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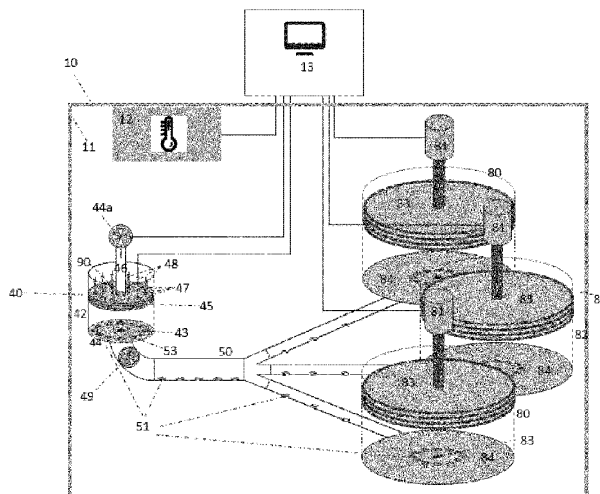
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(54) Title: SIMULATED RESPIRATORY TRACT

FIGURE 1



(57) Abstract: There is described herein a system for determining the interaction between a test atmosphere and a simulated respiratory tract, said system comprising: (a) a first pump comprising: (i) a chamber configured for containing a first volume of gas comprising a test atmosphere; (ii) a first port adapted for receiving and outputting gas and comprising a valve for regulating the flow of gas through the first port, said valve being moveable between open and closed positions, wherein in the open position said valve is openable towards a test atmosphere or surrounding air; (iii) a second port adapted for outputting and receiving gas and comprising a valve for regulating the flow of gas through the second port, said valve being moveable between open and closed positions; (iv) a piston plate in the chamber, said piston plate comprising one or more apertures for the uptake or inflow of gas into the chamber wherein one or more, or each, of the apertures include a valve that is movable between open and closed positions and is capable of regulating the uptake or inflow

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of gas; (b) a second pump comprising: (i) a chamber configured for containing a second volume of gas, wherein the first and second volumes of gas are different; (ii) a port adapted for receiving and outputting gas; and (iii) a motor for controlling the operation of the second pump; (c) a connecting structure operable to transmit the gas from the first pump into the second pump; and (d) one or more openings in the first pump or the second pump or the walls of the connecting structure or a combination of two or more thereof, said openings being capable of receiving a module for containing a cell culture medium or for monitoring conditions in the chamber or for gas sampling or for gas characterisation.