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United States Patent [19]

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Nabity et al.

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[54] PUMPING SYSTEM

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[75] Inventors: **Frederick A. Nabity; Robert R. Fiedler; James P. Masek; Brian D. Dawson; Russell T. Barker; Frederick D. Sueverkruepp, III; Ralph E. Setter**, all of Lincoln; **Paul G. Wright**, Pleasant Dale; **Larry L. Fritz**, Lincoln, all of Nebr.

Primary Examiner—Thomas P. Noland
 Attorney, Agent, or Firm—Vincent L. Carney

[73] Assignee: **Isco, Inc.**, Lincoln, Nebr.

[57] ABSTRACT

[21] Appl. No.: **387,595**

To select a designated bottle in a sampler, the distributor is calibrated as to position and the outlet of the distributor arm is moved over the desired bottle by counting changes in incremental angular movement of the distributor arm until it is over the bottle. The position of the distributor arm is recorded in memory. To calibrate the distributor, the arm is rotated against a stop member in a first direction, then in a second direction and the overrun of in excess of 360 degrees of the motion of the distributor arm is determined and corrected. A series of random numbers is generated for depositing of samples, the distributor is moved at designated times over the bottles in a random order to deposit a sample and the ordering of bottles is recorded. The rollers of a peristaltic pump are supported to prevent said rollers from compressing said tube more than the thickness of the walls of the tube. A functional module for a bubbler or pH probe or ultrasonic level detector may be connected to the housing.

[22] Filed: **Feb. 13, 1995**

Related U.S. Application Data

[60] Continuation-in-part of Ser. No. 120,724, Sep. 13, 1993, abandoned, which is a division of Ser. No. 807,200, Dec. 12, 1991, Pat. No. 5,401,139, which is a division of Ser. No. 474,154, Feb. 2, 1990, Pat. No. 5,125,801.

[51] Int. Cl.⁶ **G01N 1/14**

[52] U.S. Cl. **73/863.01; 73/864.22; 73/864.34; 141/130; 364/509; 436/50**

[58] Field of Search **73/863.01, 863.02, 73/863.03, 864.34, 864.35, 864.31, 864.22, 864.24, 864.25; 364/509, 499; 422/63, 64, 67; 436/43, 45, 50, 51, 54, 55, 163; 141/130**

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12 Claims, 16 Drawing Sheets

