A Haemodialyser
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A small, uncomplicated haemodialyser, based on new principles and a closed-circuit dialysate system, has been developed. Urea is decomposed enzymatically extracorporeally, and ammonia removed immediately (Figure 1). Creatinine and uric acid are eliminated either biologically or physicochemically. The apparatus cleanses and sterilises itself automatically; and inhibits overgrowth of bacteria in the course of haemodialysis (Figures 2 and 3). Similarly, it sterilises the membraneous portion (Figure 4) and removes any excess of calcium. Various types of blood compartments can be used. A special compartment and a blood pump, which does not cause haemodialysis, have been designed (Figure 5). The electrolyte/fluid balance is controllable by a simple means.

REFERENCE
Setälä, K. (1970) Various patent applications

Figure 1
HAEMODIALYZER cleanses & sterilizes itself automatically (PHASE 2)

Figure 2

AMMONIA ELIMINATION (ammonia is gasified by continuous, strong air-bubble stream)

Figure 3
HAEMODIALYZER • itself cleanses & sterilizes the blood compartment (PHASE 3)

Figure 4

BLOOD COMPARTMENT own design

1. Invariable blood film thickness
2. Very low resistance
3. Adjustable dialysate pressure
4. No blood for priming
5. Neither clamps nor adjusting bolts
6. Countercurrent flow
7. Surface area: freely adjustable, eg., from 5,000 to 25,000 cm²
8. Continuous air supply
9. Easiness of removal and replacement
10. Blood volume: 50 ml or less
11. One person (viz. Nurse), alone, prepares ca. 50 blood compartments per day
12. Placed: simply dropped down into its proper position along guiding grooves

BLOOD PUMP ("rubber heart") own design

1. No blood trauma
2. Valveless system
3. Blood tube never occluded
4. Pulse frequency adjustable
5. Energy source: alternating vacuum and atmospheric pressure
6. 2, 3 or 4 extravascularly pulsating balloons

Figure 5