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Jansen et al.

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(54) **HEAT EXCHANGER CLEANING PROCESS**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 196 days.

This patent is subject to a terminal disclaimer.

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(65) **Prior Publication Data**

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(51) **Int. Cl.**⁷ **B08B 9/00**

(52) **U.S. Cl.** **134/19; 134/22.1; 134/22.11; 134/22.12; 134/22.14; 134/22.15; 134/22.18; 134/22.19; 134/26; 134/27; 134/30; 134/31; 134/34; 134/35; 134/36; 134/37**

(58) **Field of Search** **134/19, 22.1, 22.11, 134/22.12, 22.14, 22.15, 22.18, 22.19, 26, 27, 30, 31, 34-37**

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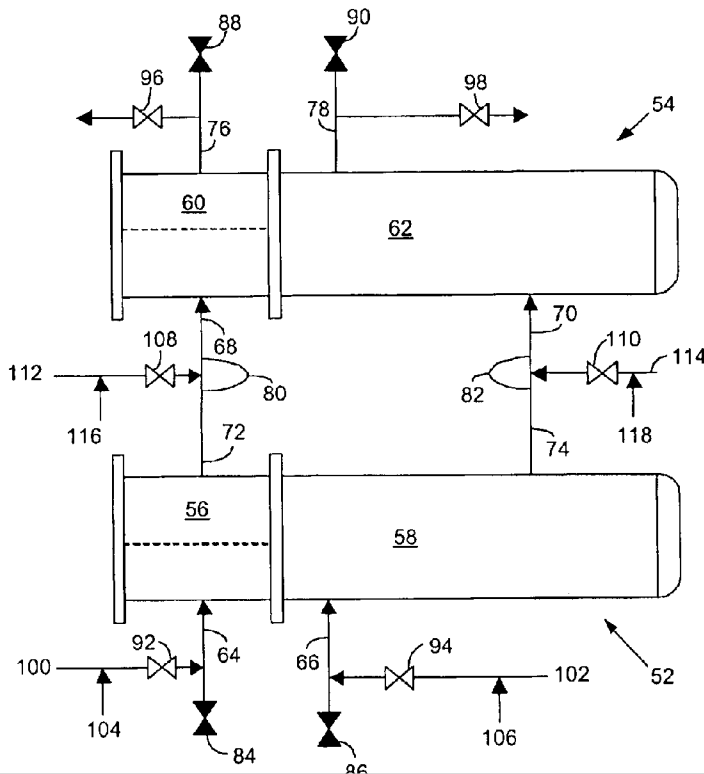
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(57) **ABSTRACT**

Disclosed is a novel process for cleaning and restoring the operating efficiency of organic liquid chemical exchangers in a safe and effective manner and in a very short period of time, without a need to disassemble the equipment and without the need to rinse contaminate from the equipment after cleaning. Used is a formulation of monocyclic saturated terpene mixed with a non-ionic surfactant package specifically suited to oil rinsing. The terpene-based chemical is injected into organically contaminated exchangers using a novel process involving high-pressure steam to form a very effective cleaning vapor.

