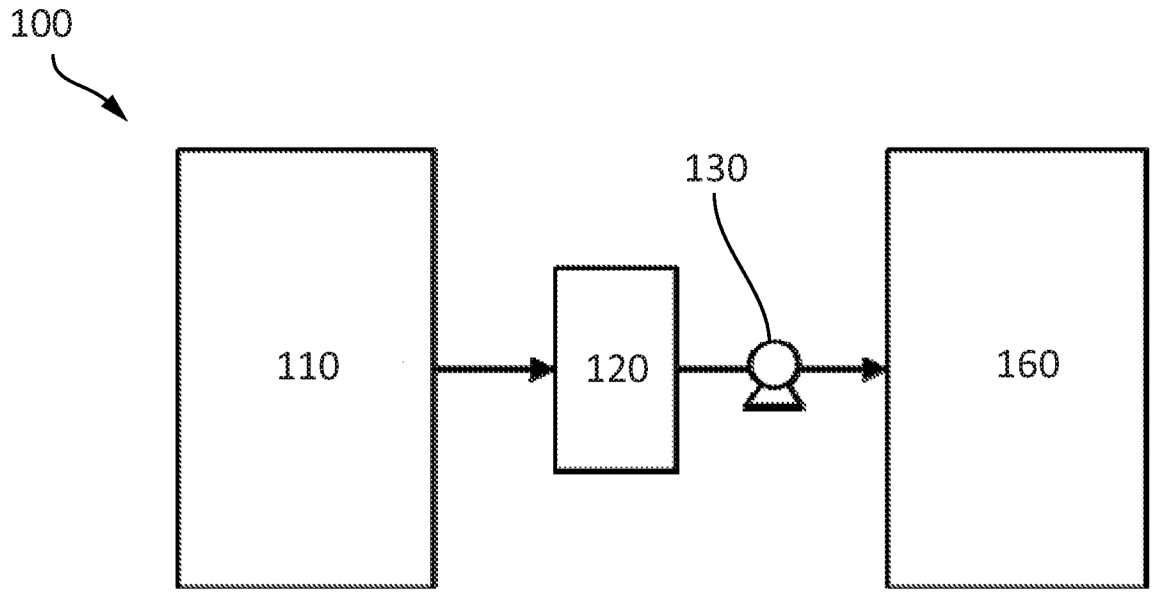

100
110
120
130
160

FIG. 1

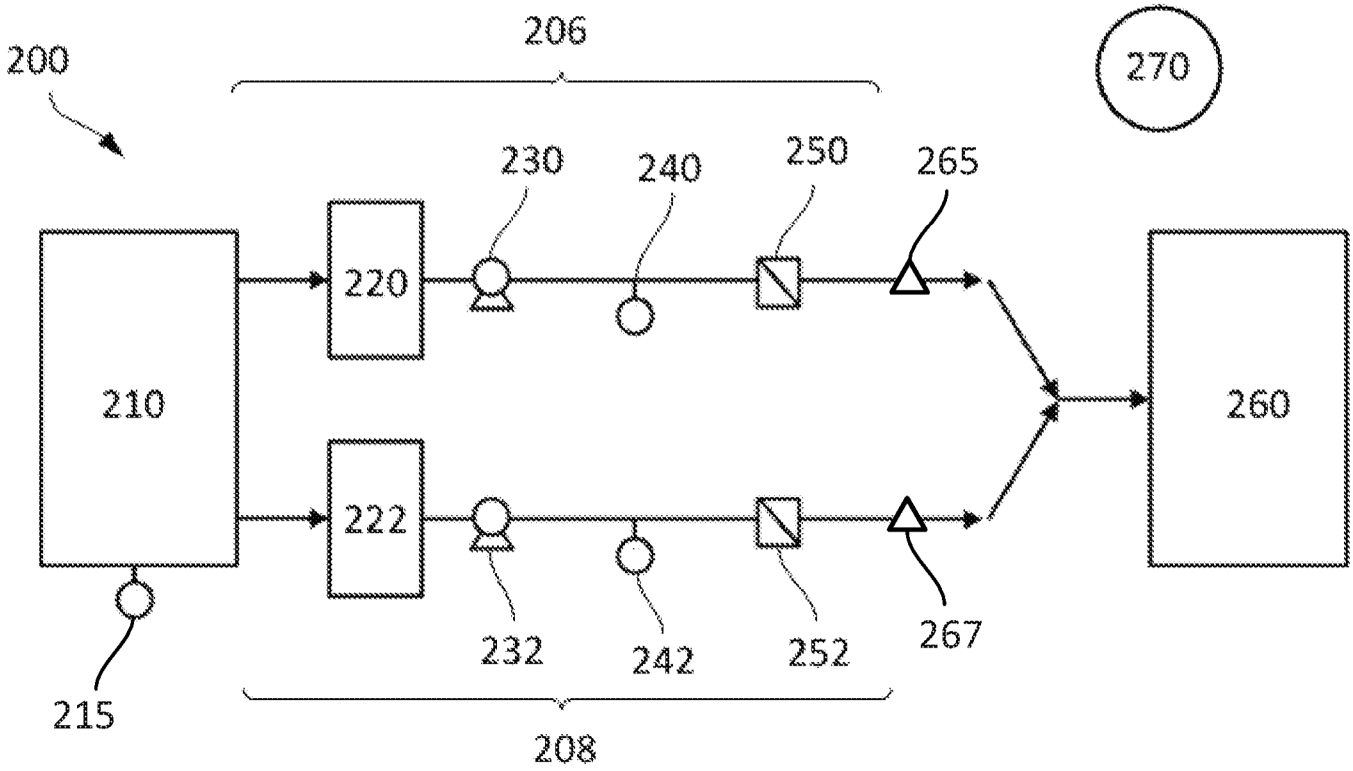

200
206
270
230
240
250
265
220
210
260
222
215
232
242
252
267
208

FIG. 2

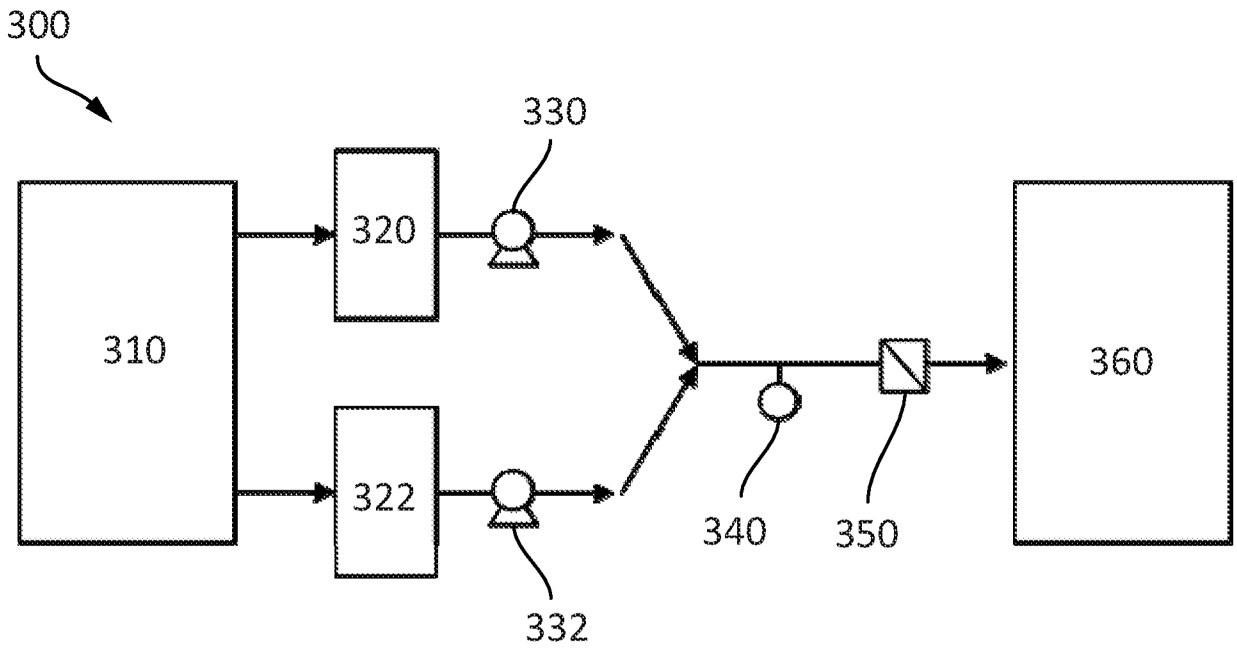

300
330
320
310
360
322
340
350
332

FIG. 3

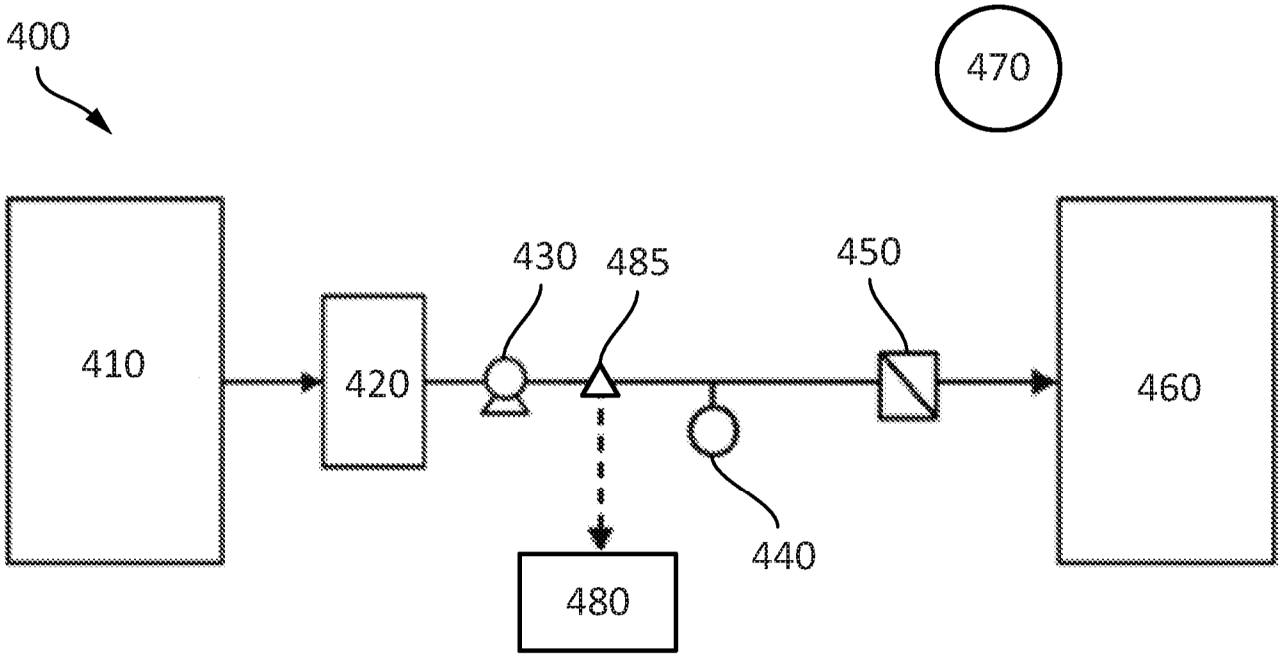

400
470
410
430
485
450
420
460
440
480

FIG. 4

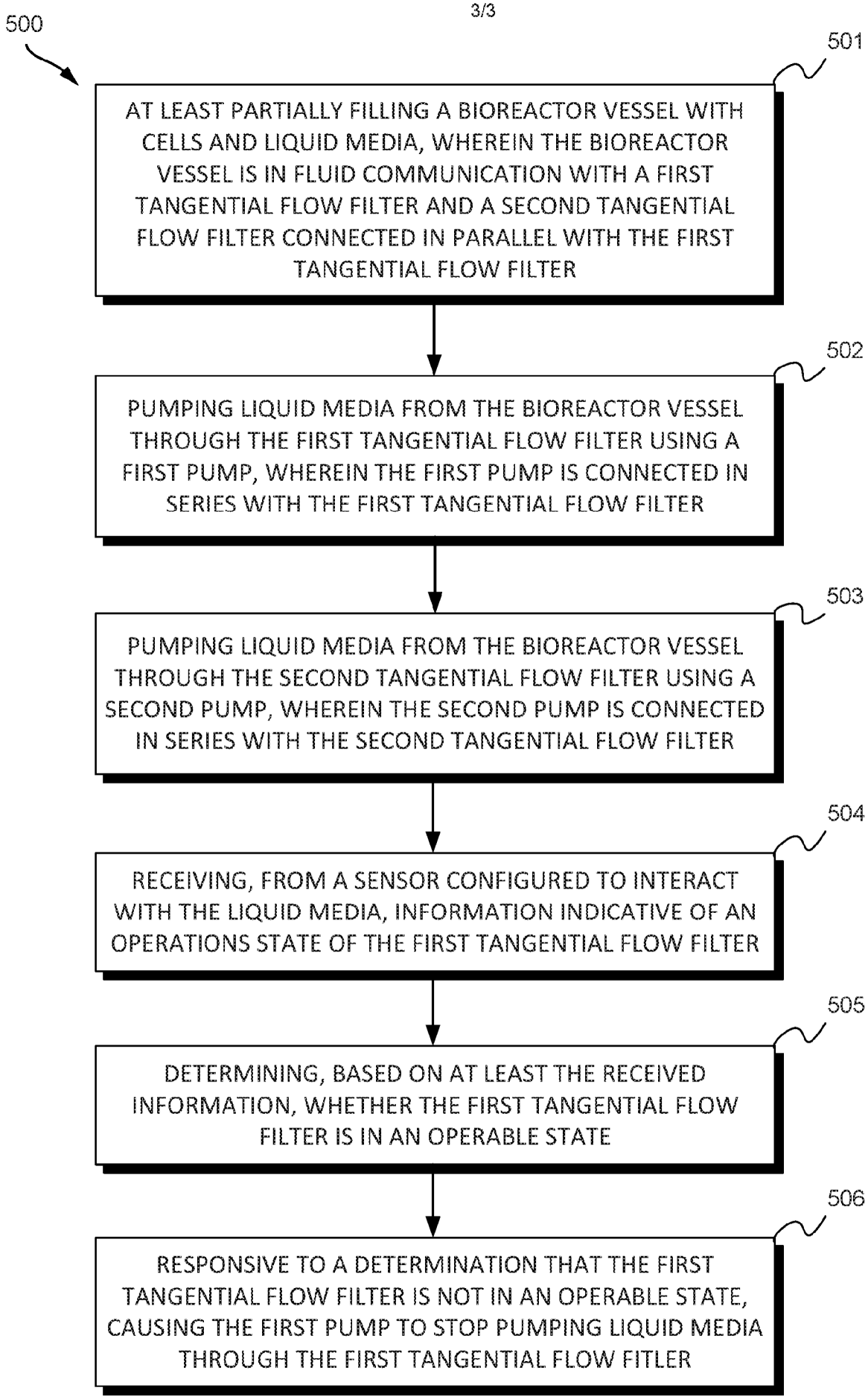

