. In an example, the hydronic system includes: an air to liquid heat pump hydraulically connected to a first load circuit; a liquid to liquid heat pump interfacing with a second source circuit having a hydraulically connected to a second load circuit; a water storage hydraulically connected to the second load circuit, and hydraulically connected to a water consumption circuit having a water supply input and a water consumption output; at least one 3-way valve which hydraulically connects the air to liquid heat pump to the liquid to liquid heat pump; and at least one controller configured to co-ordinate control of the at least one 3-way valve, the air to liquid heat pump, and the liquid to liquid heat pump.

[Continued on next page]

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