18 Claims, 7 Drawing Sheets



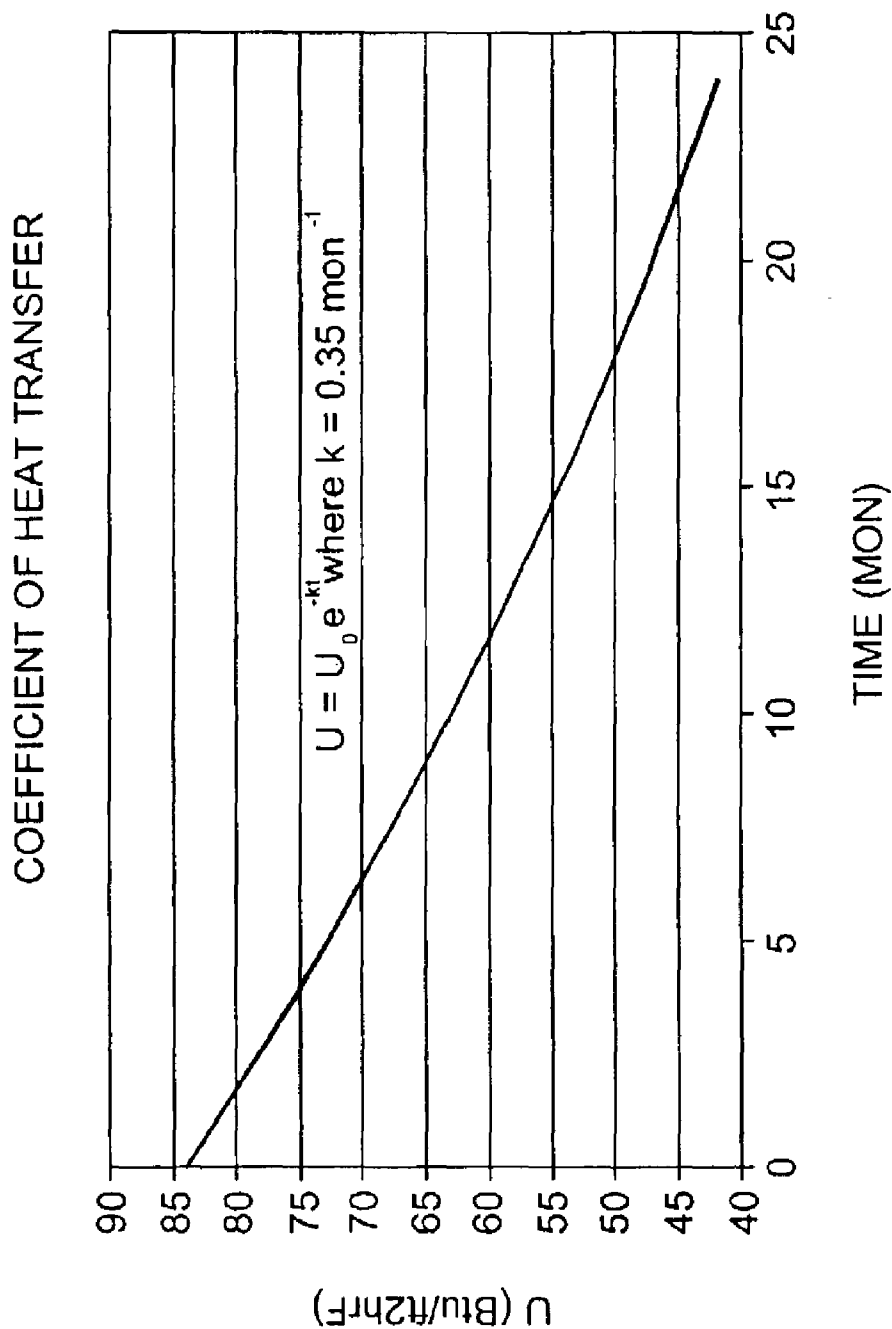


FIG. 1.

