

## Abstract

## APPARATUS, SYSTEMS AND METHODS FOR PROCESSING AND TREATING A BIOLOGICAL FLUID WITH LIGHT

Apparatus (10), systems and methods are disclosed for treating a biological fluid with light. A container (206) of biological fluid is introduced into a fluid treatment chamber (40) where it is contacted with light provided by one or more light sources (60, 70) in proximity to the fluid treatment chamber (40). A light sensing system (650) senses the intensity of illumination of the light. A radiometer (460) may be inserted into fluid treatment chamber (40) to calibrate the light sensing system (650). An electronic control system (600) utilizes an interface circuit board (606) to interface a computer circuit board (602) to a display panel (37), a user interface panel (39, 39a), a relay circuit board (640), light sensors (404) and various other sensors (649). A detector (385) senses agitating movement of a tray (90) that contains biological fluids. Methods include calibrating (781-785), sensing (770-773) and correcting (774-775) light intensity measurements, and determining the length of treatment (776) to reach a desired illumination does. A radiometer (460) is equipped with a plurality of light sensors (469) disposed on both sides to measure light intensity in chamber (40) and to provide a reference for calibrating light sensing system (650).

Figure 1