500
501
AT LEAST PARTIALLY FILLING A BIOREACTOR VESSEL WITH CELLS AND LIQUID MEDIA, WHEREIN THE BIOREACTOR VESSEL IS IN FLUID COMMUNICATION WITH A FIRST TANGENTIAL FLOW FILTER AND A SECOND TANGENTIAL FLOW FILTER CONNECTED IN PARALLEL WITH THE FIRST TANGENTIAL FLOW FILTER
502
PUMPING LIQUID MEDIA FROM THE BIOREACTOR VESSEL THROUGH THE FIRST TANGENTIAL FLOW FILTER USING A FIRST PUMP, WHEREIN THE FIRST PUMP IS CONNECTED IN SERIES WITH THE FIRST TANGENTIAL FLOW FILTER
503
PUMPING LIQUID MEDIA FROM THE BIOREACTOR VESSEL THROUGH THE SECOND TANGENTIAL FLOW FILTER USING A SECOND PUMP, WHEREIN THE SECOND PUMP IS CONNECTED IN SERIES WITH THE SECOND TANGENTIAL FLOW FILTER
504
RECEIVING, FROM A SENSOR CONFIGURED TO INTERACT WITH THE LIQUID MEDIA, INFORMATION INDICATIVE OF AN OPERATIONS STATE OF THE FIRST TANGENTIAL FLOW FILTER
505
DETERMINING, BASED ON AT LEAST THE RECEIVED INFORMATION, WHETHER THE FIRST TANGENTIAL FLOW FILTER IS IN AN OPERABLE STATE
506
RESPONSIVE TO A DETERMINATION THAT THE FIRST TANGENTIAL FLOW FILTER IS NOT IN AN OPERABLE STATE, CAUSING THE FIRST PUMP TO STOP PUMPING LIQUID MEDIA THROUGH THE FIRST TANGENTIAL FLOW FITLER

FIG. 5