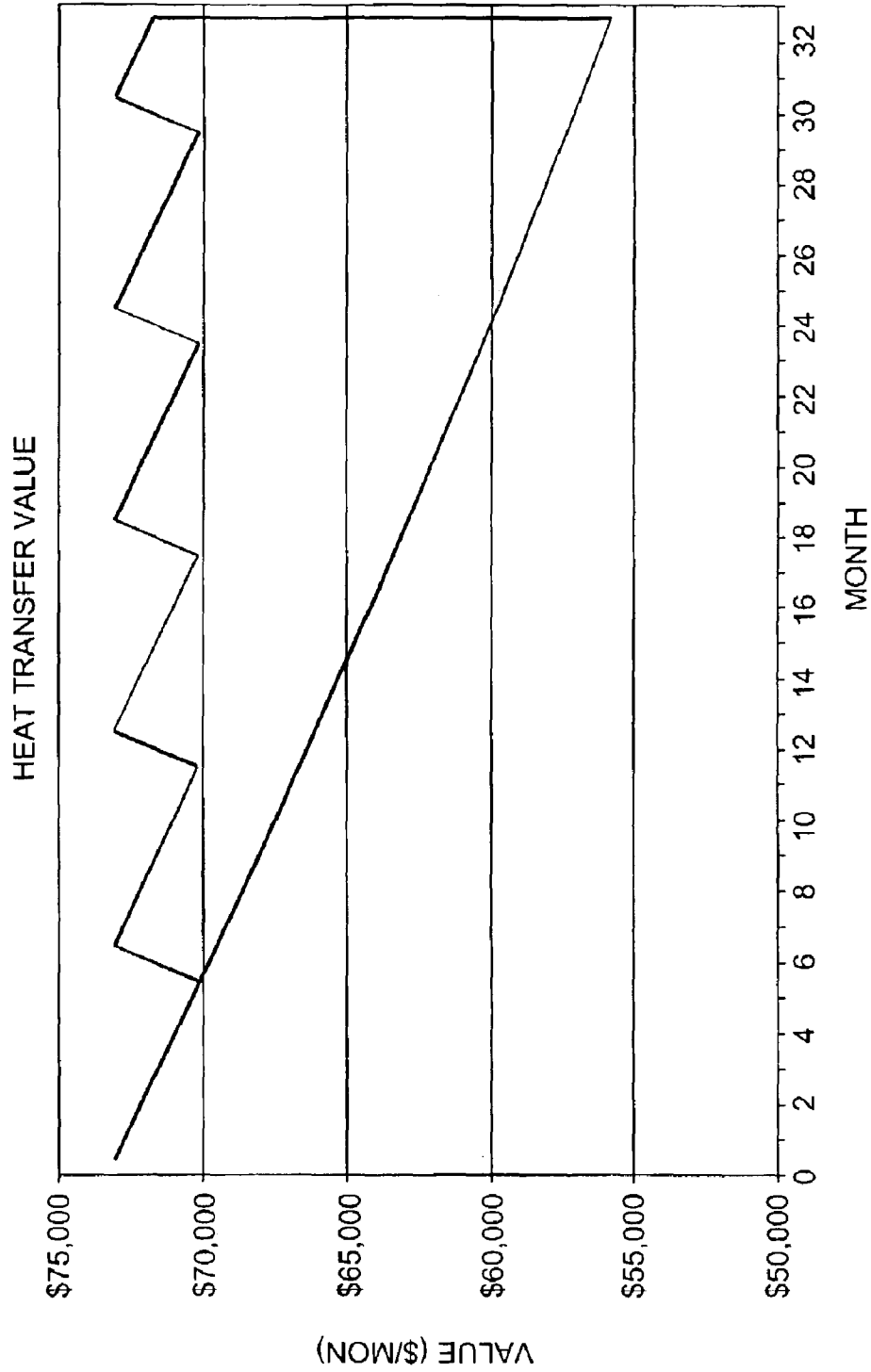


FIG. 2.

