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NASA TECH BRIEF

NASA Pasadena Office



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Liquid Sample Processor

The problem:

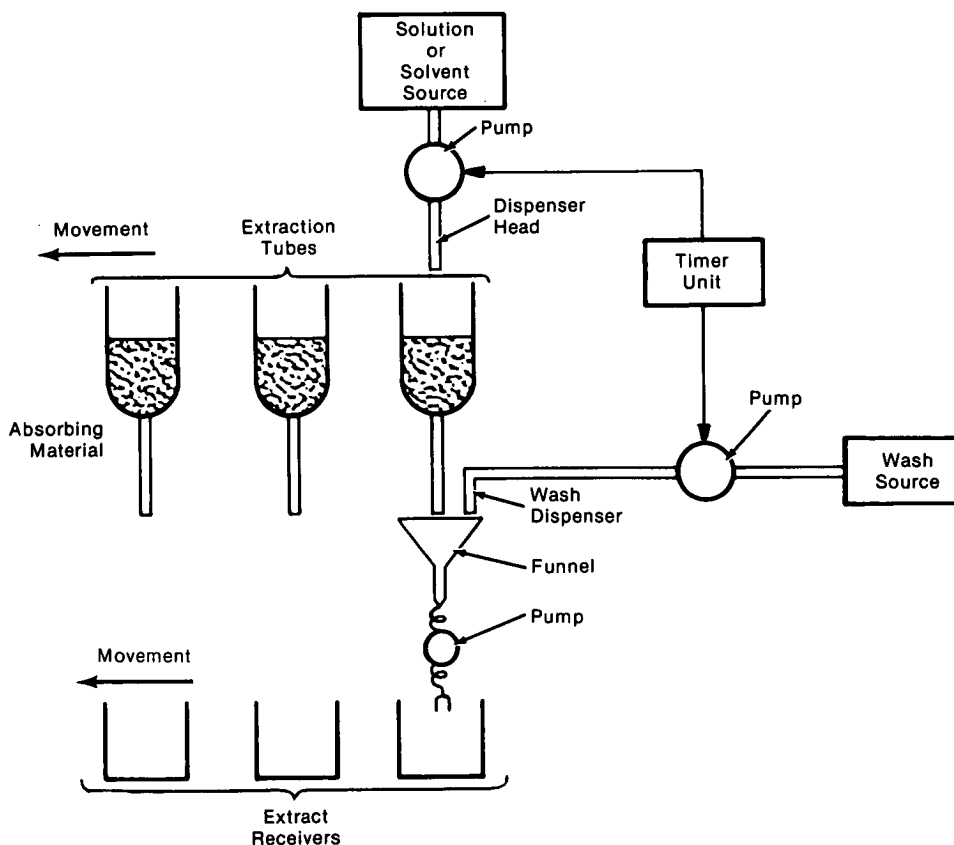
In the recently-developed automated drug identification system, described in NASA Tech Brief B74-10213 (NPO-13063), the liquid test samples are separated manually into four general drug categories before the drugs are identified. The samples are either blood or urine taken from patients suffering from drug overdose. The process of identification is automatic and includes the use of gas chromatographs, a mass spectrometer, and a computer. However, the manual separation slows the process down.

The solution:

Quick sample separation is accomplished with a newly developed processor.

How it's done:

The sample processor, as illustrated, is automatic and includes a series of extraction tubes packed with a fibrous absorbent material of large surface area. When introduced into these tubes, the liquid test samples become completely absorbed by the packing material as a thin film. The tubes are supported on a conventional carousel test-tube transporter. Lined up



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(continued overleaf).

directly under the tubes are extraction receivers which move with the tubes; the motion is controlled by a timer unit.

As each tube-receiver pair is lined up with a dispenser head and a funnel, the mechanism stops. The timer unit then activates a pump located underneath a solution or solvent source. The pump forces the solution or solvent into the tube to bring the pH of the test sample to the proper value. Depending on the pH selected, a certain drug family will be extracted from the material and poured into the extract receiver. Once the extract is in the receiver, the source pump is shut, and a wash source pump is activated to flush the funnel. After the wash is complete, the carousel moves on to line up the next tube-receiver pair.

The source can include only one chemical to separate one drug family. An alternate method is to use several sources filled with different chemicals. The sources are lined up at different points along the carousel radius to process different tube batches simultaneously.

Note:

Requests for further information may be directed to:

Technology Utilization Officer
NASA Pasadena Office
4800 Oak Grove Drive
Pasadena, California 91103
Reference: TSP74-10278

Patent status:

Title to this invention has been waived under the provisions of the National Aeronautics and Space Act [42 U.S.C. 2457(f)], to the California Institute of Technology, Pasadena, California 91109

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