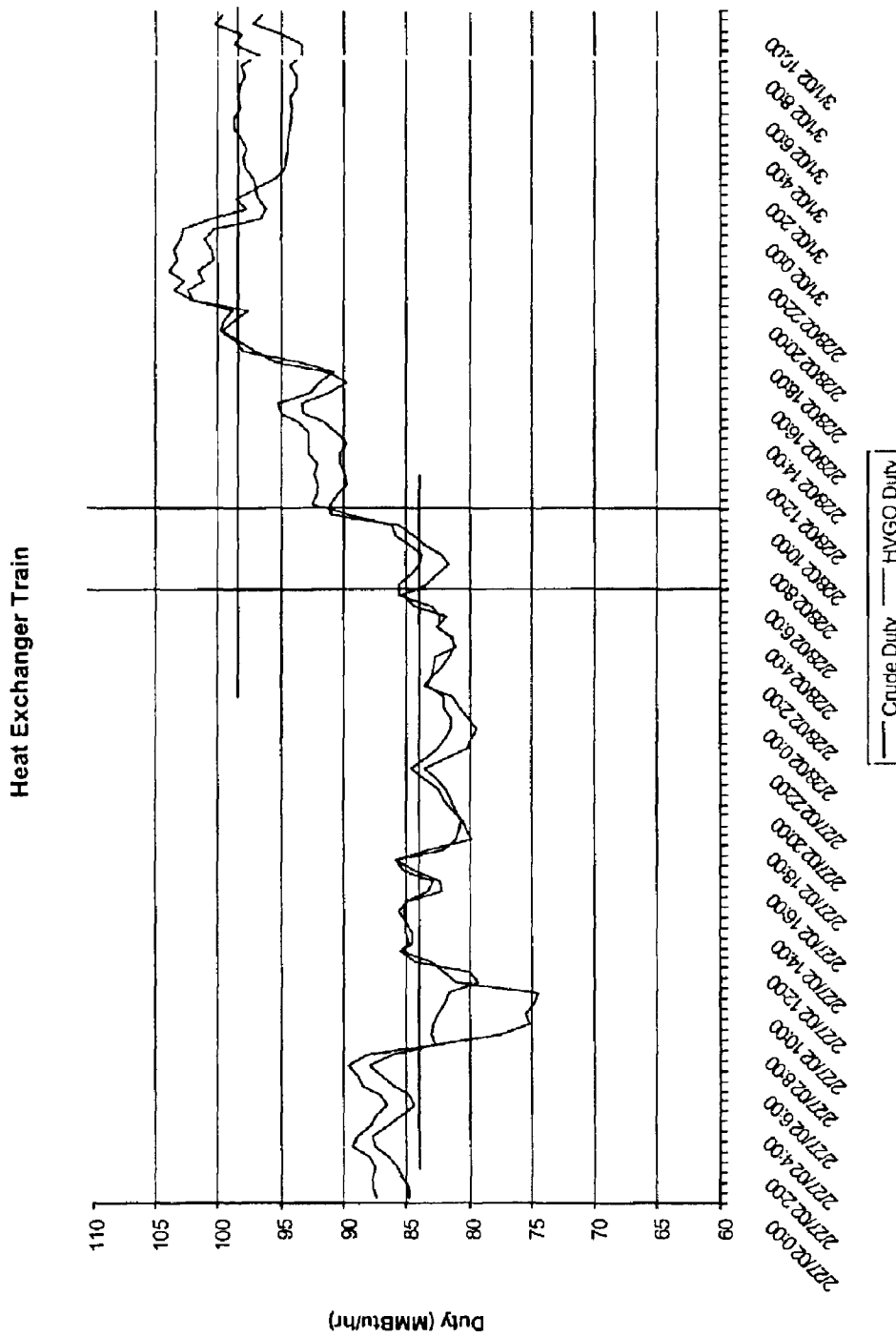


FIG. 3.

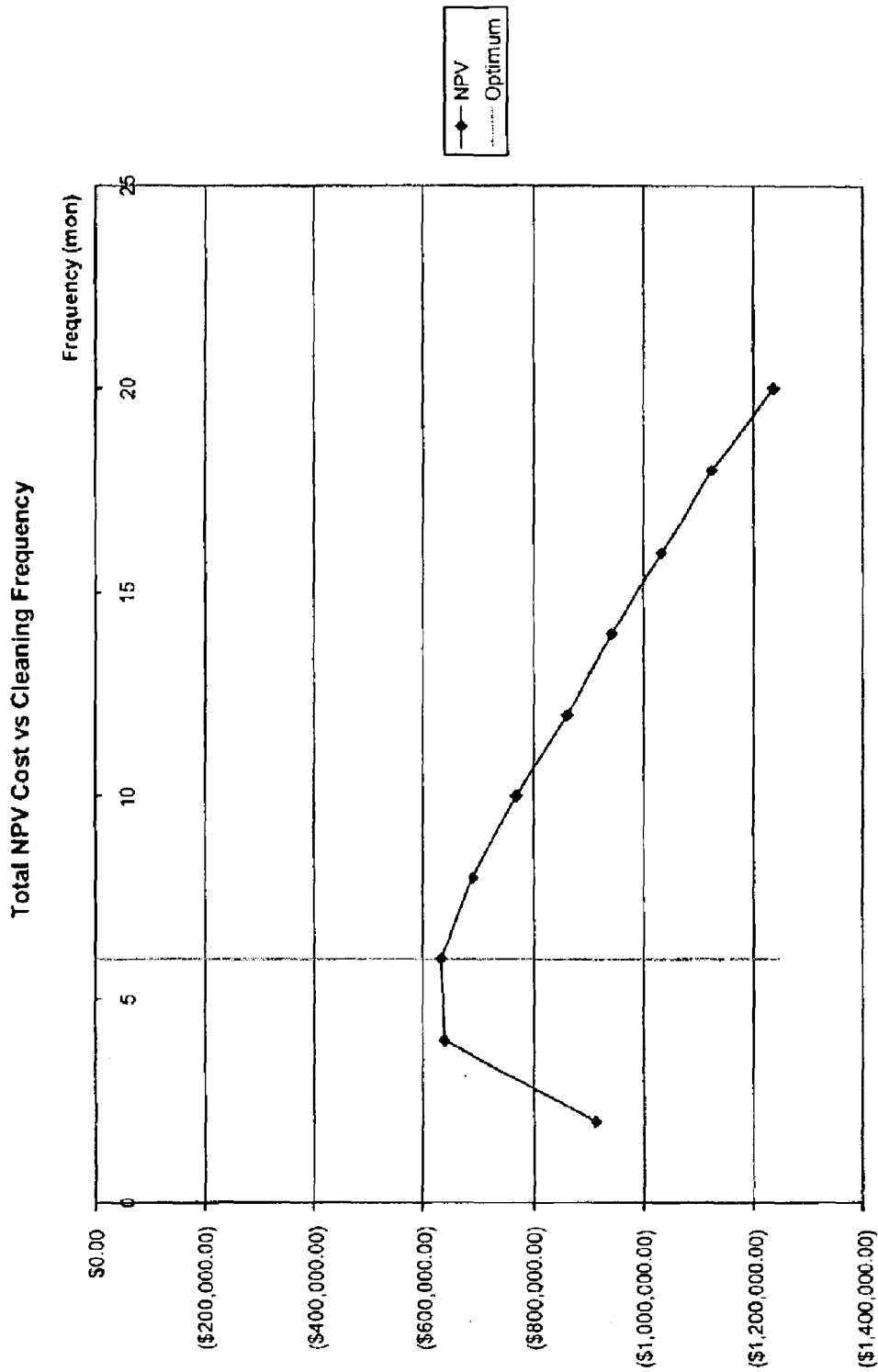


FIG. 4.

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